122-124 Graham Avenue Lurnea NSW 2170

Development Application for a Two into Three Lot Torrens Title Subdivision, Construction of two new Dwellings and Alterations to existing dwelling to include part demolition

ARCHITECTURE & DRAFTING

Title	Scale	Revision	Current Issue Date
COVER SHEET	**NTS**	**0**	**Monday, 28 February 2022**

DWG No.	DESCRIPTION
DA-001	COVER SHEET
DA-002	PROPOSED DEVELOPMENT
DA-003	EXISTING SITE PLAN
DA-004	DEMOLITION SITE PLAN
DA-005	EXISTING SITE FLOOR PLAN
DA-006	EXISTING FLOOR PLAN
DA-007	EXISTING ROOF PLAN
DA-008	EXISTING SITE ELEVATIONS
DA-009	DEMOLITION FLOOR PLAN
DA-010	PROPOSED SUBDIVISION PLAN
DA-011	PROPOSED SITE PLAN
DA-012	SITE ANALYSIS PLAN
DA-013	SEDIMENT CONTROL PLAN
DA-014	PROPOSED SITE FLOOR PLAN
DA-015	PROPOSED LOT 1 GF PLAN
DA-016	PROPOSED LOT 1 RF PLAN
DA-017	PROPOSED LOT 2/3 GF PLAN
DA-018	PROPOSED LOT 2/3 FF PLAN
DA-019	PROPOSED LOT 2/3 RF PLAN
DA-020	PROPOSED SITE ELEVATIONS
DA-021	PROPOSED ELEVATIONS (3)
DA-022	PROPOSED ELEVATIONS (4)
DA-023	PROPOSED ELEVATIONS (5)
DA-024	SECTIONS
DA-025	GLAZING SCHEDULE
DA-026	21st JUNE SHADOW DIAGRAMS (1)
DA-027	21st JUNE SHADOW DIAGRAMS (2)
DA-028	EXTERNAL FINISHES SCHEDULE

Rev	Description	Drft	Issued
O	RFI Changes-Fence, Mirror	MM	28/02/22
N	RFI Changes-Driveway	MM	08/02/22
M	RFI Changes V.2	MM	05/10/21
L	RFI Changes V.1	MM	10/09/21
K	RFI_v3	JA	23/02/21

Client:

Dale Beaumont

Development Application for a Two into Three Lot Torrens Title Subdivision, Construction of two new Dwellings and Alterations to existing dwelling to include part demolition

122-124 Graham Avenue Lurnea NSW 2170

Town Planner: TVD
Drawn By: JA/MM
Checked By: GC
Revision: **O**
Scale: **1:2.21 @ A3**

Drawing Name: **PROPOSED DEVELOPMENT**

Drawing Number: **DA-002**

Figured dimensions take precedence over scale dimensions. Contractors must verify all dimensions on site before commencing any work or making shop drawings.

p: 1300 008138
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ABN 89 104 442 337
Bradax Pty Ltd
Nominated Architect: Giuseppe Calabrese 8079

GRAHAM AVENUE

two-storey
brick residence
(tiled roof)

two-storey
brick residence
(tiled roof)

awning

#120 two-storey
brick residence
(tiled roof)

awning

LOT 3
DP 1013170

SP 72187

two-storey
brick residence
(tiled roof)

power pole

concrete footpath

colorbond fence

colorbond fence

66.430
8°47'20"

colorbond fence

grass area

grass area

hoist

grass area

LOT 6
SEC 29
DP 4849
637.73 m²

51.67

51.50

grass area

9.600

colorbond fence

awning

vehicle crossing

concrete driveway

50.33

50.50

50.67

concrete carport

fibro garage/outhouse
(metal roof)
ridge RL 54.19

water tap

drainage pit

tree stump

chicken pen

51.33

gutter RL 53.25

66.430
8°47'20"

51.17

98°46'40"

water meter

50.00

50.17

concrete area

masonry

single storey
clad residence
(tiled roof)
ridge RL 56.00

drainage pit

concrete alfresco

grass area

grass area

gas meter

49.67

metal screening

sewer lamp hole

verandah

retaining walls

50.67

LOT 5
SEC 29
DP 4849
637.73 m²

51.00

tree
0.2 dia
5s/ 5h

9.600

colorbond fence

concrete footpath

polycarb screen

gutter RL 53.25

8°47'20"
66.430

telstra pit

garden area

colorbond fence

colorbond fence

SP 63357

#126a/b two-storey
duplex brick residence
(tiled roof)

#128 single-storey
brick residence
(tiled roof)

metal carport

Rev	Description	Drft	Issued
O	RFI Changes-Fence, Mirror	MM	28/02/22
N	RFI Changes-Driveway	MM	08/02/22
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K	RFI_v3	JA	23/02/21

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122-124 Graham Avenue Lurnea NSW 2170

Town Planner: TVD Revision: **O**
Drawn By: JA/MM Scale: **1:200 @ A3**
Checked By: GC

Drawing Name: **EXISTING SITE PLAN**

Drawing Number: **DA-003**

Figured dimensions take precedence over scale dimensions. Contractors must verify all dimensions on site before commencing any work or making shop drawings.

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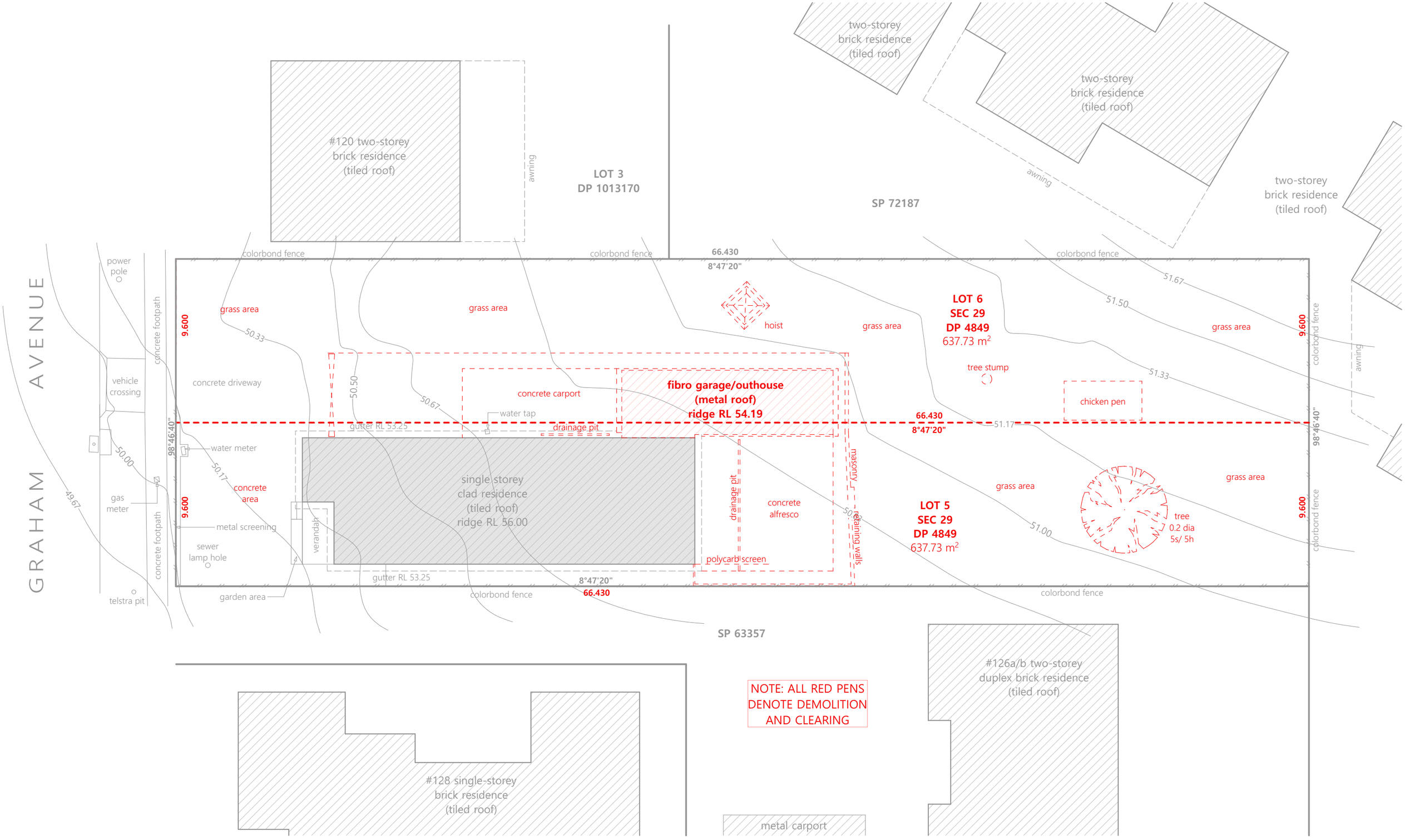

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O	RFI Changes-Fence, Mirror	MM	28/02/22
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122-124 Graham Avenue Lurnea NSW 2170

Town Planner: TVD Revision: **O**
Drawn By: JA/MM Scale: **1:200 @ A3**
Checked By: GC

Drawing Name: **DEMOLITION SITE PLAN**

Drawing Number: **DA-004**

Figured dimensions take precedence over scale dimensions. Contractors must verify all dimensions on site before commencing any work or making shop drawings.

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#120 dwelling

#114 group of dwellings

#114 group of dwel

pole

AVENUE

GRAHAM

grass area

grass area

grass area

driveway

carport

garage/
workshop

open kitchen/
laundry

chicken pen

bed 2

kitchen/meals

bath

study

existing site coverage
211.23 m²

family/rumpus

alfresco

porch

lounge

master
suite

wir

ens

bed 3

grass area

#126a/b duplex dwelling

#128 dwelling

#128 dwelling

#128 garage

Rev	Description	Drft	Issued
O	RFI Changes-Fence, Mirror	MM	28/02/22
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122-124 Graham Avenue Lurnea NSW 2170

Town Planner: TVD Revision: **O**
Drawn By: JA/MM Scale: **1:200 @ A3**
Checked By: GC

Drawing Name: **EXISTING SITE FLOOR PLAN**

Drawing Number: **DA-005**

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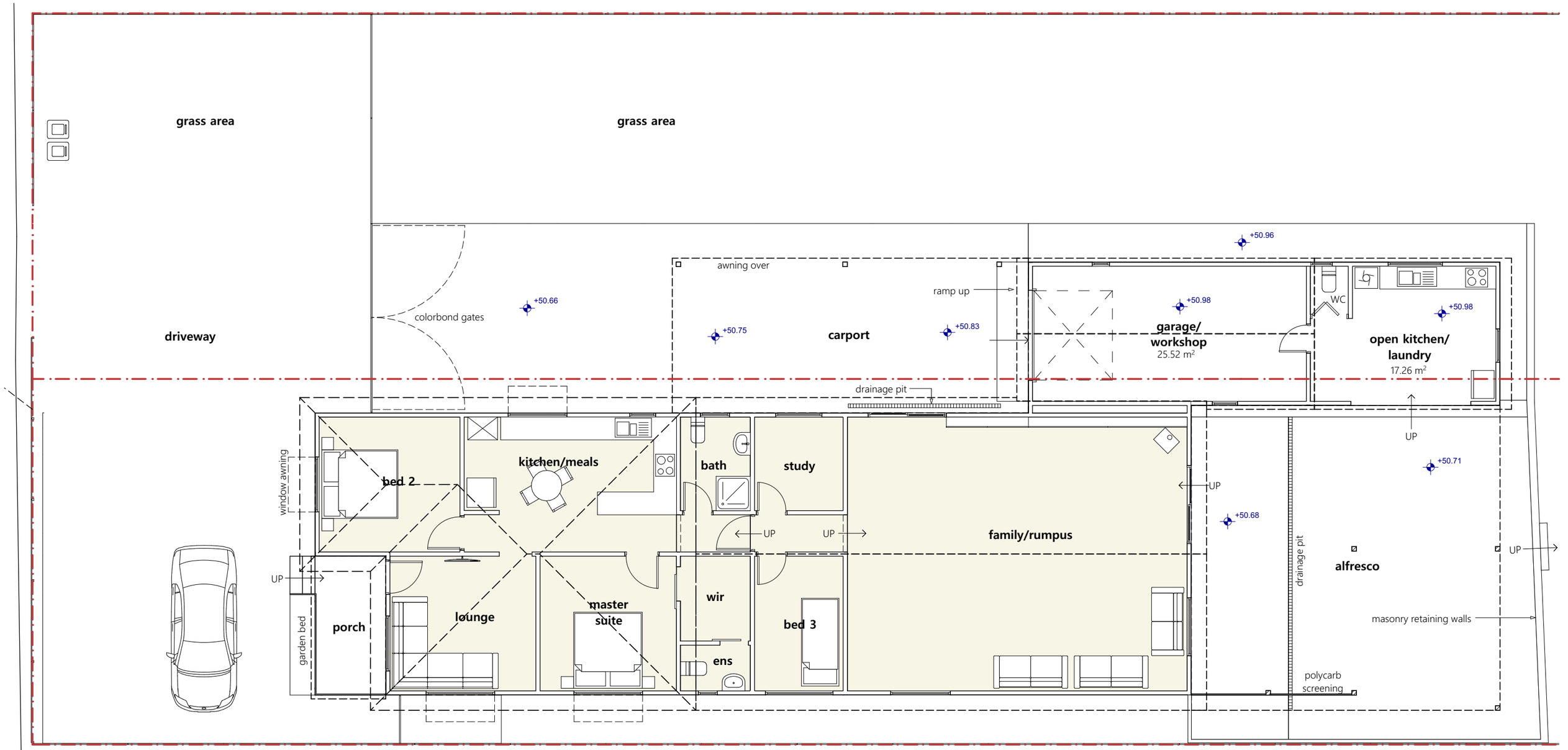

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K	RFI_v3	JA	23/02/21

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122-124 Graham Avenue Lurnea NSW 2170

Town Planner: TVD
Drawn By: JA/MM
Checked By: GC
Revision: **O**
Scale: **1:100 @ A3**

Drawing Name: **EXISTING FLOOR PLAN**

Drawing Number: **DA-006**

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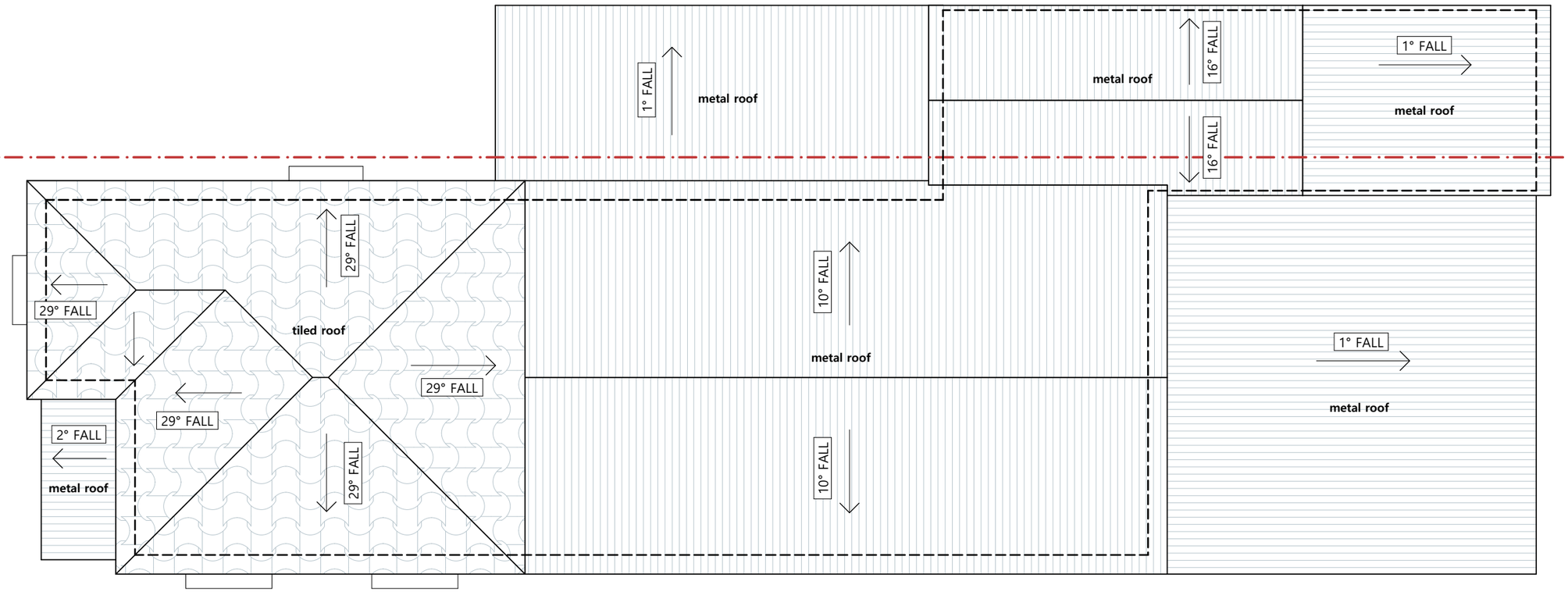

Rev	Description	Drft	Issued
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N	RFI Changes-Driveway	MM	08/02/22
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122-124 Graham Avenue Lurnea NSW 2170

Town Planner: TVD
Drawn By: JA/MM
Checked By: GC
Revision: **O**
Scale: **1:100 @ A3**

Drawing Name: **EXISTING ROOF PLAN**

Drawing Number: **DA-007**

Figured dimensions take precedence over scale dimensions. Contractors must verify all dimensions on site before commencing any work or making shop drawings.

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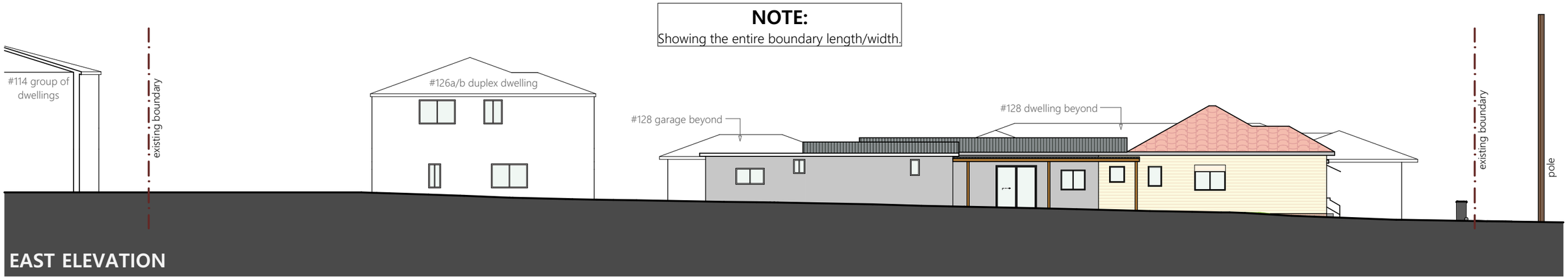
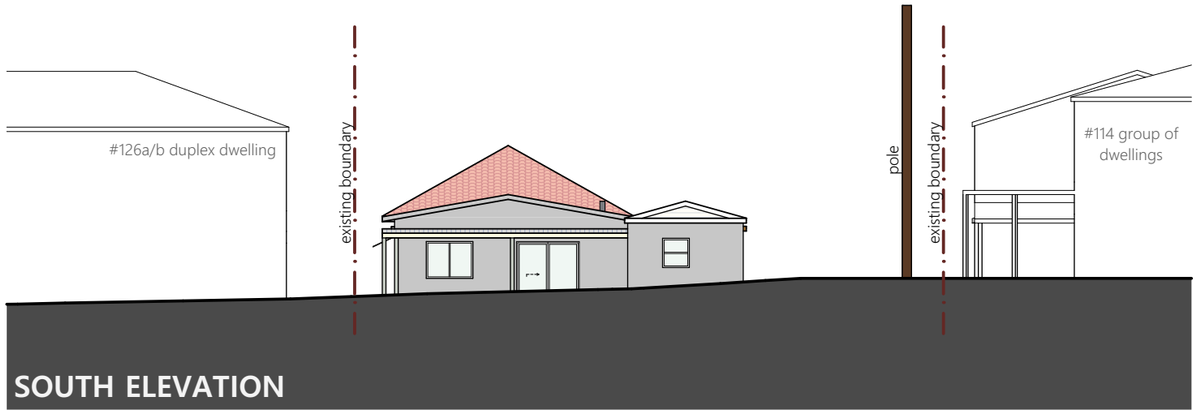
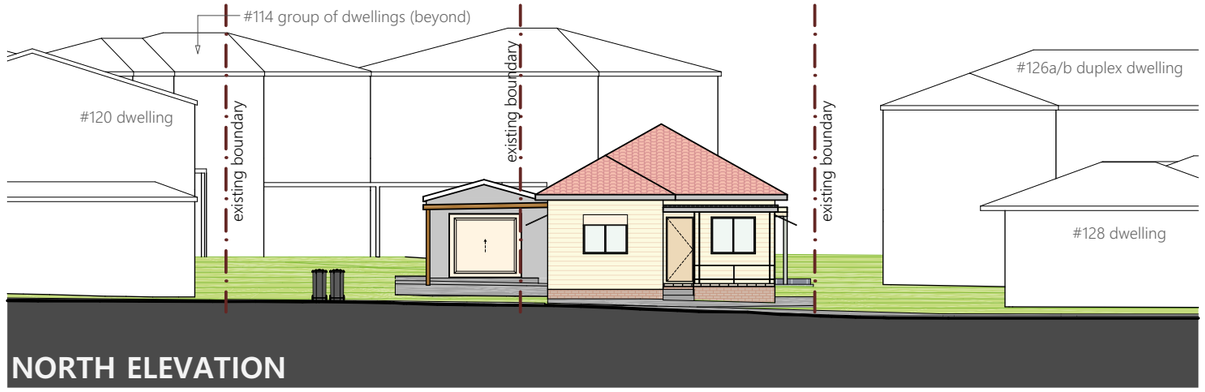
NOTE:
Showing the entire boundary length/width.



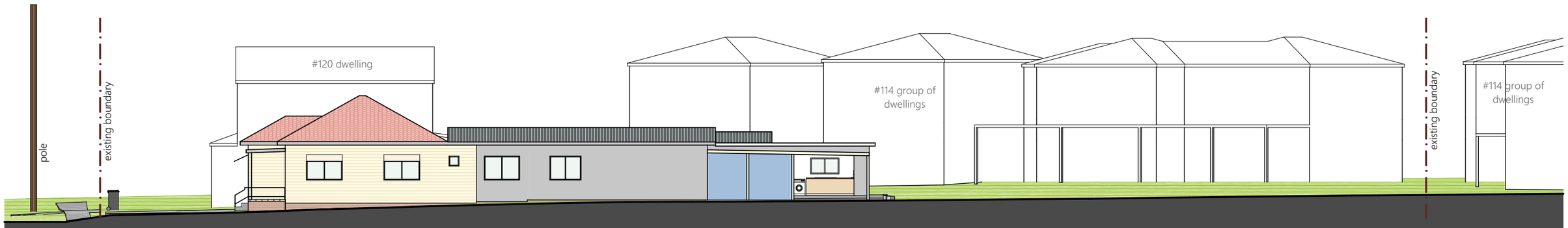
EAST ELEVATION



SOUTH ELEVATION



NORTH ELEVATION



WEST ELEVATION

Rev	Description	Drft	Issued
O	RFI Changes-Fence, Mirror	MM	28/02/22
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M	RFI Changes V.2	MM	05/10/21
L	RFI Changes V.1	MM	10/09/21
K	RFI_v3	JA	23/02/21

NOTE:
Colours are indicative only and do not represent actual finishes' shading, texture, appearance and their overall properties.

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122-124 Graham Avenue Lurnea NSW 2170

Town Planner: TVD
Drawn By: JA/MM
Checked By: GC
Revision: **O**
Scale: **1:200 @ A3**

Drawing Name: **EXISTING SITE ELEVATIONS**

Drawing Number: **DA-008**

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AVENUE

GRAHAM

#120 dwelling

#114 group of dwellings

#114 group of dwel

previous waste management area

new driveway to be installed (see proposed plans)

grass area

grass area

existing grate drain to be removed (new landscape features to be installed)

colorbond fence/ gate to be replaced

areas to be removed
- Carport
- Garage/Workshop
- Open Kitchen/Laundry
- Alfresco

grass area

driveway

previous boundary line

carport

garage/ workshop

open kitchen/ laundry

chicken pen

rooms to be swapped

entry door to be relocated

bed 2

kitchen/meals

bath

study

study replaced to laundry

door to be removed

family/rumpus

alfresco

grass area

porch

lounge

master suite

wir

bed 3

ens

cut hole for future window

railings and posts to be replaced

colorbond gate to be replaced

area to be divided into 2 new rooms (see proposed plans)

#126a/b duplex dwelling

#128 dwelling

#128 dwelling

#128 garage

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O	RFI Changes-Fence, Mirror	MM	28/02/22
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122-124 Graham Avenue Lurnea NSW 2170

Town Planner: TVD Revision: **O**
Drawn By: JA/MM Scale: **1:200 @ A3**
Checked By: GC

Drawing Name: **DEMOLITION FLOOR PLAN**

Drawing Number: **DA-009**

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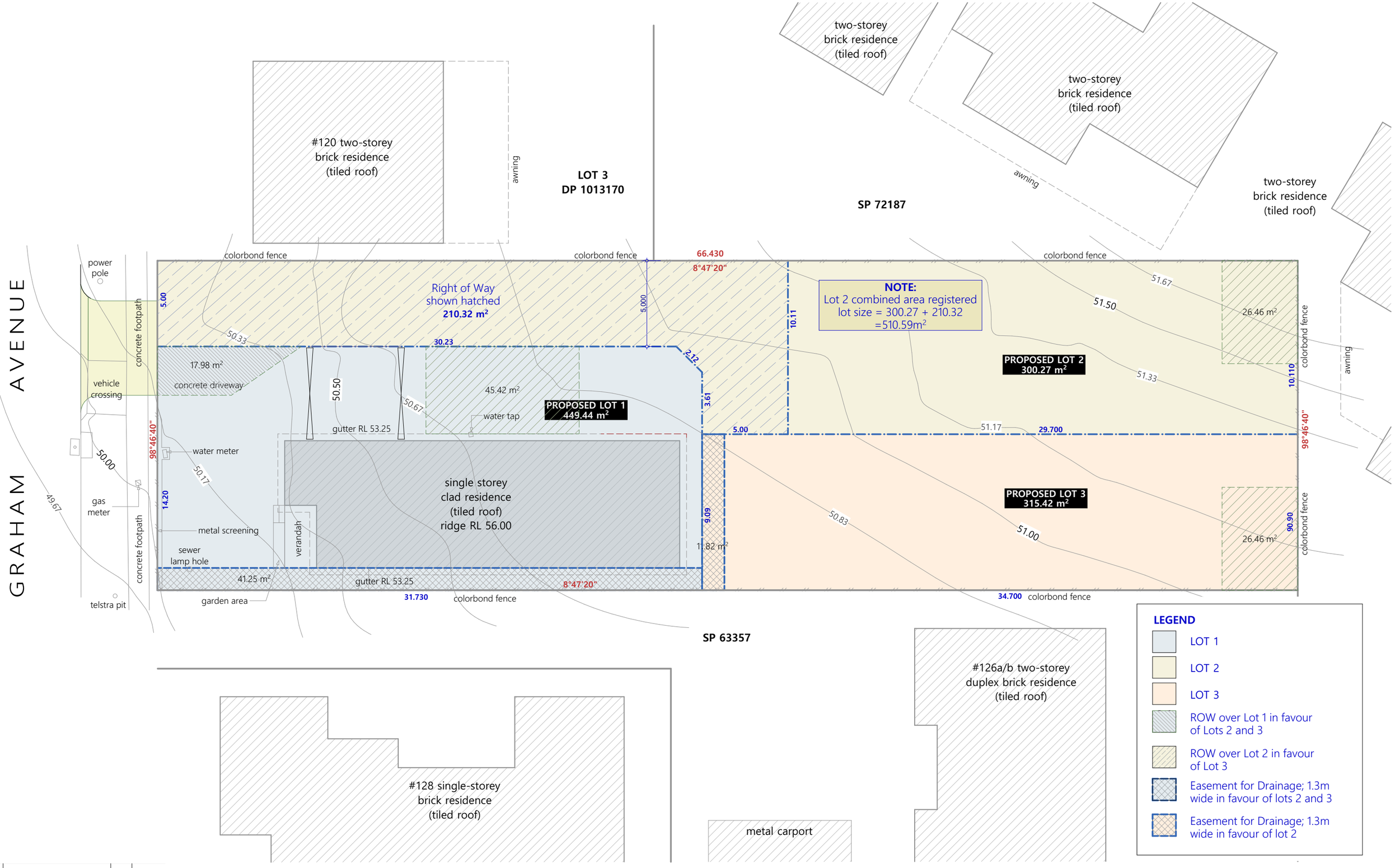

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O	RFI Changes-Fence, Mirror	MM	28/02/22
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122-124 Graham Avenue Lurnea NSW 2170

Town Planner: TVD
Drawn By: JA/MM
Checked By: GC
Revision: **O**
Scale: **1:200 @ A3**

Drawing Name: **PROPOSED SUBDIVISION PLAN**

Drawing Number: **DA-010**

Figured dimensions take precedence over scale dimensions. Contractors must verify all dimensions on site before commencing any work or making shop drawings.

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GRAHAM AVENUE

#120 two-storey brick residence (tiled roof)

awning

LOT 3
DP 1013170

SP 72187

two-storey brick residence (tiled roof)

two-storey brick residence (tiled roof)

awning

two-storey brick residence (tiled roof)

yellow shading denote combined entry/exit crossovers for all lots

power pole

colorbond fence

colorbond fence

66.430
8°47'20"

colorbond fence

new vehicle crossing

concrete footpath

vehicle crossing

5.00

shading denotes right of way
total area = 210.32 m²

5,000

50.33

30.23

new location of gates

proposed boundary lines

2.12

17.98 m²

concrete driveway

50.50

new concrete carpark

50.67

5,489 SETBACK

45.42 m²

PROPOSED LOT 1
449.44 m²

3.61

10.11

10,800 SETBACK

additional gates

water tap

gutter RL 53.25

5,000

5.00

PROPOSED LOT 2
300.27 m2

3,610 SETBACK

3,860 SETBACK

51.67

51.50

alfrecso

4,510 SETBACK

26.46 m²

proposed building footprint for residence 2
113.77 m²
FFL 51.47

51.33

5,000 SETBACK

10,110

colorbond fence

awning

98°46'40"

water meter

50.00

50.17

7,416 SETBACK

14.20

single storey clad residence (tiled roof) ridge RL 56.00

EXISTING BUILDING FOOTPRINT
163.74m²

1,304 SETBACK

12,104
DISTANCE BETWEEN TWO BUILDINGS

9.09

10,800 SETBACK

50.83

51.17

29.700

900 SETBACK

1,420 SETBACK

900 SETBACK

98°46'40"

PROPOSED LOT 3
315.42 m2

proposed building footprint for residence 3
107.69 m²
FFL 51.17

5,000 SETBACK

gas meter

49.67

metal screening

sewer lamp hole

verandah

1.82 m²

51.00

2,590 SETBACK

2,840 SETBACK

alfresco

4,000 SETBACK

26.46 m²

90.90

colorbond fence

concrete footpath

41.25 m²

gutter RL 53.25

8°47'20"

garden area

31.730

colorbond fence

1,300 SETBACK

900 SETBACK

34.700

colorbond fence

telstra pit

SP 63357

#126a/b two-storey duplex brick residence (tiled roof)

#128 single-storey brick residence (tiled roof)

metal carport

SITE COVERAGE proposed lot 1	
site area	449.44m²
proposed site coverage	163.74 m²
37.08% of the total site area	

SITE COVERAGE proposed lot 2	
site area	300.27 m²
proposed site coverage	113.77 m²
37.89% of the total site area	

SITE COVERAGE proposed lot 3	
site area	315.42 m²
proposed site coverage	107.69 m²
34.14% of the total site area	

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Town Planner: TVD
Drawn By: JA/MM
Checked By: GC
Revision: **O**
Scale: **1:200 @ A3**

Drawing Name: **PROPOSED SITE PLAN**

Drawing Number: **DA-011**

Figured dimensions take precedence over scale dimensions. Contractors must verify all dimensions on site before commencing any work or making shop drawings.

