123-133 NEW CANTERBURY ROAD LEWISHAM 2049

BOARDING HOUSE DEVELOPMENT

SCHEDULE OF AMENDMENTS

1. Room 7 and 8 combined as well as Room 29 and 30 to create 2 double rooms (7, 29).
2. Room 10 and 16 are now single rooms.
3. GFA calculation updated to include the VIP smoking area and the winter gardens.
4. A specification of a car lift has also been added to sheet 904.

ISSUE	DATE	DESCRIPTION
F	19/11/2021	AMENDED PLANS FOR COURT
E	04/11/2021	AMENDED PLANS FOR COURT
D	21/10/2021	AMENDED PLANS FOR COURT
C	08/10/2021	AMENDED PLANS FOR COURT
B	07/09/2021	AMENDED PLANS FOR COURT
A	18/01/2021	DEVELOPMENT APPLICATION

TIER ARCHITECTS

CLIENT	EMAG APARTMENTS	DATE 19/11/2021	SCALE A3
PROJECT	123-133 New Canterbury Rd LEWISHAM	DRAWN PV	CHECKED NN
TITLE	SITE PLAN / SITE ANALYSIS	DWG No 100	

DO NOT SCALE. USE FIGURED DIMENSIONS IN PREFERENCE TO SCALED. CHECK ALL DIMENSIONS ON SITE BEFORE FABRICATION.

SITE PLAN / SITE ANALYSIS

DEVELOPMENT CONTROLS FOR BOARDING HOUSE		
	CONTROL	PROPOSED
SITE AREA		950.3m²
FSR	2.2:1	2.39:1
GFA	2090.7m²	2277m²
ROOM MIX		16 SINGLE + 35 DOUBLE +1 MANAGER
BUILDING HEIGHT	17m	16.8m
SOLAR ACCESS	3hrs communal room	>3hrs provided
POS manager	min. 8m²	10.2m²
PARKING	25.5	15 spaces
MOTORCYCLE	11	11
BICYCLE	11	32
COMMUNAL ROOM	1 min.12m² (MDCP)	1 49m²
COMMUNAL OUTDOOR	min. 20m²	80m²
ACCESSIBLE UNITS	3	3

GROSS FLOOR AREA	
FLOOR	PROPOSED
GROUND	701m²
LEVEL 1	642m²
LEVEL 2	644m²
LEVEL 3	290m²
TOTAL	**2277m²**

Room Schedule

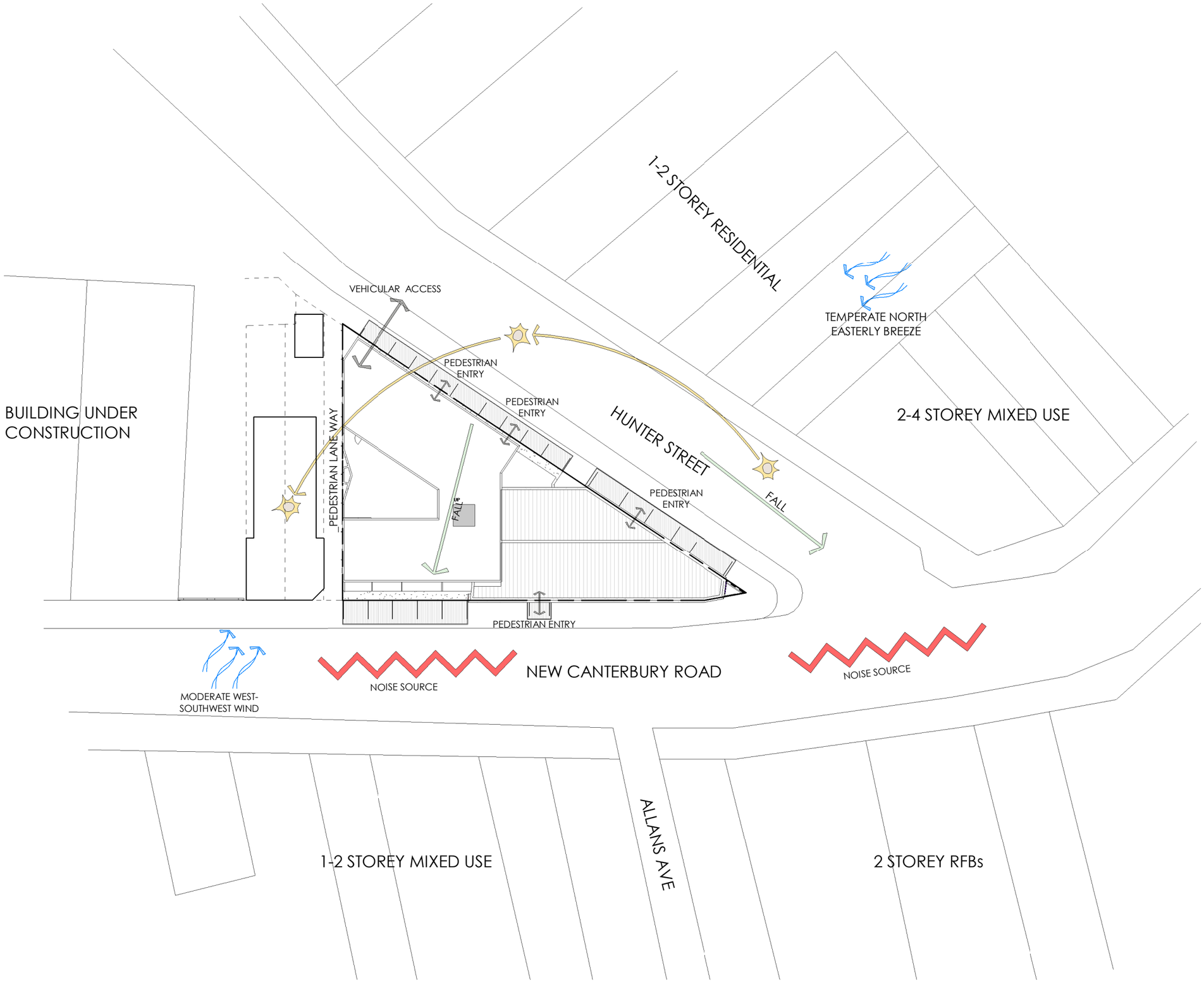
Number	Level	Area	Type
0	03 LEVEL 1 FLOOR PLAN	46 m²	COMMUNAL INDOOR
1	03 LEVEL 1 FLOOR PLAN	16 m²	DOUBLE
2	03 LEVEL 1 FLOOR PLAN	16 m²	DOUBLE
3	03 LEVEL 1 FLOOR PLAN	16 m²	DOUBLE
4	03 LEVEL 1 FLOOR PLAN	18 m²	DOUBLE
5	03 LEVEL 1 FLOOR PLAN	22 m²	DOUBLE
6	03 LEVEL 1 FLOOR PLAN	19 m²	DOUBLE
7	03 LEVEL 1 FLOOR PLAN	24 m²	DOUBLE
8	Not Placed	Not Placed	Room
9	03 LEVEL 1 FLOOR PLAN	22 m²	DOUBLE
10	03 LEVEL 1 FLOOR PLAN	14 m²	SINGLE
11	03 LEVEL 1 FLOOR PLAN	17 m²	MANAGER
12	03 LEVEL 1 FLOOR PLAN	19 m²	DOUBLE
13	03 LEVEL 1 FLOOR PLAN	13 m²	SINGLE
14	03 LEVEL 1 FLOOR PLAN	12 m²	SINGLE
15	03 LEVEL 1 FLOOR PLAN	12 m²	SINGLE
16	03 LEVEL 1 FLOOR PLAN	14 m²	SINGLE
17	03 LEVEL 1 FLOOR PLAN	14 m²	SINGLE
18	03 LEVEL 1 FLOOR PLAN	14 m²	SINGLE
19	03 LEVEL 1 FLOOR PLAN	14 m²	SINGLE
20	03 LEVEL 1 FLOOR PLAN	16 m²	DOUBLE
21	04 LEVEL 2 FLOOR PLAN	16 m²	DOUBLE
22	04 LEVEL 2 FLOOR PLAN	16 m²	DOUBLE
23	04 LEVEL 2 FLOOR PLAN	16 m²	DOUBLE
24	04 LEVEL 2 FLOOR PLAN	16 m²	DOUBLE
25	04 LEVEL 2 FLOOR PLAN	16 m²	DOUBLE
26	04 LEVEL 2 FLOOR PLAN	18 m²	DOUBLE
27	04 LEVEL 2 FLOOR PLAN	22 m²	DOUBLE
28	04 LEVEL 2 FLOOR PLAN	18 m²	DOUBLE
29	04 LEVEL 2 FLOOR PLAN	24 m²	DOUBLE
30	Not Placed	Not Placed	Room
31	04 LEVEL 2 FLOOR PLAN	23 m²	DOUBLE
32	04 LEVEL 2 FLOOR PLAN	16 m²	DOUBLE
33	04 LEVEL 2 FLOOR PLAN	17 m²	DOUBLE
34	04 LEVEL 2 FLOOR PLAN	19 m²	DOUBLE
35	04 LEVEL 2 FLOOR PLAN	14 m²	SINGLE
36	04 LEVEL 2 FLOOR PLAN	13 m²	SINGLE
37	04 LEVEL 2 FLOOR PLAN	13 m²	SINGLE
38	04 LEVEL 2 FLOOR PLAN	19 m²	DOUBLE
39	04 LEVEL 2 FLOOR PLAN	14 m²	SINGLE
40	04 LEVEL 2 FLOOR PLAN	14 m²	SINGLE
41	04 LEVEL 2 FLOOR PLAN	14 m²	SINGLE
42	04 LEVEL 2 FLOOR PLAN	16 m²	DOUBLE
43	05 LEVEL 3 FLOOR PLAN	18 m²	DOUBLE
44	05 LEVEL 3 FLOOR PLAN	16 m²	DOUBLE
45	05 LEVEL 3 FLOOR PLAN	16 m²	DOUBLE
46	05 LEVEL 3 FLOOR PLAN	16 m²	DOUBLE
47	05 LEVEL 3 FLOOR PLAN	16 m²	DOUBLE
48	05 LEVEL 3 FLOOR PLAN	17 m²	DOUBLE
49	05 LEVEL 3 FLOOR PLAN	18 m²	DOUBLE
50	05 LEVEL 3 FLOOR PLAN	16 m²	DOUBLE
51	05 LEVEL 3 FLOOR PLAN	16 m²	DOUBLE
52	05 LEVEL 3 FLOOR PLAN	16 m²	DOUBLE
53	05 LEVEL 3 FLOOR PLAN	12 m²	SINGLE
54	05 LEVEL 3 FLOOR PLAN	15 m²	SINGLE

SITE INFORMATION

ISSUE	DATE	DESCRIPTION
F	19/11/2021	AMENDED PLANS FOR COURT
E	04/11/2021	AMENDED PLANS FOR COURT
D	21/10/2021	AMENDED PLANS FOR COURT
C	08/10/2021	AMENDED PLANS FOR COURT
B	07/09/2021	AMENDED PLANS FOR COURT
A	28/07/2021	DEVELOPMENT APPLICATION

TIER ARCHITECTS

CLIENT	EMAG APARTMENTS	DATE 19/11/2021	SCALE
PROJECT	123-133 New Canterbury Rd LEWISHAM	DRAWN PV	CHECKED NN
TITLE	SITE INFORMATION	DWG No 101	



SITE ANALYSIS

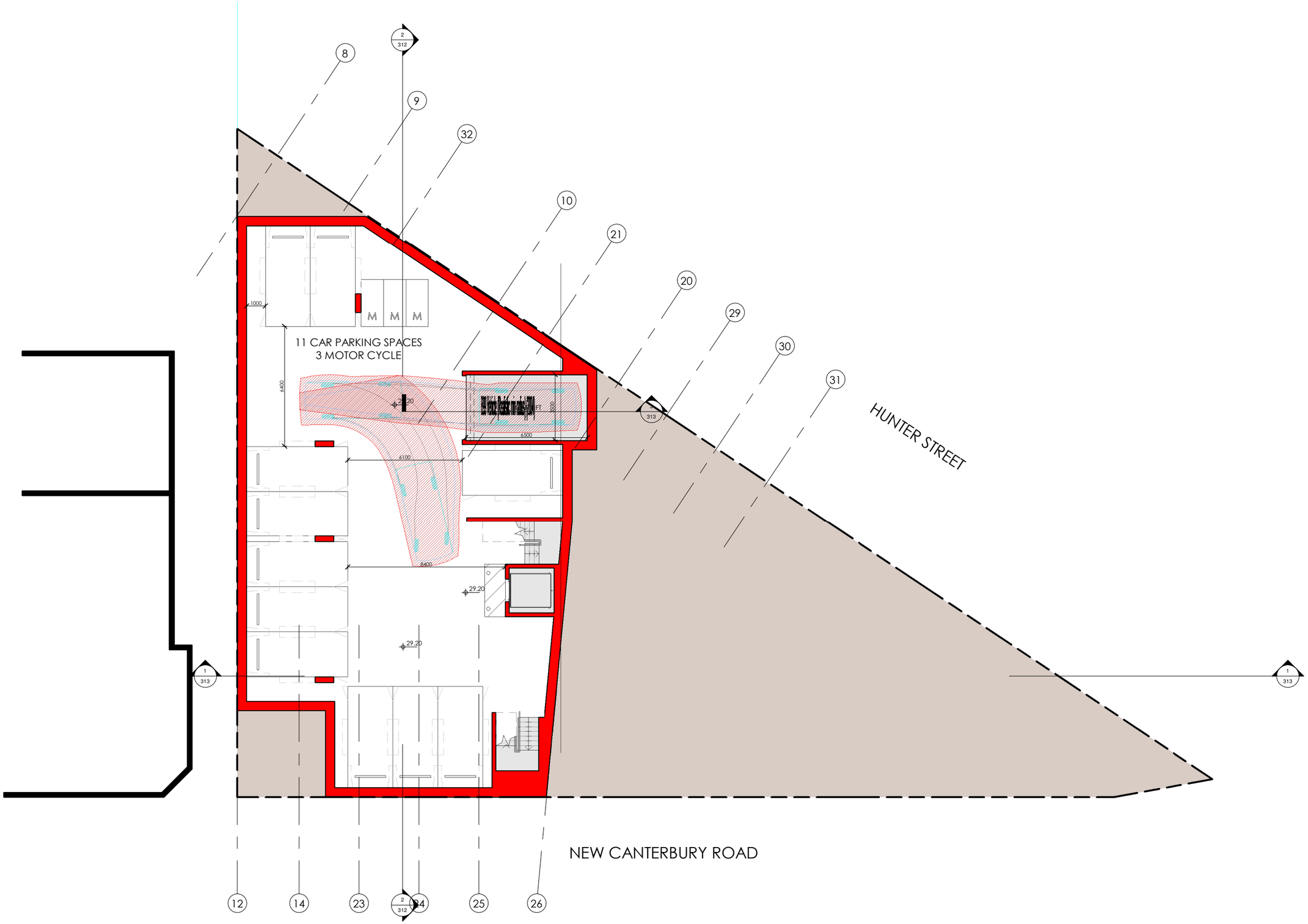
ISSUE	DATE	DESCRIPTION
F	19/11/2021	AMENDED PLANS FOR COURT
E	04/11/2021	AMENDED PLANS FOR COURT
D	21/10/2021	AMENDED PLANS FOR COURT
C	08/10/2021	AMENDED PLANS FOR COURT
B	07/09/2021	AMENDED PLANS FOR COURT
A	18/01/2021	DEVELOPMENT APPLICATION

TIER ARCHITECTS

N

		DATE	SCALE
CLIENT	EMAG APARTMENTS	19/11/2021	A3 1 : 500
PROJECT	123-133 New Canterbury Rd LEWISHAM	DRAWN PV	CHECKED NN
TITLE	SITE ANALYSIS	DWG No 102	

DO NOT SCALE. USE FIGURED DIMENSIONS IN PREFERENCE TO SCALED. CHECK ALL DIMENSIONS ON SITE BEFORE FABRICATION.



BASEMENT FLOOR PLAN

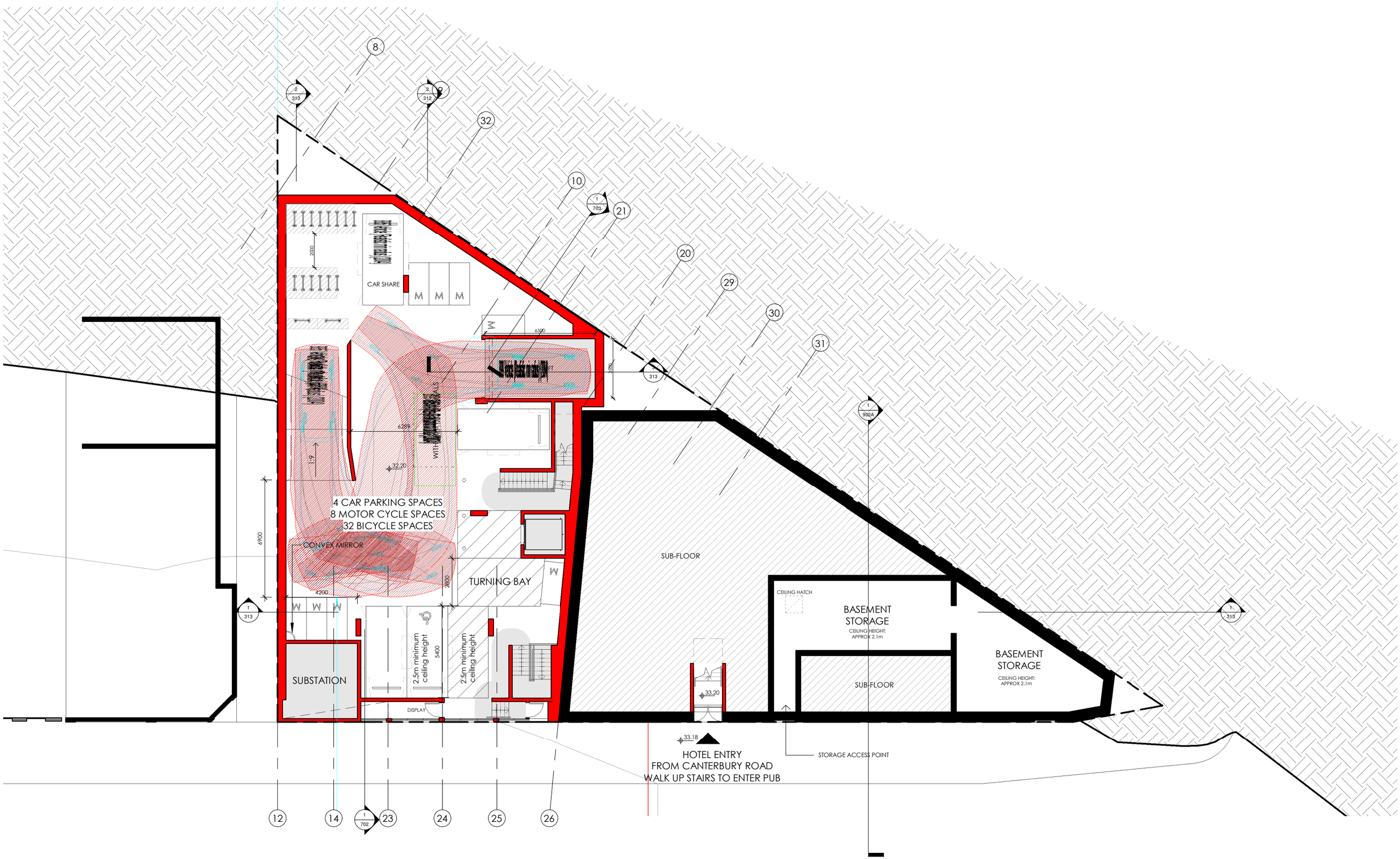
ISSUE	DATE	DESCRIPTION
F	19/11/2021	AMENDED PLANS FOR COURT
E	04/11/2021	AMENDED PLANS FOR COURT
D	21/10/2021	AMENDED PLANS FOR COURT
C	08/10/2021	AMENDED PLANS FOR COURT
B	07/09/2021	AMENDED PLANS FOR COURT
A	18/01/2021	DEVELOPMENT APPLICATION

TIER ARCHITECTS

N

CLIENT	EMAG APARTMENTS	DATE 19/11/2021	SCALE A3 1 : 200
PROJECT	123-133 New Canterbury Rd LEWISHAM	DRAWN PV	CHECKED NN
TITLE	BASEMENT FLOOR PLAN	DWG No ---	300

DO NOT SCALE. USE FIGURED DIMENSIONS IN PREFERENCE TO SCALED. CHECK ALL DIMENSIONS ON SITE BEFORE FABRICATION.



LOWER GROUND FLOOR PLAN

WALL TO BE RETAINED
WALL TO BE REMOVED
NEW WALL

SINGLE ROOM
DOUBLE ROOM
MANAGERS ROOM
COMMUNAL INDOOR AREA
HOTEL/BAR
PARKING/SERVICES

ISSUE	DATE	DESCRIPTION
F	19/11/2021	AMENDED PLANS FOR COURT
E	04/11/2021	AMENDED PLANS FOR COURT
D	21/10/2021	AMENDED PLANS FOR COURT
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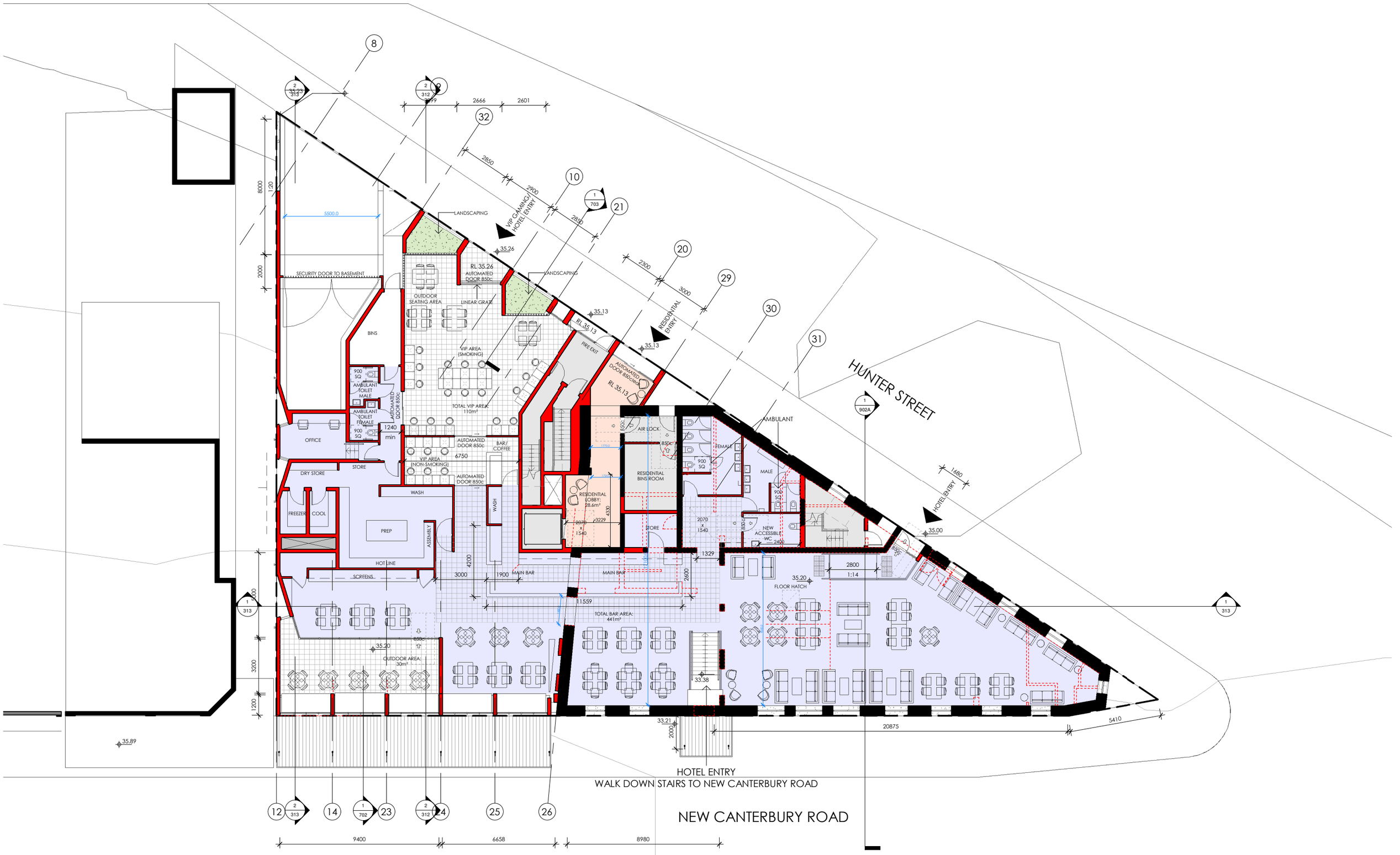
B	07/09/2021	AMENDED PLANS FOR COURT
A	18/01/2021	DEVELOPMENT APPLICATION

TIER ARCHITECTS

N

CLIENT	EMAG APARTMENTS	DATE 19/11/2021	SCALE indicated
PROJECT	123-133 New Canterbury Rd LEWISHAM	DRAWN PV	CHECKED NN
TITLE	LOWER GROUND FLOOR PLAN	DWG No ---	301



GROUND FLOOR PLAN

WALL TO BE RETAINED
WALL TO BE REMOVED
NEW WALL

SINGLE ROOM
DOUBLE ROOM
MANAGERS ROOM
COMMUNAL INDOOR AREA
HOTEL/BAR
PARKING/SERVICES

ISSUE	DATE	DESCRIPTION
F	19/11/2021	AMENDED PLANS FOR COURT
E	04/11/2021	AMENDED PLANS FOR COURT
D	21/10/2021	AMENDED PLANS FOR COURT
C	08/10/2021	AMENDED PLANS FOR COURT
B	07/09/2021	AMENDED PLANS FOR COURT
A	18/01/2021	DEVELOPMENT APPLICATION

TIER ARCHITECTS

N

CLIENT	EMAG APARTMENTS	DATE 19/11/2021	SCALE indicated
PROJECT	123-133 New Canterbury Rd LEWISHAM	DRAWN PV	CHECKED NN
TITLE	GROUND FLOOR PLAN	DWG No 302	

DO NOT SCALE. USE FIGURED DIMENSIONS IN PREFERENCE TO SCALED. CHECK ALL DIMENSIONS ON SITE BEFORE FABRICATION.

SINGLE ROOM
DOUBLE ROOM
MANAGERS ROOM
COMMUNAL INDOOR AREA
HOTEL/BAR
PARKING/SERVICES

WALL TO BE RETAINED
WALL TO BE REMOVED
NEW WALL

ISSUE	DATE	DESCRIPTION
F	19/11/2021	AMENDED PLANS FOR COURT
E	04/11/2021	AMENDED PLANS FOR COURT
D	21/10/2021	AMENDED PLANS FOR COURT
C	08/10/2021	AMENDED PLANS FOR COURT
B	07/09/2021	AMENDED PLANS FOR COURT
A	28/07/2021	DEVELOPMENT APPLICATION

TIER ARCHITECTS

N

CLIENT	EMAG APARTMENTS	DATE 19/11/2021	SCALE @ A1 indicated
PROJECT	123-133 New Canterbury Rd LEWISHAM	DRAWN PV	CHECKED NN
TITLE	LEVEL 1 FLOOR PLAN	DWG No ---	307

DO NOT SCALE. USE FIGURED DIMENSIONS IN PREFERENCE TO SCALED, CHECK ALL DIMENSIONS ON SITE BEFORE FABRICATION.

LEVEL 1 FLOOR PLAN

LEVEL 2 FLOOR PLAN

SINGLE ROOM
DOUBLE ROOM
MANAGERS ROOM
COMMUNAL INDOOR AREA
HOTEL/BAR
PARKING/SERVICES

WALL TO BE RETAINED
WALL TO BE REMOVED
NEW WALL

ISSUE	DATE	DESCRIPTION
F	19/11/2021	AMENDED PLANS FOR COURT
E	04/11/2021	AMENDED PLANS FOR COURT
D	21/10/2021	AMENDED PLANS FOR COURT
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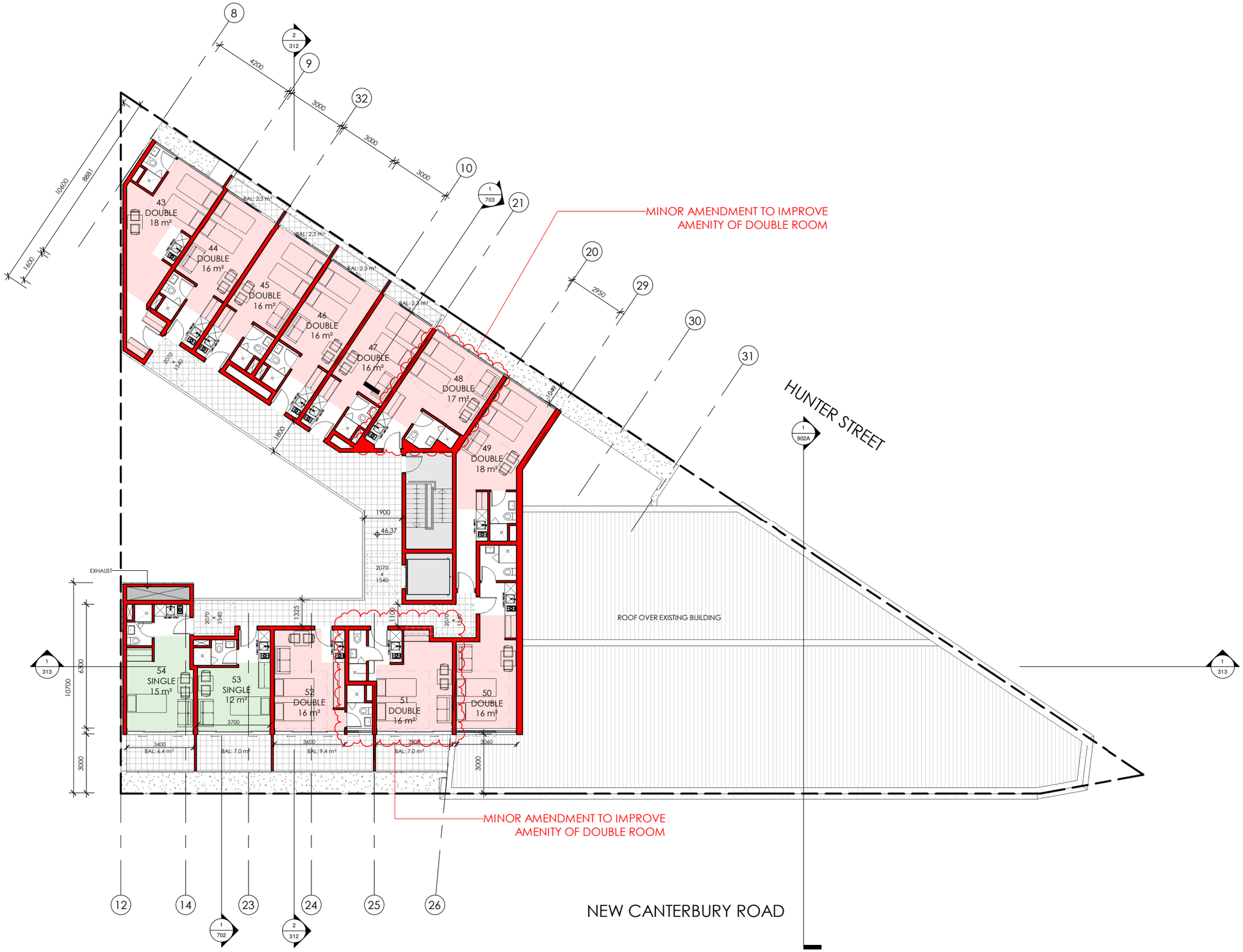
B	07/09/2021	AMENDED PLANS FOR COURT
A	28/07/2021	DEVELOPMENT APPLICATION

TIER ARCHITECTS

CLIENT	EMAG APARTMENTS	DATE 19/11/2021	SCALE @ A1 as indicated
PROJECT	123-133 New Canterbury Rd LEWISHAM	DRAWN PV	CHECKED NN
TITLE	LEVEL 2 FLOOR PLAN	DWG No 308	



LEVEL 3 FLOOR PLAN

SINGLE ROOM
DOUBLE ROOM
MANAGERS ROOM
COMMUNAL INDOOR AREA
HOTEL/BAR
PARKING/SERVICES

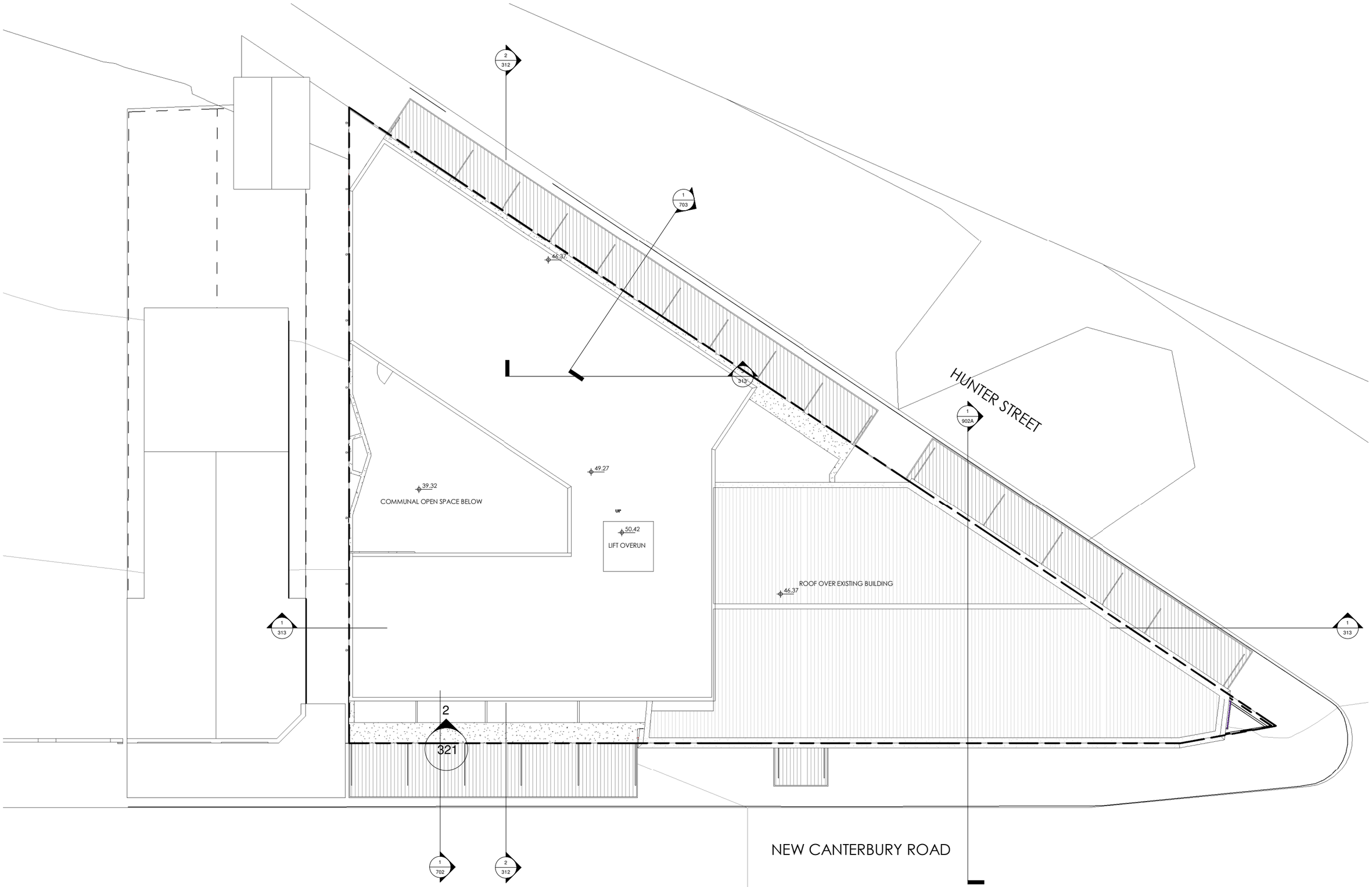
WALL TO BE RETAINED
WALL TO BE REMOVED
NEW WALL

ISSUE	DATE	DESCRIPTION
F	19/11/2021	AMENDED PLANS FOR COURT
E	04/11/2021	AMENDED PLANS FOR COURT
D	21/10/2021	AMENDED PLANS FOR COURT
C	08/10/2021	AMENDED PLANS FOR COURT
B	07/09/2021	AMENDED PLANS FOR COURT
~~A~~	~~28/09/2016~~	~~DEVELOPMENT APPLICATION~~

TIER ARCHITECTS

N

CLIENT	EMAG APARTMENTS	DATE 19/11/2021	SCALE indicated
PROJECT	123-133 New Canterbury Rd LEWISHAM	DRAWN PV	CHECKED NN
TITLE	LEVEL 3 FLOOR PLAN	DWG No ---	309



ROOF PLAN

ISSUE	DATE	DESCRIPTION
F	19/11/2021	AMENDED PLANS FOR COURT
E	04/11/2021	AMENDED PLANS FOR COURT
D	21/10/2021	AMENDED PLANS FOR COURT
C	08/10/2021	AMENDED PLANS FOR COURT
B	07/09/2021	AMENDED PLANS FOR COURT
A	18/01/2021	DEVELOPMENT APPLICATION

TIER ARCHITECTS

N

CLIENT	EMAG APARTMENTS	DATE 19/11/2021	SCALE A3 1 : 200
PROJECT	123-133 New Canterbury Rd LEWISHAM	DRAWN PV	CHECKED NN
TITLE	ROOF PLAN	DWG No –	310

DO NOT SCALE. USE FIGURED DIMENSIONS IN PREFERENCE TO SCALED, CHECK ALL DIMENSIONS ON SITE BEFORE FABRICATION.

1 NORTH-EAST ELEVATION

1 : 200

2 SOUTH ELEVATION

1 : 200

ELEVATIONS 1

ISSUE	DATE	DESCRIPTION
F	19/11/2021	AMENDED PLANS FOR COURT
E	04/11/2021	AMENDED PLANS FOR COURT
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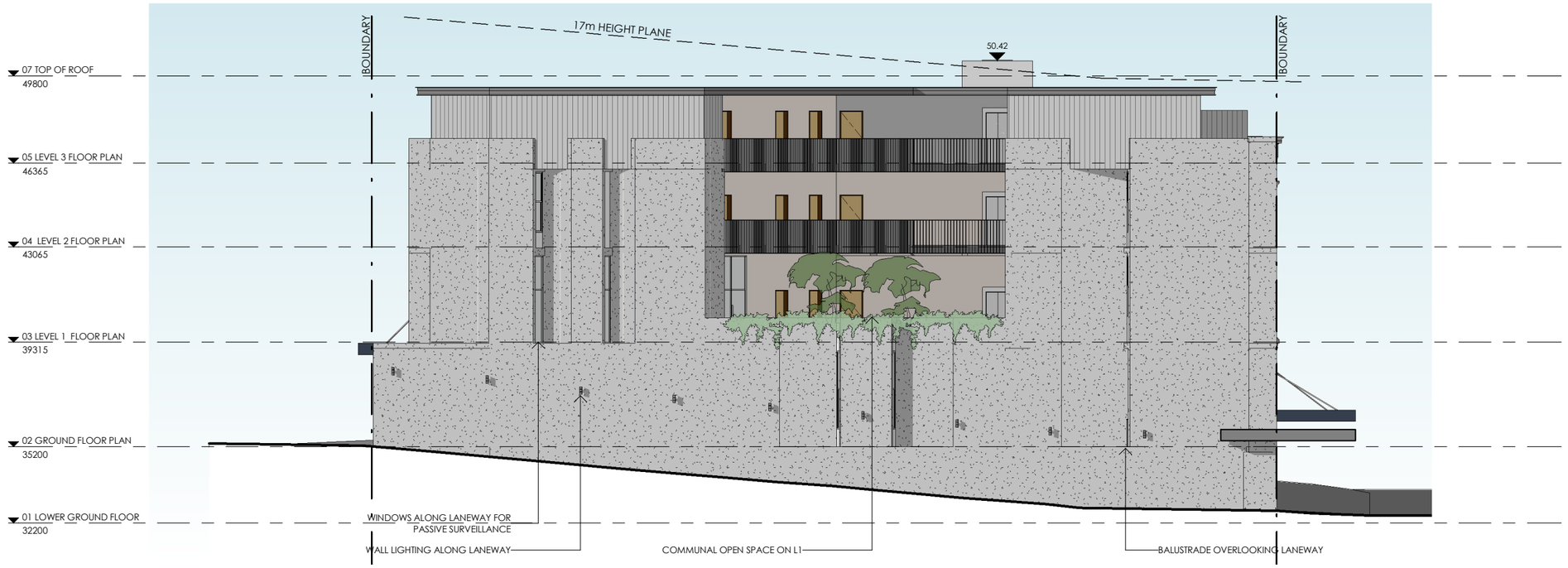
B	07/09/2021	AMENDED PLANS FOR COURT
A	18/01/2021	DEVELOPMENT APPLICATION

TIER ARCHITECTS

CLIENT	EMAG APARTMENTS	DATE 19/11/2021	SCALE A3 1 : 200
PROJECT	123-133 New Canterbury Rd LEWISHAM	DRAWN PV	CHECKED NN
TITLE	ELEVATIONS 1	DWG No ---	311

DO NOT SCALE. USE FIGURED DIMENSIONS IN PREFERENCE TO SCALED, CHECK ALL DIMENSIONS ON SITE BEFORE FABRICATION.



1 WEST ELEVATION

1 : 200

2 SECTION AA

1 : 200

SINGLE ROOM
DOUBLE ROOM
MANAGERS ROOM
COMMUNAL INDOOR AREA
HOTEL/BAR
PARKING/SERVICES

ISSUE	DATE	DESCRIPTION
F	19/11/2021	AMENDED PLANS FOR COURT
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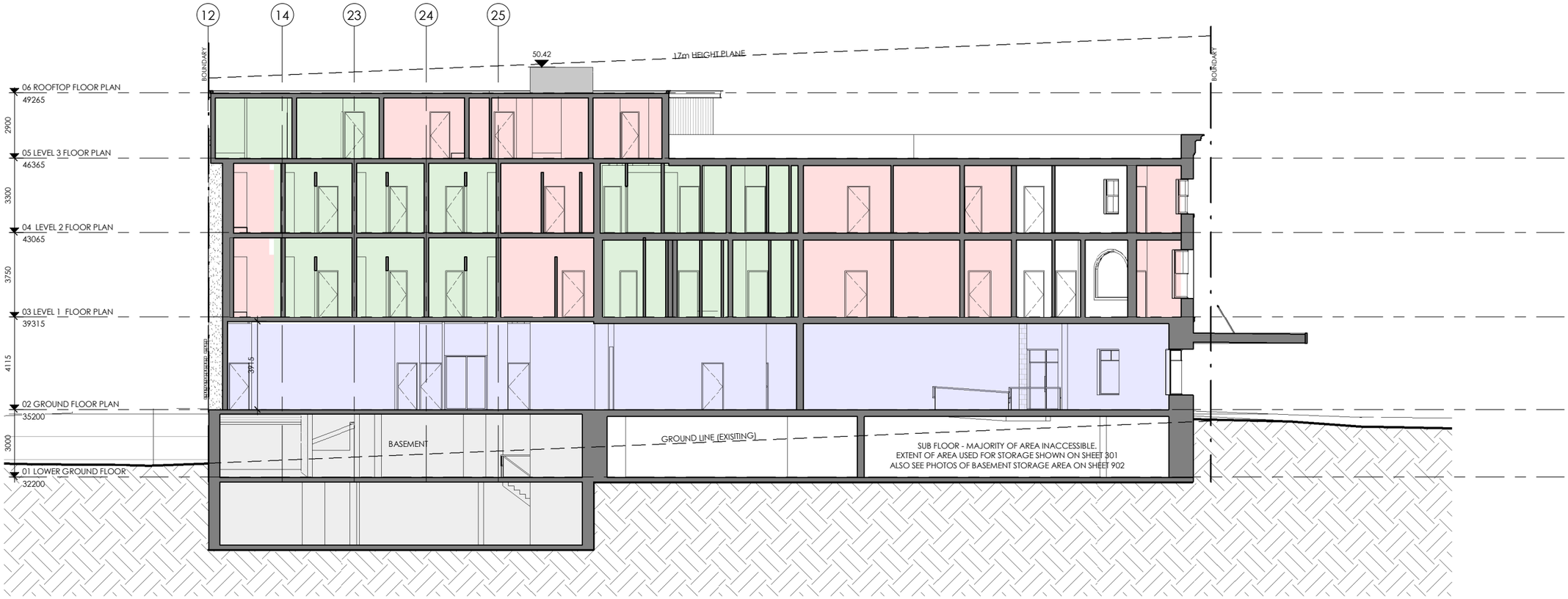
B	07/09/2021	AMENDED PLANS FOR COURT
A	18/01/2021	DEVELOPMENT APPLICATION

TIER ARCHITECTS

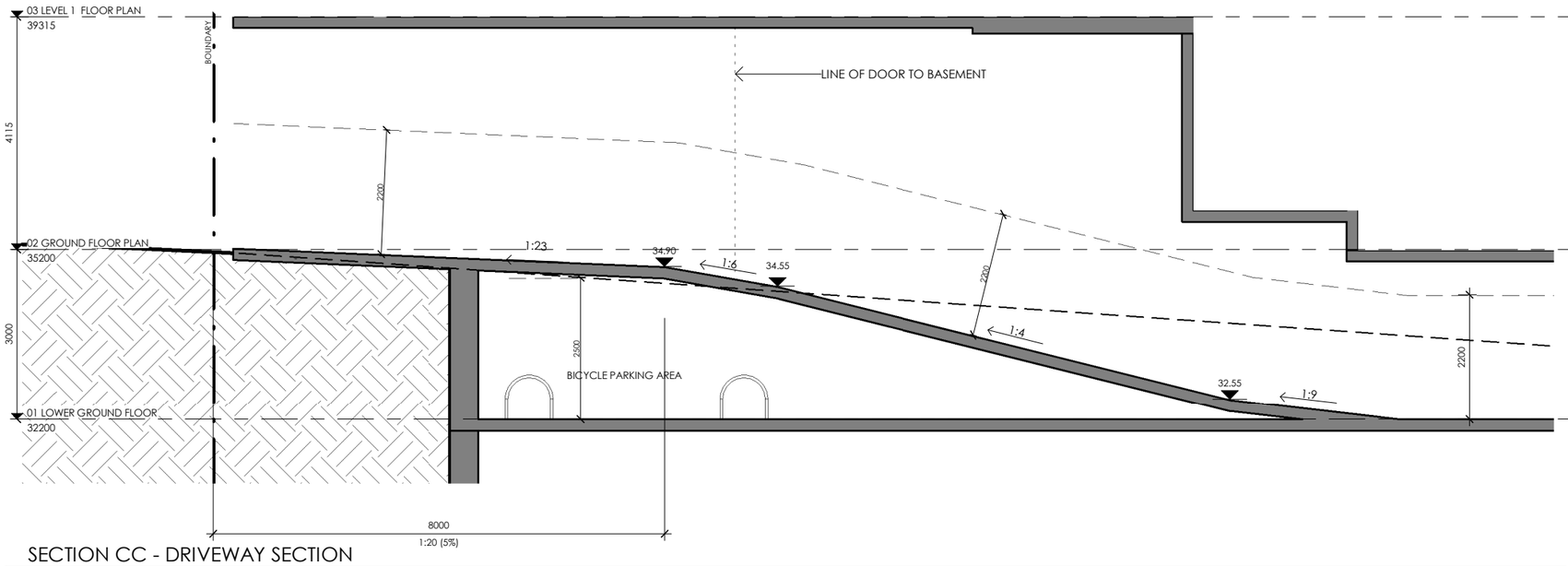
CLIENT	EMAG APARTMENTS	DATE 19/11/2021	SCALE indicated
PROJECT	123-133 New Canterbury Rd LEWISHAM	DRAWN PV	CHECKED NN
TITLE	WEST ELEVATION /SECTION	DWG No --	312

DO NOT SCALE. USE FIGURED DIMENSIONS IN PREFERENCE TO SCALED. CHECK ALL DIMENSIONS ON SITE BEFORE FABRICATION.

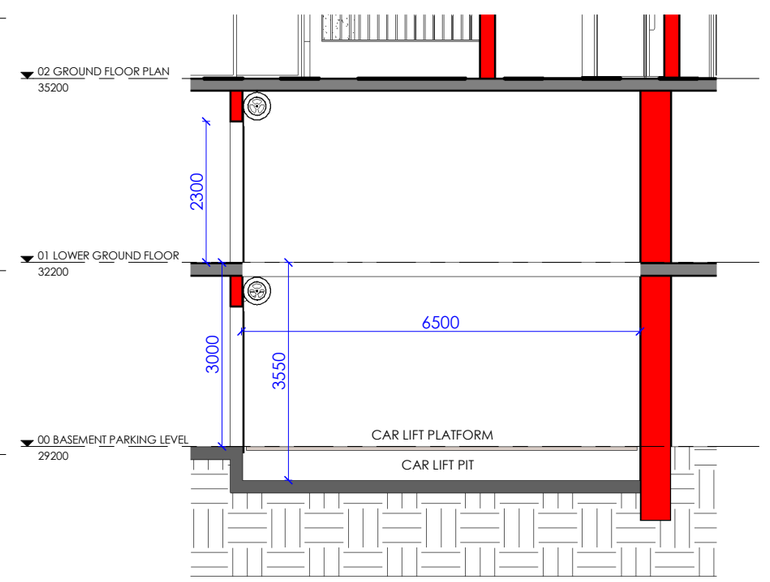
WEST ELEVATION /SECTION



1 SECTION BB
1 : 200



2 SECTION CC - DRIVEWAY SECTION
1 : 100



3 CAR LIFT SECTION
1 : 100

SINGLE ROOM
DOUBLE ROOM
MANAGERS ROOM
COMMUNAL INDOOR AREA
HOTEL/BAR
PARKING/SERVICES

ISSUE	DATE	DESCRIPTION
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TIER ARCHITECTS

CLIENT	EMAG APARTMENTS	DATE 19/11/2021	SCALE indicated
PROJECT	123-133 New Canterbury Rd LEWISHAM	DRAWN PV	CHECKED NN
TITLE	SECTIONS	DWG No ---	313

DO NOT SCALE. USE FIGURED DIMENSIONS IN PREFERENCE TO SCALED, CHECK ALL DIMENSIONS ON SITE BEFORE FABRICATION.

SECTIONS

1 SOUTH STREETSCAPE ELEVATION

1 : 250

STREETSCAPE ELEVATION

ISSUE	DATE	DESCRIPTION
F	19/11/2021	AMENDED PLANS FOR COURT
E	04/11/2021	AMENDED PLANS FOR COURT
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C	08/10/2021	AMENDED PLANS FOR COURT
B	07/09/2021	AMENDED PLANS FOR COURT
A	18/01/2021	DEVELOPMENT APPLICATION

TIER ARCHITECTS

N

CLIENT	EMAG APARTMENTS	DATE 19/11/2021	SCALE A3 1 : 250
PROJECT	123-133 New Canterbury Rd LEWISHAM	DRAWN PV	CHECKED NN
TITLE	STREETSCAPE ELEVATION	DWG No ---	316

DO NOT SCALE. USE FIGURED DIMENSIONS IN PREFERENCE TO SCALED, CHECK ALL DIMENSIONS ON SITE BEFORE FABRICATION.

GROUND FLOOR DEMOLITION PLAN

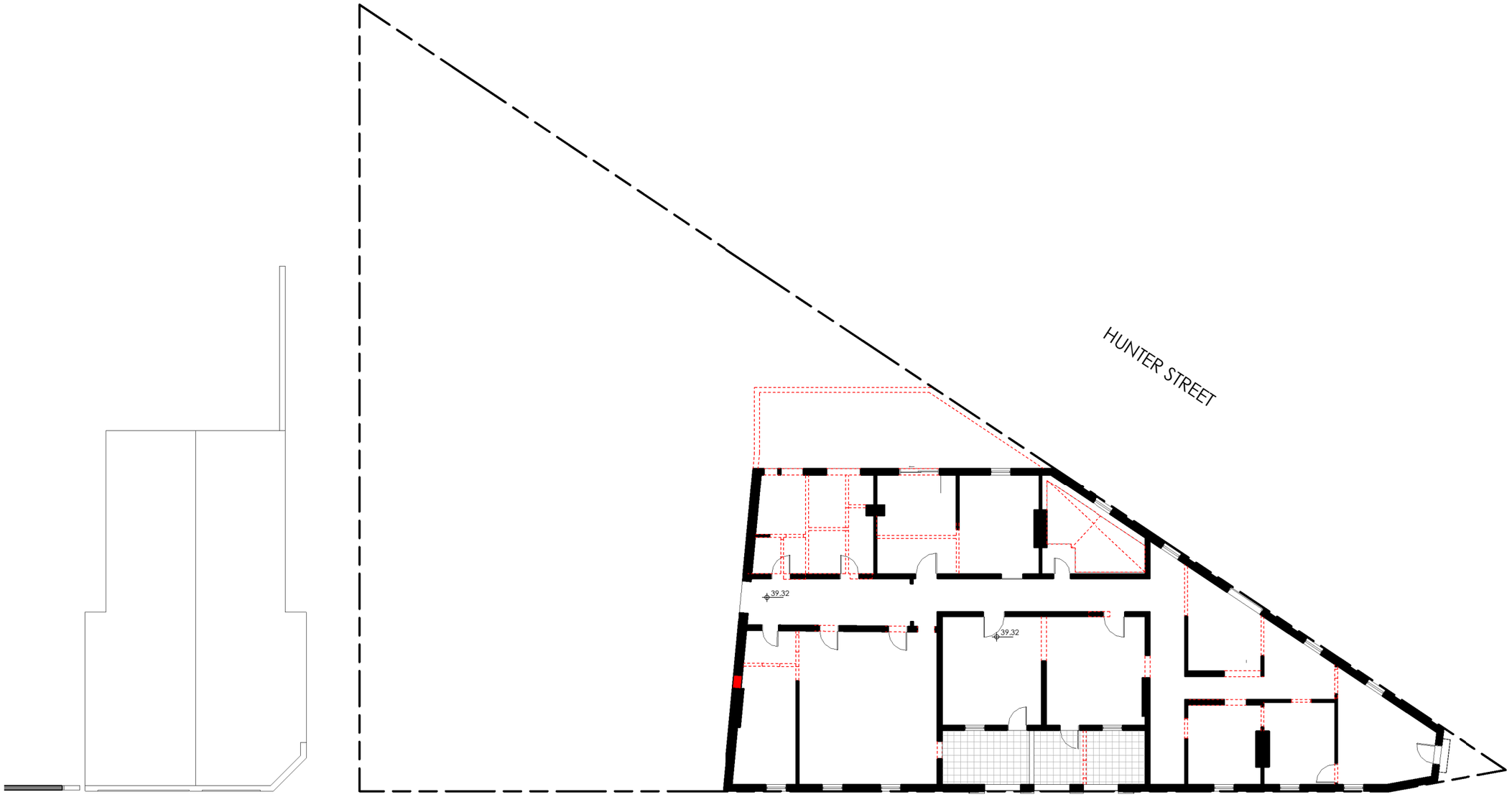
ISSUE	DATE	DESCRIPTION
F	19/11/2021	AMENDED PLANS FOR COURT
E	04/11/2021	AMENDED PLANS FOR COURT
D	21/10/2021	AMENDED PLANS FOR COURT
C	08/10/2021	AMENDED PLANS FOR COURT
B	07/09/2021	AMENDED PLANS FOR COURT
A	18/01/2021	DEVELOPMENT APPLICATION

TIER ARCHITECTS

N

CLIENT	EMAG APARTMENTS	DATE 19/11/2021	SCALE A3 1 : 200
PROJECT	123-133 New Canterbury Rd LEWISHAM	DRAWN PV	CHECKED NN
TITLE	GROUND FLOOR DEMOLITION PLAN	DWG No ---	317

DO NOT SCALE. USE FIGURED DIMENSIONS IN PREFERRENCE TO SCALED, CHECK ALL DIMENSIONS ON SITE BEFORE FABRICATION.



NEW CANTERBURY ROAD

LEVEL 1 DEMOLITION PLAN

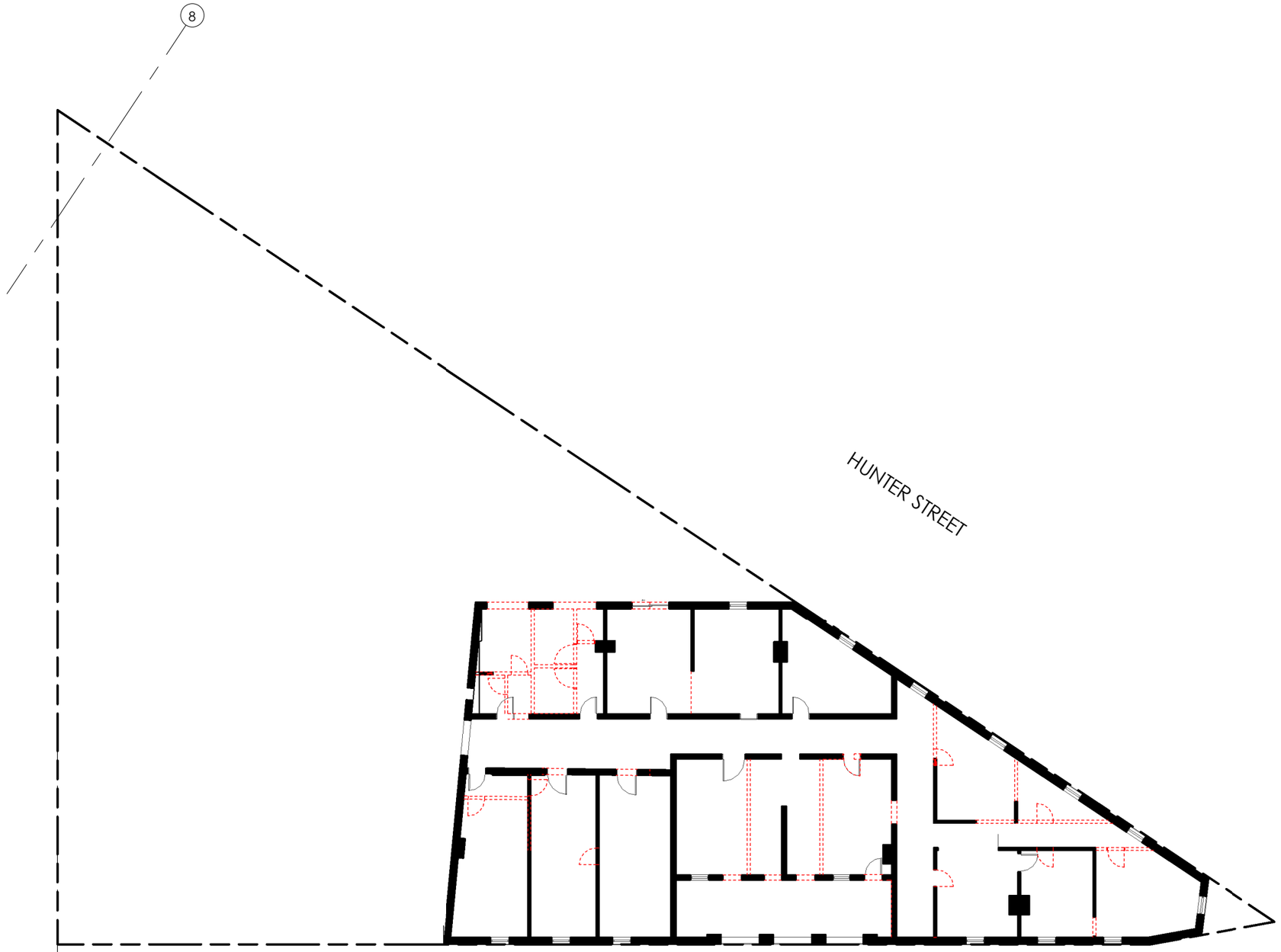
ISSUE	DATE	DESCRIPTION
F	19/11/2021	AMENDED PLANS FOR COURT
E	04/11/2021	AMENDED PLANS FOR COURT
D	21/10/2021	AMENDED PLANS FOR COURT
C	08/10/2021	AMENDED PLANS FOR COURT
B	07/09/2021	AMENDED PLANS FOR COURT
A	18/01/2021	DEVELOPMENT APPLICATION

TIER ARCHITECTS

N

CLIENT	EMAG APARTMENTS	DATE 19/11/2021	SCALE A3 1 : 200
PROJECT	123-133 New Canterbury Rd LEWISHAM	DRAWN PV	CHECKED NN
TITLE	LEVEL 1 DEMOLITION PLAN	DWG No ---	318

DO NOT SCALE. USE FIGURED DIMENSIONS IN PREFERENCE TO SCALED. CHECK ALL DIMENSIONS ON SITE BEFORE FABRICATION.