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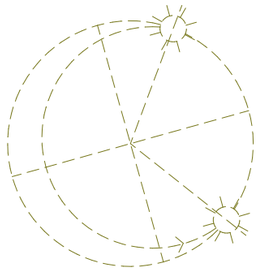

movement of summer sun

#120 two-storey brick residence (tiled roof)

NORTH-EASTERLY PREVAILING WIND
COOL IN SUMMER
WARM IN WINTER

awning

LOT 3
DP 1013170

two-storey brick residence (tiled roof)

two-storey brick residence (tiled roof)

awning

SOUTHERLY PREVAILING WIND
COLD IN WINTER
COOL IN SUMMER

two-storey brick residence (tiled roof)

SP 72187

WINTER
MORNING SUN
SUMMER

66.430
8°47'20"

colorbond fence

colorbond fence

colorbond fence

AVENUE

GRAHAM

power pole

light local traffic noise

VEHICULAR ENTRY AND EXIT

5.00

50.33

30.23

2.12

3.61

10.11

concrete footpath

vehicle crossing

concrete driveway

50.50

50.67

45.42 m²

water tap

gutter RL 53.25

PASSIVE SURVEILLANCE

98°46'40"

water meter

50.17

50.00

gas meter

14.20

49.67

metal screening

sewer lamp hole

single storey clad residence (tiled roof) ridge RL 56.00

verandah

MID-DAY

9.09

50.83

proposed dwelling 2

51.67

51.50

51.33

26.46 m²

colorbond fence

10.110

awning

51.17

29.700

98°46'40"

proposed dwelling 3

51.00

26.46 m²

90.90

colorbond fence

light local traffic noise

telstra pit

concrete footpath

garden area

gutter RL 53.25

8°47'20"

31.730

colorbond fence

34.700

colorbond fence

SP 63357

SUMMER

#126a/b two-storey duplex brick residence (tiled roof)

AFTERNOON SUN

WINTER

NORTH-WESTERLY PREVAILING WIND
WARM IN WINTER
HOT IN SUMMER

movement of winter sun

#128 single-storey brick residence (tiled roof)

metal carport

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Town Planner: TVD
Drawn By: JA/MM
Checked By: GC
Revision: **O**
Scale: **1:200 @ A3**

Drawing Name: **SITE ANALYSIS PLAN**

Drawing Number: **DA-012**

Figured dimensions take precedence over scale dimensions. Contractors must verify all dimensions on site before commencing any work or making shop drawings.

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GRAHAM AVENUE

two-storey brick residence (tiled roof)

two-storey brick residence (tiled roof)

awning

two-storey brick residence (tiled roof)

#120 two-storey brick residence (tiled roof)

awning

LOT 3
DP 1013170

SP 72187

SEDIMENT BARRIER TO BE INSTALLED TO DISTURBED AREA AS SHOWN

colorbond fence

colorbond fence

66.430
8°47'20"

colorbond fence

power pole

concrete footpath

5.00

VEHICLE MOVEMENTS TO BE RESTRICTED TO A STABILISED ACCESS

50.33

30.23

2.12

10.11

51.67

51.50

26.46 m²

colorbond fence

vehicle crossing

concrete driveway

50.50

50.67

NOMINAL GARBAGE
45.42 m² SKIP AREA + STOCKPILE AREA

water tap

3.61

proposed dwelling 2

51.33

10.110

awning

gutter RL 53.25

5.00

30.63 m²

51.17

29.700

98°46'40"

water meter

50.00

50.17

98°46'40"

14.20

single storey clad residence (tiled roof) ridge RL 56.00

proposed dwelling 3

gas meter

49.67

concrete footpath

metal screening

sewer lamp hole

verandah

9.09

30.64 m²

50.83

51.00

26.46 m²

90.90

colorbond fence

gutter RL 53.25

8°47'20"

31.730

colorbond fence

garden area

telstra pit

34.700

colorbond fence

NOMINAL WET/ WASHING AREA

DIVERTED WASTE WATER

SP 63357

#126a/b two-storey duplex brick residence (tiled roof)

#128 single-storey brick residence (tiled roof)

metal carport

Rev	Description	Drft	Issued
O	RFI Changes-Fence, Mirror	MM	28/02/22
N	RFI Changes-Driveway	MM	08/02/22
M	RFI Changes V.2	MM	05/10/21
L	RFI Changes V.1	MM	10/09/21
K	RFI_v3	JA	23/02/21

Client:
Dale Beaumont

Development Application for a Two into Three Lot Torrens Title Subdivision, Construction of two new Dwellings and Alterations to existing dwelling to include part demolition

122-124 Graham Avenue Lurnea NSW 2170

Town Planner: TVD
Drawn By: JA/MM
Checked By: GC
Revision: **O**
Scale: **1:200 @ A3**

Drawing Name: **SEDIMENT CONTROL PLAN**

Drawing Number: **DA-013**

Figured dimensions take precedence over scale dimensions. Contractors must verify all dimensions on site before commencing any work or making shop drawings.

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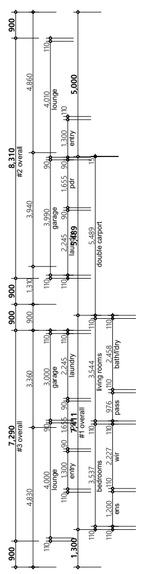
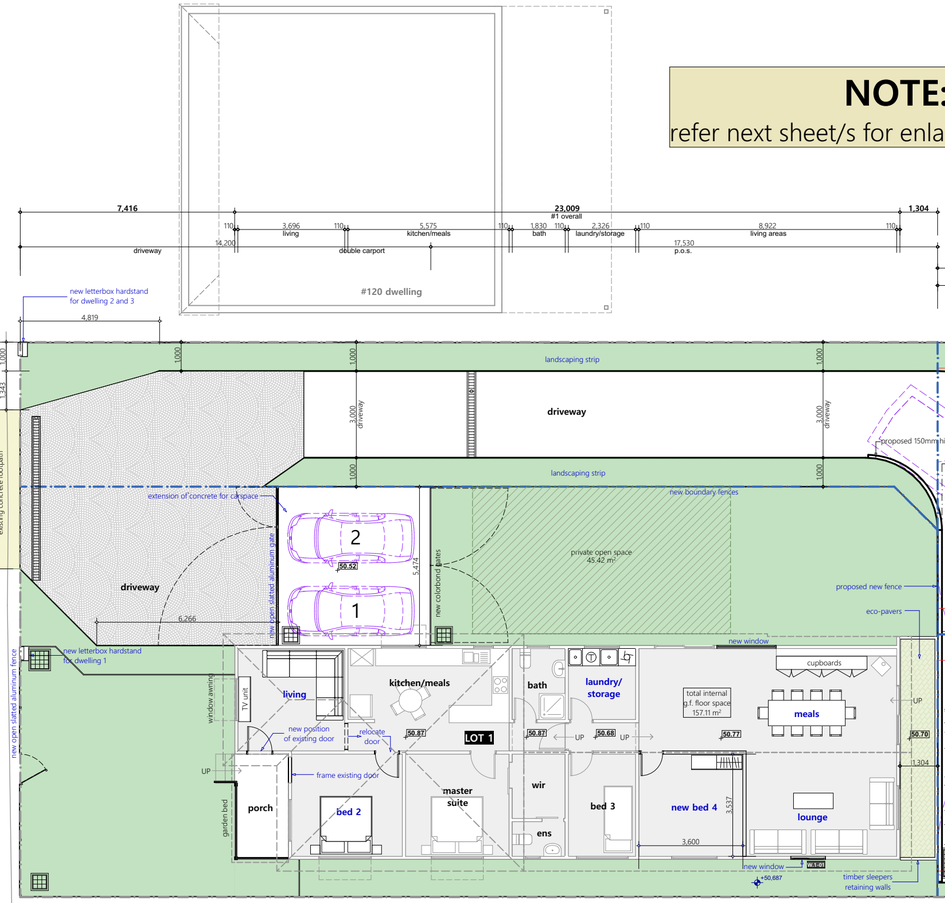
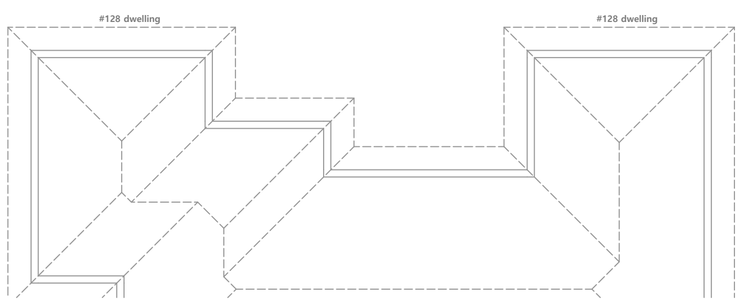
Bradax Pty Ltd
Nominated Architect: Giuseppe Calabrese 8079

NOTE:

refer next sheet/s for enlarged scale plans.







Rev	Description	Drft	Issued
O	RFI Changes-Fence, Mirror	MM	28/02/22
N	RFI Changes-Driveway	MM	08/02/22
M	RFI Changes V.2	MM	05/10/21
L	RFI Changes V.1	MM	10/09/21
K	RFI_v3	JA	23/02/21

Lot 1 Open Landscape	
Description	**Area**
Lot 1 Front Open Space	68.04
Lot 1 Side Access	31.57
Lot 1 Side Open Space	94.67
	194.28 m²

Lot 2 Open Landscape	
Description	**Area**
Lot 2 Front Open Space	35.24
Lot 2 Front Open Space	44.98
Lot 2 Rear Open Space	50.55
Lot 2 Rear Open Space	50.55
Lot 2 Side Access	18.49
Lot 2 Side Access	18.49
Lot 2 Side Open Space	46.88
Lot 2 Side Open Space	47.28
	312.46 m²

Lot 3 Open Landscape	
Description	**Area**
Lot 3 Front Open Space	38.78
Lot 3 Front Open Space	38.78
Lot 3 Rear Open Space	45.45
Lot 3 Rear Open Space	45.45
Lot 3 Side Access	17.96
Lot 3 Side Access	17.96
Lot 3 Side Open Space	32.42
Lot 3 Side Open Space	32.81
	269.61 m²

Client:
Dale Beaumont

Development Application for a Two into Three Lot Torrens Title Subdivision, Construction of two new Dwellings and Alterations to existing dwelling to include part demolition

122-124 Graham Avenue Lurnea NSW 2170

Town Planner: TVD
Drawn By: JA/MM
Checked By: GC
Revision: **O**
Scale: **1:150.00, 1:1.67 @ A2**

Drawing Name: **PROPOSED SITE FLOOR PLAN**

Drawing Number: **DA-014**

Figured dimensions take precedence over scale dimensions. Contractors must verify all dimensions on site before commencing any work or making shop drawings.

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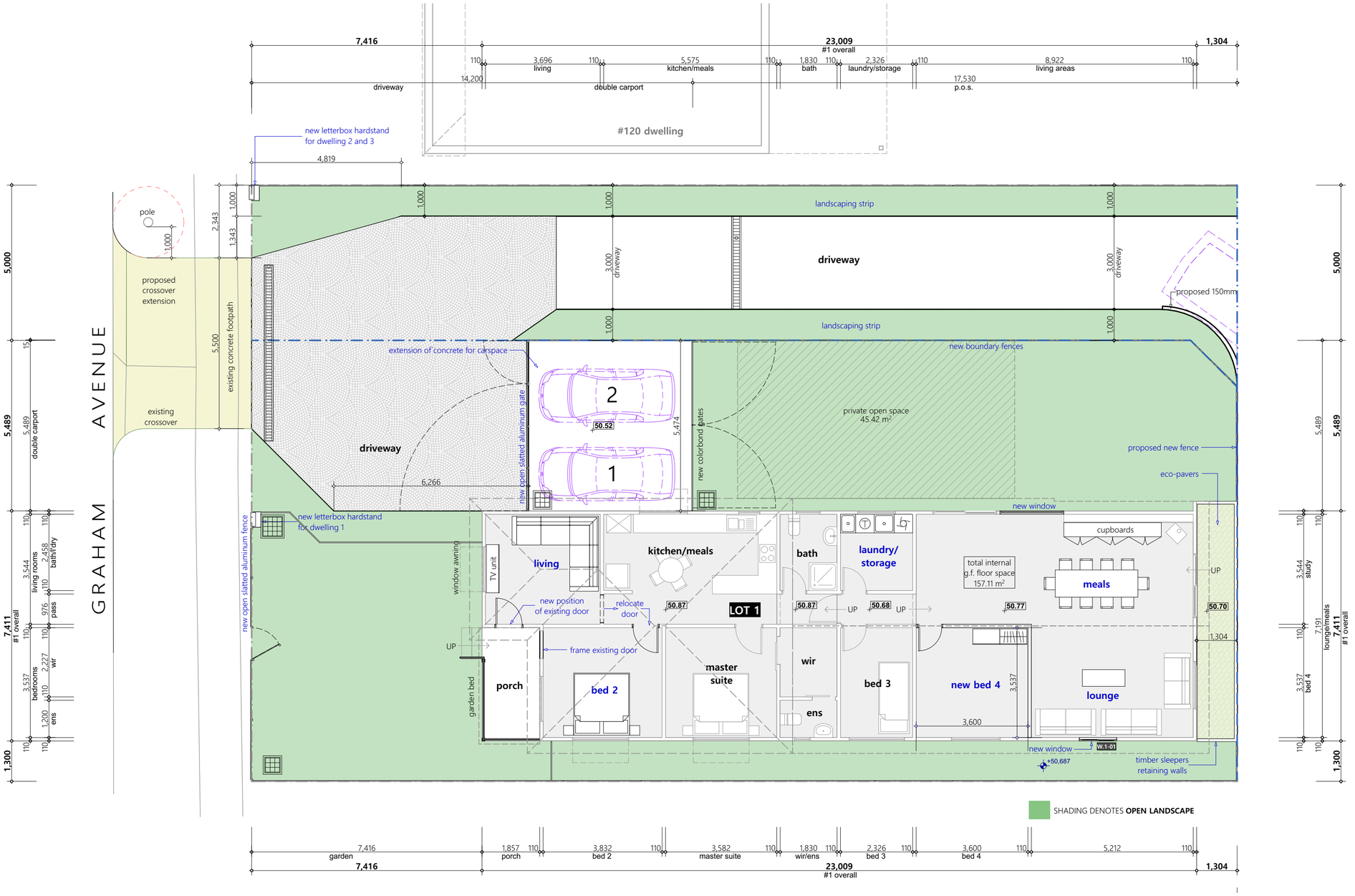

F.S.R. proposed lot 1	
site area	449.44 m²
overall floor area	157.10 m²
fsr = 0.35:1 allowance = 66.98m²	

F.S.R. proposed lot 2	
site area	300.27 m²
ground floor area	74.00 m²
upper floor area	55.20 m²
total = 129.20 m² fsr = 0.43:1 allowance = 22.15m²	

F.S.R. proposed lot 3	
site area	315.42 m²
ground floor area	74.34 m²
upper floor area	54.87 m²
total = 129.21 m² fsr = 0.41:1 allowance = 26.13m²	

Rev	Description	Drft	Issued
O	RFI Changes-Fence, Mirror	MM	28/02/22
N	RFI Changes-Driveway	MM	08/02/22
M	RFI Changes V.2	MM	05/10/21
L	RFI Changes V.1	MM	10/09/21
K	RFI_v3	JA	23/02/21

Client:
Dale Beaumont

Development Application for a Two into Three Lot Torrens Title Subdivision, Construction of two new Dwellings and Alterations to existing dwelling to include part demolition

122-124 Graham Avenue Lurnea NSW 2170

Town Planner: TVD Revision: **O**
Drawn By: JA/MM Scale: **1:100 @ A2**
Checked By: GC

Drawing Name: **PROPOSED LOT 1 GF PLAN**

Drawing Number: **DA-015**

Figured dimensions take precedence over scale dimensions. Contractors must verify all dimensions on site before commencing any work or making shop drawings.

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#120 dwelling

pole

GRAHAM AVENUE

outline of previous roof extents

LOT 1

tiled roof

metal roof

metal roof

29° FALL

29° FALL

29° FALL

29° FALL

29° FALL

2° FALL

10° FALL

10° FALL

5,000

5,089

4,564

3,647

900

8,211

7,016

23,809

904

Rev	Description	Drft	Issued
O	RFI Changes-Fence, Mirror	MM	28/02/22
N	RFI Changes-Driveway	MM	08/02/22
M	RFI Changes V.2	MM	05/10/21
L	RFI Changes V.1	MM	10/09/21
K	RFI_v3	JA	23/02/21

Client:
Dale Beaumont

Development Application for a Two into Three Lot Torrens Title Subdivision, Construction of two new Dwellings and Alterations to existing dwelling to include part demolition

122-124 Graham Avenue Lurnea NSW 2170

Town Planner: TVD Revision: **O**
Drawn By: JA/MM Scale: **1:100 @ A3**
Checked By: GC

Drawing Name: **PROPOSED LOT 1 RF PLAN**

Drawing Number: **DA-016**

Figured dimensions take precedence over scale dimensions. Contractors must verify all dimensions on site before commencing any work or making shop drawings.

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#114 group of dwellings

10,800 | 18,900 #2 overall | 5,000

5,000 driveway | 5,930 p.o.s. | 110 | 4,250 lounge | 110 | 11,210 p.o.s. | 3,090 alfresco

5,400 carpark | 400 | 6,170 garage | 90 | 1,030 pdr | 90 | 900 stairs | 90 | 900 pty | 90 | 2,980 kitchen | 3,050 meals | 3,000 living | 110

enclosed waste bins

0.9m setback

timber sleepers retaining wall

traffic mirror

high kerb

OSD tank (see stormwater plans)

clothes line

trough
washer
dryer
cupboard

private open space 39.30 m²

alfresco timber pergola over

principal private open space 26.46 m²

deep soil zone 6mX4m 24.00 m²

lounge

entry

laundry concertina

landing

UP

driveway

garage 130mm stepdown

store area

pdr

pantry under

kitchen

meals

living

LOT 2

CL =2700H

CL =2830H

total internal g.f. floor space 65.48 m²

tv unit

RWT

outdoor a/c unit

51.05 | 51.09 | 51.34 | 51.47 | 51.37

1 | 2

garage door

5,400 | 3,000 | 3,350 | 6,050 | 5,000

timber sleepers retaining wall

OSD tank (see stormwater plans)

51.04 | 50.89 | 50.90

total internal g.f. floor space 65.15 m²

cloak | 1,000

LOT 3

CL =2700H

51.17 | 51.07

private open space 28.86 m²

clothes line

26.46 m²

principal private open space

0.5m landscaping strip

timber channel and grate drain to engineer's details

enclosed waste bins

#126a/b duplex dwelling

5,000 driveway | 5,930 p.o.s. | 110 | 4,250 lounge | 110 | 11,210 p.o.s. | 3,090

4,530 carpark | 400 | 6,170 garage | 90 | 1,030 f'dry/pdr | 90 | 900 stairs | 90 | 900 pty | 90 | 2,980 kitchen | 3,050 meals | 3,000 living | 110

10,800 | 18,900 #3 overall | 5,000

SHADING (IN GREEN) DENOTES **OPEN LANDSCAPE**

SHADING (IN PURPLE) DENOTES **MIN. GARAGE SPACE**

Rev	Description	Drft	Issued
O	RFI Changes-Fence, Mirror	MM	28/02/22
N	RFI Changes-Driveway	MM	08/02/22
M	RFI Changes V.2	MM	05/10/21
L	RFI Changes V.1	MM	10/09/21
K	RFI_v3	JA	23/02/21

F.S.R. proposed lot 1	
site area	449.44 m²
overall floor area	157.10 m²
fsr = 0.35:1 allowance = 66.98m²	

F.S.R. proposed lot 2	
site area	300.27 m²
ground floor area	74.00 m²
upper floor area	55.20 m²
total = 129.20 m² fsr = 0.43:1 allowance = 22.15m²	

F.S.R. proposed lot 3	
site area	315.42 m²
ground floor area	74.34 m²
upper floor area	54.87 m²
total = 129.21 m² fsr = 0.41:1 allowance = 26.13m²	

Client:
Dale Beaumont

Development Application for a Two into Three Lot Torrens Title Subdivision, Construction of two new Dwellings and Alterations to existing dwelling to include part demolition

122-124 Graham Avenue Lurnea NSW 2170

Town Planner: TVD | Revision: **O**
Drawn By: JA/MM | Scale: **1:100, 1:2 @ A2**
Checked By: GC

Drawing Name: **PROPOSED LOT 2/3 GF PLAN**

Drawing Number: **DA-017**

Figured dimensions take precedence over scale dimensions. Contractors must verify all dimensions on site before commencing any work or making shop drawings.

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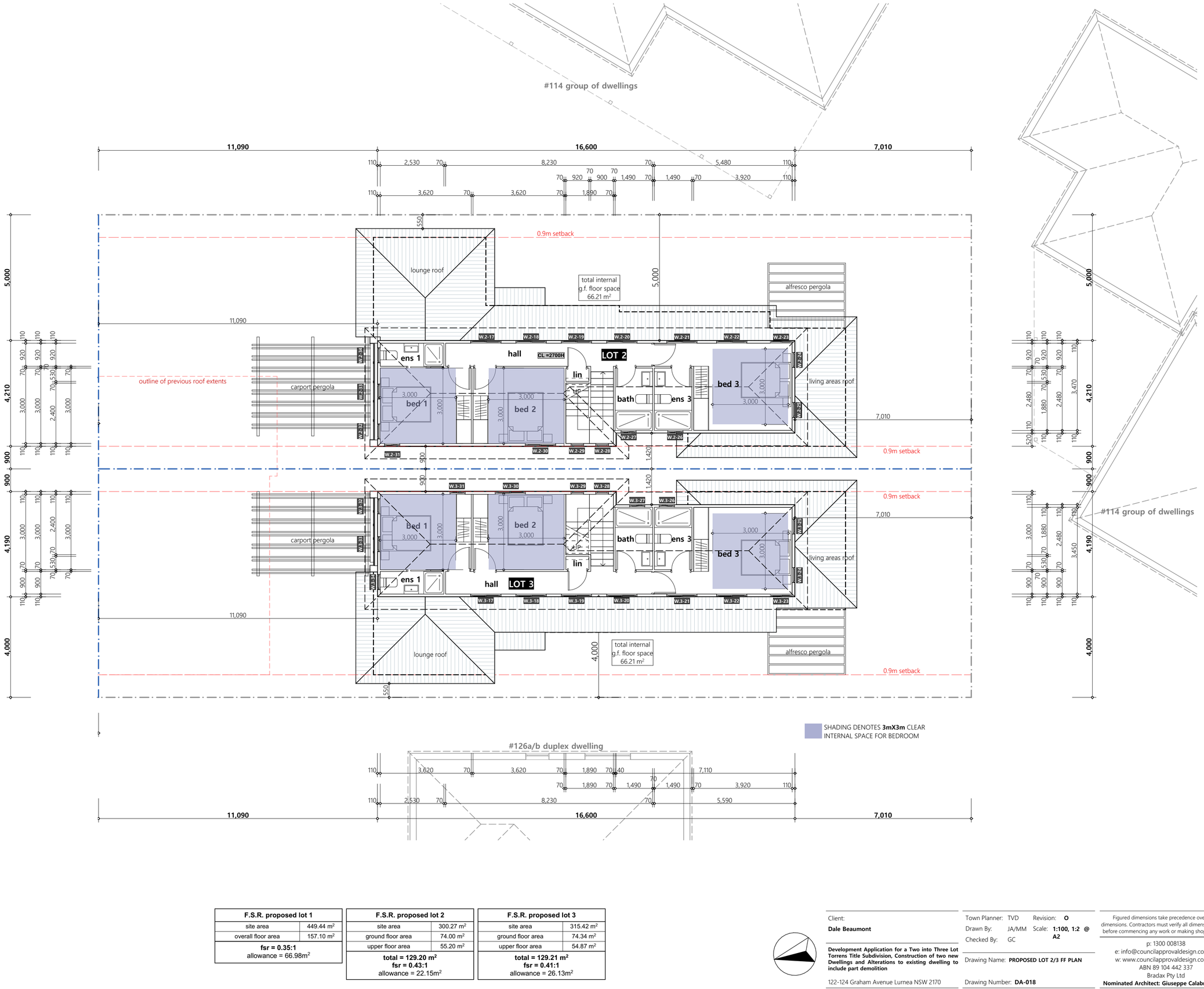
Nominated Architect: Giuseppe Calabrese 8079



Rev	Description	Drft	Issued
O	RFI Changes-Fence, Mirror	MM	28/02/22
N	RFI Changes-Driveway	MM	08/02/22
M	RFI Changes V.2	MM	05/10/21
L	RFI Changes V.1	MM	10/09/21
K	RFI_v3	JA	23/02/21

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total = 129.20 m² fsr = 0.43:1 allowance = 22.15m²	

F.S.R. proposed lot 3	
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ground floor area	74.34 m²
upper floor area	54.87 m²
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Client:
Dale Beaumont

Development Application for a Two into Three Lot Torrens Title Subdivision, Construction of two new Dwellings and Alterations to existing dwelling to include part demolition

122-124 Graham Avenue Lurnea NSW 2170

Town Planner: TVD Revision: **O**
Drawn By: JA/MM Scale: **1:100, 1:2 @ A2**
Checked By: GC

Drawing Name: **PROPOSED LOT 2/3 FF PLAN**

Drawing Number: **DA-018**

Figured dimensions take precedence over scale dimensions. Contractors must verify all dimensions on site before commencing any work or making shop drawings.

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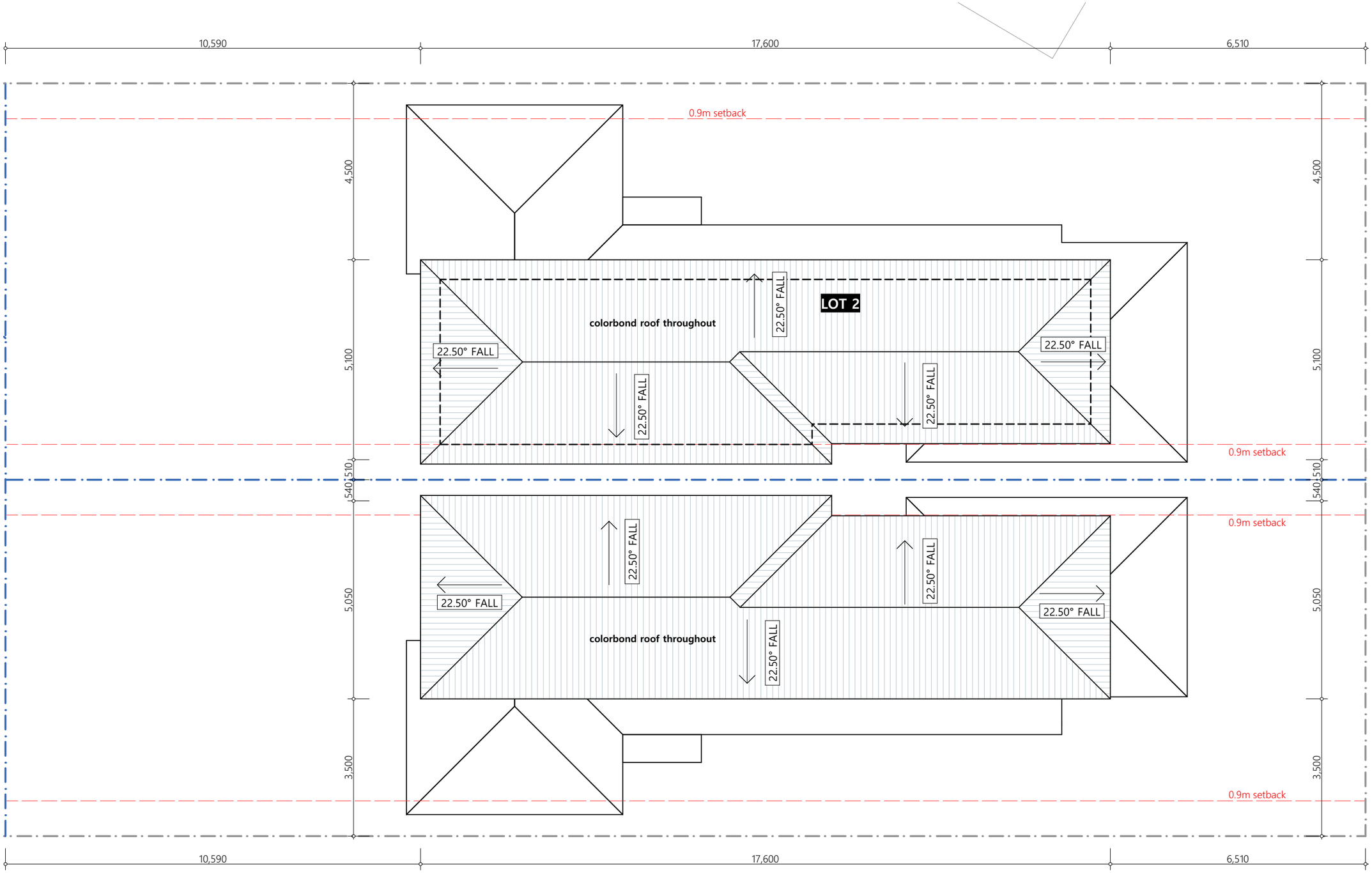
Bradax Pty Ltd
Nominated Architect: Giuseppe Calabrese 8079



#126a/b duplex dwelling

Rev	Description	Drft	Issued
O	RFI Changes-Fence, Mirror	MM	28/02/22
N	RFI Changes-Driveway	MM	08/02/22
M	RFI Changes V.2	MM	05/10/21
L	RFI Changes V.1	MM	10/09/21
K	RFI_v3	JA	23/02/21

Client:
Dale Beaumont

Development Application for a Two into Three Lot Torrens Title Subdivision, Construction of two new Dwellings and Alterations to existing dwelling to include part demolition

122-124 Graham Avenue Lurnea NSW 2170

Town Planner: TVD
Drawn By: JA/MM
Checked By: GC
Revision: **O**
Scale: **1:100, 1:2 @ A3**

Drawing Name: **PROPOSED LOT 2/3 RF PLAN**

Drawing Number: **DA-019**

Figured dimensions take precedence over scale dimensions. Contractors must verify all dimensions on site before commencing any work or making shop drawings.

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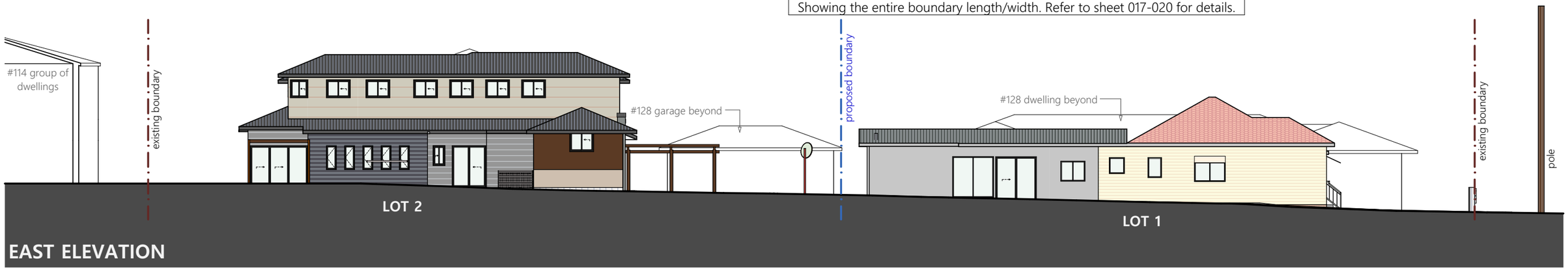
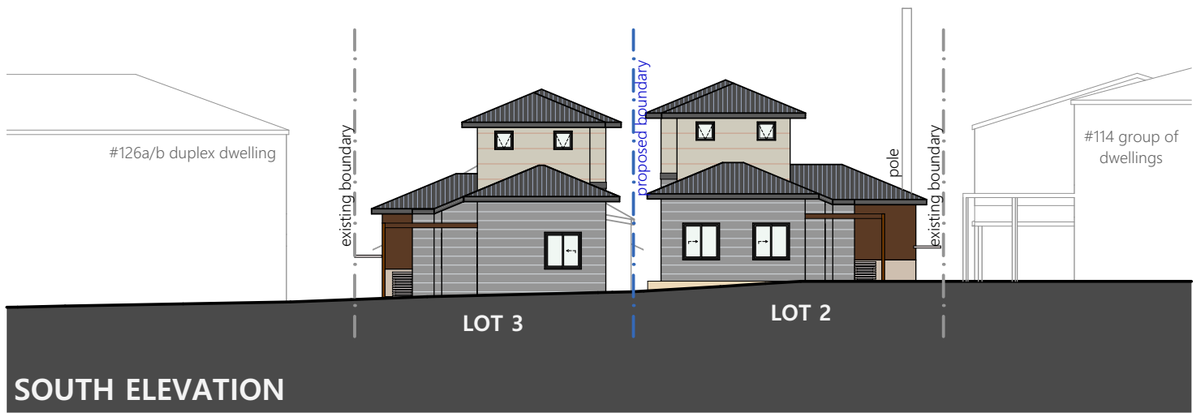
Nominated Architect: Giuseppe Calabrese 8079

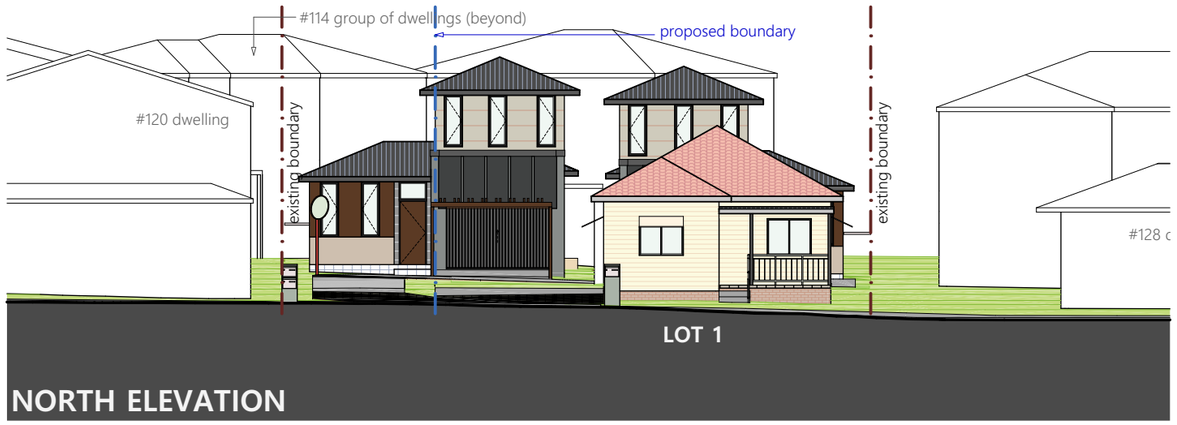
NOTE:
Showing the entire boundary length/width. Refer to sheet 017-020 for details.



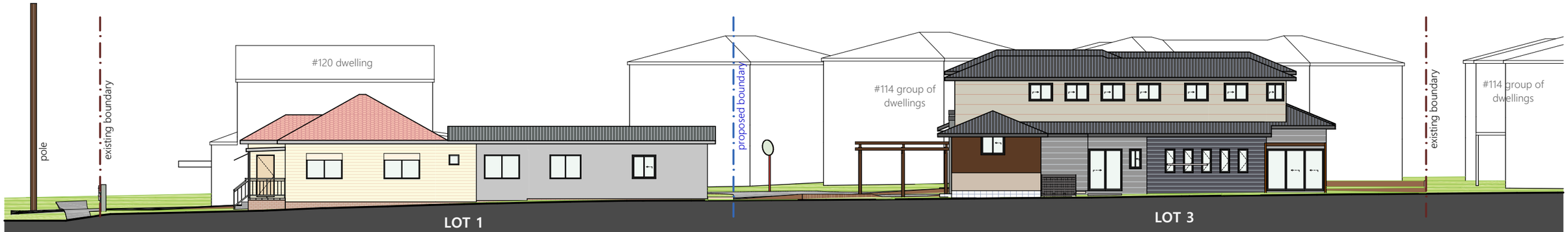
EAST ELEVATION



SOUTH ELEVATION



NORTH ELEVATION



WEST ELEVATION

Rev	Description	Drft	Issued
O	RFI Changes-Fence, Mirror	MM	28/02/22
N	RFI Changes-Driveway	MM	08/02/22
M	RFI Changes V.2	MM	05/10/21
L	RFI Changes V.1	MM	10/09/21
K	RFI_v3	JA	23/02/21

IMPORTANT:
Colours are indicative only and do not represent actual finishes' shading, texture, appearance and their overall properties.

Client:
Dale Beaumont

Development Application for a Two into Three Lot Torrens Title Subdivision, Construction of two new Dwellings and Alterations to existing dwelling to include part demolition

122-124 Graham Avenue Lurnea NSW 2170

Town Planner: TVD
Drawn By: JA/MM
Checked By: GC
Revision: **O**
Scale: **1:200 @ A3**

Drawing Name: **PROPOSED SITE ELEVATIONS**

Drawing Number: **DA-020**

Figured dimensions take precedence over scale dimensions. Contractors must verify all dimensions on site before commencing any work or making shop drawings.

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Bradax Pty Ltd
Nominated Architect: Giuseppe Calabrese 8079

LOT 2/3 NORTH ELEVATION

LOT 2/3 WEST ELEVATION

Rev	Description	Drft	Issued
O	RFI Changes-Fence, Mirror	MM	28/02/22
N	RFI Changes-Driveway	MM	08/02/22
M	RFI Changes V.2	MM	05/10/21
L	RFI Changes V.1	MM	10/09/21
K	RFI_v3	JA	23/02/21

IMPORTANT:
Colours are indicative only and do not represent actual finishes' shading, texture, appearance and their overall properties.

NOTE:
Refer to addenda or final finishes selections sheet/package for materials.

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Bradax Pty Ltd
Nominated Architect: Giuseppe Calabrese 8079

Client:
Dale Beaumont

Development Application for a Two into Three Lot Torrens Title Subdivision, Construction of two new Dwellings and Alterations to existing dwelling to include part demolition

122-124 Graham Avenue Lurnea NSW 2170

Figured dimensions take precedence over scale dimensions. Contractors must verify all dimensions on site before commencing any work or making shop drawings.

Town Planner:	TVD	Revision:	**O**
Drawn By:	JA/MM	Scale:	**1:100 @ A3**
Checked By:	GC		

Drawing Name: **PROPOSED ELEVATIONS (3)**

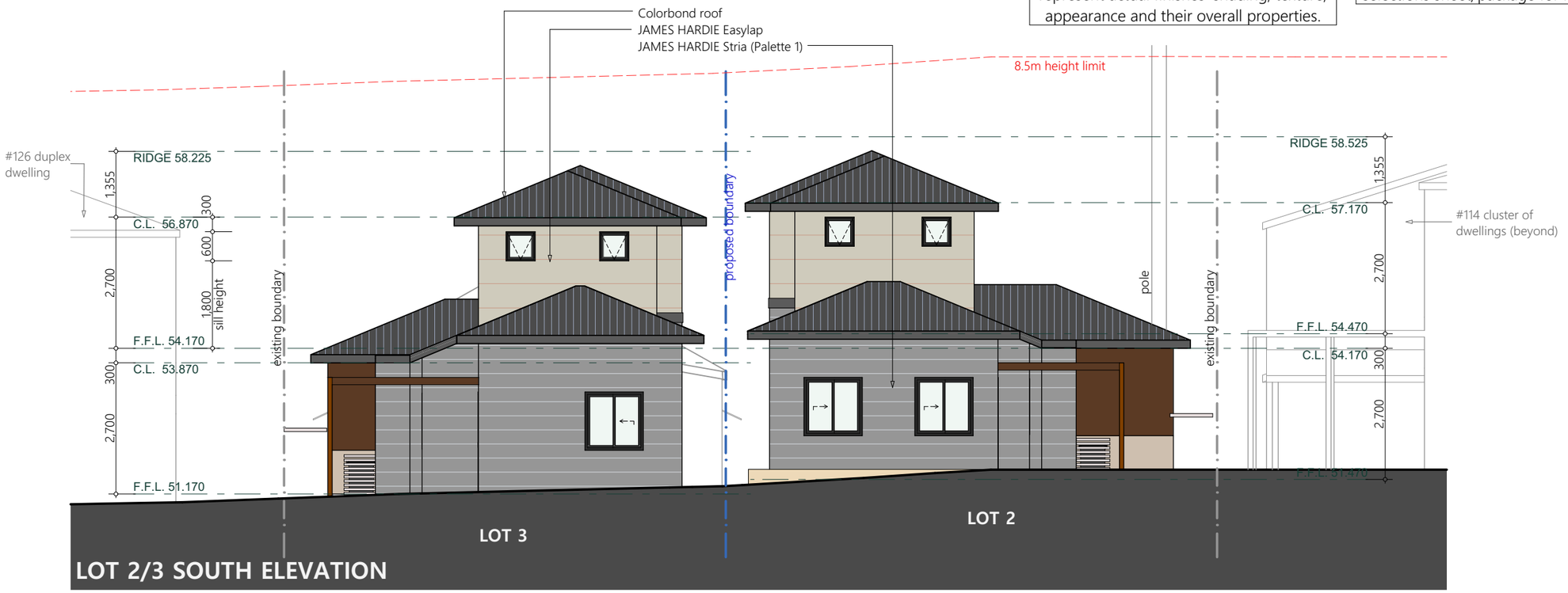
Drawing Number: **DA-021**

Rev	Description	Drft	Issued
O	RFI Changes-Fence, Mirror	MM	28/02/22
N	RFI Changes-Driveway	MM	08/02/22
M	RFI Changes V.2	MM	05/10/21
L	RFI Changes V.1	MM	10/09/21
K	RFI_v3	JA	23/02/21

LOT 2/3 EAST ELEVATION

IMPORTANT:
Colours are indicative only and do not represent actual finishes' shading, texture, appearance and their overall properties.

NOTE:
Refer to addenda or final finishes selections sheet/package for materials.



LOT 2/3 SOUTH ELEVATION

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Bradax Pty Ltd
Nominated Architect: Giuseppe Calabrese 8079

Client:
Dale Beaumont

Development Application for a Two into Three Lot Torrens Title Subdivision, Construction of two new Dwellings and Alterations to existing dwelling to include part demolition
122-124 Graham Avenue Lurnea NSW 2170

Figured dimensions take precedence over scale dimensions. Contractors must verify all dimensions on site before commencing any work or making shop drawings.

Town Planner:	TVD	Revision:	**O**
Drawn By:	JA/MM	Scale:	**1:100 @ A3**
Checked By:	GC		

Drawing Name: **PROPOSED ELEVATIONS (4)**

Drawing Number: **DA-022**

Rev	Description	Drft	Issued
O	RFI Changes-Fence, Mirror	MM	28/02/22
N	RFI Changes-Driveway	MM	08/02/22
M	RFI Changes V.2	MM	05/10/21
L	RFI Changes V.1	MM	10/09/21
K	RFI_v3	JA	23/02/21

LOT 3 EAST ELEVATION

IMPORTANT:
Colours are indicative only and do not represent actual finishes' shading, texture, appearance and their overall properties.

NOTE:
Refer to addenda or final finishes selections sheet/package for materials.

LOT 2 WEST ELEVATION

p: 1300 008138
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w: www.councilapprovaldesign.com.au
ABN 89 104 442 337
Bradax Pty Ltd
Nominated Architect: Giuseppe Calabrese 8079

Client:
Dale Beaumont

Development Application for a Two into Three Lot Torrens Title Subdivision, Construction of two new Dwellings and Alterations to existing dwelling to include part demolition

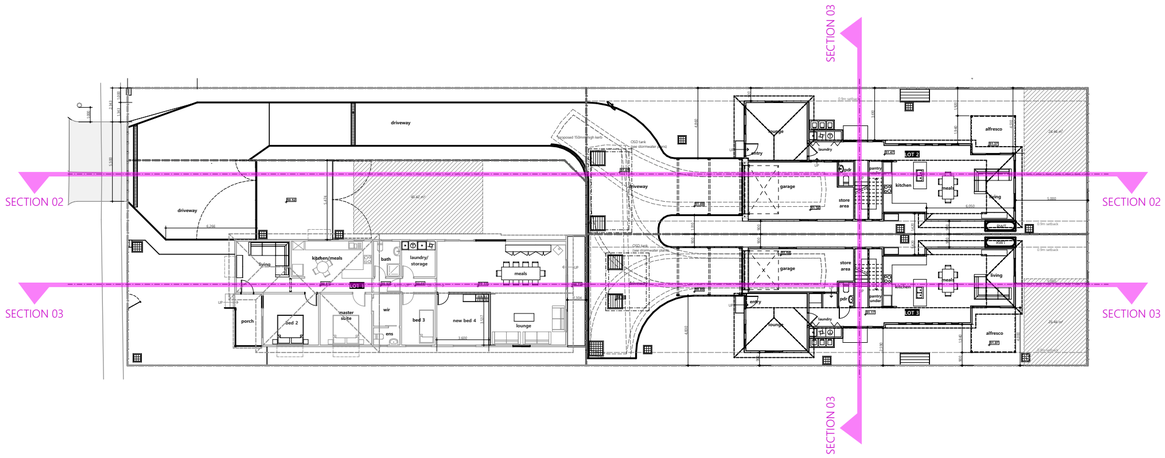
122-124 Graham Avenue Lurnea NSW 2170

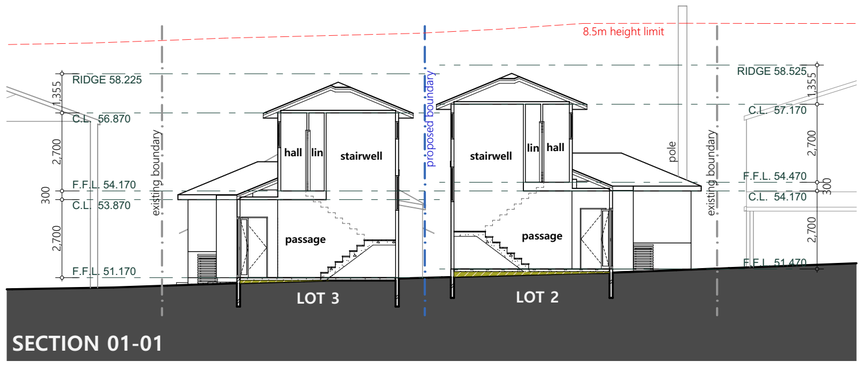
Figured dimensions take precedence over scale dimensions. Contractors must verify all dimensions on site before commencing any work or making shop drawings.

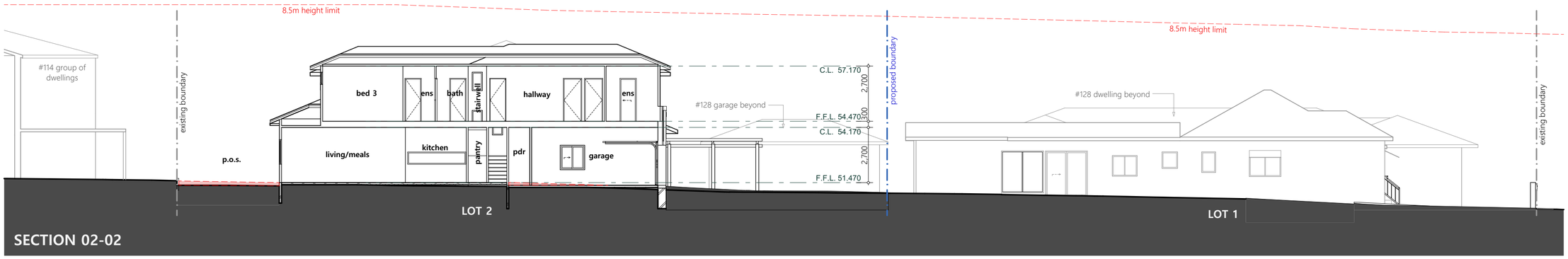
Town Planner:	TVD	Revision:	**O**
Drawn By:	JA/MM	Scale:	**1:100 @ A3**
Checked By:	GC		

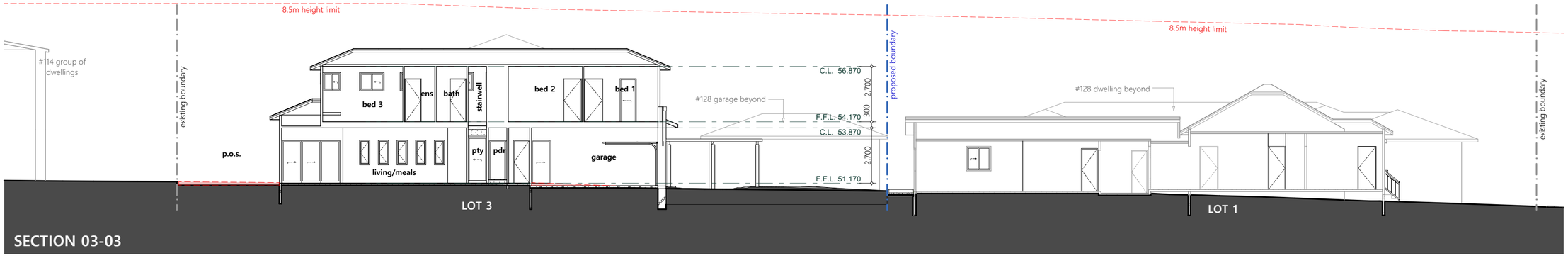
Drawing Name: **PROPOSED ELEVATIONS (5)**

Drawing Number: **DA-023**









Rev	Description	Drft	Issued
O	RFI Changes-Fence, Mirror	MM	28/02/22
N	RFI Changes-Driveway	MM	08/02/22
M	RFI Changes V.2	MM	05/10/21
L	RFI Changes V.1	MM	10/09/21
K	RFI_v3	JA	23/02/21

Client:
Dale Beaumont

Development Application for a Two into Three Lot Torrens Title Subdivision, Construction of two new Dwellings and Alterations to existing dwelling to include part demolition

122-124 Graham Avenue Lurnea NSW 2170

Town Planner: TVD Revision: **O**
Drawn By: JA/MM Scale: **1:150, 1:300.00 @ A2**
Checked By: GC

Drawing Name: **SECTIONS**

Drawing Number: **DA-024**

Figured dimensions take precedence over scale dimensions. Contractors must verify all dimensions on site before commencing any work or making shop drawings.

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Bradax Pty Ltd
Nominated Architect: Giuseppe Calabrese 8079

ID	W.1-01	W.2-01	W.2-01	W.2-02	W.2-03	W.2-04	W.2-05	W.2-06	W.2-07	W.2-08	W.2-09	W.2-10
Height	1,200	600	1,800	1,800	1,200	1,000	1,200	1,200	1,200	1,200	1,200	1,200
Width	1,200	900	600	600	1,200	600	500	500	500	500	500	1,200
3D Front View												
Area	1.44	0.54	1.08	1.08	1.44	0.60	0.60	0.60	0.60	0.60	0.60	1.44

W.2-11	W.2-12	W.2-13	W.2-14	W.2-15	W.2-16	W.2-17	W.2-18	W.2-19	W.2-20	W.2-21	W.2-22	W.2-23	W.2-24	W.2-25	W.2-26
1,200	600	1,200	1,200	1,200	1,200	900	900	900	900	900	900	900	600	600	600
1,200	2,850	500	500	500	1,200	1,200	1,200	1,200	1,200	1,200	1,200	880	600	600	600
															
1.44	1.71	0.60	0.60	0.60	1.44	1.08	1.08	1.08	1.08	1.08	1.08	0.79	0.36	0.36	0.36

W.2-27	W.2-28	W.2-29	W.2-30	W.2-31	W.2-32	W.2-33	W.2-34	W.3-01	W.3-02	W.3-03	W.3-04	W.3-05	W.3-06	W.3-07	W.3-08	W.3-09
600	900	900	900	600	1,700	1,700	1,700	1,800	1,800	1,200	1,000	1,200	1,200	1,200	1,200	1,200
600	500	500	1,200	600	600	600	600	600	600	1,200	600	500	500	500	500	500
																
0.36	0.45	0.45	1.08	0.36	1.02	1.02	1.02	1.08	1.08	1.44	0.60	0.60	0.60	0.60	0.60	0.60

W.3-11	W.3-12	W.3-13	W.3-14	W.3-15	W.3-16	W.3-17	W.3-18	W.3-19	W.3-20	W.3-21	W.3-22	W.3-23	W.3-24	W.3-25	W.3-26	W.3-27
1,200	600	1,200	1,200	1,200	1,200	900	900	900	900	900	900	900	600	600	600	600
1,200	2,850	500	500	500	1,200	1,200	1,200	1,200	1,200	1,200	1,200	880	600	600	600	600
1.44	1.71	0.60	0.60	0.60	1.44	1.08	1.08	1.08	1.08	1.08	1.08	0.79	0.36	0.36	0.36	0.36

W.3-28	W.3-29	W.3-30	W.3-31	W.3-32	W.3-33
600	600	600	600	1,700	1,700
500	500	1,200	600	600	600
0.30	0.30	0.72	0.36	1.02	1.02

ID	D-47	D.2-01	D.2-02	D.3-01
Height	2,100	2,100	2,100	2,100
Width	2,245	1,693	2,890	1,693
3D Front View				
Area	4.71	3.56	6.07	3.56

Rev	Description	Drft	Issued
O	RFI Changes-Fence, Mirror	MM	28/02/22
N	RFI Changes-Driveway	MM	08/02/22
M	RFI Changes V.2	MM	05/10/21
L	RFI Changes V.1	MM	10/09/21
K	RFI_v3	JA	23/02/21

Client:

Dale Beaumont

Development Application for a Two into Three Lot Torrens Title Subdivision, Construction of two new Dwellings and Alterations to existing dwelling to include part demolition

122-124 Graham Avenue Lurnea NSW 2170

Town Planner: TVD Revision: **O**

Drawn By: JA/MM Scale: **1:1.50 @ A3**

Checked By: GC

Drawing Name: **GLAZING SCHEDULE**

Drawing Number: **DA-025**

Figured dimensions take precedence over scale dimensions. Contractors must verify all dimensions on site before commencing any work or making shop drawings.

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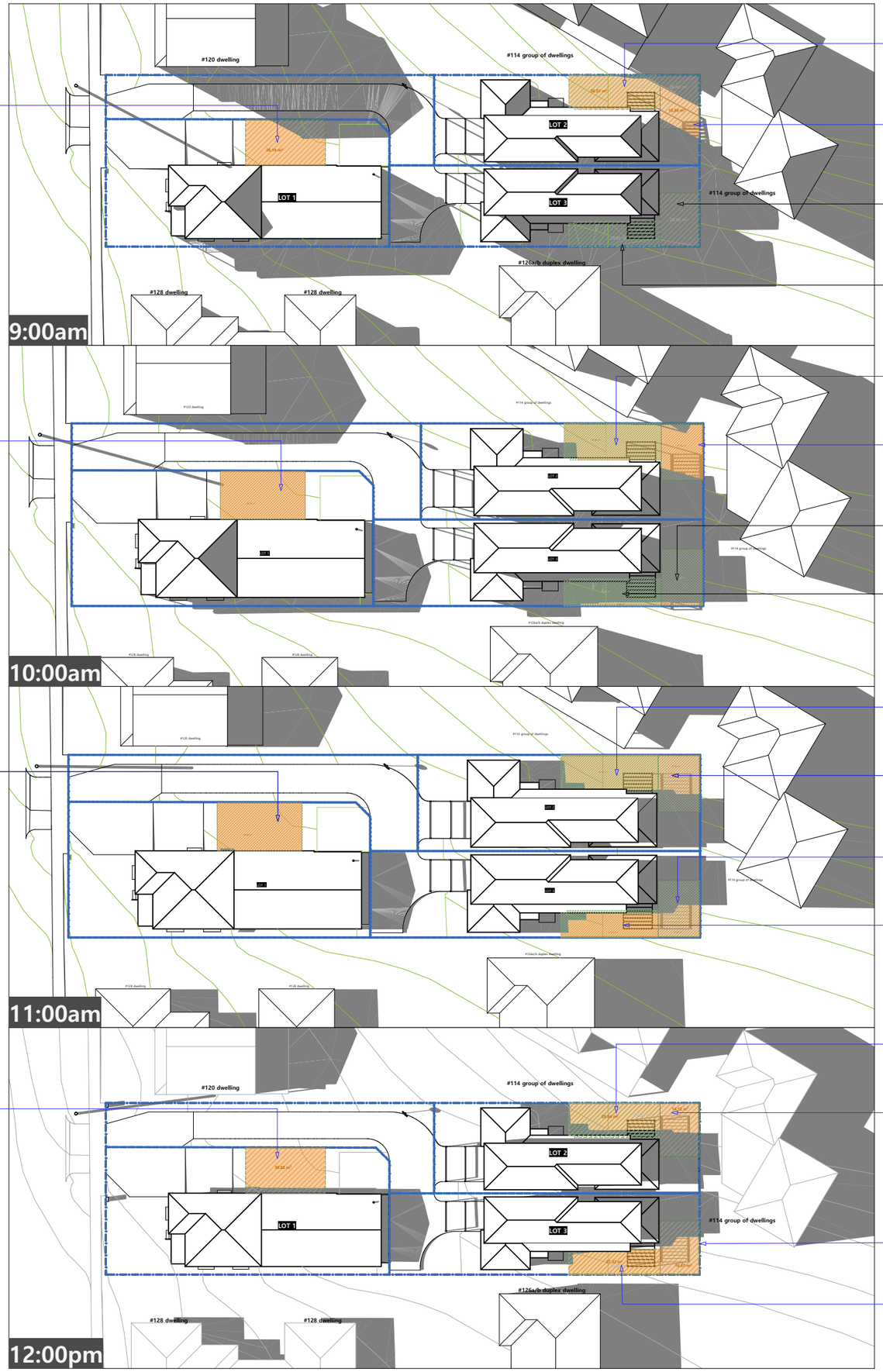


Lot 1 solar penetration = 79.68%

Lot 2 POS solar penetration = 92.9%

Lot 2 PPOS solar penetration = 59.71%

Lot 3 PPOS solar penetration = 0%

Lot 3 POS solar penetration = 0%

Lot 1 solar penetration = 100%

Lot 2 POS solar penetration = 91.5%

Lot 2 PPOS solar penetration = 80.16%

Lot 3 PPOS solar penetration = 5.74%

Lot 3 POS solar penetration = 10.18%

Lot 1 solar penetration = 99.1%

Lot 2 POS solar penetration = 87.9%

Lot 2 PPOS solar penetration = 65.5%

Lot 3 PPOS solar penetration = 50.6%

Lot 3 POS solar penetration = 79.8%

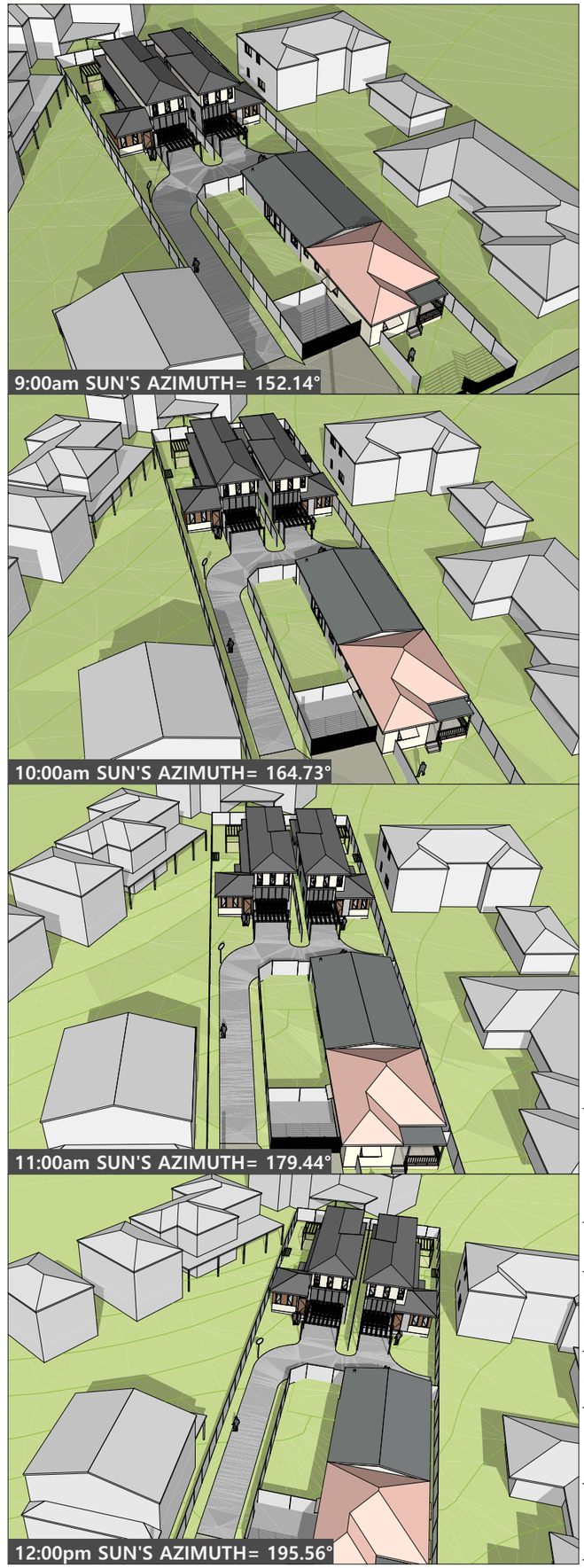
Lot 1 solar penetration = 79.68%

Lot 2 POS solar penetration = 73.9%

Lot 2 PPOS solar penetration = 53.36%

Lot 3 PPOS solar penetration = 63.76%

Lot 3 POS solar penetration = 94.66%



Rev	Description	Drft	Issued
O	RFI Changes-Fence, Mirror	MM	28/02/22
N	RFI Changes-Driveway	MM	08/02/22
M	RFI Changes V.2	MM	05/10/21
L	RFI Changes V.1	MM	10/09/21
K	RFI_v3	JA	23/02/21

hatching denotes principal private open space

shading denotes solar penetration on private open space

shading denotes 50% or more solar penetration

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Client:
Dale Beaumont

Development Application for a Two into Three Lot Torrens Title Subdivision, Construction of two new Dwellings and Alterations to existing dwelling to include part demolition

122-124 Graham Avenue Lurnea NSW 2170

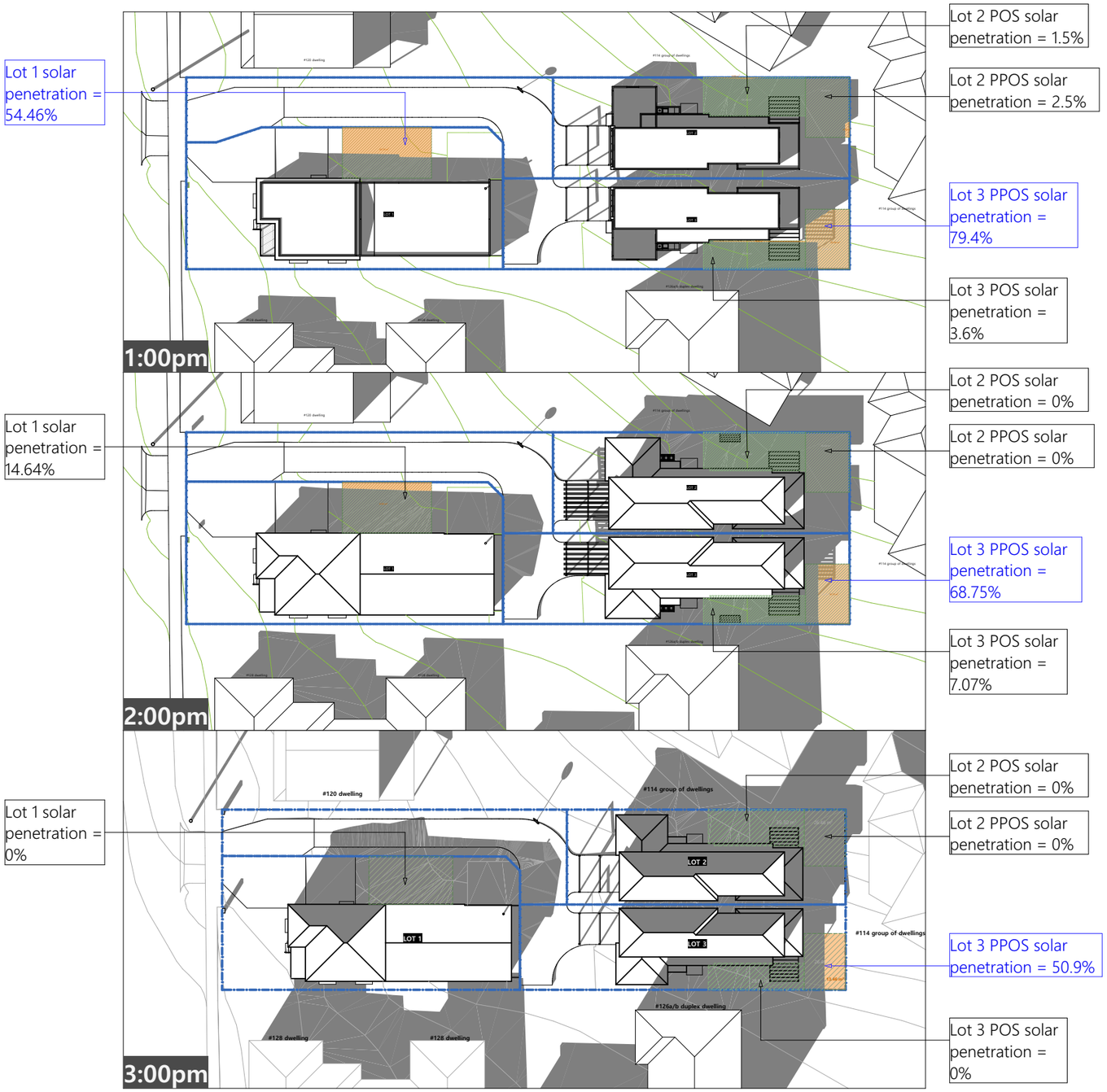
Figured dimensions take precedence over scale dimensions. Contractors must verify all dimensions on site before commencing any work or making shop drawings.