LEVEL 2 DEMOLITION PLAN

ISSUE	DATE	DESCRIPTION
F	19/11/2021	AMENDED PLANS FOR COURT
E	04/11/2021	AMENDED PLANS FOR COURT
D	21/10/2021	AMENDED PLANS FOR COURT
C	08/10/2021	AMENDED PLANS FOR COURT
B	07/09/2021	AMENDED PLANS FOR COURT
A	18/01/2021	DEVELOPMENT APPLICATION

TIER ARCHITECTS

N

CLIENT	EMAG APARTMENTS	DATE 19/11/2021	SCALE A3 1 : 200
PROJECT	123-133 New Canterbury Rd LEWISHAM	DRAWN PV	CHECKED NN
TITLE	LEVEL 2 DEMOLITION PLAN	DWG No —	319

DO NOT SCALE. USE FIGURED DIMENSIONS IN PREFERENCE TO SCALED. CHECK ALL DIMENSIONS ON SITE BEFORE FABRICATION.

HEIGHT PLANE DIAGRAM

ISSUE	DATE	DESCRIPTION
F	19/11/2021	AMENDED PLANS FOR COURT
E	04/11/2021	AMENDED PLANS FOR COURT
D	21/10/2021	AMENDED PLANS FOR COURT
C	08/10/2021	AMENDED PLANS FOR COURT
B	07/09/2021	AMENDED PLANS FOR COURT
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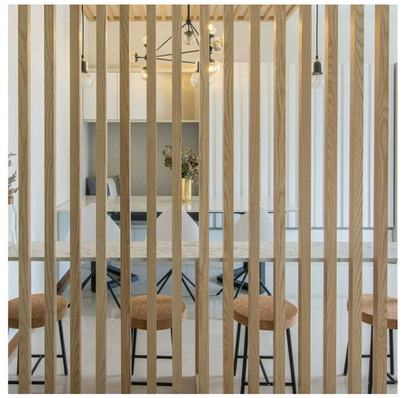
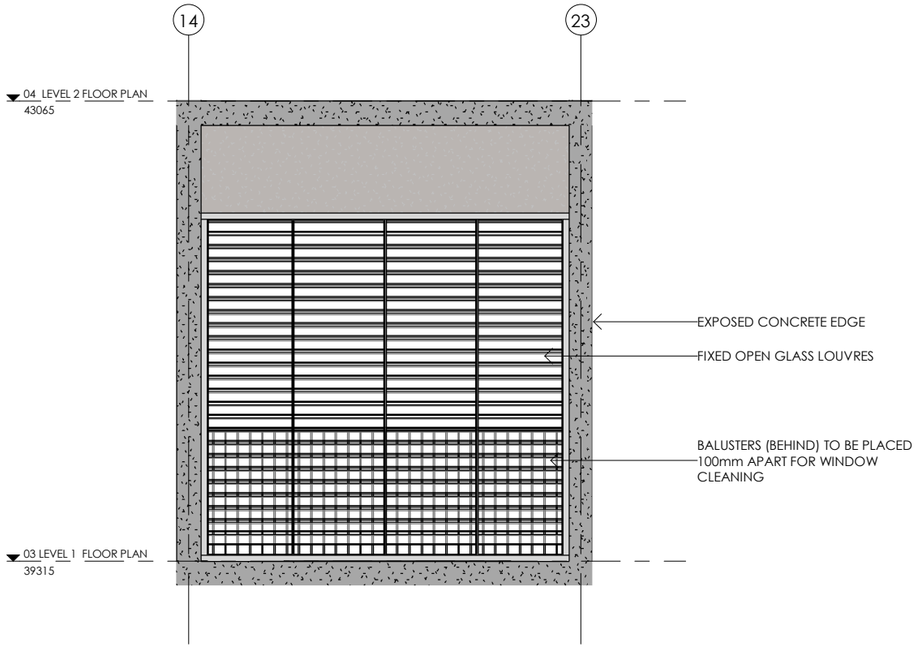
TIER ARCHITECTS

CLIENT	EMAG APARTMENTS	DATE 19/11/2021	SCALE A3
PROJECT	123-133 New Canterbury Rd LEWISHAM	DRAWN PV	CHECKED NN
TITLE	HEIGHT PLANE DIAGRAM	DWG No ---	320



1 NORTH ELEVATION - SCREEN DETAIL

1 : 100



2 BALCONY/LOUVRE ELEVATION DETAIL

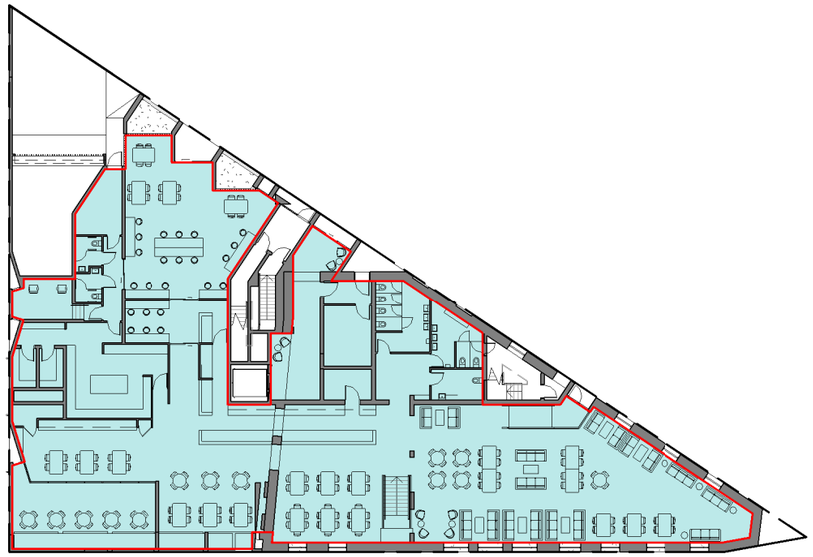
1 : 50

ELEVATION DETAILS

ISSUE	DATE	DESCRIPTION
F	19/11/2021	AMENDED PLANS FOR COURT
E	04/11/2021	AMENDED PLANS FOR COURT
D	21/10/2021	AMENDED PLANS FOR COURT
C	08/10/2021	AMENDED PLANS FOR COURT
B	07/09/2021	AMENDED PLANS FOR COURT
A	18/01/2021	DEVELOPMENT APPLICATION

TIER ARCHITECTS

CLIENT	EMAG APARTMENTS	DATE 19/11/2021	SCALE indicated
PROJECT	123-133 New Canterbury Rd LEWISHAM	DRAWN PV	CHECKED NN
TITLE	ELEVATION DETAILS	DWG No ---	321

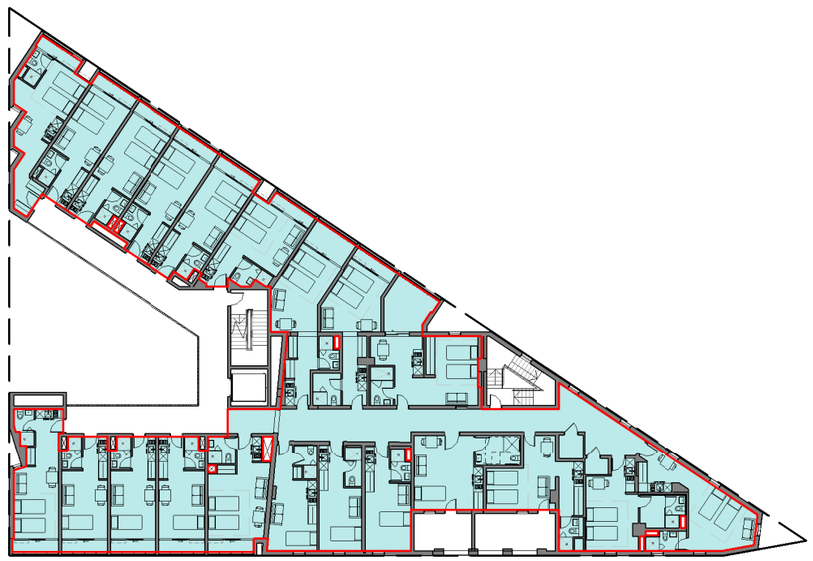


701m²

1 02 GROUND FLOOR PLAN
1 : 400

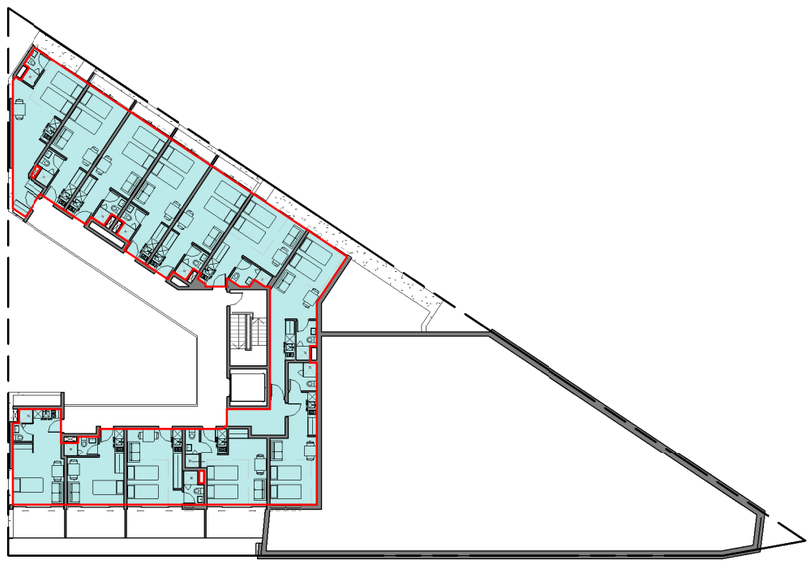
642m²

2 03 LEVEL 1 FLOOR PLAN
1 : 400



644m²

3 04 LEVEL 2 FLOOR PLAN
1 : 400



290m²

4 05 LEVEL 3 FLOOR PLAN
1 : 400

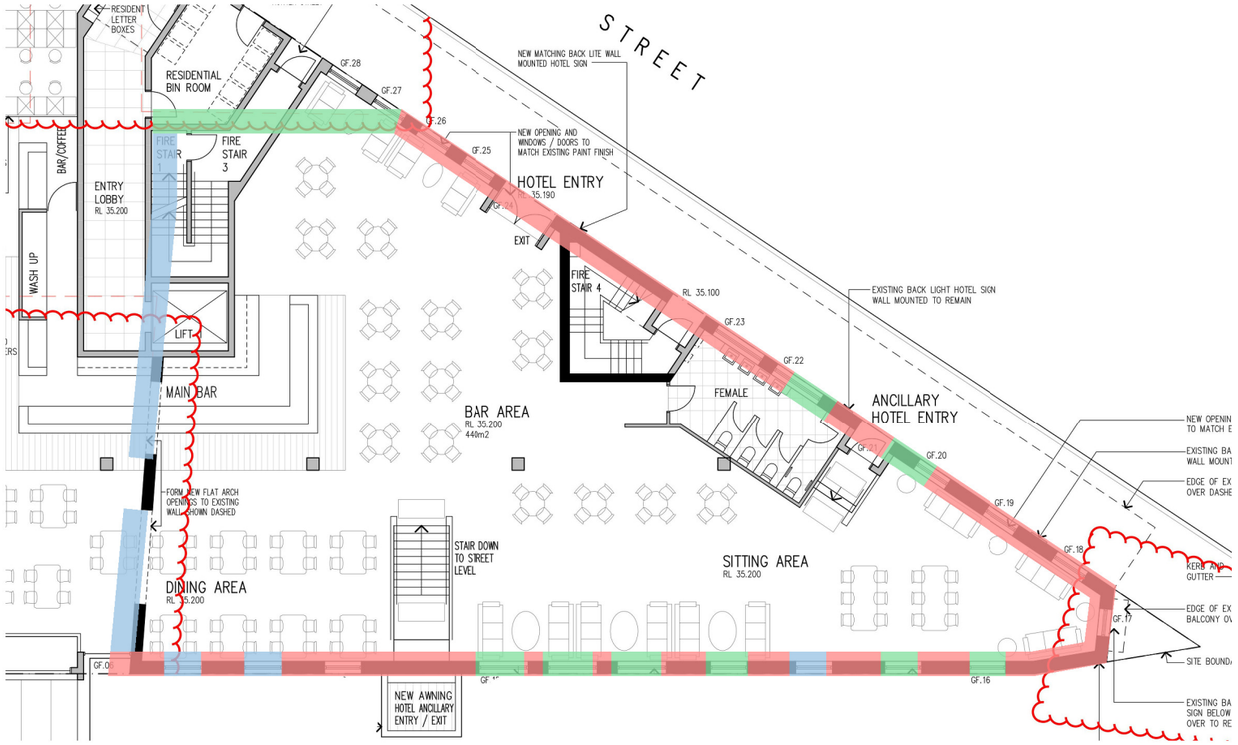
FLOOR AREA CALCULATIONS

ISSUE	DATE	DESCRIPTION
F	19/11/2021	AMENDED PLANS FOR COURT
E	04/11/2021	AMENDED PLANS FOR COURT
D	21/10/2021	AMENDED PLANS FOR COURT
C	08/10/2021	AMENDED PLANS FOR COURT
B	07/09/2021	AMENDED PLANS FOR COURT
A	28/07/2021	DEVELOPMENT APPLICATION

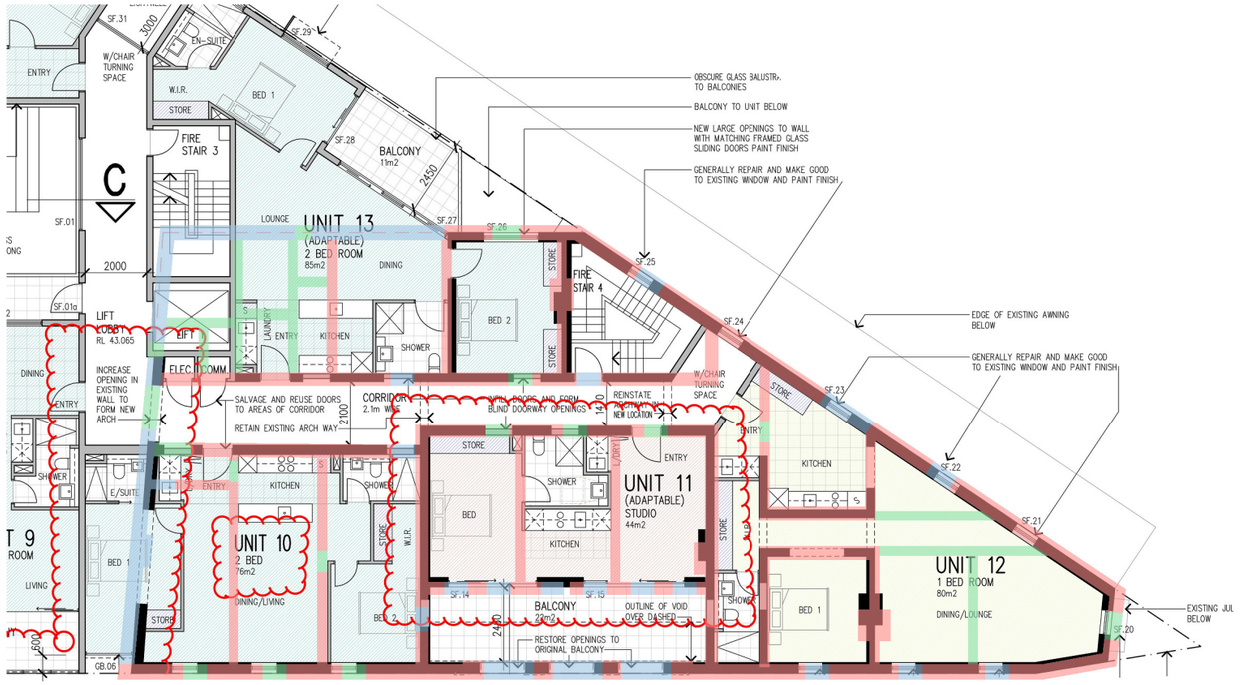
TIER ARCHITECTS

N

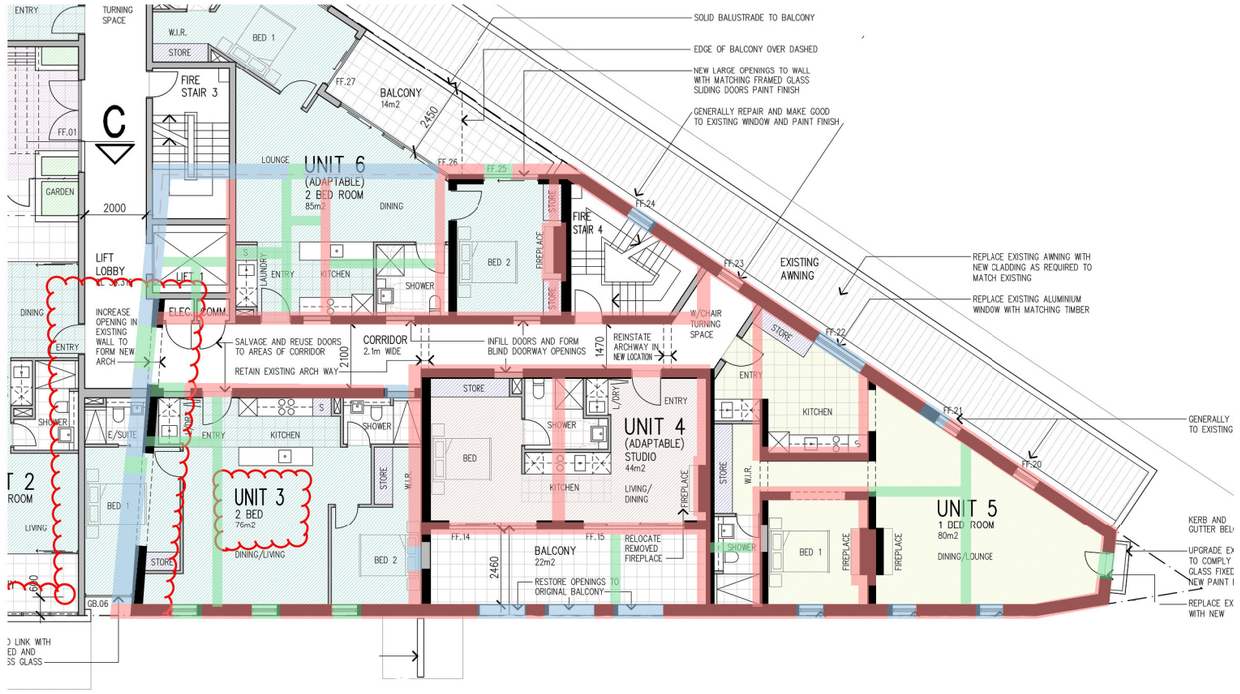
CLIENT	EMAG APARTMENTS	DATE 19/11/2021	SCALE A3 1 : 400
PROJECT	123-133 New Canterbury Rd LEWISHAM	DRAWN PV	CHECKED NN
TITLE	FLOOR AREA CALCULATIONS	DWG No --	600



1 02 GROUND FLOOR PLAN - DA Approved
1 : 200



3 04 LEVEL 2 FLOOR PLAN - DA Approved
1 : 200



2 03 LEVEL 1 FLOOR PLAN - DA Approved
1 : 200

DA APPROVED FLOOR PLAN VS GRADING SIGNIFICANCE

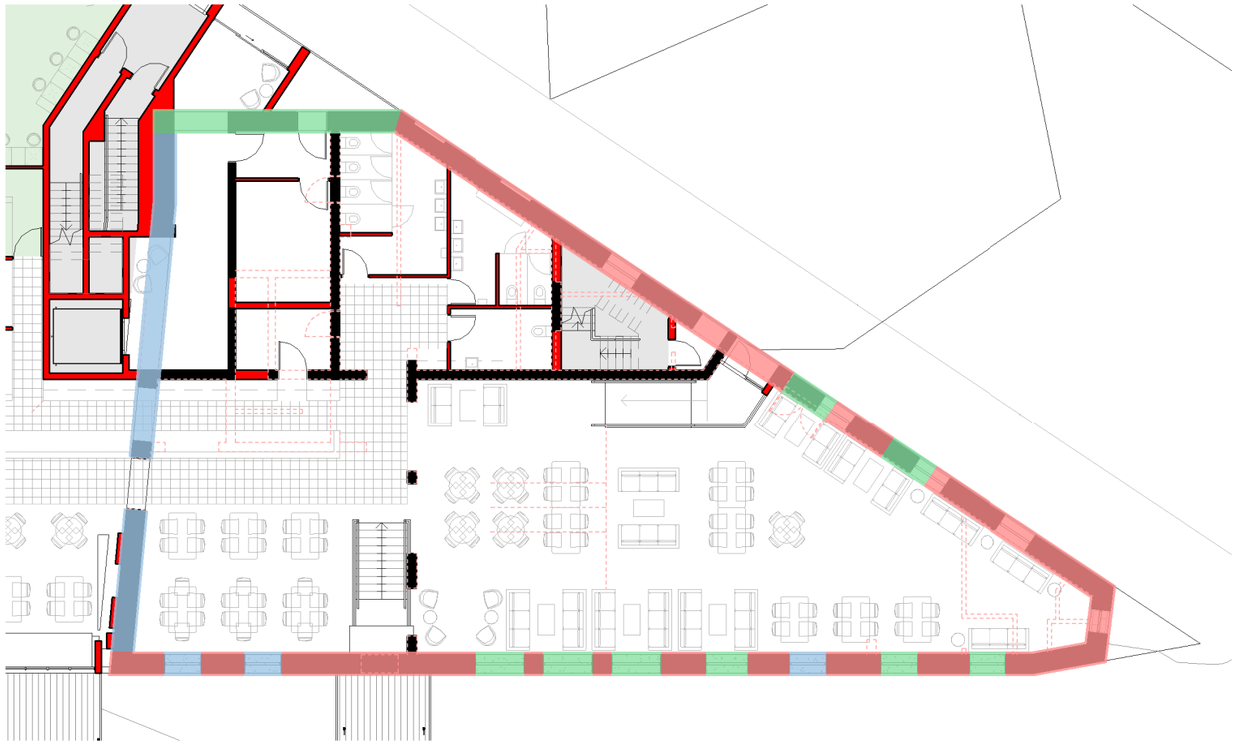
GRADING SIGNIFICANCE
EXCEPTIONAL
HIGH
MODERATE
LITTLE
INTRUSIVE

ISSUE	DATE	DESCRIPTION
F	19/11/2021	AMENDED PLANS FOR COURT
E	04/11/2021	AMENDED PLANS FOR COURT
D	21/10/2021	AMENDED PLANS FOR COURT
C	08/10/2021	AMENDED PLANS FOR COURT
B	07/09/2021	AMENDED PLANS FOR COURT
A	18/01/2021	DEVELOPMENT APPLICATION

TIER ARCHITECTS

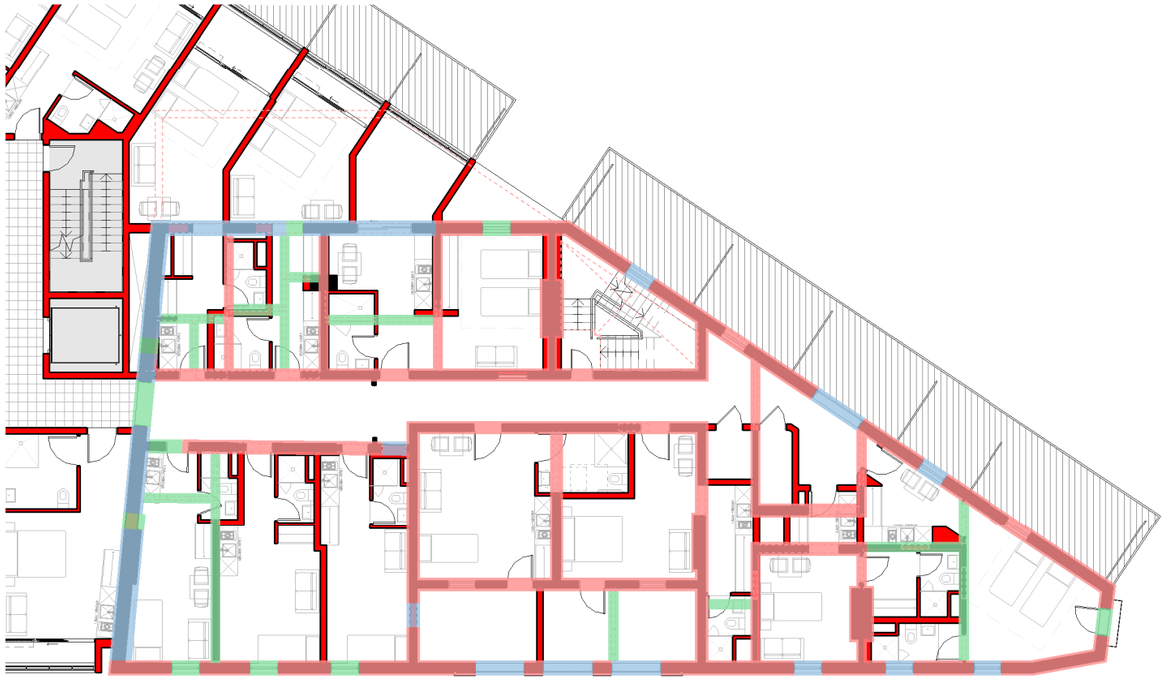
N

CLIENT	EMAG APARTMENTS	DATE 19/11/2021	SCALE ~~@ A1~~ indicated
PROJECT	123-133 New Canterbury Rd LEWISHAM	DRAWN PV	CHECKED NN
TITLE	DA APPROVED FLOOR PLAN VS GRADING SIGNIFICANCE	DWG No ...	700



1 02 GROUND FLOOR PLAN SIGNIFICANCE
1 : 200

3 04 LEVEL 2 FLOOR PLAN SIGNIFICANCE
1 : 200



2 03 LEVEL 1 FLOOR PLAN SIGNIFICANCE
1 : 200

PROPOSED FLOOR PLAN VS GRADING SIGNIFICANCE

GRADING SIGNIFICANCE
EXCEPTIONAL
HIGH
MODERATE
LITTLE
INTRUSIVE

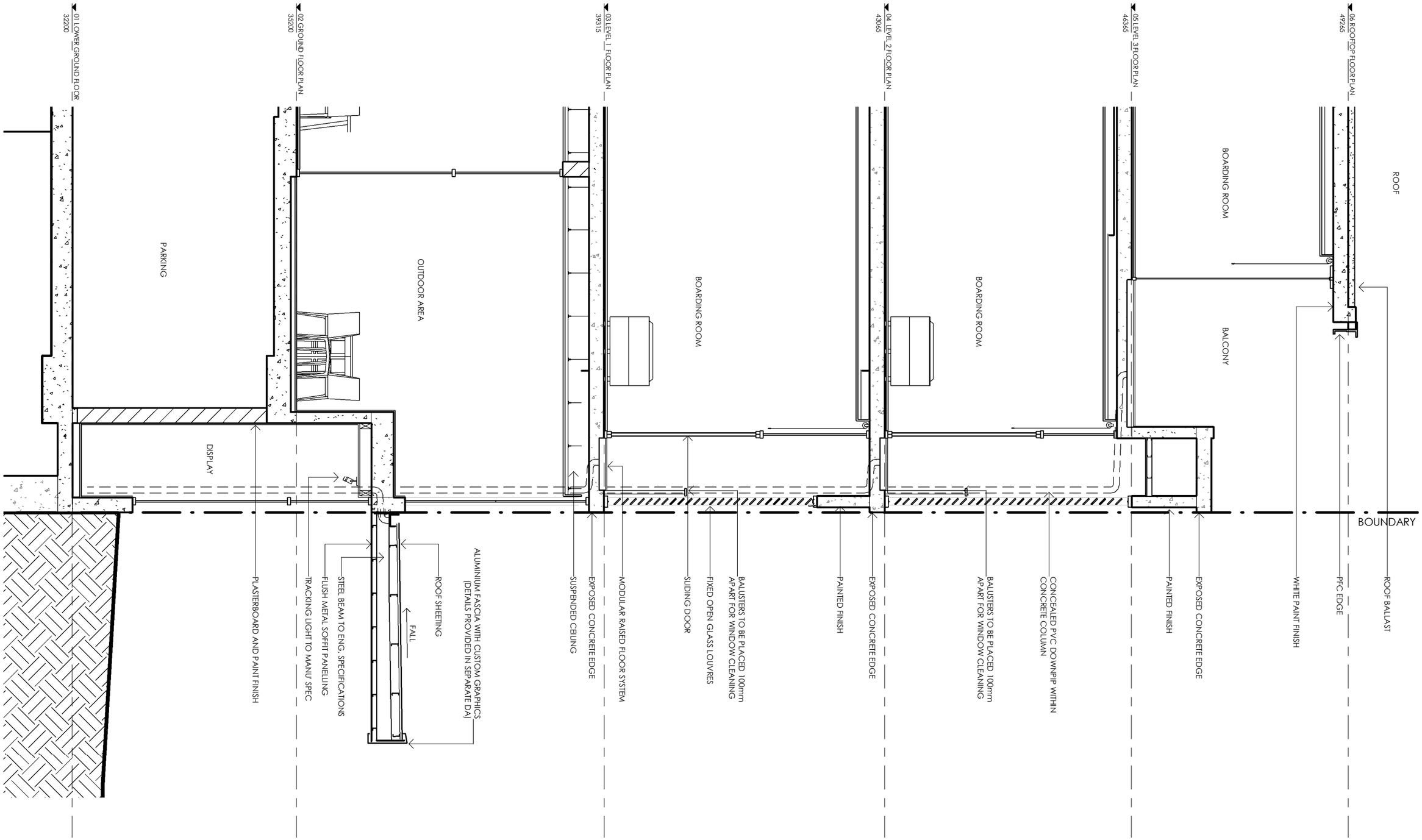
ISSUE	DATE	DESCRIPTION
F	19/11/2021	AMENDED PLANS FOR COURT
E	04/11/2021	AMENDED PLANS FOR COURT
D	21/10/2021	AMENDED PLANS FOR COURT
C	08/10/2021	AMENDED PLANS FOR COURT
B	07/09/2021	AMENDED PLANS FOR COURT
A	18/01/2021	DEVELOPMENT APPLICATION

TIER ARCHITECTS

N

CLIENT	EMAG APARTMENTS	DATE 19/11/2021	SCALE indicated
PROJECT	123-133 New Canterbury Rd LEWISHAM	DRAWN PV	CHECKED NN
TITLE	PROPOSED FLOOR PLAN VS GRADING SIGNIFICANCE	DWG No -	701

DO NOT SCALE. USE FIGURED DIMENSIONS IN PREFERENCE TO SCALED. CHECK ALL DIMENSIONS ON SITE BEFORE FABRICATION.



DETAILED SECTION - CANTERBURY ROAD

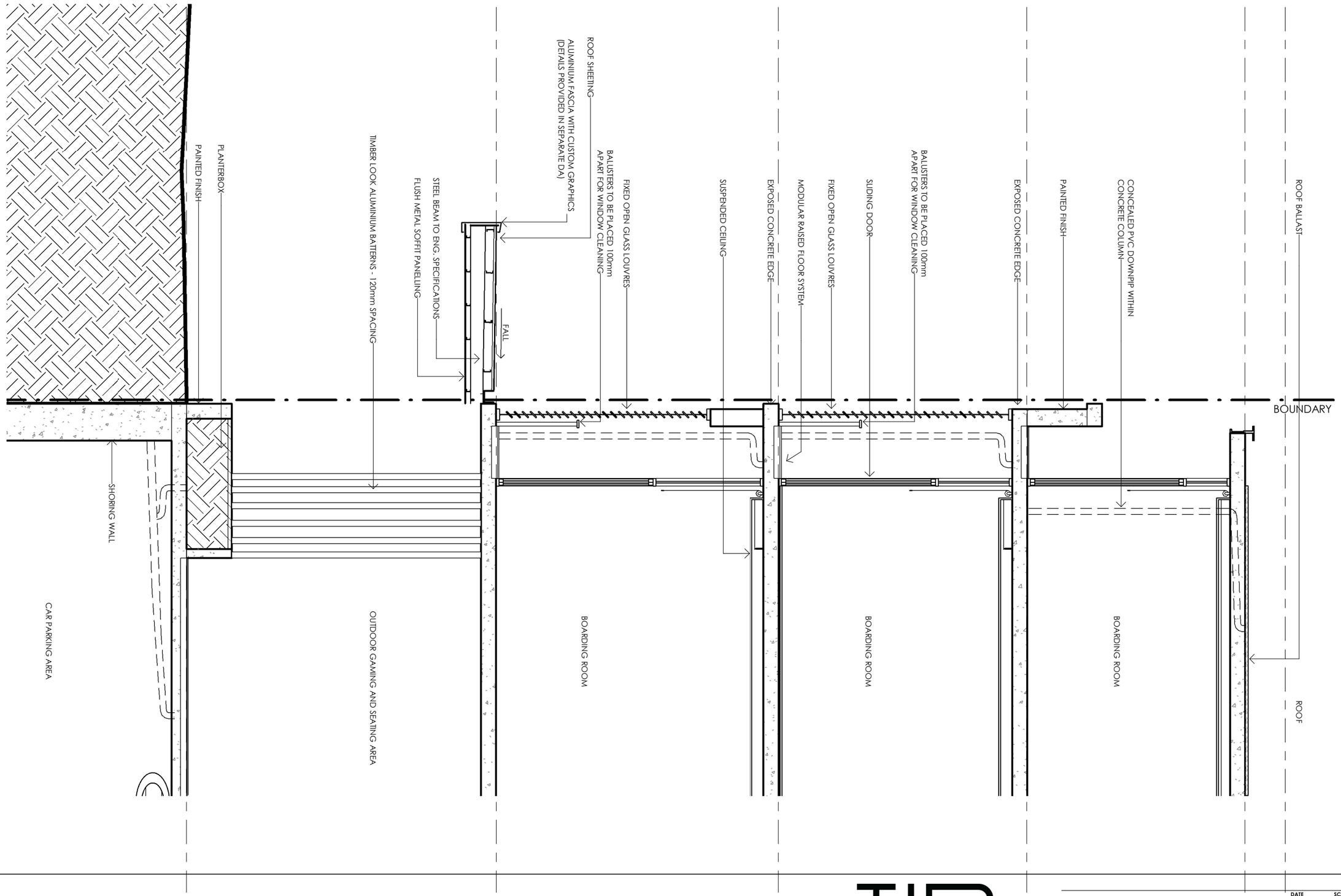
ISSUE	DATE	DESCRIPTION
F	19/11/2021	AMENDED PLANS FOR COURT
E	04/11/2021	AMENDED PLANS FOR COURT
D	21/10/2021	AMENDED PLANS FOR COURT
C	08/10/2021	AMENDED PLANS FOR COURT
B	07/09/2021	AMENDED PLANS FOR COURT
A	18/01/2021	DEVELOPMENT APPLICATION

TIER ARCHITECTS

N

CLIENT	EMAG APARTMENTS	DATE 19/11/2021	SCALE A3 1 : 50
PROJECT	123-133 New Canterbury Rd LEWISHAM	DRAWN PV	CHECKED NN
TITLE	DETAILED SECTION - CANTERBURY ROAD	DWG No ---	702

DO NOT SCALE. USE FIGURED DIMENSIONS IN PREFERRENCE TO SCALED, CHECK ALL DIMENSIONS ON SITE BEFORE FABRICATION.



DETAILED SECTION - HUNTER STREET

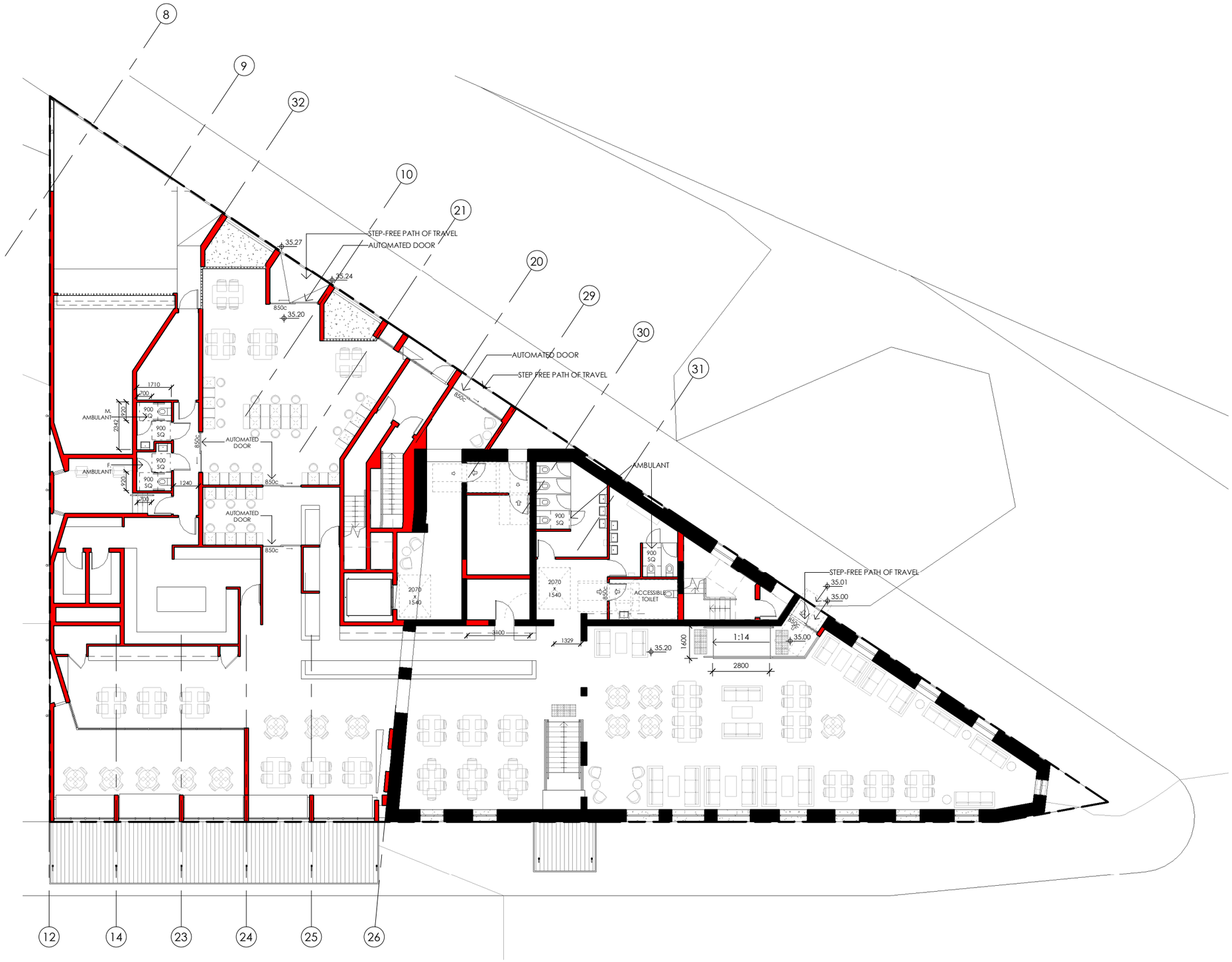
ISSUE	DATE	DESCRIPTION
F	19/11/2021	AMENDED PLANS FOR COURT
E	04/11/2021	AMENDED PLANS FOR COURT
D	21/10/2021	AMENDED PLANS FOR COURT
C	08/10/2021	AMENDED PLANS FOR COURT
B	07/09/2021	AMENDED PLANS FOR COURT
A	18/01/2021	DEVELOPMENT APPLICATION

TIER ARCHITECTS

N

		DATE	SCALE
CLIENT	EMAG APARTMENTS	19/11/2021	A3 1 : 50
PROJECT	123-133 New Canterbury Rd LEWISHAM	DRAWN PV	CHECKED NN
TITLE	DETAILED SECTION - HUNTER STREET	DWG No ---	703

DO NOT SCALE. USE FIGURED DIMENSIONS IN PREFERRENCE TO SCALED, CHECK ALL DIMENSIONS ON SITE BEFORE FABRICATION.



GROUND FLOOR PUB ACCESSIBILITY

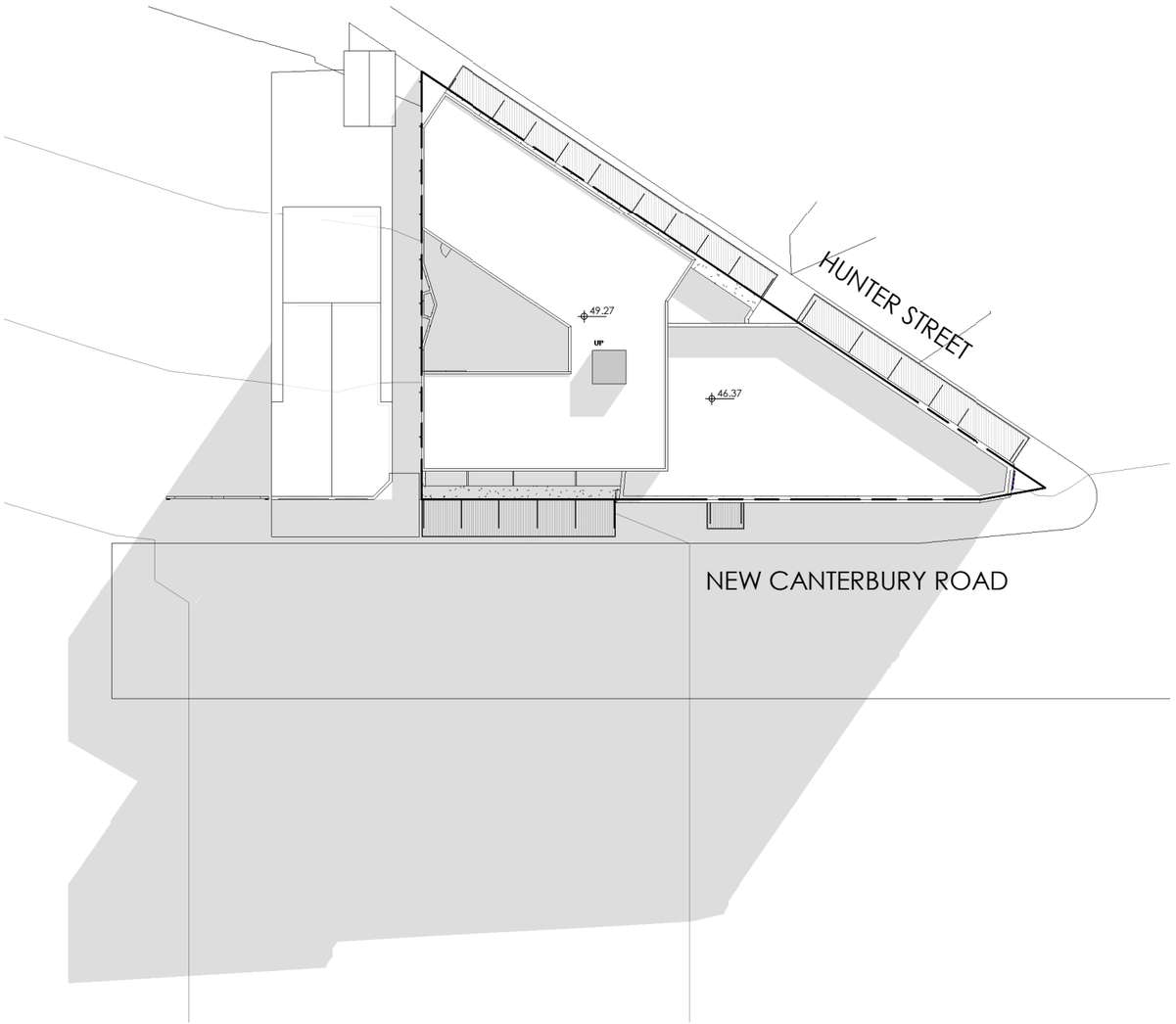
ISSUE	DATE	DESCRIPTION
F	19/11/2021	AMENDED PLANS FOR COURT
E	04/11/2021	AMENDED PLANS FOR COURT
D	21/10/2021	AMENDED PLANS FOR COURT
C	08/10/2021	AMENDED PLANS FOR COURT
B	07/09/2021	AMENDED PLANS FOR COURT
A	18/01/2021	DEVELOPMENT APPLICATION

TIER ARCHITECTS

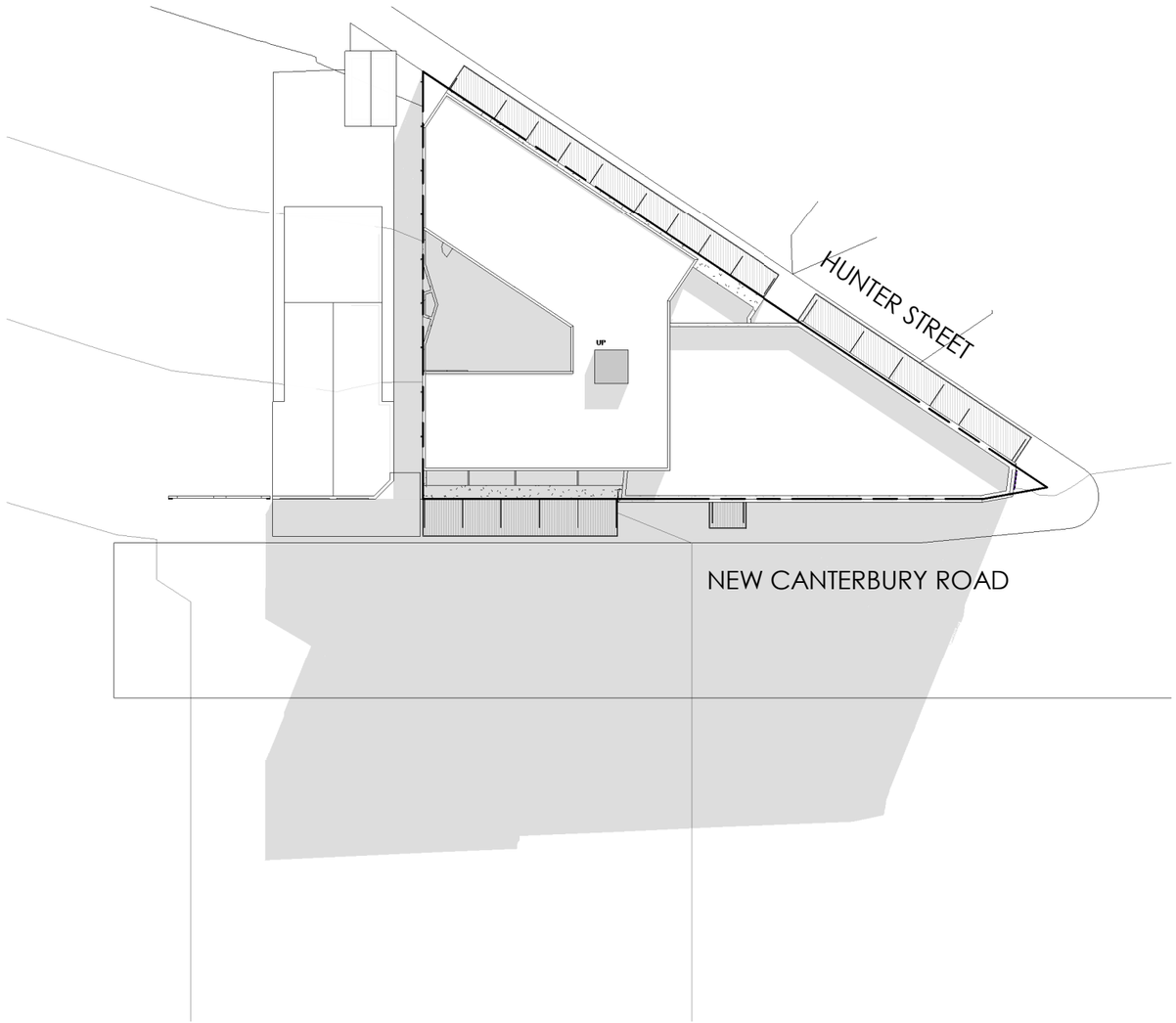
N

		DATE	SCALE
CLIENT	EMAG APARTMENTS	19/11/2021	A3 1 : 200
PROJECT	123-133 New Canterbury Rd LEWISHAM	DRAWN PV	CHECKED NN
TITLE	GROUND FLOOR PUB ACCESSIBILITY	DWG No ---	704

DO NOT SCALE. USE FIGURED DIMENSIONS IN PREFERENCE TO SCALED, CHECK ALL DIMENSIONS ON SITE BEFORE FABRICATION.



1 WINTER SHADOW - 9AM
1 : 500



2 WINTER SHADOW - 10AM
1 : 500

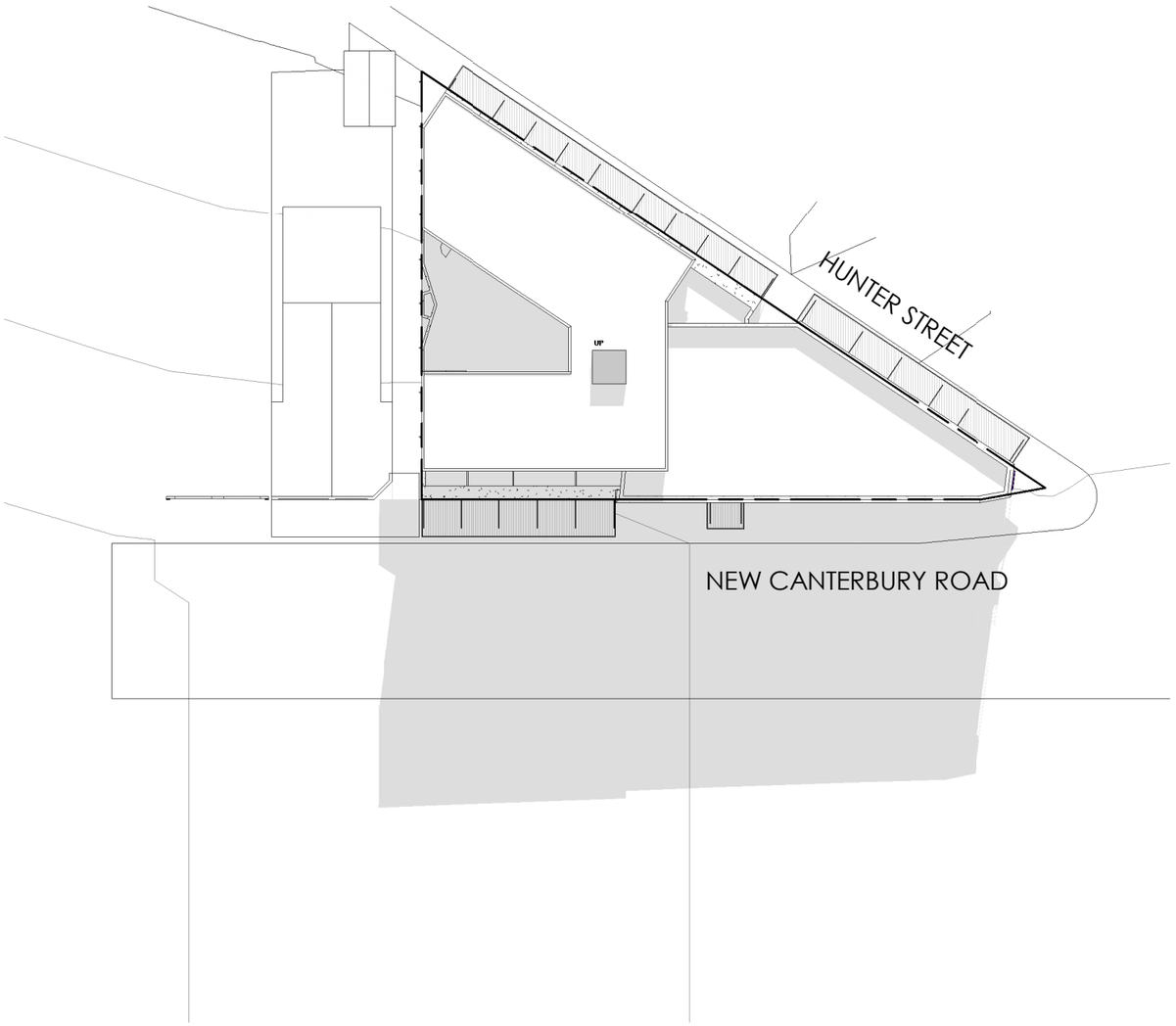
WINTER SHADOW - 9AM, 10AM

ISSUE	DATE	DESCRIPTION
F	19/11/2021	AMENDED PLANS FOR COURT
E	04/11/2021	AMENDED PLANS FOR COURT
D	21/10/2021	AMENDED PLANS FOR COURT
C	08/10/2021	AMENDED PLANS FOR COURT
B	07/09/2021	AMENDED PLANS FOR COURT
A	18/01/2021	DEVELOPMENT APPLICATION

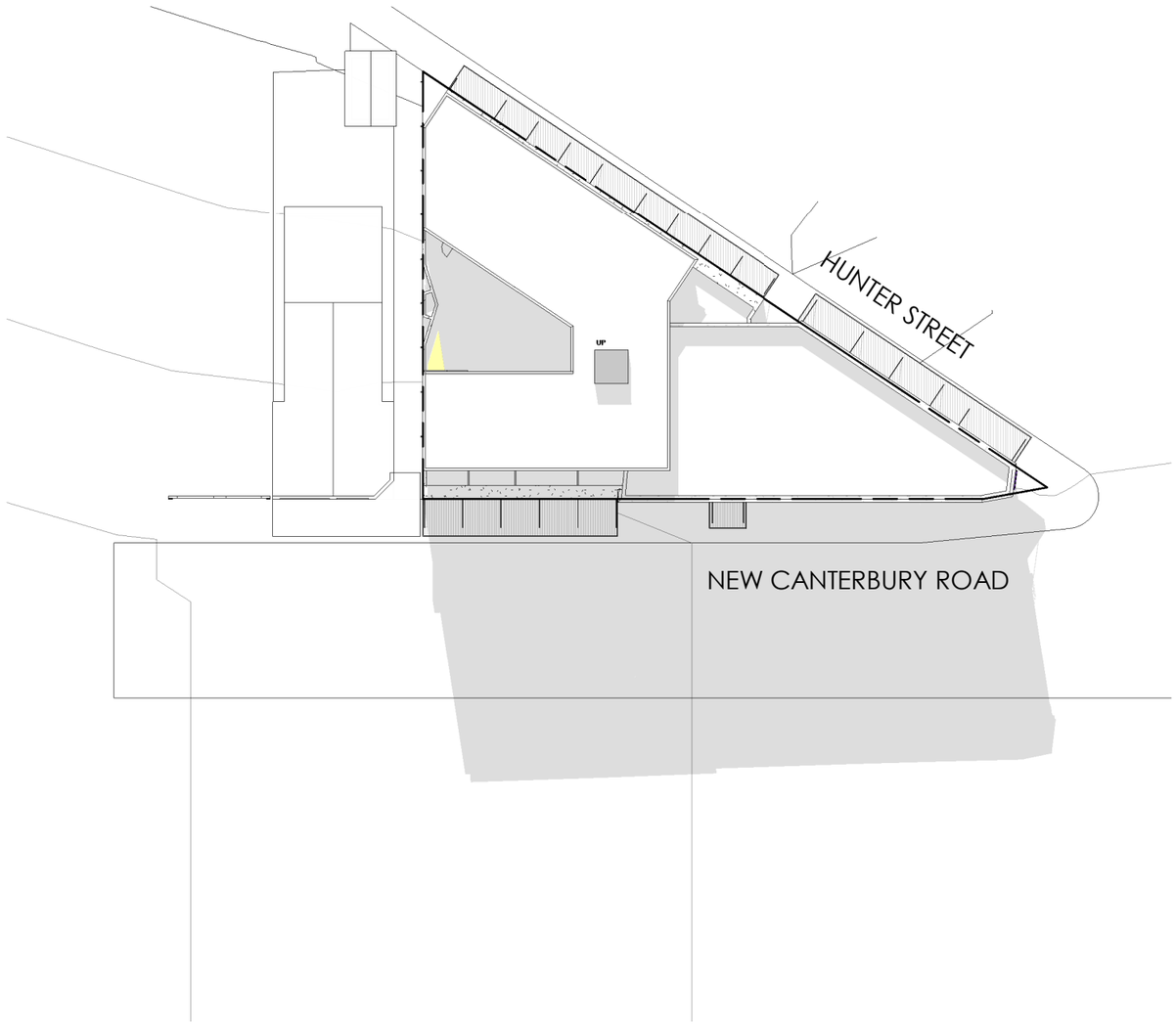
TIER ARCHITECTS

N

CLIENT	EMAG APARTMENTS	DATE 19/11/2021	SCALE A3 1 : 500
PROJECT	123-133 New Canterbury Rd LEWISHAM	DRAWN PV	CHECKED NN
TITLE	WINTER SHADOW - 9AM, 10AM	DWG No ---	800



1 WINTER SHADOW - 11AM
1 : 500



2 WINTER SHADOW - 12PM
1 : 500

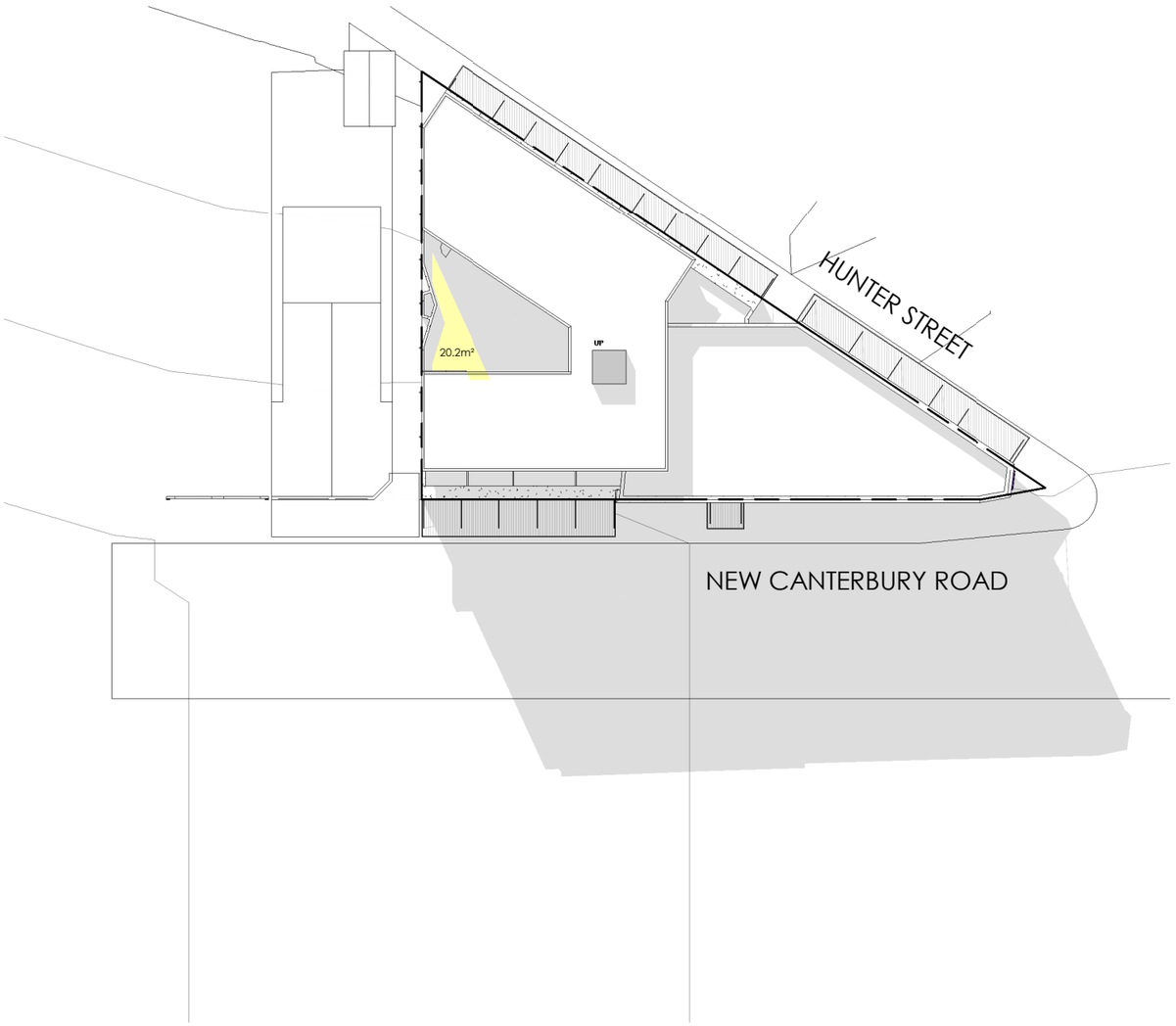
WINTER SHADOW - 11AM, 12PM

ISSUE	DATE	DESCRIPTION
F	19/11/2021	AMENDED PLANS FOR COURT
E	04/11/2021	AMENDED PLANS FOR COURT
D	21/10/2021	AMENDED PLANS FOR COURT
C	08/10/2021	AMENDED PLANS FOR COURT
B	07/09/2021	AMENDED PLANS FOR COURT
A	18/01/2021	DEVELOPMENT APPLICATION