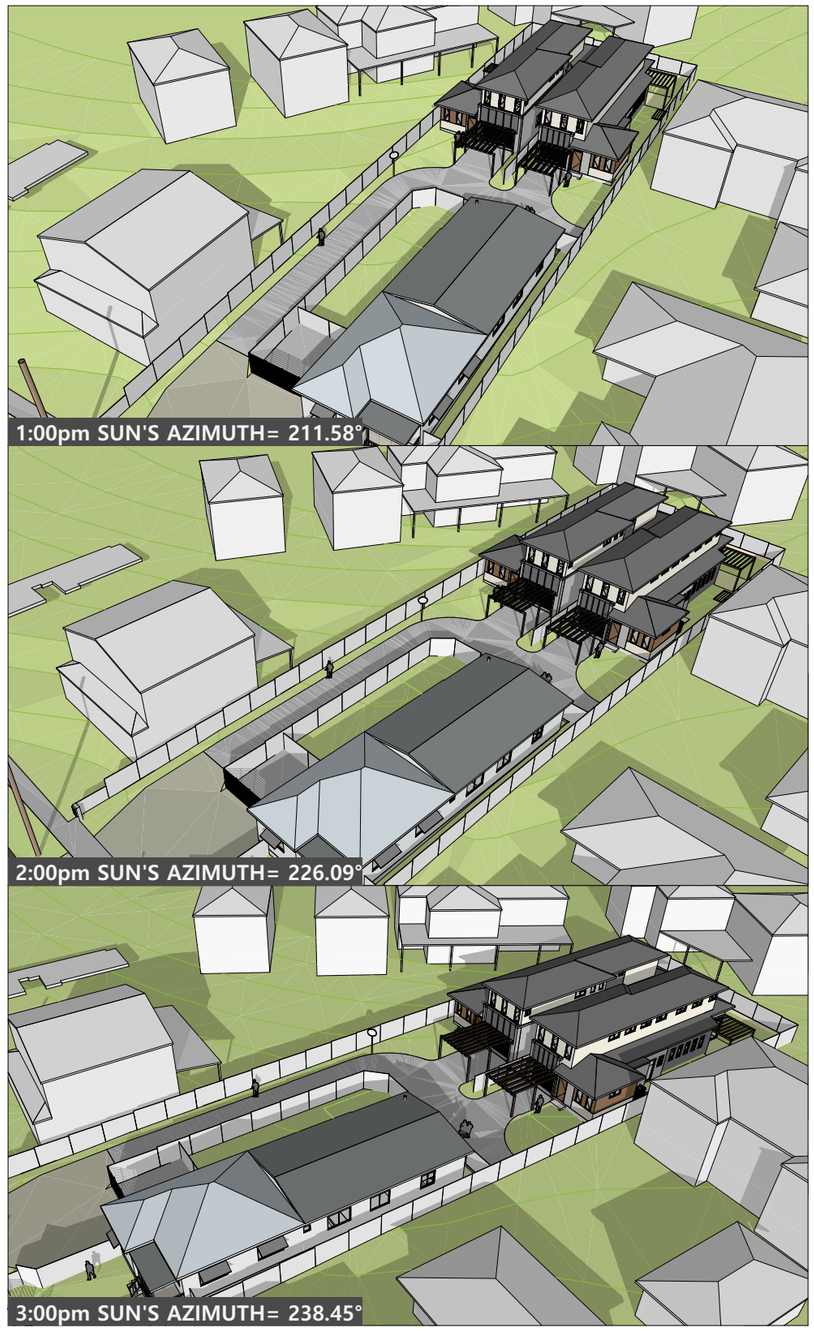
Town Planner:	TVD	Revision:	**O**
Drawn By:	JA/MM	Scale:	**1:531.93, 1:328.68, 1:500 @ A3**
Checked By:	GC		

Drawing Name: **21st JUNE SHADOW DIAGRAMS (1)**

Drawing Number: **DA-026**

Rev	Description	Drft	Issued
O	RFI Changes-Fence, Mirror	MM	28/02/22
N	RFI Changes-Driveway	MM	08/02/22
M	RFI Changes V.2	MM	05/10/21
L	RFI Changes V.1	MM	10/09/21
K	RFI_v3	JA	23/02/21





hatching denotes principal private open space

shading denotes solar penetration on private open space

shading denotes 50% or more solar penetration

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Nominated Architect: Giuseppe Calabrese 8079

Client:
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Development Application for a Two into Three Lot Torrens Title Subdivision, Construction of two new Dwellings and Alterations to existing dwelling to include part demolition

122-124 Graham Avenue Lurnea NSW 2170

Figured dimensions take precedence over scale dimensions. Contractors must verify all dimensions on site before commencing any work or making shop drawings.

Town Planner:	TVD	Revision:	**O**
Drawn By:	JA/MM	Scale:	**1:500, 1:531.93, 1:328.68 @ A3**
Checked By:	GC		

Drawing Name: **21st JUNE SHADOW DIAGRAMS (2)**

Drawing Number: **DA-027**

1

selected external walls
JAMES HARDIE easylap
Dune

2

feature walls and pergola
timber
Dark Walnut

3

selected external walls
JAMES HARDIE fibro w/ trim
Monument

4

selected external walls
JAMES HARDIE stria (tone 1)
Malay Grey

5

selected external walls
JAMES HARDIE rendered harditex
Dune

6

roof cover
colorbond
Monument

Rev	Description	Drft	Issued
O	RFI Changes-Fence, Mirror	MM	28/02/22
N	RFI Changes-Driveway	MM	08/02/22
M	RFI Changes V.2	MM	05/10/21
L	RFI Changes V.1	MM	10/09/21
K	RFI_v3	JA	23/02/21

Client:
Dale Beaumont

Development Application for a Two into Three Lot Torrens Title Subdivision, Construction of two new Dwellings and Alterations to existing dwelling to include part demolition

122-124 Graham Avenue Lurnea NSW 2170

Town Planner: TVD
Drawn By: JA/MM
Checked By: GC
Revision: **O**
Scale: **1:111.11 @ A3**

Drawing Name: **EXTERNAL FINISHES SCHEDULE**

Drawing Number: **DA-028**

Figured dimensions take precedence over scale dimensions. Contractors must verify all dimensions on site before commencing any work or making shop drawings.

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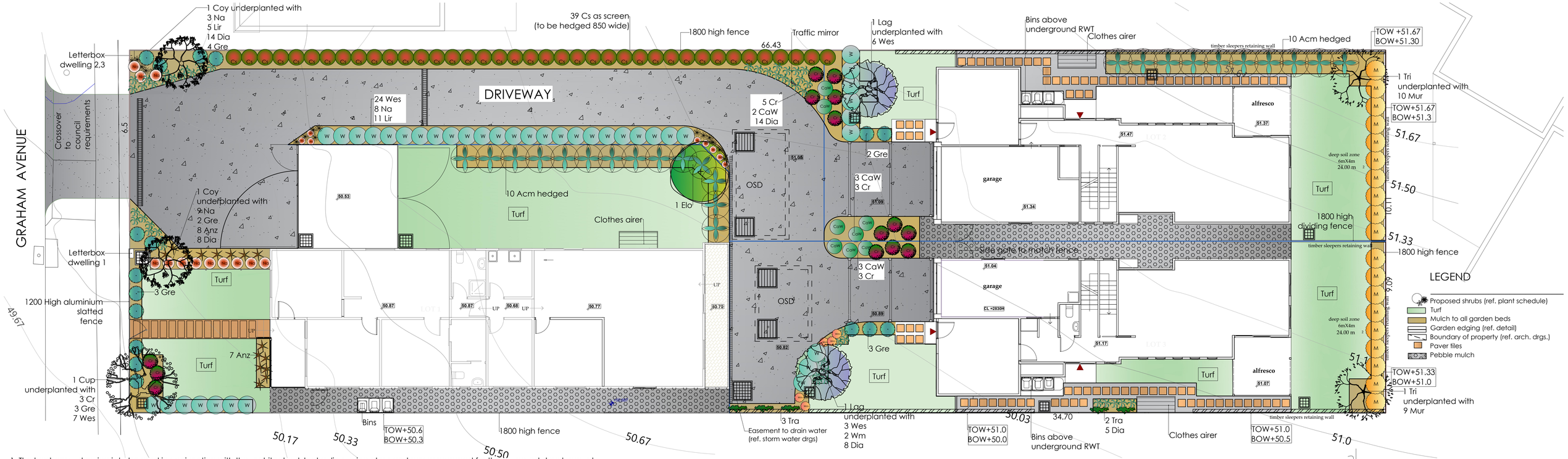
ABN 89 104 442 337
Bradax Pty Ltd
Nominated Architect: Giuseppe Calabrese 8079



1. The landscape drawing is to be read in conjunction with the architectural, hydraulic,service plans and survey prepared for the proposed development.
2. Do not scale off drawings. Refer to dimensions on plan.
3. All services to be checked and verified on site.
4. Topsoil mixture, as specified, is to be thoroughly mixed prior to placement. Imported top soil to be compatible with existing top soil.
6. Prior to landscape works, remove all builders' debris, cultivate garden bed and turf areas to required levels and incorporate compost as specified.
7. Ensure all garden beds and tree planting have adequate drainage to prevent water logging during periods of high rainfall.
8.Council crossover and layback to meet council specification.
10.Turf on council verge to be made good after construction.
11.All street trees on council verge to be retained and protected during construction.
12.Where retaining walls align with boundary fence, the total height shall not exceed1.8M above ground level.
13.Rain water to be used on site.
14.Check boundaries, levels, dimensions and locate services on site prior to starting work
15.Retaining walls and concrete driveways to engineer's details.

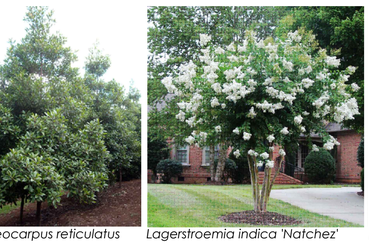
PLANTING INSTRUCTIONS

Remove all building rubble and weeds from garden beds.
Fill garden beds with 300mm organic garden mix.
Stand plant the pots in their position according to the planting plan.
Dig hole same size as the pot.
Remove the plant from the pot.
Plant so that the top of the root ball is level with the soil.
Sprinkle granular wetting agent and fertilizer according to directions on the pack.
Water in well.
Run irrigation tubing over the soil.
Cover the entire soil surface with 75mm mulch.

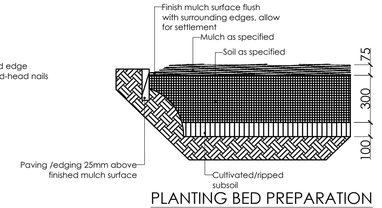
PLANT SCHEDULE:

CODE	BOTANICAL NAME	COMMON NAME	QTY	POT SIZE	MATURE HT	STAKE
TREES						
Cup	Cupaniopsis anacardioides	Tuckeroo	1	45Lit	8M	Y
Coy	Corymbia 'Summer Beauty'	Summer Beauty	2	45Lit	4-5M	Y
Elo	Eleocarpus reticulatus	Blueberry Ash	1	45Lit	6-8M	Y
Lag	Lagerstroemia indica 'Natchez'	Crepe Myrtle	2	45Lit	4-6M	Y
Tri	Tristaniopsis laurina 'Luscious'	Water Gum	2	75 Lit	8M	Y
SHRUBS						
Acm	Acmena smithii 'Cherry Surprise'	Lilly Pilly	20	200mm	1-3M	
Anz	Anigozanthos 'Amber Velvet'	Kangaroo Paw	15	200mm	500mm	
CaW	Callistemon 'White Anzac'	Bottle Brush	8	200mm	1-1.5M	
Cr	Correa alba	Native Fuschia	14	200mm	1.5M	
Cs	Callistemon viminalis 'Slim'	Bottlebrush	39	35mm	3M	
Gre	Grevillea Hills Jubilee	Grevillea	17	200mm	800mm	
Mur	Murraya paniculata	Orange Jessamine	19	200mm	2M	
Na	Nandina 'Gulf Stream'	Heavenly Bamboo	19	200mm	750mm	
Wes	Westringia fruticosa 'Aussie Box'	Coastal Rosemary	34	200mm	450mm	
Wm	Westringia fruticosa Mundi	Coastal Rosemary	5	200mm	500mm	
GROUNDCOVER						
Dia	Dianella tasmanica 'Tasred'	Blue Flax Lily	49	140mm		
Lir	Liriope 'Just Right'	Turf Lily	16	140mm	500mm	
Tra	Trachelospermum jasminoides	Star Jasmine	5	140mm		
Turf	Sir Walter Buffalo/Zoysia Nara					

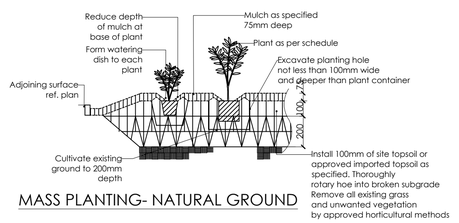
NOTE: Plant quantities shown on planting plan take precedence over quantities shown on Plant Schedule (to be used as a guide)
The landscape contractor shall ensure that correct quantities are installed as per planting plan.



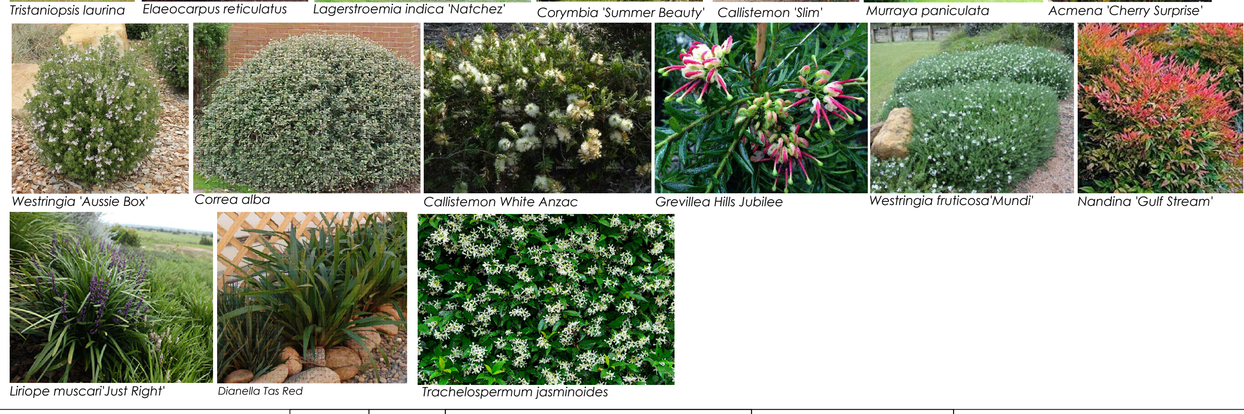
TIMBER EDGE DETAIL

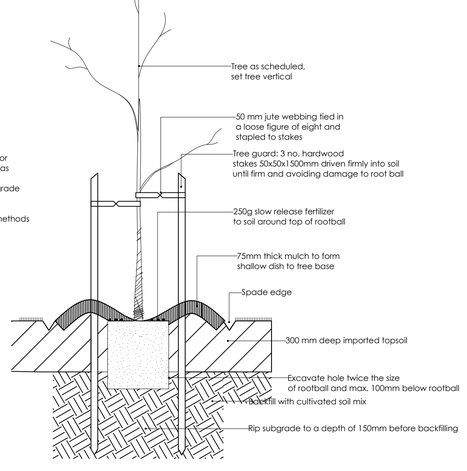


PLANTING BED PREPARATION



MASS PLANTING- NATURAL GROUND





TREE PLANTING DETAIL

AREA CALCULATIONS:		
TOTAL SITE AREA =1913.19m²		
Driveway =213.82 m²		
LOT 1	LOT 2	LOT 3
Site area		
445.94m²	300.27m²	315.42m²
Site coverage		
163.74m²	112.27m²	106.18m²
Landscape area		
194.69m²	157.9m²	138.22m²
Total landscaped area = 490.81m² (25.65 %)		

EarthMatters CONSULTING

north

PLACE MAKERS AND LANDSCAPE CONSULTANTS

DRAWINGS TO BE READ AND NOT SCALED
DISCREPANCY IF ANY TO BE BROUGHT TO THE DESIGNER'S ATTENTION
ALL LEVELS AS PER SURVEY PLAN

Revision	Date	Amendment
R1	15.2.22	Amendments per Council RFI dated 7.1.22
R2	1.3.22	Garage door sizes and front fence material changed(per arch Rev O); traffic mirror added

ADDRESS:
122-124 GRAHAM AVENUE LURNEA

CLIENT:
DALE BEAUMONT

DRAWING TITLE: **LANDSCAPE PLAN**

PROJECT NO.	DRAWING NO.	DATE	SCALE	DRAWN	STATUS
GRA 21	LD01	FEBRUARY 2021	1:100@ A1	SVS	DA

SANDHYA SUNIL
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Blackett Acoustics

Noise & Vibration Consultants

122-124 GRAHAM AVENUE, LURNEA
TRAFFIC NOISE AND VIBRATION ASSESSMENT

Report No BA211220
Version A

February 2022

Prepared
for

DKB Group Pty Ltd

Association of Australian Acoustical Consultants

Blackett Acoustics is an AAAC Member Firm Since 2014

TABLE OF CONTENTS

GLOSSARY

Most environments are affected by environmental noise which continuously varies, largely as a result of road traffic. To describe the overall noise environment, a number of noise descriptors have been developed and these involve statistical and other analysis of the varying noise over sampling periods, typically taken as 15 minutes. These descriptors, which are demonstrated in the graph below, are defined below.

Maximum Noise Level (L_{Amax}) – The maximum noise level over a sample period is the maximum level, measured on fast response, during the sample period.

L_{A1} – The L_{A1} level is the noise level which is exceeded for 1% of the sample period. During the sample period, the noise level is below the L_{A1} level for 99% of the time.

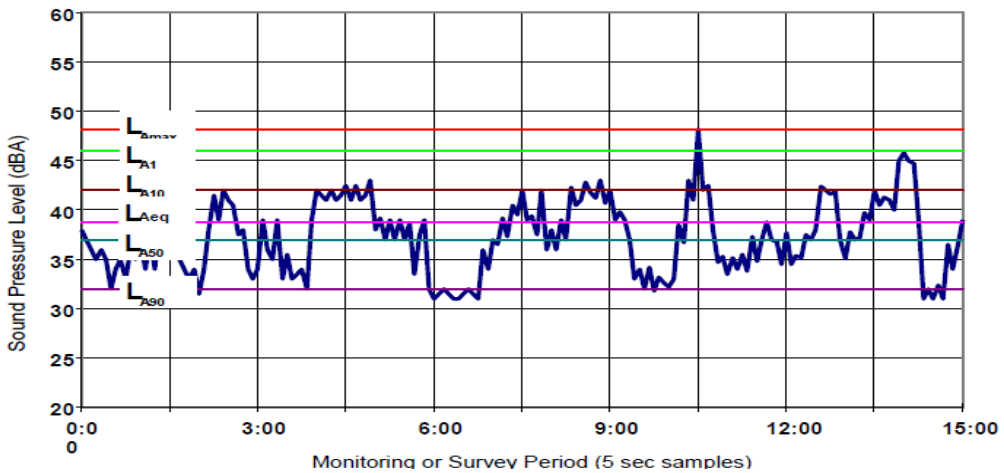
L_{A10} – The L_{A10} level is the noise level which is exceeded for 10% of the sample period. During the sample period, the noise level is below the L_{A10} level for 90% of the time. The L_{A10} is a common noise descriptor for environmental noise and road traffic noise.

L_{Aeq} – The equivalent continuous sound level (L_{Aeq}) is the energy average of the varying noise over the sample period and is equivalent to the level of a constant noise which contains the same energy as the varying noise environment. This measure is also a common measure of environmental noise and road traffic noise.

L_{A90} – The L_{A90} level is the noise level which is exceeded for 90% of the sample period. During the sample period, the noise level is below the L_{A90} level for 10% of the time. This measure is commonly referred to as the background noise level.

ABL – The Assessment Background Level is the single figure background level representing each assessment period (daytime, evening and night time) for each day. It is determined by calculating the 10th percentile (lowest 10th percent) background level (L_{A90}) for each period.

RBL – The Rating Background Level for each period is the median value of the ABL values for the period over all of the days measured. There is therefore an RBL value for each period – daytime, evening and night time.



1 INTRODUCTION

Blackett Acoustics has been engaged by DKB Group Pty Ltd to conduct a DA Acoustic Assessment for the proposed residential development located at Lurnea. The Project Site is potentially impacted by road traffic noise from the M5 Motorway.

This report has made references to the following document to assess the potential noise impact associated with road traffic to the Project Site:

- NSW Department of Planning's *Interim Guideline for Development Near Rail Corridors and Busy Roads*.

2 PROJECT AND SITE DESCRIPTION

The Project Site location is situated at 122-124 Graham Avenue, Lurnea. A total of 3 lots are proposed to be sub-divided the Project Site. During a site survey conducted on Friday, 21 January 2022, it was visually and aurally observed that the Project Site has relatively flat terrain and main noise emission is from traffic on the M5 Motorway.

Unattended noise monitoring was conducted in a free field position at 122-124 Graham Avenue, Lurnea to establish the existing traffic noise impact from the M5 Motorway to the Project Site.

Figure 2-1 presents an aerial outlining the Project Site with the proposed lots, the surroundings buildings and noise monitoring location. Figure 2-2 presents the lot number of the proposed subdivision.

Figure 2-3 to Figure 2-5 present the proposed internal layout of the respective lots.

Figure 2-1 Aerial of Project Site

Figure 2-2 Proposed Subdivision Lot Number

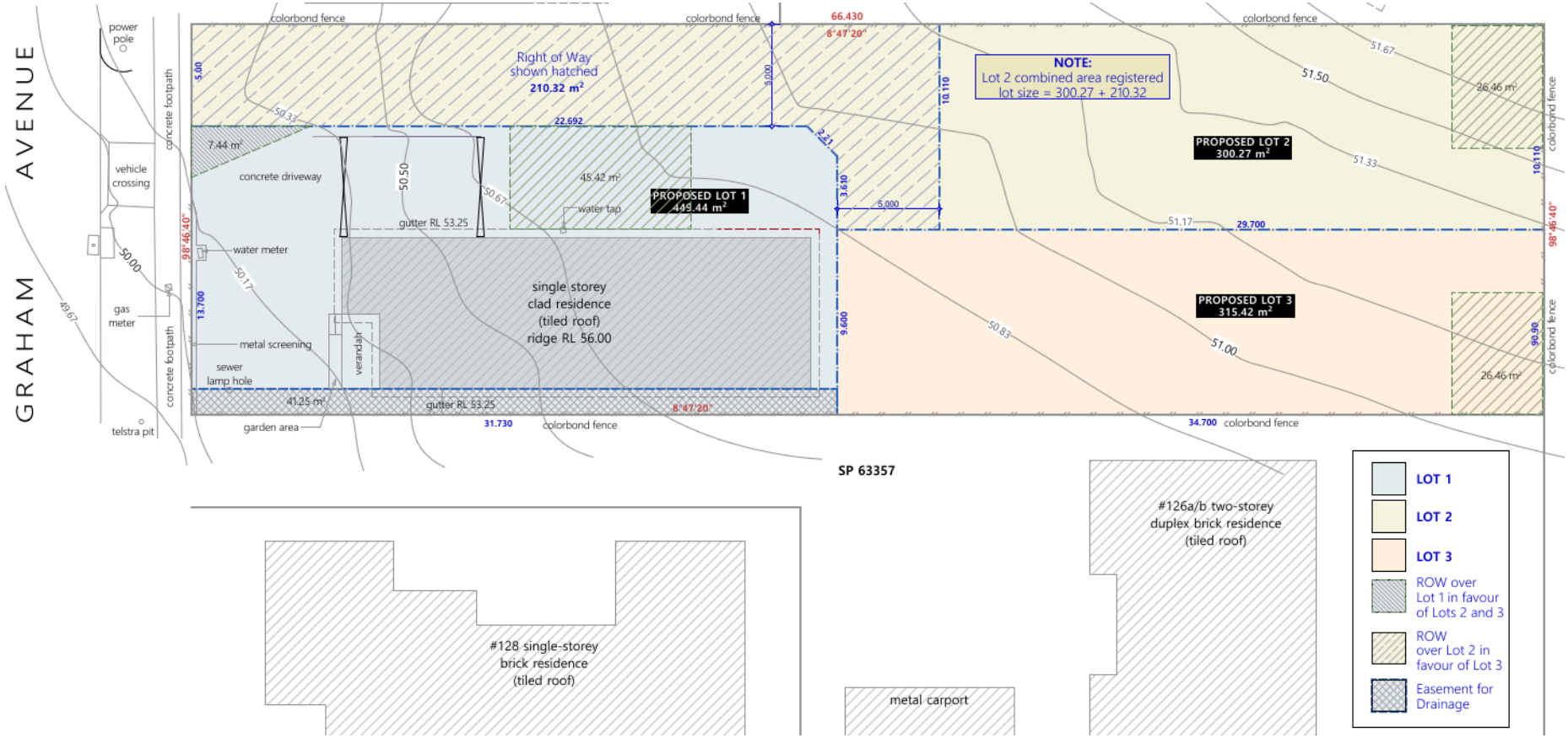


Figure 2-3 Lot 1 Proposed Internal Layout – Ground Level

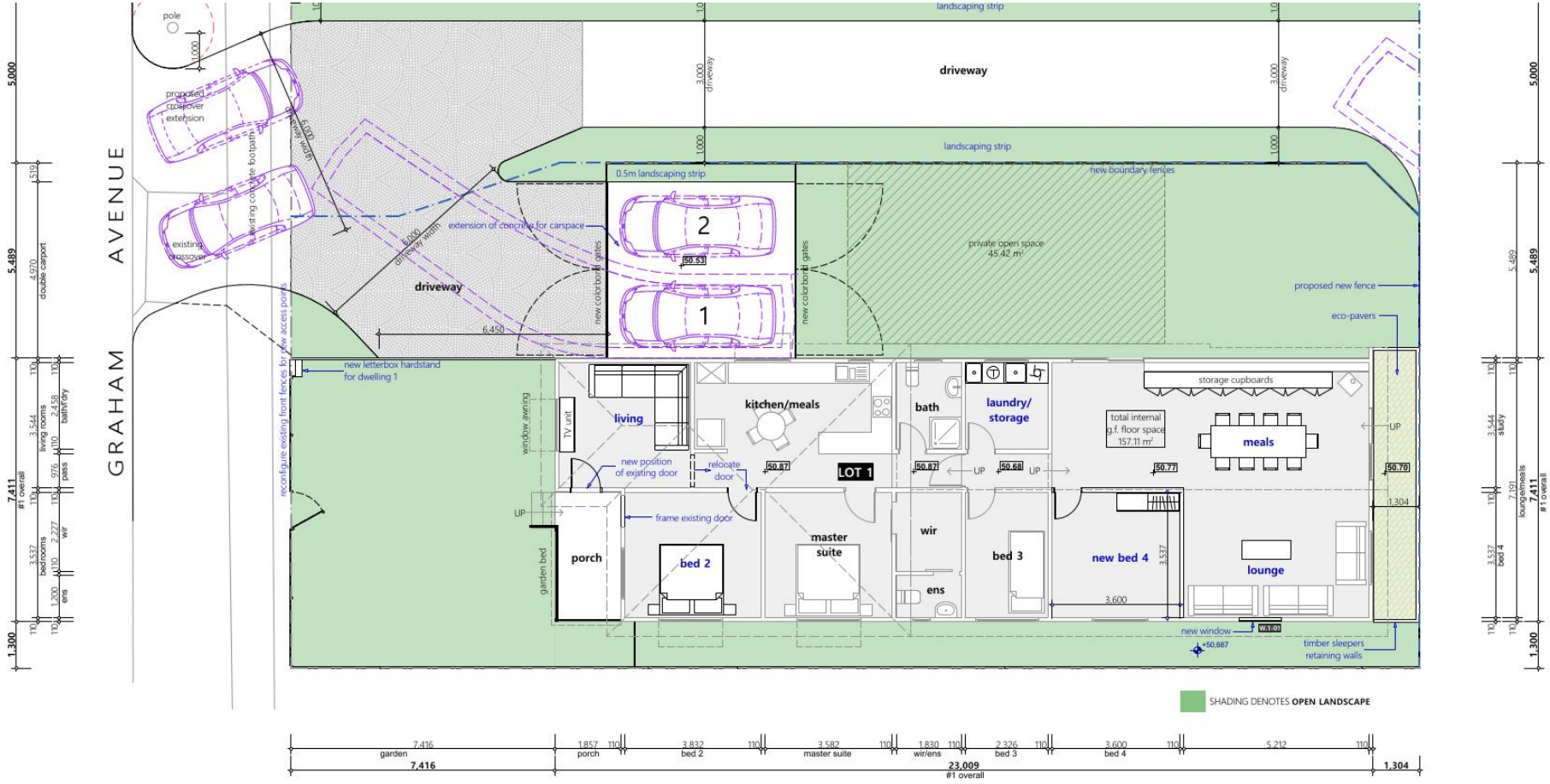


Figure 2-4 Lot 2 & Lot 3 Proposed Internal Layout – Ground Level

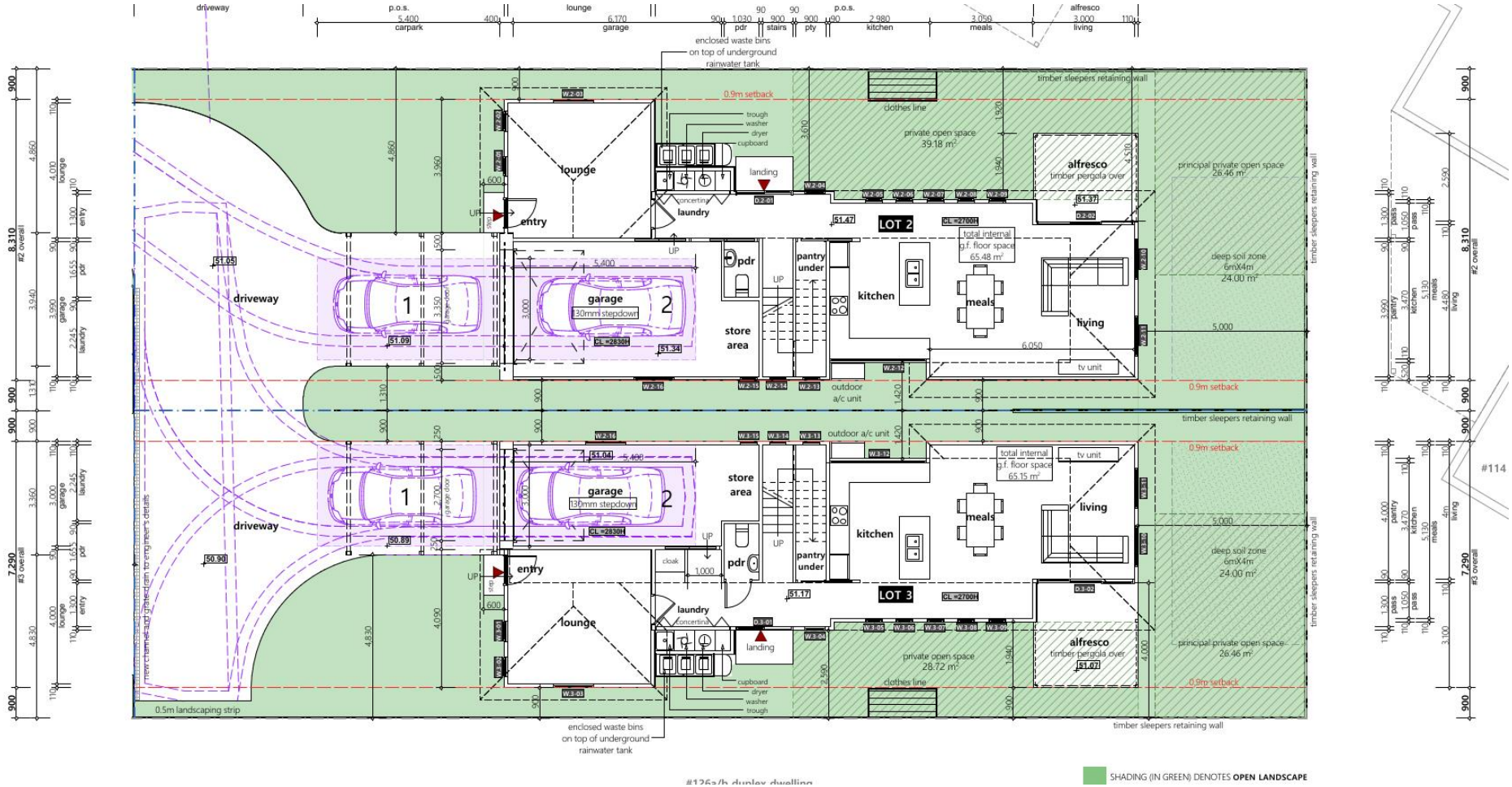
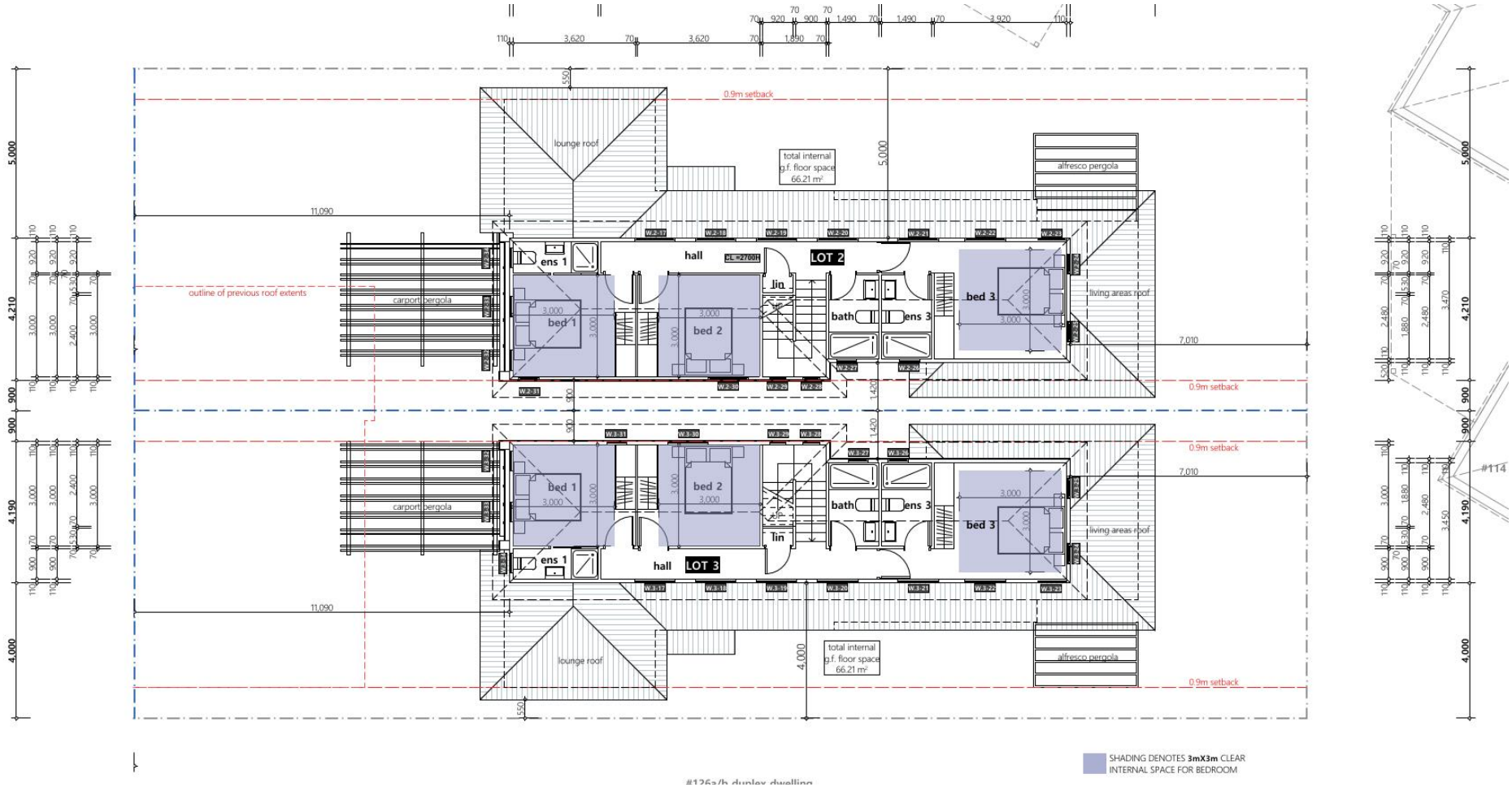


Figure 2-5 Lot 2 & Lot 3 Proposed Internal Layout – First Level



3 ROAD TRAFFIC NOISE AND VIBRATION REQUIREMENTS

3.1 Noise Requirements

The relevant noise criteria for residential buildings are outlined in Department of Planning's *Interim Guideline for Development Near Rail Corridors and Busy Roads* and are summarised below:

If the development is for the purposes of a building for residential use, the consent authority must not grant consent to the development unless it is satisfied that appropriate measures will be taken to ensure that the following L_{Aeq} levels are not exceeded:

a) in any bedroom in the building – 35 dB(A) at any time between 10pm and 7am,

b) Anywhere else in the building (other than a garage, kitchen, bathroom or hallway) – 40 dB(A) at any time.

In addition to the noise requirements, Section 3.6.1 of the above-mentioned Guideline states that if internal noise levels with windows or doors open exceed the criteria by more than 10dBA, the design of the ventilation for these rooms should be such that occupants can leave windows closed, if they so desire, and also to meet the ventilation requirements of the Building Could of Australia.

3.2 Vibration Requirements

The relevant vibration criteria for residential buildings are outlined in Department of Environment and Conservation's document entitled "*Assessing Vibration: A Technical Guideline".*

The guideline categorised 3 different types of vibration as presented in Table 3-1 presented below.

Table 3-1 Examples of Types of Vibration

Continuous vibration	Impulsive vibration	Intermittent vibration
Machinery, steady road traffic, continuous construction activity (such as tunnel boring machinery).	Infrequent: Activities that create up to 3 distinct vibration events in an assessment period, e.g. occasional dropping of heavy equipment, occasional loading and unloading. Blasting is assessed using ANZECC (1990).	Trains, nearby intermittent construction activity, passing heavy vehicles, forging machines, impact pile driving, jack hammers. Where the number of vibration events in an assessment period is three or fewer this would be assessed against impulsive vibration criteria.

Based on the information presented in Table 3-1, vibration associated with passing heavy vehicles are classified as **intermittent vibration**. Table 3-2 presents a summary of the range of acceptable vibration dose values during heavy vehicle pass-by.

Table 3-2 Acceptable Vibration Dose Values for Intermittent Vibration ($m/s^{1.75}$)

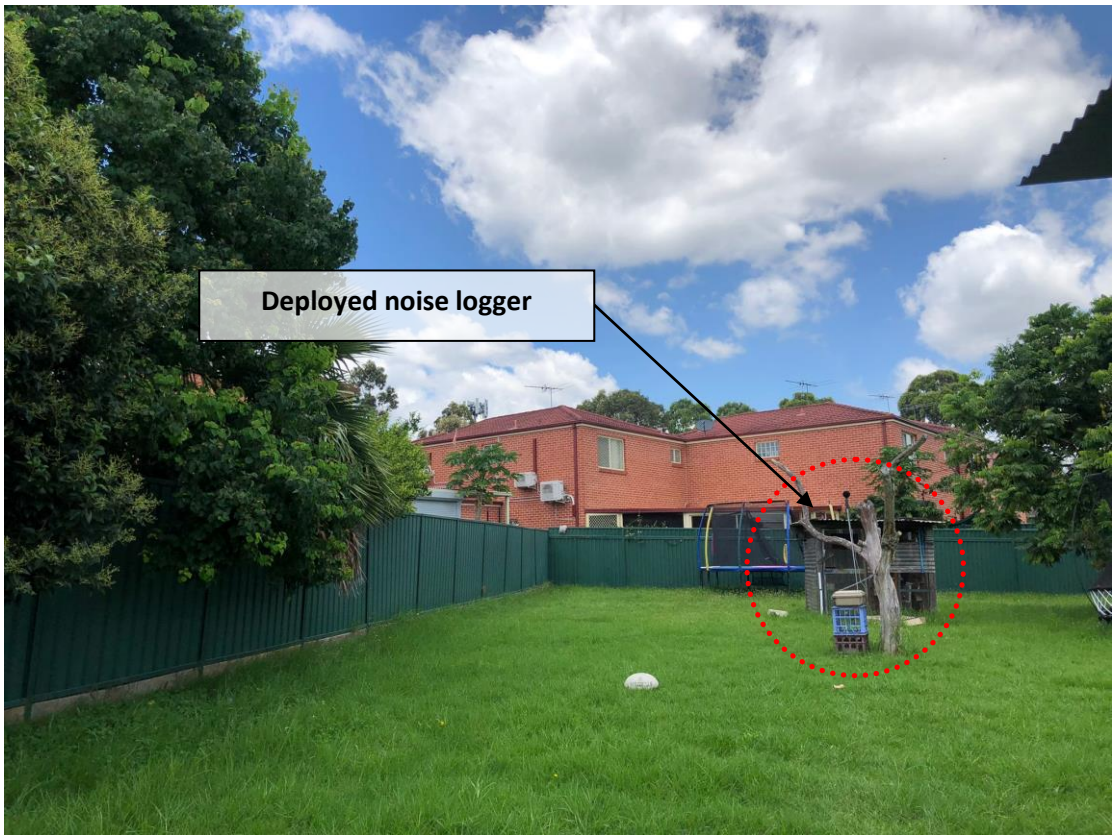
Location	Daytime (7.00am to 10.00pm)		Night Time (10.00pm to 7.00am)	
	Preferred value	Maximum value	Preferred value	Maximum value
Residences	0.20	0.40	0.13	0.26

4 EXISTING ACOUSTIC ENVIRONMENT

Unattended noise monitoring equipment consisted of an Environmental Noise Logger. This was deployed by Blackett Acoustics within the Project Site to establish the existing traffic noise impact from M5 Motorway. The noise logger was setup in the back yard of 122-124 Graham Avenue, Lurnea in a free field location with a setback distance of approximately 70m the nearest laneway of M5 Motorway. The noise monitoring location is also outlined in Figure 2-1.

Figure 4-1 presents a photograph of the deployed noise logger location.

Figure 4-1 Photograph of Deployed Noise Logger



The monitoring period was from Friday, 21 January 2022 to Sunday, 30 January 2022. The calibration of the logger was checked prior to, and following, each measurement

survey and the variation in calibration was found not to exceed 0.5 dB. The noise logger was set to record statistical noise descriptors in continuous 15-minute sampling periods for the duration of its deployment.

Based on the monitoring data, it has been established that the traffic noise level recorded during daytime and night time hours are as follows:

- Daytime $L_{Aeq,15hr}$ (7.00am - 10.00pm) : 55dBA
- Night time $L_{Aeq,9hr}$ (10.00pm - 7.00am) : 52dBA

The measurement data presented above will be used to verify and calibrate the road traffic noise model. The unattended noise monitoring data are graphically presented in Appendix A.

5 PREDICTED NOISE LEVELS AND RECOMMENDED CONSTRUCTION

This Section presents the predicted noise levels at each building lot and the recommended building fabric constructions to meet the recommended internal noise levels under Clause 102 of the Infrastructure SEPP.

Based on the proposed subdivided lots and indicative building envelopes within the Project Site, worst-case traffic noise emissions to the proposed building envelopes have been predicted using CadnaA acoustic noise prediction software. Factors that have been taken into consideration in the noise modeling are:

- building envelope locations
- ground topography
- noise attenuation due to geometric spreading
- ground absorption

To validate the noise model, a single receiver point representing the unattended noise monitoring location was established in the model. The noise model was then used to calculate noise level at the single receiver point. Table 5-1 presents the comparison between the predicted noise levels and the unattended noise measurements at the noise logger location.

Table 5-1 Predicted Noise Level Compared with Measured Level – dBA

Location	**Measured $L_{Aeq,period}$ Traffic Noise Level**		**Predicted $L_{Aeq,period}$ Traffic Noise Level**	
70m from the nearest laneway of M5 Motorway	**Daytime 15hr**	**Night Time 9hr**	**Daytime 15hr**	**Night Time 9hr**
	55.3	51.7	55.3	51.7

The established model validates well with the measured existing noise environment and will be used for predicted noise levels to areas beyond the unattended noise measurement point.

Figure 5-1 presents a 3D view of the established noise model used for the purpose of predicted the $L_{Aeq,period}$ traffic noise levels based on existing traffic.

Figure 5-1 3D View of the Established Noise Model

Table 5-2 presents the predicted $L_{Aeq,period}$ traffic noise levels based on existing traffic on M5 Motorway.

Table 5-2 Predicted $L_{Aeq,period}$ Noise Levels Based Existing Traffic on M5 Motorway

Lot No.	Predicted $L_{Aeq,period}$ Noise Levels	
	Daytime (7.00am-10.00pm)	Night Time (10.00pm-7.00am)
Lot 1	56	53
Lot 2	59	56
Lot 3	58	55

Based on the worst case predicted daytime and night time noise levels, good design requires careful consideration of a range of factors – including the location and orientation of buildings and the internal layout as well as external spaces. The layout and configuration of a development should also respond to the local environment and purpose of space (e.g. internal sleeping area and external recreational area). The potential benefit of noise barriers and acoustic shielding from other structures should be considered in conjunction with the use of appropriate windows, doors, mechanical ventilation and facade materials.

One way to reduce noise level at the facade of a dwelling is to locate courtyard / external recreational areas between the road and the dwelling by means of increasing the separation between the road noise source and the noise sensitive area.

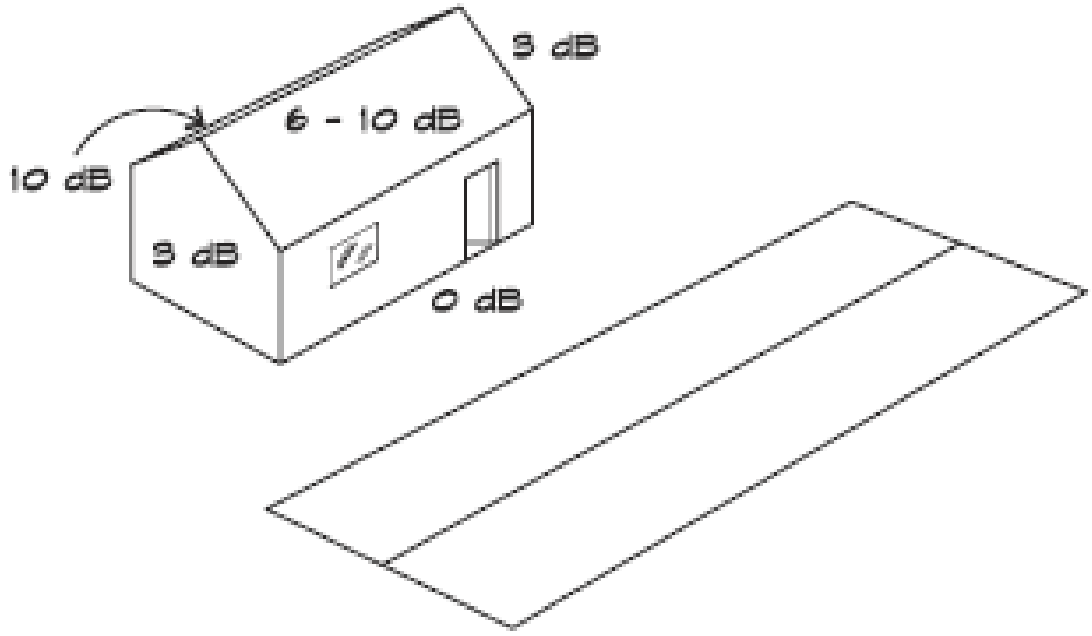
As a rule of thumb, doubling the distance from the road noise source to the receiver will normally reduce the L_{Aeq} noise levels by 3dB. It should be noted that although the criteria provided in Section 3 apply to internal spaces, which are regarded as the most sensitive, external spaces should also be considered.

A noise barrier is an effective way to reduce traffic noise and is the most effective at protecting outdoor areas and ground floor of buildings. Single-storey dwellings are therefore easier to shield from noise than the upper floor of two-storey dwellings.

Sleeping and habitable areas should be placed on the side of the building furthest from the source of noise, noting that halving the angle of view of the road reduces noise level by 3dB. Conversely, rooms which are less sensitive (e.g. garage, laundries, bathrooms, storage rooms, corridor, stairwells, etc.) should be placed on the noisy side of the building to act as a noise buffer. Figure 5-2 shows ground level self-shielding factors for various surface orientations.

Another way of minimising the intrusion of noise is to minimise the number of doors and windows (particularly windows that can be opened) as well as size of the window on the noisy side of the building.

Figure 5-2 Line source self-shielding factors



The predicted potential road traffic noise impact is grouped into six categories and the indicative $L_{Aeq,(period)}$ noise levels for each category are as follows:

- **Category 1** – 55dBA or less
- **Category 2** – 56dBA to 60dBA
- **Category 3** – 61dBA to 65dBA
- **Category 4** – 66dBA to 70dBA
- **Category 5** – 71dBA to 74dBA
- **Category 6** – greater than 74dBA

Each noise impact category, except category 6, refers to a set of standard construction methods and building materials for each key element of a building with the aim of achieving the internal performance criteria for noise identified in Clause 102 of the Infrastructure SEPP.

These noise control treatments are taken from the Department of Planning's Interim Guideline for development near rail corridors and busy Roads (2008) and are reproduced below in Table 5-3, Table 5-4, Table 5-5, Table 5-6 and Table 5-7 for Categories 1 to 5 respectively.

For some residential developments, there may be a desire to apply more stringent design goals in response to market demand for a higher quality living environment.

Table 5-3 Standard Construction for Category 1 Noise Treatment

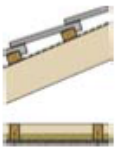
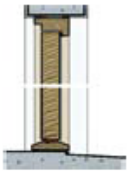
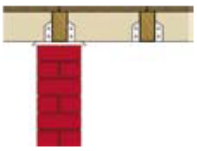
Category No.	Building Element	Standard Constructions	sample
1	**Windows/Sliding Doors**	Openable with minimum 4mm monolithic glass and standard weather seals	
	Frontage Facade	**Timber Frame or Cladding:** 6mm fibre cement sheeting or weatherboards or plank cladding externally, 90mm deep timber stud or 92mm metal stud, 13mm standard plasterboard internally	
		Brick Veneer: 110mm brick, 90mm timber stud or 92mm metal stud, minimum 50mm clearance between masonry and stud frame, 10mm standard plasterboard internally	
		Double Brick Cavity: 2 leaves of 110mm brickwork separated by 50mm gap	
	Roof	Pitched concrete or terracotta tile or metal sheet roof with sarking, 10mm plasterboard ceiling fixed to ceiling joists, R1.5 insulation batts in roof cavity.	
	Entry Door	35mm solid core timber door fitted with full perimeter acoustic seals	
	Floor	1 layer of 19mm structural floor boards, timber joist on piers	
		Concrete slab floor on ground	

Table 5-4 Standard Construction for Category 2 Noise Treatment

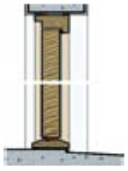
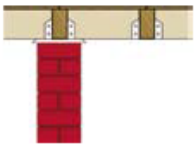
Category No.	Building Element	Standard Constructions	sample
2	**Windows/Sliding Doors**	Openable with minimum 6mm monolithic glass and full perimeter acoustic seals	
	Frontage Facade	**Timber Frame or Cladding Construction:** 6mm fibre cement sheeting or weatherboards or plank cladding externally, 90mm deep timber stud or 92mm metal stud, 13mm standard plasterboard internally with R2 insulation in wall cavity.	
		Brick Veneer Construction: 110mm brick, 90mm timber stud frame or 92mm metal stud, minimum 50mm clearance between masonry and stud frame, 10mm standard plasterboard internally.	
		Double Brick Cavity Construction: 2 leaves of 110mm brickwork separated by 50mm gap	
	Roof	Pitched concrete or terracotta tile or metal sheet roof with sarking, 10mm plasterboard ceiling fixed to ceiling joists, R2 insulation batts in roof cavity.	
	Entry Door	40mm solid core timber door fitted with full perimeter acoustic seals	
	Floor	1 layer of 19mm structural floor boards, timber joist on piers	
		Concrete slab floor on ground	

Table 5-5 Standard Construction for Category 3 Noise Treatment

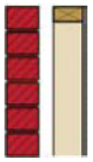
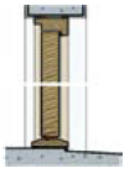
Category No.	Building Element	Standard Constructions	sample
3	**Windows/Sliding Doors**	Openable with minimum 6.38mm laminated glass and full perimeter acoustic seals	
	Frontage Facade	**Brick Veneer Construction:** 110mm brick, 90mm timber stud or 92mm metal stud, minimum 50mm clearance between masonry and stud frame, 10mm standard plasterboard internally.	
		Double Brick Cavity Construction: 2 leaves of 110mm brickwork separated by 50mm gap	
	Roof	Pitched concrete or terracotta tile or sheet metal roof with sarking, 1 layer of 13mm sound-rated plasterboard fixed to ceiling joists, R2 insulation batts in roof cavity.	
	Entry Door	45mm solid core timber door fitted with full perimeter acoustic seals	
	Floor	Concrete slab floor on ground	

Table 5-6 Standard Construction for Category 4 Noise Treatment

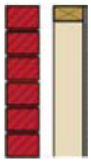
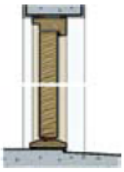
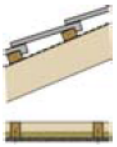
Category No.	Building Element	Standard Constructions	sample
4	**Windows/Sliding Doors**	Openable with minimum 10.38mm laminated glass and full perimeter acoustic seals	
	Frontage Facade	**Brick Veneer Construction:** 110mm brick, 90mm timber stud or 92mm metal stud, minimum 50mm clearance between masonry and stud frame, R2 insulation batts in wall cavity, 10mm standard plasterboard internally.	
		Double Brick Cavity Construction: 2 leaves of 110mm brickwork separated by 50mm gap	
	Roof	Pitched concrete or terracotta tile or sheet metal roof with sarking, 2 layers of 10mm sound-rated plasterboard fixed to ceiling joists, R2 insulation batts in roof cavity.	
	Entry Door	45mm solid core timber door fitted with full perimeter acoustic seals	
	Floor	Concrete slab floor on ground	

Table 5-7 Standard Construction for Category 5 Noise Treatment

Category No.	Building Element	Standard Constructions	sample
5	**Windows/Sliding Doors**	Openable Double Glazing with separate panes: 5mm monolithic glass, 100mm air gap, 5mm monolithic glass with full perimeter acoustic seals.	
	Frontage Facade	**Double Brick Cavity Construction:** 2 leaves of 110mm brickwork separated by 50mm gap with cement render to the external face of the wall and cement render or 13mm plasterboard direct fixed to internal faces of the wall.	
	Roof	Pitched concrete or terracotta tile or sheet metal roof with sarking, 2 layers of 10mm sound-rated plasterboard fixed to ceiling joist using resilient mounts, R2 insulation batts in roof cavity	
	Entry Door	Special high performance acoustic door required - Consult an Acoustic Engineer	*Door to acoustic consultant's specifications*
	Floor	Concrete slab floor on ground	
6	**All**	Consult an Acoustic Engineer	

In situations where windows and doors must be kept closed to achieve the internal noise goals, it is necessary to provide alternative ventilation. In this way the indoor noise goals can be met while providing room ventilation that meets the Building Code of Australia. Typical ways to achieve this are as below:

Option 1

Fully ducted air-conditioning with provision included of outside air. Many domestic air conditioning systems do not include outside air by default – it must be specified at the time of tendering and ordering. Commercial ducted air-conditioning systems

Option 2

A proprietary wall-mounted ventilation system, such as Aeropac. Aeropac units are approximately $800 each (per habitable room). Available from Acoustica, phone: 1300 722 825.

Option 3

Provision of an attenuated air inlet in an external faced proprietary unit such as "Silenceair". Available from www.silenceair.com

Table 5-8 presents a summary of the minimum noise treatment category required for each building lot and if alternate ventilation is required.

Table 5-8 Recommended Noise Treatment Category for Each Lot

Lot No.	Predicted $L_{Aeq,period}$ Noise Levels		Noise Treatment Category	Alternate Ventilation (Yes/No)
	Daytime (7.00am-10.00pm)	Night Time (10.00pm-7.00am)		
Lot 101	56	53	Category 2	Yes
Lot 102	59	56	Category 2	Yes
Lot 103	58	55	Category 2	Yes

6 VIBRATION MEASUREMENTS AND RECOMMENDATIONS

Vibration levels were measured with a Svantek 958A Four Channels Sound and Vibration Analyser. The transducer used for vibration measurements was coupled to the ground with an aluminium spiked plate at 70m setback from the nearest laneway of M5 Motorway. Vibration levels of the vibration dose value (VDV) in each of the three orthogonal axes (x, y and z) were recorded with this analyser.

Visual observation during time of survey, indicate that the project site is relatively flat with restricted line of sight to M5 Motorway.

Table 6-1 presents a summary of VDV levels measured during time of survey. Traffic on M5 Motorway was constant during time of measurement.

Table 6-1 Measured VDV Associated with Traffic Movements

Time	Measured VDV ($m/s^{1.75}$) in each orthogonal axes		
	x	y	z
10.00am to 11.00am	0.010-0.015	0.015-0.020	0.030-0.055

The measured VDV levels presented in Table 6-1 during each train pass-by are well within the preferred night time VDV level of $0.13 m/s^{1.75}$ and vibration from the traffic movements was imperceptible.

This indicates a low probability of adverse comment or disturbance to the occupants of the proposed residential development at the recorded VDV levels.

7 CONCLUSION

A noise assessment of the proposed subdivision and residential development at 122-124 Graham Avenue, Lurnea has been undertaken, taking into consideration of the provisions in the Department of Planning's Interim Guideline for Development near Rail Corridors and Busy Roads, to identify the required noise mitigation measures to achieve compliance.

Recommendations contained in this report have been made for the roof, wall and glazing building elements to control traffic noise ingress from M5 Motorway to within design levels recommended in the guideline.

Vibration levels associated with traffic movements on M5 Motorway are well within the preferred night time VDV level of 0.13m/s$^{1.75}$ and vibration from the traffic movements was imperceptible.

Note
All materials specified by Blackett Acoustics have been selected solely on the basis of acoustic performance. Any other properties of these materials, such as fire rating, chemical properties etc. should be checked with the suppliers or other specialised bodies for fitness for a given purpose.