TIER ARCHITECTS

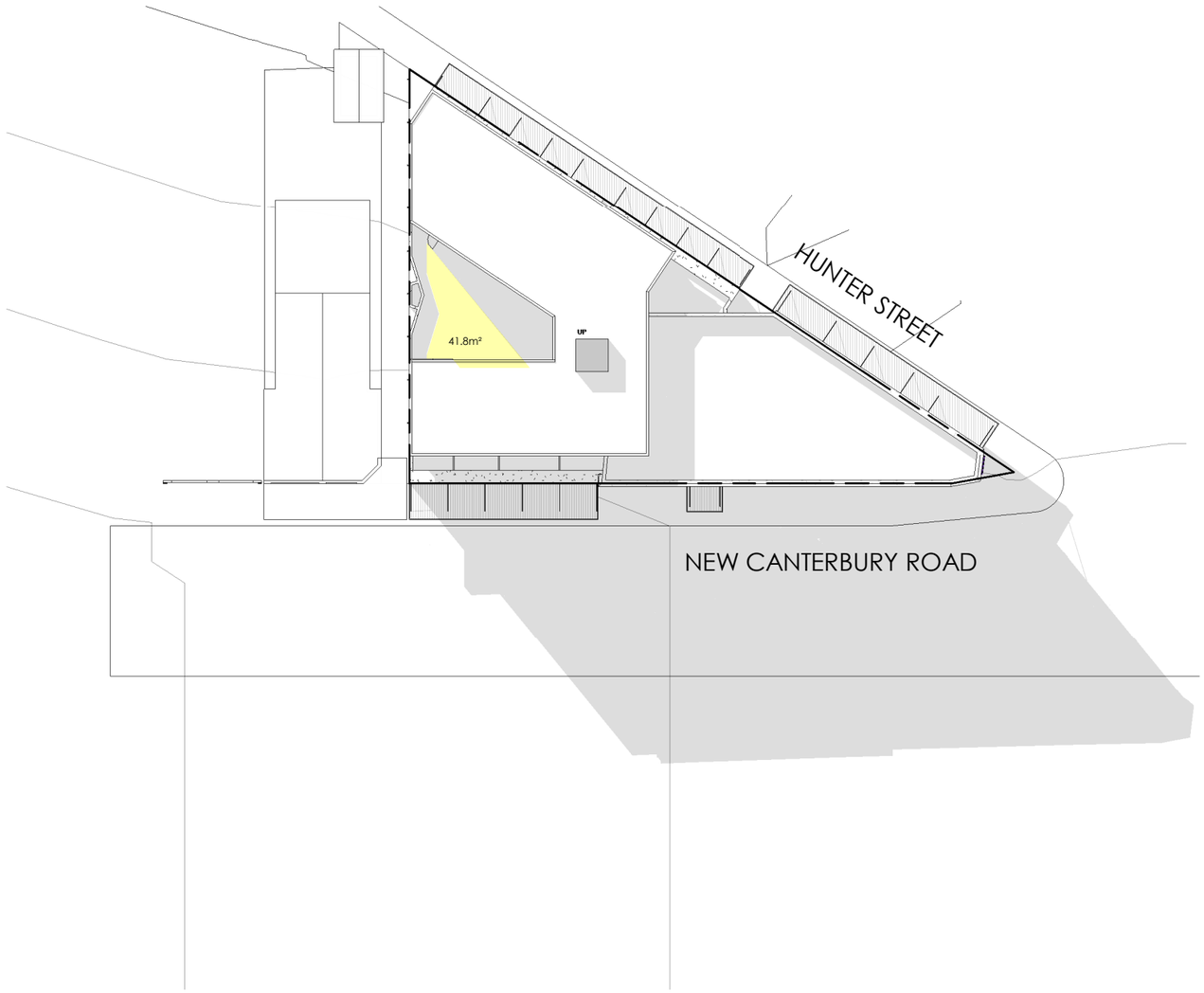
N

CLIENT	EMAG APARTMENTS	DATE 19/11/2021	SCALE A3 1 : 500
PROJECT	123-133 New Canterbury Rd LEWISHAM	DRAWN PV	CHECKED NN
TITLE	WINTER SHADOW - 11AM, 12PM	DWG No ---	801



1 WINTER SHADOW - 1PM

1 : 500



2 WINTER SHADOW - 2PM

1 : 500

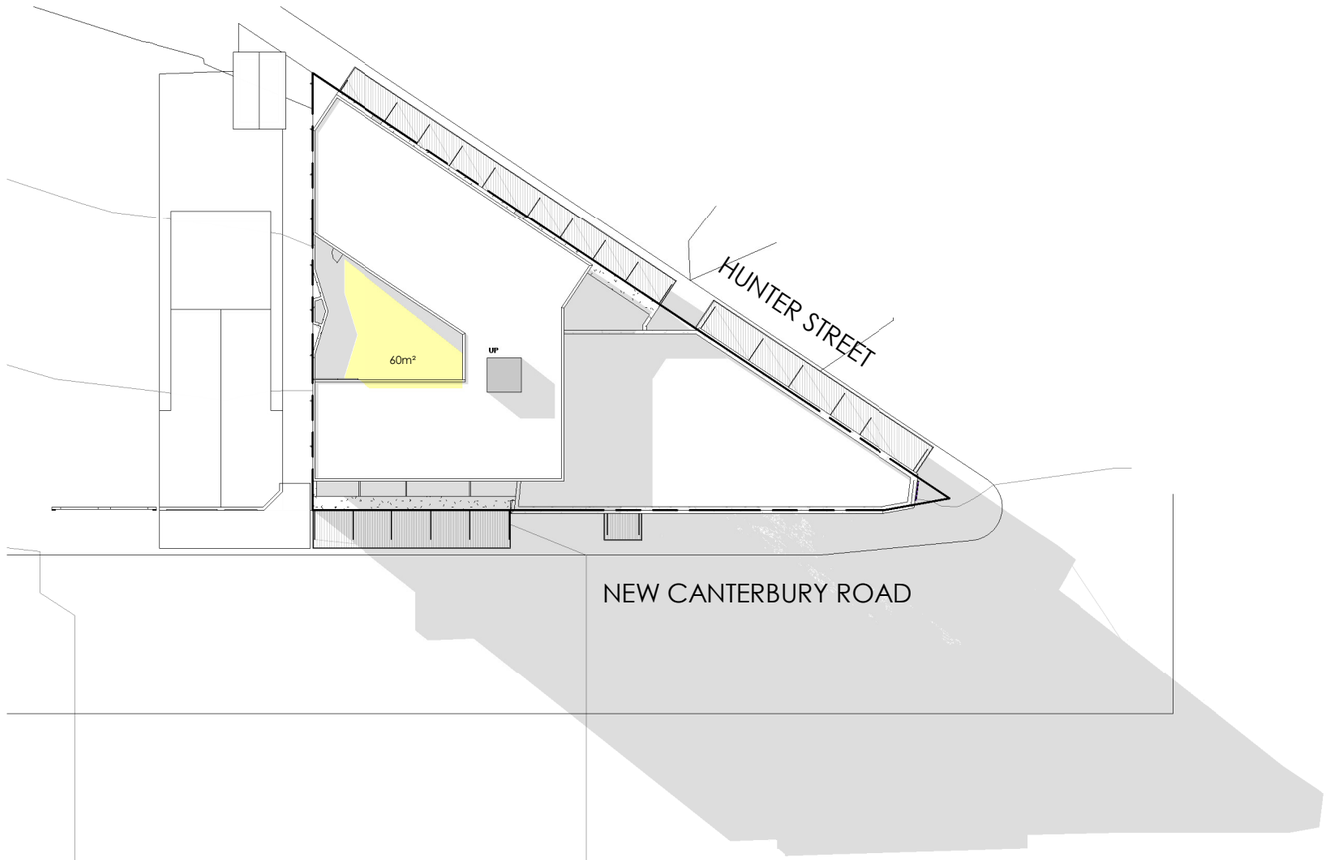
WINTER SHADOW - 1PM, 2PM

ISSUE	DATE	DESCRIPTION
F	19/11/2021	AMENDED PLANS FOR COURT
E	04/11/2021	AMENDED PLANS FOR COURT
D	21/10/2021	AMENDED PLANS FOR COURT
C	08/10/2021	AMENDED PLANS FOR COURT
B	07/09/2021	AMENDED PLANS FOR COURT
A	18/01/2021	DEVELOPMENT APPLICATION

TIER ARCHITECTS

N

CLIENT	EMAG APARTMENTS	DATE 19/11/2021	SCALE A3 1 : 500
PROJECT	123-133 New Canterbury Rd LEWISHAM	DRAWN PV	CHECKED NN
TITLE	WINTER SHADOW - 1PM, 2PM	DWG No ---	802



1 WINTER SHADOW - 3PM

1 : 500

WINTER SHADOW - 3PM

ISSUE	DATE	DESCRIPTION
F	19/11/2021	AMENDED PLANS FOR COURT
E	04/11/2021	AMENDED PLANS FOR COURT
D	21/10/2021	AMENDED PLANS FOR COURT
C	08/10/2021	AMENDED PLANS FOR COURT
B	07/09/2021	AMENDED PLANS FOR COURT
A	18/01/2021	DEVELOPMENT APPLICATION

TIER ARCHITECTS

N

CLIENT	EMAG APARTMENTS	DATE 19/11/2021	SCALE A3 1 : 500
PROJECT	123-133 New Canterbury Rd LEWISHAM	DRAWN PV	CHECKED NN
TITLE	WINTER SHADOW - 3PM	DWG No ---	803

DO NOT SCALE. USE FIGURED DIMENSIONS IN PREFERENCE TO SCALED, CHECK ALL DIMENSIONS ON SITE BEFORE FABRICATION.

VIEW FROM NEW CANTERBURY ROAD

VIEW FROM HUNTER STREET

1 DULUX CAPS

2 DULUX GRAND PIANO

3 DULUX IRONSTONE

4 DULUX LEXICON

5 DULUX MONUMENT

6 DULUX WEATHERED MUSTARD

8 ALUMINIUM DOORS AND WINDOWS

9 CONCRETE

10 TIMBER PRIVACY SCREEN

11 DULUX IRONSTONE - EXISTING AND NEW TIMBER WINDOW FRAMES

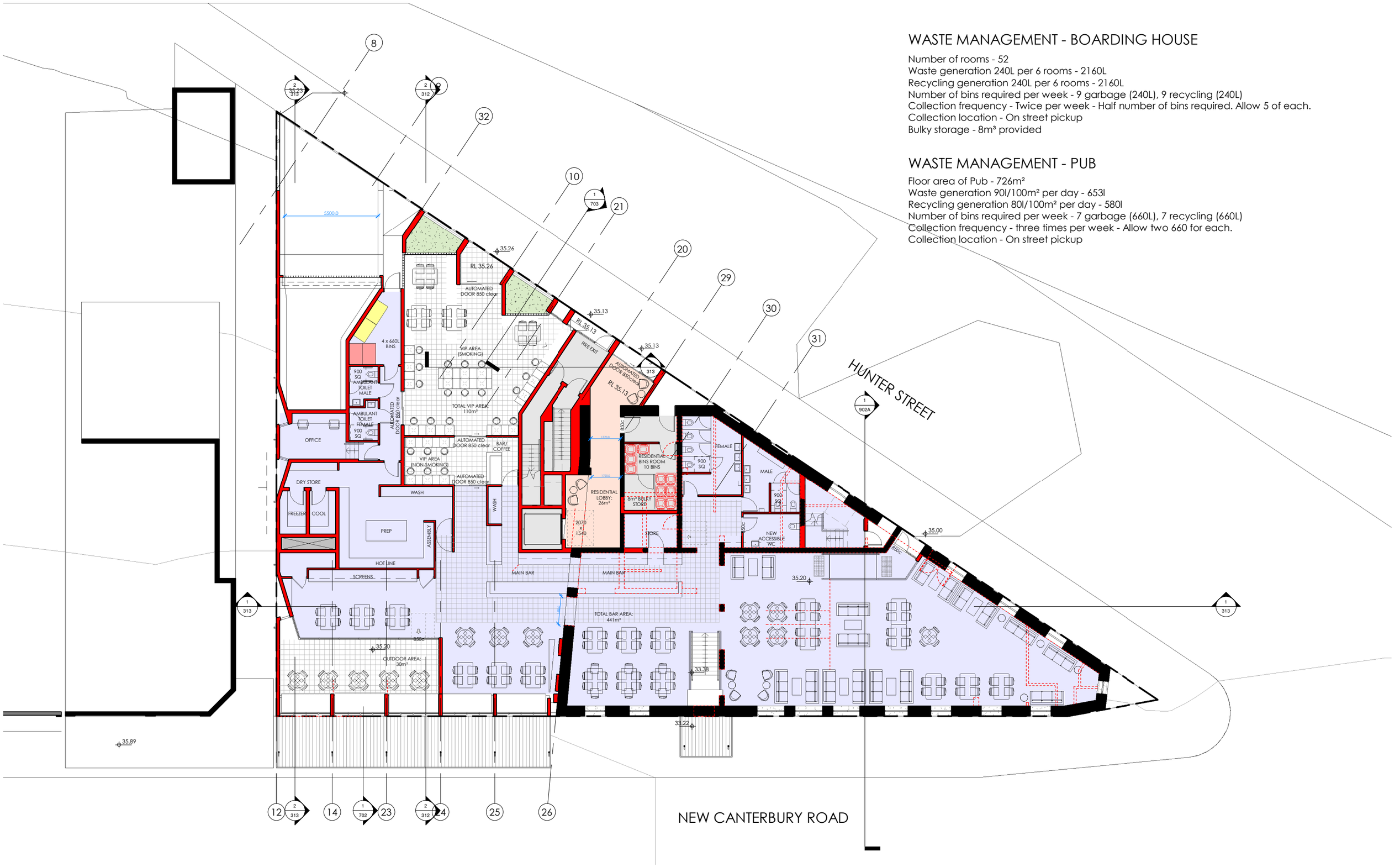
MATERIALS AND FINISHES

ISSUE	DATE	DESCRIPTION
F	19/11/2021	AMENDED PLANS FOR COURT
E	04/11/2021	AMENDED PLANS FOR COURT
D	21/10/2021	AMENDED PLANS FOR COURT
C	08/10/2021	AMENDED PLANS FOR COURT
B	07/09/2021	AMENDED PLANS FOR COURT
A	18/01/2021	DEVELOPMENT APPLICATION

TIER ARCHITECTS

		DATE	SCALE
CLIENT	EMAG APARTMENTS	19/11/2021	
PROJECT	123-133 New Canterbury Rd LEWISHAM	DRAWN PV	CHECKED NN
TITLE	MATERIALS AND FINISHES	DWG No ---	900

DO NOT SCALE. USE FIGURED DIMENSIONS IN PREFERENCE TO SCALED, CHECK ALL DIMENSIONS ON SITE BEFORE FABRICATION.



WASTE MANAGEMENT - BOARDING HOUSE

Number of rooms - 52
Waste generation 240L per 6 rooms - 2160L
Recycling generation 240L per 6 rooms - 2160L
Number of bins required per week - 9 garbage (240L), 9 recycling (240L)
Collection frequency - Twice per week - Half number of bins required. Allow 5 of each.
Collection location - On street pickup
Bulky storage - 8m³ provided

WASTE MANAGEMENT - PUB

Floor area of Pub - 726m²
Waste generation 90l/100m² per day - 653l
Recycling generation 80l/100m² per day - 580l
Number of bins required per week - 7 garbage (660L), 7 recycling (660L)
Collection frequency - three times per week - Allow two 660 for each.
Collection location - On street pickup

WASTE MANAGEMENT PLAN

ISSUE	DATE	DESCRIPTION
F	19/11/2021	AMENDED PLANS FOR COURT
E	04/11/2021	AMENDED PLANS FOR COURT
D	21/10/2021	AMENDED PLANS FOR COURT
C	08/10/2021	AMENDED PLANS FOR COURT
B	07/09/2021	AMENDED PLANS FOR COURT
A	18/01/2021	DEVELOPMENT APPLICATION

TIER ARCHITECTS

N

CLIENT	EMAG APARTMENTS	DATE 19/11/2021	SCALE A3 1 : 200
PROJECT	123-133 New Canterbury Rd LEWISHAM	DRAWN PV	CHECKED NN
TITLE	WASTE MANAGEMENT PLAN	DWG No ---	901

BASEMENT STORAGE AREA

BASEMENT STORAGE AREA

PHOTOS OF BASEMENT STORAGE AREA

ISSUE	DATE	DESCRIPTION

TIER ARCHITECTS

CLIENT	EMAG APARTMENTS	DATE 19/11/2021	SCALE
PROJECT	123-133 New Canterbury Rd LEWISHAM	DRAWN PV	CHECKED NN
TITLE	PHOTOS OF BASEMENT STORAGE AREA	DWG No ---	902

DO NOT SCALE. USE FIGURED DIMENSIONS IN PREFERENCE TO SCALED, CHECK ALL DIMENSIONS ON SITE BEFORE FABRICATION.

SECTION THROUGH EXISTING BASEMENT

ISSUE	DATE	DESCRIPTION
F	19/11/2021	AMENDED PLANS FOR COURT
E	04/11/2021	AMENDED PLANS FOR COURT
D	21/10/2021	AMENDED PLANS FOR COURT
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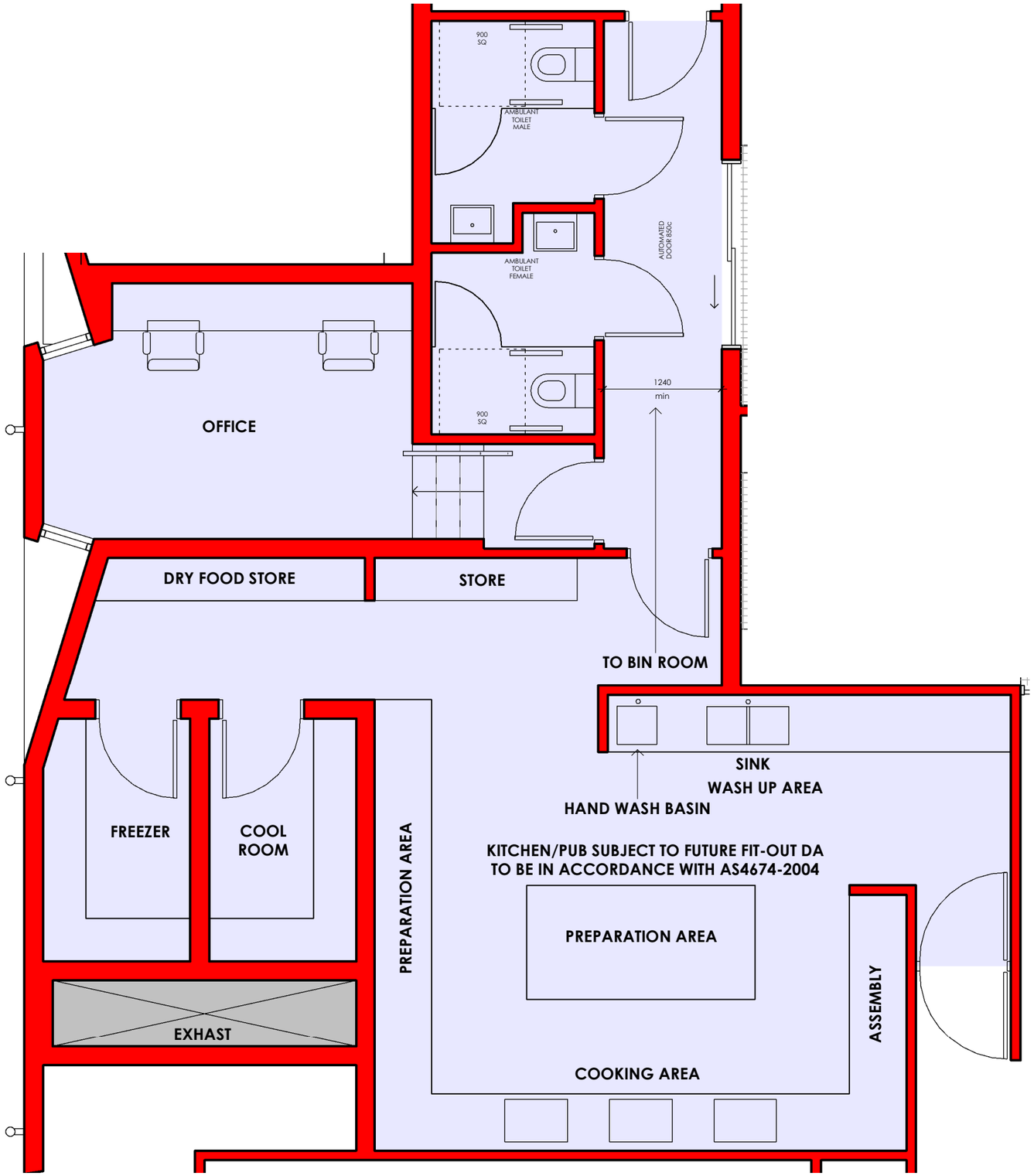
TIER ARCHITECTS

CLIENT	EMAG APARTMENTS	DATE 19/11/2021	SCALE A3 1 : 100
PROJECT	123-133 New Canterbury Rd LEWISHAM	DRAWN PV	CHECKED NN
TITLE	SECTION THROUGH EXISTING BASEMENT	DWG No ---	902A



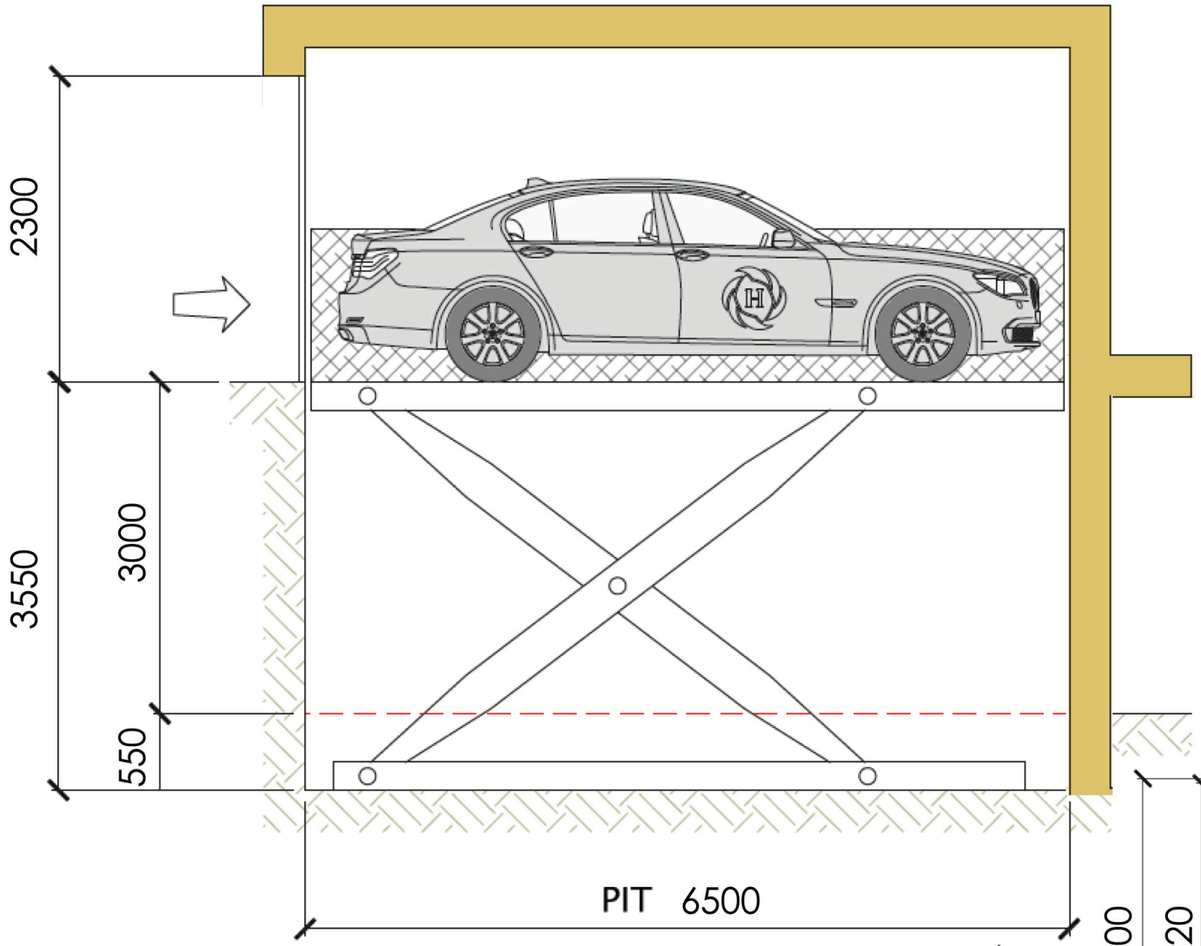
DETAILED KITCHEN LAYOUT

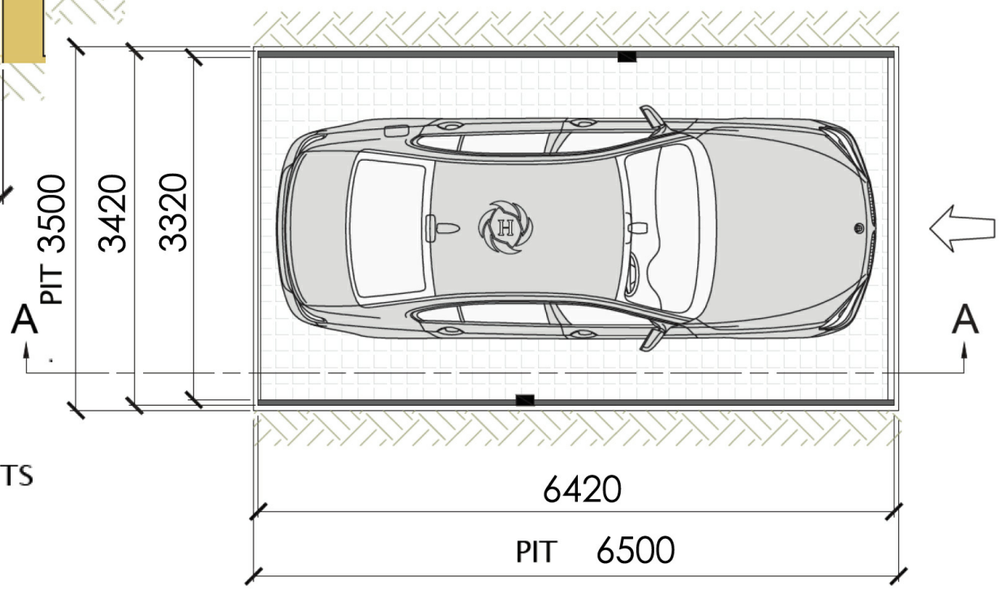
ISSUE	DATE	DESCRIPTION
F	19/11/2021	AMENDED PLANS FOR COURT
E	04/11/2021	AMENDED PLANS FOR COURT
D	21/10/2021	AMENDED PLANS FOR COURT
C	08/10/2021	AMENDED PLANS FOR COURT
B	07/09/2021	AMENDED PLANS FOR COURT
A	18/01/2021	DEVELOPMENT APPLICATION

TIER ARCHITECTS

CLIENT	EMAG APARTMENTS	DATE 19/11/2021	SCALE A3 1 : 50
PROJECT	123-133 New Canterbury Rd LEWISHAM	DRAWN PV	CHECKED NN
TITLE	DETAILED KITCHEN LAYOUT	DWG No –	903

DO NOT SCALE. USE FIGURED DIMENSIONS IN PREFERENCE TO SCALED. CHECK ALL DIMENSIONS ON SITE BEFORE FABRICATION.





CAPACITY: 3000 Kgs

PRELIMINARY DRAWING: DIMENSIONS ARE SUBJECT TO ADJUSTMENTS

PROTECTION TO BE DEFINED

	. .				MODEL NAME	HCP – ES – CLM2932	JOB					TITLE	CAR LIFT
	. .				HERCULES CARPARKING SYSTEMS		DATE			SCALE		SUBJECT	LAYOUT
	. .						DRAW	DESIGNED	CHECKED	REVIEWED	APPROVED	FILE NAME	HCP – ES – CLM2932
	DATE	REVISIONS & DESCRIPTION	ENG'R	APPR'D			San					DWG NO.	. – – – REV. △

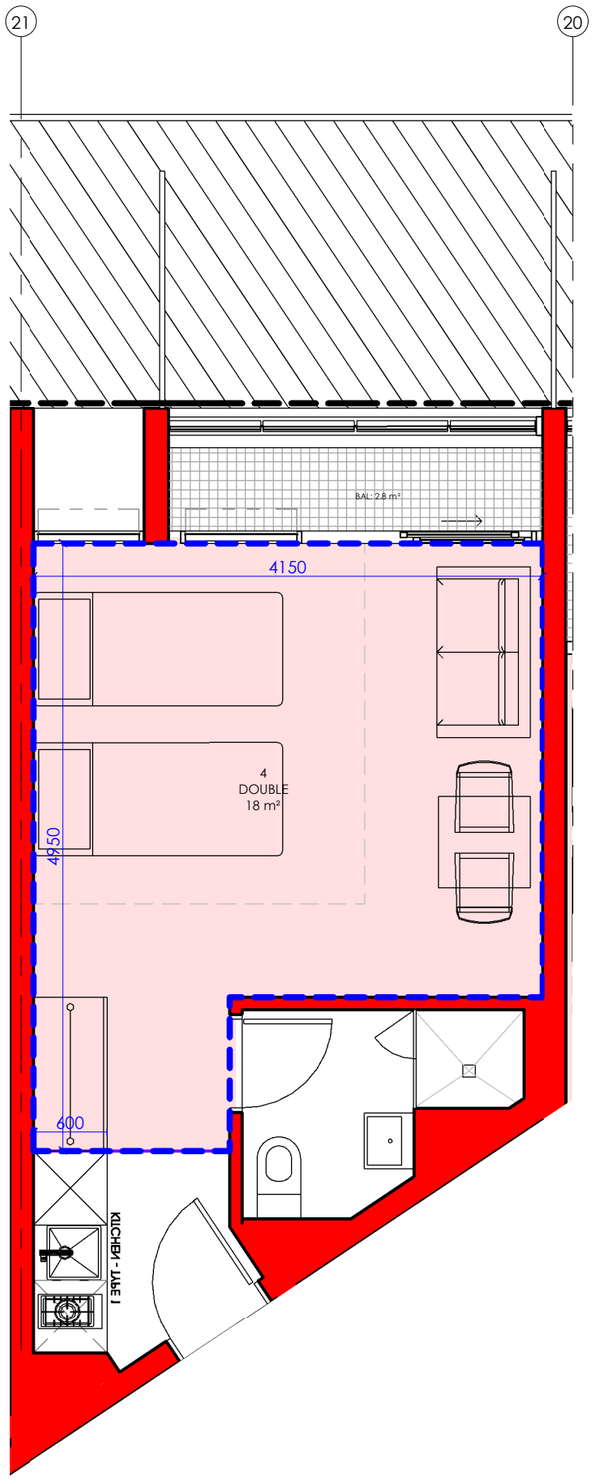
CAR LIFT SPECIFICATION

ISSUE	DATE	DESCRIPTION
F	19/11/2021	AMENDED PLANS FOR COURT
E	04/11/2021	AMENDED PLANS FOR COURT
D	21/10/2021	AMENDED PLANS FOR COURT
C	08/10/2021	AMENDED PLANS FOR COURT
B	07/09/2021	AMENDED PLANS FOR COURT
A	18/01/2021	DEVELOPMENT APPLICATION

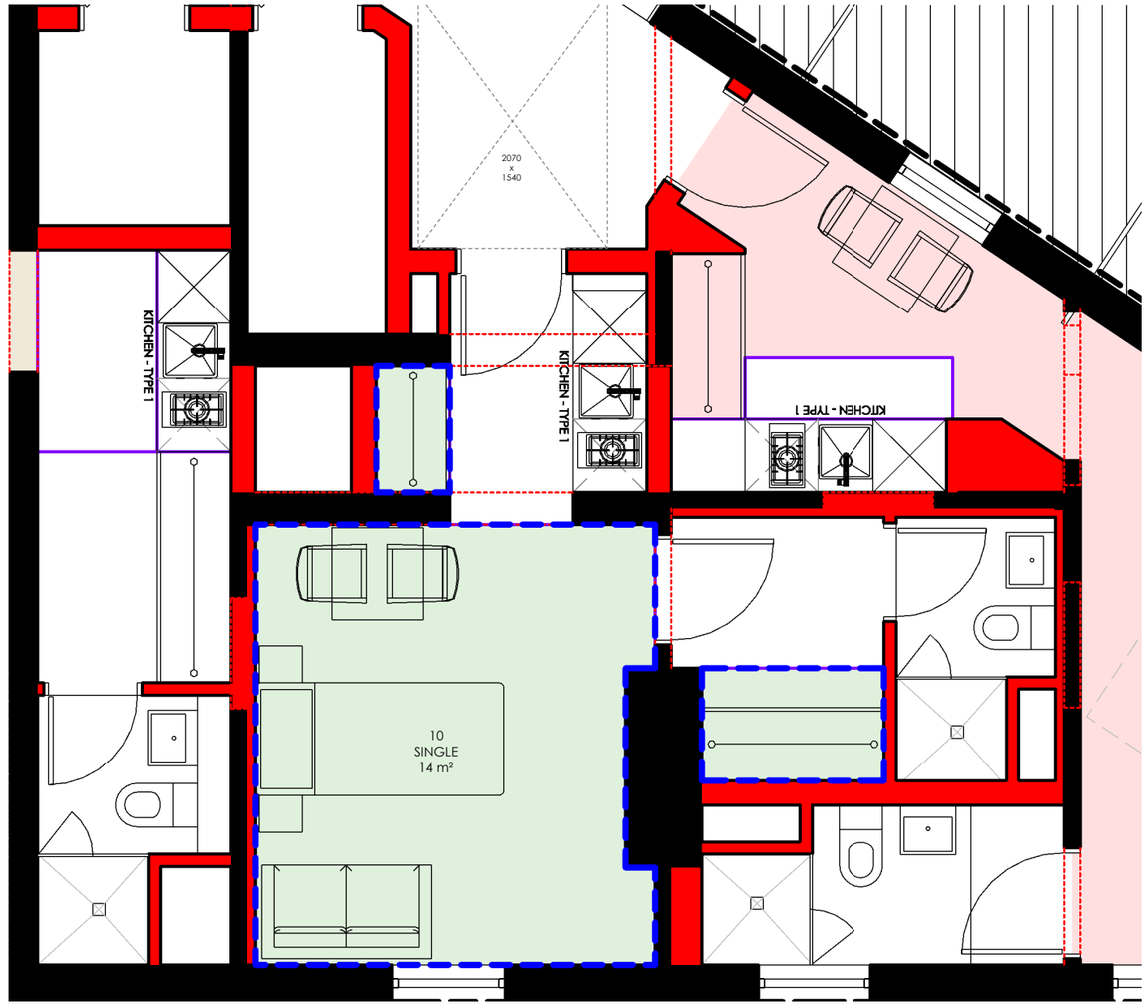
TIER ARCHITECTS

		DATE	SCALE
CLIENT	EMAG APARTMENTS	19/11/2021	
PROJECT	123-133 New Canterbury Rd LEWISHAM	DRAWN PV	CHECKED NN
TITLE	CAR LIFT SPECIFICATION	DWG No ---	904

DO NOT SCALE. USE FIGURED DIMENSIONS IN PREFERENCE TO SCALED, CHECK ALL DIMENSIONS ON SITE BEFORE FABRICATION.



1 03 LEVEL 1 FLOOR PLAN UNIT 4
1 : 50



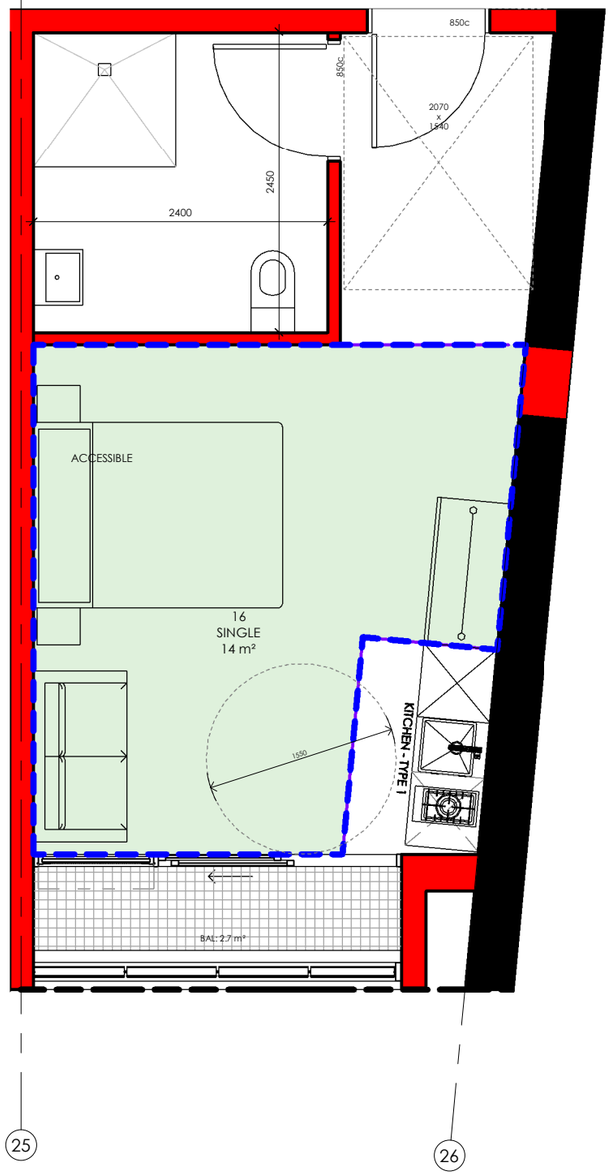
2 03 LEVEL 1 FLOOR PLAN UNIT 10
1 : 50

INDIVIDUAL UNIT - LEVEL 1

ISSUE	DATE	DESCRIPTION
F	19/11/2021	AMENDED PLANS FOR COURT
E	04/11/2021	AMENDED PLANS FOR COURT
D	21/10/2021	AMENDED PLANS FOR COURT
C	08/10/2021	AMENDED PLANS FOR COURT
B	07/09/2021	AMENDED PLANS FOR COURT
A	28/07/2021	DEVELOPMENT APPLICATION

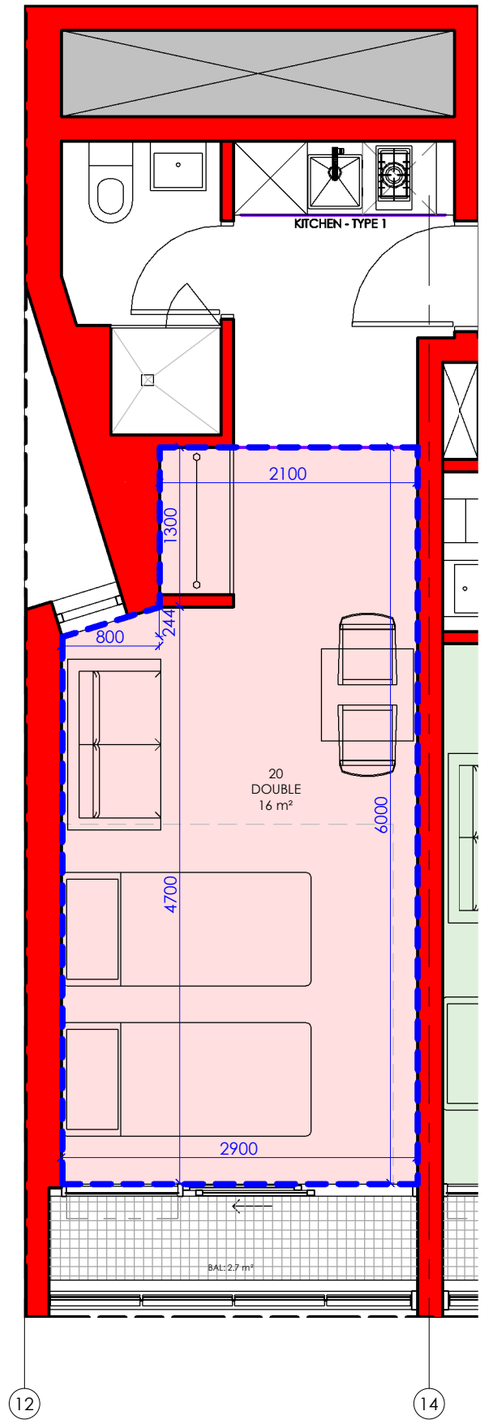
TIER ARCHITECTS
PHONE: 02 9744 2859 | ADDRESS: 4 COOPER STREET STATHFIELD 2135

CLIENT	EMAG APARTMENTS	DATE 19/11/2021	SCALE A3 1 : 50
PROJECT	123-133 New Canterbury Rd LEWISHAM	DRAWN PV	CHECKED NN
TITLE	INDIVIDUAL UNIT - LEVEL 1	DWG No --	905



1 03 LEVEL 1 FLOOR PLAN UNIT 16

1 : 50



2 03 LEVEL 1 FLOOR PLAN UNIT 20

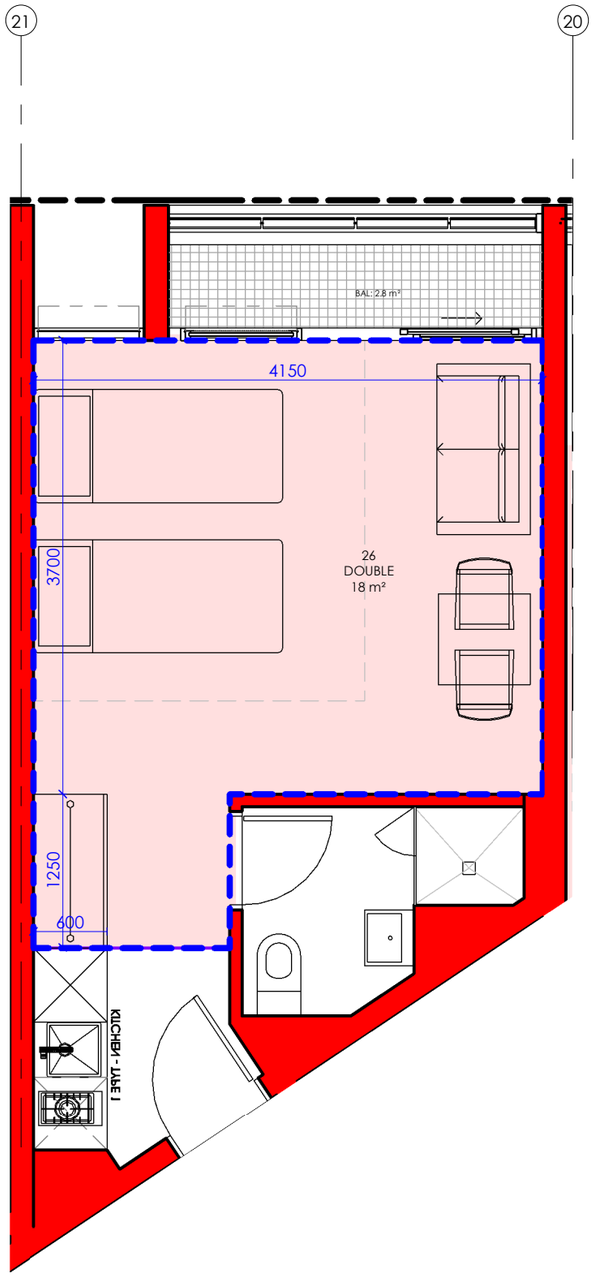
1 : 50

INDIVIDUAL UNIT - LEVEL 1

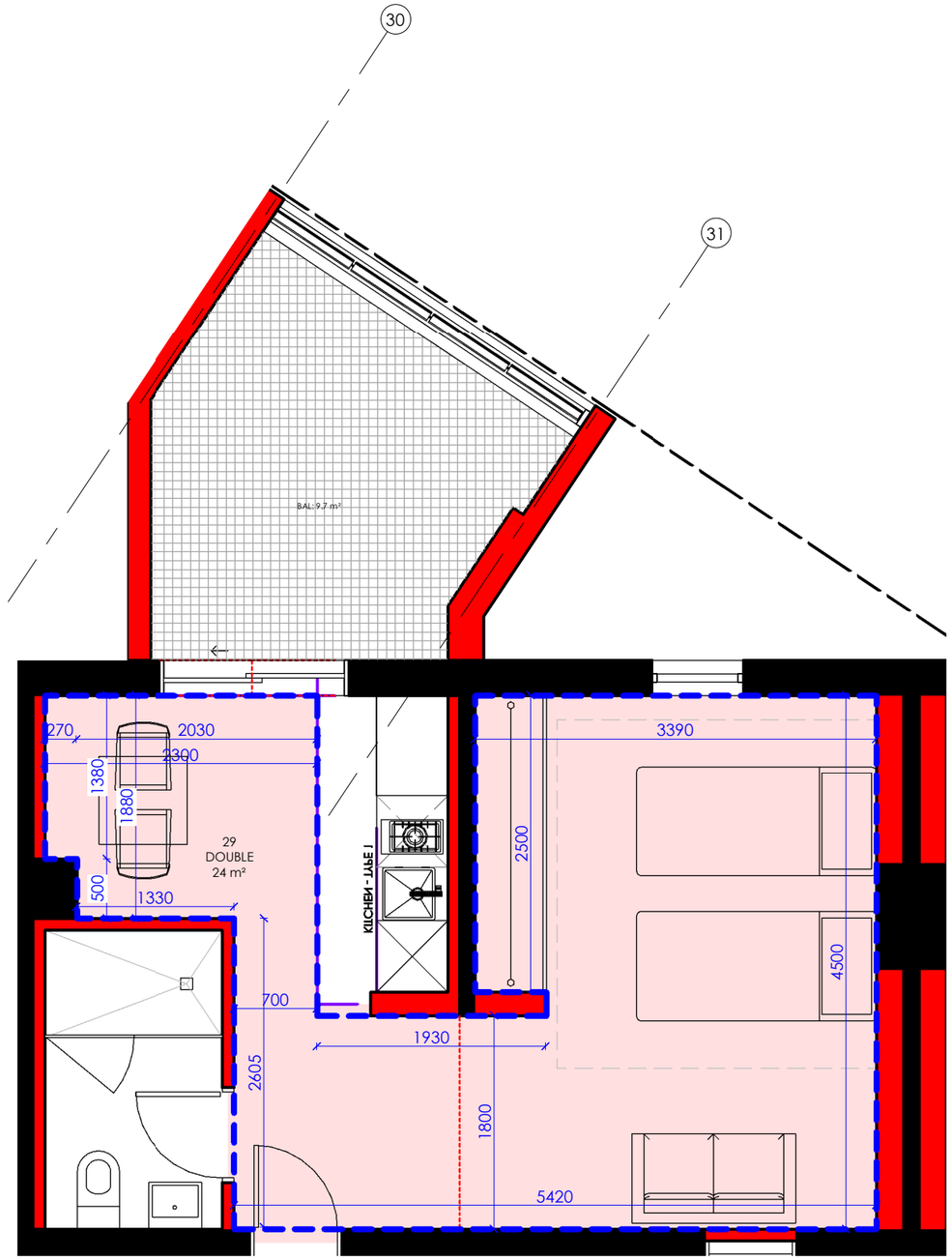
ISSUE	DATE	DESCRIPTION
F	19/11/2021	AMENDED PLANS FOR COURT
E	04/11/2021	AMENDED PLANS FOR COURT
D	21/10/2021	AMENDED PLANS FOR COURT
C	08/10/2021	AMENDED PLANS FOR COURT
B	07/09/2021	AMENDED PLANS FOR COURT
A	28/07/2021	DEVELOPMENT APPLICATION

TIER ARCHITECTS
PHONE: 02 9744 2859 | ADDRESS: 4 COOPER STREET STATHFIELD 2135

CLIENT	EMAG APARTMENTS	DATE 19/11/2021	SCALE A3 1 : 50
PROJECT	123-133 New Canterbury Rd LEWISHAM	DRAWN PV	CHECKED NN
TITLE	INDIVIDUAL UNIT - LEVEL 1	DWG No –	906



1 04 LEVEL 2 FLOOR PLAN UNIT 26
1 : 50



2 04 LEVEL 2 FLOOR PLAN UNIT 29 (+30)
1 : 50

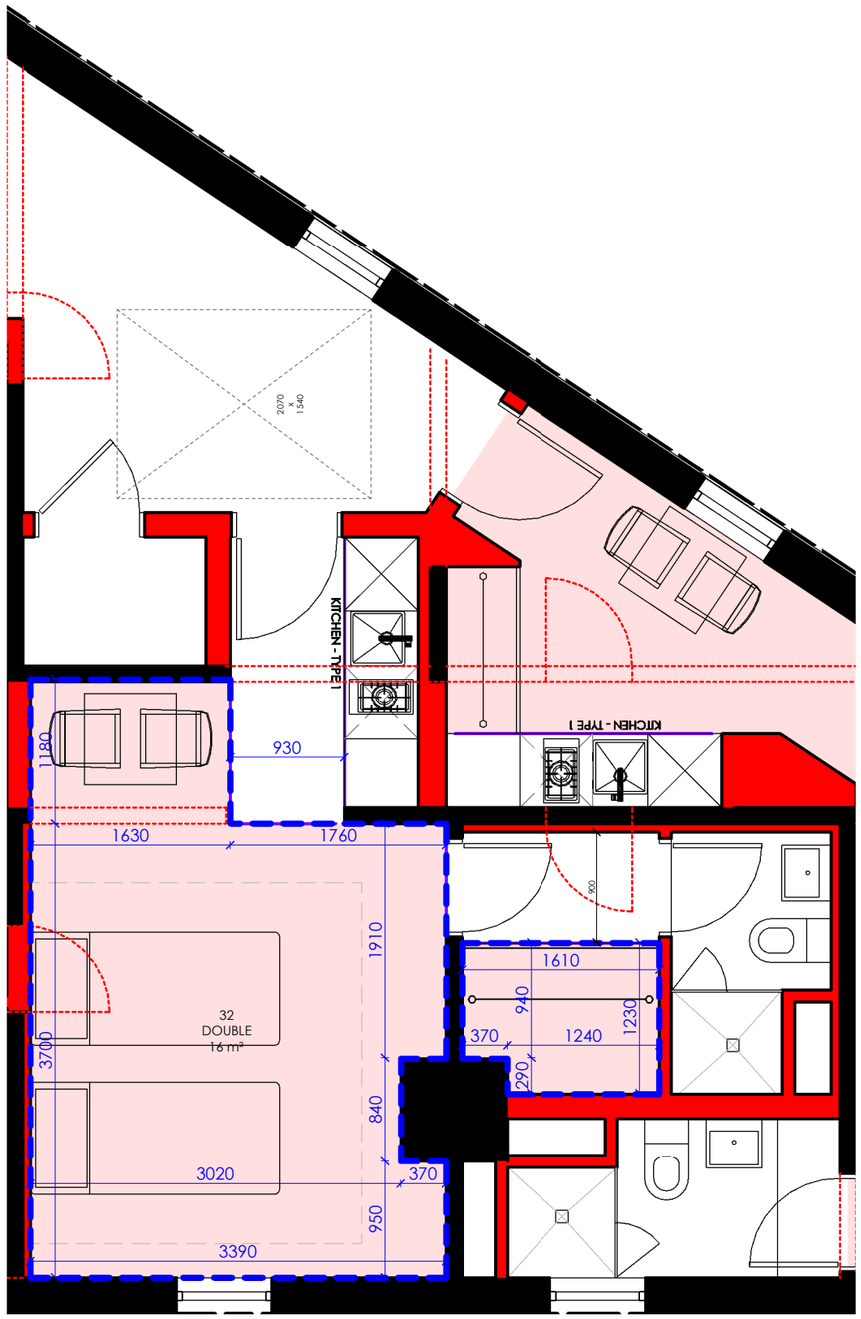
INDIVIDUAL UNIT - LEVEL 2

ISSUE	DATE	DESCRIPTION
F	19/11/2021	AMENDED PLANS FOR COURT
E	04/11/2021	AMENDED PLANS FOR COURT
D	21/10/2021	AMENDED PLANS FOR COURT
C	08/10/2021	AMENDED PLANS FOR COURT
B	07/09/2021	AMENDED PLANS FOR COURT
A	28/07/2016	DEVELOPMENT APPLICATION

TIER ARCHITECTS
PHONE: 02 9744 2859 | ADDRESS: 4 COOPER STREET STATHFIELD 2135

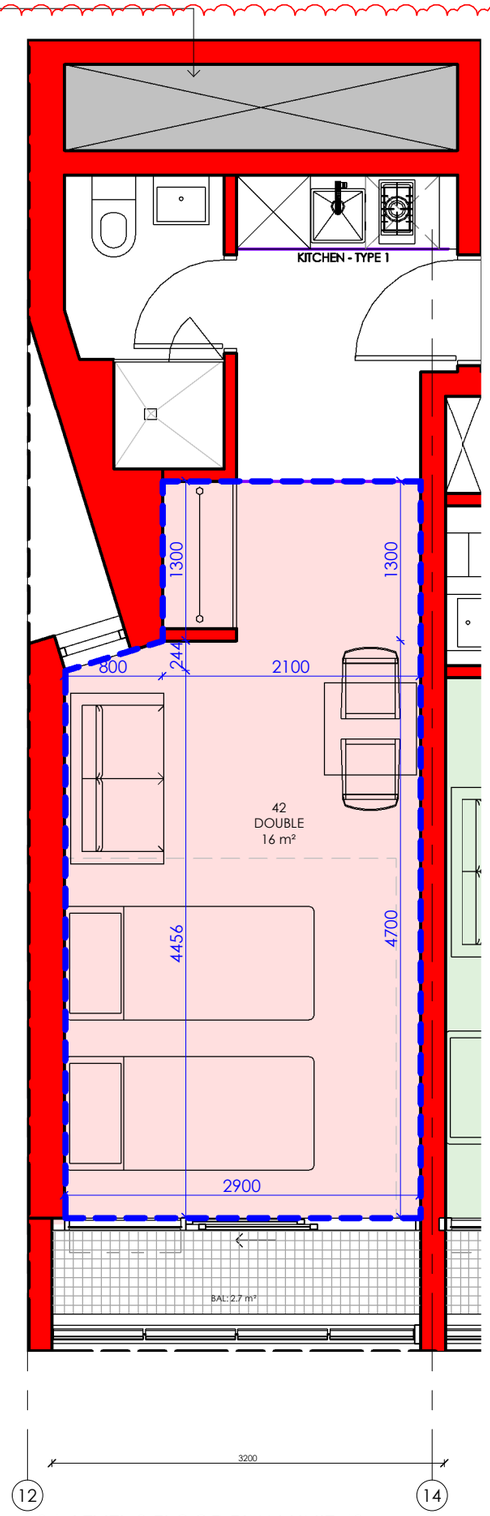
CLIENT	EMAG APARTMENTS	DATE 19/11/2021	SCALE A3 1 : 50
PROJECT	123-133 New Canterbury Rd LEWISHAM	DRAWN PV	CHECKED NN
TITLE	INDIVIDUAL UNIT - LEVEL 2	DWG No ---	907

DO NOT SCALE. USE FIGURED DIMENSIONS IN PREFERENCE TO SCALED, CHECK ALL DIMENSIONS ON SITE BEFORE FABRICATION.