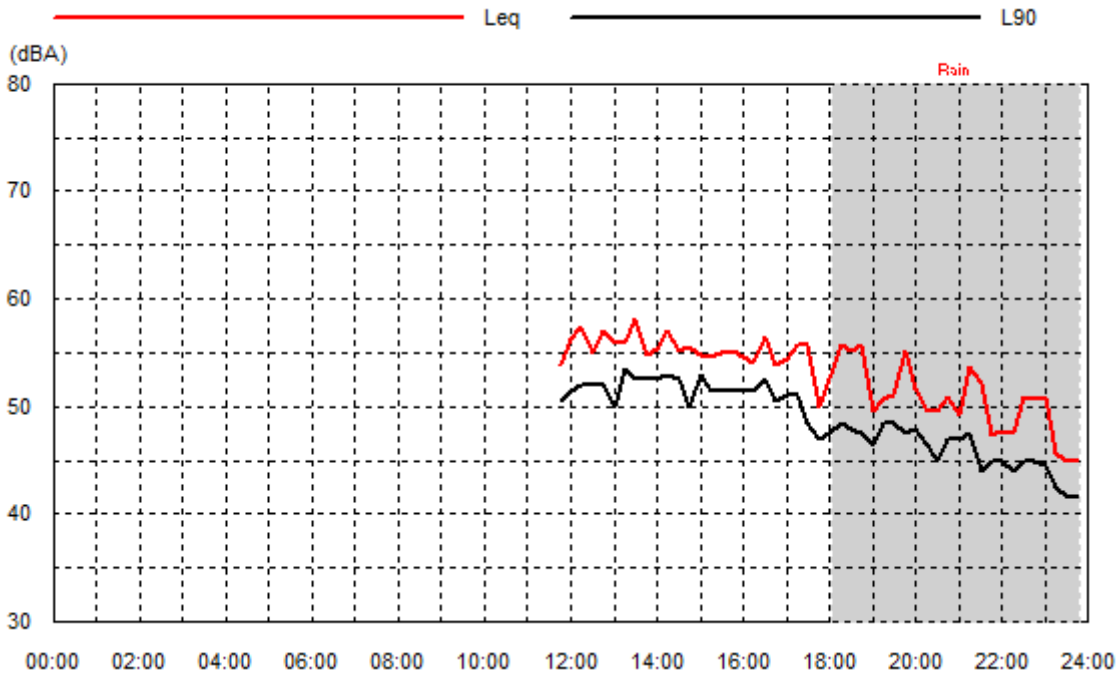
Version	Status	Issue Date	Prepared by
A	Final	22 February 2022	Jimi Ang

Appendix A

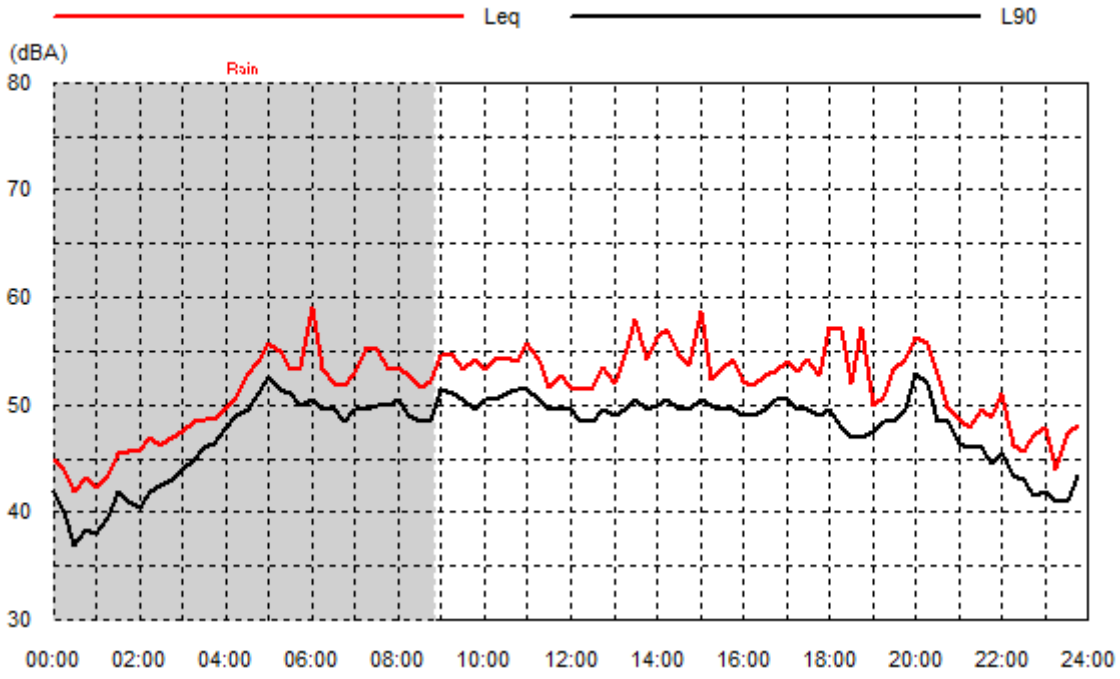
Noise Logger Graphs

Location: 122-124 Graham Ave, Lurnea
Data shaded: Rain

Fri 21 Jan 22

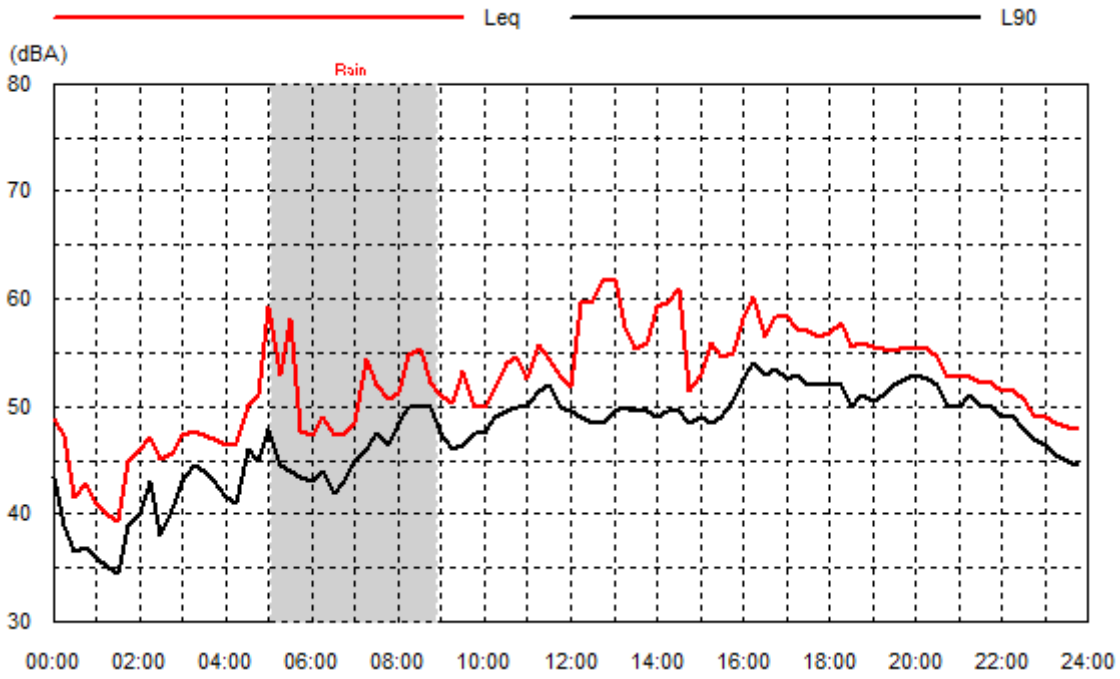


Sat 22 Jan 22

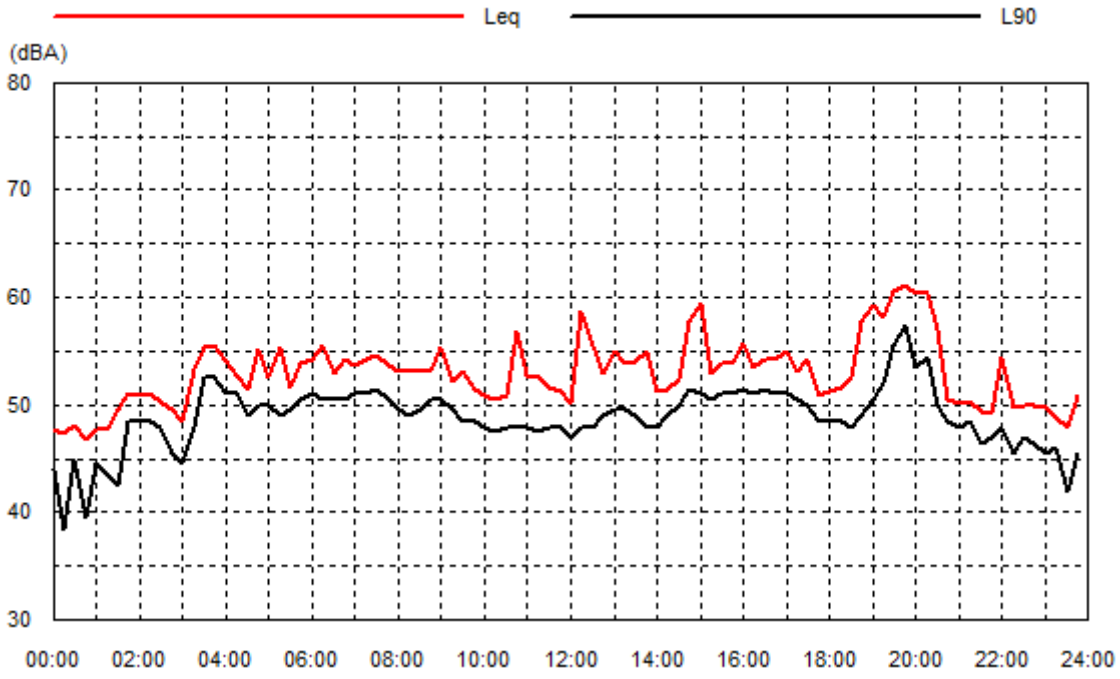


Location: 122-124 Graham Ave, Lurnea
Data shaded: Rain

Sun 23 Jan 22

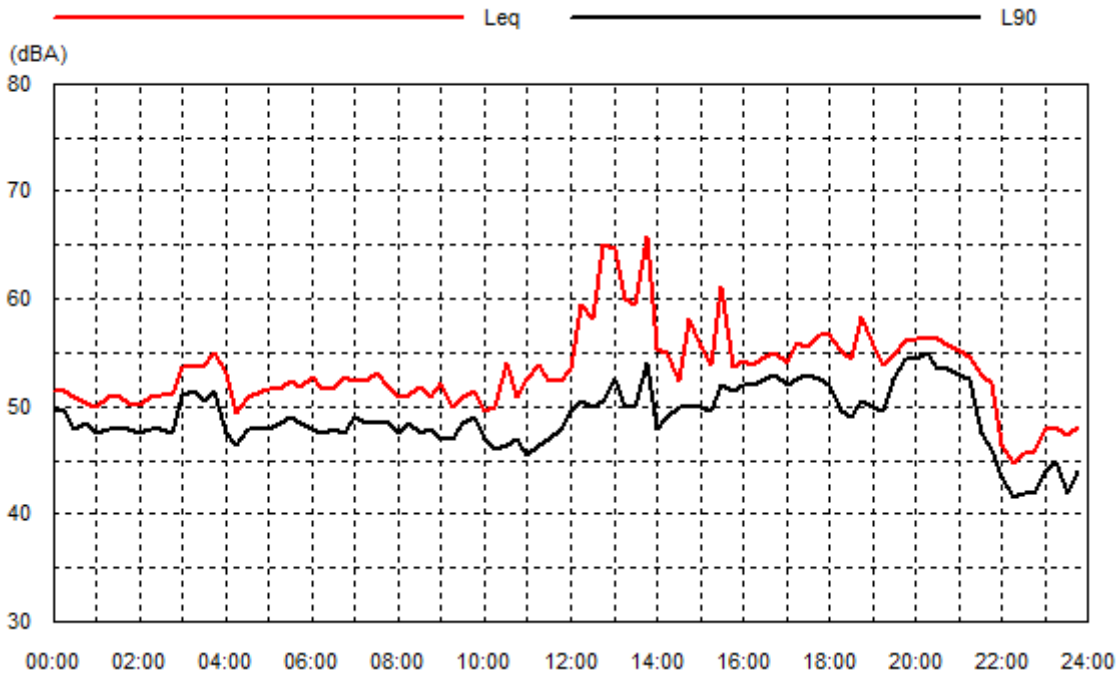


Mon 24 Jan 22

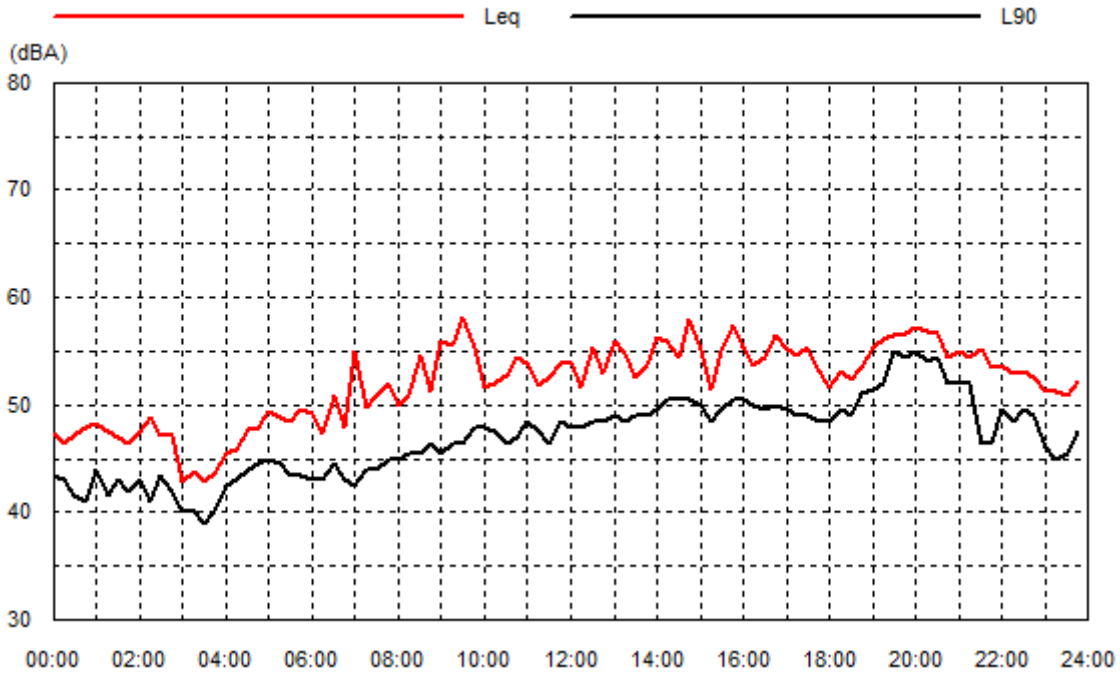


Location: 122-124 Graham Ave, Lurnea
Data shaded: Rain

Tue 25 Jan 22

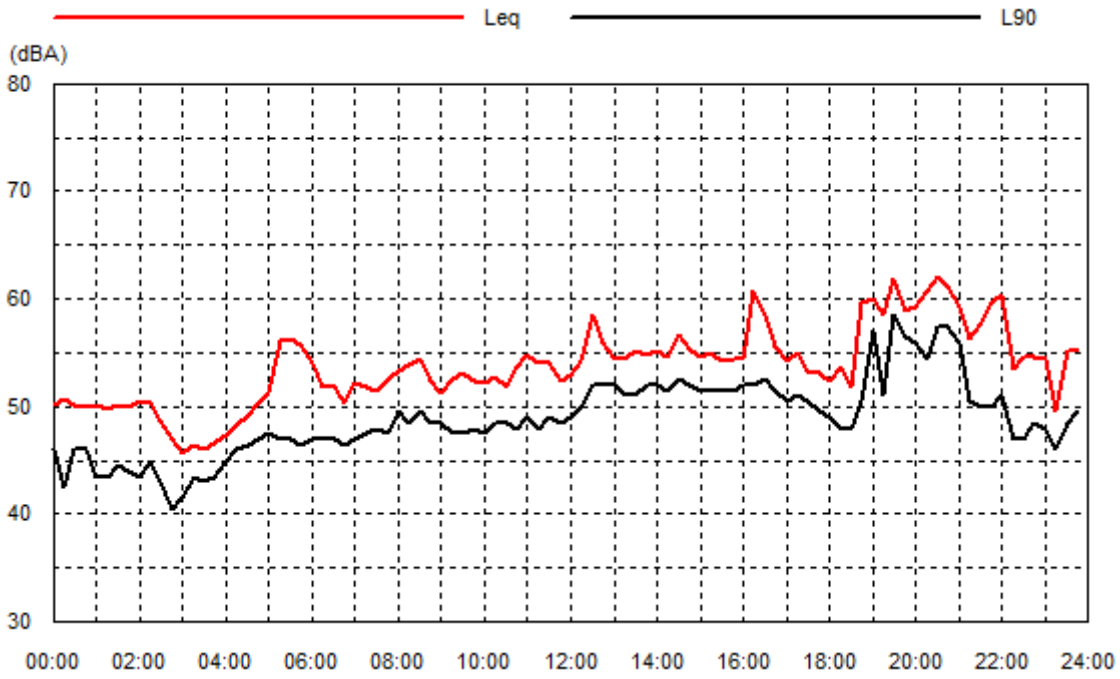


Wed 26 Jan 22

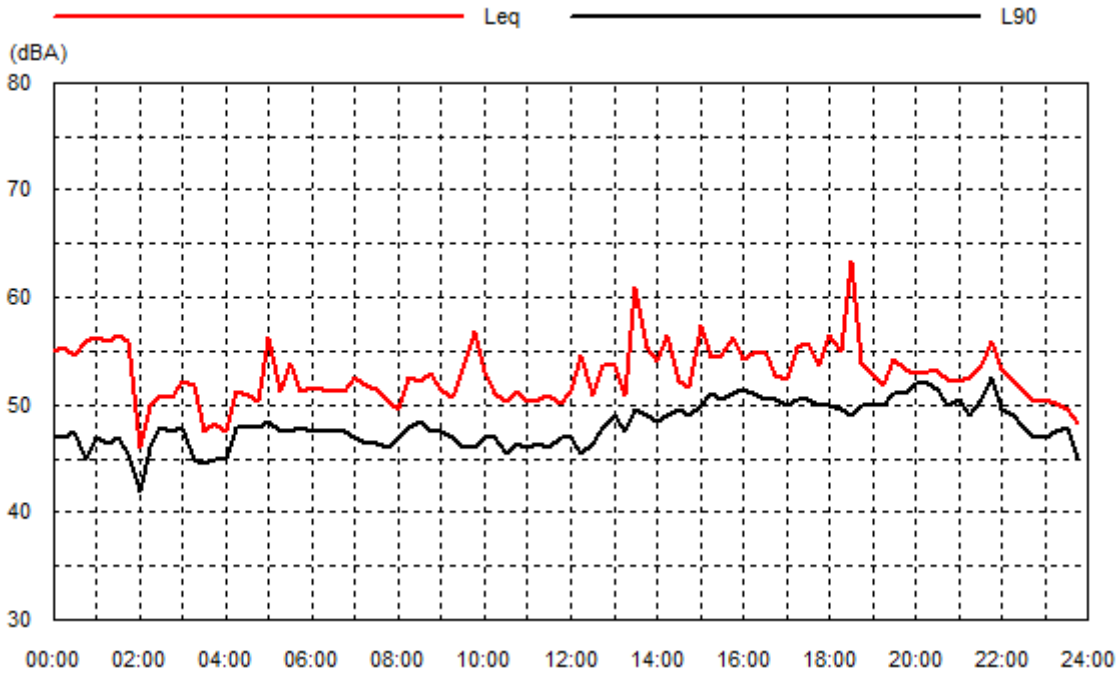


Location: 122-124 Graham Ave, Lurnea
Data shaded: Rain

Thu 27 Jan 22

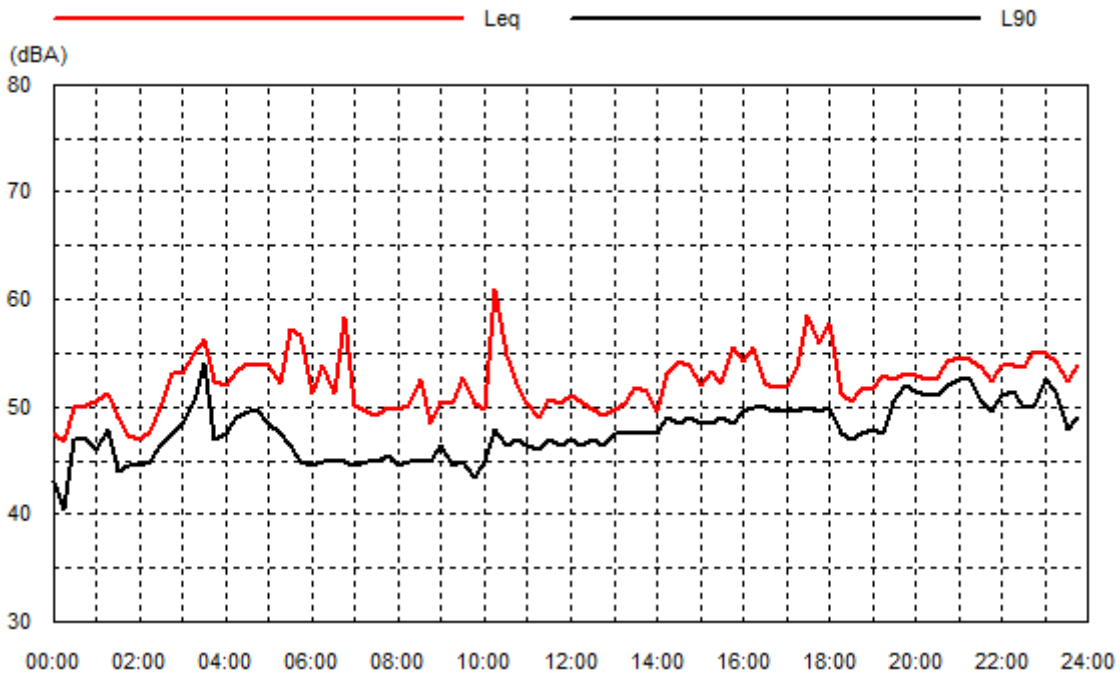


Fri 28 Jan 22

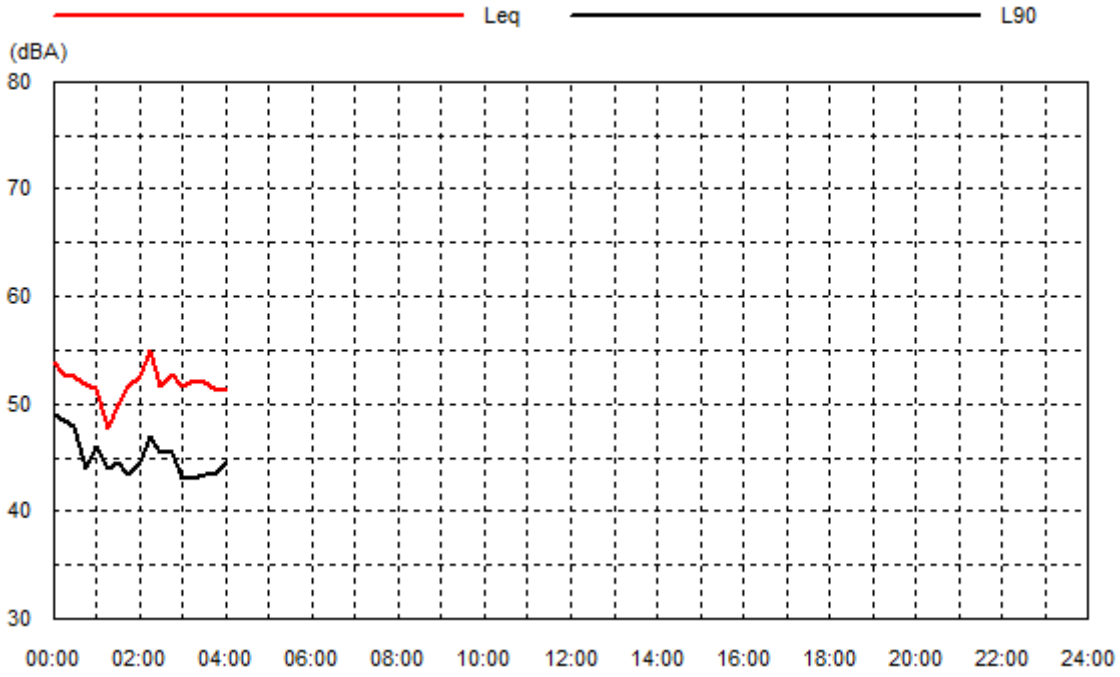


Location: 122-124 Graham Ave, Lurnea
Data shaded: Rain

Sat 29 Jan 22



Sun 30 Jan 22



Summary table for ILSAX results
developed site data

file: issue A Feb-22
lot 2 plus access handle graham dwelling
osd based on entire site & no existing imp area

q for orifice				wier flows						rl	q cum/s
h	q cum/s	diameter	rl	h	q l/s	h	q l/s				
0	0.000	0.105	50.05	0						50.05	0.000
0.03	0.0041	0.105	50.08	0.03						50.08	0.0041
0.23	0.0114	0.105	50.28	0.23						50.28	0.0114
0.43	0.0156	0.105	50.48	0.43						50.48	0.0156
0.61	0.0186	0.105	50.66	0.61						50.66	0.0186
0.71	0.0200	0.105	50.76	0.71			0.05	0.005		50.76	0.0248
0.86	0.0220	0.105	50.94	0.86			0.23	0.010		50.94	0.0324

q weir

h (m)	b (m)				
0.1	1.8	0.125	flat 1.8m		
0.0048		0.05	dia 100		
0.0103		0.23	dia 100		

see attached ILSAX files
& attached engineering plans
Leon Savage, BE Civil

notes

basinbase floorarea	tank	14	sqm
basintopsurfacearea	tank	14	sqm
site L used		66	m
site fall used		1.5	m
site grade used		2.3%	
site area used		510	sqm
site impervious used		0	sqm
existing pervious area		0	
existing impervious area		0	

area to osd sqm	350	
uncontrolled	160	31%

5 year event					
Storm (minutes)	Pre develop flows (l/s)	Orifice flow (l/s)	Total post flow (l/s)	Water storage level (m)	Remark
5	18	11	17	50.26	Ok
20	16	10	15	50.24	Ok
30	17	10	16	50.25	Ok
40	14	9	14	50.22	Ok
60	17	10	15	50.24	Ok
120	18	10	15	50.23	Ok

100 year event					
Storm (minutes)	Pre develop flows (l/s)	Orifice flow (l/s)	Total post flow (l/s)	Water storage level (m)	Remark
5	35	16	26	50.5	Ok
20	33	15	24	50.47	Ok
30	31	15	25	50.47	Ok
40	28	15	23	50.44	Ok
60	31	16	25	50.48	Ok
120	31	15	23	50.45	Ok

20% buffer due to landscape not required - this is a tank

Summary table for ILSAX results — file: issue A — Feb-22

developed site data — lot 3 graham dwelling

osd based on entire site & no existing imp area

q for orifice				wier flows				rl	q cum/s
h	q cum/s	diameter	rl	h	q l/s	h	q l/s		
0	0.000	0.085	50.01	0				50.01	0.000
0.15	0.0060	0.085	50.16	0.15				50.16	0.0060
0.30	0.0085	0.085	50.31	0.3				50.31	0.0085
0.45	0.0104	0.085	50.46	0.45				50.46	0.0104
0.61	0.0122	0.085	50.62	0.61				50.62	0.0122
0.71	0.0131	0.085	50.72	0.71		0.05	0.005	50.72	0.0179
0.74	0.0134	0.085	50.9	0.74		0.23	0.010	50.9	0.0237

q weir

h (m)	b (m)			
0.1	1.8	0.125	flat 1.8m	
0.0048		0.05	dia 100	
0.0103		0.23	dia 100	

see attached ILSAX files
& attached engineering plans
Leon Savage, BE Civil

notes

basinbase floorarea	tank	9.4	sqm
basintopsurfacearea	tank	9.4	sqm
site L used		66	m
site fall used		1.2	m
site grade used		1.8%	
site area used		315	sqm
site impervious used		0	sqm
existing pervious area		0	
existing impervious area		0	

area to osd sqm	315	
uncontrolled	0	0%

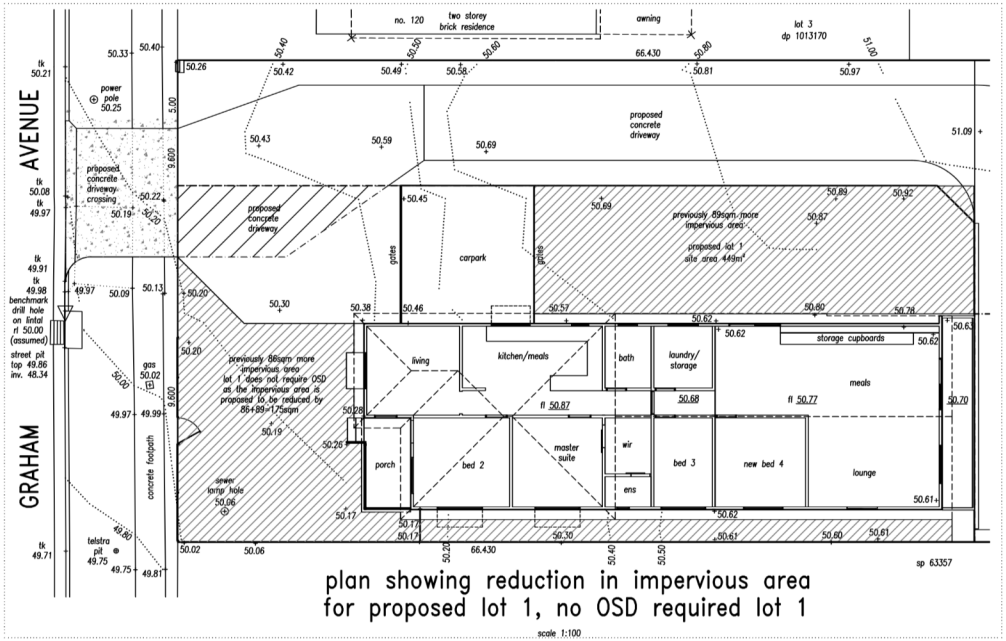
5 year event					
Storm (minutes)	Pre develop flows (l/s)	Orifice flow (l/s)	Total post flow (l/s)	Water storage level (m)	Remark
5	11	9	9	50.34	Ok
20	10	8	8	50.3	Ok
30	11	9	9	50.31	Ok
40	8	8	8	50.27	Ok
60	11	8	8	50.3	Ok
120	11	8	8	50.3	Ok

100 year event					
Storm (minutes)	Pre develop flows (l/s)	Orifice flow (l/s)	Total post flow (l/s)	Water storage level (m)	Remark
5	22	13	15	50.68	Ok
20	20	13	14	50.66	Ok
30	19	13	14	50.66	Ok
40	18	12	13	50.63	Ok
60	20	13	15	50.67	Ok
120	20	12	13	50.64	Ok

20% buffer due to landscape not required - this is a tank

FRAGAR PLANNING & DEVELOPMENT

PROPOSED DEVELOPMENT
AT
#122-124 GRAHAM AVENUE
LURNEA NSW



plan showing reduction in impervious area
for proposed lot 1, no OSD required lot 1

scale 1:100

INDEX TO SHEETS	
SHEET	TITLE
C-000	cover sheet & drawing list & lot 1 catchment plan
C-401	stormwater drainage, rainwater reuse & on site detention
C-402	stormwater drainage, rainwater reuse & on site detention

Summary table for ILSAX results — file: issue A — Feb-22
developed site data — lot 2 plus access handle graham dwelling — osd based on entire site & no existing imp area

q for orifice — wier flows

h	q cum/s	diameter	rl	h	q l/s	h	q l/s	rl	q cum/s
0	0.000	0.105	50.05	0				50.05	0.000
0.03	0.0041	0.105	50.08	0.03				50.08	0.0041
0.20	0.0114	0.105	50.25	0.25				50.39	0.0114
0.43	0.0156	0.105	50.48	0.43				50.48	0.0155
0.61	0.0196	0.105	50.66	0.61				50.66	0.0195
0.71	0.0209	0.105	50.76	0.71		0.05	0.903	50.76	0.0248
0.86	0.0209	0.105	50.94	0.86		0.23	0.910	50.94	0.0324

q weir

h (m)	b (m)
0.1	1.8
0.0048	
0.0103	

0.126 flat 1.8m
0.05 dia 100
0.23 dia 100

notes
see attached ILSAX files & attached engineering plans
Leon Savage, BE Civil

bushbase floorarea tank	14 sqm
bushbase surfacearea tank	14 sqm
site L used	86 m
site fall used	1.5 m
site grade used	2.3%
site area used	510 sqm
site impervious used	0 sqm
existing pervious area	0
existing impervious area	0

area to osd sqm 350
uncontrolled 160 31%

5 year event

Storm (minutes)	Pre develop flows (l/s)	Orifice flow (l/s)	Total post flow (l/s)	Water storage level (m)	Remark
5	18	11	17	50.25	Ok
20	16	10	15	50.24	Ok
30	17	10	15	50.25	Ok
45	14	9	14	50.22	Ok
60	17	10	15	50.24	Ok
120	18	10	15	50.23	Ok

100 year event

Storm (minutes)	Pre develop flows (l/s)	Orifice flow (l/s)	Total post flow (l/s)	Water storage level (m)	Remark
5	30	16	26	50.5	Ok
20	33	15	24	50.47	Ok
30	31	15	25	50.47	Ok
45	28	15	23	50.44	Ok
60	31	16	25	50.48	Ok
120	31	15	23	50.45	Ok

20% buffer due to landscape not required - this is a tank

Summary table for ILSAX results — file: issue A — Feb-22
lot 3 graham dwelling — osd based on entire site & no existing imp area

q for orifice — wier flows

h	q cum/s	diameter	rl	h	q l/s	h	q l/s	rl	q cum/s
0	0.000	0.085	50.01	0				50.01	0.000
0.15	0.0060	0.085	50.16	0.15				50.16	0.0060
0.30	0.0085	0.085	50.31	0.3				50.31	0.0085
0.45	0.0104	0.085	50.46	0.45				50.46	0.0104
0.61	0.0122	0.085	50.62	0.61				50.62	0.0122
0.71	0.0131	0.085	50.72	0.71		0.05	0.903	50.72	0.0179
0.74	0.0134	0.085	50.9	0.74		0.23	0.910	50.9	0.0257

q weir

h (m)	b (m)
0.1	1.8
0.0048	
0.0103	

0.126 flat 1.8m
0.05 dia 100
0.23 dia 100

notes
see attached ILSAX files & attached engineering plans
Leon Savage, BE Civil

bushbase floorarea tank	8.4 sqm
bushbase surfacearea tank	8.4 sqm
site L used	66 m
site fall used	1.2 m
site grade used	1.8%
site area used	315 sqm
site impervious used	0 sqm
existing pervious area	0
existing impervious area	0

area to osd sqm 315
uncontrolled 0 0%

5 year event

Storm (minutes)	Pre develop flows (l/s)	Orifice flow (l/s)	Total post flow (l/s)	Water storage level (m)	Remark
5	11	9	9	50.34	Ok
20	10	8	8	50.3	Ok
30	11	9	9	50.31	Ok
45	8	6	6	50.27	Ok
60	11	8	8	50.3	Ok
120	11	8	8	50.3	Ok

100 year event

Storm (minutes)	Pre develop flows (l/s)	Orifice flow (l/s)	Total post flow (l/s)	Water storage level (m)	Remark
5	20	13	15	50.68	Ok
20	20	13	14	50.66	Ok
30	19	13	14	50.66	Ok
40	18	12	13	50.63	Ok
60	20	13	15	50.67	Ok
120	20	12	13	50.64	Ok

20% buffer due to landscape not required - this is a tank

issued for land and environment court NSW

OWNER 'The owner is responsible for maintenance of building and site. Refer to the CSIRO 'Guide to Home Owners on Foundation Maintenance and Performance'.