1 04 LEVEL 2 FLOOR PLAN UNIT 32

1 : 50



2 04 LEVEL 2 FLOOR PLAN UNIT 42

1 : 50

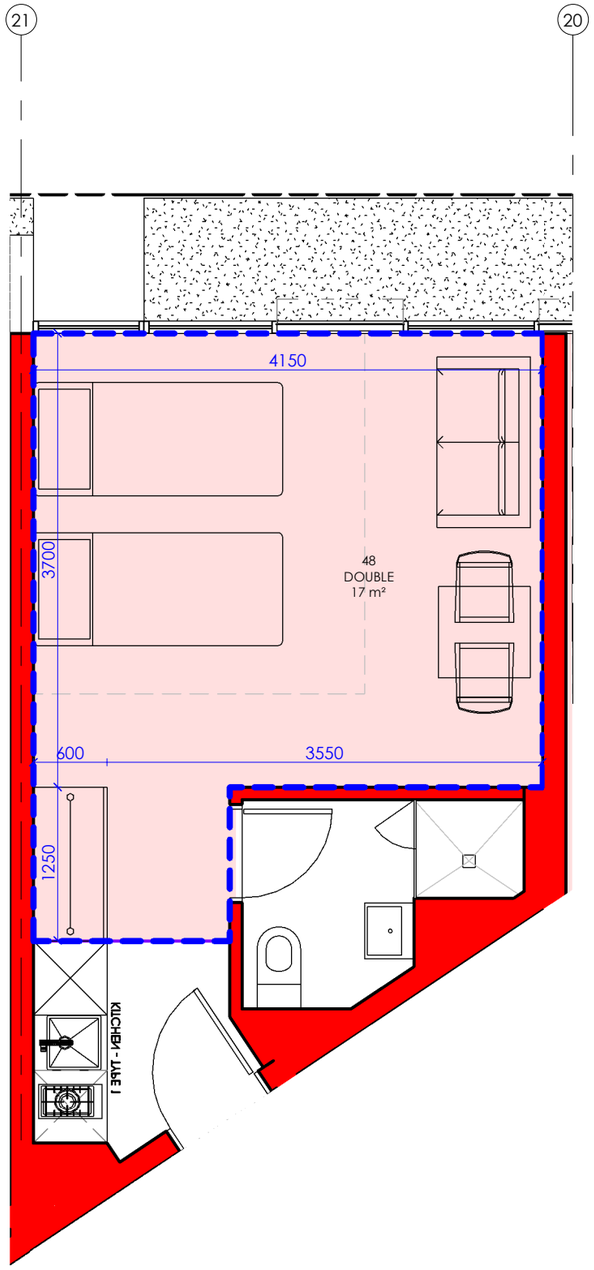
INDIVIDUAL UNIT - LEVEL 2

ISSUE	DATE	DESCRIPTION
F	19/11/2021	AMENDED PLANS FOR COURT
E	04/11/2021	AMENDED PLANS FOR COURT
D	21/10/2021	AMENDED PLANS FOR COURT
C	08/10/2021	AMENDED PLANS FOR COURT
B	07/09/2021	AMENDED PLANS FOR COURT
A	28/07/2021	DEVELOPMENT APPLICATION

TIER ARCHITECTS
PHONE: 02 9744 2859 | ADDRESS: 4 COOPER STREET STATHFIELD 2135

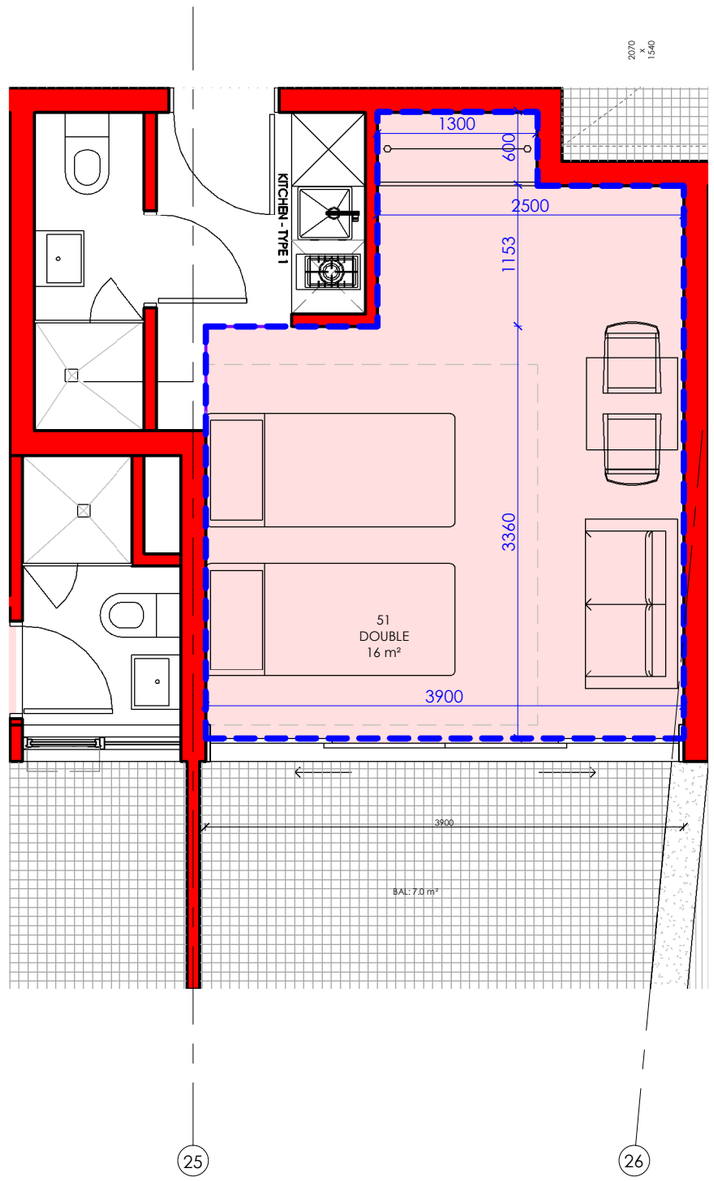
CLIENT	EMAG APARTMENTS	DATE 19/11/2021	SCALE A3 1 : 50
PROJECT	123-133 New Canterbury Rd LEWISHAM	DRAWN PV	CHECKED NN
TITLE	INDIVIDUAL UNIT - LEVEL 2	DWG No ---	908

DO NOT SCALE. USE FIGURED DIMENSIONS IN PREFERENCE TO SCALED. CHECK ALL DIMENSIONS ON SITE BEFORE FABRICATION.



1 05 LEVEL 3 FLOOR PLAN UNIT 48

1 : 50



2 05 LEVEL 3 FLOOR PLAN UNIT 51

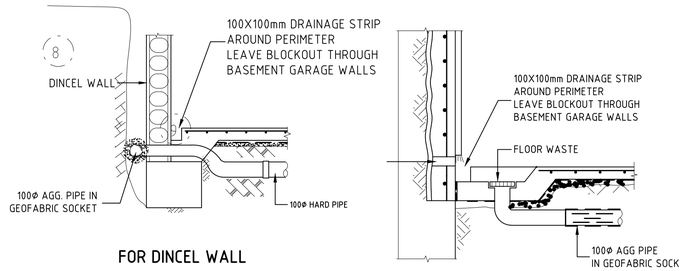
1 : 50

INDIVIDUAL UNIT - LEVEL 3

ISSUE	DATE	DESCRIPTION
F	19/11/2021	AMENDED PLANS FOR COURT
E	04/11/2021	AMENDED PLANS FOR COURT
D	21/10/2021	AMENDED PLANS FOR COURT
C	08/10/2021	AMENDED PLANS FOR COURT
B	07/09/2021	AMENDED PLANS FOR COURT
A	28/09/2021	DEVELOPMENT APPLICATION

TIER ARCHITECTS
PHONE: 02 9744 2859 | ADDRESS: 4 COOPER STREET STATHFIELD 2135

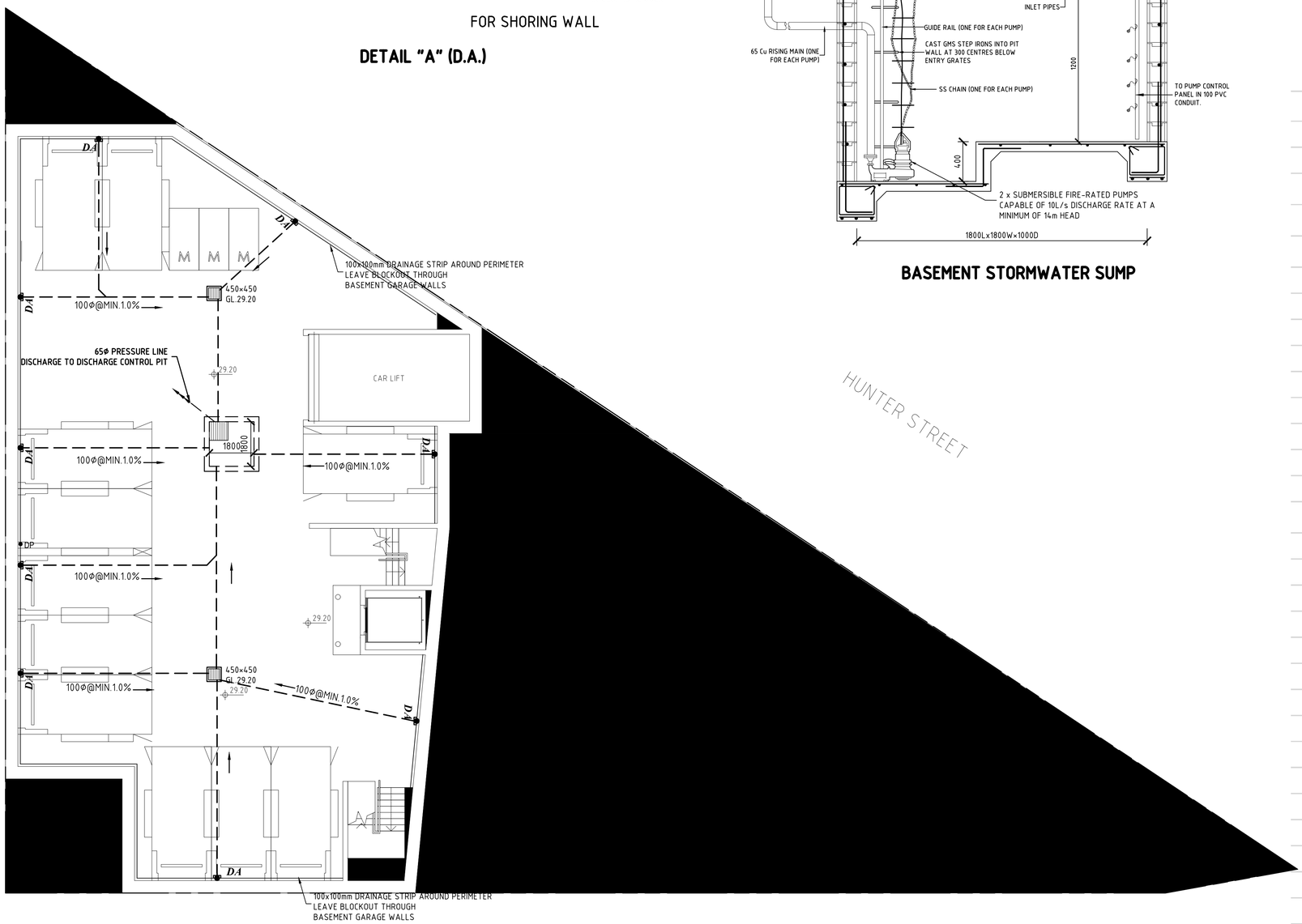
CLIENT	EMAG APARTMENTS	DATE 19/11/2021	SCALE A3 1 : 50
PROJECT	123-133 New Canterbury Rd LEWISHAM	DRAWN PV	CHECKED NN
TITLE	INDIVIDUAL UNIT - LEVEL 3	DWG No ---	909



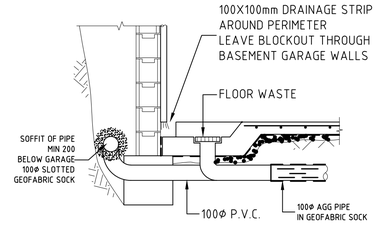
FOR DINCEL WALL

FOR SHORING WALL

DETAIL "A" (D.A.)



BASEMENT STORMWATER SUMP



FOR BLOCK WALL

STORMWATER PUMPOUT SYSTEM

DESIGN REQUIREMENTS

ADDRESS: 123-133 NEW CANTERBURY ROAD, LEWISHAM

1. ARI
   - I_{50}= 40.4 mm (2 Hour 50 YEAR ARI)
   - I_{100}= 239 mm (6 Min. 100 YEAR ARI)
2. AREA DRAINING TO BASEMENT SUMP(A) = 78.13 m^2
3. STORAGE REQUIREMENTS

   MINIMUM BLOCKOUT STORAGE: 1 HOURS, 50 YEARS ARI STORM

   Q = FxCxAxI
   = 1/3600x1xAxI
   = **0.88** L/Sec

   V = Qxt
   = Qx1x3600 L
   = **3.16** m^3
4. PUMP REQUIREMENTS

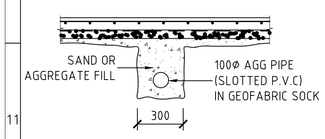
   PUMP DISCHARGE REQUIREMENTS: 6 MINUTES, 100 YEAR ARI STORM

   Q = FxCxAxI
   = 1/3600x1xAxI
   = **5.19** L/Sec
5. ADOPT **4** L/Sec

   FOR EACH PUMP WITH HIGH LEVEL ON SWITCH FOR STANDBY PUMP TO PROVIDE A TOTAL DISCHARGE OF

   8 L/Sec
6. PUMPOUT TANK SIZES

LENGTH (L)	1.8	m
WIDTH(B)	1.8	m
DEPTH (D)	1	m
VOLUME(V)	3.24	m^3



SECTION A
SCALE: –

NEW CANTERBURY ROAD

HUNTER STREET

REV.	DATE	BY	CHECKED	AMENDMENTS
B	NOV. 21	S.C.	S.W.W.	DRAWING UPDATE
A	FEB. 21	Z.S.	S.W.W.	PRELIMINARY ISSUE

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Lugarno NSW 2210
Phone: (02) 9533 5778
Fax: (02) 9543 1058
Mobile: 0418 285 592
Email : lmwdesigngroup@gmail.com

JOB NAME: PROPOSED ALTERATIONS AND ADDITIONS AT NO. 123-133 NEW CANTERBURY ROAD, LEWISHAM

CLIENT, ARCHITECT: EMAG APARTMENTS

DRAWING TITLE: BASEMENT STORMWATER DRAINAGE CONCEPT PLAN

NO. IN SET	JOB NO	1810.20	DRG. NO	REV
			D1	B
SCALE	DESIGNED	DRAWN	DATE	NO.
N.T.S.	S.W.W.	S.C.	NOV 2021	

APPROVED BY

STEVEN WATERS
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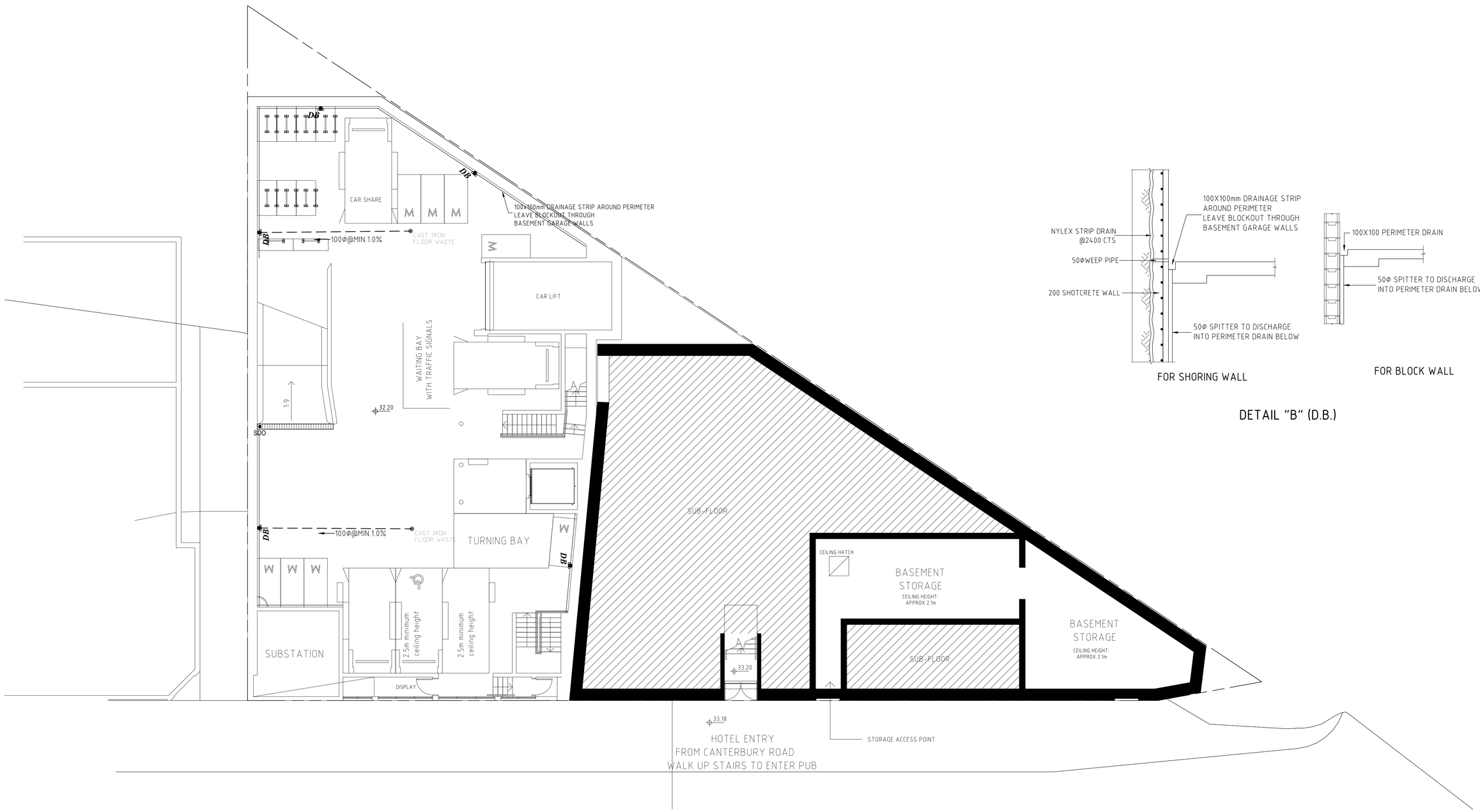
M.I.E. AUST., C.P. ENG, NPER-3
REG. NO. 417092
CIVIL AND STRUCTURAL



FOR SHORING WALL

FOR BLOCK WALL

DETAIL "B" (D.B.)

REV.	DATE	BY	CHECKED	AMENDMENTS
B	NOV. 21	S.C.	S.W.W.	DRAWING UPDATE
A	FEB. 21	Z.S.	S.W.W.	PRELIMINARY ISSUE

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JOB NAME
PROPOSED ALTERATIONS AND ADDITIONS
AT NO. 123-133 NEW CANTERBURY ROAD,
LEWISHAM

CLIENT, ARCHITECT
EMAG APARTMENTS

DRAWING TITLE
UPPER LEVEL BASEMENT STORMWATER
DRAINAGE CONCEPT PLAN

NO. IN SET	JOB NO	1810.20	DRG. NO	REV
			D1(A)	B
SCALE	DESIGNED	DRAWN	DATE	NO.
N.T.S.	S.W.W.	S.C.	NOV 2021	

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REG. NO. 417092
CIVIL AND STRUCTURAL

GROUND FLOOR AND SITE STORMWATER DRAINAGE CONCEPT PLAN

SCALE: 1:100

NEW CANTERBURY ROAD

RAINWATER REUSE NOTES:

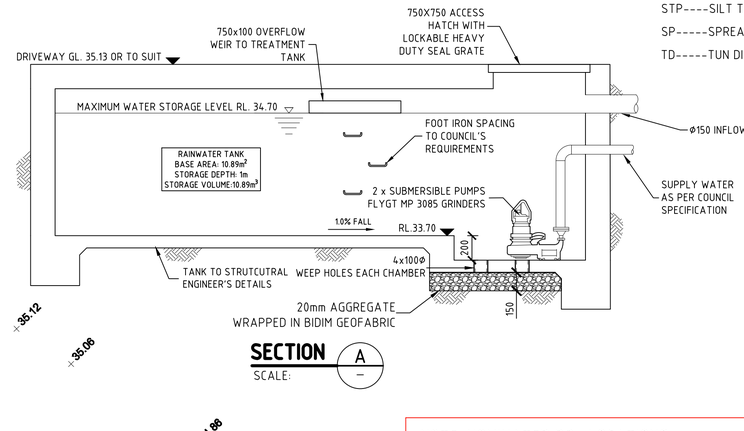
1. EVERY FIXTURE SERVICED FROM THE RECYCLED WATER SUPPLY MUST BE NOTED WITH A PLAQUE FOR IDENTIFICATION AND MARKED WITH "NOT FOR HUMAN CONSUMPTION" OR "NON-POTABLE WATER".
2. OVERFLOW FROM RAINWATER TANK TO BE CONNECTED TO STORMWATER DRAINAGE SYSTEM.
3. ALL RECYCLE WATER PIPES TO BE COLOUR CODED FOR IDENTIFICATION.
4. WATER AUTHORITY MUST BE CONTACTED REGARDING RECYCLED WATER ON THE BUILDING AND FOR THE BACKFLOW PREVENTION REQUIREMENTS AND TOP-UP SYSTEM.
5. ANY GARDEN OR CARWASH TAPS CONNECTED RECYCLE SYSTEM MUST BE LOCATED 1.5m MIN. ABOVE THE SURFACE.
6. FOR PERIOD OF LOW WATER LEVEL IN THE RAINWATER TANK, A CONNECTION TO WATER MAIN IS NEEDED AND TO BE PROVIDED IN ACCORDANCE WITH THE WATER AUTHORITY.
7. PUMPS AND FILTERS ON OUTLETS FROM RECYCLE SYSTEM TO BE SUPPLIED AS MAY BE REQUIRED.

STORMWATER DRAINAGE NOTES

1. PROVIDE INSPECTION OPENINGS TO ALL DOWNPIPES NOT DIRECTLY CONNECTED TO PITS.
2. ALL PIPES TO BE 100Ø UPVC SEWER GRADE UNO, LAID ON A MIN 1% GRADE, MINIMUM 300mm COVER UNO.
3. PIT SIZE
   - TO BE 450x450mm, PITS ARE 600mm OR LESS DEEP TO BE 450X450mm.
   - TO BE 600x600mm, PITS ARE GREATER THAN 600mm BUT LESS THAN 1000mm DEEP.
4. ALL PIPES TO BE ADVISED.
5. ALL PIT FLOORS TO HAVE A MINIMUM OF 20mm FALL, PROFILED AND STEAMLINED (FOR HALF OF THE DEPTH OF THE PIPE) IN THE DIRECTION OF FLOW.
6. ALL GRATES ON THE DRIVEWAY TO BE HEAVY DUTY.
7. ALL GUTTERS, PITS, PIPES AND DOWNPIPES TO BE INSTALLED IN ACCORDANCE WITH AS3500.3.2.1 1998.
8. THE CONNECTION TO COUNCIL'S DRAINAGE SYSTEM SHALL BE CONSTRUCTED PRIOR TO THE CONSTRUCTION OF ALL INTERNAL DRAINAGE. THE COUNCIL ENGINEER BEING GIVEN 48 HOURS NOTICE PRIOR TO CONSTRUCTION.
9. DRIVEWAY BOUNDARY LEVEL'S MUST BE CONFIRMED PRIOR TO CONSTRUCTION.

ABBREVIATIONS

AH----ACCESS HATCH
DDO---DISH DRAIN OUTLET
CO----CLEAR OUT
DCP----DISCHARGE CONTROL PIT
DP-----DOWNPIPE
FFL----FINISH FLOOR LEVEL
FW-----FLOOR WASTE
GL-----GROUND FLOOR LEVEL
IL------INVERT LEVEL
OSD----ON SITE DETENTION
PD.-----PLANTERS DRAIN
PFO-----PLANTER FLOOR OUTLET
PP------PLANTER PIT
RH-----RAINWATER HEAD
RP-----RELN PIT
RO.-----ROOF OUTLET
SDO---STRIP DRAIN OUTLET
SIP----SURFACE INLET PIT
STP----SILT TRAP PIT
SP-----SPREADER
TD-----TUN DISH



SECTION A
SCALE:

NOTE: NOMINATED DPs LOCATIONS, DETAILS TO BE COORDINATED WITH ARCHITECTURE PRIOR ANY CONSTRUCTION

REV.	DATE	BY	CHECKED	AMENDMENTS
A	FEB. 21	Z.S.	S.W.W.	PRELIMINARY ISSUE

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Email : lmwdesigngroup@gmail.com

JOB NAME: PROPOSED ALTERATIONS AND ADDITIONS AT NO. 123-133 NEW CANTERBURY ROAD, LEWISHAM
CLIENT, ARCHITECT: EMAG APARTMENTS
DRAWING TITLE: GROUND FLOOR AND SITE STORMWATER DRAINAGE CONCEPT PLAN

NO. IN SET	JOB NO	1810.20	DRG. NO	REV
			D2	A
SCALE	DESIGNED	DRAWN	DATE	No.
N.T.S.	S.W.W.	Z.S.	FEB. 2021	

APPROVED BY

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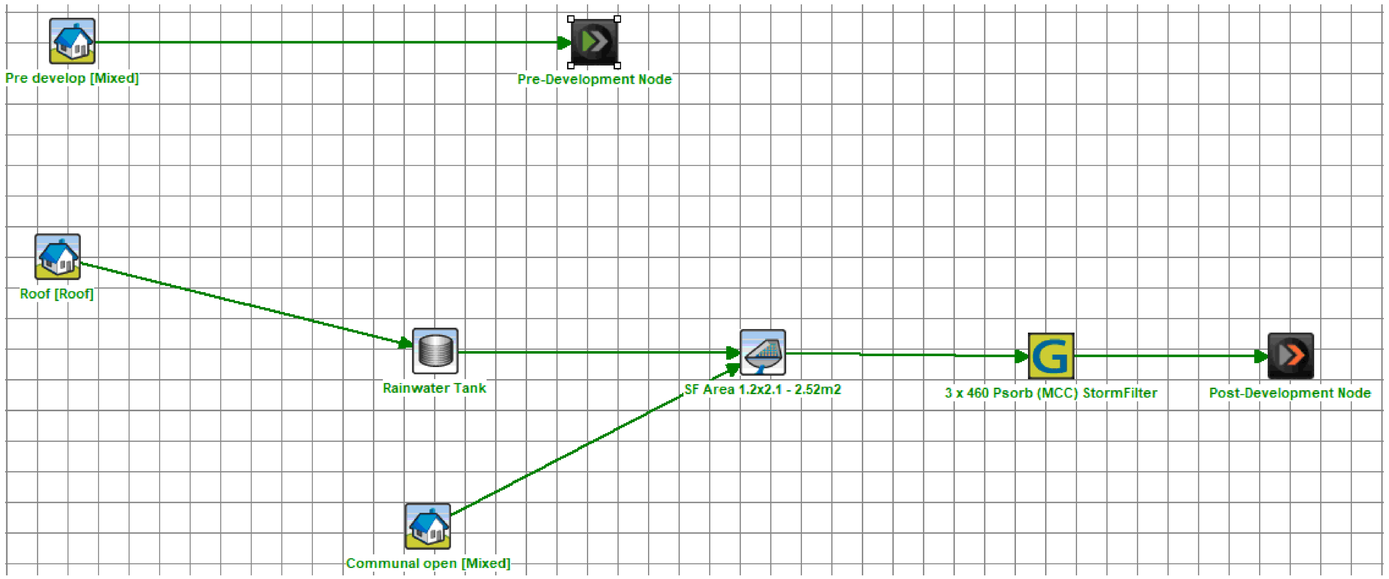
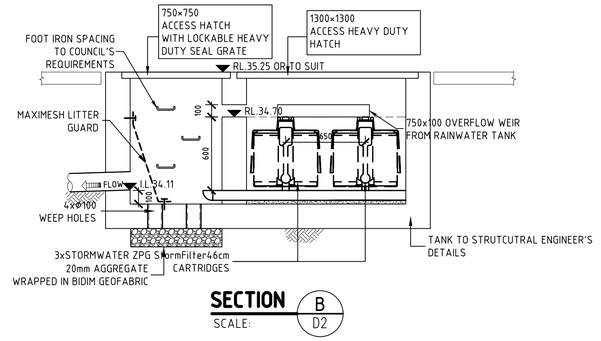
REG. NO. 417092
CIVIL AND STRUCTURAL



MUSIC MODELING

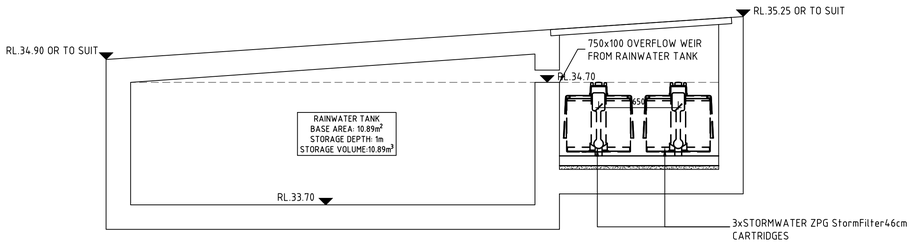
	Sources	Residual Load	% Reduction
Flow (ML/yr)	1.28	1.28	0
Total Suspended Solids (kg/yr)	55.2	6.42	88.4
Total Phosphorus (kg/yr)	0.222	0.0375	83.1
Total Nitrogen (kg/yr)	2.91	1.29	55.7
Gross Pollutants (kg/yr)	30.9	0	100

MUSIC RESULT

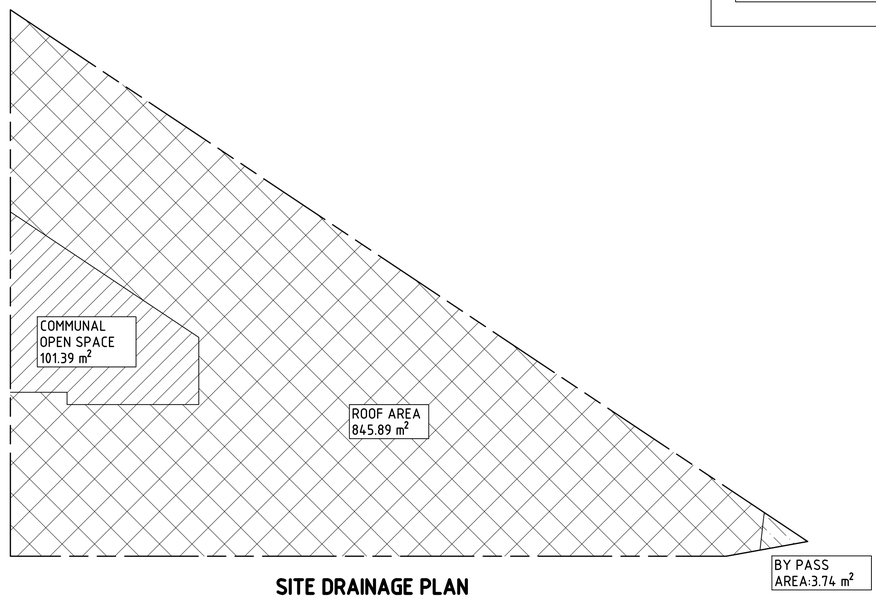


NOTE:

- INSTALLATION OF THE Stormfilter TO MANUFACTORY'S SPECIFIC.
- DIMENSION OF THE TREATMENT TANK TO BE CONFIRMED WITH MANUFACTORY.



SECTION C
SCALE: D2



SITE DRAINAGE PLAN

REV.	DATE	BY	CHECKED	AMENDMENTS
A	FEB. 21	Z.S.	S.W.W.	PRELIMINARY ISSUE

LMW DESIGN GROUP P/L
Building Consultants and Structural Engineers
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Email : lmwdesigngroup@gmail.com

JOB NAME
PROPOSED ALTERATIONS AND ADDITIONS AT NO. 123-133 NEW CANTERBURY ROAD, LEWISHAM

CLIENT, ARCHITECT
EMAG APARTMENTS

DRAWING TITLE
MUSIC MODELING

NO. IN SET	JOB NO	1810.20	DRG. NO	REV
			D2A	A
SCALE	DESIGNED	DRAWN	DATE	NO.
N.T.S.	S.W.W.	Z.S.	FEB. 2021	

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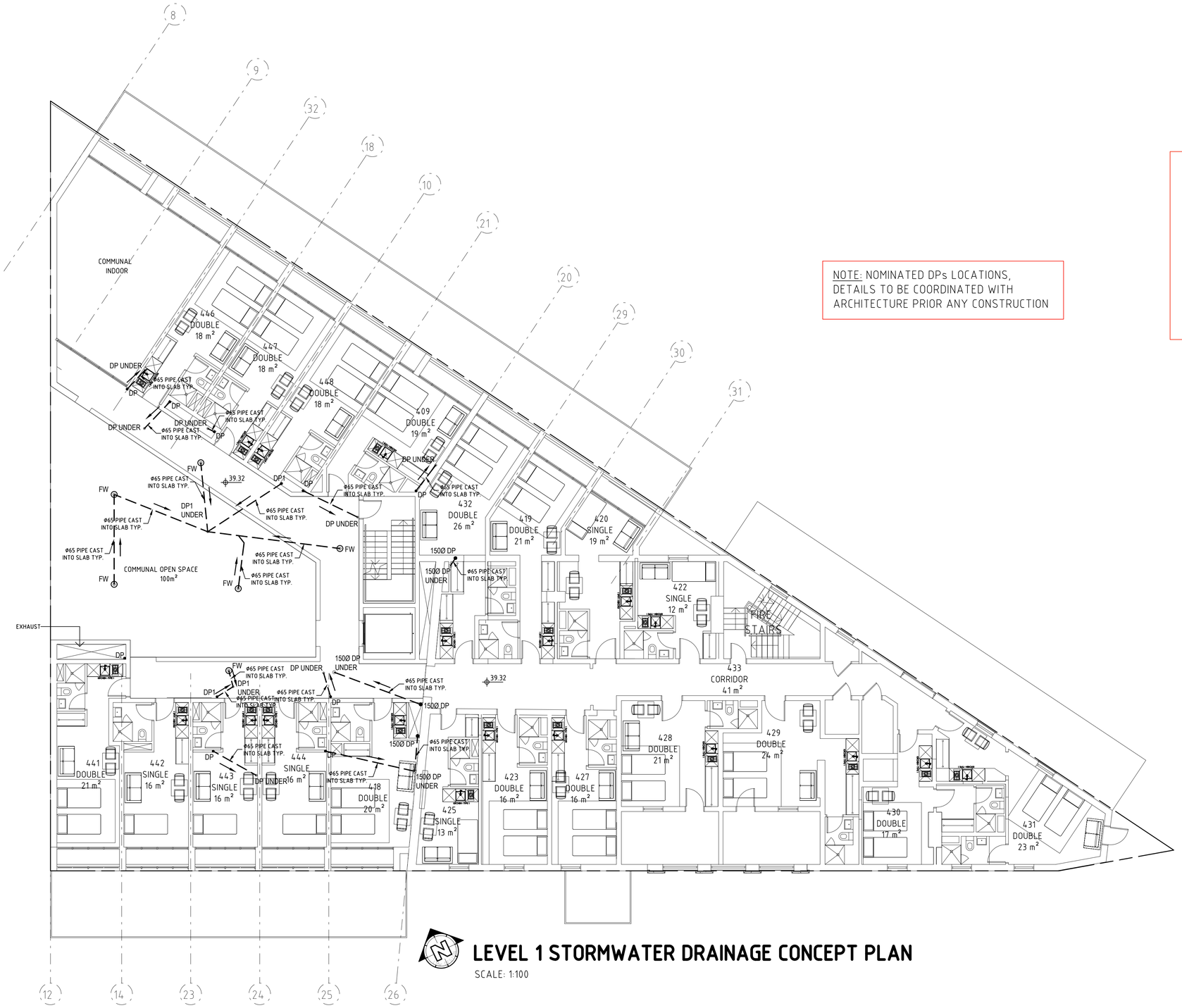

NOTE: NOMINATED DPs LOCATIONS, DETAILS TO BE COORDINATED WITH ARCHITECTURE PRIOR ANY CONSTRUCTION

LEVEL 1 STORMWATER DRAINAGE CONCEPT PLAN

SCALE: 1:100

ABBREVIATIONS

AH----ACCESS HATCH
DDO---DISH DRAIN OUTLET
CO----CLEAR OUT
DCP----DISCHARGE CONTROL PIT
DP-----DOWNPIPE
FFL----FINISH FLOOR LEVEL
FW-----FLOOR WASTE
GL-----GROUND FLOOR LEVEL
IL------INVERT LEVEL
OSD----ON SITE DETENTION
PD.-----PLANTERS DRAIN
PFO-----PLANTER FLOOR OUTLET
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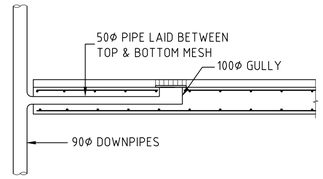
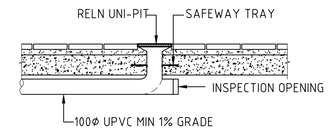
RO.-----ROOF OUTLET
SDO---STRIP DRAIN OUTLET
SIP----SURFACE INLET PIT
STP----SILT TRAP PIT
SP-----SPREADER
TD-----TUN DISH

NOTE:
- FOR THE 'CAST IN-SLAB' PIPE, THE DIA SHOULD BE LESS THAN OR EQUAL TO 65mm.
- THE 100mm DIA OR LARGER PIPES SHOULD BE STRAPPED TO UNDERSIDE OF SLAB.

STRICT COMPLIANCE WITH THIS DESIGN SHALL BE MAINTAINED. ANY DEVIATION FROM THIS DESIGN, WITHOUT PRIOR DISCUSSION AND APPROVAL BY THE SUPERVISING ENGINEER (SUPERINTENDENT), MAY CAUSE CERTIFICATION OF CONSTRUCTION AT THE COMPLETION OF WORK NOT TO BE ISSUED.



TYPICAL BALCONY FLOOR WASTE (F.W.)



FLOOR WASTE-PODIUM SLAB TYPICAL DETAIL

REV.	DATE	BY	CHECKED	AMENDMENTS
A	FEB. 21	Z.S.	S.W.W.	PRELIMINARY ISSUE

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JOB NAME: PROPOSED ALTERATIONS AND ADDITIONS AT NO. 123-133 NEW CANTERBURY ROAD, LEWISHAM
CLIENT, ARCHITECT: EMAG APARTMENTS
DRAWING TITLE: LEVEL 1 STORMWATER DRAINAGE CONCEPT PLAN

NO. IN SET	JOB NO	1810.20	DRG. NO	REV
			D3	A
SCALE	DESIGNED	DRAWN	DATE	NO.
N.T.S.	S.W.W.	Z.S.	FEB. 2021	

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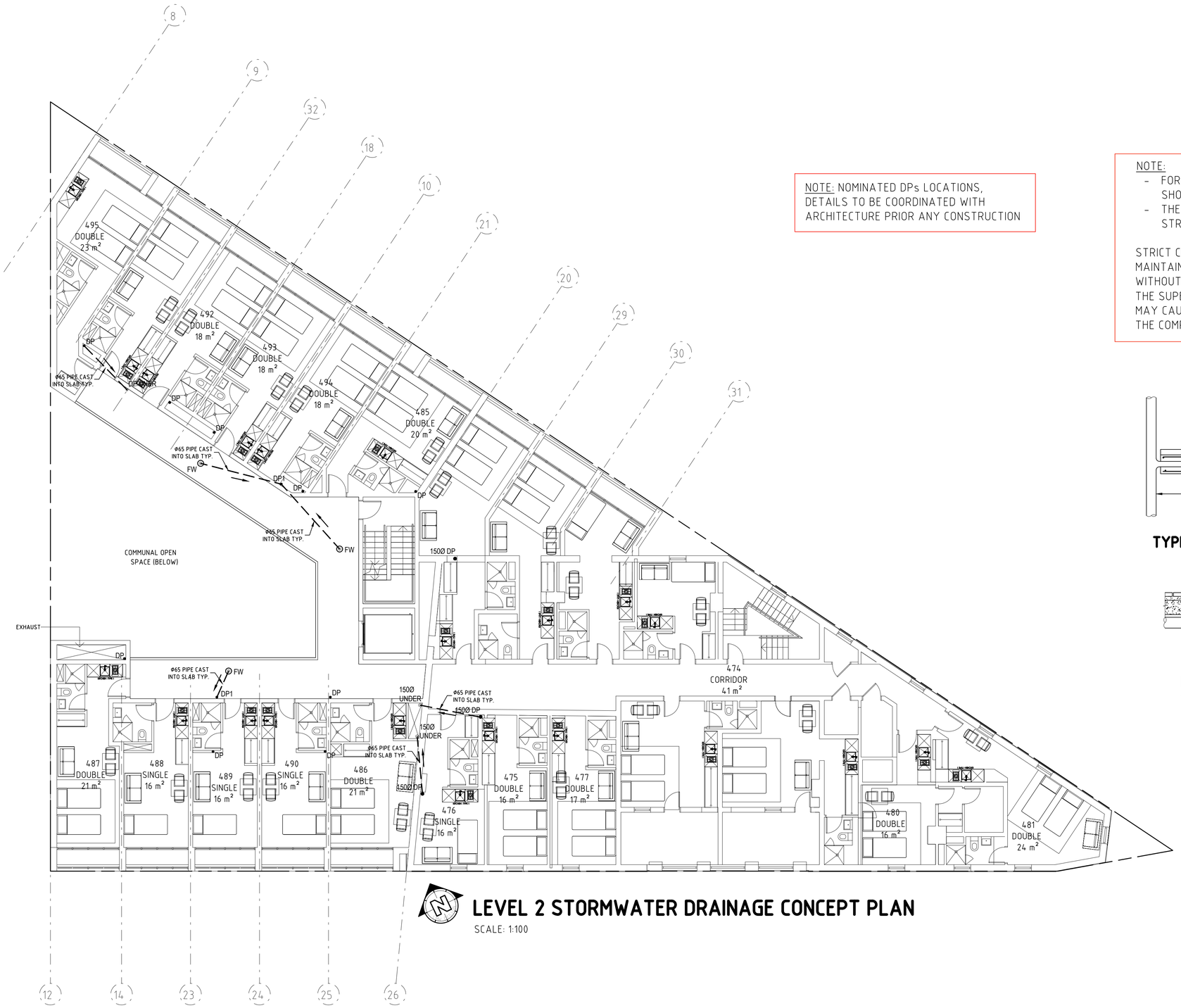
CIVIL AND STRUCTURAL



NOTE: NOMINATED DPs LOCATIONS, DETAILS TO BE COORDINATED WITH ARCHITECTURE PRIOR ANY CONSTRUCTION

NOTE:
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- THE 100mm DIA OR LARGER PIPES SHOULD BE STRAPPED TO UNDERSIDE OF SLAB.

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ABBREVIATIONS

AH----ACCESS HATCH
DDO---DISH DRAIN OUTLET
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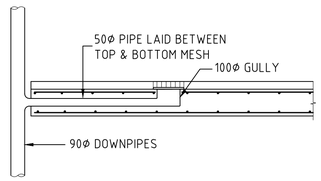
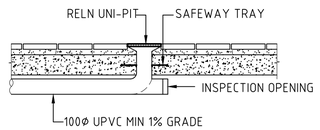


TYPICAL BALCONY FLOOR WASTE (F.W.)



FLOOR WASTE-PODIUM SLAB TYPICAL DETAIL

LEVEL 2 STORMWATER DRAINAGE CONCEPT PLAN

SCALE: 1:100

REV.	DATE	BY	CHECKED	AMENDMENTS
A	FEB. 21	Z.S.	S.W.W.	PRELIMINARY ISSUE

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Email : lmwdesigngroup@gmail.com

JOB NAME: PROPOSED ALTERATIONS AND ADDITIONS AT NO. 123-133 NEW CANTERBURY ROAD, LEWISHAM
CLIENT, ARCHITECT: EMAG APARTMENTS
DRAWING TITLE: LEVEL 2 STORMWATER DRAINAGE CONCEPT PLAN

NO. IN SET	JOB NO	1810.20	DRG. NO	REV
			D4	A
SCALE	DESIGNED	DRAWN	DATE	NO.
N.T.S.	S.W.W.	Z.S.	FEB. 2021	

APPROVED BY

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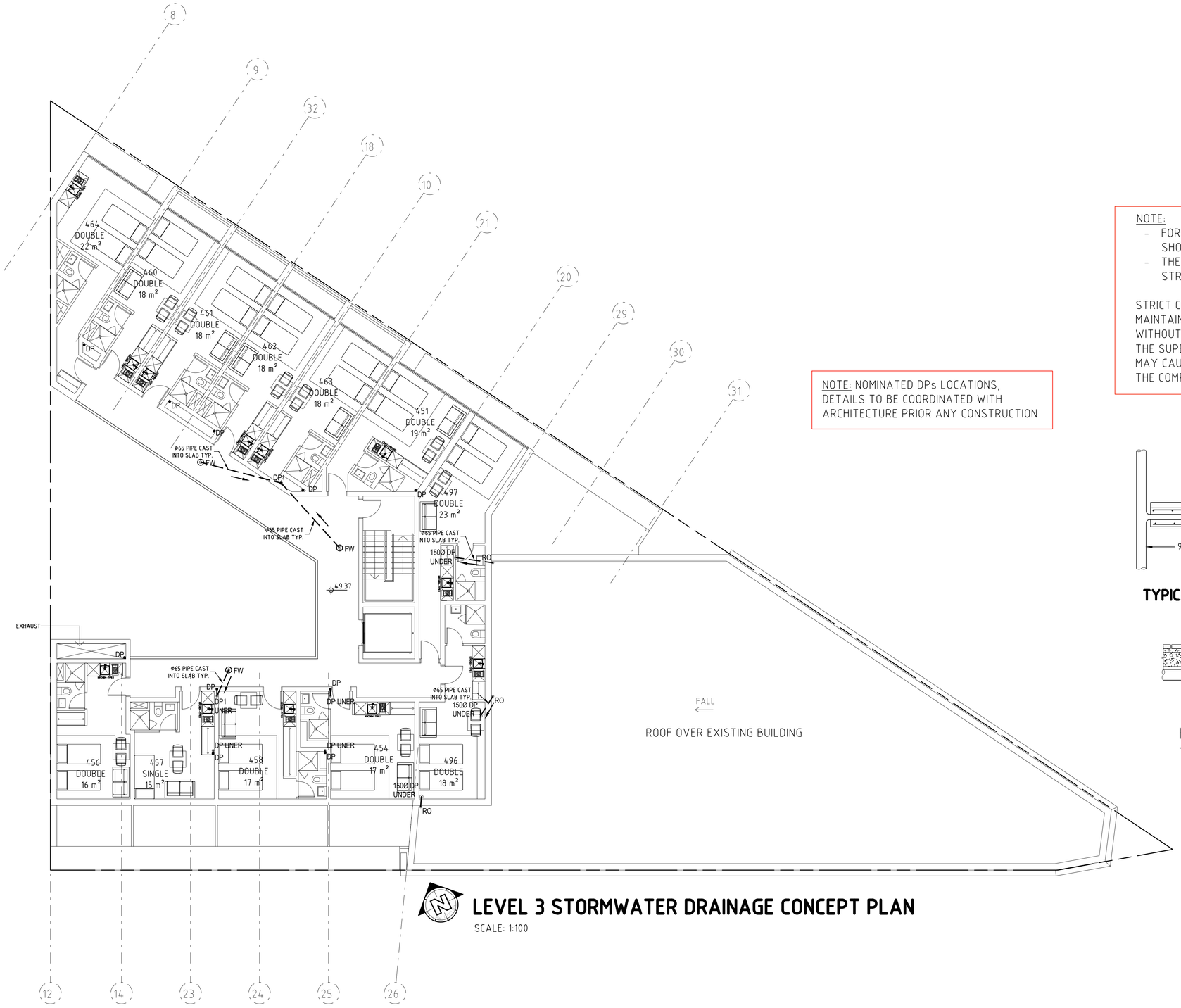
REG. NO. 417092
CIVIL AND STRUCTURAL



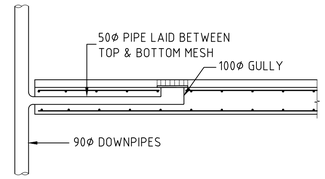
LEVEL 3 STORMWATER DRAINAGE CONCEPT PLAN

SCALE: 1:100

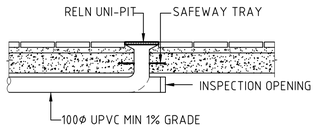
NOTE: NOMINATED DPs LOCATIONS, DETAILS TO BE COORDINATED WITH ARCHITECTURE PRIOR ANY CONSTRUCTION

NOTE:
- FOR THE 'CAST IN-SLAB' PIPE, THE DIA SHOULD BE LESS THAN OR EQUAL TO 65mm.
- THE 100mm DIA OR LARGER PIPES SHOULD BE STRAPPED TO UNDERSIDE OF SLAB.

STRICT COMPLIANCE WITH THIS DESIGN SHALL BE MAINTAINED. ANY DEVIATION FROM THIS DESIGN, WITHOUT PRIOR DISCUSSION AND APPROVAL BY THE SUPERVISING ENGINEER (SUPERINTENDENT), MAY CAUSE CERTIFICATION OF CONSTRUCTION AT THE COMPLETION OF WORK NOT TO BE ISSUED.



TYPICAL BALCONY FLOOR WASTE (F.W.)



FLOOR WASTE-PODIUM SLAB TYPICAL DETAIL

ABBREVIATIONS

AH----ACCESS HATCH
DDO---DISH DRAIN OUTLET
CO----CLEAR OUT
DCP----DISCHARGE CONTROL PIT
DP-----DOWNPIPE
FFL----FINISH FLOOR LEVEL
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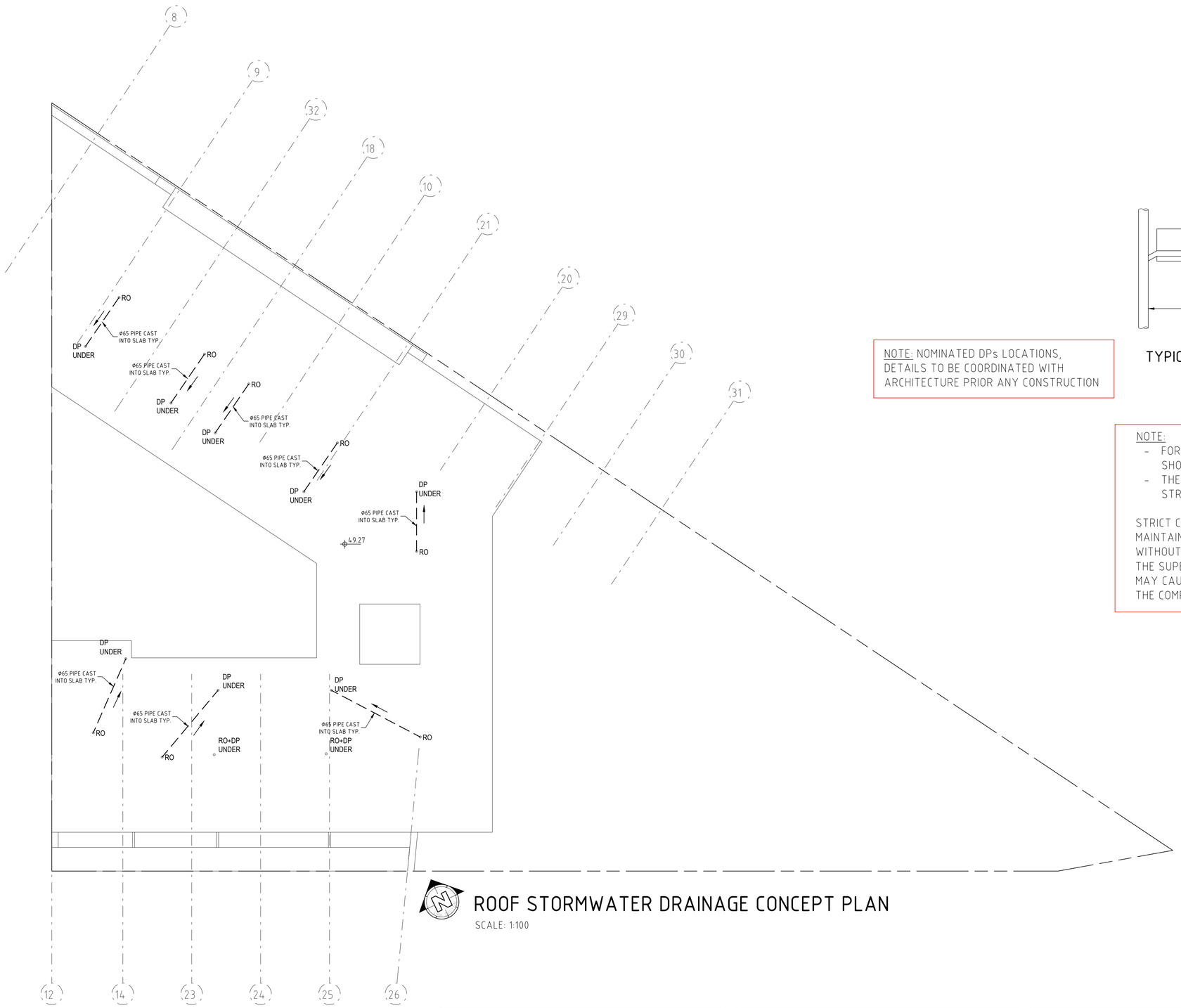
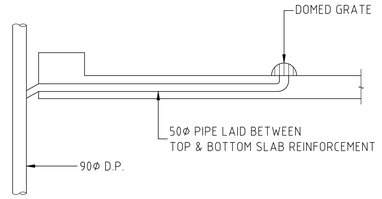


ROOF STORMWATER DRAINAGE CONCEPT PLAN

SCALE: 1:100



TYPICAL CONCRETE ROOF OUTLET (R.O)

NOTE: NOMINATED DPs LOCATIONS, DETAILS TO BE COORDINATED WITH ARCHITECTURE PRIOR ANY CONSTRUCTION

NOTE:
- FOR THE 'CAST IN-SLAB' PIPE, THE DIA SHOULD BE LESS THAN OR EQUAL TO 65mm.
- THE 100mm DIA OR LARGER PIPES SHOULD BE STRAPPED TO UNDERSIDE OF SLAB.

STRICT COMPLIANCE WITH THIS DESIGN SHALL BE MAINTAINED. ANY DEVIATION FROM THIS DESIGN, WITHOUT PRIOR DISCUSSION AND APPROVAL BY THE SUPERVISING ENGINEER (SUPERINTENDENT), MAY CAUSE CERTIFICATION OF CONSTRUCTION AT THE COMPLETION OF WORK NOT TO BE ISSUED.

ABBREVIATIONS

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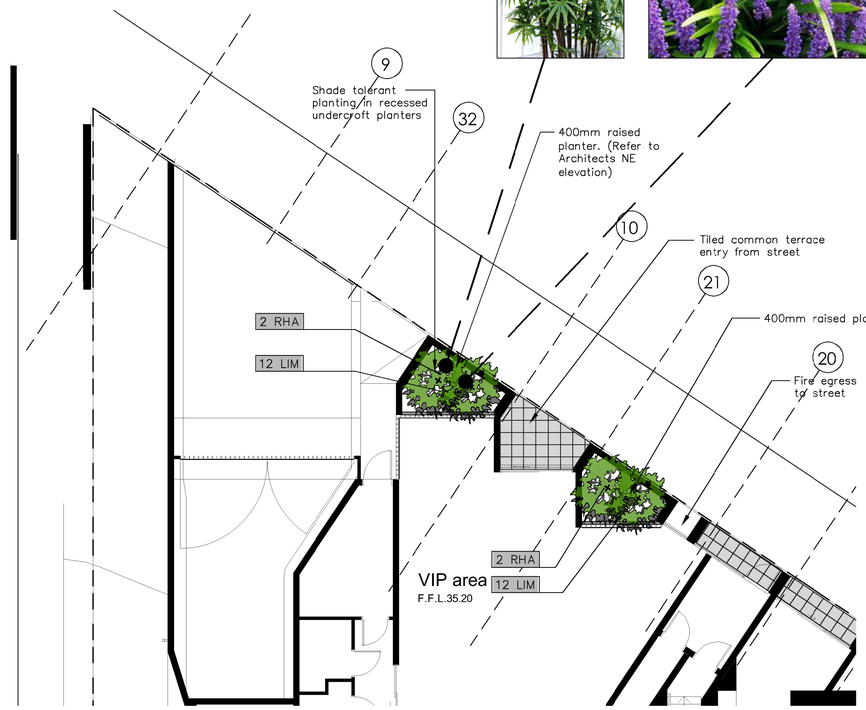
CIVIL AND STRUCTURAL

Ground floor plan 1:0 @ A1

0 1 2 3 4 5 10



Rhapis excelsor Palm

Liriope

Magnolia 'Kay Parris'

Open screen / balustrading

Rhapis excelsor Palm

Kaffir Lilly

Dragon tree

Frangipani

Seating bench & wall

Lomandra Tanika border plants

Agave

Japanese Maple (Acer Palmatum)

Trachelespermum Jasminoides

Liriope

First floor plan 1:0 @ A1

0 1 2 3 4 5 10

Irrigation notes

Automatic drip line watering system to be selected. To extend to ALL planter areas within the development including the roof terrace planters. Water supply tap hosecocks to be located to all isolated planters. (To be coordinated with Hydraulic and Structural Engineer's construction certificate details). Dripline supply system only to be incorporated.

Prior to approval by the project manager and prior to installation the Contractor responsible for the irrigation installation is to provide an irrigation design to meet the folbwing requirements.

Generally: Supply an automatic drip line irrigation system. To include all piping to solenoids either PVC lines and/or class 12 pressure pipe or low density, rubber modified polypropeyline reticulation as required to provide water supply to the nominated areas. To be coordinated with Hydraulic engineers plans. To include all bends, junctions, ends, ball valves, solenoids and all other ancillary equipment. Backwash valve: An approved backwash prevention valve is to be located at the primary water source for top up valves to rainwater tanks (where applicable).

Ensure rain sesnsor is installed for common area garden zones connected to timers

Root inhibiting system. Driplines to be 'Netafim Techline AS XR' drip tubing or approved equivalent

Automatic Controller: Provide automatic 2 week timer with hourly multi-cycle operation for each zone as noted on the irrigation areas plan on sheet 3. Battery timers to isolated planter boxes is acceptable and to maintained by the owners corporation as part of the ongoing property maintenanace.

Performance: It shall be the Landscape Contractor's responsibility to ensure and guarantee satisfactory operation of the irrigation system. The system is to be fit for the purpose and should utilize sufficient solenoids to provide for the varying watering requirements of landscape areas to allow all plants and lawn areas to thrive and attain long term viability.

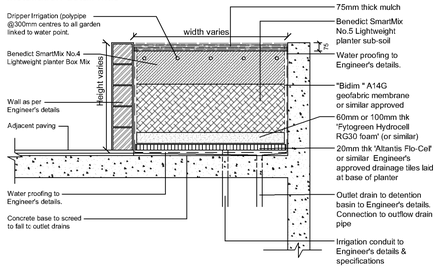
Testing: After the system has been installed to the satisfaction of the project manager, the installation shall be tested under working conditions. Acceptance of the installed plant and equipment shall be subject to these being satisfactory.

Warranty: A twelve month warranty is to be provided in writing by the Landscape Contractor, which shall commit the Landscape Contractor to rectify the system (the items they have installed) to the satisfaction of the project manager or nominated representative. This will apply should any fault develop, or the capacity or efficiency fall below that guaranteed, or should the discharge or pressure be inadequate, or should defects develop in the filter unit or control heads, or any blockages that may develop in the system.

Approvals: The Landscape Contractor is to liaise as necessary, to ensure that the irrigation system conforms with all Water Board, Council and Australian standards (AS)

Detail 1.

On structure planter typical soil installation detail n.t.s



General construction notes

1.Site preparation
Any existing trees and vegetation to be retained shall be preserved and protected from damage of any sort during the execution of landscape work. In particular, root systems of existing plants must not be disturbed if possible. Any nearby site works should be carried carefully using hand tools. To ensure the survival and growth of existing trees during landscaping works, protect by fencing or armoring where necessary. Trees shall not be removed or lopped unless specific written approval to do so is given or is indicated on plan. Storage of materials, mixing of materials, vehicle parking, disposal of liquids, machinery repairs and refueling, site office and sheds, and the lighting of fires shall not occur within three (3) metres of any existing trees. Do not stockpile soil, rubble or other debris cleared from the site, or building materials, within the dripline of existing trees. Vehicular access shall not be permitted within three (3) metres of any tree.

2.Soil preparation
All proposed planting areas to be deep ripped to 200mm (where possible) and clay soils to be treated with clay breaker.. Apply at least 200mm depth good quality garden soil mix to all garden planting areas. To comply with AS 4419 Turfed areas as noted to be laid over 100mm min. good quality turf underlay over existing soil which is to be deep ripped to 200mm depth prior to installation. To be worked in with rotary hoe except where tree root damage would otherwise occur. In such situations care to be taken to hand cultivate in any area where existing tree roots exist to preserve health of trees and to comply with the requirements of the Arborist's report. Where planting is to occur in existing soil profiles ensure soil conditioners and compots worked into the top 200mm profile. To comply with AS 4454:1999 .

3.New plantings
Newly planted trees and large shrubs should be secured to stakes with hessian ties to prevent rocking by wind. Planting holes for plant material should be large enough in size to take root ball with additional space to take back filling of good quality planting mix. (Please note mature heights of planting as shown on planting schedule can vary due to site conditions, locations in constricted deep soil or over slab planters and so forth) Also shallow soils in certain locations may affect planting heights. Nominated heights for plantings in raised planters over slabs are nominated as less than their normal expected heights in acknowledgement of the contained soil environment. For other deep soil trees heights are subject to particular site conditions, and intended hedging or pruning for functional requirements such as available planting width, intended access under branches and solar access.

4.Planter boxes & waterproofing.
All slab areas to be waterproofed and 'Atlantis' drainage cell installed with geotextile fabric or similar approved. (see planter drainage detail this drawing package) Refer Engineer's details for ALL structural, drainage and installation details whatsoever for planter box construction. All internal planter slab levels to have mortar screed to fall to drainage outlets as nominated by the Stormwater Engineering details. All planting containers to have the following soils:

- Benedicts Smart Mix no. 4 Lightweight Planter Mix (or approved equivalent) to min. 300mm depth. To be installed over Benedicts light weight No.5 light weight sub-soil mix (or approved equivalent). To comply with AS 4419 and AS 3743
- All planter boxes are to have automatic dripline irrigation system. Connecting pipes/conduit to be cast into slab structures prior to slab pour to be coordinated with the Structural Engineer's plans.
- Landscape contractor to install all planter box fill material and plant material after other site works are completed to ensure no deterioration of waterproof membrane. To be confirmed by Engineers and project manager to confirm the integrity of the engineer's specified waterproofing of the planter boxes at time of soil and plant installation.