ISSUE / REVISIONS

REV	BY	DATE	ISSUE / REVISION DESCRIPTION	CHK	APP
0	JZ	04/03/2020	ISSUED FOR DA	MJ	GP
A	LS	FEB 2022	issued for land and environment court NSW	LS	GP

TITLE	NAME	DATE
DRAFTER	K. DANG	FEB 2022
DESIGNER	L. SAVAGE	FEB 2022
ENG. CHECK	G. PURCH	FEB 2022

AUTHORISED BY:
(SERVICE PERSON)
FEAust CPEng NER BPB RBP RPEQ

NORTH

CLIENT: FRAGAR PLANNING & DEVELOPMENT

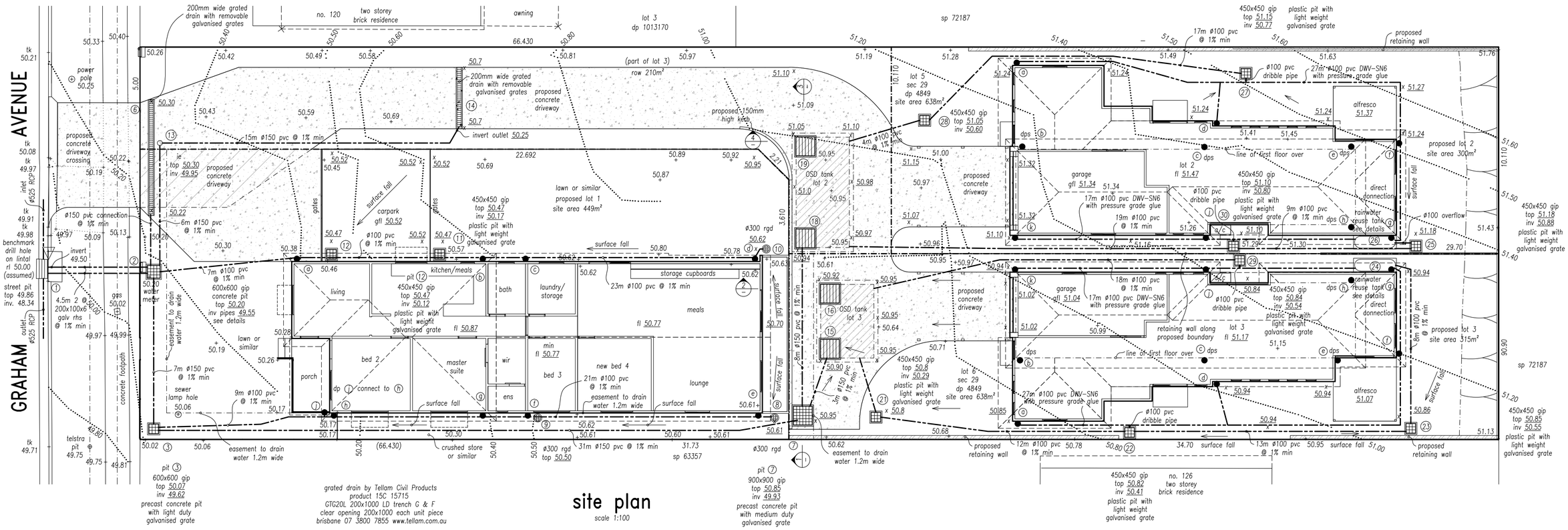
STRUCterre consulting
Structerre Consulting Engineers (NSW) Pty Ltd (ACN 151 746 265)
SUITE 1, LEVEL 2, 42 BIRNIE AVENUE, LIDCOMBE NSW 2141
TEL (02) 9475 3000 FAX (02) 9646 2311 EMAIL sydney@structerre.com.au

PROJECT: PROPOSED DEVELOPMENT
AT
#122-124 GRAHAM AVENUE
LURNEA NSW

COVER SHEET & DRAWING LIST

CLIENT REF. No	N/A
SCALE	N/A
STRUCTERRE JOB No	3.20.877.2
DRAWING REF. No	3.20.877-C-000
REV	A

SHEET SIZE: A1



site plan

scale 1:100

LOT 1

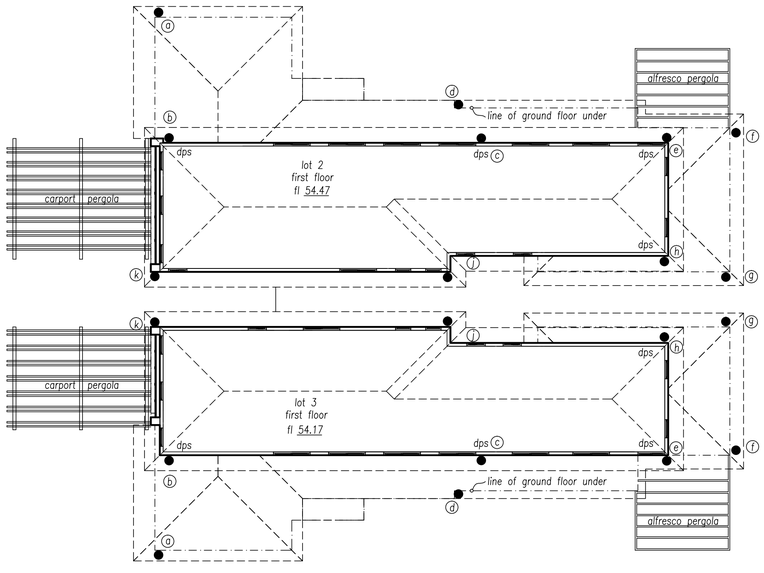
TABLE OF DOWN PIPE INFORMATION

down pipe number	size	surface level	invert level
a	ø90mm	50.38	50.18
b	ø90mm	50.50	50.30
c	ø90mm	50.52	50.32
d	ø90mm	50.62	50.42
e	ø90mm	50.61	50.41
f	ø90mm	50.50	50.30
g	ø90mm	50.40	50.20
h	ø90mm	50.20	50.00
j	ø90mm	connected to (h)	

all downpipes ø90 pvc or ø90 or 50x100 colourbond

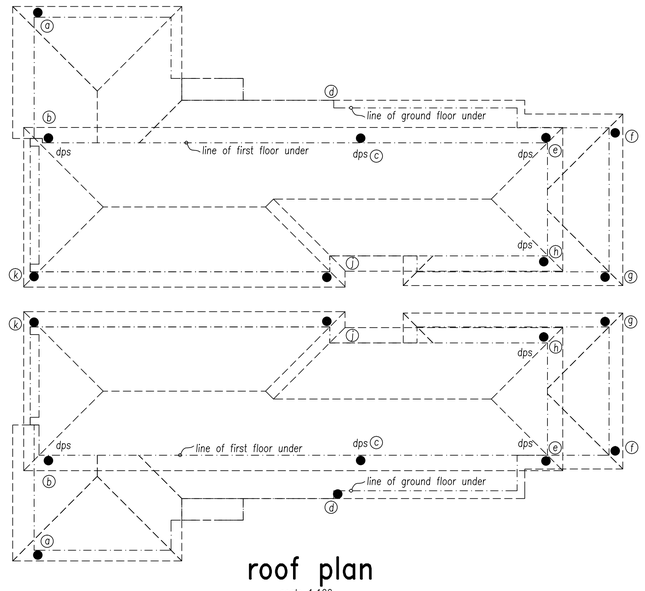
NOTES

1. all work to be done to the satisfaction of Liverpool City Council.
2. legend: tw top of wall; tk top of kerb; ● ; fw floor waste; gfl garage floor level; fl floor level; 56.89 existing level; 53.81 design level; gip grated inlet pit; bfl basement floor level; jp junction pit; ie upvc sewer grade inspection eye; dps – downpipe with spreader; D.E.B – dropped edge beam; rgd – round grated drain; eof – emergency over flow; ie – inspection eye
3. proposed concrete driveway to be constructed in accordance with plans, specifications, and levels issued seperately by council.
4. all pipes to be min. 100mm dia unless noted otherwise (uno).
5. all pipes to be grade upvc at min 1% uno.



first floor plan

scale 1:100



roof plan

scale 1:100

LOT 2

TABLE OF DOWN PIPE INFORMATION

down pipe number	size	surface level	invert level
a	ø90mm	51.24	51.04
b	ø90mm	dps	–
c	ø90mm	dps	–
d	ø90mm	51.24	51.04
e	ø90mm	dps	–
f	ø90mm	51.24	51.04
g	ø90mm	direct connection	
h	ø90mm	dps	–
j	ø90mm	51.11	50.90
k	ø90mm	51.10	50.90

all proposed downpipes to be ø90 pvc SWV-SN6 with pressure grade glue (green glue) in joints

LOT 3

TABLE OF DOWN PIPE INFORMATION

down pipe number	size	surface level	invert level
a	ø90mm	50.85	50.65
b	ø90mm	dps	–
c	ø90mm	dps	–
d	ø90mm	50.94	50.74
e	ø90mm	dps	–
f	ø90mm	50.89	50.69
g	ø90mm	direct connection	
h	ø90mm	dps	–
j	ø90mm	50.86	50.66
k	ø90mm	50.94	50.74

all proposed downpipes to be ø90 pvc SWV-SN6 with pressure grade glue (green glue) in joints

issued for land and environment court NSW

OWNER The owner is responsible for maintenance of building and site. Refer to the CSIRO 'Guide to Home Owners on Foundation Maintenance and Performance'.

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AUTHORISED BY:

GERVASE PURICH
FIEAust CPEng NER BPB RBP RPEQ

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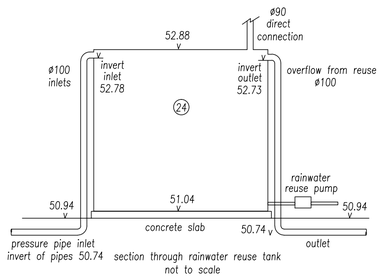
PROJECT

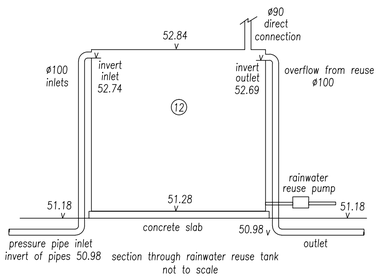
PROPOSED DEVELOPMENT AT
#122-124 GRAHAM AVENUE
LURNEA NSW

stormwater drainage, rainwater reuse & on site detention

CLIENT REF. No.	N/A
SCALE	N/A
STRUCTERRE JOB No.	3.20.877.2
DRAWING REF. No.	3.20.877-C-401
REV	A
SHEET SIZE	A1



section through rainwater reuse tank
not to scale



section through rainwater reuse tank
not to scale

reuse required per BASIX 1500 or 1200 litres
proposed 1500 litres storage covers both
rainwater reuse tanks
per suppliers specifications

UltraSlimline 1500, 2000 long 1540 high 575 wide tank system
supplier Bluescope Water

any openings shall be meshed or sealed to
prevent access by insects such as mosquitos

pump to be suitably soundproofed

the drainage system & the downpipes & fittings
are to be DWV-SN6 pvc pipes with pressure glue
specified in AS3500.1:2015

BASIX Commitments Lot 1

item	requirement
refer BASIX Certificate number	~~1176086M_02 dated 01 July 2021~~
rainwater tank size	n.a.
roof area	n.a.
rainwater tank connected to	n.a.

BASIX Commitments Lot 2

item	requirement
refer BASIX Certificate number	1082305S_03 dated 14 February 2022
rainwater tank size	at least 1200 litres, 1500 litres proposed
roof area	at least 135sqm, 100% of roof proposed
rainwater tank connected to	all toilets & at least one outdoor tap
	the cold water tap that supplies each clothes washer

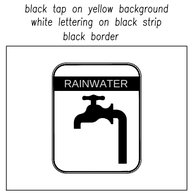
BASIX Commitments Lot 3

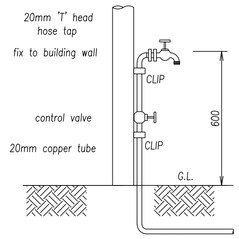
item	requirement
refer BASIX Certificate number	~~1176086M_02 dated 01 July 2021~~
rainwater tank size	at least 1500 litres, 1500 litres proposed
roof area	at least 142sqm, 100% of roof proposed
rainwater tank connected to	all toilets & at least one outdoor tap
	the cold water tap that supplies each clothes washer

sign at
each entrance to
osd & reuse tanks

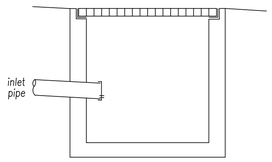
THIS IS AN ON-SITE DETENTION STRUCTURE.
DO NOT TAMPER WITH.
CONTACT LIVERPOOL CITY COUNCIL PRIOR
TO ANY PROPSED WORKS IN THIS AREA.

Minimum size: 150mm x 60mm
Material: Non-corrosive metal or 4mm thick laminated plastic.
Location: Screwed to the nearest concrete or Permanent surface and be above the expected water surface level in the basin. If in doubt Council.
Wording: Minimum letter height of 5mm. Wording to consist of;





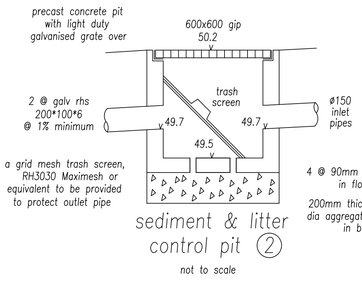
hose tap detail
not to scale



dribble pipe details
not to scale

dribble pipe connection
screw cap over connection

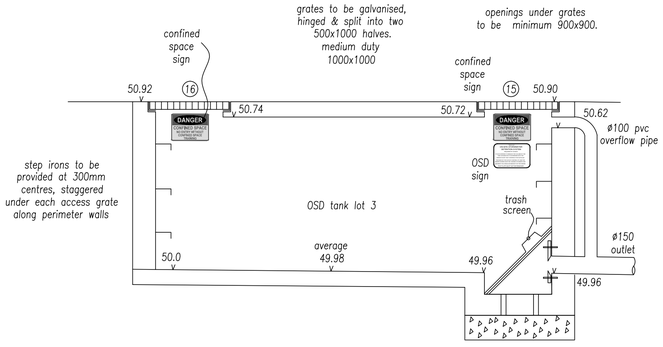
5mm diameter weephole
to be provided at
base of screwcap



4 @ 90mm dia weep holes
in floor of pit

200mm thick bed of 20mm
dia aggregate to be wrapped
in bidim a14

sediment & litter
control pit (2)
not to scale



step irons to be
provided at 300mm
centres, staggered
under each access grate
along perimeter walls

a grid mesh trash screen,
RH3030 Maximesh or
equivalent to be provided
to protect outlet pipe/orifice

orifice plates
400x400x3mm thick
to be bolted to pit
wall with 4m16 holts
or equivalent

orifice diameter 85mm
plate to be stainless steel
set orifice invert
at invert of outlet pipe
silicon seal plate to wall

4 @ 90mm dia weep holes
in floor of pit

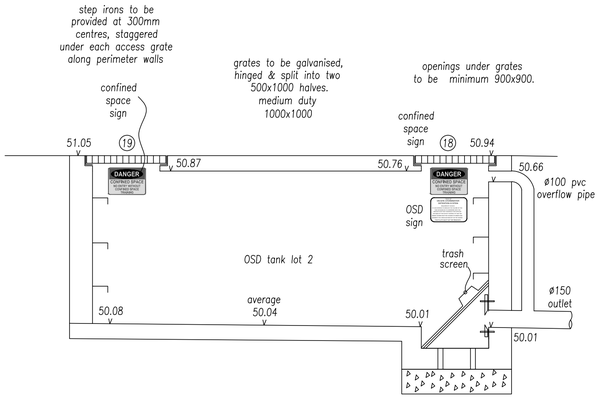
200mm thick bed of 20mm
dia aggregate to be wrapped
in bidim a14

section through on site detention tank lot 3
not to scale (1)

structural details of detention
tank to be prepared by a
suitably qualified structural engineer.

All walls or kerbs forming the detention basin shall be constructed
wholly within the property boundaries of the site being developed.

section through on site detention tank lot 3
not to scale (2)



step irons to be
provided at 300mm
centres, staggered
under each access grate
along perimeter walls

a grid mesh trash screen,
RH3030 Maximesh or
equivalent to be provided
to protect outlet pipe/orifice

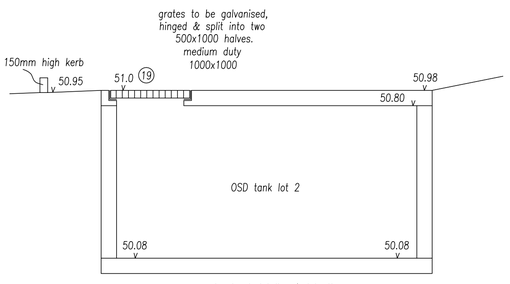
orifice plates
400x400x3mm thick
to be bolted to pit
wall with 4m16 holts
or equivalent

orifice diameter 105mm
plate to be stainless steel
set orifice invert
at invert of outlet pipe
silicon seal plate to wall

4 @ 90mm dia weep holes
in floor of pit

200mm thick bed of 20mm
dia aggregate to be wrapped
in bidim a14

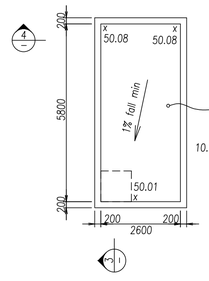
section through on site detention tank lot 2
not to scale (3)



structural details of detention
tank to be prepared by a
suitably qualified structural engineer.

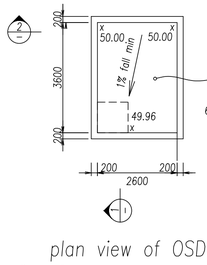
All walls or kerbs forming the detention basin shall be constructed
wholly within the property boundaries of the site being developed.

section through on site detention tank lot 2
not to scale (4)



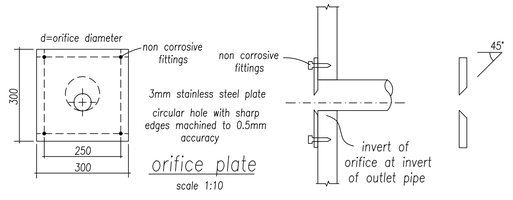
OSD tank lot 2
floor area 14m²
50.76-50.04=0.72m
average depth 0.72m
14x0.72=10.1 KL
10.1 KL available, satisfactory

plan view of OSD tank
& rainwater reuse tank lot 2
scale 1:100



OSD tank lot 3
floor area 9.4m²
50.72-49.98=0.74m
average depth 0.74m
9.4x0.74=6.6 KL
6.6 KL available, satisfactory

plan view of OSD tank
& rainwater reuse tank lot 3
scale 1:100



orifice plate
scale 1:10

issued for land and environment court NSW

OWNER The owner is responsible for maintenance of building and site. Refer to the CSIRO 'Guide to Home Owners on Foundation Maintenance and Performance'.

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TITLE	NAME	DATE
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DESIGNER	L. SAVAGE	FEB 2022
ENG. CHECK	G. PURICH	FEB 2022

AUTHORISED BY:

GERVASE PURICH
FIEAust CPEng NER BPB RBP RPEQ

NORTH

CLIENT
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Structerre Consulting Engineers (NSW) Pty Ltd (ACN 131 748 260)
SUITE 1, LEVEL 2, 42 BIRNIE AVENUE, LIDCOMBE NSW 2141
TEL (02) 9475 3000 FAX (02) 9646 2311 EMAIL: sydney@structerre.com.au

PROJECT
PROPOSED DEVELOPMENT AT
#122-124 GRAHAM AVENUE
LURNEA NSW
stormwater drainage, rainwater reuse & on site detention

CLIENT REF. No.	N/A
SCALE	N/A
STRUCTERRE JOB No.	3.20.877.2
DRAWING REF. No.	3.20.877-C-402
REV	A
SHEET SIZE	A1

M^CLAREN TRAFFIC ENGINEERING

Address: Shop 7, 720 Old Princes Highway Sutherland NSW 2232
Postal: P.O Box 66 Sutherland NSW 1499

Telephone: (02) 9521 7199
Web: www.mclarentraffic.com.au
Email: admin@mclarentraffic.com.au

Division of RAMTRANS Australia ABN: 45067491678 RPEQ: 19457

Transport Planning, Traffic Impact Assessments, Road Safety Audits, Expert Witness

23 February 2022 Reference: 211090.01DA

Dale Beaumont
DKB Group Pty Ltd
c/- Council Approval Group
122 Graham Avenue, Lurnea
Attention: Tania Van Dyk

LETTER OF RESPONSE TO STATEMENT OF FACTS AND CONTENTIONS FOR PROPOSED RESIDENTIAL DEVELOPMENT AT 122-124 GRAHAM AVENUE, LURNEA

Dear Tania,

Reference is made to your request to provide a Letter of Response to Statement of Facts and Contentions for the Proposed Residential Development at 122-124 Graham Avenue, Lurnea, with proposed plans depicted in **Annexure A**). This letter is in response to the *Statement of Facts and Contentions* (case number 2021/00311773), filed 26 November 2021. The relevant contentions related to traffic and parking are shown below (italicised) with *M^CLaren Traffic Engineering*'s (MTE) response thereafter.

> *26 (a)(i) The proposed vehicular crossing shall be minimum 1 metre clear of the power pole. Power pole may be required to be relocated which requires approval from Endeavour Energy. (This was raised in the first engineering deferral dated 31 August 2020)*

MTE Response: The vehicular crossing has been amended to align perpendicularly with Graham Avenue while maintaining a minimum width of 5.5m. The driveway is now located 1 metre from the power pole and therefore relocation of the power pole is unnecessary. The amended vehicular crossing is shown in **Annexure A**.

> *26 (a)(ii) If the vehicular crossing is amended because of the above point, then the proposed vehicular crossing shall be in accordance with Australian Standard AS2890. In particular, the first 6 metres need to allow for 2-way movement (5.5 metres wide) and a passing bay is required along the driveway.*

MTE Response: It is not a requirement for the first 6 metres of a driveway to be a minimum width of 5.5m for domestic properties. *AS 2890.1:2004 Clause 3.2.2* outlines the following in relation to access driveway width requirements for domestic properties:

> *Where the circulation roadway leading from a Category 1 access driveway is 30m or longer, or sight distance from one end to the other is restricted, and the frontage road is an arterial or sub-arterial road, both the access driveway and the circulation*

roadway for at least the first 6m from the property boundary shall be a minimum of 5.5m wide. In other cases subject to consideration of traffic volumes on a case-by-case basis, lesser widths, down to a minimum of 3.0m at a domestic property, may be provided. As a guide, 30 or more movements in a peak hour (in and out combined) would usually require provision for two vehicles to pass on the driveway, i.e. a minimum width of 5.5m. On long driveways, passing opportunities should be provided at least every 30 m.

AS 2890.1:2004 defines a domestic property as *"A property comprising three or less domestic units"*. The proposed development consists of three domestic units and can therefore be classified as a domestic property in accordance with *Clause 1.3.13*.

Since the development is a "domestic property", a minimum driveway width of 3.0m is permitted if the traffic volume is expected to be low. There are two (2) lots that will use the single lane driveway to access the rear of the lot. The traffic generation of low-density residential dwellings is outline in the *RMS Technical Direction TDT2013/04a* which states an evening peak hour vehicle generation rate of 0.99 trips per dwelling. Therefore, it is expected that the two (2) rear lots would generate two (2) vehicle trips in the peak hour. This is significantly less than the 30 or more movements in a peak hour prescribed by AS2890.1:2004 to require two vehicles to pass and as such a minimum width of 5.5m is unnecessary. Therefore, a lesser width may be considered.

To provide context on the likelihood of vehicle conflict along the single lane driveway a probability assessment has been undertaken. The following assumptions have been made to formulate the probability analysis:

- A length of 35m is present between vehicular passing opportunities.
- Vehicles travel at 5km/h (1.39m/s) along the driveway.
    - This corresponds to a total of 25s (35m/1.39ms^{-1}) that an entering or exiting vehicle is blocking the driveway.
- One (1) vehicle enters, and one (1) vehicle exits each peak hour.

Considering the above, an entering or an exiting vehicle would block the driveway 0.694% (25s/3600s) of a peak hour. The probability that both an entering and an exiting vehicle would conflict within the driveway is 0.0048% (0.694% x 0.694%) or one in every 20,736 peak hours which corresponds to once every 28 years. This is an extremely low likelihood of conflict such that the need for a passing bay is not required.

Nevertheless, the updated plans detail a minimum width of 5.5m for the first 6m of the vehicular crossing in compliance with Council's preference. The swept path testing in **Annexure B** demonstrates the successful two-way passing of two B99 design vehicles. This goes beyond standard requirements to demonstrate successful two-way passing at the vehicular crossing. *AS 2890.1 – 2004* states that *"Areas in which it is necessary for two vehicles to pass one another shall be designed for a B85 vehicle to pass a B99 vehicle".*

26 (c) The Respondent's Traffic Engineering Department have assessed the Development Application and require Swept Path Analysis Diagrams which indicate that two (2) B99 class vehicles can pass on another at the passing bay and have to ability to leave the Site in a forward position.

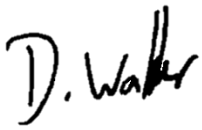
MTE Response: As outlined above, it is standard for swept path analysis diagrams to demonstrate two-way passing between a B85 and a B99 vehicle rather than two B99 vehicles. Clause 2.5.2 (c) of *AS 2890.1 – 2004* states that *"Areas in which it is necessary for two vehicles to pass one another shall be designed for a B85 vehicle to pass a B99 vehicle".* It is reiterated that it is usual and standard for swept paths to demonstrate two-way passing between a B85 and B99 vehicle for most development types. Nevertheless, the swept path tests reproduced in **Annexure B** demonstrate successful two-way passing on-site of two (2) B99 vehicles, satisfying Council's request.

Additionally, Council has advised that vehicles should be able to leave the site in a forward position. The design of the site allows for vehicles to leave the site in a forward direction as demonstrated in **Annexure B**.

It should be noted that reverse in or reverse out vehicle manoeuvres are typically permitted for domestic properties and that by providing the ability for cars to forward out of the site is an improvement. In addition, the subject site is located on a cul-de-sac road and would therefore not have significant traffic volumes passing the site such that reverse manoeuvres onto Graham Avenue would not have any impact to the safety or traffic flow efficiency of the road network.

Please contact the undersigned on 9521 7199 should you require further information or assistance.

Yours faithfully,
McLaren Traffic Engineering



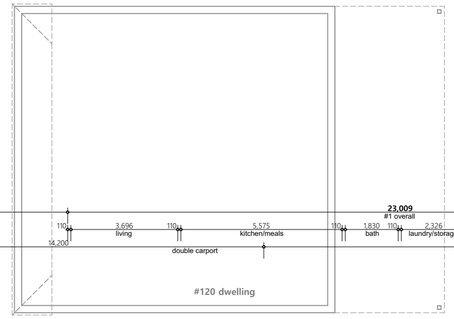
Daniel Walker
Traffic Engineer
B.E. (Hons) (Schol) (Civil Engineering)
Accredited Level 1 Road Safety Auditor

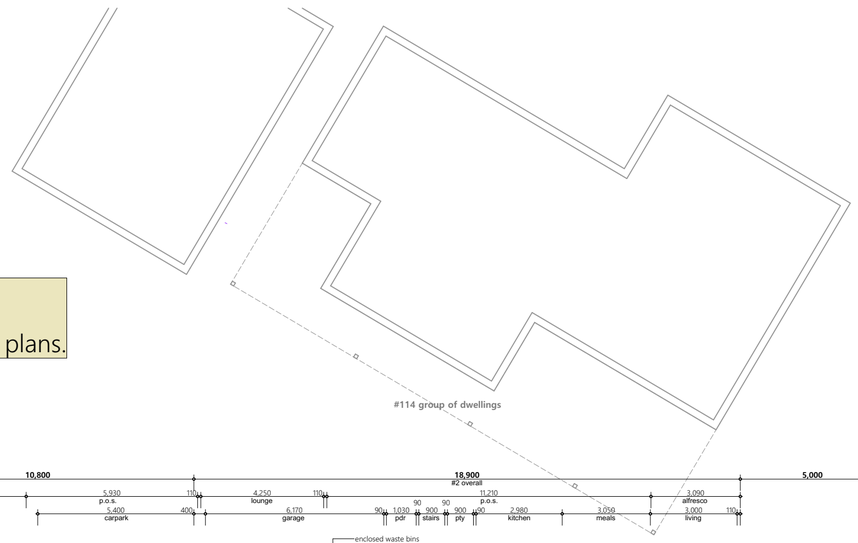
ANNEXURE A: UPDATED PLANS

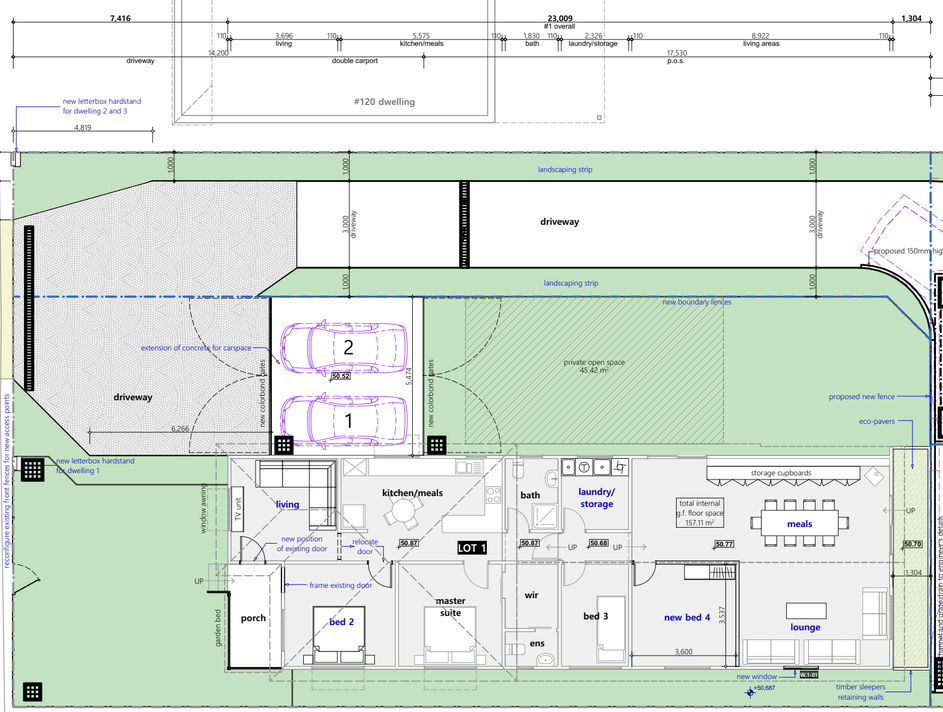
(1 SHEET)

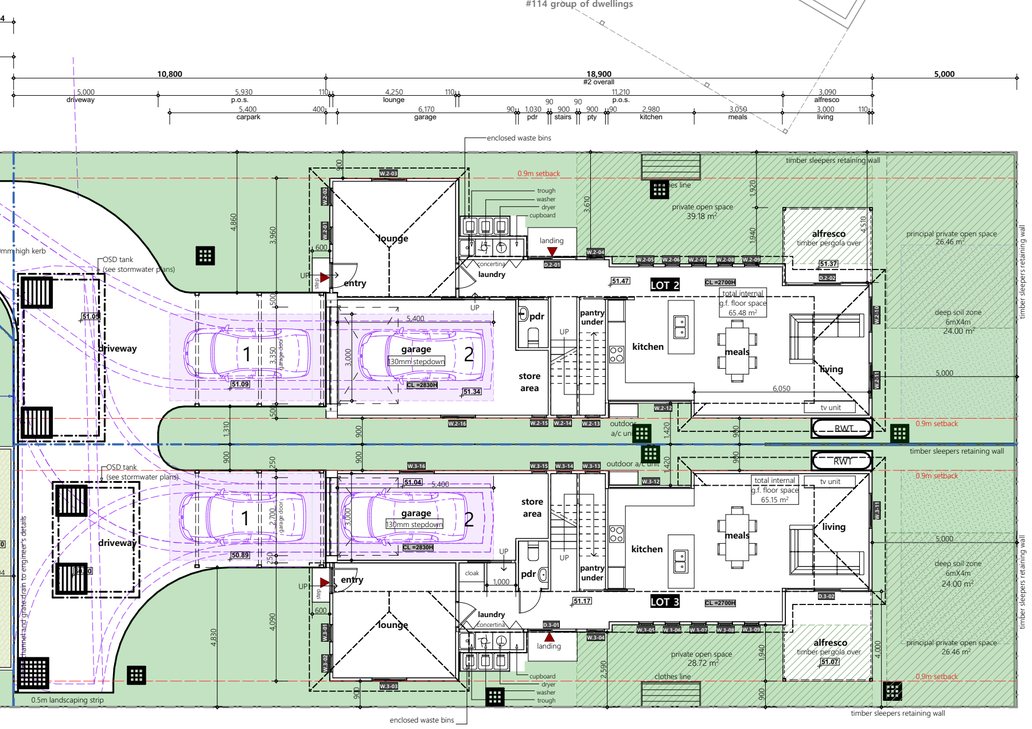
NOTE:

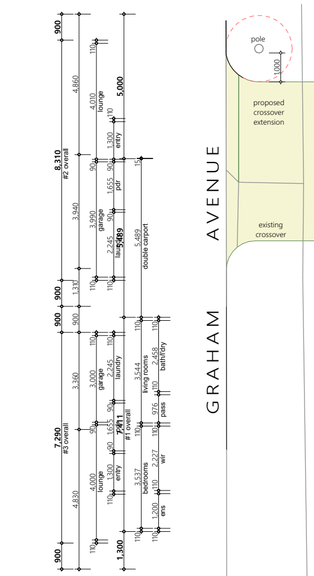
refer next sheet/s for enlarged scale plans.