5.Mulching
All planting areas to be mulched with a minimum 75mm thick cover of recycled hard wood chip mulch and then all plant areas to be thoroughly soaked with water. To comply with AS 4454

6.Fertliser
All planting areas to be fertilised with 9 month 'NPK' slow release fertiliser.

7.Staking
To those plants indicated on the planting schedules provide: hardwood stakes as nominated and able to achieve rigid support. Care taken for staking in raised planters to avoid damaging waterproofing installation

8.Structural
All structural and stormwater / drainage details whatsoever to Engineer's plans. Where discrepancies occur the engineering plans are to prevail. Notify the project manager of any discrepancies prior to construction or installation

Planting schedule

Symbol	Botanical name	Common name	Cont. size	Staking	Mature height	No. req.
Small – medium trees						
APA	Acer palmatum	Japanese Maple (Small – med deciduous garden tree)	150Lt	3x50x50x1800	5-7.0M	1
MKP	Magnolia Kay Parris	Evegreen Kay Parris Magnolia (small tree. Glossy eb	45Lt		5-6.0M	1
PLU	Plumeria acutifolia	Frangipani (small flowering deciduous tree)	100Ltt	2x50x50x1800	3-4.0M	1
Palms / Succulents						
AGV	Agave attenuata	Century plant (striking spiky leaved succulent)	200mm	nil	0.5M	5
DRD	Draceana draco	Dragon Tree (striking feature plant)	100Litre	nil	2.5-3.5M	1
RHA	Raphis excelsor	Lady Finger Palm	300mm	nil	2-2.5M	7
Groundcovers/Climbers						
TJA	Trachelospermum asiaticum	Flatmat Star Jasmine (FT01 Ozbbreed hyvrid groundcover)	200mm	nil	0.2M	20
TJT	Trachelospermum tricolor	Variegated Star Jasmine (variegated colour groundcover)	200mm	nil	0.3M	4
Ornamental grasses/strappy leaved plants						
CM	Clivea miniata	Kaffir Lily (shade tolerant groundcover)	200mm	nil	0.5M	8
LIM	Liriope Evergreen Giant	Turf Lily (shade tolerant groundcover)	150mm	nil	0.4M	24
LOT	Lomandra 'Tanika'	Dwarf Mat Rush (native mass planted groundcover)	150mm	nil	0.4M	34
SML	Spathyphyllum 'Walsii'	Peace Lilly (shade tolerant flowering. Glossy leaves)	200mm	nil	0.4M	18

Planting schedule species to be sourced from local nurseries supplying plants of local provenance wherever possible. Landscape contractor is to check plant numbers on plan against the schedule prior to submitting tender price. Contact landscape architect if any number discrepancies are found. Council compliance controls require that any substitution of species variety or container size MUST be confirmed with landscape architect to ensure a compliance certificate can be issued that's meets the specific development consent conditions of the project.

Amendments

C	19.11.21	For DA
B	19.11.21	For Review
A	27.1.21	For Review

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Project: Redevelopment at 23-133 New Canterbury Rd Lewisham. NSW

Dwg: Landscape Plan

Date: 19.11.21 Scale: 1:100 @A1

Job Ref: 21/2229 Sheet No: 1 of 1

Builder must verify all dimensions of the site before work commences.
Figured dimensions should be used in preference to those scaled off.

North

1 of 1

ISSUE- C

eiaustralia

Contamination | Remediation | Geotechnical

EMAG PTY LTD

Dewatering Management Plan

123-133 New Canterbury Road, Lewisham, NSW

E25390.E16_Rev2
22 November 2021

DOCUMENT CONTROL

Report Title: Dewatering Management Plan; 123-133 New Canterbury Road, Lewisham, NSW

Report No: E25390.E16_Rev2

Copies		Recipient
1	Soft Copy (PDF – Secured, issued by email)	Mr Joe Ghosn Emag Pty Ltd 1 / 32-34 Burn Street, Pyrmont NSW 2009
2	Original (Saved to Digital Archives)	EI Australia Suite 6.01, 55 Miller Street, **PYRMONT NSW 2009**

Author	Technical Reviewer
Emily Scanlon **Environmental Engineer**	**Warwick Hayes** **Environmental Scientist**

Revision	Details	Date	Amended By
0	Original	18 November 2021	-
1	Updated Development Plans	19 November 2021	ES
2	Updated Development Plans	22 November 2021	ES

TABLE OF CONTENTS

SCHEDULE OF TABLES

APPENDICES

1. INTRODUCTION

1.1 Background

Mr Joe Ghosn of Emag Pty Ltd ('the client') engaged EI Australia (EI) to prepare a Dewatering Management Plan (DMP) for 123-133 New Canterbury Road, Lewisham, NSW ('the site').

The site is located 6.5km south-south-west of the Sydney central business district within the local government area (LGA) of Inner West Council (**Figure 1, Appendix A**). It is further identified as Lots 3-5 in Deposited Plan (DP) 10989 and Lots 2-5 in DP 1543, comprising a total area of 950.3m² (**Figure 2, Appendix A**).

The site is designated for development, involving the construction of a four-storey, mixed use (boarding house) building, with a basement within the western portion (**Appendix C**). As the local groundwater table will be intercepted during the corresponding excavations, a DMP is required in accordance with the *Environmental Planning and Assessment Act 1979* and *Protection of the Environment Operations Act 1997*. The purpose of this plan is to achieve compliance with WaterNSW and Inner West Council requirements in relation to the dewatering activities. This DMP outlines site-specific measures for the appropriate management of storm and groundwater discharge during the excavation and construction stages of the development. It has been drafted with reference to the following reports:

- JK Geotechnics Pty Ltd (JK; 2020) *Report to Emag Apartments on Geotechnical Investigation for Proposed Alterations and Additions at 123-133 New Canterbury Road, Lewisham NSW* (JK Report Ref. 28799Rrpt rev2, dated 4 December 2020); and
- EI Australia (2020) *Groundwater Take Assessment; 123-133 New Canterbury Road, Lewisham NSW* (EI Report Ref. E25390.G12_Rev1, dated 19 November 2021).

It is understood that the plan will support applications for a stormwater discharge permit (through Inner West Council) and a temporary dewatering licence (through WaterNSW). EI note the Applicant will need to seek consent for any direct connection to Council's stormwater system, as the pumping of groundwater to kerb and gutter is not permitted.

Note: This report supersedes previous revisions as the Client has provided new development plans including an additional basement level.

1.2 Proposed Development

Based on the provided documents (**Appendix C**), EI understands that the proposed site development involves partial demolition of the existing structures, followed by the construction of a four-storey, mixed use (boarding house) building. Basement construction will require soil excavation to depths of up to 6.4m below ground level (BGL), the final (bulk) level equating to 29.0m Australian Height Datum (AHD), although it may extend further in localised areas for footings, service trenches, crane pads and lift over-run pits.

As mentioned in the Ground Water Take Assessment (GTA; EI, 2021), EI expects that control of groundwater inflows into the basement during construction will be feasible using a suitably designed sump and pump system and hence tanking of basement structures will not be required for groundwater control.

1.3 DMP Objectives

The objectives of this DMP are to:

a) Describe the extraction, treatment, monitoring and reporting procedures to be employed during temporary dewatering activities; and

b) Provide effective management (contingency) measures to ensure that the discharge of extracted groundwater does not pose unacceptable risks to the receiving environment.

1.4 Scope of Work

In order to achieve the DMP objectives, the following works were completed:

- A desktop study including:
  - Review of the development proposal and proposed shoring/dewatering designs;
  - Review of site and regional setting information, based on geological and soil maps, as well as on-line data resources; and
  - A search for groundwater bores registered with Water NSW within a 500m radius of the site.
- Field investigation including:
  - Construction of a groundwater monitoring bore (BH1M), drilled to a maximum depth of 3.5m within the northern (proposed basement) part of the site;
  - One round of groundwater sampling from the constructed monitoring bore;
  - Laboratory analysis of groundwater samples for relevant analytical parameters; and
  - Interpretation of the analytical results in relation to the recommended quality criteria.
- Preparation of this DMP.

1.5 Regulatory Requirements

The following regulatory instruments were considered during the drafting of this DMP:

- *Protection of the Environment Operations Act 1997*;
- *Environmental Planning and Assessment Act 1979*;
- *Water Management Act 2000*; in particular the
- *Mandatory Assessment Requirements for Groundwater Approval (Dewatering) Under the Water Management Act 2000;*
- *NSW Aquifer Interference Policy;*
- DPIE (2021) *Minimum Requirements for Building Site Groundwater Investigations and Reporting. Information for Developers and Consultants*; and
- *Marrickville Local Environmental Plan 2011.*

2. SITE DESCRIPTION

2.1 Property Identification, Location and Physical Setting

The site identification details and associated information are summarised in **Table 2-1**. Site locality and layout plans are provided in **Appendix A**.

Table 2-1 Site Identification, Location and Zoning

Attribute	Description
Street Address	123-133 New Canterbury Road, Lewisham, NSW
Lots and DPs	Lots 3-5 in DP 10989 Lots 2-5 in DP 1543
Site Area	950.3m²
Site Coordinates	Northern corner of site (datum GDA2020-MGA56): ▪ Easting: 328948.621 ▪ Northing: 6247765.605 (Source: http://maps.six.nsw.gov.au)
State Survey Marks	Four markers are in close proximity (<100m) to the site: ▪ SS51526 located on Hunter Street (approximately 25m northwest); ▪ SS51524D located on the intersection of New Canterbury Road and Hunter Street (approximately 35m southeast); ▪ SS510165D located on the intersection of New Canterbury Road and Hunter Street (approximately 40m southeast); ▪ SS46936F located on New Canterbury Road (approximately 50m west). (Source: http://maps.six.nsw.gov.au)
LGA	Inner West Council
Current Zoning	B2: Local Centre (*Marrickville Local Environmental Plan 2011*)
Surrounding Land Use	**North**: Hunter Street, followed by low density residential properties. **East**: New Canterbury Road and Hunter Street intersection, followed by medium density residential and commercial properties. **South**: New Canterbury Road, followed by commercial properties (Inner West Smash Repair). **West**: Commercial properties.
Site Stratigraphy	Based on recent JK and EI investigations, the stratigraphy is comprised of: **CONCRETE:** Concrete pavement of 100mm thickness; overlying **FILL:** Gravelly silty clay / clayey silt fill (from 0.1 to 0.9m BGL); overlying **RESIDUAL SOIL:** Silty clay (from 0.9m to 3.5m BGL, at least).

2.2 Regional Setting

Regional topographical, (hydro)geological and soil landscape information is given in **Table 2-2.**

Table 2-2 Regional Setting Information

Attribute	Description
Topography	The site is located on a hillside that slopes down (approximately 7 degrees) towards the southwest.

Attribute	Description
Drainage	The main drainage pathway for stormwater on-site is anticipated to be overland flow to the various stormwater pits and strip gutters present within the site and on nearby streets, which subsequently discharge to the municipal stormwater system. The local stormwater system is expected to drain to Hawthorne Canal, approximately 700m west to northwest of the site.
Surface Water Receptor	The nearest surface water receptor is Hawthorne Canal, approximately 700m west to northwest of the site. Hawthorne Canal which ultimately drains into the Parramatta River.
Geology	Information on regional sub-surface conditions, referenced from the Department of Mineral Resources *Sydney 1:100,000 Geological Series Sheet 9130* (DMR 1983), indicated the site overlies Ashfield Shale (*Rwa*) which consists of black to dark grey shale and laminate.
Acid Sulfate Soils (ASS)	With reference to the *Botany Bay Acid Sulfate Soil Risk Map* (1:25,000 scale; Murphy, 1997), the subject land lies within the class description of '*no known occurrence'* of ASS materials. The *Marrickville LEP 2011 Acid Sulfate Soils Map* (Sheet ASS_003) shows that the site lies within an unmapped area for ASS.
Hydrogeology and Groundwater Use	Based on findings from previous JK and EI investigations, standing water levels (SWL) in monitoring bores ranged from 2.0-3.3m BGL. Groundwater flow is inferred to be northwest, in the general direction of the Hawthorne Canal (approximately 700m west to northwest). An on-line search for groundwater bores registered with Water NSW within a 500m radius of the site was performed by EI for this DMP. The searched revealed there were no licenced groundwater bores within this search radius.

3. GROUNDWATER CONDITIONS

3.1 Groundwater Depth

Groundwater depth measurements have been measured at separate locations across the site, the data from which are presented in **Table 3-1**. Data for BH5 and BH6 were derived from the JK (2020) *Geotechnical Investigation*, while BH1M corresponds to the groundwater monitoring well constructed by EI on 19 October 2021 within the northern (proposed basement) portion of the site (the final auger drilling depth being 3.5m BGL (31.9m AHD)). Refer also to the EI (2020) *Groundwater Take Assessment* for additional information, including soil permeability values (**Appendix D**).

Table 3-1 Groundwater Depth Summary

Bore / Monitoring Well	Measurement Date	SWL (m BGL)	Reduced Water Level (m AHD)
BH1M	29 October 2021	2.0	33.4
BH5	6 October 2015	3.3	31.7
BH6	6 October 2015	Not encountered	Not encountered

3.2 Groundwater Quality

In order to obtain baseline water quality for this DMP, a round of groundwater sampling was conducted at the monitoring bore BH1M (completed on 28 October 2021). The representative sample, identified as GW_BH1M-1, was laboratory analysed for relevant analytical parameters (namely dissolved heavy metals (aluminium, arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc), polycyclic aromatic hydrocarbons (PAH), C_6-C_{40} total petroleum hydrocarbons (TPH), volatile organic compounds (VOC; including the monocyclic aromatic hydrocarbons *benzene*, *toluene*, *ethyl-benzene* and *xylenes* (BTEX) and chlorinated VOC), phenols, cyanide, pH, electrical conductivity (EC) and turbidity).

Refer to **Appendix B** (result summary table) and **Appendix E** (laboratory documentation) for the corresponding supporting information.

All analytical results were found to comply with the recommended Discharge Water Criteria (see **Section 5.2**), except as follows:

- pH 5.9; and
- Turbidity 2900 NTU.

An elevated concentration of C_{10}-C_{40} TPH was also detected (1500 µg/L), due to the heavy F3 (870 µg/L) and F4 (620 µg/L) fractions. Note that no petrochemical sheen or surface film was observed during the groundwater sampling.

Based on these results, future groundwater monitoring must include pH, turbidity and TPH (including *oil and grease*). Water treatment, if deemed necessary may need to consider pH adjustment (neutralisation by alkali), settlement of suspended mater (to reduce turbidity) and extraction / separation of hydrocarbons (e.g. granular activated carbon filtration, or coalescing plate separation).

4. DEWATERING METHODOLOGY

4.1 Excavation and Shoring

The proposed development involves partial demolition of the existing structures, followed by the construction of a four-storey, mixed use (boarding house) building, with a basement within the western portion of the site. As described in the EI (2021) *Groundwater Take Assessment* (GTA; **Appendix D**), we expect that control of groundwater inflows into the basement during construction will be feasible using a suitably designed sump and pump system and hence tanking of basement structures will not be required for groundwater control.

At the time of writing this report, no shoring designs were provided. Therefore, based on the subsurface conditions and recommendations for excavation proposed under the JK (2020) *Geotechnical Investigation*, a soldier / contiguous pile wall was assumed in our model. Therefore, the excavation face has also been modelled as fully drained.

It was not the purpose of the GTA to assess the overall stability of the shoring system. Should final shoring design differ from the above assumed levels however, the groundwater take assessment must be reviewed by the appointed geotechnical engineering specialist, accordingly.

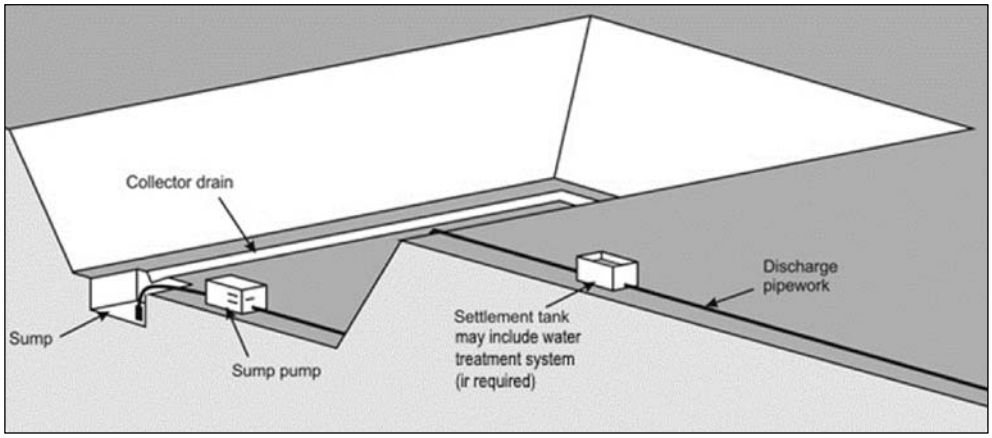
4.2 Groundwater Extraction Method

At the time of preparing this plan, EI had not received details of the proposed dewatering system design (including number and depth of well points, alignment, pumping rates). Dewatering at sites with hydraulically conductive soil conditions is generally undertaken via spear point extraction wells (typically 40mm diameter PVC spears) installed at 1.5m intervals around the internal perimeter of the excavation, coupled with suction pumps. Actual well intervals and construction details are typically determined by the appointed dewatering contractor to suit site-specific conditions.

In fine grained soils, and particularly after shoring, which will significantly limit the rate of inflow to the excavation, a sump and pump system may be used to control seepage, as illustrated in **Figure 4-1**.

It is recommended that during construction, any pumped-out groundwater will be discharged into a vessel (basin, or equivalent) prior to discharging into Council's municipal stormwater network. The preferred vessel type will require adequate capacity to accommodate the rate of groundwater seepage, estimated by the EI (2021) GTA (**Appendix D**).

Figure 4-1 Hypothetical layout of a *Sump and Pump* seepage collection system



4.3 Estimated Groundwater Volumes

The EI (2021) GTA volume estimate during construction of the proposed two-level basement was based on the following assumptions:

- The ground surface is level across the site and lies at an elevation of 35.4m AHD.
- The subsurface conditions were horizontal along the site. The determined permeability values were adopted for each unit.
- Dewatering will be required for 6 months, which is the assumed time required to complete the basement construction.
- The perimeter shoring wall will be free draining.
- Temporary dewatering will be undertaken within the basement excavation down to 1m below the assumed bulk excavation level of 29.0m AHD, to allow for construction of localised excavations (e.g. footings) in dry conditions.
- An external design groundwater level of 93.4m AHD (which is based on the highest observed groundwater level in BH1M) was assumed to be constant up to 20m away from the shoring wall.
- A “No-Flow” boundary is defined along the symmetric line (the centre of the excavation) at 15m from the perimeter shoring walls.
- The shoring walls surrounding the basement excavation has a total length of about 90m.

Should groundwater treatment for pH, turbidity and/or petroleum hydrocarbons become necessary to meet the discharge water criteria, it will be undertaken in the vessel prior to discharge into Council’s stormwater network. Should treatment for other parameters become necessary during the course of dewatering, this may require additional water treatment systems to be installed prior to the discharge point. Additional information regarding water treatment is provided in **Section 5**. EI has assumed treated water will be discharged into Council’s stormwater drain or channel located in close vicinity of the site.

4.4 Dewatering Strategy

The Project / Site Manager, Dewatering Contractor and Water Treatment Specialist must agree on a dewatering strategy to confirm that dewatering treatment systems and retention tanks can be positioned appropriately within approved areas prior to the start of works.

4.5 Proposed Groundwater Level Reductions

As stated in **Section 4.3**, an external design groundwater level of 93.4m AHD was assumed to be constant up to 20m away from the shoring wall. Assuming an ambient groundwater level of around 93.4m AHD and lowering of groundwater levels inside the excavation (by dewatering) to 1m below the finished basement level (i.e. to 29.0m AHD), to allow construction to be undertaken in dry conditions, this would result in a lowering of the groundwater level immediately outside of the shoring wall by 1.0m, equating to 33.0m AHD.

4.6 Drawdown Impacts

In specific cases, dewatering may induce ground subsidence on neighbouring properties, associated with the increased vertical effective stress of the underlying landform. It is beyond the scope of this DMP to assess the risk on neighbouring properties associated with ground settlement. Structural/geotechnical engineers should be engaged to determine whether the estimated settlement would jeopardise the stability of existing nearby structures and infrastructure, and whether a more accurate prediction of settlement is required.

5. WATER QUALITY MANAGEMENT

Groundwater quality assessment (monitoring) must be performed prior to and during the dewatering. The on-going monitoring will ensure the treatment system (if required) is functioning as intended, as well as confirm the quality of discharge water is acceptable for release into the Council's municipal stormwater network.

5.1 Discharge Water Quality Guidelines

In accordance with statutory requirements for site dewatering operations, discharged waters must comply with the ANZG (2018) *Trigger Values* for the protection of fresh / marine water ecosystems, or relevant default criteria where the ANZG (2018) guidelines do not provide values. This requirement is in compliance with the *Protection of the Environment Operations Act 1997*.

For this site, the primary receiving water body is the Parramatta River, which is a marine system. Therefore, the corresponding ANZG (2018) *Trigger Values* and default thresholds will be adopted as the Discharge Water Criteria (DWC).

In accordance with DPIE (2021) and Inner West Council requirements, dewatering must also adhere to the following:

a) Discharge water must have a pH of between 6.5 and 8.5;

b) Discharge water must not exceed a suspended sediment concentration of 50mg/L;

c) Records for all water testing must be kept for the duration of the dewatering period; and

d) Written details of the results of any water tested must be provided within 7 days to requesting authorised officers.

A summary of the recommended DWC for this site is provided in **Section 5**. These parameters and their respective criteria will apply for both the initial (pre-dewatering) and on-going assessment of water quality.

Table 5-1 Discharge Water Quality Performance Criteria

Analyte	Discharge Water Criterion (µg/L) [1]
Metals	
Aluminium	80 [3]
Arsenic III	94 [3]
Arsenic V	42 [3]
Cadmium	0.7[1]
Chromium III	27
Chromium VI	4.4
Copper	13 [4]
Lead	4.4
Mercury (inorganic)	0.1
Nickel	7
Zinc	150 [4]
Petroleum Hydrocarbons	
Oil and grease	*No visible sheens, surface films or oil and grease*
Volatile TPH (C_6 – <C_{10})	*If TPH is detected analysis for BTEX and PAH is required*
Semi-volatile to heavy TPH (>C_{10} – C_{40})	
Monocyclic Aromatic Hydrocarbons (BTEX)	
Benzene	500
Toluene	180 [2]
Ethylbenzene	80
o - xylene	350 [2]
p - xylene	200 [2]
m - xylene	75
Polycyclic Aromatic Hydrocarbons (PAH)	
Benzo(α)pyrene	0.1
Naphthalene	50
Chlorinated VOCs	
Tetrachloroethene (PCE)	70 [2]
Trichloroethene (TCE)	330 [2]
Chloroethene (vinyl chloride)	100 [2]
cis-1,2-Dichloroethene	60 [5]
trans-1,2-Dichloroethene	
1,1-Dichloroethane	250 [2]
1,2-Dichlorobenzene	160 [2]
Other Parameters	
Phenol (total)	400

Analyte	Discharge Water Criterion (µg/L) [1]
Cyanide (total)	4
Physico-Chemical Parameters	
pH	6.5 to 8.5[6]
Turbidity (NTU)	10 [7]

Note 1 Discharge water quality performance criteria are the ANZG 2018 95% Marine Trigger Values (the 99% Marine Trigger Values are applied for the bio-accumulative parameters cadmium and mercury), unless otherwise indicated.

Note 2 ANZG 2018 Marine Trigger Values at the unknown level of protection are applied, where ANZG 2018 95% Marine Trigger Values are not available, including chlorinated VOCs.

Note 3 The ANZG 2018 90% Freshwater Trigger Values for disturbed ecosystems are applied for the indicated parameters, in the absence of marine water criteria.

Note 4 For the metals copper and zinc which are naturally above the ANZG 2018 95% Marine Trigger Values under regional (background) conditions, performance criteria are set at one order of magnitude higher than the ANZG 2018 Trigger Value.

Note 5 In the absence of ANZG 2018 criteria for cis- and trans-1,2-Dichloroethene, the Aust. Gov. Australian Drinking Water Guidelines 6, 2011, Vers. 3.5, August 2018, are applied.

Note 6 In the absence of ANZG 2018 criteria for pH, the ANZECC & ARMCANZ 2000 criteria are applied (Ref. Table3.2.2 *Default trigger values for physical and chemical stressors for south-east Australia for slightly disturbed ecosystems*. Adopted range is between Lowland River minimum and Marine maximum values).

Note 7 In the absence of ANZG 2018 criteria in relation to Turbidity, the ANZECC & ARMCANZ 2000 criteria are applied (Ref. Table 3.3.3 *Ranges of default trigger values for estuarine and marine ecosystems*).

5.2 Discharge Water Quality Monitoring

5.2.1 Visual Monitoring

Visual inspections of the dewatering measures and equipment should occur regularly (daily where possible) by the Site Manager and/or Dewatering Contractor, to ensure:

- The effective operation of all dewatering treatment equipment;
- Short circuiting of water around baffles and filter media within sediment retention tanks;
- No hydrocarbon sheens are visible and no hydrocarbon odours are emitted from the groundwater or sediment;
- No green blue or extremely clear water indicating high levels of dissolved aluminium is present;
- No sediment or suspended load is allow to bypass the baffles and sediment tanks; and
- Appropriate quantities of chemical product are available for use within the dosing system (if required).

The Site Manager must keep a record of all visual observations, as well as flow rates, to enable the determination of groundwater extraction/discharge volumes following the completion of dewatering activities.

5.2.2 Sample Collection and Analysis

Pre-Dewatering Groundwater Quality Assessment

Sampling of groundwater is to be completed prior to commencement of dewatering activities, to expand the baseline conditions and confirm any treatment requirements. A review of the proposed DWC will be conducted as part of this assessment. Should deviations from the DWC be technically justifiable, approval from Council and/or WaterNSW must be sought to allow any alternative discharge criteria.

Dewatering Quality Assessment

On-going sample analysis must continue for the duration of the dewatering activities, to establish that the treatment system (if required) is functioning as intended, as well as confirm the quality of discharge water is acceptable for release into the stormwater system. Sample collection should be completed by a suitably qualified environmental scientist or equivalent, with the subsequent analyses performed by a NATA-accredited laboratory. The analytical program is to include the parameters of concern, as identified by the *Pre-Dewatering Groundwater Quality Assessment*.

The following activities are to be implemented for the on-going monitoring program:

Trial-Run Period

Prior to the discharge of any extracted groundwater, a trial run will be completed as follows:

- Initial groundwater pumped from the site will be diverted back into the excavation, to infiltrate site strata and re-enter the underlying groundwater aquifer, thus allowing a reduction in suspended sediments, which are expected in the initial pump-out waters;
- Samples of the treated groundwater will be collected and laboratory analysed for the water quality parameters of concern; and
- After confirmation that the water quality complies with criteria, the extracted groundwater will be directed to the stormwater discharge point.

Bi-weekly (twice per week) sampling frequency will occur during the trial-run period. As a minimum, two samples will collected prior to, and post treatment of the extracted groundwater. The analytical results will be compared to each other, as well as the DWC, to assess the

performance of the water treatment system, and the results of each sampling event will be recorded, to establish the trend of water quality change.

Bi-weekly sampling should be maintained for a minimum of two weeks following commencement of the dewatering treatment, unless stated otherwise by the Environmental Consultant. Sampling for trial run purposes will cease once the target parameters in treated water stabilise (i.e. consecutive tests are within ± 10% of the observed results) and contaminant concentrations are within the adopted discharge criteria for three consecutive sampling events. The trial-run period may be extended if stabilisation is not observed, or if the treated water does not satisfy the adopted criteria (**Section 5**).

The Dewatering Contractor / Water Treatment Specialist should seek advice from the Environmental Consultant regarding termination of the trial-run period. During the trial-run period, all collected groundwater seepage (including treated water) should be retained on-site and stored in appropriate bulk containers, or allowed to infiltrate back to the aquifer. No collected groundwater should be discharged until it is proven to meet the adopted criteria.

Discharge Monitoring Period (Weekly to Fortnightly)

After the Trial-Run Period, and subject to statutory authority approval, treated water may be discharged directly to the stormwater system. A weekly sampling frequency will be adopted for four weeks. The sampling program will involve the collection of one system discharge (i.e. treated) sample (as a minimum), to be analysed for the target parameters of concern, to confirm the system is functioning as intended.

After four weeks, the weekly sampling frequency may be extended to fortnightly monitoring for a month and then monthly for the remaining duration of dewatering, provided the analytical monitoring results indicate the treated water quality consistently meets the adopted criteria. If this is not achieved and contingency measures have been implemented, weekly monitoring will re-commence, until consistency in the discharged water results is re-established.

Dewatering contingency measures are detailed in **Section 6** and should be implemented where groundwater results exceed the adopted criteria for any one monitoring event. Any changes to the sampling frequency are to be determined by the appointed environmental consultant.

All laboratory analytical results for the water samples must be retained, to be made available upon request by Council and/or WaterNSW. The Site Manager and Dewatering Contractor / Water Treatment Specialist should seek advice from the Environmental Consultant prior to deviating from any of the above monitoring requirements, to ensure the quality of discharged groundwater is not compromised.

5.2.3 Reporting of Water Quality Results

Dewatering management procedures and monitoring results will be reviewed by the appointed Environmental Consultant to ensure that the treatment procedures are effective, and that the discharge waters are in compliance with the adopted criteria (**Section 5**). Discharge water quality reporting will be required as follows:

- A summary report will be prepared upon completion of the *Pre-Dewatering Groundwater Quality Assessment*. The report will be submitted to the Site Manager, Dewatering Contractor / Water Treatment Specialist and Council upon request.
- Interim Monitoring Reports will be prepared upon receipt of laboratory data for each round of water quality monitoring for the discharged waters. The interim reports will detail the sampling methods and procedures, and will provide a comparison of historic and current results obtained from the site, against the adopted criteria and shall corrective actions and recommendations based on the results, where required.
- Following completion of dewatering activities, a Dewatering Completion Report will be prepared by the appointed Environmental Consultant, and must include copies of all analytical results and interim monitoring reports issued during the dewatering period. A clear statement will be made regarding the overall quality of groundwater discharged in

comparison to the acceptable quality standards. The final report will be submitted to Council and Water NSW.

Reporting of Other Information

The Site Manager must keep records of cumulative discharge volume and treatment methods / chemicals. In addition, any periods of dewatering stoppage should also be recorded.

5.3 Water Treatment

The need for treatment is not as yet confirmed, although the current baseline data (**Section 3.2**) suggests that pH, turbidity and petroleum hydrocarbons (e.g. oil and grease) may be of concern. This will be determined by the pre-dewatering quality assessment, as outlined in **Section 5.2.2**.

Should treatment be required, EI suggests that the selection and design of the preferred treatment system is made by the Dewatering Contractor / Water Treatment Specialist, in collaboration with the appointed Environmental Consultant. Alternative and/or additional treatment options will be implemented, if necessary, depending on which parameters are found to exceed the DWC.

The design and installation of the preferred system should consider:

- A treatment tank with minimum capacity capable of containing the expected inflow for the basement excavation (as described in **Section 4**);
- Groundwater filtration to reduce fine particulates;
- Automated in-line chemical dosing systems for the addition of buffering solutions and coagulants for the management of water pH and other parameters, which may be required from time to time, as described in **Section 6** *Dewatering Contingencies*;
- Groundwater treatment to reduce concentrations of TPH (if required; e.g. granular activated carbon filtration, or coalescing plate separation);
- Spare retention tank(s) to provide additional residence time and sedimentation, in the case that non-compliant water quality is identified during routine monitoring, triggering temporary redirection of discharge while adjustments to the water treatment system are being implemented; and
- A means of monitoring flow rate to enable the accurate determination of total discharge volume.

The water treatment system should be installed, tested and operational prior to the commencement of dewatering, to ensure that only treated water that meets the adopted quality criteria is discharged to storm water.

System Maintenance

The groundwater treatment system(s) must be regularly maintained by the Dewatering Contractor / Water Treatment Specialist. Maintenance must include:

- Regular cleaning and or replacement of the geo-fabric filters within the retention tanks; and
- Regular removal of sediment from the retention tanks by an appropriately-licensed waste contractor.

6. SITE MANAGEMENT CONTROLS

6.1 Deviations from this Plan

The Site Manager should seek advice from the Environmental Consultant whenever deviation from the agreed monitoring program is considered. To ensure the monitoring data set and the early warning objectives of the DMP are not compromised, variations will only be considered where technical justification exists, and any deviations that may be accepted will be documented within the corresponding reports, and must include all justifications for the variation accepted.

6.2 Contact Details for Key Personnel

Once the relevant personnel have been appointed, their names and contact information must be clearly displayed on-site, within the site office. An example format is as follows:

Site Manager	Name: Company:	Mobile phone: Email:
Dewatering Contractor	Name: Company:	Mobile phone: Email:
Water Treatment Specialist	Name: Company:	Mobile phone: Email:
Environmental Consultant (Water Quality Expert)	Name: Company:	Mobile phone: Email:
Geotechnical Engineer	Name: Company:	Mobile phone: Email:

6.3 Summary of Specific Activities

The appointed contractors and/or Site Manager will be responsible for ensuring that the following activities (requirements) are undertaken during the dewatering program:

- Maintain erosion and sediment control measures in a functioning condition, until all earthwork activities are completed.
- Perform daily visual inspection of stormwater diversions and sediment / erosion control devices, ensuring they are operating effectively and at full capacity.
- Implement appropriate remedial measures where any controls or devices are not functioning effectively or are inappropriate.
- Collate records and comments on the condition of existing erosion and run-off controls (drains, silt fences, catch drains etc.), dewatering procedures and test results, and any site instructions issued to sub-contractors to undertake remedial works.
- Maintain rainfall data (to be filed on site).
- Confirm that the water collected from the dewatering process is free of building waste, litter, paint and paint wastes, oil and grease and fuel products.
- Reporting any incidents of poor drainage or uncontrolled discharge.

- Recording all daily inspection reports, environmental incidents and controlled discharge volumes, which may be reviewed during any environmental audit performed on the site.
- Submit all laboratory analytical reports, including relevant quality control data, to the client (or the delegated environmental consultant), so that the performance of the water quality treatment can be assessed and periods of uncompliant discharge minimised.
- Should dewatering samples give results that do not comply with the discharge criteria (and/or any other Council and WaterNSW requirements), corrective measures with subsequent retesting and re-inspection will be required. Where treated groundwater is deemed unsatisfactory for discharge to the asset, the dewatering process must be immediately interrupted and alternative treatment and/or discharge options must be considered.

6.4 Vibration, Noise, and Odour Management

The following vibration, noise and odour risks must not occur during dewatering:

- Excessive vibration and noise levels associated with site plant / dewatering equipment; and
- Odours released from collected groundwater, which may pose a risk to human health and/or the aesthetic condition of the environment.

It is the responsibility of the Site Manager to ensure appropriate management of vibration, noise and odour during dewatering operations. Appropriate management methodologies include:

- Undertaking dilapidation surveys of neighbouring buildings, in accordance with potential for impacts in final design type.
- All sub-contractors to work only within defined hours set by the DA conditions.
- All reasonable steps shall be taken to muffle and acoustically baffle all plant and equipment. Noise and vibration levels generated by site works must be within the limits set by the DA conditions, the site specific environmental management plan and the *Protection of Environmental Operation Act 1997*.
- Give consideration to the noise emission of plant/equipment prior to its selection/mobilisation to site.
- Schedule the use of noisy equipment at the least-sensitive time of day.
- Situate noisy equipment at the greatest distance from the noise-sensitive area, or orient the equipment so that noise emissions are directed away from sensitive areas, to achieve the maximum attenuation of noise.
- Where there are several noisy pieces of equipment, schedule operations to minimise cumulative impacts.
- Keep equipment well maintained.
- Ensure engine shrouds (acoustic linings) are installed (where feasible).

6.5 Dewatering Contingencies

Contingent actions for scenarios that may arise during dewatering are detailed in **Table 6-1**.

Table 6-1 Mitigation Measures for Potential Dewatering Issues

Anticipated Problem	Corrective Actions
Water Quality Criteria Non-Compliance	
Water Quality Criteria Exceedance Laboratory analytical report for any monitoring event reveals that the quality of treated discharge water does not satisfy the adopted criteria detailed in **Section 5**.	Immediate action must be taken to halt the release of water into stormwater system, where water quality is found not to meet the adopted criteria detailed in **Section 5**. Discharge of water must be suspended to enable the following procedure to be implemented: 1) Water will be redirected to the spare retention basin; 2) A water sample will then be sent to the laboratory for confirmation analysis for the non-compliant parameter(s) on an express (24hr) results turn-around basis; 3) Should the analytical result for the confirmation sample show that the previously non-compliant parameter(s) is/are now meet the adopted criteria, the treated water outlet may be redirected to the stormwater onsite; 4) Should the analytical result for the confirmation sample show that the discharge water quality does not comply with the adopted criteria, the environmental consultant / water treatment specialist will be required to modify the water treatment system, in order to achieve compliant discharge water quality. Collection of further treated water samples will be required to confirm the effectiveness of the modifications; 5) After laboratory confirmation that the revised treated water quality complies with criteria, extracted groundwater may be re-directed to the stormwater onsite; and 6) Weekly monitoring of treated discharge water quality monitoring will be required, until such time that contaminant concentrations are within the adopted criteria values for three consecutive sampling events. Once this is achieved, fortnightly monitoring may be reinstated. **Note:** It may be necessary to have collected waters removed by a licensed wastewater contractor, should quantities exceed the on-site capacity for temporary storage.
Visible and Olfactory Impacts Visual and/or olfactory anomalies (e.g. change in water colour, turbidity, odour, presence of oil / grease) are observed in extracted groundwater	Similar to the above procedure (Steps 1 to 6) treated water will be redirected to an alternative retention vessel, while the treatment system is adjusted. It may be necessary to have collected waters removed by a licensed wastewater contractor, should retained quantities exceed the on-site capacity for temporary storage. The contractor is to seek advice from a suitably experienced environmental consultant in regard to the additional assessment and treatment that may be required for any observed changes to water appearance or detectable odours. In accordance with Council's Contaminated Land Policy, no nuisance odours are to be detected at any site boundary during the dewatering stage. Should odour emissions be detected at a site boundary, the following measures will be implemented: 1. Stop work, to allow odour to subside. 2. Monitor ambient air across the site and boundaries with a portable photo-ionisation detector (PID). 3. Implement control measures, including respirators for on-site workers, use of odour suppressants and wetting down of excavated material.

Anticipated Problem	Corrective Actions
	4. Notify the occupants of adjoining premises regarding odour issues. Notification should be in writing, providing the contact details of the responsible site personnel. 5. Record logs for volatile emissions and odours.
Repeated Criteria Exceedances After three non-compliances for discharge water quality	Retain extracted water on-site in spare retention basin(s) and appropriate bulk containers, until it can be removed by a licensed waste contractor. Determine an alternative discharge method, if necessary, updating the DMP accordingly.
Groundwater Take Non-Compliance	
Excessive Extraction Daily discharge rate is greater than expected and it is apparent that the projected total groundwater extraction volume will be exceeded	Advise the appointed environmental consultant and determine the cause of the increased dewatering rate. If reduction in dewatering rate cannot be implemented, WaterNSW should be contacted to review options, which may include a combination of: ▪ Temporary retention of tail water on-site in appropriate bulk containers for subsequent removal by a licensed wastewater contractor; ▪ Aquifer re-injection after obtaining regulatory approval; and/or ▪ Fast-tracking of construction works to complete dewatering sooner than the scheduled timeframe.
System Performance Issues	
Dewatering system failures	Ensure that spare equipment parts (where practical) are on hand. Ensure that the failed equipment can be serviced by site personnel or an appointed contractor who can rapidly report to site when needed.
Power outages	Ensure that a backup generator is readily available. In this event, an assessment across the site and surrounding sites should also be completed in order to identify whether any other lights and electrical equipment are working so to identify if the issue is site specific or if it is across a whole area. In addition to having the back-up generator running, the contractor should also seek advice from an electrician in regard to the additional assessment and repairs that may be required.
Unexpected contaminants found during monitoring	Contact the appointed environmental consultant / water quality expert and collect samples for analysis, to assess the identified concentrations against relevant criteria. If the contaminant is found to exceed the adopted criteria for the 95% species protection for fresh waters (ANZG, 2018), follow the corrective actions corresponding to *Water Quality Criteria Exceedance* above. Expand the adopted criteria accordingly.
Chemical / fuel spill and leaks from machinery	Stop earthworks, notify site project manager. Use accessible soil or appropriate absorbent material to absorb the spill (if practicable). Stockpile the impacted material in a secure location, on builder's plastic to avoid cross contamination. Inspect groundwater and note any visual and/or changes. The contractor should seek advice from environmental consultant in regard to assessment and treatment requirements.
Excessive rainfall	Ensure sediment and surface water controls are in place and functioning as intended, as per the designs provided in the site specific Soil and Water Management Plan. Any non-conformance is to be documented and rectified. The capacity of the dewatering system to dispose larger volumes of water should be evaluated and if required, a temporary system should be utilised following correspondence with Council / WaterNSW and the environmental consultant.

Anticipated Problem	Corrective Actions
Excessive noise	Identify the source and isolate if possible. Modify the actions of the source or erect temporary noise barriers if required.
Impacts on the stability of adjacent structures	Contractor to seek advice from qualified professional (such as a geotechnical engineer and/or structural consultant) in regards to the additional assessment and monitoring that may be required.
Complaint management	Notify client, project manager(s) and environmental consultant (if required) following complaint, and report complaint as per management procedures. Implement control measures to address reason of complaint (if possible) and notify complainant of outcome.

7. MANAGEMENT SUMMARY

The requirements of this Dewatering Management Plan are summarised in **Table 7-1**.

Table 7-1 Dewatering Management Summary

Item	Requirement / Procedure
Objective of DMP	Ensure that the proposed dewatering operations do not impact on the quality of the receiving surface waters (i.e. at the point of groundwater discharge). Where necessary, groundwater will be treated to achieve an acceptable water quality prior to discharge: ▪ *See **Section 3**for groundwater conditions.* ▪ *See **Section 5** for groundwater quality discharge requirements.* ▪ *See **Section 5.3** for groundwater treatment options.* Provide comment on groundwater level changes that occur during dewatering: ▪ *See **Section 5** for summary of groundwater take assessment and dewatering drawdown impacts.* ▪ *Refer to **Appendix B** for groundwater take assessment model.*
Person Responsible for Implementation of DMP	The Site Manager will be responsible for ensuring the implementation of appropriate treatment of extracted groundwater, as outlined in this document.
Operation Policy	To ensure that all extracted groundwater is effectively treated prior to discharge to the stormwater system.
Pre-Dewatering Groundwater Assessment	As set out in **Section 5.2.2**, a representative sample(s) must be collected prior to any dewatering. It will be tested for the identified potential contaminants, to provide baseline groundwater quality data and review the proposed discharge water quality requirements.
Discharge Performance Criteria	All groundwater designated for discharge is to meet (at the very least) the criteria outlined within **Section 5**.
Implementation Strategy	All extracted groundwater will be monitored and treated (where necessary). On-going testing to be performed, to confirm water quality meets the adopted criteria prior to release into the stormwater onsite. Additional treatment / waste disposal to be undertaken if the criteria values are not met.
Monitoring Requirements	As specified in **Section 5.2**: 1. Initial Assessment = Prior to dewatering 2. Trial-Run Period = Twice per week* 3. Discharge Monitoring Period = Weekly for a month to fortnightly for a month then monthly* **provided the analytical results indicate treated water quality meets the adopted criteria, or risks are considered to be significantly low. Should analytical results exceed the adopted discharge criteria, contingencies listed in **Section 6** must be followed.*
Auditing	The appointed environmental consultant (water quality expert) will undertake weekly audits during the Trial-Run Period (if required), and monthly audits during the Monitoring Period, to ensure that all discharges to the stormwater onsite comply with the criteria specified in **Section 5**.

Item	Requirement / Procedure
Reporting	The contractor responsible for dewatering will keep records of all monitoring and laboratory test results, as well as quantities of treatment agents applied during the dewatering process. All records should be made available for inspection onsite during the construction phase.
Corrective Actions	As specified in the contingency measures, outlined in **Section 6**.

8. STATEMENT OF LIMITATIONS

This plan has been prepared for the exclusive use of Emag Pty Ltd, whom is the only intended beneficiary of EI's work. The scope of work completed for the purpose of this plan is limited to that agreed with Emag Pty Ltd.

No other party should rely on the document without the prior written consent of EI, and EI undertakes no duty, or accepts any responsibility or liability, to any third party who purports to rely upon this document without EI's approval.

EI has used a degree of care and skill ordinarily exercised in drafting similar plans by reputable members of the environmental industry in Australia, as at the date of this document. No other warranty, expressed or implied, is made or intended. Each section must be read in conjunction with the whole of this plan, including its appendices.

EI's professional opinions are reasonable and based on its judgment, experience, training and results from analytical data. EI may also have relied upon information provided by the client and other third parties to prepare this document, some of which may not have been verified by EI.

EI's professional opinions contained in this document are subject to modification if additional information is obtained through further investigation or observations. In some cases, further testing and analysis may be required, which may result in a further report with different conclusions.

Should you have any queries regarding this plan, please do not hesitate to contact EI.

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ABBREVIATIONS

AHD	Australian Height Datum
ANZECC	Australian and New Zealand Environment Conservation Council
ANZG	Australian and New Zealand Guidelines
ASS	Acid Sulfate Soils
BGL	Below Ground Level
BTEX	Benzene, Toluene, Ethyl benzene, Xylene
DMP	Dewatering Management Plan
DP	Deposited Plan
DWC	Discharge Water Criteria
EC	Electrical Conductivity
EI	EI Australia
GTA	Groundwater Take Assessment
km	Kilometres
LEP	Local Environmental Plan
LGA	Local Government Area
LOR	Limit of Reporting (limit of reporting for respective analytical method; see PQL)
m	metres
ML	Megalitres
mg/L	Milligrams per litre
µg/L	Micrograms per litre
µS/cm	Microsiemens per Centimetre
NATA	National Association of Testing Authorities
NTU	Nepholemetric Turbidity Units
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyls
pH	Potential Hydrogen (a measure of the acidity or basicity of an aqueous solution)
PQL	Practical Quantitation Limit (quantitative limit for respective analytical method)
RL	Reduced / Relative Level
SWL	Standing Water Level
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons (superseded term equivalent to TRH)
TRH	Total Recoverable Hydrocarbons (non-specific analysis of organic compounds)
TSS	Total Suspended Solids
VOC	Volatile Organic Compounds

Appendix A - Figures

eiaustralia
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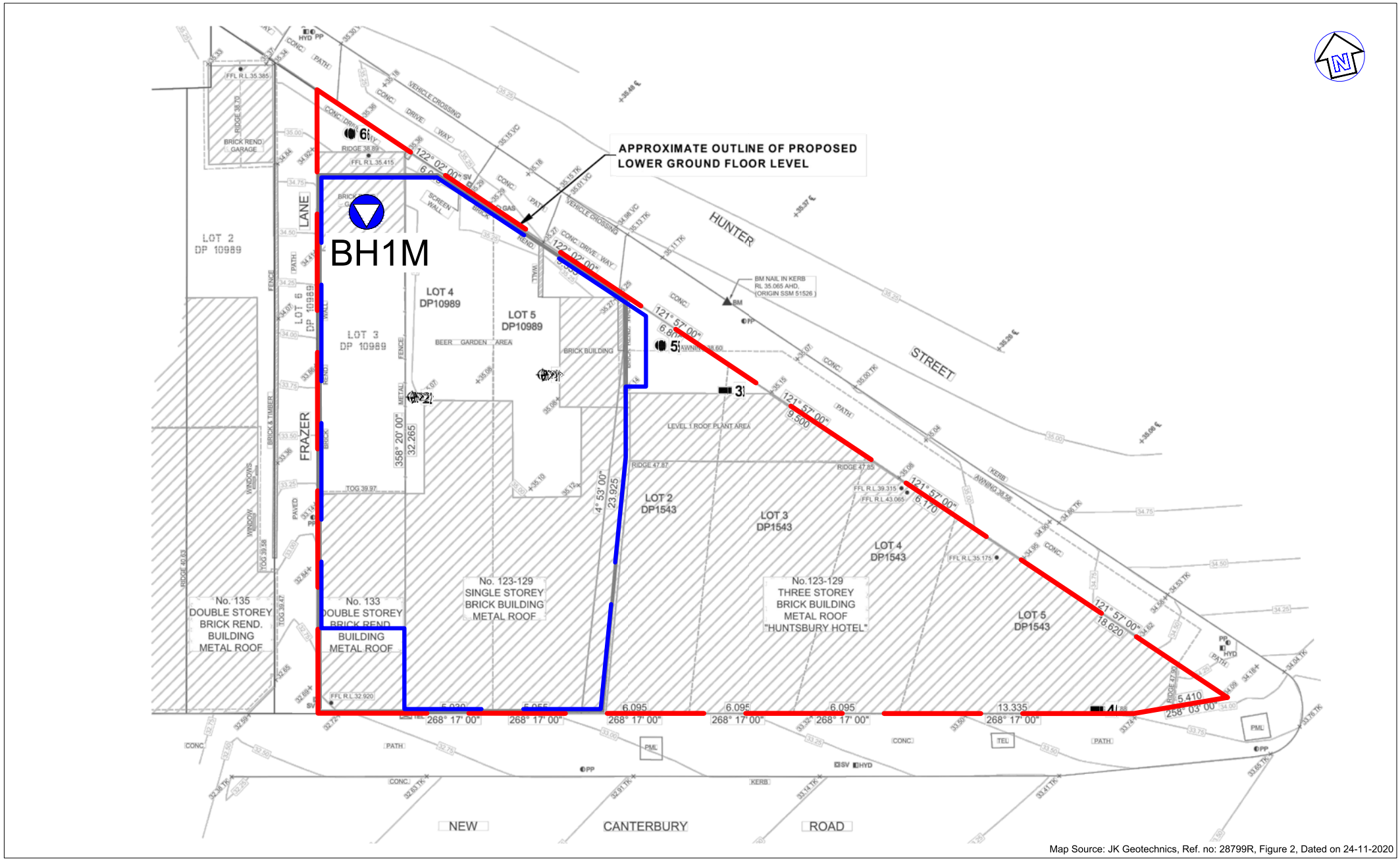
Suite 6.01, 55 Miller Street, PYRMONT 2009
Ph (02) 9516 0722 Fax (02) 9518 5088

Drawn:	A.N.
Approved:	E.S.
Date:	11-11-21
Scale:	Not To Scale

Emag Apartments Pty Ltd
Dewatering Management Plan
123-133 New Canterbury Road, Lewisham, NSW
Site Locality Plan

Figure:
1

Project: E25390.E16_Rev0



Map Source: JK Geotechnics, Ref. no: 28799R, Figure 2, Dated on 24-11-2020

LEGEND (Note: All locations are approximate)

- Site boundary
- Proposed basement boundary
- Monitoring well location/Borehole location

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Ph (02) 9516 0722 Fax (02) 9518 5088

Drawn:	A.N.
Approved:	E.S.
Date:	19-11-21

Emag Apartments Pty Ltd
Dewatering Management Plan
123-133 New Canterbury Road, Lewisham, NSW
Sampling Location Plan

Figure: 2

Project: E25390.E16_Rev2

Appendix B -Tables

Table B1 – Physicochemical Results for Groundwater sampled in October 2021 **E25390.E16 Lewisham**

Sample Identification	Date Sampled	Physicochemical Properties				
		Electrical Conductivity (µS/cm)	Total Dissolved Solids (mg/L)	pH	Turbidity NTU	Hardness (mg/CaCO3/L)
GW_BH1M-1	29/10/2021	1,000	760	5.9	2,900	34
Guidelines						
Adopted Water Criteria		NR	NR	6.5 - 8.5 [1]	10 [2]	NR

Notes:
All values are mg/L unless stated otherwise

[1] In the absence of ANZG 2018 criteria for any specific water quality parameter, alternative criteria will be applied where relevant. ANZECC & ARMCANZ 2000 are applied in the case of pH
(Ref. Table 3.2.2 Default trigger values for physical and chemical stressors for south-east Australia for slightly disturbed ecosystems. Adopted range is between Lowerland River minimum and Marine maximum value)

[2] In the absence of ANZG 2018 criteria in relation to Turbidity, the ANZECC & ARMCANZ 2000 criteria are applied, Ref. Table 3.3.3 Ranges of default trigger values for lowland rivers (the upper range turbidity value).

Value is above or below the adopted Criteria

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Table B2 - Analytical Results for Groundwater sampled in October 2021

Sample Identification	Date	Metals									BTEX					PAHs		TPHs *		VOCs			Total Cyanide	Total Phenols
		Al	As	Cd	Total Cr	Cu	Pb	Ni	Zn	Hg	Benzene	Toluene	Ethylbenzene	m + p-xylene	o-xylene	Benzo(a)pyrene	Naphthalene	Volatile TRH (C_6 -<C_{10})	Semi-volatile (C_{10}-C_{40})	cis-1,2-dichloroethene	Trichloroethene (TCE)	1,2,4-trimethylbenzene		
GW_BH1M-1	29/10/2021	60	<1	<0.1	<1	2	<1	1	29	<0.1	<0.5	<0.5	<0.5	<1	<0.5	<0.1	<0.11	<50	1500	<0.5	<0.5	<0.5	<4	<10
Guidelines																								
Adopted Water Quality Criteria		80 [3]	94 [3]	0.7 [1]	Cr(III) 27 Cr(VI) 4.4	13 [4]	4.4	7	150 [4]	0.1 [1]	500	180 [2]	80	275 [2]	350 [2]	0.1	50	No visible sheen or film on the surface or the water sample		60	330		4	400

Notes:

All values are µg/L unless stated otherwise

* Total petroleum hydrocarbon (TPH) results were analysed using Silica Gel clean-up method to report only detected fuel product impacts

Note 1 Discharge water quality performance criteria are the ANZG 2018 95% Marine Trigger Values (the 99% Marine Trigger Values are applied for the bio-accumulative parameters cadmium and mercury), unless otherwise indicated.

Note 2 ANZG 2018 Marine Trigger Values at the unknown level of protection are applied, where ANZG 2018 95% Marine Trigger Values are not available, including chlorinated VOCs.

Note 3 The ANZG 2018 90% Freshwater Trigger Values for disturbed ecosystems are applied for the indicated parameters, in the absence of marine water criteria.

Note 4 For the metals copper and zinc which are naturally above the ANZG 2018 95% Marine Trigger Values under regional (background) conditions, performance criteria are set at one order of magnitude higher than the ANZG 2018 Trigger Value.

Note 5 In the absence of ANZG 2018 criteria for cis- and trans-1,2-Dichloroethene, the Aust. Gov. Australian Drinking Water Guidelines 6, 2011, Vers. 3.5, August 2018, are applied.

↑↓ Raised/ lowered Limit of Reporting

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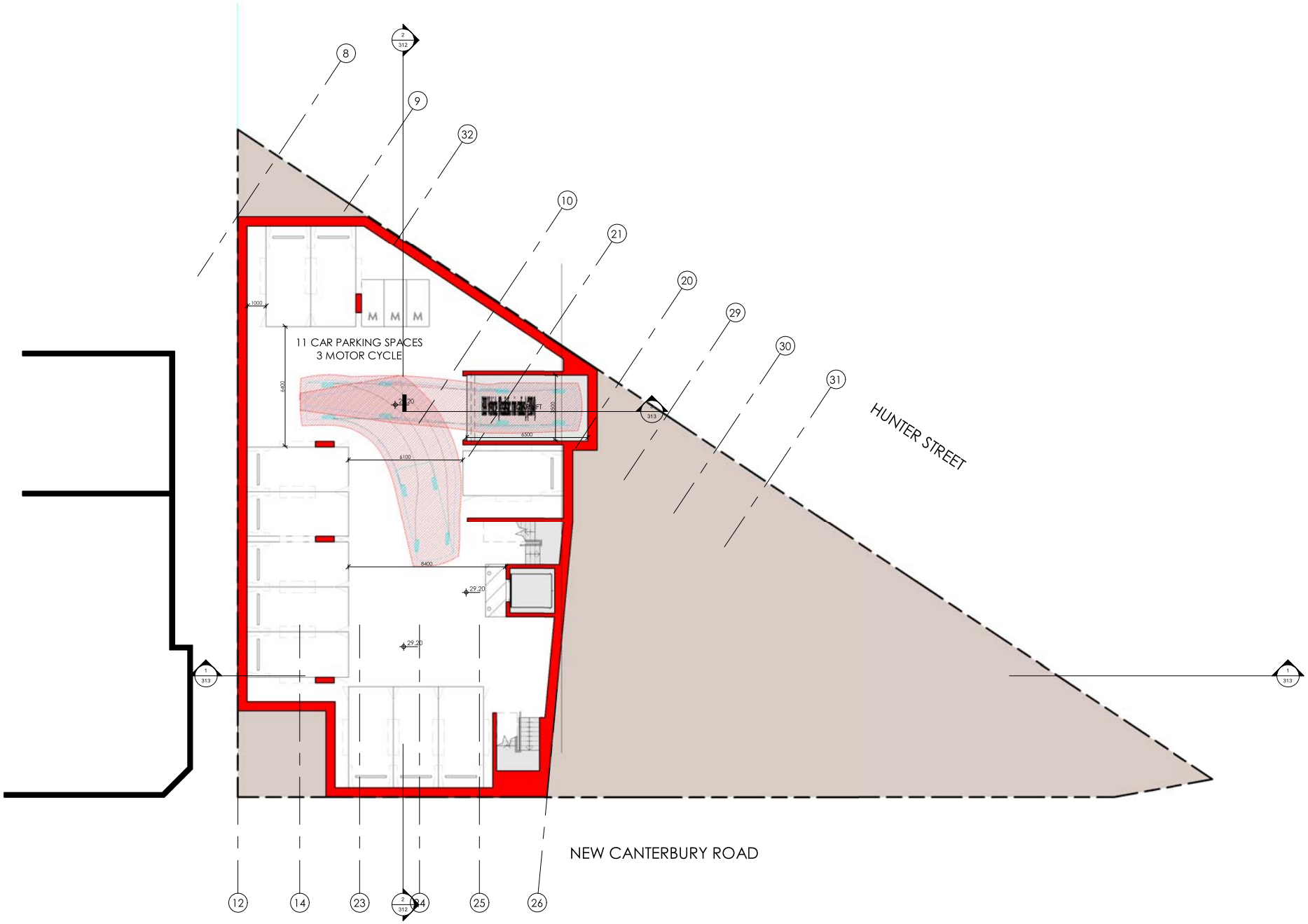
Appendix C – Proposed Development Plans



BASEMENT FLOOR PLAN

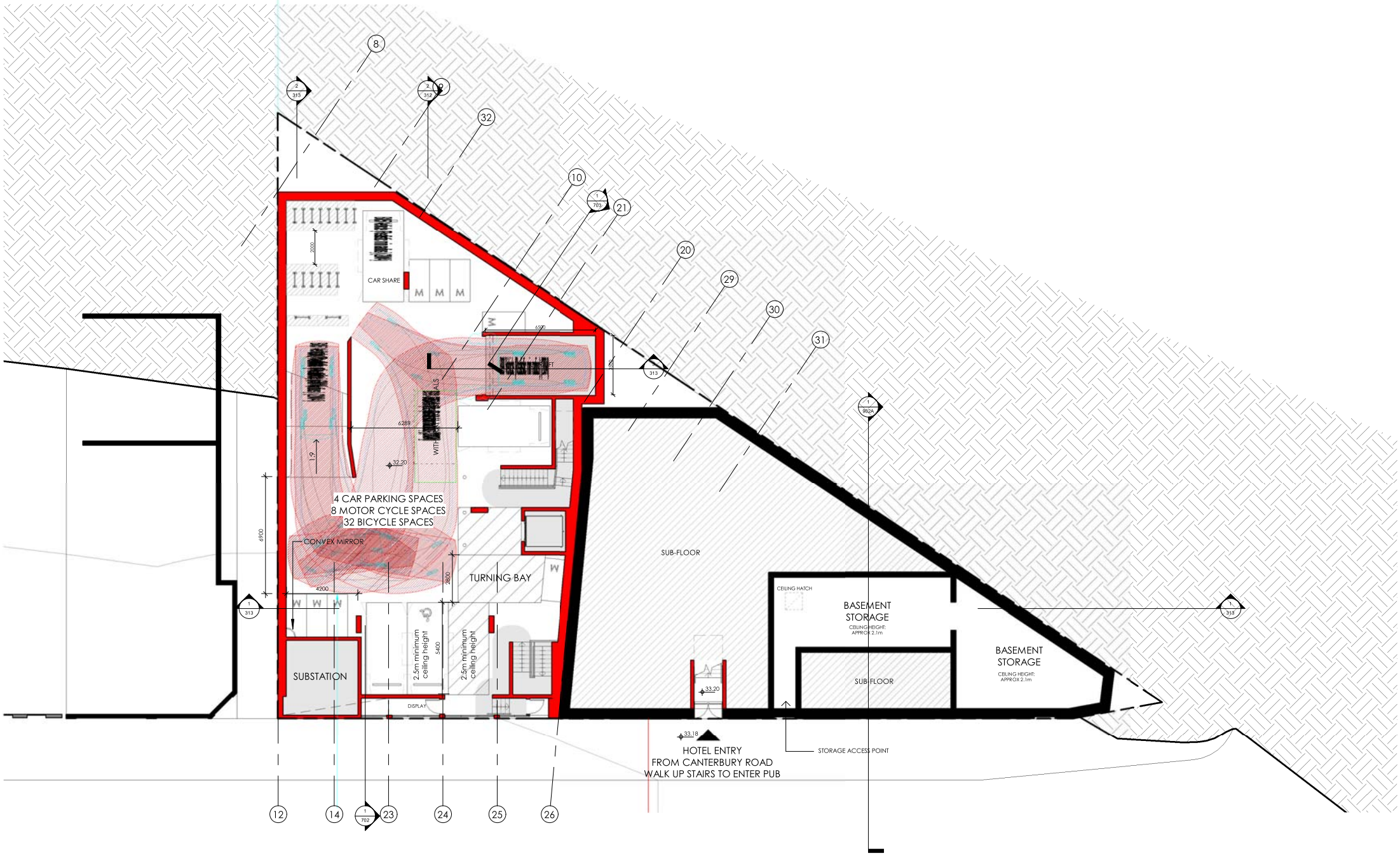
ISSUE	DATE	DESCRIPTION
F	16/11/2021	AMENDED PLANS FOR COURT
E	04/11/2021	AMENDED PLANS FOR COURT
D	21/10/2021	AMENDED PLANS FOR COURT
C	08/10/2021	AMENDED PLANS FOR COURT
B	07/09/2021	AMENDED PLANS FOR COURT
A	18/01/2021	DEVELOPMENT APPLICATION

TIER ARCHITECTS

N

CLIENT	EMAG APARTMENTS	DATE 04/11/2021	SCALE A3 1 : 200
PROJECT	123-133 New Canterbury Rd LEWISHAM	DRAWN PV	CHECKED NN
TITLE	BASEMENT FLOOR PLAN	DWG No -	300

DO NOT SCALE. USE FIGURED DIMENSIONS IN PREFERENCE TO SCALED. CHECK ALL DIMENSIONS ON SITE BEFORE FABRICATION.