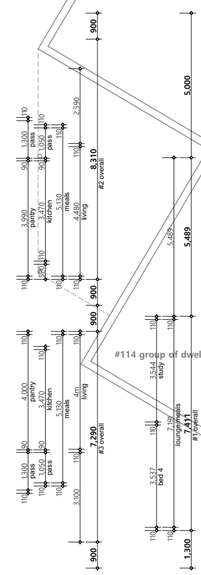


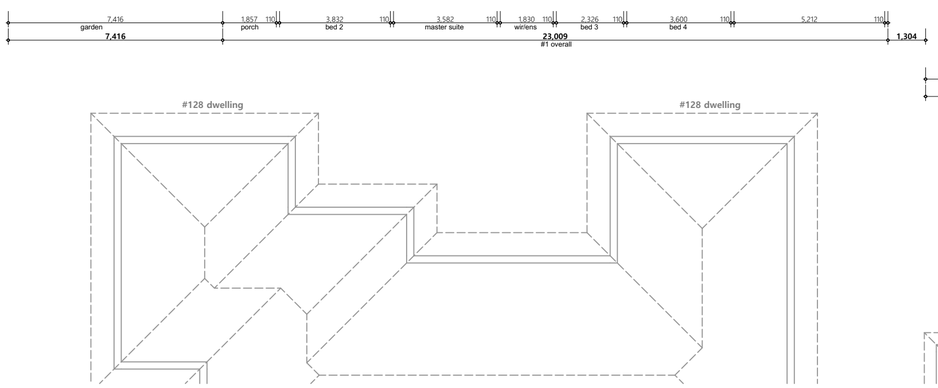


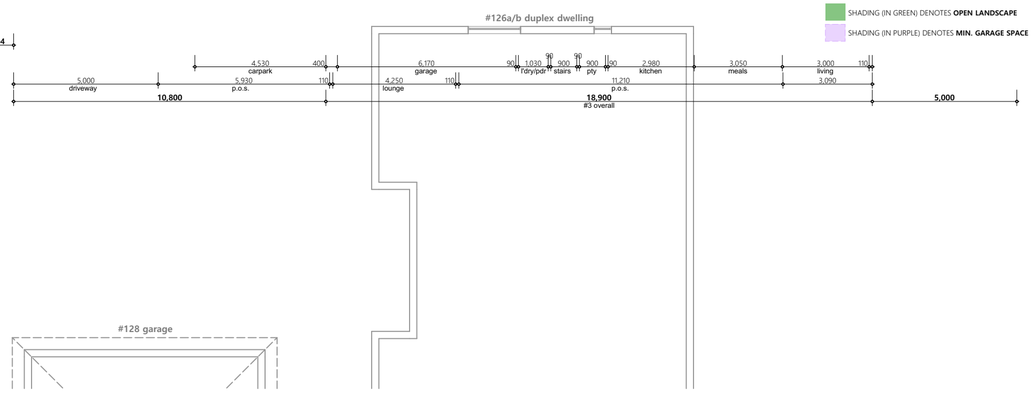












Rev	Description	Drft	Issued
N	RFI Changes-Driveway	MM	08/02/22
M	RFI Changes V.2	MM	05/10/21
L	RFI Changes V.1	MM	10/09/21
K	RFI_v3	JA	23/02/21

Lot 1 Open Landscape	
Description	**Area**
Lot 1 Front Open Space	68.04
Lot 1 Side Access	31.57
Lot 1 Side Open Space	94.67
	194.28 m²

Lot 2 Open Landscape	
Description	**Area**
Lot 2 Front Open Space	35.24
Lot 2 Front Open Space	44.98
Lot 2 Rear Open Space	50.55
Lot 2 Rear Open Space	50.55
Lot 2 Side Access	18.49
Lot 2 Side Access	18.49
Lot 2 Side Open Space	46.88
Lot 2 Side Open Space	46.88
	312.06 m²

Lot 3 Open Landscape	
Description	**Area**
Lot 3 Front Open Space	38.78
Lot 3 Front Open Space	38.78
Lot 3 Rear Open Space	45.45
Lot 3 Rear Open Space	45.45
Lot 3 Side Access	17.96
Lot 3 Side Access	17.96
Lot 3 Side Open Space	32.42
Lot 3 Side Open Space	32.42
	269.22 m²

Client:
Dale Beaumont

Development Application for a Two into Three Lot Torrens Title Subdivision, Construction of two new Dwellings and Alterations to existing dwelling to include part demolition

122-124 Graham Avenue Lurnea NSW 2170

Town Planner: TVD
Drawn By: JA/MM
Checked By: GC
Revision: **N**
Scale: **1:150.00, 1:1.67 @ A2**

Drawing Name: **PROPOSED SITE FLOOR PLAN**

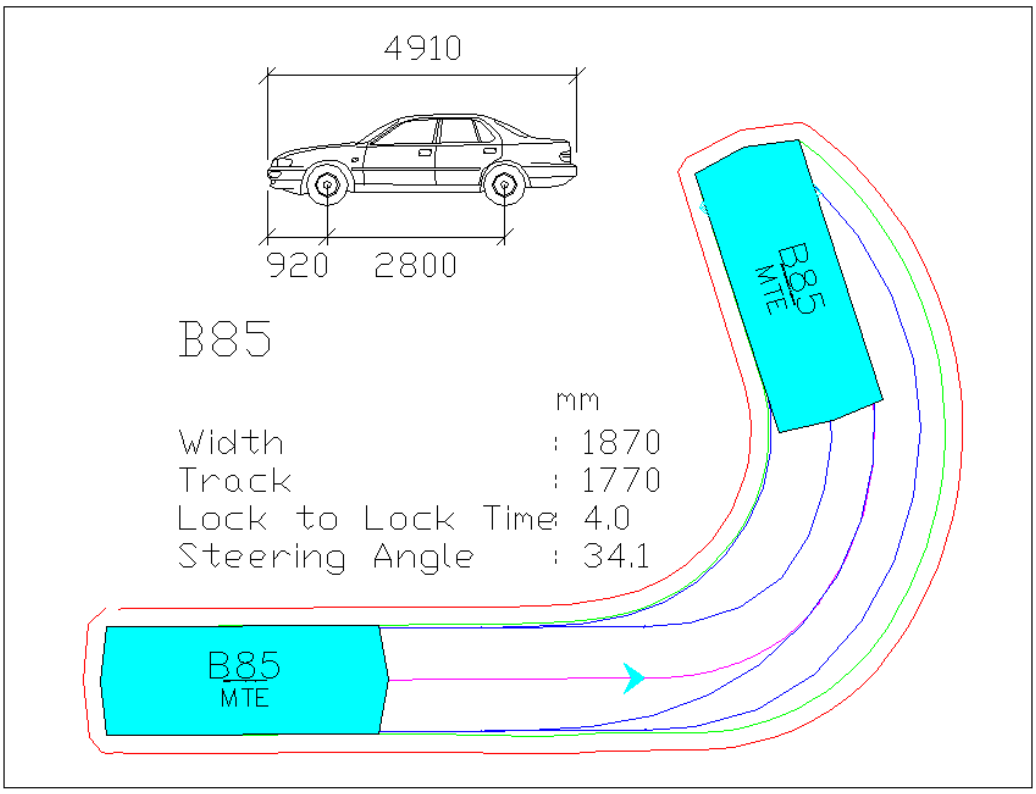
Drawing Number: **DA-014**

Figured dimensions take precedence over scale dimensions. Contractors must verify all dimensions on site before commencing any work or making shop drawings.

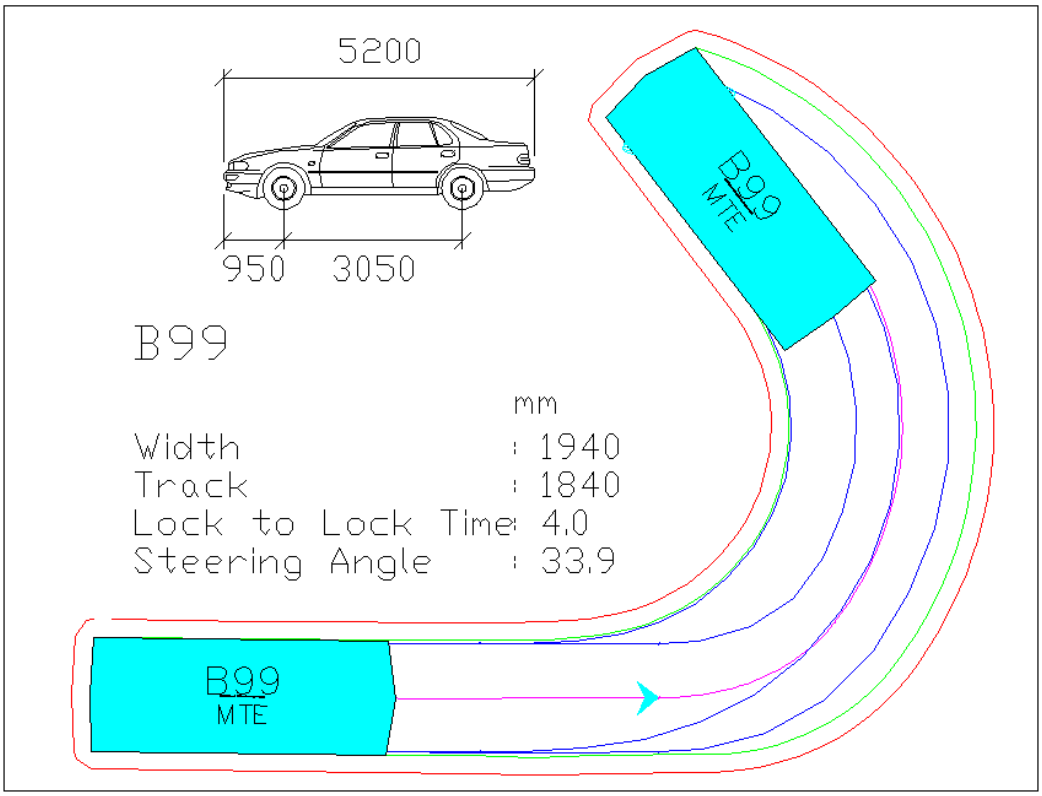
p: 1300 008138
e: info@councilapprovaldesign.com.au
w: www.councilapprovaldesign.com.au
ABN 89 104 442 337
Bradax Pty Ltd
Nominated Architect: Giuseppe Calabrese 8079

ANNEXURE B: SWEPTH PATH TESTS

(6 SHEETS)



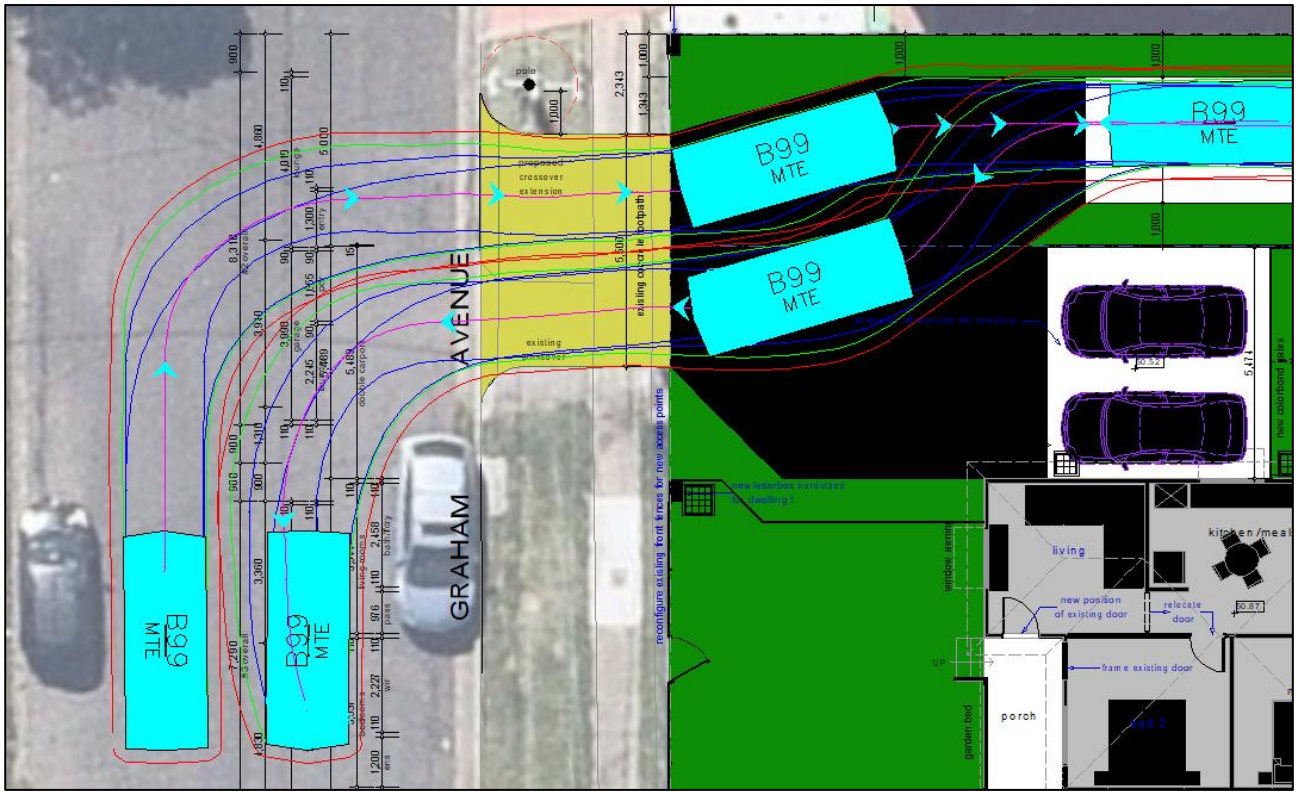
AUSTRALIAN STANDARD 85TH PERCENTILE SIZE VEHICLE (B85)



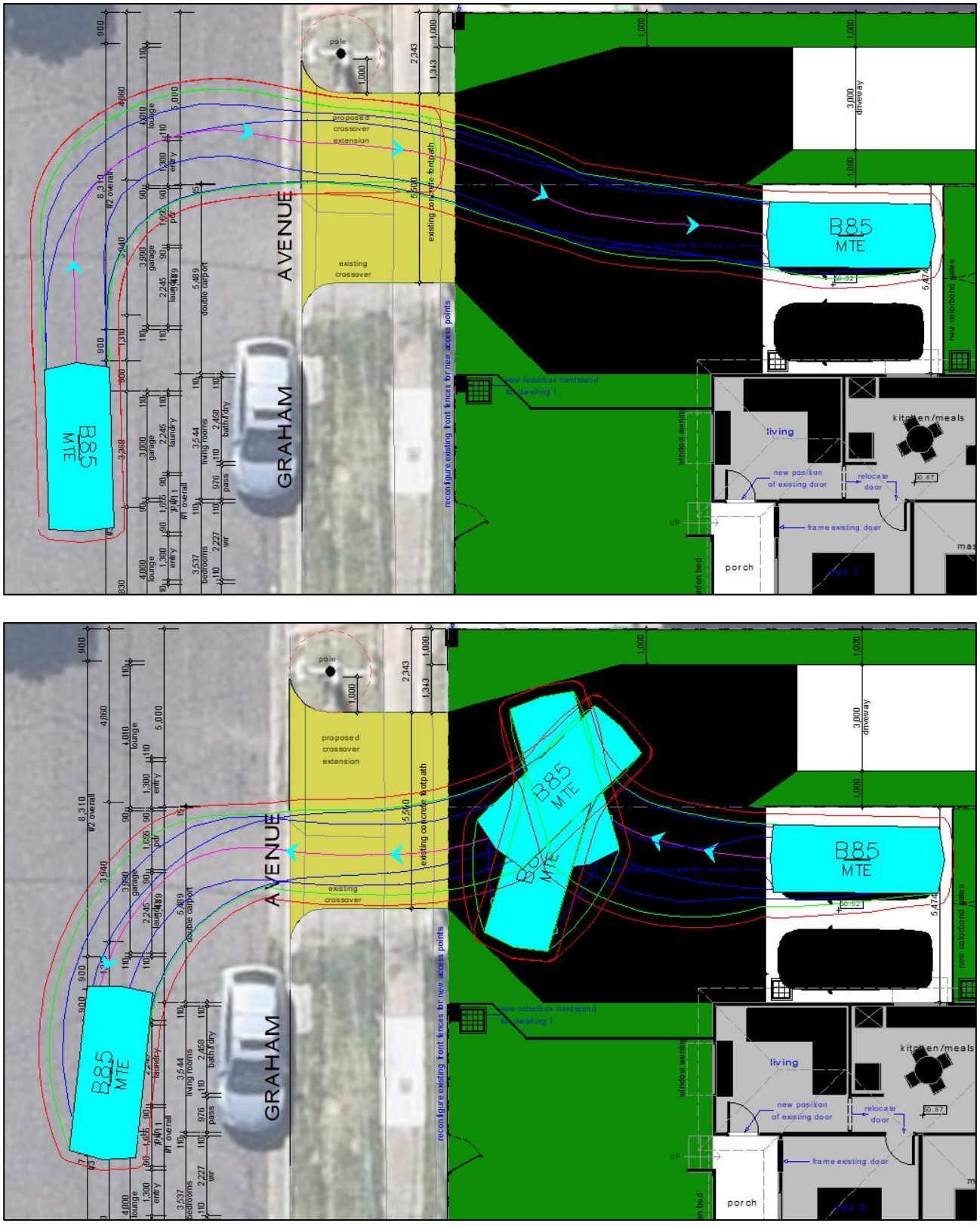
AUSTRALIAN STANDARD 99.8TH PERCENTILE SIZE VEHICLE (B99)

Blue – Tyre Path
Green – Vehicle Body
Red – 300mm Clearance

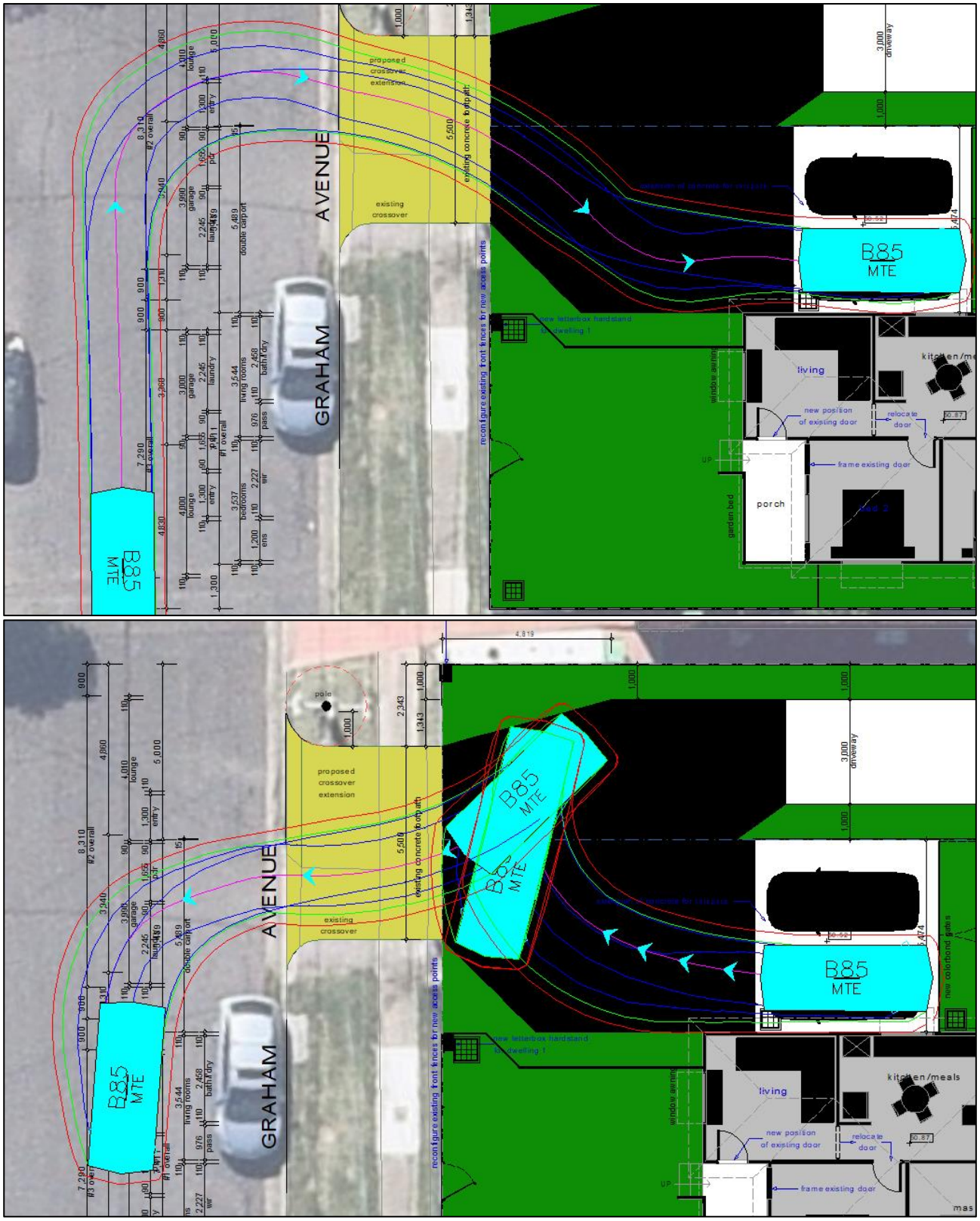
All tests performed at 5km/h forwards and reverse.



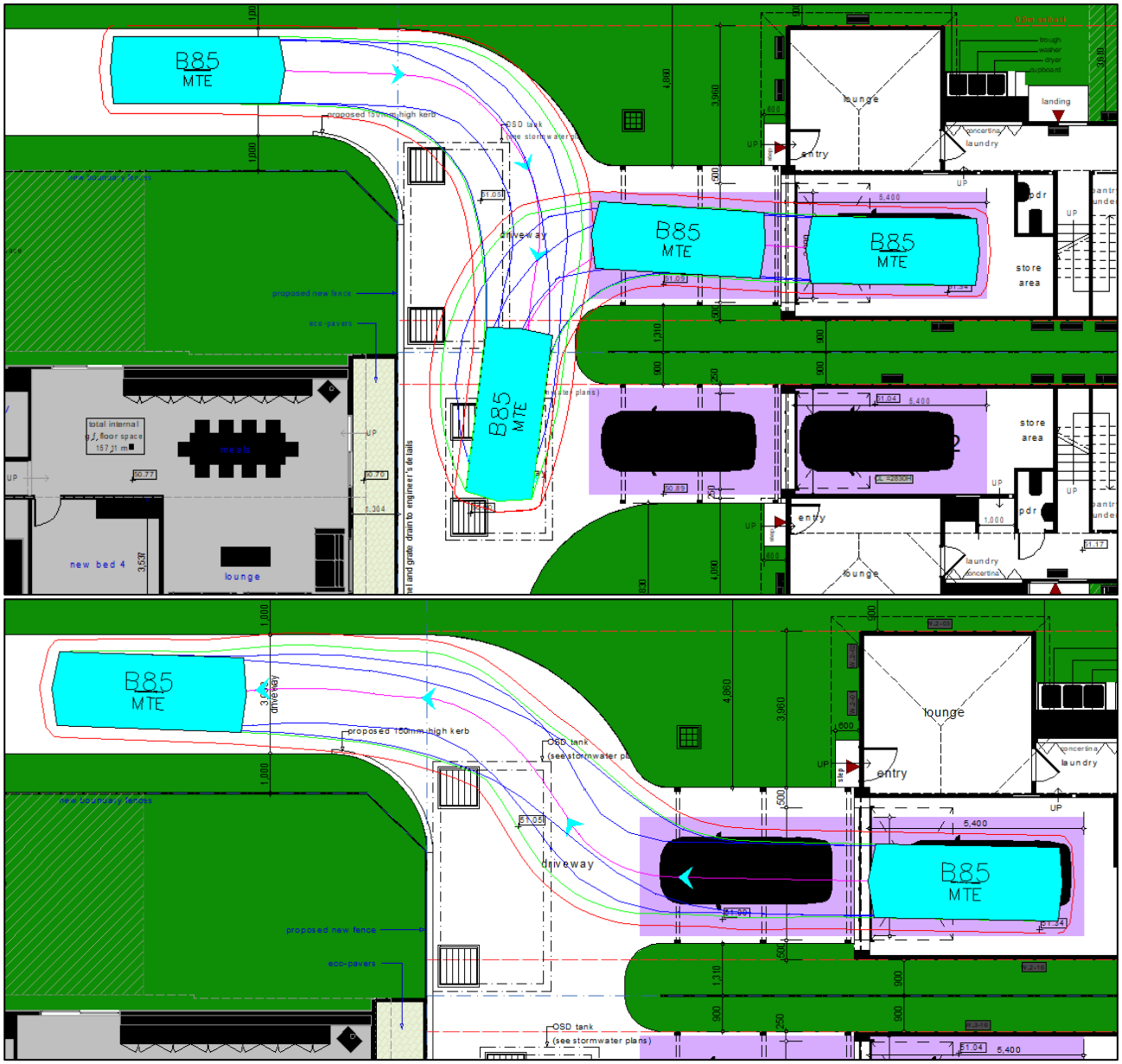
B99 passing B99 within property boundary
SUCCESSFUL



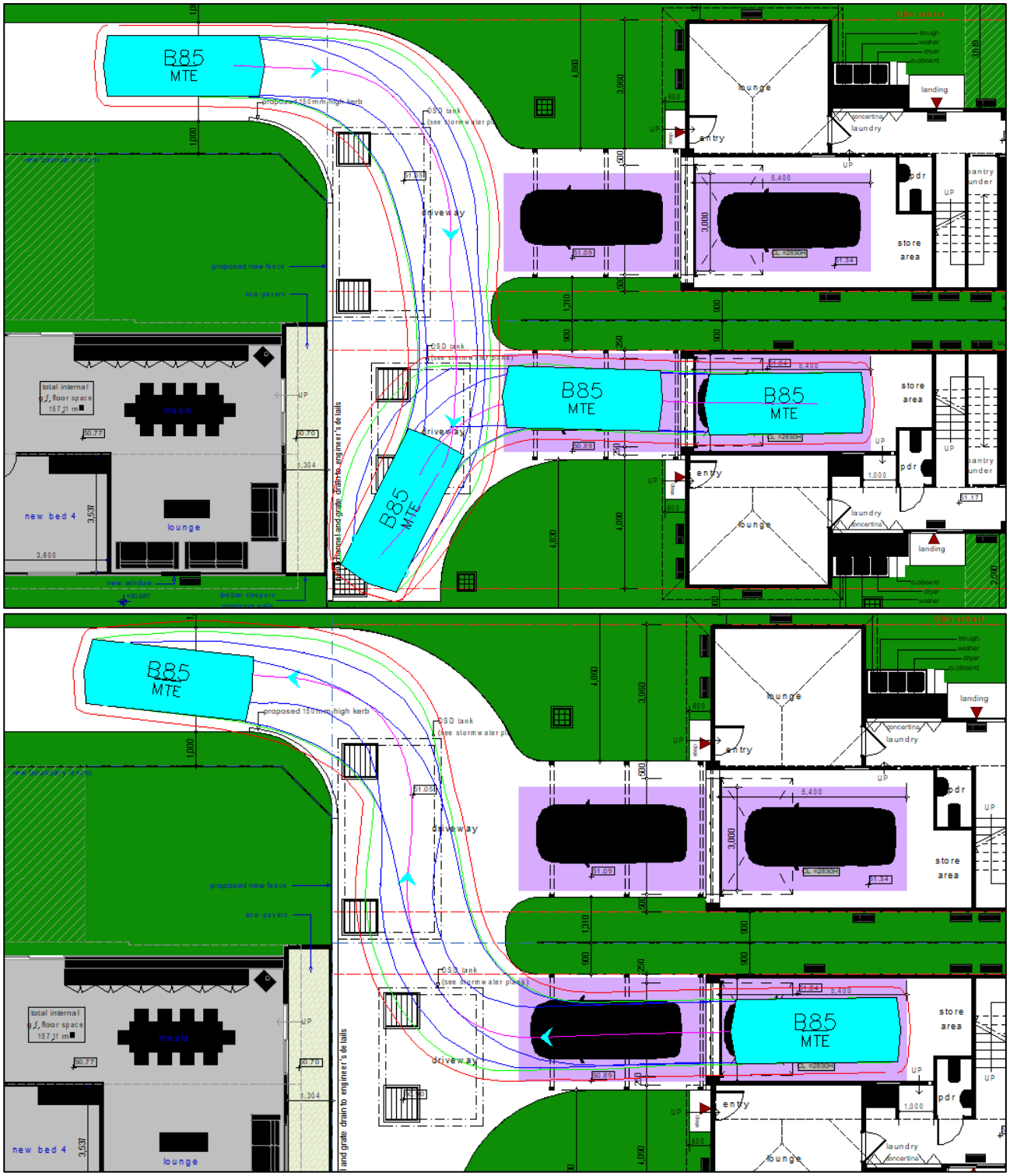
B85 Entry and Exit Dwelling 1 eastern side
SUCCESSFUL



B85 Entry and Exit Dwelling 1 western side
SUCCESSFUL



B85 Entry and Exit Dwelling 2
SUCCESSFUL



B85 Entry and Exit Dwelling 3
SUCCESSFUL