LOWER GROUND FLOOR PLAN

WALL TO BE RETAINED
WALL TO BE REMOVED
NEW WALL

SINGLE ROOM
DOUBLE ROOM
MANAGERS ROOM
COMMUNAL INDOOR AREA
HOTEL/BAR
PARKING/SERVICES

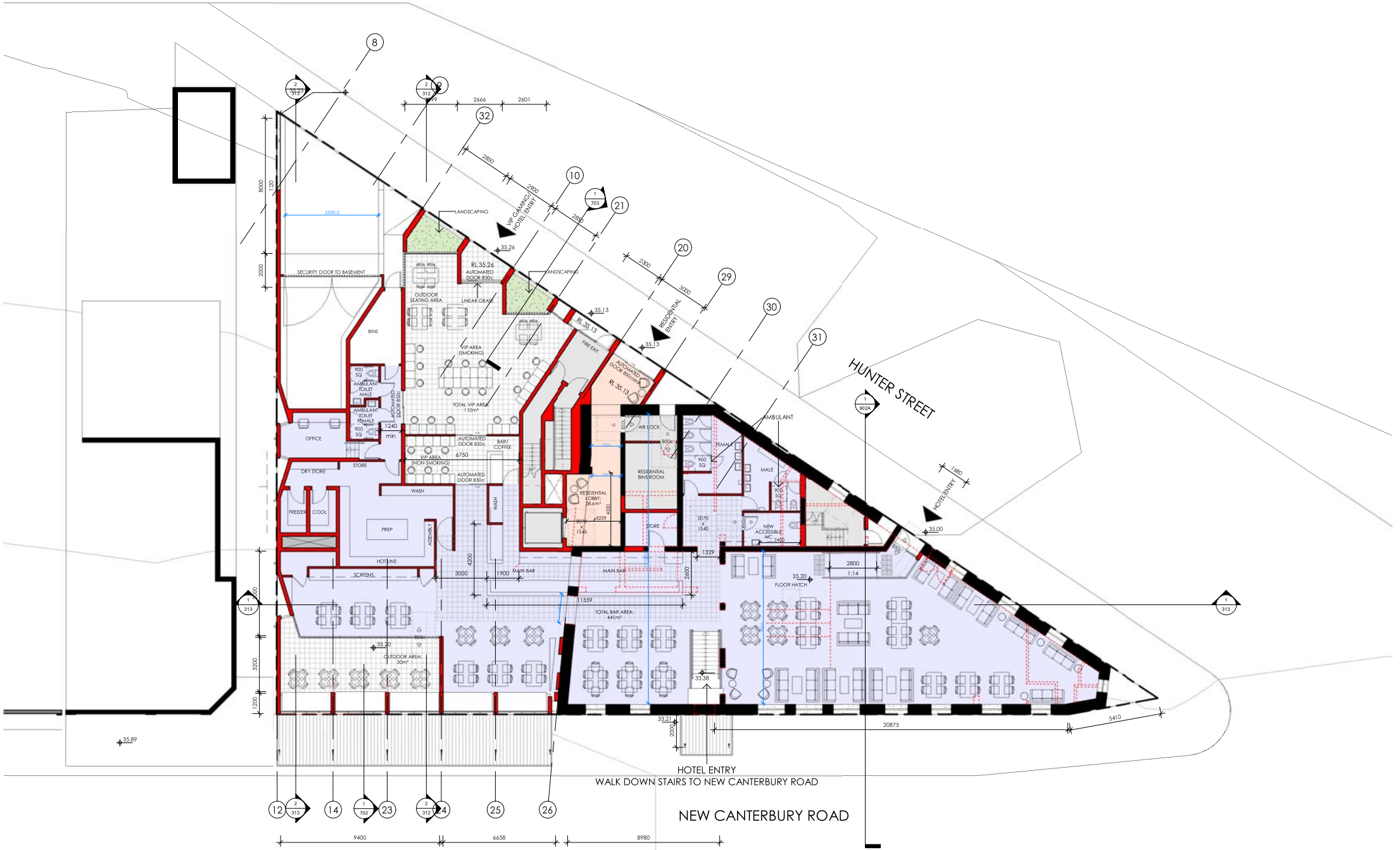
ISSUE	DATE	DESCRIPTION
F	16/11/2021	AMENDED PLANS FOR COURT
E	04/11/2021	AMENDED PLANS FOR COURT
D	21/10/2021	AMENDED PLANS FOR COURT
C	08/10/2021	AMENDED PLANS FOR COURT
B	07/09/2021	AMENDED PLANS FOR COURT
A	18/01/2021	DEVELOPMENT APPLICATION

TIER ARCHITECTS

N

CLIENT	EMAG APARTMENTS	DATE 04/11/2021	SCALE indicated
PROJECT	123-133 New Canterbury Rd LEWISHAM	DRAWN PV	CHECKED NN
TITLE	LOWER GROUND FLOOR PLAN	DWG No -	301

DO NOT SCALE. USE FIGURED DIMENSIONS IN PREFERENCE TO SCALED. CHECK ALL DIMENSIONS ON SITE BEFORE FABRICATION.



GROUND FLOOR PLAN

WALL TO BE RETAINED
WALL TO BE REMOVED
NEW WALL

SINGLE ROOM
DOUBLE ROOM
MANAGERS ROOM
COMMUNAL INDOOR AREA
HOTEL/BAR
PARKING/SERVICES

ISSUE	DATE	DESCRIPTION
F	16/11/2021	AMENDED PLANS FOR COURT
E	04/11/2021	AMENDED PLANS FOR COURT
D	21/10/2021	AMENDED PLANS FOR COURT
C	08/10/2021	AMENDED PLANS FOR COURT
B	07/09/2021	AMENDED PLANS FOR COURT
A	18/01/2021	DEVELOPMENT APPLICATION

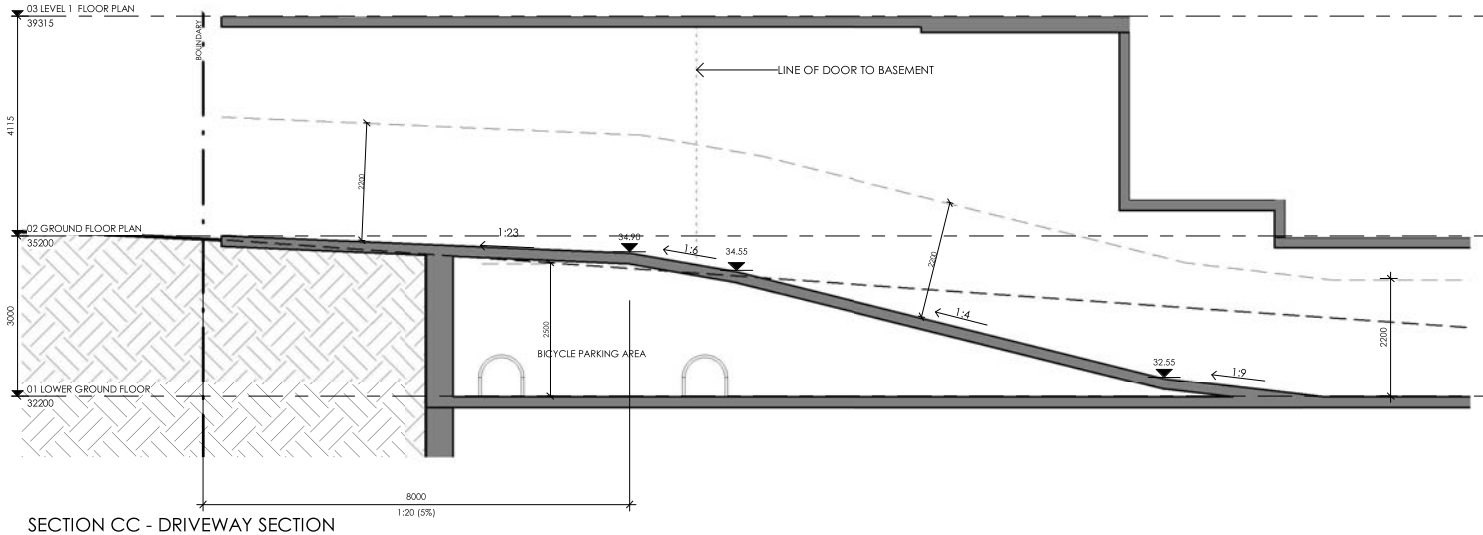
TIER ARCHITECTS

N

CLIENT	EMAG APARTMENTS	DATE 04/11/2021	SCALE indicated
PROJECT	123-133 New Canterbury Rd LEWISHAM	DRAWN PV	CHECKED NN
TITLE	GROUND FLOOR PLAN	DWG No -	302

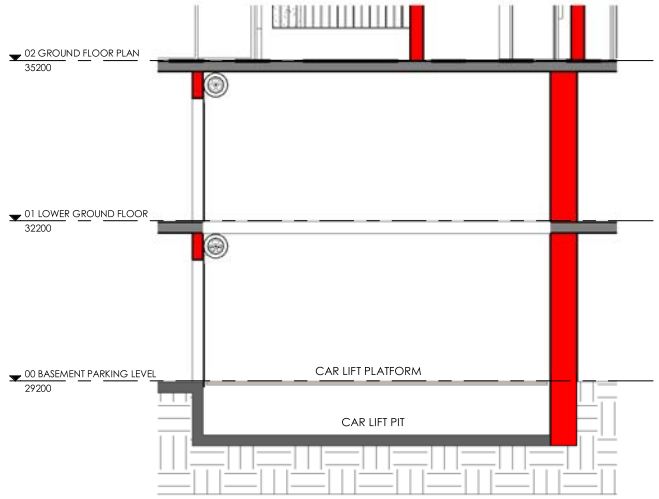
1 SECTION BB

1 : 200



2 SECTION CC - DRIVEWAY SECTION

1 : 100



3 CAR LIFT SECTION

1 : 100

SECTIONS

SINGLE ROOM
DOUBLE ROOM
MANAGERS ROOM
COMMUNAL INDOOR AREA
HOTEL/BAR
PARKING/SERVICES

ISSUE	DATE	DESCRIPTION
F	16/11/2021	AMENDED PLANS FOR COURT
E	04/11/2021	AMENDED PLANS FOR COURT
D	21/10/2021	AMENDED PLANS FOR COURT
C	08/10/2021	AMENDED PLANS FOR COURT
B	07/09/2021	AMENDED PLANS FOR COURT
A	18/01/2021	DEVELOPMENT APPLICATION

TIER ARCHITECTS

CLIENT	EMAG APARTMENTS	DATE 04/11/2021	SCALE indicated
PROJECT	123-133 New Canterbury Rd LEWISHAM	DRAWN PV	CHECKED NN
TITLE	SECTIONS	DWG No -	313

DO NOT SCALE. USE FIGURED DIMENSIONS IN PREFERENCE TO SCALED. CHECK ALL DIMENSIONS ON SITE BEFORE FABRICATION.

Appendix D – Groundwater Take Assessment

19 November 2021
E25390.G12_Rev1

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Mr Joe Ghosn
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Groundwater Take Assessment
123-133 New Canterbury Road, Lewisham NSW

1. INTRODUCTION

At the request of Mr Joe Ghosn of Emag Apartments Pty Ltd (the Client), EI Australia (EI) has prepared this Groundwater Take Assessment (GTA) for the proposed development at 123-133 New Canterbury Road, Lewisham NSW (the Site).

The following documents were used to assist in the preparation of this GTA:

- Architectural Drawings prepared by Tier Achitects – Project No. 19068, Drawing No. 100 to 102, 300 to 302, 307 to 313 and 316 to 321, Rev. F, Dated 16 November 2021;
- Geotechnical Investigation (GI) Report prepared by JK Geotechnics (JK) – Ref. 28799Rrpt rev2, Dated 4 December 2020; and
- Unreferenced site survey plan from the above referenced report by JK.

Based on the provided documents, EI understands that the proposed development involves partial demolition of existing site structures and the addition of a four-storey mixed use building with two basement level within the western portion of the site. The basement will require a Finished Floor Level (FFL) of RL 29.2m AHD. A Bulk Excavation Level (BEL) of RL 29.0m has been assumed, which includes allowance for the construction of the basement slab. To achieve the BEL, excavation depths of up to 6.4m Below Existing Ground Level (BEGL) have been estimated. Locally deeper excavations may be required for footings, service trenches, crane pads and lift overrun pits.

1.1. ASSESSMENT OBJECTIVES

The objective of this GTA is to provide an estimation of the groundwater inflow volumes that require pumping out during the construction and operational stage of the development and to assess if tanking is required for control of groundwater inflows into the proposed basement during and after construction.

2. SITE DESCRIPTION

2.1. REGIONAL GEOLOGY

Information on regional sub-surface conditions, referenced from the Department of Mineral Resources Geological Map Sydney 1:100,000 Geological Series Sheet 9030 (DMR 1991) indicates the site is underlain by Ashfield Shale, which consists of black to dark grey shale and laminite.

3. SITE MODEL

3.1. SUBSURFACE CONDITIONS AND PERMEABILITY

To supplement the borehole data for the site, EI has augered one borehole (BH1M) on 19 October 2021 within the northern area of the site down to a depth of 3.5m BEGL (RL 31.9m). The following subsurface conditions were encountered within BH1M:

- CONCRETE: Concrete pavement of 100mm thickness
- FILL: Gravelly silty clay / clayey silt fill from 0.1m to 0.9m BEGL
- RESIDUAL SOIL: Silty Clay from 0.9m up to termination depth of 3.5m BEGL.

To assess the permeability of the subsurface materials, a monitoring well was installed within BH1M shortly after augering with screen interval 1.5m to 3.5m (i.e. screening the residual soil). A rising head test was carried out within the monitoring well on 29 October 2021.

For the purpose of this GTA, the subsurface conditions from BH1M and the GI report by JK have been adopted. Groundwater and subsurface condition data from boreholes have been used to find the average depth and thickness of each unit as well as the average depth of groundwater across the site. A summary of the average depths of each soil unit and permeability values is shown below in **Table 1**.

Table 1 Subsurface Conditions and Adopted Permeability Values

Unit	Material [2]	Modelled Depth to top of Unit (m BEGL) [1]	Modelled RL of top of Unit (m AHD) [1]	Modelled Thickness (m)	Material Description[2]	Adopted Permeability, k_x (m/s) [3]	Anisotropic permeability k_y / k_x
1	Fill	0	35.4	1.0	Silty Clay Fill	7.0×10^{-7}	1.0
2	Residual Soil	1.0	34.4	6.4	Silty Clay		0.7

Note 1 Approximate depth and level at the time of our assessment. Depths and levels may vary across the site.
Note 2 For more detailed descriptions of the subsurface conditions, reference should be made to the GI by JK.
Note 3 The permeability of the Unit 2 Residual Soil was based on EI's pump-out test results, while the permeability of Unit 1 is based on published data from Look (2009)

3.2. GROUNDWATER OBSERVATIONS

The groundwater levels were measured within the monitoring wells installed by EI as given in **Table 2** below. Groundwater was not encountered during auger drilling of BH1M, BH5 and BH6.

Table 2 Summary of Groundwater Levels

Monitoring Well / Borehole ID	Date of Observation	Approximate Depth to Groundwater (m BEGL)	Approximate RL of Groundwater (m AHD)
BH1M	29/10/2021	2.0 (monitoring well)	33.4
BH5	6/10/2015	3.3 (after rock coring)	31.7
BH6	6/10/2015	Not encountered	Not encountered

3.3. SHORING SYSTEM

At the time of writing this report, no shoring designs were provided. Therefore, based on the subsurface conditions and recommendations for basement excavation retention by JK, a soldier / contiguous pile wall has been assumed in our model. Therefore, the excavation face has also been modelled as fully drained.

This assessment does not assess the overall stability of the shoring system, which will need to be designed to satisfy stability considerations by the structural engineer. If the assumptions or shoring design adopted in the model differ from the final design, this report should be revised.

4. GROUNDWATER TAKE ASSESSMENT

4.1. ASSESSMENT OF GROUNDWATER TAKE DURING CONSTRUCTION PHASE

Seepage analysis for groundwater inflows following excavation has been undertaken using SEEP/W, a finite element groundwater seepage analysis software. This model estimates the volume of water which will be required to be dewatered during the construction of the basement and until the dewatering is turned off.

For the purpose of this modelling, it has been assumed that:

- The ground surface is level across the site and lies at an elevation of RL 35.4m AHD.
- The subsurface conditions were horizontal along the site. Permeability values presented in **Table 1** above were adopted for each unit.
- Dewatering will be required for 6 months, which is the assumed time required to complete the basement construction.
- The perimeter shoring wall will be free draining;
- Temporary dewatering will be undertaken within the basement excavation down to 1m below the assumed BEL of RL 29.0m AHD to allow for construction of localised excavations (e.g. footings) in dry conditions.
- An external design groundwater level of RL 93.4m AHD (which is based on the highest observed groundwater level in BH1M) was assumed to be constant at 20m away from the shoring wall.
- A “No-Flow” boundary is defined along the symmetric line (the centre of the excavation) at 15m from the perimeter shoring walls.
- The shoring walls surrounding the basement excavation has a total length of about 90m.

The SEEP/W model is presented in **Appendix A.** The estimated groundwater inflow rate into the basement is provided in **Table 3** below:

Table 3 Summary of Groundwater Seepage Analysis Results

Inflow per m length of perimeter wall (m^3/sec)	Inflow per m length of perimeter wall (m^3/day)	Inflow into excavation (m^3/day)	Total Inflow during construction (ML/180 days)
8.76×10^{-7}	0.0757	6.81	1.23

5. CONCLUSIONS AND COMMENTS

Based on the findings of this report and within the limitations of available data, EI concludes that:

- Construction phase groundwater take will be approximately 1.23 ML / 180 days based on the following assumptions:
  - Continuous dewatering will take place 1m below BEL, and construction of the basement will take 180 days;
  - The perimeter shoring wall is assumed to be free draining;
  - Groundwater inflow rates are constant during the excavation and construction of the basement;
- Considering the above, we expect that control of groundwater inflows into the basement during and permanently after construction will be feasible using a suitably designed sump and pump system and hence tanking of basement structures will not be required for groundwater control.
- Should any design or construction conditions differ from that adopted in this report; this assessment report should be reviewed and updated as required.

6. LIMITATIONS

The advice and parameters presented in this Groundwater Take Assessment are for preliminary assessment of the expected groundwater take based upon the proposed development and encountered site conditions of the previous GI. This report is not a dewatering management plan. This assessment does not assess the overall stability of the assumed shoring system. The shoring system will need to be designed to satisfy stability, piping, founding and groundwater cut-off considerations by the structural engineer. A suitably qualified dewatering contractor should be engaged to confirm dewatering requirements.

Your attention is drawn to the document "Important Information", attached as **Appendix B** at the end of this letter report. The statements presented in this document are intended to advise you of what your realistic expectations of this report should be. The document is not intended to reduce the level of responsibility accepted by EI, but rather to ensure that all parties who may rely on this report are aware of the responsibilities each assumes in so doing.

This letter report was prepared by EI for the sole use of Emag Apartments Pty Ltd for the particular project and purpose described. No responsibility is accepted for the use of any part of this letter report in any other content or for any other purpose.

EI has used a degree of care, skill and diligence normally exercised by consulting engineers in similar circumstances and locality and has relied on the accuracy of information provided by Emag Apartments Pty Ltd. No other warranty expressed or implied is made or intended.

EI retains the property of this letter report subject to payment of all fees due for the services. The letter report shall not be reproduced except in full and with prior written permission by EI.

7. CLOSURE

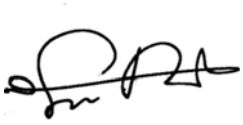
Please do not hesitate to contact the undersigned should you have any questions.

For and on behalf of:
EI AUSTRALIA

Authors

David Saw
Geotechnical Engineer

Technical Reviewer

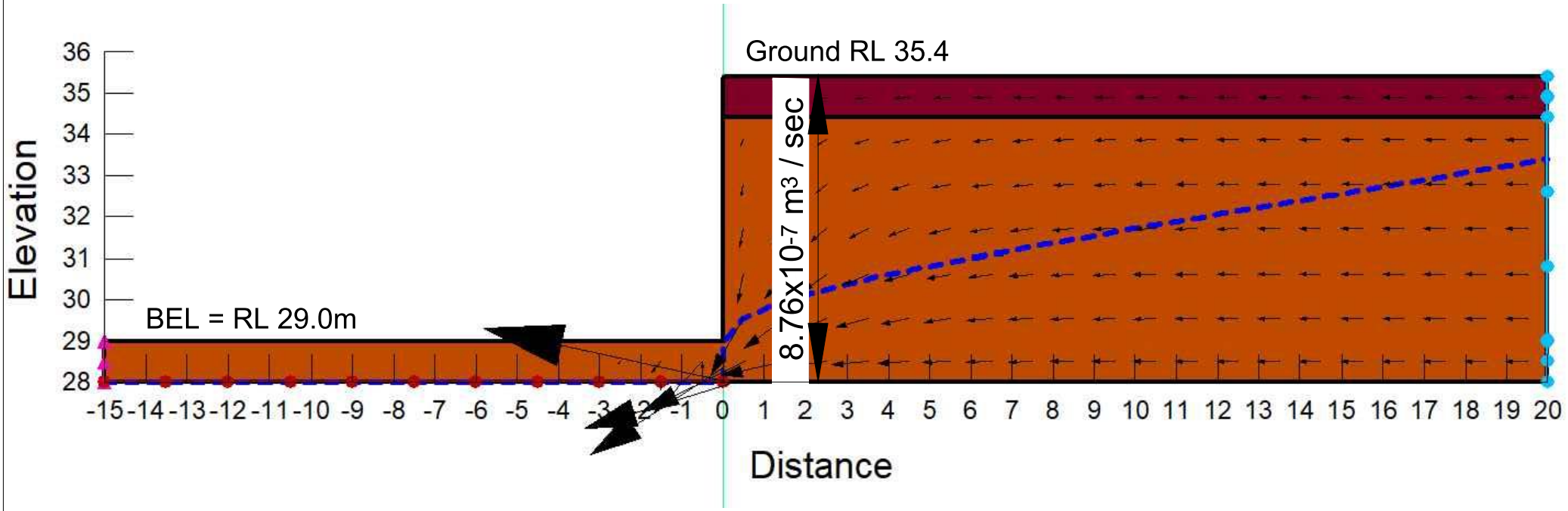


Sam Kazemi
Geotechnical Engineer

Attachments: Appendix A – Seep/W Model
Appendix B – Important Information

APPENDIX A

Seep/W Model



LEGEND

eiaustralia
Contamination | Remediation | Geotechnical
Suite 6.01, 55 Miller Street, PYRMONT 2009
Ph (02) 9516 0722 Fax (02) 9518 5088

Drawn:	D.S.
Approved:	S.Ka.
Date:	19/11/2021

Emag Apartments Pty Ltd
Groundwater Take Assessment
123-133 New Canterbury Road, Lewisham NSW
SeepW Results

Appendix: A

Project: E25390.G12_Rev1

APPENDIX B

Important Information

Important Information

SCOPE OF SERVICES

The geotechnical report ("the report") has been prepared in accordance with the scope of services as set out in the contract, or as otherwise agreed, between the Client And EI Australia ("EI"). The scope of work may have been limited by a range of factors such as time, budget, access and/or site disturbance constraints.

RELIANCE ON DATA

EI has relied on data provided by the Client and other individuals and organizations, to prepare the report. Such data may include surveys, analyses, designs, maps and plans. EI has not verified the accuracy or completeness of the data except as stated in the report. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations ("conclusions") are based in whole or part on the data, EI will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to EI.

GEOTECHNICAL ENGINEERING

Geotechnical engineering is based extensively on judgment and opinion. It is far less exact than other engineering disciplines. Geotechnical engineering reports are prepared for a specific client, for a specific project and to meet specific needs, and may not be adequate for other clients or other purposes (e.g. a report prepared for a consulting civil engineer may not be adequate for a construction contractor). The report should not be used for other than its intended purpose without seeking additional geotechnical advice. Also, unless further geotechnical advice is obtained, the report cannot be used where the nature and/or details of the proposed development are changed.

LIMITATIONS OF SITE INVESTIGATION

The investigation programme undertaken is a professional estimate of the scope of investigation required to provide a general profile of subsurface conditions. The data derived from the site investigation programme and subsequent laboratory testing are extrapolated across the site to form an inferred geological model, and an engineering opinion is rendered about overall subsurface conditions and their likely behaviour with regard to the proposed development. Despite investigation, the actual conditions at the site might differ from those inferred to exist, since no subsurface exploration program, no matter how comprehensive, can reveal all subsurface details and anomalies. The engineering logs are the subjective interpretation of subsurface conditions at a particular location and time, made by trained personnel. The actual interface between materials may be more gradual or abrupt than a report indicates.

SUBSURFACE CONDITIONS ARE TIME DEPENDENT

Subsurface conditions can be modified by changing natural forces or man-made influences. The report is based on conditions that existed at the time of subsurface exploration. Construction operations adjacent to the site, and natural events such as floods, or ground water fluctuations, may also affect subsurface conditions, and thus the continuing adequacy of a geotechnical report. EI should be kept appraised of any such events, and should be consulted to determine if any additional tests are necessary.

VERIFICATION OF SITE CONDITIONS

Where ground conditions encountered at the site differ significantly from those anticipated in the report, either due to natural variability of subsurface conditions or construction activities, it is a condition of the report that EI be notified of any variations and be provided with an opportunity to review the recommendations of this report. Recognition of change of soil and rock conditions requires experience and it is recommended that a suitably experienced geotechnical engineer be engaged to visit the site with sufficient frequency to detect if conditions have changed significantly.

REPRODUCTION OF REPORTS

 Where information from the accompanying report is to be included in contract documents or engineering specification for the project, the entire report should be included in order to minimize the likelihood of misinterpretation from logs.

REPORT FOR BENEFIT OF CLIENT

The report has been prepared for the benefit of the Client and no other party. EI assumes no responsibility and will not be liable to any other person or organisation for or in relation to any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report (including without limitation matters arising from any negligent act or omission of EI or for any loss or damage suffered by any other party relying upon the matters dealt with or conclusions expressed in the report). Other parties should not rely upon the report or the accuracy or completeness of any conclusions and should make their own inquiries and obtain independent advice in relation to such matters.

OTHER LIMITATIONS

EI will not be liable to update or revise the report to take into account any events or emergent circumstances or fact occurring or becoming apparent after the date of the report.

Appendix E – Documentation for Groundwater Sample GW_BH1M-1

source: Sydney.pdf page: 1 SGS Ref: SE225299_COC

E-MAILED
1/11/21 @ 1.58pm

Sheet 1 of 1

Site: 123-133 New Canterbury Rd, Lewisham

Project No: E25390

Laboratory: SGS Australia
Unit 16, 33 Maddox Street,
ALEXANDRIA NSW 2015
P: 02 8594 0400 F: 02 8594 0499

Sample ID	Laboratory ID	Container Type	Sampling Date	Sampling Time	Sample Matrix: SOIL	WATER	0.45 µm field filtered	OTHER	Analysis: HM ^ /TRH/BTEX/PAHs OCP/OP/PCB/Asbestos	HM ^ /TRH/BTEX/PAHs	HM ^ /TRH/BTEX	BTEX	VOCs & Phenolic Compounds	Asbestos	Asbestos Quantification	Excavated Natural Material (ENM) Suite	Dewatering Suite	pH / pH peroxide	sPOCAS	Chromium Reducible Sulfur (CrS)	PFAS	pH / CEC (cation exchange)	pH / EC (electrical conductivity) / TDS	Sulphate / Chloride	Turbidity & Hardness	Cyanide	TCLP HM B / PAH
GW_BH1M-1	1	P/VC/ZNC	29/10/21	pm		X	X						X				X						X		X	X	

Comments
HM ^
Arsenic
Cadmium
Chromium
Copper
Lead
Mercury
Nickel
Zinc

HM B
Arsenic
Cadmium
Chromium
Lead
Mercury
Nickel

Dewatering Suite
pH & EC
TDS / TDU
Hardness
Total Cyanide
Metals (Al, As, Cd, Cr, Cu, Pb, Hg, Ni, Zn)
TRH (F1, F2, F3, F4)
BTEX
PAH

SGS EHS Sydney COC
SE225299

LABORATORY TURNAROUND
- [ ] Standard
- [ ] 24 Hours
- [ ] 48 Hours
- [x] 72 Hours
- [ ] Other_____

Container Type:
J = solvent washed, acid rinsed, Tefton sealed glass jar
S = solvent washed, acid rinsed glass bottle
P = natural HDPE plastic bottle
VC = glass vial, Tefton Septum
ZLB = Zip-Lock Bag

Investigator: I attest that these samples were collected in accordance with standard EI field sampling procedures.

Report with EI Waste Classification Table [ ]

Sampler's Name (EI):	Received by (SGS):
Print: Manish Chandra	Print: George Zhi
Signature:	Signature:
Date: 1/11/21	Date: 29/10/21 @ 5:15pm

Sampler's Comments:
please
cc
Andrew.Ibrahim@eiaustralia.com.au

IMPORTANT:
Please e-mail laboratory results to: lab@eiaustralia.com.au

eiaustralia
Contamination | Remediation | Geotechnical
Suite 6.01, 55 Miller Street,
PYRMONT NSW 2009
Ph: 9516 0722
lab@eiaustralia.com.au

COC June 2021 FORM v 5 - SGS

SAMPLE RECEIPT ADVICE

SE225299

CLIENT DETAILS

Contact	Andrew Ibrahim
Client	EI AUSTRALIA
Address	SUITE 6.01 55 MILLER STREET PYRMONT NSW 2009
Telephone	61 2 95160722
Facsimile	(Not specified)
Email	andrew.ibrahim@eiaustralia.com.au
Project	**E25390 123-133 New Canderbury Rd, Lemsha**
Order Number	**E25390**
Samples	1

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
Samples Received	Fri 29/10/2021
Report Due	Wed 3/11/2021
SGS Reference	**SE225299**

SUBMISSION DETAILS

This is to confirm that 1 sample was received on Friday 29/10/2021. Results are expected to be ready by COB Wednesday 3/11/2021. Please quote SGS reference SE225299 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice Bricks
Samples received in correct containers	Yes	Sample counts by matrix	1 Water
Date documentation received	1/11/2021 @1:58 PM	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	16°C	Sufficient sample for analysis	Yes
Turnaround time requested	Three Days		

Unless otherwise instructed, water and bulk samples will be held for one month from date of report, and soil samples will be held for two months.

COMMENTS

SAMPLE RECEIPT ADVICE

SE225299

CLIENT DETAILS

Client EI AUSTRALIA

Project E25390 123-133 New Canderbury Rd, Lemsha

SUMMARY OF ANALYSIS

No.	Sample ID	Conductivity and TDS by Calculation - Water	PAH (Polynuclear Aromatic Hydrocarbons) in Water	pH in water	Total Dissolved Solids (TDS) in water	Total Phenolics in Water	TRH (Total Recoverable Hydrocarbons) in Water	VOCs in Water	Volatile Petroleum Hydrocarbons in Water
001	GW_BH1M-1	1	23	1	1	1	9	78	7

CONTINUED OVERLEAF

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction .

SAMPLE RECEIPT ADVICE

SE225299

CLIENT DETAILS

Client EI AUSTRALIA

Project E25390 123-133 New Canderbury Rd, Lemsha

SUMMARY OF ANALYSIS

No.	Sample ID	Mercury (dissolved) in Water	Metals in Water (Dissolved) by ICPOES	Total Cyanide in water by Discrete Analyser	Trace Metals (Dissolved) in Water by ICPMS	Turbidity
001	GW_BH1M-1	1	3	1	8	1

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction .

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

Contact	Andrew Ibrahim
Client	EI AUSTRALIA
Address	SUITE 6.01 55 MILLER STREET PYRMONT NSW 2009
Telephone	61 2 95160722
Facsimile	(Not specified)
Email	andrew.ibrahim@eiaustralia.com.au
Project	**E25390 123-133 New Canderbury Rd, Lemsha**
Order Number	**E25390**
Samples	1

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE225299 R0**
Date Received	29/10/2021
Date Reported	3/11/2021

COMMENTS

Accredited for compliance with ISO/IEC 17025 - Testing. NATA accredited laboratory 2562(4354).

SIGNATORIES

Akheeqar BENIAMEEN
Chemist

Bennet LO
Senior Chemist

Dong LIANG
Metals/Inorganics Team Leader

Shane MCDERMOTT
Inorganic/Metals Chemist

Teresa NGUYEN
Organic Chemist

VOCs in Water [AN433] Tested: 2/11/2021

PARAMETER	UOM	LOR	GW_BH1M-1 WATER - 29/10/2021 SE225299.001
Benzene	µg/L	0.5	<0.5
Toluene	µg/L	0.5	<0.5
Ethylbenzene	µg/L	0.5	<0.5
m/p-xylene	µg/L	1	<1
o-xylene	µg/L	0.5	<0.5
Total Xylenes	µg/L	1.5	<1.5
Total BTEX	µg/L	3	<3
Naphthalene	µg/L	0.5	<0.5
Dichlorodifluoromethane (CFC-12)	µg/L	5	<5
Chloromethane	µg/L	5	<5
Vinyl chloride (Chloroethene)	µg/L	0.3	<0.3
Bromomethane	µg/L	10	<10
Chloroethane	µg/L	5	<5
Trichlorofluoromethane	µg/L	1	<1
Acetone (2-propanone)	µg/L	10	<10
Iodomethane	µg/L	5	<5
1,1-dichloroethene	µg/L	0.5	<0.5
Acrylonitrile	µg/L	0.5	<0.5
Dichloromethane (Methylene chloride)	µg/L	5	<5
Allyl chloride	µg/L	2	<2
Carbon disulfide	µg/L	2	<2
trans-1,2-dichloroethene	µg/L	0.5	<0.5
MtBE (Methyl-tert-butyl ether)	µg/L	2	<2
1,1-dichloroethane	µg/L	0.5	<0.5
Vinyl acetate	µg/L	10	<10
MEK (2-butanone)	µg/L	10	<10
cis-1,2-dichloroethene	µg/L	0.5	<0.5
Bromochloromethane	µg/L	0.5	<0.5
Chloroform (THM)	µg/L	0.5	<0.5
2,2-dichloropropane	µg/L	0.5	<0.5
1,2-dichloroethane	µg/L	0.5	<0.5
1,1,1-trichloroethane	µg/L	0.5	<0.5
1,1-dichloropropene	µg/L	0.5	<0.5
Carbon tetrachloride	µg/L	0.5	<0.5
Dibromomethane	µg/L	0.5	<0.5
1,2-dichloropropane	µg/L	0.5	<0.5
Trichloroethene (Trichloroethylene,TCE)	µg/L	0.5	<0.5
2-nitropropane	µg/L	100	<100
Bromodichloromethane (THM)	µg/L	0.5	<0.5
MIBK (4-methyl-2-pentanone)	µg/L	5	<5
cis-1,3-dichloropropene	µg/L	0.5	<0.5
trans-1,3-dichloropropene	µg/L	0.5	<0.5
1,1,2-trichloroethane	µg/L	0.5	<0.5
1,3-dichloropropane	µg/L	0.5	<0.5
Dibromochloromethane (THM)	µg/L	0.5	<0.5
2-hexanone (MBK)	µg/L	5	<5
1,2-dibromoethane (EDB)	µg/L	0.5	<0.5
Tetrachloroethene (Perchloroethylene,PCE)	µg/L	0.5	<0.5
1,1,1,2-tetrachloroethane	µg/L	0.5	<0.5
Chlorobenzene	µg/L	0.5	<0.5
Bromoform (THM)	µg/L	0.5	<0.5
cis-1,4-dichloro-2-butene	µg/L	1	<1
Styrene (Vinyl benzene)	µg/L	0.5	<0.5
1,1,2,2-tetrachloroethane	µg/L	0.5	<0.5
1,2,3-trichloropropane	µg/L	0.5	<0.5
trans-1,4-dichloro-2-butene	µg/L	1	<1

VOCs in Water [AN433] Tested: 2/11/2021 (continued)

PARAMETER	UOM	LOR	GW_BH1M-1 WATER - 29/10/2021 SE225299.001
Isopropylbenzene (Cumene)	µg/L	0.5	<0.5
Bromobenzene	µg/L	0.5	<0.5
n-propylbenzene	µg/L	0.5	<0.5
2-chlorotoluene	µg/L	0.5	<0.5
4-chlorotoluene	µg/L	0.5	<0.5
1,3,5-trimethylbenzene	µg/L	0.5	<0.5
tert-butylbenzene	µg/L	0.5	<0.5
1,2,4-trimethylbenzene	µg/L	0.5	<0.5
sec-butylbenzene	µg/L	0.5	<0.5
1,3-dichlorobenzene	µg/L	0.5	<0.5
1,4-dichlorobenzene	µg/L	0.3	<0.3
p-isopropyltoluene	µg/L	0.5	<0.5
1,2-dichlorobenzene	µg/L	0.5	<0.5
n-butylbenzene	µg/L	0.5	<0.5
1,2-dibromo-3-chloropropane	µg/L	0.5	<0.5
1,2,4-trichlorobenzene	µg/L	0.5	<0.5
Hexachlorobutadiene	µg/L	0.5	<0.5
1,2,3-trichlorobenzene	µg/L	0.5	<0.5
Total VOC	µg/L	10	<10

Volatile Petroleum Hydrocarbons in Water [AN433] Tested: 2/11/2021

PARAMETER	UOM	LOR	GW_BH1M-1 WATER - 29/10/2021 SE225299.001
TRH C6-C9	µg/L	40	<40
Benzene (F0)	µg/L	0.5	<0.5
TRH C6-C10	µg/L	50	<50
TRH C6-C10 minus BTEX (F1)	µg/L	50	<50

TRH (Total Recoverable Hydrocarbons) in Water [AN403] Tested: 2/11/2021

PARAMETER	UOM	LOR	GW_BH1M-1 WATER - 29/10/2021 SE225299.001
TRH C10-C14	µg/L	50	<50
TRH C15-C28	µg/L	200	**630**
TRH C29-C36	µg/L	200	**420**
TRH C37-C40	µg/L	200	**450**
TRH >C10-C16	µg/L	60	<60
TRH >C10-C16 - Naphthalene (F2)	µg/L	60	<60
TRH >C16-C34 (F3)	µg/L	500	**870**
TRH >C34-C40 (F4)	µg/L	500	**620**
TRH C10-C40	µg/L	320	**1500**

PAH (Polynuclear Aromatic Hydrocarbons) in Water [AN420] Tested: 2/11/2021

PARAMETER	UOM	LOR	GW_BH1M-1 WATER - 29/10/2021 SE225299.001
Naphthalene	µg/L	0.1	<0.1
2-methylnaphthalene	µg/L	0.1	<0.1
1-methylnaphthalene	µg/L	0.1	<0.1
Acenaphthylene	µg/L	0.1	<0.1
Acenaphthene	µg/L	0.1	<0.1
Fluorene	µg/L	0.1	<0.1
Phenanthrene	µg/L	0.1	<0.1
Anthracene	µg/L	0.1	<0.1
Fluoranthene	µg/L	0.1	<0.1
Pyrene	µg/L	0.1	<0.1
Benzo(a)anthracene	µg/L	0.1	<0.1
Chrysene	µg/L	0.1	<0.1
Benzo(b&j)fluoranthene	µg/L	0.1	<0.1
Benzo(k)fluoranthene	µg/L	0.1	<0.1
Benzo(b&j&k)fluoranthene	µg/L	0.2	<0.2
Benzo(a)pyrene	µg/L	0.1	<0.1
Indeno(1,2,3-cd)pyrene	µg/L	0.1	<0.1
Dibenzo(ah)anthracene	µg/L	0.1	<0.1
Benzo(ghi)perylene	µg/L	0.1	<0.1
Total PAH (18)	µg/L	1	<1

Total Phenolics in Water [AN289] Tested: 3/11/2021

PARAMETER	UOM	LOR	GW_BH1M-1 WATER - 29/10/2021 SE225299.001
Total Phenols	mg/L	0.05	<0.05

pH in water [AN101] Tested: 1/11/2021

PARAMETER	UOM	LOR	GW_BH1M-1 WATER - 29/10/2021 SE225299.001
pH**	pH Units	0.1	**5.9**

Conductivity and TDS by Calculation - Water [AN106] Tested: 1/11/2021

PARAMETER	UOM	LOR	GW_BH1M-1 WATER - 29/10/2021 SE225299.001
Conductivity @ 25 C	µS/cm	2	**1000**

Total Dissolved Solids (TDS) in water [AN113] Tested: 2/11/2021

PARAMETER	UOM	LOR	GW_BH1M-1 WATER - 29/10/2021 SE225299.001
Total Dissolved Solids Dried at 175-185°C	mg/L	10	**760**

Turbidity [AN119] Tested: 1/11/2021

PARAMETER	UOM	LOR	GW_BH1M-1 WATER - 29/10/2021 SE225299.001
Turbidity	NTU	0.5	**2900**

Total Cyanide in water by Discrete Analyser (Aquakem) [AN077/AN287] Tested: 2/11/2021

PARAMETER	UOM	LOR	GW_BH1M-1 WATER - 29/10/2021 SE225299.001
Total Cyanide	mg/L	0.004	<0.004

Metals in Water (Dissolved) by ICPOES [AN320] Tested: 2/11/2021

PARAMETER	UOM	LOR	GW_BH1M-1 WATER - 29/10/2021 SE225299.001
Calcium, Ca	mg/L	0.2	**6.4**
Magnesium, Mg	mg/L	0.1	**4.5**
Total Hardness by Calculation	mg CaCO3/L	1	**34**

Trace Metals (Dissolved) in Water by ICPMS [AN318] Tested: 2/11/2021

PARAMETER	UOM	LOR	GW_BH1M-1 WATER - 29/10/2021 SE225299.001
Aluminium, Al	µg/L	5	**60**
Arsenic, As	µg/L	1	<1
Cadmium, Cd	µg/L	0.1	<0.1
Chromium, Cr	µg/L	1	<1
Copper, Cu	µg/L	1	**2**
Lead, Pb	µg/L	1	<1
Nickel, Ni	µg/L	1	**1**
Zinc, Zn	µg/L	5	**29**

Mercury (dissolved) in Water [AN311(Perth)/AN312] Tested: 3/11/2021

PARAMETER	UOM	LOR	GW_BH1M-1 WATER - 29/10/2021 SE225299.001
Mercury	mg/L	0.0001	<0.0001

METHOD	METHODOLOGY SUMMARY
AN020	Unpreserved water sample is filtered through a 0.45µm membrane filter and acidified with nitric acid similar to APHA3030B.
AN077	Hydrogen cyanide is liberated from an acidified sample by distillation and purging with air. The hydrogen cyanide gas is then collected by passing it through a sodium hydroxide scrubbing solution. The scrubbing solution will then be analysed for cyanide by the appropriate method.
AN101	pH in Soil Sludge Sediment and Water: pH is measured electrometrically using a combination electrode (glass plus reference electrode) and is calibrated against 3 buffers purchased commercially. For soils, an extract with water is made at a ratio of 1:5 and the pH determined and reported on the extract. Reference APHA 4500-H+.
AN106	Conductivity and TDS by Calculation: Conductivity is measured by meter with temperature compensation and is calibrated against a standard solution of potassium chloride. Conductivity is generally reported as µmhos /cm or µS/cm @ 25°C. For soils, an extract with water is made at a ratio of 1:5 and the EC determined and reported on the extract, or calculated back to the as-received sample. Total Dissolved Salts can be estimated from conductivity using a conversion factor, which for natural waters, is in the range 0.55 to 0.75. SGS use 0.6. Reference APHA 2510 B.
AN106	Salinity may be calculated in terms of NaCl from the sample conductivity. This assumes all soluble salts present , measured by the conductivity, are present as NaCl.
AN113	Total Dissolved Solids: A well-mixed filtered sample of known volume is evaporated to dryness at 180°C and the residue weighed. Approximate methods for correlating chemical analysis with dissolved solids are available . Reference APHA 2540 C.
AN113	The Total Dissolved Solids residue may also be ignited at 550 C and volatile TDS (Organic TDS) and non-volatile TDS (Inorganic) can be determined.
AN119	Turbidity by Nepholometry: Small particles in a light beam scatter light at a range of angles. A turbidimeter measures this scatter and reports results compared to turbidity standards, in NTU. This procedure is not suitable for very dark coloured liquids or samples with high solids because light absorption causes artificially low light scatter and low turbidity. Reference APHA 2130B.
AN287	A buffered distillate or water sample is treated with chloramine/barbituric acid reagents and the intensity of the colour developed is proportional to the cyanide concentration by Aquakem DA .
AN289	Analysis of Total Phenols in Soil Sediment and Water: Steam distillable phenols react with 4-aminoantipyrine at pH 7.9±0.1 in the presence of potassium ferricyanide to form a coloured antipyrine dye analysed by Discrete Analyser. Reference APHA 5530 B/D.
AN311(Perth)/AN312	Mercury by Cold Vapour AAS in Waters: Mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500.
AN318	Determination of elements at trace level in waters by ICP-MS technique,, referenced to USEPA 6020B and USEPA 200.8 (5.4).
AN320	Metals by ICP-OES: Samples are preserved with 10% nitric acid for a wide range of metals and some non-metals. This solution is measured by Inductively Coupled Plasma. Solutions are aspirated into an argon plasma at 8000-10000K and emit characteristic energy or light as a result of electron transitions through unique energy levels. The emitted light is focused onto a diffraction grating where it is separated into components .
AN320	Photomultipliers or CCDs are used to measure the light intensity at specific wavelengths. This intensity is directly proportional to concentration. Corrections are required to compensate for spectral overlap between elements . Reference APHA 3120 B.
AN403	Total Recoverable Hydrocarbons: Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C6-C9, C10-C14, C15-C28 and C29-C36 and in recognition of the NEPM 1999 (2013), >C10-C16 (F2), >C16-C34 (F3) and >C34-C40 (F4). Where F2 is corrected for Naphthalene, the VOC data for Naphthalene is used.
AN403	Additionally, the volatile C6-C9/C6-C10 fractions may be determined by a purge and trap technique and GC/MS because of the potential for volatiles loss. Total Recoveerable Hydrocarbons - Silica (TRH-Silica) follows the same method of analysis after silica gel cleanup of the solvent extract. Aliphatic/Aromatic Speciation follows the same method of analysis after fractionation of the solvent extract over silica with differential polarity of the eluent solvents.
AN403	The GC/FID method is not well suited to the analysis of refined high boiling point materials (ie lubricating oils or greases) but is particularly suited for measuring diesel, kerosene and petrol if care to control volatility is taken. This method will detect naturally occurring hydrocarbons, lipids, animal fats, phenols and PAHs if they are present at sufficient levels, dependent on the use of specific cleanup/fractionation techniques. Reference USEPA 3510B, 8015B.

AN420	(SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols (etc) in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN433	VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC`s are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.

FOOTNOTES

*	NATA accreditation does not cover the performance of this service.	-	Not analysed.	UOM	Unit of Measure.
		NVL	Not validated.	LOR	Limit of Reporting.
**	Indicative data, theoretical holding time exceeded.	IS	Insufficient sample for analysis.	↑↓	Raised/lowered Limit of Reporting.
		LNR	Sample listed, but not received.		
***	Indicates that both * and ** apply.				

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received.
Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calculated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the " Total" LOR will be the sum of those two LORs.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

Results reported for samples tested under test methods with codes starting with ARS-SOP, radionuclide or gross radioactivity concentrations are expressed in becquerel (Bq) per unit of mass or volume or per wipe as stated on the report. Becquerel is the SI unit for activity and equals one nuclear transformation per second.
Note that in terms of units of radioactivity:

a. 1 Bq is equivalent to 27 pCi
b. 37 MBq is equivalent to 1 mCi

For results reported for samples tested under test methods with codes starting with ARS-SOP, less than (<) values indicate the detection limit for each radionuclide or parameter for the measurement system used. The respective detection limits have been calculated in accordance with ISO 11929.

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au/en-gb/environment-health-and-safety.

STATEMENT OF QA/QC PERFORMANCE

SE225299 R0

CLIENT DETAILS

Contact	Andrew Ibrahim
Client	EI AUSTRALIA
Address	SUITE 6.01 55 MILLER STREET PYRMONT NSW 2009
Telephone	61 2 95160722
Facsimile	(Not specified)
Email	andrew.ibrahim@eiaustralia.com.au
Project	**E25390 123-133 New Canderbury Rd, Lemsha**
Order Number	**E25390**
Samples	1

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE225299 R0**
Date Received	29 Oct 2021
Date Reported	03 Nov 2021

COMMENTS

All the laboratory data for each environmental matrix was compared to SGS' stated Data Quality Objectives (DQO). Comments arising from the comparison were made and are reported below.

The data relating to sampling was taken from the Chain of Custody document.
This QA/QC Statement must be read in conjunction with the referenced Analytical Report.
The Statement and the Analytical Report must not be reproduced except in full.

All Data Quality Objectives were met with the exception of the following:

Extraction Date	pH in water	1 item
	Turbidity	1 item
Analysis Date	pH in water	1 item
	Turbidity	1 item
Surrogate	PAH (Polynuclear Aromatic Hydrocarbons) in Water	1 item

SAMPLE SUMMARY

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice Bricks
Samples received in correct containers	Yes	Sample counts by matrix	1 Water
Date documentation received	1/11/2021 @1:58 PM	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	16°C	Sufficient sample for analysis	Yes
Turnaround time requested	Three Days		

HOLDING TIME SUMMARY

SE225299 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the

Conductivity and TDS by Calculation - Water

Method: ME-(AU)-[ENV]AN106

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
GW_BH1M-1	SE225299.001	LB235976	29 Oct 2021	29 Oct 2021	26 Nov 2021	01 Nov 2021	26 Nov 2021	01 Nov 2021

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
GW_BH1M-1	SE225299.001	LB236150	29 Oct 2021	29 Oct 2021	26 Nov 2021	03 Nov 2021	26 Nov 2021	03 Nov 2021

Metals in Water (Dissolved) by ICPOES

Method: ME-(AU)-[ENV]AN320

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
GW_BH1M-1	SE225299.001	LB236023	29 Oct 2021	29 Oct 2021	27 Apr 2022	02 Nov 2021	27 Apr 2022	02 Nov 2021

PAH (Polynuclear Aromatic Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
GW_BH1M-1	SE225299.001	LB236026	29 Oct 2021	29 Oct 2021	05 Nov 2021	02 Nov 2021	12 Dec 2021	02 Nov 2021

pH in water

Method: ME-(AU)-[ENV]AN101

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
GW_BH1M-1	SE225299.001	LB235976	29 Oct 2021	29 Oct 2021	30 Oct 2021	01 Nov 2021†	30 Oct 2021	01 Nov 2021†

Total Cyanide in water by Discrete Analyser (Aquakem)

Method: ME-(AU)-[ENV]AN077/AN287

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
GW_BH1M-1	SE225299.001	LB236050	29 Oct 2021	29 Oct 2021	12 Nov 2021	02 Nov 2021	12 Nov 2021	02 Nov 2021

Total Dissolved Solids (TDS) in water

Method: ME-(AU)-[ENV]AN113

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
GW_BH1M-1	SE225299.001	LB236030	29 Oct 2021	29 Oct 2021	05 Nov 2021	02 Nov 2021	05 Nov 2021	03 Nov 2021

Total Phenolics in Water

Method: ME-(AU)-[ENV]AN289

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
GW_BH1M-1	SE225299.001	LB236132	29 Oct 2021	29 Oct 2021	26 Nov 2021	03 Nov 2021	26 Nov 2021	03 Nov 2021

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
GW_BH1M-1	SE225299.001	LB236039	29 Oct 2021	29 Oct 2021	27 Apr 2022	02 Nov 2021	27 Apr 2022	02 Nov 2021

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
GW_BH1M-1	SE225299.001	LB236026	29 Oct 2021	29 Oct 2021	05 Nov 2021	02 Nov 2021	12 Dec 2021	03 Nov 2021

Turbidity

Method: ME-(AU)-[ENV]AN119

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
GW_BH1M-1	SE225299.001	LB235977	29 Oct 2021	29 Oct 2021	30 Oct 2021	01 Nov 2021†	30 Oct 2021	01 Nov 2021†

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
GW_BH1M-1	SE225299.001	LB236082	29 Oct 2021	29 Oct 2021	12 Nov 2021	02 Nov 2021	12 Nov 2021	03 Nov 2021

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
GW_BH1M-1	SE225299.001	LB236082	29 Oct 2021	29 Oct 2021	12 Nov 2021	02 Nov 2021	12 Nov 2021	03 Nov 2021

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

PAH (Polynuclear Aromatic Hydrocarbons) in Water — Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	GW_BH1M-1	SE225299.001	%	40 - 130%	40
d14-p-terphenyl (Surrogate)	GW_BH1M-1	SE225299.001	%	40 - 130%	42
d5-nitrobenzene (Surrogate)	GW_BH1M-1	SE225299.001	%	40 - 130%	32 ⓘ

VOCs in Water — Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	GW_BH1M-1	SE225299.001	%	40 - 130%	100
d4-1,2-dichloroethane (Surrogate)	GW_BH1M-1	SE225299.001	%	40 - 130%	100
d8-toluene (Surrogate)	GW_BH1M-1	SE225299.001	%	40 - 130%	97

Volatile Petroleum Hydrocarbons in Water — Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	GW_BH1M-1	SE225299.001	%	40 - 130%	100
d4-1,2-dichloroethane (Surrogate)	GW_BH1M-1	SE225299.001	%	60 - 130%	100
d8-toluene (Surrogate)	GW_BH1M-1	SE225299.001	%	40 - 130%	97

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Conductivity and TDS by Calculation - Water

Method: ME-(AU)-[ENV]AN106

Sample Number	Parameter	Units	LOR	Result
LB235976.001	Conductivity @ 25 C	µS/cm	2	<2

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

Sample Number	Parameter	Units	LOR	Result
LB236150.001	Mercury	mg/L	0.0001	<0.0001

Metals in Water (Dissolved) by ICPOES

Method: ME-(AU)-[ENV]AN320

Sample Number	Parameter	Units	LOR	Result
LB236023.001	Calcium, Ca	mg/L	0.2	<0.2
	Magnesium, Mg	mg/L	0.1	<0.1

PAH (Polynuclear Aromatic Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB236026.001		Naphthalene	µg/L	0.1	<0.1
		2-methylnaphthalene	µg/L	0.1	<0.1
		1-methylnaphthalene	µg/L	0.1	<0.1
		Acenaphthylene	µg/L	0.1	<0.1
		Acenaphthene	µg/L	0.1	<0.1
		Fluorene	µg/L	0.1	<0.1
		Phenanthrene	µg/L	0.1	<0.1
		Anthracene	µg/L	0.1	<0.1
		Fluoranthene	µg/L	0.1	<0.1
		Pyrene	µg/L	0.1	<0.1
		Benzo(a)anthracene	µg/L	0.1	<0.1
		Chrysene	µg/L	0.1	<0.1
		Benzo(b&j&k)fluoranthene	µg/L	0.2	<0.2
		Benzo(a)pyrene	µg/L	0.1	<0.1
		Indeno(1,2,3-cd)pyrene	µg/L	0.1	<0.1
		Dibenzo(ah)anthracene	µg/L	0.1	<0.1
		Benzo(ghi)perylene	µg/L	0.1	<0.1
	Surrogates	d5-nitrobenzene (Surrogate)	%	-	56
		2-fluorobiphenyl (Surrogate)	%	-	58
		d14-p-terphenyl (Surrogate)	%	-	74

Total Cyanide in water by Discrete Analyser (Aquakem)

Method: ME-(AU)-[ENV]AN077/AN287

Sample Number	Parameter	Units	LOR	Result
LB236050.001	Total Cyanide	mg/L	0.004	<0.004

Total Dissolved Solids (TDS) in water

Method: ME-(AU)-[ENV]AN113

Sample Number	Parameter	Units	LOR	Result
LB236030.001	Total Dissolved Solids Dried at 175-185°C	mg/L	10	<10

Total Phenolics in Water

Method: ME-(AU)-[ENV]AN289

Sample Number	Parameter	Units	LOR	Result
LB236132.001	Total Phenols	mg/L	0.05	<0.05

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Number	Parameter	Units	LOR	Result
LB236039.001	Aluminium, Al	µg/L	5	<5
	Arsenic, As	µg/L	1	<1
	Cadmium, Cd	µg/L	0.1	<0.1
	Chromium, Cr	µg/L	1	<1
	Copper, Cu	µg/L	1	<1

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Trace Metals (Dissolved) in Water by ICPMS (continued)

Method: ME-(AU)-[ENV]AN318

Sample Number	Parameter	Units	LOR	Result
LB236039.001	Lead, Pb	µg/L	1	<1
	Nickel, Ni	µg/L	1	<1
	Zinc, Zn	µg/L	5	<5

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Sample Number	Parameter	Units	LOR	Result
LB236026.001	TRH C10-C14	µg/L	50	<50
	TRH C15-C28	µg/L	200	<200
	TRH C29-C36	µg/L	200	<200
	TRH C37-C40	µg/L	200	<200

Turbidity

Method: ME-(AU)-[ENV]AN119

Sample Number	Parameter	Units	LOR	Result
LB235977.001	Turbidity	NTU	0.5	<0.5

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB236082.001	Fumigants	2,2-dichloropropane	µg/L	0.5	<0.5
		1,2-dichloropropane	µg/L	0.5	<0.5
		cis-1,3-dichloropropene	µg/L	0.5	<0.5
		trans-1,3-dichloropropene	µg/L	0.5	<0.5
		1,2-dibromoethane (EDB)	µg/L	0.5	<0.5
	Halogenated Aliphatics	Dichlorodifluoromethane (CFC-12)	µg/L	5	<5
		Chloromethane	µg/L	5	<5
		Vinyl chloride (Chloroethene)	µg/L	0.3	<0.3
		Bromomethane	µg/L	10	<10
		Chloroethane	µg/L	5	<5
		Trichlorofluoromethane	µg/L	1	<1
		Iodomethane	µg/L	5	<5
		1,1-dichloroethene	µg/L	0.5	<0.5
		Dichloromethane (Methylene chloride)	µg/L	5	<5
		Allyl chloride	µg/L	2	<2
		trans-1,2-dichloroethene	µg/L	0.5	<0.5
		1,1-dichloroethane	µg/L	0.5	<0.5
		cis-1,2-dichloroethene	µg/L	0.5	<0.5
		Bromochloromethane	µg/L	0.5	<0.5
		1,2-dichloroethane	µg/L	0.5	<0.5
		1,1,1-trichloroethane	µg/L	0.5	<0.5
		1,1-dichloropropene	µg/L	0.5	<0.5
		Carbon tetrachloride	µg/L	0.5	<0.5
		Dibromomethane	µg/L	0.5	<0.5
		Trichloroethene (Trichloroethylene,TCE)	µg/L	0.5	<0.5
		1,1,2-trichloroethane	µg/L	0.5	<0.5
		1,3-dichloropropane	µg/L	0.5	<0.5
		Tetrachloroethene (Perchloroethylene,PCE)	µg/L	0.5	<0.5
		1,1,1,2-tetrachloroethane	µg/L	0.5	<0.5
		cis-1,4-dichloro-2-butene	µg/L	1	<1
		1,1,2,2-tetrachloroethane	µg/L	0.5	<0.5
		1,2,3-trichloropropane	µg/L	0.5	<0.5
		trans-1,4-dichloro-2-butene	µg/L	1	<1
		1,2-dibromo-3-chloropropane	µg/L	0.5	<0.5
		Hexachlorobutadiene	µg/L	0.5	<0.5
	Halogenated Aromatics	Chlorobenzene	µg/L	0.5	<0.5
		Bromobenzene	µg/L	0.5	<0.5
		2-chlorotoluene	µg/L	0.5	<0.5
		4-chlorotoluene	µg/L	0.5	<0.5
		1,3-dichlorobenzene	µg/L	0.5	<0.5
		1,4-dichlorobenzene	µg/L	0.3	<0.3
		1,2-dichlorobenzene	µg/L	0.5	<0.5
		1,2,4-trichlorobenzene	µg/L	0.5	<0.5

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

VOCs in Water (continued)

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB236082.001	Halogenated Aromatics	1,2,3-trichlorobenzene	µg/L	0.5	<0.5
	Monocyclic Aromatic	Benzene	µg/L	0.5	<0.5
	Hydrocarbons	Toluene	µg/L	0.5	<0.5
		Ethylbenzene	µg/L	0.5	<0.5
		m/p-xylene	µg/L	1	<1
		o-xylene	µg/L	0.5	<0.5
		Styrene (Vinyl benzene)	µg/L	0.5	<0.5
		Isopropylbenzene (Cumene)	µg/L	0.5	<0.5
		n-propylbenzene	µg/L	0.5	<0.5
		1,3,5-trimethylbenzene	µg/L	0.5	<0.5
		tert-butylbenzene	µg/L	0.5	<0.5
		1,2,4-trimethylbenzene	µg/L	0.5	<0.5
		sec-butylbenzene	µg/L	0.5	<0.5
		p-isopropyltoluene	µg/L	0.5	<0.5
		n-butylbenzene	µg/L	0.5	<0.5
	Nitrogenous Compounds	Acrylonitrile	µg/L	0.5	<0.5
	Oxygenated Compounds	Acetone (2-propanone)	µg/L	10	<10
		MtBE (Methyl-tert-butyl ether)	µg/L	2	<2
		Vinyl acetate	µg/L	10	<10
		MEK (2-butanone)	µg/L	10	<10
		MIBK (4-methyl-2-pentanone)	µg/L	5	<5
		2-hexanone (MBK)	µg/L	5	<5
	Polycyclic VOCs	Naphthalene	µg/L	0.5	<0.5
	Sulphonated	Carbon disulfide	µg/L	2	<2
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	99
		d8-toluene (Surrogate)	%	-	94
		Bromofluorobenzene (Surrogate)	%	-	97
	Trihalomethanes	Chloroform (THM)	µg/L	0.5	<0.5
		Bromodichloromethane (THM)	µg/L	0.5	<0.5
		Dibromochloromethane (THM)	µg/L	0.5	<0.5
		Bromoform (THM)	µg/L	0.5	<0.5

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB236082.001		TRH C6-C9	µg/L	40	<40
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	99
		d8-toluene (Surrogate)	%	-	94
		Bromofluorobenzene (Surrogate)	%	-	97

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

Conductivity and TDS by Calculation - Water

Method: ME-(AU)-[ENV]AN106

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE225299.001	LB235976.006	Conductivity @ 25 C	µS/cm	2	1000	990	15	2

Metals in Water (Dissolved) by ICPOES

Method: ME-(AU)-[ENV]AN320

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE225299.001	LB236023.011	Calcium, Ca	mg/L	0.2	6.4	6.4	18	1
		Magnesium, Mg	mg/L	0.1	4.5	4.4	17	1

pH in water

Method: ME-(AU)-[ENV]AN101

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE225299.001	LB235976.006	pH**	pH Units	0.1	5.9	5.7	17	2

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE225300.001	LB236039.019	Arsenic, As	µg/L	1	2	2	56	2
		Cadmium, Cd	µg/L	0.1	<0.1	<0.1	200	0
		Chromium, Cr	µg/L	1	46	46	17	0
		Copper, Cu	µg/L	1	2	2	59	1
		Lead, Pb	µg/L	1	<1	<1	195	0
		Nickel, Ni	µg/L	1	2	2	64	1
		Zinc, Zn	µg/L	5	<5	<5	200	0

Turbidity

Method: ME-(AU)-[ENV]AN119

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE225299.001	LB235977.006	Turbidity	NTU	0.5	2900	2800	15	2

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Conductivity and TDS by Calculation - Water

Method: ME-(AU)-[ENV]AN106

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB235976.002	Conductivity @ 25 C	µS/cm	2	310	303	90 - 110	102

Metals in Water (Dissolved) by ICPOES

Method: ME-(AU)-[ENV]AN320

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB236023.002	Calcium, Ca	mg/L	0.2	51	50.5	80 - 120	102
	Magnesium, Mg	mg/L	0.1	49	50.5	80 - 120	98

PAH (Polynuclear Aromatic Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB236026.002		Naphthalene	µg/L	0.1	26	40	60 - 140	64
		Acenaphthylene	µg/L	0.1	33	40	60 - 140	82
		Acenaphthene	µg/L	0.1	30	40	60 - 140	75
		Phenanthrene	µg/L	0.1	32	40	60 - 140	81
		Anthracene	µg/L	0.1	31	40	60 - 140	78
		Fluoranthene	µg/L	0.1	33	40	60 - 140	82
		Pyrene	µg/L	0.1	34	40	60 - 140	86
		Benzo(a)pyrene	µg/L	0.1	35	40	60 - 140	88
	Surrogates	d5-nitrobenzene (Surrogate)	µg/L	-	0.24	0.5	40 - 130	48
		2-fluorobiphenyl (Surrogate)	µg/L	-	0.31	0.5	40 - 130	62
		d14-p-terphenyl (Surrogate)	µg/L	-	0.34	0.5	40 - 130	68

pH in water

Method: ME-(AU)-[ENV]AN101

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB235976.003	pH**	pH Units	0.1	7.4	7.415	98 - 102	99

Total Cyanide in water by Discrete Analyser (Aquakem)

Method: ME-(AU)-[ENV]AN077/AN287

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB236050.002	Total Cyanide	mg/L	0.004	0.026	0.025	80 - 120	105

Total Dissolved Solids (TDS) in water

Method: ME-(AU)-[ENV]AN113

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB236030.002	Total Dissolved Solids Dried at 175-185°C	mg/L	10	280	293	81 - 119	97

Total Phenolics in Water

Method: ME-(AU)-[ENV]AN289

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB236132.002	Total Phenols	mg/L	0.05	0.24	0.25	80 - 120	98

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB236039.002	Aluminium, Al	µg/L	5	22	20	80 - 120	112
	Arsenic, As	µg/L	1	20	20	80 - 120	99
	Cadmium, Cd	µg/L	0.1	22	20	80 - 120	111
	Chromium, Cr	µg/L	1	22	20	80 - 120	110
	Copper, Cu	µg/L	1	21	20	80 - 120	106
	Lead, Pb	µg/L	1	20	20	80 - 120	102
	Nickel, Ni	µg/L	1	21	20	80 - 120	107
	Zinc, Zn	µg/L	5	23	20	80 - 120	115

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB236026.002		TRH C10-C14	µg/L	50	1400	1200	60 - 140	115
		TRH C15-C28	µg/L	200	1400	1200	60 - 140	119
		TRH C29-C36	µg/L	200	1400	1200	60 - 140	120
	TRH F Bands	TRH >C10-C16	µg/L	60	1400	1200	60 - 140	119

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

TRH (Total Recoverable Hydrocarbons) in Water (continued)

Method: ME-(AU)-[ENV]AN403

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB236026.002	TRH F Bands	TRH >C16-C34 (F3)	µg/L	500	1400	1200	60 - 140	116
		TRH >C34-C40 (F4)	µg/L	500	760	600	60 - 140	127

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB236082.002	Halogenated	1,1-dichloroethene	µg/L	0.5	50	45.45	60 - 140	110
	Aliphatics	1,2-dichloroethane	µg/L	0.5	52	45.45	60 - 140	115
		Trichloroethene (Trichloroethylene,TCE)	µg/L	0.5	47	45.45	60 - 140	105
	Halogenated	Chlorobenzene	µg/L	0.5	53	45.45	60 - 140	116
	Monocyclic	Benzene	µg/L	0.5	52	45.45	60 - 140	115
	Aromatic	Toluene	µg/L	0.5	52	45.45	60 - 140	114
		Ethylbenzene	µg/L	0.5	53	45.45	60 - 140	116
		m/p-xylene	µg/L	1	110	90.9	60 - 140	116
		o-xylene	µg/L	0.5	53	45.45	60 - 140	116
	Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	11	10	60 - 140	106
		d8-toluene (Surrogate)	µg/L	-	10	10	70 - 130	102
		Bromofluorobenzene (Surrogate)	µg/L	-	10	10	70 - 130	101
	Trihalomethan	Chloroform (THM)	µg/L	0.5	59	45.45	60 - 140	130

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB236082.002		TRH C6-C10	µg/L	50	830	946.63	60 - 140	87
		TRH C6-C9	µg/L	40	720	818.71	60 - 140	87
	Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	11	10	60 - 140	106
		d8-toluene (Surrogate)	µg/L	-	10	10	70 - 130	102
		Bromofluorobenzene (Surrogate)	µg/L	-	10	10	70 - 130	101
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	µg/L	50	510	639.67	60 - 140	80

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Metals in Water (Dissolved) by ICPOES — **Method: ME-(AU)-[ENV]AN320**

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE225255.001	LB236023.004	Calcium, Ca	mg/L	0.2	65	9.5	50.5	110
		Magnesium, Mg	mg/L	0.1	59	3.6	50.5	109

Trace Metals (Dissolved) in Water by ICPMS — **Method: ME-(AU)-[ENV]AN318**

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE225244.001	LB236039.004	Arsenic, As	µg/L	1	20	-0.007	20	99
		Cadmium, Cd	µg/L	0.1	22	0.004	20	108
		Chromium, Cr	µg/L	1	22	0.068	20	110
		Copper, Cu	µg/L	1	22	0.198	20	107
		Lead, Pb	µg/L	1	20	0.055	20	101
		Nickel, Ni	µg/L	1	22	0.02	20	108
		Zinc, Zn	µg/L	5	27	3.57	20	116

MATRIX SPIKE DUPLICATES

SE225299 R0

Matrix spike duplicates are calculated as Relative Percent Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The original result is the analyte concentration of the matrix spike. The Duplicate result is the analyte concentration of the matrix spike duplicate.

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the

No matrix spike duplicates were required for this job.

Samples analysed as received.

Solid samples expressed on a dry weight basis.

QC criteria are subject to internal review according to the SGS QA/QC plan and may be provided on request or alternatively can be found here: https://www.sgs.com.au/~/media/Local/Australia/Documents/Technical Documents/MP-AU-ENV-QU-022 QA QC Plan.pdf

*	NATA accreditation does not cover the performance of this service.
**	Indicative data, theoretical holding time exceeded.
***	Indicates that both * and ** apply.
-	Sample not analysed for this analyte.
IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
LOR	Limit of reporting.
QFH	QC result is above the upper tolerance.
QFL	QC result is below the lower tolerance.
①	At least 2 of 3 surrogates are within acceptance criteria.
②	RPD failed acceptance criteria due to sample heterogeneity.
③	Results less than 5 times LOR preclude acceptance criteria for RPD.
④	Recovery failed acceptance criteria due to matrix interference.
⑤	Recovery failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeds the spike level).
⑥	LOR was raised due to sample matrix interference.
⑦	LOR was raised due to dilution of significantly high concentration of analyte in sample.
⑧	Reanalysis of sample in duplicate confirmed sample heterogeneity and inconsistency of results.
⑨	Recovery failed acceptance criteria due to sample heterogeneity.
⑩	LOR was raised due to high conductivity of the sample (required dilution).
†	Refer to relevant report comments for further information.

BASIX® Certificate

Building Sustainability Index www.basix.nsw.gov.au

Multi Dwelling

Certificate number: 1171565M_02

This certificate confirms that the proposed development will meet the NSW government's requirements for sustainability, if it is built in accordance with the commitments set out below. Terms used in this certificate, or in the commitments, have the meaning given by the document entitled "BASIX Definitions" dated 10/09/2020 published by the Department. This document is available at www.basix.nsw.gov.au

Secretary
Date of issue: Monday, 22 November 2021
To be valid, this certificate must be lodged within 3 months of the date of issue.

NSW GOVERNMENT | Planning, Industry & Environment

Project summary	
Project name	123-133 New Canterbury Rd, Lewisham_02
Street address	123-133 New Canterbury Road Lewisham 2049
Local Government Area	Inner West Council
Plan type and plan number	deposited 1543
Lot no.	2-5
Section no.	-
No. of residential flat buildings	1
No. of units in residential flat buildings	54
No. of multi-dwelling houses	0
No. of single dwelling houses	0

Project score			
Water	✔ 42		Target 40
Thermal Comfort	✔	concession	Target Pass
Energy	✔ 35		Target 35

Certificate Prepared by
Name / Company Name: Greenworld Architectural Drafting
ABN (if applicable): 70203970543

Description of project

Project address	
Project name	123-133 New Canterbury Rd, Lewisham_02
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Lot no.	2-5
Section no.	-
Project type	
No. of residential flat buildings	1
No. of units in residential flat buildings	54
No. of multi-dwelling houses	0
No. of single dwelling houses	0
Site details	
Site area (m²)	946.5
Roof area (m²)	850
Non-residential floor area (m²)	0.0
Residential car spaces	15
Non-residential car spaces	0

Common area landscape	
Common area lawn (m²)	101.0
Common area garden (m²)	9.5
Area of indigenous or low water use species (m²)	0.0
Assessor details	
Assessor number	N/A
Certificate number	N/A
Climate zone	N/A
Ceiling fan in at least one bedroom	N/A
Ceiling fan in at least one living room or other conditioned area	N/A

Project score		
Water	✔ 42	Target 40
Thermal Comfort	✔ concession	Target Pass
Energy	✔ 35	Target 35

Description of project

The tables below describe the dwellings and common areas within the project

Residential flat buildings - Building1, 54 dwellings, 5 storeys above ground

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
1	1	22.0	0.0	0.0	0.0
6	1	25.0	0.0	0.0	0.0
11	1	26.0	0.0	0.0	0.0
16	1	26.0	0.0	0.0	0.0
21	1	27.0	0.0	0.0	0.0
26	1	23.0	0.0	0.0	0.0
31	1	28.0	0.0	0.0	0.0
36	1	19.0	0.0	0.0	0.0
41	1	20.0	0.0	0.0	0.0
46	1	22.0	0.0	0.0	0.0
51	1	22.0	0.0	0.0	0.0

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
2	1	22.0	0.0	0.0	0.0
7	1	22.0	0.0	0.0	0.0
12	1	27.0	0.0	0.0	0.0
17	1	20.0	0.0	0.0	0.0
22	1	22.0	0.0	0.0	0.0
27	1	28.0	0.0	0.0	0.0
32	1	23.0	0.0	0.0	0.0
37	1	20.0	0.0	0.0	0.0
42	1	22.0	0.0	0.0	0.0
47	1	22.0	0.0	0.0	0.0
52	1	21.0	0.0	0.0	0.0

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
3	1	22.0	0.0	0.0	0.0
8	1	17.0	0.0	0.0	0.0
13	1	19.0	0.0	0.0	0.0
18	1	20.0	0.0	0.0	0.0
23	1	22.0	0.0	0.0	0.0
28	1	25.0	0.0	0.0	0.0
33	1	23.0	0.0	0.0	0.0
38	1	26.0	0.0	0.0	0.0
43	1	27.0	0.0	0.0	0.0
48	1	23.0	0.0	0.0	0.0
53	1	18.0	0.0	0.0	0.0

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
4	1	23.0	0.0	0.0	0.0
9	1	29.0	0.0	0.0	0.0
14	1	20.0	0.0	0.0	0.0
19	1	20.0	0.0	0.0	0.0
24	1	22.0	0.0	0.0	0.0
29	1	22.0	0.0	0.0	0.0
34	1	27.0	0.0	0.0	0.0
39	1	20.0	0.0	0.0	0.0
44	1	22.0	0.0	0.0	0.0
49	1	27.0	0.0	0.0	0.0
54	1	20.0	0.0	0.0	0.0

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
5	1	29.0	0.0	0.0	0.0
10	1	22.0	0.0	0.0	0.0
15	1	19.0	0.0	0.0	0.0
20	1	22.0	0.0	0.0	0.0
25	1	22.0	0.0	0.0	0.0
30	1	17.0	0.0	0.0	0.0
35	1	20.0	0.0	0.0	0.0
40	1	20.0	0.0	0.0	0.0
45	1	22.0	0.0	0.0	0.0
50	1	23.0	0.0	0.0	0.0

Description of project

The tables below describe the dwellings and common areas within the project

Common areas of unit building - Building1

Common area	Floor area (m²)
Car park area	912.0
Garbage room (Res)	17.0
VIP Smoking	75.0

Common area	Floor area (m²)
Lift car (No.1)	-
GF Common area	519.0
Ground floor lobby	29.0

Common area	Floor area (m²)
Bins	10.0
Communal Indoor	46.0
Upper floor lobbies	277.0

Schedule of BASIX commitments

1. Commitments for Residential flat buildings - Building1
    (a) Dwellings
        (i) Water
        (ii) Energy
        (iii) Thermal Comfort
    (b) Common areas and central systems/facilities
        (i) Water
        (ii) Energy

2. Commitments for multi-dwelling houses

3. Commitments for single dwelling houses

4. Commitments for common areas and central systems/facilities for the development (non-building specific)
        (i) Water
        (ii) Energy

Schedule of BASIX commitments

The commitments set out below regulate how the proposed development is to be carried out. It is a condition of any development consent granted, or complying development certificate issued, for the proposed development, that BASIX commitments be complied with.

1. Commitments for Residential flat buildings - Building1

(a) Dwellings

(i) Water	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) The applicant must comply with the commitments listed below in carrying out the development of a dwelling listed in a table below.			
(b) The applicant must plant indigenous or low water use species of vegetation throughout the area of land specified for the dwelling in the "Indigenous species" column of the table below, as private landscaping for that dwelling. (This area of indigenous vegetation is to be contained within the "Area of garden and lawn" for the dwelling specified in the "Description of Project" table).	✔	✔	
(c) If a rating is specified in the table below for a fixture or appliance to be installed in the dwelling, the applicant must ensure that each such fixture and appliance meets the rating specified for it.		✔	✔
(d) The applicant must install an on demand hot water recirculation system which regulates all hot water use throughout the dwelling, where indicated for a dwelling in the "HW recirculation or diversion" column of the table below.		✔	✔
(e) The applicant must install: (aa) a hot water diversion system to all showers, kitchen sinks and all basins in the dwelling, where indicated for a dwelling in the "HW recirculation or diversion" column of the table below; and (bb) a separate diversion tank (or tanks) connected to the hot water diversion systems of at least 100 litres. The applicant must connect the hot water diversion tank to all toilets in the dwelling.		✔ ✔	✔ ✔
(e) The applicant must not install a private swimming pool or spa for the dwelling, with a volume exceeding that specified for it in the table below.	✔	✔	
(f) If specified in the table, that pool or spa (or both) must have a pool cover or shading (or both).		✔	
(g) The pool or spa must be located as specified in the table.	✔	✔	
(h) The applicant must install, for the dwelling, each alternative water supply system, with the specified size, listed for that dwelling in the table below. Each system must be configured to collect run-off from the areas specified (excluding any area which supplies any other alternative water supply system), and to divert overflow as specified. Each system must be connected as specified.	✔	✔	✔

	Fixtures					Appliances		Individual pool				Individual spa		
Dwelling no.	All shower-heads	All toilet flushing systems	All kitchen taps	All bathroom taps	HW recirculation or diversion	All clothes washers	All dish-washers	Volume (max volume)	Pool cover	Pool location	Pool shaded	Volume (max volume)	Spa cover	Spa shaded
All dwellings	4 star (> 4.5 but <= 6 L/min)	4 star	3 star	3 star	no	2 star	-	-	-	-	-	-	-	-

	Alternative water source							
Dwelling no.	Alternative water supply systems	Size	Configuration	Landscape connection	Toilet connection (s)	Laundry connection	Pool top-up	Spa top-up
None	-	-	-	-	-	-	-	-

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) The applicant must comply with the commitments listed below in carrying out the development of a dwelling listed in a table below.			
(b) The applicant must install each hot water system specified for the dwelling in the table below, so that the dwelling's hot water is supplied by that system. If the table specifies a central hot water system for the dwelling, then the applicant must connect that central system to the dwelling, so that the dwelling's hot water is supplied by that central system.	✔	✔	✔
(c) The applicant must install, in each bathroom, kitchen and laundry of the dwelling, the ventilation system specified for that room in the table below. Each such ventilation system must have the operation control specified for it in the table.		✔	✔
(d) The applicant must install the cooling and heating system/s specified for the dwelling under the "Living areas" and "Bedroom areas" headings of the "Cooling" and "Heating" columns in the table below, in/for at least 1 living/bedroom area of the dwelling. If no cooling or heating system is specified in the table for "Living areas" or "Bedroom areas", then no systems may be installed in any such areas. If the term "zoned" is specified beside an air conditioning system, then the system must provide for day/night zoning between living areas and bedrooms.		✔	✔
(e) This commitment applies to each room or area of the dwelling which is referred to in a heading to the "Artificial lighting" column of the table below (but only to the extent specified for that room or area). The applicant must ensure that the "primary type of artificial lighting" for each such room in the dwelling is fluorescent lighting or light emitting diode (LED) lighting. If the term "dedicated" is specified for a particular room or area, then the light fittings in that room or area must only be capable of being used for fluorescent lighting or light emitting diode (LED) lighting.		✔	✔

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(f) This commitment applies to each room or area of the dwelling which is referred to in a heading to the "Natural lighting" column of the table below (but only to the extent specified for that room or area). The applicant must ensure that each such room or area is fitted with a window and/or skylight.	✔	✔	✔
(g) This commitment applies if the applicant installs a water heating system for the dwelling's pool or spa. The applicant must: (aa) install the system specified for the pool in the "Individual Pool" column of the table below (or alternatively must not install any system for the pool). If specified, the applicant must install a timer, to control the pool's pump; and (bb) install the system specified for the spa in the "Individual Spa" column of the table below (or alternatively must not install any system for the spa). If specified, the applicant must install a timer to control the spa's pump.		✔ ✔	
(h) The applicant must install in the dwelling: (aa) the kitchen cook-top and oven specified for that dwelling in the "Appliances & other efficiency measures" column of the table below; (bb) each appliance for which a rating is specified for that dwelling in the "Appliances & other efficiency measures" column of the table, and ensure that the appliance has that minimum rating; and (cc) any clothes drying line specified for the dwelling in the "Appliances & other efficiency measures" column of the table.		✔ ✔ ✔	✔
(i) If specified in the table, the applicant must carry out the development so that each refrigerator space in the dwelling is "well ventilated".		✔	

	Hot water	Bathroom ventilation system		Kitchen ventilation system		Laundry ventilation system	
Dwelling no.	Hot water system	Each bathroom	Operation control	Each kitchen	Operation control	Each laundry	Operation control
All dwellings	central hot water system 1	individual fan, ducted to façade or roof	manual switch on/off	individual fan, ducted to façade or roof	manual switch on/off	individual fan, ducted to façade or roof	manual switch on/off

	Cooling		Heating		Artificial lighting						Natural lighting	
Dwelling no.	living areas	bedroom areas	living areas	bedroom areas	No. of bedrooms &/or study	No. of living &/or dining rooms	Each kitchen	All bathrooms/ toilets	Each laundry	All hallways	No. of bathrooms &/or toilets	Main kitchen
All dwellings	1-phase airconditioning EER 3.0 - 3.5	-	1-phase airconditioning EER 3.0 - 3.5	-	1 (dedicated)	1 (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	0	no

	Individual pool		Individual spa		Appliances & other efficiency measures							
Dwelling no.	Pool heating system	Timer	Spa heating system	Timer	Kitchen cooktop/oven	Refrigerator	Well ventilated fridge space	Dishwasher	Clothes washer	Clothes dryer	Indoor or sheltered clothes drying line	Private outdoor or unsheltered clothes drying line
All dwellings	-	-	-	-	induction cooktop & electric oven	-	yes	-	4 star	2 star	no	no

(iii) Thermal Comfort	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) The development will be a Class 3 building. The applicant must include in the documentation accompanying the application for a construction certificate (or complying development certificate, if applicable), a report demonstrating that the development will meet Section J of the National Construction Code - Volume 1.	✔	✔	✔

(b) Common areas and central systems/facilities

(i) Water	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) If, in carrying out the development, the applicant installs a showerhead, toilet, tap or clothes washer into a common area, then that item must meet the specifications listed for it in the table.		✔	✔
(b) The applicant must install (or ensure that the development is serviced by) the alternative water supply system(s) specified in the "Central systems" column of the table below. In each case, the system must be sized, be configured, and be connected, as specified in the table.	✔	✔	✔
(c) A swimming pool or spa listed in the table must not have a volume (in kLs) greater than that specified for the pool or spa in the table.	✔	✔	
(d) A pool or spa listed in the table must have a cover or shading if specified for the pool or spa in the table.		✔	
(e) The applicant must install each fire sprinkler system listed in the table so that the system is configured as specified in the table.		✔	✔
(f) The applicant must ensure that the central cooling system for a cooling tower is configured as specified in the table.		✔	✔

Common area	Showerheads rating	Toilets rating	Taps rating	Clothes washers rating
All common areas	no common facility	4 star	3 star	no common laundry facility

Central systems	Size	Configuration	Connection (to allow for...)
Fire sprinkler system (No. 1)	-	-	-

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) If, in carrying out the development, the applicant installs a ventilation system to service a common area specified in the table below, then that ventilation system must be of the type specified for that common area, and must meet the efficiency measure specified.		✔	✔

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(b) In carrying out the development, the applicant must install, as the "primary type of artificial lighting" for each common area specified in the table below, the lighting specified for that common area. This lighting must meet the efficiency measure specified. The applicant must also install a centralised lighting control system or Building Management System (BMS) for the common area, where specified.		✔	✔
(c) The applicant must install the systems and fixtures specified in the "Central energy systems" column of the table below. In each case, the system or fixture must be of the type, and meet the specifications, listed for it in the table.	✔	✔	✔

	Common area ventilation system		Common area lighting		
Common area	Ventilation system type	Ventilation efficiency measure	Primary type of artificial lighting	Lighting efficiency measure	Lighting control system/BMS
Car park area	ventilation (supply + exhaust)	carbon monoxide monitor + VSD fan	light-emitting diode	zoned switching with motion sensor	No
Lift car (No.1)	-	-	light-emitting diode	connected to lift call button	No
Bins	ventilation exhaust only	-	light-emitting diode	motion sensors	No
Garbage room (Res)	ventilation exhaust only	-	light-emitting diode	motion sensors	No
GF Common area	ventilation supply only	time clock or BMS controlled	light-emitting diode	zoned switching with motion sensor	No
Communal Indoor	ventilation supply only	time clock or BMS controlled	light-emitting diode	zoned switching with motion sensor	No
VIP Smoking	no mechanical ventilation	-	light-emitting diode	zoned switching with motion sensor	No
Ground floor lobby	no mechanical ventilation	-	light-emitting diode	zoned switching with motion sensor	No
Upper floor lobbies	no mechanical ventilation	-	light-emitting diode	zoned switching with motion sensor	No

Central energy systems	Type	Specification
Central hot water system (No. 1)	gas instantaneous	Piping insulation (ringmain & supply risers): (a) Piping external to building: R1.0 (~38 mm); (b) Piping internal to building: R0.6 (~25 mm)

Central energy systems	Type	Specification
Lift (No. 1)	gearless traction with V V V F motor	Number of levels (including basement): 5

4. Commitments for common areas and central systems/facilities for the development (non-building specific)

(b) Common areas and central systems/facilities

(i) Water	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) If, in carrying out the development, the applicant installs a showerhead, toilet, tap or clothes washer into a common area, then that item must meet the specifications listed for it in the table.		✔	✔
(b) The applicant must install (or ensure that the development is serviced by) the alternative water supply system(s) specified in the "Central systems" column of the table below. In each case, the system must be sized, be configured, and be connected, as specified in the table.	✔	✔	✔
(c) A swimming pool or spa listed in the table must not have a volume (in kLs) greater than that specified for the pool or spa in the table.	✔	✔	
(d) A pool or spa listed in the table must have a cover or shading if specified for the pool or spa in the table.		✔	
(e) The applicant must install each fire sprinkler system listed in the table so that the system is configured as specified in the table.		✔	✔
(f) The applicant must ensure that the central cooling system for a cooling tower is configured as specified in the table.		✔	✔

Common area	Showerheads rating	Toilets rating	Taps rating	Clothes washers rating
All common areas	no common facility	4 star	3 star	no common laundry facility

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) If, in carrying out the development, the applicant installs a ventilation system to service a common area specified in the table below, then that ventilation system must be of the type specified for that common area, and must meet the efficiency measure specified.		✔	✔
(b) In carrying out the development, the applicant must install, as the "primary type of artificial lighting" for each common area specified in the table below, the lighting specified for that common area. This lighting must meet the efficiency measure specified. The applicant must also install a centralised lighting control system or Building Management System (BMS) for the common area, where specified.		✔	✔
(c) The applicant must install the systems and fixtures specified in the "Central energy systems" column of the table below. In each case, the system or fixture must be of the type, and meet the specifications, listed for it in the table.	✔	✔	✔

Central energy systems	Type	Specification
Alternative energy supply	Photovoltaic system	Rated electrical output (min): 16.0 peak kW

Notes

1. In these commitments, "applicant" means the person carrying out the development.
2. The applicant must identify each dwelling, building and common area listed in this certificate, on the plans accompanying any development application, and on the plans and specifications accompanying the application for a construction certificate / complying development certificate, for the proposed development, using the same identifying letter or reference as is given to that dwelling, building or common area in this certificate.
3. This note applies if the proposed development involves the erection of a building for both residential and non-residential purposes (or the change of use of a building for both residential and non-residential purposes). Commitments in this certificate which are specified to apply to a "common area" of a building or the development, apply only to that part of the building or development to be used for residential purposes.
4. If this certificate lists a central system as a commitment for a dwelling or building, and that system will also service any other dwelling or building within the development, then that system need only be installed once (even if it is separately listed as a commitment for that other dwelling or building).
5. If a star or other rating is specified in a commitment, this is a minimum rating.
6. All alternative water systems to be installed under these commitments (if any), must be installed in accordance with the requirements of all applicable regulatory authorities. NOTE: NSW Health does not recommend that stormwater, recycled water or private dam water be used to irrigate edible plants which are consumed raw, or that rainwater be used for human consumption in areas with potable water supply.

Legend

1. Commitments identified with a "✔" in the "Show on DA plans" column must be shown on the plans accompanying the development application for the proposed development (if a development application is to be lodged for the proposed development).
2. Commitments identified with a "✔" in the "Show on CC/CDC plans and specs" column must be shown in the plans and specifications accompanying the application for a construction certificate / complying development certificate for the proposed development.
3. Commitments identified with a "✔" in the "Certifier check" column must be certified by a certifying authority as having been fulfilled. (Note: a certifying authority must not issue an occupation certificate (either interim or final) for a building listed in this certificate, or for any part of such a building, unless it is satisfied that each of the commitments whose fulfilment it is required to monitor in relation to the building or part, has been fulfilled).

DRAFT SEPP (HOUSING) 2021 ASSESSMENT

127-133 New Canterbury Road, Lewisham NSW

Alterations and Additions to an Existing Hotel to create a Mixed Use Development comprising a Pub and a Boarding House

19 November 2021 | P367

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Draft State Environmental Planning Policy (Housing) 2021

The provisions of Draft State Environmental Planning Policy (Housing) 2021 are a matter for consideration. The following table summarises the compliance of the application with the draft policy.

Draft State Environmental Planning Policy (Housing) 2021 Part 2: Development for affordable housing Division 2: Boarding Houses Summary Compliance Table				
Clause No.	**Clause**	**Standard**	**Proposed**	**Complies**
22	Boarding Houses permitted with consent	(1) Development for the purposes of a boarding house may be carried out with consent on land on which development for the purposes of a boarding house is permitted with consent under another environmental planning instrument.	Zone B2 Local Centre	Y
		(2) Development for the purposes of a boarding house must not be carried out on land in Zone R2 Low Density Residential or an equivalent land use zone unless— (a) for land in the Greater Sydney region—the land is within an accessible area, or (b) otherwise—all or part of the development is within 400m walking distance of land in Zone B2 Local Centre or Zone B4 Mixed Use, or an equivalent land use zone.	The site is not in the R2 zone.	N/A
23	**Non-discretionary development standards – the Act, s 4.15**			
23(1)		Compliance with the following standards for development prevents Council requiring more onerous standards for the matters.		
23(2)(a)		Development on non-heritage land in a zone in which residential flat buildings are permitted—a floor space ratio not exceeding—	B2 Local Centre zone - residential flat buildings are not permitted and the site contains a heritage item.	N/A
23(2)(a)(i)		the maximum permissible floor space ratio for residential accommodation on the land, and		N/A
23(2)(a)(ii)		an additional 25% of the maximum permissible floor space ratio if the additional floor space is used only for the purposes of the boarding house,		N/A
23(2)(b)		If 23(2)(a) does not apply—a floor space ratio not exceeding the maximum permissible floor space ratio for residential accommodation on the land, **Max. FSR 2.2:1 (2,090.7m^2)**	Proposed FSR 2.40:1 (2,277m^2) Refer to accompanying 4.6 request.	A
23(2)(c)		Development on land in Zone R2 Low Density Residential or Zone R3 Medium Density Residential—the minimum landscaping requirements for multi dwelling housing under a relevant planning instrument,	Not located in R2 or R3 zones.	N/A
23(2)(d)		For development on land in Zone R4 High Density Residential—the minimum landscaping requirements for residential flat buildings under a relevant planning instrument,	Not located in R4 zone.	N/A
23(2)(e)		At least 3 hours of direct solar access provided between 9am and 3pm at mid-winter in at least 1 communal living area,	The communal living room would be oriented to the north-east and would receive a minimum of 3 hours direct sunlight between 9am and 3pm in mid-winter.	Y

Draft State Environmental Planning Policy (Housing) 2021 Part 2: Development for affordable housing Division 2: Boarding Houses Summary Compliance Table				
Clause No.	**Clause**	**Standard**	**Proposed**	**Complies**
23(2)(f)	Communal living	For a boarding house containing 6 boarding rooms—	More than 6 rooms proposed.	N/A
		(i) a total of at least 30m2 of communal living area, and		N/A
		(ii) minimum dimensions of 3m for each communal living area,		N/A
23(2)(g)		For a boarding house containing more than 6 boarding rooms—	More than 6 boarding rooms proposed	
		(i) a total of at least 30m2 of communal living area plus at least a further 2m2 for each boarding room in excess of 6 boarding rooms, and **Required** 53 rooms (total) 47 x 2sqm = **94sqm**	Proposed area of communal living space on Level 1 is 49sqm. Acceptable area of communal indoor living space provided as the proposal also includes private open space in the form of balconies (min 2.7sqm) with fixed open glass louvres for each boarding room. Each room will also comprise kitchenette and bathroom facilities in each room for private use.	A
		(ii) minimum dimensions of 3m for each communal living area,	Minimum 3m dimension	Y
23(2)(h)	Communal open spaces	(i) with a total area of at least 20% of the site area, and **Required** 20% of 950.3sqm = **190sqm.**	The communal open space on Level 1 will have an area of 80sqm (8.4% of total site area). The proposed communal open space responds to the existing constraints of the site, being a heritage item being located within an inner-city context. The communal open space will be directly accessible from the communal living area integrating the usability of the communal areas. Balconies with a min 2.7sqm and fixed open glass louvres are proposed for each boarding room providing individual private open space for occupants.	A
		(ii) each with minimum dimensions of 3m,	minimum. 3m dimension achieved	Y
23(2)(i)	Parking	For development carried out by or on behalf of a social housing provider – (i) in an accessible area – at least 0.2 parking space for each boarding room, or		N/A

Draft State Environmental Planning Policy (Housing) 2021 Part 2: Development for affordable housing Division 2: Boarding Houses Summary Compliance Table				
Clause No.	**Clause**	**Standard**	**Proposed**	**Complies**
		(ii) otherwise – at least 0.4 parking space for each boarding room,		N/A
23(2)(j)		If paragraph (h) does not apply – (i) for development within the Greater Sydney region – at least 0.5 parking space for each boarding room, or	15 (incl. 1 disabled) This is considered to be acceptable given: • the proximity of the site to major public transport nodes and local retail and commercial facilities; • application of parking credits from non-compliance of previous use; • Application of Green Travel Plan; • Provision of 1 car share space. Refer to accompanying traffic report. Note that the consent authority may grant consent for a development with a lesser provision of car parking.	A
		(ii) otherwise at least 1 parking space for each boarding room.		N/A
23(2)(k)		At least 1 motorcycle parking space for every 5 boarding rooms,	11 motorbike parking spaces	Y
23(2)(l)		At least 1 bicycle parking space for each boarding room. **Required** 53 bicycle spaces	32 bicycle parking spaces The number of bicycle parking spaces are acceptable given the proximity of the site to public transport nodes, retail and commercial facilities, application of Green Travel Plan and the provision of car share availability on the site.	A
23(3)		In this section— ***social housing provider*** does not include a registered community housing provider unless the registered community housing provider is a registered entity within the meaning of the *Australian Charities and Not-for-profits Commission Act 2012* of the Commonwealth.	Noted.	N/A
24	**Standards for Boarding Houses**			
24(1)		A consent authority must not grant consent to development to which this Division applies unless it is satisfied of each of the following:		
24(1) (a)		The design of the development will be compatible with the character of the local area, and	The proposal would be consistent with the evolving character of the local area and in particular that of adjacent	Y

Draft State Environmental Planning Policy (Housing) 2021 Part 2: Development for affordable housing Division 2: Boarding Houses Summary Compliance Table				
Clause No.	**Clause**	**Standard**	**Proposed**	**Complies**
			and nearby development to which it: • retains the built form and façades of the heritage listed Huntsbury Hotel. • presents a sophisticated contemporary addition adjoining the Huntsbury Hotel that would be compatible with the hotel and in harmony with the surrounding development in the locality. • has a zero-front setback along Hunter Street and New Canterbury Road. • has a flat roof, which is the norm for adjoining commercial premises. See accompanying street elevations.	
24(1) (b)		No boarding room will have a gross floor area, excluding an area, if any, used for the purposes of private kitchen or bathroom facilities, of more than 25m2, and	All rooms less than 25m2.	Y
24(1) (c)		No boarding room will be occupied by more than 2 adult residents, and	No boarding room is proposed to be occupied by more than two lodgers.	Y
24(1) (d)		Adequate bathroom, kitchen and laundry facilities will be available within the boarding house for the use of each resident, and	Each boarding room would have private kitchen and bathroom facilities.	Y
24(1) (e)		For a boarding house on land in Zone R2 Low Density Residential or an equivalent land use zone—the boarding house will not have more than 12 boarding rooms, and		N/A
24(1) (f)		For a boarding house on land zoned primarily for commercial purposes—no part of the ground floor of the boarding house that fronts a street will be used for residential purposes unless another environmental planning instrument permits the use, and	Site is zoned B2 Local Centre, and the ground floor would be used primarily as a pub.	Y
24(1) (g)		For a boarding house containing at least 6 boarding rooms—the boarding house will have at least 1 communal living room, and	One communal living area provided on Level 1.	Y
24(1) (h)		The minimum lot size for the development is not less than—	Residential accommodation is not permitted within B2 Local Centre Zone.	N/A
24(1) (h)(i)		for development on land in Zone R2 Low Density Residential—the minimum lot size requirements for manor houses under a relevant planning instrument, or 600m2, housing under a relevant planning instrument,		N/A

Draft State Environmental Planning Policy (Housing) 2021 Part 2: Development for affordable housing Division 2: Boarding Houses Summary Compliance Table				
Clause No.	**Clause**	**Standard**	**Proposed**	**Complies**
24(1) (h)(ii)		for development on land in Zone R3 Medium Density Residential—the minimum lot size requirements for multi dwelling		N/A
24(1) (h)(iii)		for development on other land—the minimum lot size requirements for residential flat buildings under a relevant planning instrument,		N/A
24(1) (i)		The front, side and rear setbacks for the development are not less than—	Site is located within B2 Local Centre Zone.	N/A
24(1) (i)(i)		for development on land in Zone R2 Low Density Residential or Zone R3 Medium Density Residential—the minimum setback requirements for multi dwelling housing under a relevant planning instrument,		N/A
24(1) (i)(ii)		for development on land in Zone R4 High Density Residential—the minimum setback requirements for residential flat buildings under a relevant planning instrument,		N/A
24(1) (j)		If the boarding house exceeds 3 storeys—the building will comply with the minimum building separation distances specified in the Apartment Design Guide,	The proposal has a maximum four storeys with main street frontages on New Canterbury Road and Hunter Street and frontage to pedestrian laneway to west. Windows and balconies from habitable spaces require minimum 9m. Blank walls require zero metre setback. Separation distance less than 9 from to secondary frontage of neighbouring property to the west. Separation considered acceptable as visual privacy impacts would be mitigated through diagonal orientation of narrow windows on the western elevation. Sunlight access would be retained to properties to the west between 11am and 3pm and principal outlook to the north and south from neighbouring properties would be conserved. Were the SEPP gazetted a Clause 4.6 variation would be required.	A
24(1) (k)		The development has a gross floor area, excluding an area, if any, used for the purposes of private kitchen or bathroom facilities, of at least the following for each boarding room—	All rooms comply with size requirements.	Y

Draft State Environmental Planning Policy (Housing) 2021 Part 2: Development for affordable housing Division 2: Boarding Houses Summary Compliance Table				
Clause No.	**Clause**	**Standard**	**Proposed**	**Complies**
24(1) (k)(i)		for a boarding room intended to be used by a single resident—12m2,	Min.12sqm	Y
24(1) (k)(ii)		otherwise—16m2.	Min.16sqm	Y
24(2)		Subsection (1)(f) does not apply to a part of the building that –		N/A
24(2) (a)		faces a service lane that does not require active street frontages, or		N/A
24(2) (b)		is used for any of the following purposes – (i) a lobby for a residential, serviced apartment hotel or tenanted component of the building, (ii) access for fire services, (iii) vehicular access		N/A
24(3)		This section does not apply to development for the purposes of minor alterations or additions to an existing boarding house.	The site is not occupied by an existing boarding house.	N/A
25		**Must be used for affordable housing in perpetuity**		
25(1)		Development consent must not be granted under this Division unless the consent authority is satisfied that from the date of the issue of the occupation certificate and continuing in perpetuity— (a) the boarding house will be used for affordable housing, and (b) the boarding house will be managed by a registered community housing provider.	Use of the premises will be subject to condition of consent.	C
25(2)		Subsection (1) does not apply to development on land owned by the Land and Housing Corporation or to a development application made by a public authority.		N/A
26	Subdivision of boarding houses not permitted	Development consent must not be granted for the subdivision of a boarding house permitted under this Division.	No subdivision is proposed.	Y
Schedule 6		**Provisions consequent on commencement of State Environmental Planning Policy (Housing) 2021**		
1	Definitions	In this Schedule— ***repealed instrument*** means an instrument repealed under section 10. ***repeal day*** means the day on which section 10 commenced.		
2	General savings provision	The former provisions of a repealed instrument continue to apply to the following— (a) a development application made, but not yet determined, on or before the repeal day, (b) a development consent granted on or before the repeal day.	The Development Application was lodged prior to the gazettal of this instrument. Accordingly, should this clause be included in the gazetted instrument, none of the provisions as outlined above would apply.	Y
3	Continued application of site compatibility certificates	The former provisions of *State* Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 (the repealed SEPP) continue to apply to a development application made after the repeal day if—	Noted.	N/A

Draft State Environmental Planning Policy (Housing) 2021 Part 2: Development for affordable housing Division 2: Boarding Houses Summary Compliance Table				
Clause No.	**Clause**	**Standard**	**Proposed**	**Complies**
		(a) the development application relies on a site compatibility certificate, within the meaning of the repealed SEPP, and (b) the application for the certificate was made on or before the repeal day.		
Legend: Y=Complies, N = Does not Comply, C = Condition of consent, N/A = Not applicable, A = Does not strictly comply but acceptable				

REQUEST TO CONTRAVENE A DEVELOPMENT STANDARD UNDER CLAUSE 4.6

Cl 4.4, Marrickville LEP 2011: Floor Space Ratio

127-133 New Canterbury Road, Lewisham NSW

Alterations and Additions to an Existing Hotel to create a Mixed Use Development comprising a Pub and a Boarding House

25 November 2021 | P367

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1.0 INTRODUCTION

This request to contravene a development standard in respect of floor space ratio under Clause 4.4 of Marrickville LEP 2011 is submitted to accompany a development application for:

alterations and additions to an existing hotel to create a mixed use development comprising a pub and a boarding house

at 127-133 New Canterbury Road, Lewisham NSW.

It has been prepared with particular reference to the decisions of the Court in respect of:

- Initial Action Pty Ltd v Woollahra Municipal Council [2018] NSWLEC 118;
- Four2Five Pty Limited v Ashfield Council [2015] NSWLEC 90;
- Wehbe v Pittwater Council [2007] NSWLEC 827;
- Petrovic v Randwick City Council [2021] NSWLEC 1242;

and other relevant case law.

2.0 THE DEVELOPMENT STANDARD

2.1 The applicable planning instrument which specifies the development standard:

Marrickville Local Environmental Plan 2011 (MLEP 2011)

2.2 The number of the relevant clause:

Clause 4.4 – Floor space ratio.

2.3 The provisions of the relevant clause:

Clause 4.4 – Floor space ratio.

The development standard to which this request for contravention relates is Clause 4.4(2) of MLEP 2011 – Floor space ratio, which specifies that:

The maximum floor space ratio for a building on any land is not to exceed the floor space ratio shown for the land on the Floor Space Ratio Map.

The nominated FSR on the map is 2.2:1.

3.0 THE CONTRAVENTION SOUGHT:

3.1 Description of the contravention:

The proposed development would contravene the development standard as follows:

3.1.1 Site Area:

950.3m^2

3.1.2 Maximum floor space ratio:

2.2:1 (2,090.7m^2)

3.1.3 Proposed floor space ratio:

2.40:1 (2,277m^2)

3.1.4 Extent of proposed contravention:

0.20:1 (186.3m^2) (8.9% variation)

3.1.5 Causes of the contravention:

The contravention would result from the inclusion in the calculations of:

- the balconies which are screened with fixed open glass louvres; and
- the open VIP (smoking) located on the ground floor.

4.0 PROVISIONS OF CLAUSE 4.6

4.1 Cl. 4.6(1): Objectives

Clause 4.6 seeks to provide appropriate flexibility to the application of development standards in order to achieve better planning outcomes both for the development and from the development. The objectives of Clause 4.6 are as follows:

Cl. 4.6(1) Objectives of Clause		
Clause	**Control**	**Justification**
(1)(a)	to provide an appropriate degree of flexibility in applying certain development standards to particular development	The proposal contravenes the standard which sets a maximum floor space ratio. It seeks to utilise this clause to provide appropriate flexibility in application of the standard to permit approval.
(1)(b)	to achieve better outcomes for and from development by allowing flexibility in particular circumstances	The proposal would achieve better outcomes: • ***For*** the development: The contravention would permit: o Improved amenity of the balconies and improved external architectural expression due the to the fixed glass louvres on the balconies; and o A degree of enclosure and security to the VIP (smoking) area on the ground floor. • ***From*** the development: The contravention would result in: o Improved external architectural expression due to the provision of glazed louvres on the balconies.

4.2 Cl. 4.6(3): Justification of the Contravention of the Development Standard

Under the provisions of clause 4.6(3) – Exceptions to development standards of MLEP 2011, the consent authority must consider a written request from the applicant that seeks to justify the contravention of the development standard. This justification is summarised in the table below:

Cl. 4.6(3) Justification of Contravention		
Clause	**Control**	**Justification**
4.6(3)	Development consent must not be granted for development that contravenes a development standard unless the consent authority has considered a written request from the applicant that seeks to justify the contravention of the development standard by demonstrating:	This written request addresses this clause.
4.6(3)(a)	That compliance with the development standard is unreasonable or unnecessary in the circumstances of the case, and	Compliance with the development standard is unnecessary given that: • The objectives of the development standard are met (see below); and • The objectives of the zone are met; notwithstanding the non-compliance. Compliance with the development standard is unreasonable given that: • the areas which constitute the contravention, arguably, do not satisfy the definition of gross floor area and should not be included as FSR (as per HPG Mosman Projects Pty Ltd v Mosman Municipal Council [2021] NSWLEC 1243).
4.6(3)(b)	That there are sufficient environmental planning grounds to justify contravening the development standard.	Contravention of the development standard is justified on the following environmental planning grounds (consistent with the decision of *Eather*): • The numerical departure is small (ie less than 10%); and

		• There is a lack of any material adverse impacts, in particular, relating to bulk and scale, heritage, overshadowing or privacy. In addition, the following present sufficient environmental planning grounds to justify the contravention:
	As established in Initial Action [23], 'environmental planning grounds' refer to grounds that relate to the subject matter, scope and purpose of the EPA Act, including the objects in s 1.3 of the EPA Act. These are as relevantly follows:	-
1.3(a)	to promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources,	The contravention resulting from the enclosure of the balconies would facilitate provision of higher quality affordable rental housing dwellings and the associated social and economic benefits.
1.3(c)	to promote the orderly and economic use and development of land,	The contravention would facilitate the orderly and economic use of the land by providing higher quality residential accommodation.
1.3(d)	to promote the delivery and maintenance of affordable housing,	The contravention would facilitate the provision of higher levels of amenity in an affordable rental housing development.
1.3(f)	to promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage),	The contravention would enable the installation of glass louvres on the otherwise open balconies thus providing a more suitable response to the heritage significant fabric on the site.
1.3(g)	to promote good design and amenity of the built environment,	The contravention would: • enable a more architecturally resolved facade and streetscape; and • provide greater amenity for the balconies.
1.3(h)	to promote the proper construction and maintenance of buildings, including the protection of the health and safety of their occupants,	The contravention would facilitate the health and safety of the occupants by providing; • improved amenity to the balconies; and • An outdoor VIP area with increased ventilation for smokers.

4.3 Cl. 4.6(4)(a): Objectives of the Zone & Development Standard

Under the provisions of clause 4.6(4) – Exceptions to development standards of MLEP 2011, the consent authority must be satisfied that contraventions of development standards are consistent with the objectives of both the development standard itself and the zone in which the development is proposed. This assessment is summarised in the table below:

Cl. 4.6(4): Justification of contravention against development standard and zone objectives		
Clause	**Objectives**	**Justification**
4.4(2)	**Floor space ratio**	
(a)	to establish the maximum floor space ratio,	The proposal seeks to vary the maximum floor space ratio.
(b)	to control building density and bulk in relation to the site area in order to achieve the desired future character for different areas,	The contravention would not alter the density of the proposal as the floor space would not be associated with additional occupancies. Further , it would not alter the external bulk of the proposal which is already established by the outer most elements oof the balconies which would remain the same whether enclosed or not.
(c)	to minimise adverse environmental impacts on adjoining properties and the public domain.	The contravention would avoid adverse impacts upon adjacent properties and the public domain as it would not be associated with additional overshadowing, density, noise impacts or other amenity issues.
2.3	**Zone B2 – Local Centre**	
	To provide a range of retail, business, entertainment and community uses that serve the needs of people who live in, work in and visit the local area.	The proposal would provide commercial areas at ground level which would: • Activate the existing streetscape; • Provide passive surveillance and consequently a safer environment; and • Support the needs of surrounding residents.
	To encourage employment opportunities in accessible locations.	The pub would provide employment opportunities in an accessible area.
	To maximise public transport patronage and encourage walking and cycling.	The provision of residential population in an accessible area would maximise use of public transport, cycling and walking.
	To provide housing attached to permissible non-residential uses which is of a type and scale commensurate with the accessibility and function of the centre or area.	The proposal would provide affordable housing associated with ground floor non-residential uses.
	To provide for spaces, at street level, which are of a size and configuration suitable for land uses which generate active street-fronts.	The proposal includes ground floor commercial uses with glazed shopfronts which would activate the street frontages.
	To constrain parking and reduce car use.	The provision of high density residential accommodation on the site in close proximity to public transport and other facilities would minimise the need for both car use and car parking.

4.4 cl. 4.6(4)(b): Concurrence

Under the provisions of clause 4.6(4)(b) – Exceptions to development standards of MLEP 2011, the consent authority must be satisfied that the concurrence of the Secretary (of the Department of Planning and the Environment) has been obtained before it can exercise the power to grant development consent for development that contravenes the development standard.

Under cl 64 of the Environmental Planning and Assessment Regulation 2000, the Secretary has given written notice dated 21 February 2018, attached to the Planning Circular PS 18-003 issued on 21 February 2018, to each consent authority, that it may assume the Secretary's concurrence for exceptions to

development standards in respect of applications made under cl 4.6, subject to the conditions in the table in the notice.

4.5 Cl. 4.6(5): Criteria for Concurrence

Under the provisions of clause 4.6(5) – Exceptions to development standards of MLEP 2011, the Council or the Secretary, as the concurrence authority, is required to consider the following matters:

Cl. 4.6(5) Criteria for Concurrence		
Clause	**Control**	**Justification**
(a)	whether contravention of the development standard raises any matter of significance for State or regional environmental planning, and	The contravention is not of an extent which would raise regional or State environmental planning issues. It is noted, however, that it is broadly consistent with the subregional strategic planning policies for the locality.
(b)	the public benefit of maintaining the development standard, and	There would be no public benefit achieved by maintaining the development standard given that numerous planning benefits would accrue from its contravention as noted above.
(c)	any other matters required to be taken into consideration by the Secretary before granting concurrence.	The matters requiring consideration are addressed above.

5.0 THE FIVE PART TEST

In Wehbe v Pittwater Council [2007] NSWLEC 827, Preston CJ established five potential tests for determining whether a development standard could be considered to be unreasonable or unnecessary. These are examined below:

The Five Part Test: **(in accordance with Preston CJ in Wehbe v Pittwater Council [2007] NSW LEC 827)**		
Part	**Test**	**Discussion**
1.	The objectives of the standard are achieved notwithstanding non-compliance with the standard.	The objectives of the development standard are achieved. See discussion under 3(c) above.
2.	The underlying objective or purpose of the standard is not relevant to the development and therefore compliance is unnecessary.	The objectives of the standard are relevant to the proposal and an assessment of compliance is provided above. It is considered that the objectives of the standard are achieved more satisfactorily than maintaining the existing subdivision pattern.
3.	The underlying object or purpose would be defeated or thwarted if compliance was required and therefore compliance is unreasonable.	N/A
4.	The development standard has been virtually abandoned or destroyed by the Council's own actions in granting consents departing from the standard and hence compliance with the standard is unnecessary and unreasonable	There is no evidence that the development standard has been abandoned.
5.	the zoning of the particular land is unreasonable or inappropriate so that a development standard appropriate for that zoning is also unreasonable and unnecessary as it applies to the land and compliance with the standard would be unreasonable or unnecessary. That is, the particular parcel of land should not have been included in the particular zone.	Not applicable. The zoning of the land is considered appropriate.

6.0 CONCLUSION

This Clause 4.6 contravention request to clause 4.4 – Floor space ratio of Marrickville LEP 2011 should be supported on the basis that strict application of the development standard is unnecessary and unreasonable given that:

a) The development meets the stated objectives of clause 4.4, specifically:

   a) to establish the maximum floor space ratio,

   b) to control building density and bulk in relation to the site area in order to achieve the desired future character for different areas,

   c) to minimise adverse environmental impacts on adjoining properties and the public domain.

b) The development meets the zone objectives of the B2 Local centre zone, specifically:

   - To provide a range of retail, business, entertainment and community uses that serve the needs of people who live in, work in and visit the local area.
   - To encourage employment opportunities in accessible locations.
   - To maximise public transport patronage and encourage walking and cycling.
   - To provide housing attached to permissible non-residential uses which is of a type and scale commensurate with the accessibility and function of the centre or area.
   - To provide for spaces, at street level, which are of a size and configuration suitable for land uses which generate active street-fronts.
   - To constrain parking and reduce car use.

c) The areas which constitute the contravention, arguably, do not satisfy the definition of gross floor area and should not be included as FSR (as per HPG Mosman Projects Pty Ltd v Mosman Municipal Council [2021] NSWLEC 1243).

d) There are sufficient environmental planning grounds to justify contravening the development standard, specifically that (consistent with the decision of *Eather*):

   - The numerical departure is small (ie less than 10%); and
   - There is a lack of any material adverse impacts, in particular, relating to bulk and scale, heritage, overshadowing or privacy.

   In addition, that the proposed contravention would result in:

   - The provision of higher quality affordable rental housing due to higher amenity of the balconies and the associated social and economic benefits.
   - The orderly and economic use of the land by providing higher quality residential accommodation.
   - The provision of higher levels of amenity in an affordable rental housing development.
   - The installation of glass louvres on the otherwise open balconies thus providing a more suitable response to the heritage significant fabric on the site.
   - A more architecturally resolved facade and streetscape;
   - The health and safety of the occupants by providing;
     - improved amenity to the balconies; and
     - An outdoor VIP area with increased ventilation for smokers.

For the reasons set out above, the development may be granted consent notwithstanding the contravention of the development standard in respect of floor space ratio in clause 4.4 of MLEP 2011.

West and Associates Pty. Ltd.

Email: ABN 12 003 731 851 **ACOUSTIC AND AIRCONDITIONING ENGINEERS**

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Total number of pages including this page:.7

Job No: 2253/7

From: **Joel West**

SUBJECT 123 -133 NEW CANTERBURY ROAD, LEWISHAM - ACOUSTIC SERVICES

I. BACKGROUND

West & Associates Pty Ltd have prepared this response in accordance with Councils request for additional information as below;

6a. A supplementary acoustic assessment for the pub is required to be undertaken with a revised report submitted that addresses the following matters:

i. Interior acoustic amenity – noise impact from the operation of the pub on the proposed boarding house development and other adjoining residential and commercial premises.

ii. Interior acoustic amenity - noise impact from the mechanical ventilation system duct work on the adjacent boarding house rooms.

iii. Noise spill from the VIP area/Smoking (Hunter Street), Outdoor area (New Canterbury Road) and entire Bar area (New Canterbury Road & Hunter Street) – plans indicate that these 3 areas will have will either have either bifold doors/windows opening directly onto public land.

iv. Amplified music throughout the premises i.e. background music vs live band/DJ on some nights (dB(A) and dB(C)).

v. Patron noise and maximum number of patrons per area of the hotel.

vi. Cumulative impact of the hotel operating at maximum capacity with amplified music being provided.

vii. Noise controls for all gaming machines and gaming areas.

viii. Operating hours for the hotel and each area of the hotel.

ix. Operating hours of the proposed communal outdoor area for the boarding house.

II. BACKGROUND NOISE LEVELS

Background noise levels and relevant criteria for the area has been determined within the PKA DA Acoustic report as follows;

Table 1: PKA Project Trigger Noise Levels

Facade	Day Criteria	Evening Criteria	Night Criteria	Commercial
New Canterbury Road	54 dB(A)	53 dB(A)	50 dB(A)	63dB(A)
Hunter St	53 dB(A)	48 dB(A)	44 dB(A)	63 dB(A)

III. MECHANICAL SERVICES NOISE ON RECEIVERS

As the project is within the DA stage mechanical services drawings are not required. Once the project reaches the stage where mechanical services designs are required the engineer must ensure that their design is in accordance with AS2107:2016 for internal noise levels. The Mechanical Engineer must also ensure all external plant and equipment has been designed to not generate noise that exceeds the Project Trigger Noise Levels in accordance with the PKA DA Acoustic report.

We do not expect internal duct work to create an impact on boarding houses as all risers must be built in accordance with the BCA which requires 40 Rw+Ctr for a services shaft wall if adjacent to a habitable room.

IV. OCCUPATIONAL NOISE ON RECEIVERS

The site consists of a Pub located on the ground floor which has a main seating area, gaming rooms and an outdoor smoking area. The proposed hours of the Pub is as follows:

- Monday - Saturday: 10am - 12am Midnight.
- Sunday: 10am - 10pm.

The main sources of noise generated by the use of the pub consists of the following;

- Background music
- Entertainment music such as a live band
- Gaming room
- Outdoor smoking area

We have nominated the noise levels and spectrums for each noise source within the below tables. For the outdoor Smoking Area we have used previously measured Communal Open Space noise levels.

Table 2: Occupant Noise with people dining and background music

Noise Source	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**	**dB(A)**
Patron Noise bi-fold doors open $L_{Aeq,.}$ (inside) approx 45 people	50	54	63	76	75	74	66	63	70

Table 3: Entertainment Noise Level

Noise Source	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**	**dB(A)**
Gymnasium-special event 100 people dance music through PA	93	91	91	96	98	97	93	88	102

Table 4: Gaming Room

Noise Source	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**	**dB(A)**
Gaming Rm. Approximately 25 People & Including Machine Noise	68	76	72	71	70	66	62	58	74.4

Table 5: Smoking Area

Noise Source	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**	**dB(A)**
Open Communal area 40 people $L_{Aeq,.}$	55	63	60	59	58	55	50	46	**62**

In order to determine the impact of the noise generated on site we have carried out distance attenuation calculations to determine the calculated noise levels at the closest sensitive receiver below;

Table 6: Calculated Noise Level At Receivers With Open Windows

Noise Source	**Receiver Location**	**Noise Source Level**	**Calculated Noise Level**	**Criteria Day/ Evening/ Night**	**Compliance**
Background Music + Occupancy	174 New Canterbury Rd	70dB(A)	39.5dB(A)	54dB(A)/ 53dB(A)/ 50dB(A)	Yes / Yes / Yes
Background Music + Occupancy	Above Boarding House	70dB(A)	37.8dB(A)	54dB(A)/ 53dB(A)/ 50dB(A)	Yes / Yes / Yes
Background Music +	123 New Canterbury	70dB(A)	43.6dB(A)	54dB(A)/ 53dB(A)/	Yes / Yes / Yes

Occupancy	Rd			50dB(A)	
Background Music	53 Hunter St	70dB(A)	42dB(A)	53dB(A)/ 48dB(A)/ 44dB(A)	Yes / Yes / Yes
Entertainment Music	174 New Canterbury Rd	102dB(A)	72.1dB(A)	54dB(A)/ 53dB(A)/ 50dB(A)	No / No / No
Entertainment Music	Above Boarding House	102dB(A)	69.8dB(A)	54dB(A)/ 53dB(A)/ 50dB(A)	No / No / No
Entertainment Music	123 New Canterbury Rd	102dB(A)	76.2dB(A)	54dB(A)/ 53dB(A)/ 50dB(A)	No / No / No
Entertainment Music	53 Hunter St	102dB(A)	74.6dB(A)	53dB(A)/ 48dB(A)/ 44dB(A)	No / No / No
VIP AREA	174 New Canterbury Rd	75dB(A)	<50dB(A)	54dB(A)/ 53dB(A)/ 50dB(A)	Yes / Yes / Yes
VIP AREA	Above Boarding House	75dB(A)	<44dB(A)	53dB(A)/ 48dB(A)/ 44dB(A)	Yes / Yes / Yes
VIP AREA	123 New Canterbury Rd	75dB(A)	<50dB(A)	54dB(A)/ 53dB(A)/ 50dB(A)	Yes / Yes / Yes
VIP AREA	53 Hunter St	75dB(A)	<44dB(A)	53dB(A)/ 48dB(A)/ 44dB(A)	Yes / Yes / Yes
Outdoor Area	174 New Canterbury Rd	70dB(A)	<50dB(A)	54dB(A)/ 53dB(A)/ 50dB(A)	Yes / Yes / Yes
Outdoor Area	Above Boarding House	70dB(A)	<50dB(A)	54dB(A)/ 53dB(A)/ 50dB(A)	Yes / Yes / Yes
Outdoor Area	123 New Canterbury Rd	70dB(A)	<50dB(A)	54dB(A)/ 53dB(A)/ 50dB(A)	Yes / Yes / Yes

Outdoor Area	53 Hunter St	70dB(A)	<44dB(A)	53dB(A)/ 48dB(A)/ 44dB(A)	Yes / Yes / Yes

We would expect that the total number of occupants of the pub when in use will exceed the amount of people referenced within our used spectrums above. However we would not expect the total noise level to exceed the spectrums supplied as it is reaching the upper limit of people generated noise levels within a space for this level of activity.

In addition to this, due to the significant difference between the nominated entertainment noise via amplification there is little to no cumulative total that exceeds the entertainment noise levels itself. Due to this if the criteria for entertainment noise via amplification then the remaining of site is also fully compliant in full use.

Based on the above calculations we also do not have any specific recommended noise controls for the VIP Area including the occupation and gaming machines.

As can be seen in table 6 the noise level of entertainment noise at the closest sensitive receiver exceeds the criteria with open windows. Due to this we have recalculated the noise level at the closest sensitive receiver with windows closed (~30Rw) in the following table;

Table 7: Calculated Noise Level At Receivers With Closed Windows

Noise Source	**Receiver Location**	**Noise Source Level**	**Calculated Noise Level**	**Criteria Day/ Evening/ Night**	**Compliance**
Entertainment Music	174 New Canterbury Rd	102dB(A)	50dB(A)	54dB(A)/ 53dB(A)/ 50dB(A)	Yes / Yes / Yes
Entertainment Music	Above Boarding House	102dB(A)	54dB(A)	54dB(A)/ 53dB(A)/ 50dB(A)	Yes / No / No
Entertainment Music	123 New Canterbury Rd	102dB(A)	54dB(A)	54dB(A)/ 53dB(A)/ 50dB(A)	Yes / No / No
Entertainment Music	53 Hunter St	102dB(A)	52dB(A)	53dB(A)/ 48dB(A)/ 44dB(A)	Yes / No / No

As can be seen above with the nominated noise level of 102dB(A) there are some areas of non compliance. In order to determine the loudest noise levels allowed internally to still comply at all receivers we have determined the greatest noise level differential for each day criteria which has been nominated as follows;

- Day Period: All Calculated noise levels at closest sensitive receivers comply. Due to this the maximum allowed generated noise level is 102dB(A).
- 52-48=4dB(A). 102dB(A)-4dB(A) = 98dB(A) for evening period.
- 52-44=8dB(A). 102dB(A)-8dB(A) = 93dB(A) for night period.

In order to ensure noise levels do not exceed the above we recommend that a noise limiting device be installed in parallel with any noise amplification equipment.

Alternatively if the occupants wish to generate a greater noise level windows with higher attenuation factors must be installed.

We have prepared a summary within the following table of the maximum noise level for Entertainment Music being a Live Band with amplified music per the above.

The nominated maximum internal noise level being the noise generated by the live band with amplified music has been taken as the strictest noise level from all locations.

Although some locations may allow a higher Internal Noise Level than others the strictest noise level must be assessed as the main criteria due to the fact that noise at all closest sensitive receivers must be compliant. The table below shows the Maximum Internal Noise Level that is compliant depending on time period and window status.

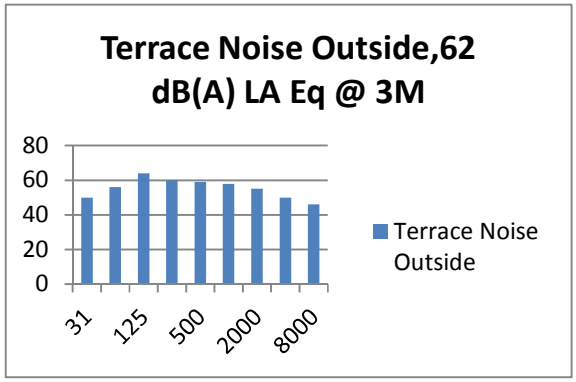
Table 8: Summary of Maximum Allowed Entertainment Noise Level

Noise Source	**Time Period**	**Window Status**	**Maximum Internal Noise Level**
Live Band	Day 07:00-18:00	Open	~80dB(A)
Live Band	Evening 18:00-22:00	Open	~75dB(A)
Live Band	Night 22:00-07:00	Open	~71dB(A)
Live Band	Day 07:00-18:00	Closed	~102dB(A)
Live Live	Evening 18:00-22:00	Closed	~98dB(A)
Live Band	Night 22:00-07:00	Closed	~93dB(A)

The above internal noise levels shall be the set points of the noise limiting device for the different time periods. The development must implement a noise management plan and decide on the use of windows being open or shut during live band event periods.

V. BOARDING HOUSE COMMUNAL OPEN SPACE NOISE ON RECEIVERS

In order to determine approximate noise levels generated by the Communal Open Space within this site we have used monitored results from our library of a COS area with 40 people talking which resulted in a noise level of $L_{A10\ t=15\ min}$ 62 dB(A).
A spectrum of the measured COS noise has been included adjacent.



The proposed operating hours of the communal open space is 7am to 10pm. As the communal open space is not open during the night period it has not been assessed. The noise generated within the COS must meet the criteria set out within the PKA DA Acoustic Report. An assessment of this has been included within the table below;

Table 9: COS Noise At Closest Sensitive Receivers

Receiver	Source Noise Level	Calculated Noise Level at Receiver	Criteria Day/ Evening/ Night	Compliance
135 New Canterbury Rd	62dB(A)	52dB(A)	54dB(A)/ 53dB(A)/ 50dB(A)	Yes / Yes / No

We trust this meets with your understanding and please contact us if you have any questions.

Yours Sincerely; Joel West,
Associate Engineer West & Associates Pty. Ltd.

TRAFFIC IMPACT ASSESSMENT

123 – 133 New Canterbury Road, Lewisham

PREPARED FOR:
Emag Apartments Pty Ltd

REFERENCE:
0351r01v06

DATE:
26/10/2021

TRAFFIC IMPACT ASSESSMENT

123 – 133 New Canterbury Road, Lewisham

Prepared for: Emag Apartments Pty Ltd

ABN: 98 103 622 279

Reference: 0351r01v06

Date: 26/10/2021

Revision History

VERSION	DATE	PREPARED	REVIEWED	APPROVED	SIGNED
01	11/02/2021	Ben Midgley	Julius Boncato	Paul Corbett	Original signed
02	22/03/2021	Ben Midgley	Julius Boncato	Paul Corbett	Original signed
03	12/10/2021	Ben Midgley	Paul Corbett	Ben Midgley	Original signed
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05	21/10/2021	Ben Midgley	Paul Corbett	Ben Midgley	Original signed
06	26/10/2021	Ben Midgley	Paul Corbett	Paul Corbett	

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Appendices

1. Introduction

1.1. Overview

PDC Consultants has been commissioned by Emag Apartments Pty Ltd to undertake a traffic impact assessment of a Development Application (DA) for a proposed mixed-use development at 123 – 133 New Canterbury Road, Lewisham. Specifically, the DA proposes modification of the existing buildings for the construction of a four-storey mixed-use development consisting of:

- 586 m^2 gross floor area (GFA) of hotel / pub use on Ground Floor;
- 53 boarding rooms and associated communal area across Levels 1 – 3;
- One (1) manager's room on Level 1;
- Basement Level parking accommodating a total of seven (7) car parking spaces including one (1) car share space;
- A 6.1-metre-wide combined entry / exit driveway onto Hunter Street.

Having regard for the above, it is evident that development is not of a scale that requires referral of the DA to Transport for NSW (TfNSW) under the provisions of the State Environmental Planning Policy (Infrastructure) 2007.

The site is located in the newly formed Inner West local government area (LGA) however, a consolidated Development Control Plan for the Inner West LGA is yet to be announced or adopted. The proposed development has therefore been assessed in accordance with the Marrickville Development Control Plan 2011 and Local Environmental Plan 2011. In addition to Council's planning controls, the development has also been assessed accordance with the State Environmental Planning Policy (Affordable Rental Housing) 2009.

1.2. Structure of this Report

This report documents the findings of our investigations in relation to the anticipated traffic and parking impacts of the proposed development and should be read in the context of the Statement of Environmental Effects (SEE), prepared separately by Weir Phillips Heritage and Planning. The remainder of this report is structured as follows:

- Section 2: Describes the site and existing traffic and parking conditions in the locality;
- Section 3: Describes the proposed development;
- Section 4: Assesses the parking requirements of the development;
- Section 5: Assesses the traffic impacts of the development;
- Section 6: Discusses the proposed access and internal design arrangements;
- Section 7: Presents the overall study conclusions.

1.3. References

In preparing this report, reference has been made to the following guidelines / standards:

- Marrickville Local Environmental Plan 2011 (MLEP 2011);
- Marrickville Development Control Plan 2011 (MDCP 2011);
- State Environmental Planning Policy (Infrastructure) 2007 (SEPP Infrastructure 2007);
- State Environmental Planning Policy (Affordable Rental Housing) 2009 (SEPP ARH 2009);
- Disability (Access to Premises – Buildings) Standards 2010 (Disability Standard 2010);
- Australian Standard AS 2890.1-2004, Part 1: Off-Street Car Parking (AS 2890.1);
- Australian Standard AS 2890.3-2015, Part 3: Bicycle Parking Facilities (AS 2890.3);
- Australian Standard AS 2890.6-2009, Part 6: Off-Street Parking for People with Disabilities (AS 2890.6);
- RMS[1] Guide to Traffic Generating Development 2002 (RMS Guide);
- RMS[1] Technical Direction TDT 2013/04a - Guide to Traffic Generating Developments, Updated Traffic Surveys (RMS Guide Update).

[1] Roads and Maritime Services (RMS) has joined with Transport for NSW, with reference to RMS now taken legally to automatically mean TfNSW.

2. Existing Conditions

2.1. Location and Site

The subject site is located at 123 – 133 New Canterbury Road, Lewisham, being situated approximately 500 metres south-east of Lewisham Railway Station and 6 kilometres south-west of the Sydney CBD. More specifically, it is located on the north-western corner of the intersection of New Canterbury Road and Hunter Street.

The site is triangular in configuration with a total area of approximately 945 m^2. The site has two (2) street frontages being New Canterbury Road to the south having a length of approximately 50 metres, and Hunter Street to the north-east with a length of approximately 60 metres. The western boundary border neighbouring industrial developments and is approximately 35 metres in length.

The site currently accommodates a hotel of 23 rooms with an associated Ground Level bar area of 640 m^2 GFA. A single 3.0-metre-wide vehicle access is provided via Hunter Street; however, this access is not used and no on-site car parking is provided.

The site also accommodates a single shop-top housing development, with Ground Floor commercial space of 155 m^2 GFA and a single (1) residential unit on Level 1. This shop-top housing development also has a vehicle access provided via Hunter Street which serves a single (1) enclosed garage; however, this garage is used as a bins room for the hotel and not as a car parking space for the shop-top housing.

Figure 1 and **Figure 2** provide an appreciation of the site's location in a broad and local context respectively.

2.2. Road Network

The road hierarchy in the vicinity of the site is shown by **Figure 1**, with the following roads considered noteworthy:

- New Canterbury Road: forms part of a TfNSW Main Road, MR 167. New Canterbury Road runs in an east-west direction between Stanmore Road in the east and Canterbury Road in the west. Near the site, it is subject to 60km/h speed zoning restrictions and accommodates two (2) lanes of traffic in each direction. A combination of parking restrictions operate near the site, including No Stopping and Clearways which operate 6 – 10AM in the eastbound direction and 3 – 7PM in the westbound direction.

- Walker Street: a local road that runs in a north-south direction between New Canterbury Road in the south and Railway Terrace in the north. It is subject to 50km/h speed zoning restrictions near the site and carries a single lane of traffic in each direction. On-street parking is permitted on both sides. A combination of unrestricted and timed parking (2P 8:30AM – 6PM Monday to Friday) restrictions apply along both sides.

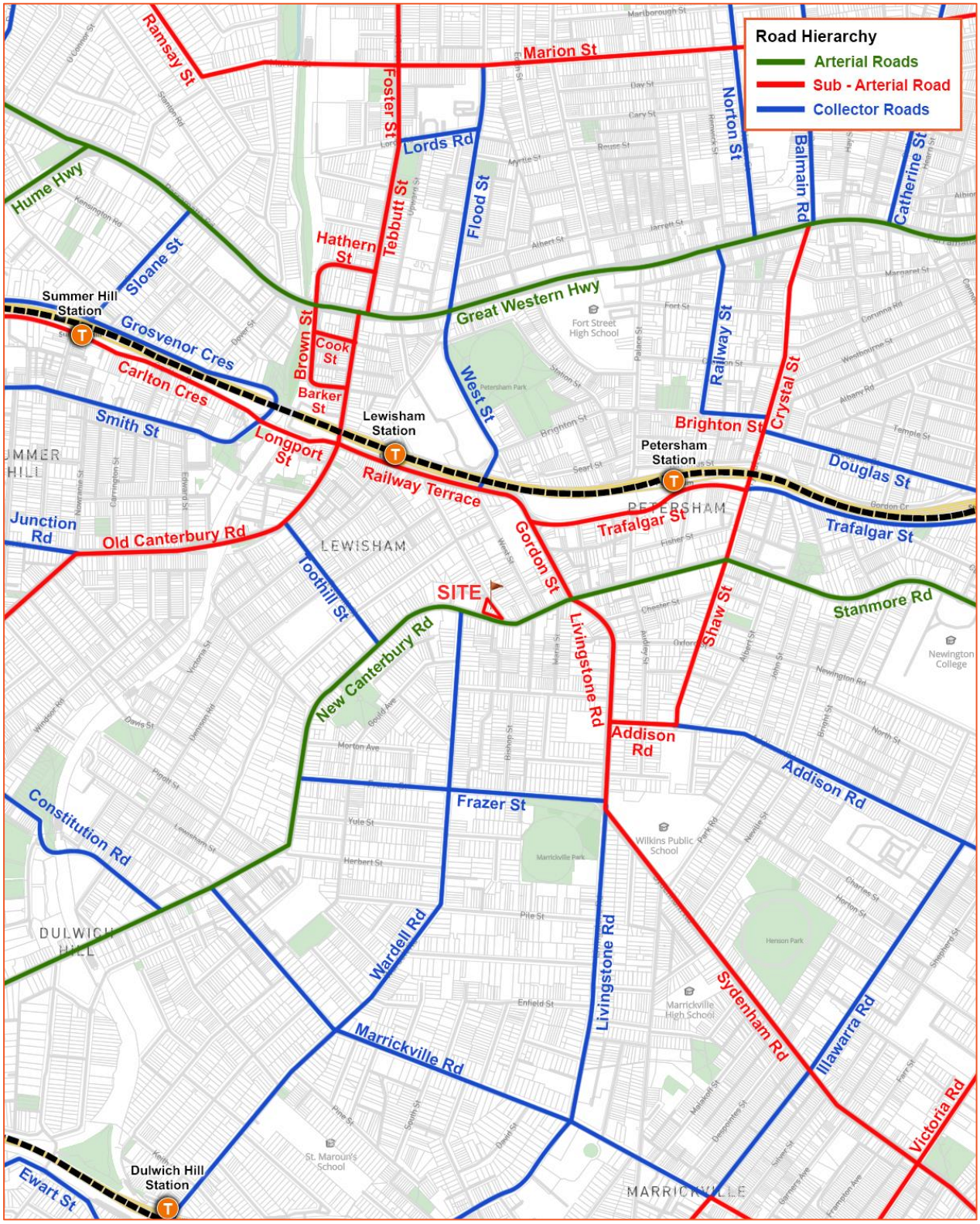


Figure 1: Location and Road Hierarchy Plan

Figure 2: Site Plan

2.3. Public and Active Transport

2.3.1. Rail Services

The Integrated Public Transport Service Planning Guidelines, Sydney Metropolitan Area, states that the walking catchment for metropolitan railway stations includes all areas within an 800-metre radius of a station. It can be seen from **Figure 3** that Lewisham and Petersham Railway Stations are located within 500 and 550 metres respectively of the site, and hence fall within the typical walking catchment area. Accordingly, residents and employees of the proposed development would have good access to the Sydney rail network.

Lewisham and Petersham Railway Stations are serviced by the T2 Inner West & Leppington Line which operates between Leppington, Parramatta, and the Sydney CBD. **Table 1** below shows the notable town centres that are accessible along the T2 Line and the average service headways during peak and off-peak periods.

Table 1: Rail Services

RAILWAY LINE	NOTABLE TOWN CENTRES ALONG LINE	AVERAGE HEADWAY
T2 Line	Parramatta, Lidcombe, Homebush, Strathfield, Ashfield, Newtown, Redfern, Sydney CBD, Cabramatta, Liverpool, Glenfield, and Leppington	Weekdays: 4 – 15 minutes Weekends: 15 minutes

2.3.2. Light Rail Services

The Integrated Public Transport Service Planning Guidelines, Sydney Metropolitan Area, states that the walking catchment for metropolitan light rail stations includes all areas within an 800-metre radius of a station. It can be seen from **Figure 3** that Lewisham West Light Rail Station is located within 700 metres of the site, and hence falls within the typical walking catchment area. Accordingly, residents and employees of the proposed development would have good access to the Sydney light rail network.

Lewisham West Light Rail Station is serviced by the L1 Dulwich Hill Line which operates between Dulwich Hill and Central. **Table 1** below shows the notable town centres that are accessible along the L1 Line and the average service headways during peak and off-peak periods.

Table 2: Light Rail Services

RAILWAY LINE	NOTABLE TOWN CENTRES ALONG LINE	AVERAGE HEADWAY
L1 Line	Dulwich Hill, Lewisham West, Leichhardt North, Rozelle Bay, Glebe, Fish Market, Pyrmont Bay, Paddy's Markets and Central	Weekdays: 8 – 15 minutes Weekends: 10 – 15 minutes

2.3.3. Bus Services

The Integrated Public Transport Service Planning Guidelines, Sydney Metropolitan Area, states that the walking catchment for metropolitan bus services includes all areas within a 400-metre radius of a bus stop. As can be seen from **Figure 3**, the site is situated within 400 metres of several bus stops located along New Canterbury Road, Railway Parade, Gordon Street, Audley Street and Livingstone Road. Accordingly, the site falls within the walking

catchment, with residents and employees expected to utilise these services for journeys to and from the proposed development.

Figure 3 also shows that several additional bus stops are accessible within 800 metres of the site. **Table 3** shows the notable town centres that are accessible via the bus services within 400 metres of the site, and the average service headways during peak and off-peak periods.

Table 3: Bus Services

ROUTE NO.	TO / FROM	ROUTE DESCRIPTION	AVERAGE HEADWAY
412	Campsie to City Martin Place	Via Clemton Park, Earlwood, Dulwich Hill, Marrickville, Petersham, Camperdown & Chippendale	Weekdays: 15-20 minutes Weekends: 15 minutes
413	Campsie to Central Pitt St	Via Ashbury, Summer Hill, Lewisham, Camperdown & Chippendale	Weekdays: 10-25 minutes Weekends: 1 hour on Saturdays / 30 minutes Sundays
428	Canterbury to City Martin Place	Via Hurlstone Park, Lewisham, Petersham, Enmore, Newtown, Darlington & Chippendale	Weekdays: 10-15 minutes Weekends: 10-15 minutes
428X	Canterbury to City Martin Place (Express Service)	Via Hurlstone Park, Lewisham, Petersham, Enmore, Newtown, Darlington & Chippendale	Weekdays: 8 Services only Weekends: No Services
445	Campsie to Balmain	Via Canterbury, Lewisham, Leichhardt, Lilyfield & Rozelle	Weekdays: 10-20 minutes Weekends: 15-30 minutes
N50	Liverpool to City Town Hall (Night Service)	Via Cabramatta, Fairfield, Fairfield East, Villawood, Berala, Homebush West, Burwood, Ashfield, Summer Hill, Camperdown & Chippendale	Weekdays: 5 Services only Weekends: 5 Services only

2.3.4. Cycle Network

Figure 4 shows that the site has good access to the local bicycle network with West Street accommodating an on-road cycle path which provides connections across the Inner West and to the wider active and public transport networks.

2.4. Existing Traffic Generation

As discussed in Section 2.1 of this report, the site currently accommodates a hotel and shop-top housing development. The RMS Guide Update recommends trip rates for the residential component of the shop-top housing as of 0.95 trips / dwelling / hour during the AM peak period and 0.99 trips / dwelling / hour during the PM peak period. Trip rates or the commercial component are advised as 1.6 trips / 100 m^2 GFA / hour during the AM peak period and 1.2 trips / 100 m^2 GFA / hour during the PM peak period.

Application of these rates to the existing shop-top housing development results in the following estimated traffic generation:

- 2 vehicle trips / hour (1 in, 1 out) during the AM peak period
- 2 vehicle trips / hour (1 in, 1 out) during the PM peak period

The above assumes a 50% inbound and 50% outbound split during the AM peak period noting that residents of the housing would typically leave for work in the weekday morning with workers of the commercial component arriving, and vice versa for the weekday PM peak period.

Neither the RMS Guide nor the RMS Guide Update provide trip generation rates for hotels or bars, noting the high variability across such developments and difficulty in generalising. Given the absence of any existing on-site parking and the fact that most visitors to the hotel would be to the pub and unlikely to be driving a car, trip generation during the peak periods of the site is expected to be low.

It is also noted that peak traffic generation for hotels and bars would not typically coincide with road network commuter peaks of weekday AM (7-9am) and PM (4 – 6pm) peaks.

Notwithstanding, it is considered that the most relevant use of the above is to determine the net change in traffic generation resulting from the proposed development, as is discussed in Section 5.1 of this report.

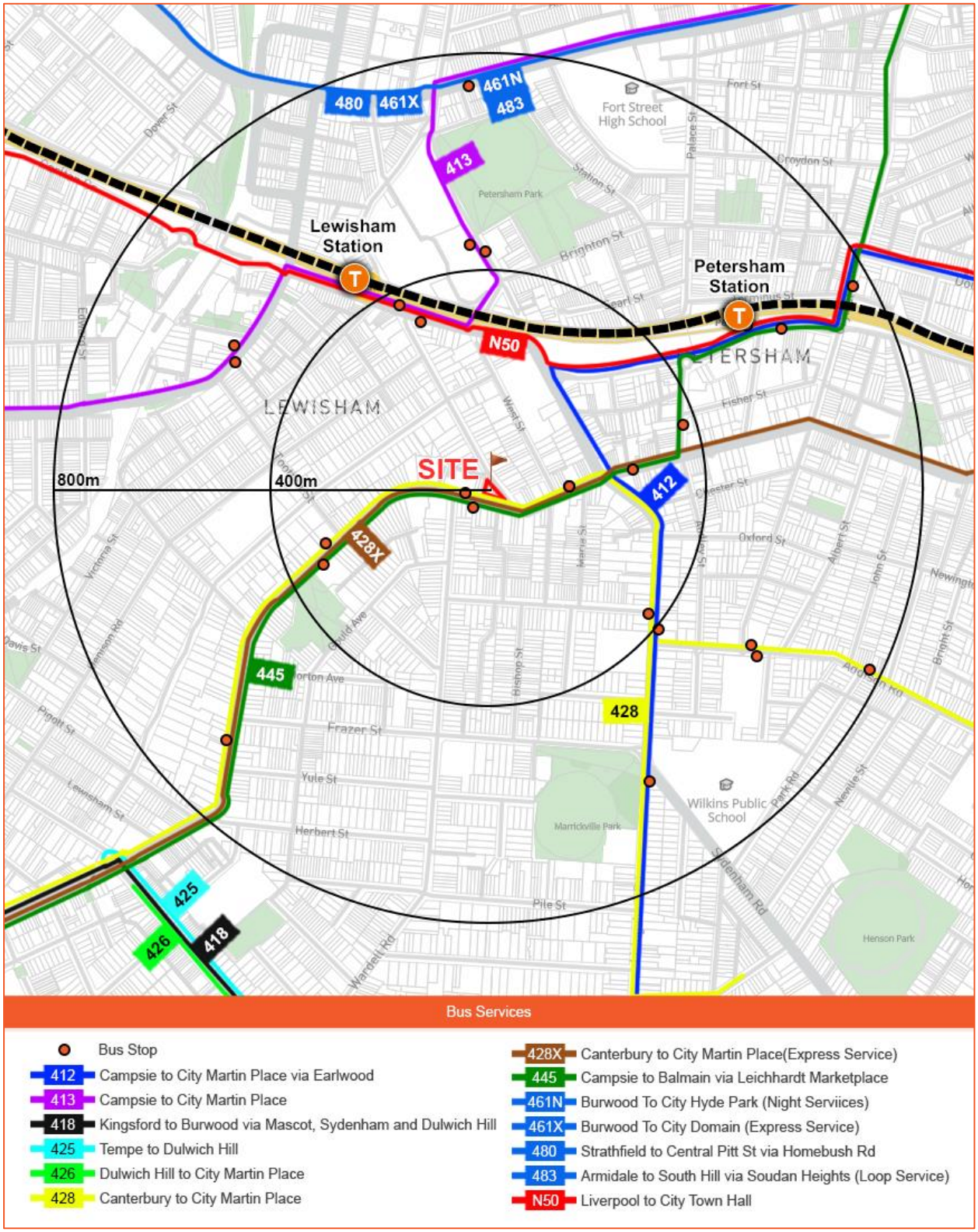


Figure 3: Public & Active Transport Services

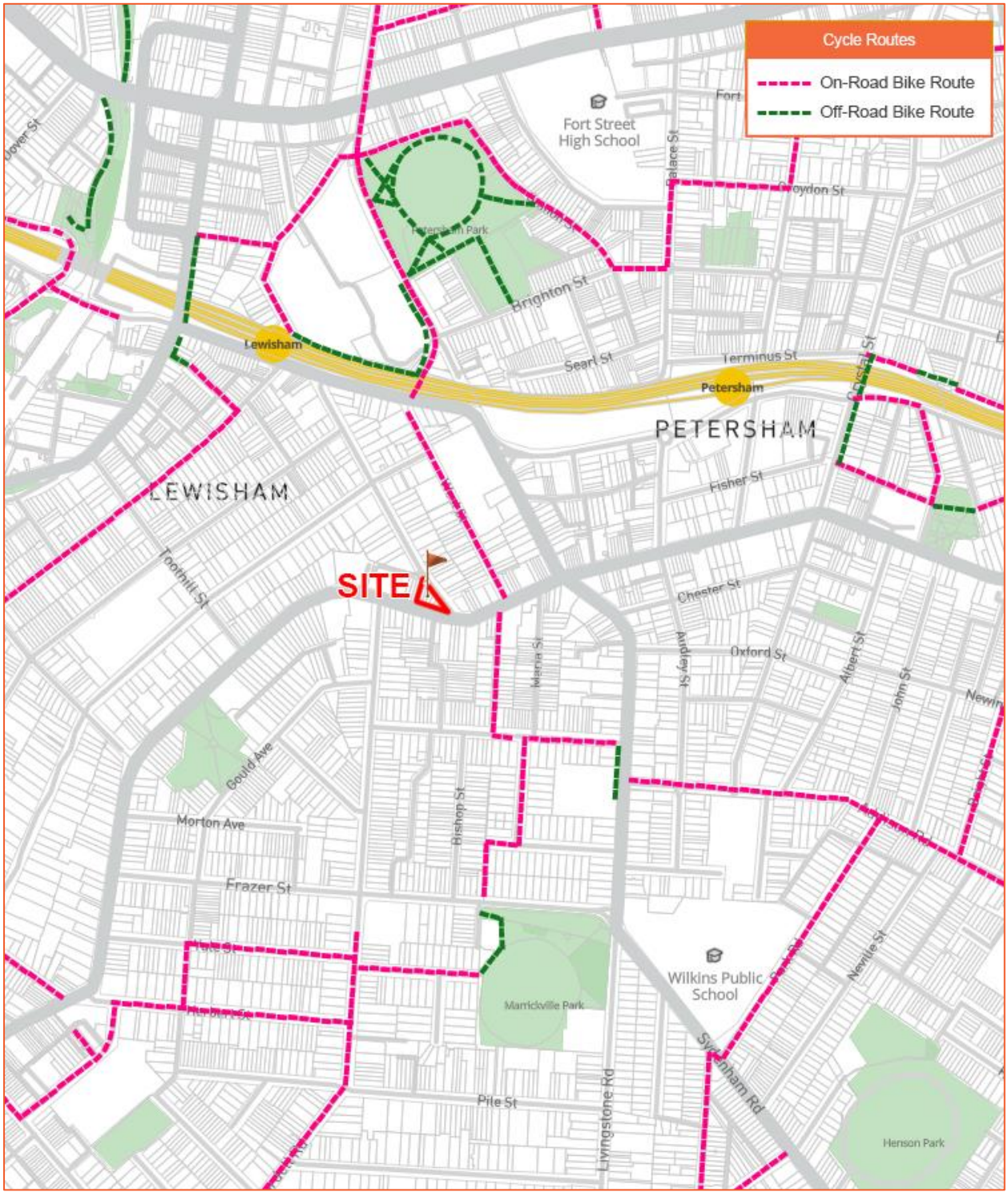


Figure 4: Cycle Network

3. Proposed Development

A detailed description of the proposed development for which approval is now sought, is outlined in the Statement of Environmental Effects prepared separately by Weir Phillips Heritage and Planning. In summary, the DA proposes the modification of the existing building and the construction of a four-storey mixed-use development consisting of:

- 586 m^2 gross floor area (GFA) of hotel / pub use on Ground Floor;
- 53 boarding rooms and associated communal area across Levels 1 – 3;
- One (1) manager's room on Level 1;
- Basement Level parking accommodating a total of seven (7) car parking spaces including one (1) car share space;
- A 6.1-metre-wide combined entry / exit driveway onto Hunter Street.

The parking and traffic implications arising from the proposed development are discussed in Sections 4 and 5 respectively. A copy of the relevant architectural drawings, prepared by Tier Architects, are included in **Appendix A**.

4. Parking Requirements

4.1. Car Parking

4.1.1. Boarding House Component

Clause 29(2)(e) of the SEPP ARH 2009 outlines the following car parking rates for boarding house developments:

> *(2) A consent authority must not refuse consent to development to which this Division applies on any of the following grounds:*
>
> ***(e) parking***
>
> *if:*
>
> *(i) in the case of development carried out by or on behalf of a social housing provider in an accessible area—at least 0.2 parking spaces are provided for each boarding room, and*
>
> *(ii) in the case of development carried out by or on behalf of a social housing provider not in an accessible area—at least 0.4 parking spaces are provided for each boarding room, and*
>
> *(iia) in the case of development not carried out by or on behalf of a social housing provider—at least 0.5 parking spaces are provided for each boarding room, and*
>
> *(iii) in the case of any development—not more than 1 parking space is provided for each person employed in connection with the development and who is resident on site.*

The application is not being carried out by or on behalf of a social housing provider and accordingly, the parking rates under Clause 29(2)(e)(iia) and Clause 29(2)(e)(iii) of the SEPP ARH 2009 are required to be adopted for the development.

MDCP 2011 also specifies car parking rates for boarding houses. **Table 4** below shows the car parking requirement for the development based on the applicable car parking rates under both the SEPP ARH 2009 and MDCP 2011.

Table 4: Boarding House Car Parking Requirement

TYPE	NO. / GFA	PARKING RATE		REQUIREMENT	
		SEPP	DCP	SEPP	DCP
Boarding room	53	0.5 spaces / room	0.5 spaces / room	27	27
Manager's room	1	Max. 1.0 space / manager	1.0 space / manager	0	1
			TOTAL	***27***	***28***

It is evident from **Table 4** that the development requires a minimum of 27 car spaces under the SEPP ARH 2009 and 28 car spaces under the MDCP 2011. Additionally, it is evident from **Table 4** and specifically, Clause 29 (2)(e)(iii) of the SEPP ARH 2009, that the development is permitted to provide a maximum of one (1) additional car parking space for an on-site manager however, this is an optional provision that does not influence the minimum requirement for 27 car parking spaces.

In response, the boarding house component of the development provides seven (7) car parking spaces for residents including one (1) car share space. As discussed below and based on research by GoGet, the car share space equates to 10 to 13 car spaces, meaning the development effectively provides a total of 16 to 19 car parking spaces. This level of provision is considered acceptable in the circumstances for the following reasons:

Occupant Survey of Recent Boarding House Developments in Central and Southern Sydney, Southern Sydney Regional Organisation of Councils, 2019

- The Southern Sydney Regional Organisation of Councils (SSROC), which includes Inner West Council, undertook occupant surveys of dozens of recent boarding house developments to better understand occupant characteristics, with key findings pertaining to car parking outlined below:
    - 67% of boarding house households do not own a car (i.e. **33% of households do own a car**).
    - 13% of boarding house households use a car as their main mode of transport to 'work or study', with the remaining 87% using other modes.
    - 19% of boarding house households use a car as their main mode of transport to 'socialise', with the remaining 81% using other modes.
    - 23% of boarding house households use a car as their main mode of transport to 'shop', with the remaining 77% using other modes.
- SSROC Occupant Surveys notes *"…the current requirement that one-space-for-two-rooms be provided is in excess of that evidently needed."* and that *"the survey responses did indicate that the proportion of tenants that did not own a car was higher closer to the city".*
- It is evident therefore that application of the NSW state-wide generic boarding house car parking rate identified in SEPP ARH 2009 is excessive for development at the subject site.
- The veracity of the SSROC Occupant Survey was confirmed in a recent Order made 01/10/2021 (*Contill Holdings Pty Ltd ATF Revay Discretionary Trust v Randwick City Council [2021] NSWLEC 1543)*, which upheld an appeal against a boarding house proposal providing 26 car parking spaces within a 68-room boarding house, a shortfall of eight (8) spaces, with the Senior Commissioner noting "*I am prepared to accept it as an objective assessment of the parking needs".*
- Applying the above car ownership rate of 33% to the proposed 53 rooms, results in a car parking demand for 18 car parking spaces (17.49 spaces rounded up).
- As discussed above, the development effectively provides 16 to 19 car parking spaces, which meets the expected parking demand of the development and ensures all parking demands are accommodated on-site.

Parking Credits

- As discussed in Section 2.1, the site currently contains a hotel of 23 rooms across Levels 1 and 2. MDCP 2011 recommends car parking requirements for 'Hotel or motel accommodation' within Parking Area 1 at a rate of '1 per 5 staff for staff + 1 per 5 units for residents'. The hotel component of the existing site is therefore required to provide five (5) car parking spaces.
- Given the hotel and bar currently provides no (nil) car parking spaces, the above requirement, totalling five (5) spaces, forms a parking credit which can be applied to the requirement for the proposed development.
- As discussed in Section 2.1, the shop-top housing development contains one (1) residential dwelling and 155 m^2 GFA of commercial space. MDCP 2011 notes a required provision within Parking Area 1 of '1 per dwelling house' and '1 per 100 m^2 GFA for customers and staff' of business premises, retail premises and shops. The shop-top housing component is therefore required to provide three (3) car parking spaces on-site. Whilst the shop-top housing development does provide one (1) enclosed garage, this is currently used as a bins room for the hotel bar and does not serve as provision for one (1) on-site car parking space.
- Totalling the above, the site has a total credit of eight (8) car parking spaces which are to be subtracted from the required provision presented in **Table 4**.
- This demand for eight (8) spaces is currently accommodated on-street under the existing development, with the proposed development effectively now accommodating all parking demands on-site.

Recent Approvals

- There have been several Land & Environment Court (LEC) Orders made in the Inner West (and its predecessors) Council area regarding boarding house developments with car parking provision lower than that required by the SEPP ARH 2009 or relevant DCP.
- It is acknowledged that some of the below Orders and approvals were made at times during which the SEPP ARH 2009 car parking rate was lower; this is accounted for in the tables.
- **Table 5** provides details of some of these LEC Orders, as provided by NUPD, with further details provided as **Appendix B**.

Table 5: Details of Relevant LEC Orders

ADDRESS	NO. ROOMS	SEPP PARKING REQUIREMENT	PARKING PROVISION	SHORTFALL ACCEPTED
8 Pembroke Street, Ashfield	20	2	1	1 (50%)
193 Liverpool Road, Ashfield	31	6	1	5 (83%)
244 Wardell Road, Dulwich Hill	50	10	2	8 (80%)

- Further approvals have been made by Council and its predecessors near the site, as summarised in **Table 6** (provided by NUPD).

Table 6: Details of Relevant Council Approvals

ADDRESS	NO. ROOMS	SEPP PARKING REQUIREMENT	PARKING PROVISION	SHORTFALL ACCEPTED
59 Liverpool Road, Ashfield	31	6	1	5 (83%)
44 Liverpool Road, Summer Hill	20	4	0	4 (100%)
187 – 189 Parramatta Road, Camperdown	64	13	4	7 (69%)
52 – 60 Enmore Road, Newtown	80	16	8	8 (50%)

- It is evident that there is precedence from prior Orders and Council approvals for significantly reduced car parking provision at boarding houses within the Inner West LGA.

Public Transport

- The SEPP ARH 2009 is a generic rate required to be adopted for all boarding house developments throughout NSW and does not include any discounts for sites that are well served by public transport services.
- It is clear from MDCP 2011 Clause 2.10.1, Objective O3 and the stated provision rates approach noted in Clause 2.10.4 (repeated below for reference) that the MDCP 2011 seeks to minimise on-site parking provisions and car ownership rates across the LGA to encourage the use of more sustainable modes of transport such as buses and rail.
    - *"The main elements of the approach to parking provision rates in this DCP are:*
        - *Car parking provision is slightly constrained across the entire LGA as a demand management measure; and*
        - *Car parking provision rates are further constrained in accessible areas."*
- **Figure 3** demonstrates that the site benefits from excellent access to public transport services, being within 550 metres of two (2) Railway Stations, 700 metres of Lewisham West Light Rail Station and within 400 metres of several bus stops located along New Canterbury Road, Railway Parade, Gordon Street, Audley Street and Livingstone Road that serve six (6) different bus routes with destinations across the City. The site benefits from a Transit Score of 73[2], classified as 'Excellent Transit'.
- It is therefore expected this excellent service by public transport options will result in reduced car ownership rates and car parking demand from the site.

Proximity to Amenities

- The site is favourably sited in between town centres of Lewisham and Petersham, each of which are located within 400 – 600 metres distance. These centres, along with independent retailers in the vicinity, provide a vast array of amenities within walking distance of the site, thus reducing the requirement for car journeys and removing incentive for residents of the site to own a car.

[2] *https://www.walkscore.com/score/125-new-canterbury-rd-petersham-nsw-australia*

- This excellent accessibility gives the site a Walk Score[2] of 89, termed as 'very walkable' and a location where 'most errands can be accomplished on foot'.

Green Travel Plan

- It is recommended that a Green Travel Plan (GTP) be prepared for the development and submitted to Council for approval prior to the issue of any occupation certificate.
- A GTP is a travel demand management tool to promote the use of active and public transport to / from developments. The primary purpose of the GTP is to coordinate a site-wide approach to influence the travel behaviour of residents and visitors away from the use of private vehicles towards more efficient modes of transport including active transport such as walking and cycling; public transport such as train and bus; and car-pooling and car sharing.
- A GTP includes a Transport Access Guide, in the form of a map / brochure, illustrating the available modes of transport available in the locality including, but not limited to, the following:
    - Location of GoGet and other car share service pods within close proximity to the site;
    - Bus routes, stops and a table of services;
    - Rail stations and a table of services;
    - Bicycle network and the location of any on-site or on-street bicycle parking facilities;
    - Details on how to download transport phone applications such as Car Next Door, Uber, OLA and Taxify.
- With regard to the above, Council is invited to impose a suitable condition requiring a GTP to be submitted and approved prior to the issue of any occupation certificate for the development. The GTP will ensure that residents and visitors are aware of and encouraged to use the abovementioned alternative modes of transport and infrastructure within the site's locality, thereby minimising the reliance on private vehicles.

Restrictions on Parking Permits

- The site is located within parking permit area M7 as identified on the parking permit areas map on Council's website.
- These restrictions discourage long term (all day) parking by motorists who do not have a resident parking permit, as they are required to adhere to the short-term restrictions (such as 2P parking along Hunter Street). The restrictions also encourage a reduction in private car ownership for residents who do not have a resident parking permit.
- Council is invited to impose a Condition of Consent prohibiting residents of the development from being able to obtain a resident parking permit. This arrangement will enforce an increased uptake on public transport services and reduce private car ownership. Future residents would be notified of this restriction and hence, the development would generate little or no parking demand by residents.
- It is noted that the subject site is not currently marked as a 'property eligible for parking permit', a measure it is proposed is maintained.

Car Share Space

- MDCP 2011 is supportive of car share vehicles, noting *"Council will look more favourably on proposed reductions from the rates specified in car parking provision in Table 1 if a car share scheme is provided on the site"*.
- The GoGet vehicle will be accessible to on-site residents as well as other GoGet members. Accordingly, the provision of an on-site GoGet vehicle will not only benefit future residents of the development but also neighbouring residents who also use car share services.
- The proposed car share vehicle will build upon GoGet's existing network of vehicles located in the vicinity of the site, shown by **Figure 5**, which includes 23 vehicles within 800 metres of the site. This ensures members will generally always have access to an available and conveniently located GoGet vehicle, ensuring that these are as convenient as a privately-owned vehicle.
- The report titled The Impact of Car Share Services in Australia, prepared by Phillip Boyle & Associates dated October 2016 includes an extensive assessment and economic modelling of car share services in Australia, with a particular focus on the City of Sydney LGA, and confirms that each car share vehicle replaces up to 10-13 private cars.
- The development provides seven (7) car parking spaces including one (1) car share space. Based on Phillip Boyles & Associates research the development therefore effectively provides a total of 16-19 car parking spaces (six (6) standard spaces plus 10 – 13 spaces as a result of the car share space).
- Convenient access to public transport services, illustrated by **Figure 3**, complements the uptake of car share participation as opportunities would exist for commuter members to use the available car share vehicles to undertake short-distance errands with the convenience and assurance of a pod to park their car share vehicles.
- If deemed appropriate by Council, a suitable condition of consent could be imposed which requires the owner of the boarding house to subsidise membership of residents for car share schemes such as GoGet, or otherwise apply a levy to residents who own a private vehicle. This would encourage a reduction in private car ownership and residents to use available car share vehicles in the area.

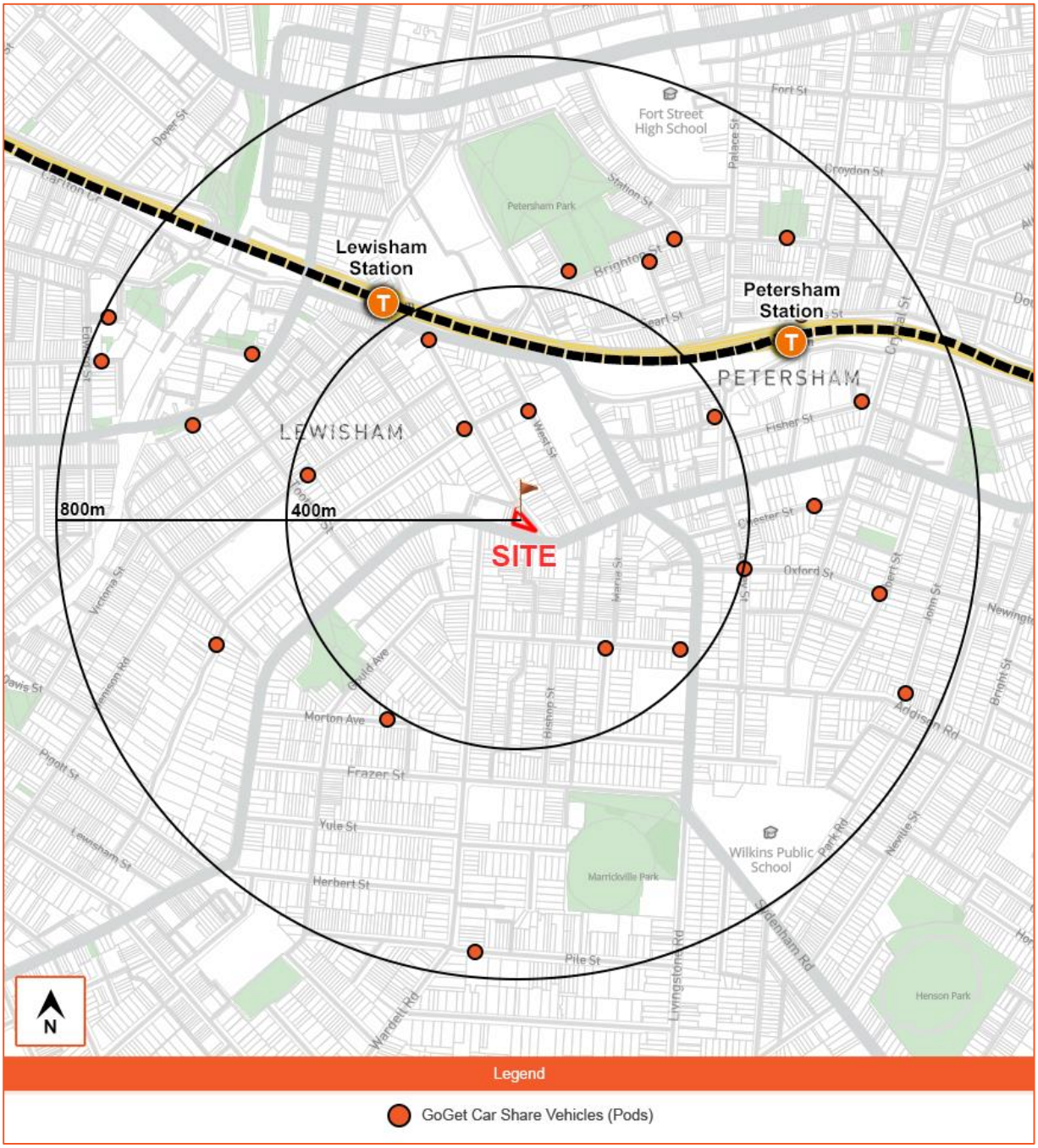


Figure 5: GoGet Car Share Locations

The proposed boarding house car parking provision is therefore considered acceptable and will ensure that all demands are accommodated on-site, with no reliance on on-street parking.

4.1.2. Hotel Bar Component

The MDCP 2011 stipulates car parking rates for 'bar component of hotel or motel accommodation'. Whilst boarding houses are not specifically mentioned, this parking rate is considered most appropriate for the hotel bar proposed and reflects the current use also. **Table 4** below shows the car parking requirement for the hotel bar component based on the applicable parking rates under the MDCP 2011 and the proposed provision in response.

Table 7: Commercial Car Parking Requirement & Provision

TYPE	ADDITIONAL STAFF	PARKING RATE	REQUIREMENT	PARKING PROVISION
Hotel bar	2	1 per 6 staff for patrons & staff	0	0
		TOTAL	***0***	***0***

It is evident from **Table 4** that the development is not required to provide any additional car parking under the MDCP 2011 for staff and patrons following the proposed increase in staff of eight (8), as existing, to 10 employees. In response, no (nil) additional car spaces are proposed for the hotel bar component, which therefore satisfies the requirements of the MDCP 2011. The proposed hotel bar provision is therefore considered acceptable.

4.2. Accessible Car Parking

Consultation with the Applicant's access consultant has confirmed that the development is required to provide one (1) accessible car parking space. In response, the development provides one (1) accessible car space in accordance with the access consultant's requirements, and this is considered an acceptable level of provision.

4.3. Motorcycle Parking

Both the SEPP ARH 2009 and MDCP 2011 stipulate minimum motorcycle parking rates. **Table 8** below shows the minimum motorcycle parking requirement for the development and the proposed provision in response.

Table 8: Motorcycle Parking Requirement & Provision

TYPE	NO.	PARKING RATE		MIN. REQUIREMENT		PARKING PROVISION
		SEPP	DCP	SEPP	DCP	
Boarding room	53	0.2 spaces / room	5% of DCP car parking requirement (28 spaces)	11	1	11
Hotel bar	2 staff	-	5% of DCP car parking requirement (0 spaces)	-	0	

In terms of the boarding house, it is evident from **Table 8** that the proposed development is required to provide a minimum of 11 motorcycle spaces under the SEPP ARH 2009 and one (1) space under the MDCP 2011. The hotel bar development is not required to provide any (nil) motorcycle spaces under the MDCP 2011.

In response, the development provides a total of 11 motorcycle spaces for the boarding house and therefore satisfies both the SEPP ARH 2009 and MDCP 2011. The proposed motorcycle parking provision is therefore considered acceptable.

4.4. Bicycle Parking

Clause 30(1)(h) of the SEPP ARH 2009 stipulates minimum bicycle parking rates that are required to be adopted for boarding house developments. MDCP 2011 does not stipulate minimum bicycle rates for hotel bars. **Table 9** below shows the minimum bicycle parking requirement for the development and the proposed provision in response.

Table 9: Bicycle Parking Requirement & Provision

TYPE	GFA / NO.	PARKING RATE		MIN. REQUIREMENT		PARKING PROVISION
		SEPP	DCP	SEPP	DCP	
Boarding room	53	0.2 spaces / room	1 space per 2 rooms + 1 visitor space per 10 rooms	11	32	32

It is evident from **Table 9** that the proposed development is required to provide a minimum of 11 bicycle spaces under the SEPP ARH 2009 and 32 under MDCP 2011. In response, the development provides 32 bicycle spaces in the form of stacked, two-tier bicycle racks, the specifications of which are provided as **Appendix C**, thereby exceeding the minimum requirement of the SEPP ARH 2009 and meeting the minimum requirement of MDCP 2011. The proposed bicycle parking provision is therefore considered acceptable.

4.5. Service Vehicle Parking & Waste Collection

Neither the SEPP ARH 2009 nor MDCP 2011 specify a rate for the provision of service vehicle parking for boarding house developments. Given the use and moderate scale of the proposed boarding house, it is expected that there would be a negligible demand for service vehicle parking.

In terms of the hotel pub development, the existing hotel bar keg deliveries currently load and unload at the site frontage along New Canterbury Road. These deliveries are scheduled to occur within a four-hour window between 10am – 2pm. All other deliveries park on-street along either Hunter Street and New Canterbury Road and trolly deliveries to the Hunter Street entrance. Given the modest scale of increase in GFA of the hotel bar component, being 86 m^2 GFA, the impact on servicing and deliveries is expected to be negligible and thus it is proposed the existing arrangements be maintained.

Additionally, it is considered appropriate that waste collection of the development occur on-street along Hunter Street, as it does currently for the existing hotel bar. The hotel bar currently utilises the enclosed garage of the shop-top housing as bins storage, with private waste contractors parking on-street along Hunter Street to collect the bins. The proposed hotel bin room is located adjacent to the proposed ramp to the rear of the property, and thus similar waste collection operation is proposed, given the modest increase in GFA of the hotel bar is not expected to materially impact waste volume or collection requirements.

Waste collection for the boarding house is also proposed to occur on-street along Hunter Street. To facilitate this, an on-site caretaker will be responsible for transferring bins from the Ground Level waste storage area, which fronts Hunter Street, to the kerbside prior to collection being undertaken. The bins would then be promptly returned to the storage area by the on-site caretaker, following collection. This arrangement will ensure that waste can be collected safely and efficiently and is considered acceptable for the proposal.

5. Traffic Impacts

5.1. Trip Generation

5.1.1. Boarding House

Neither the RMS Guide nor RMS Guide Update policies include traffic generation rates for boarding house developments. Reference was therefore made to the medium-density residential trip rates outlined in the RMS Guide, noting that the traffic generation of such developments would be somewhat comparable to a boarding house development. In this regard, it is noted that the RMS Guide recommends application of a peak period traffic generation rate of 0.4 trips / dwelling for a studio apartment, which generate a car parking rate of 1.0 car space / dwelling during AM and PM peak periods.

Conversely, the SEPP ARH 2009 requires car parking to be provided at a rate of only 0.5 car spaces / boarding room, or 50% of that required under the RMS Guide for a studio apartment. Accordingly, a peak period traffic generation rate of 0.2 trips / boarding room can be derived for boarding house developments. Application of this rate to the 53 boarding rooms proposed results in the following peak period traffic generation:

- 11 vehicle trips / hour (2 in, 9 out) during the AM peak period;
- 11 vehicle trips / hour (9 in, 2 out) during the PM peak period.

The above assumes an 80% inbound and 20% outbound split during the AM peak period noting that residents of the housing would typically leave for work in the weekday morning, and vice versa for the weekday PM peak period.

It is also noted that the above car parking rates are recommended for unconstrained environments, where car parking provision is made available. Given the proposal constrains car parking as discussed in Section 4.1.1, the trip generation of the boarding house component is expected to be much lower than that conservatively stated above.

5.1.2. Hotel pub

As discussed in Section 2.4, neither the RMS Guide nor the RMS Guide Update provide trip generation rates for hotels or bars, noting the high variability across such developments and difficulty in generalising. The total hotel pub GFA is only to increase marginally, and given the absence of any existing on-site parking and the fact that most visitors to the hotel would be to the pub and unlikely to be driving a car, the number of additional trips generated during the peak periods of the site as a result of the proposal is expected to be negligible.

5.1.3. Combined Traffic Generation Increase

The net increase in traffic generation resulting from the boarding house development and minor increase in hotel bar GFA, upon consideration of the generation of the existing development discussed in Section 2.4, is expected the be as follows:

- 9 vehicle trips / hour (1 in, 8 out) during the AM peak period;
- 9 vehicle trips / hour (8 in, 1 out) during the PM peak period.

5.2. Traffic Distribution & Impacts

The proposed development will result in a net increase in traffic generation of up to nine (9) vehicle trips / hour during the weekday peak periods. This equates to a maximum of approximately one (1) additional vehicle trip every 6-7 minutes, which is expected to have little to no impact on the performance of the external road network, and accordingly no external improvements will be required to facilitate the development.

Furthermore, computer modelling techniques available to analyse intersection performances are not sensitive to such small changes in traffic volumes and hence, such an assessment is not considered to be required. The traffic impacts of the proposed development are therefore considered acceptable.

6. Design Aspects

6.1. Access

With seven (7) car parking spaces of User Class 1A, the proposed development requires a Category 1 Driveway under Table 3.1 of AS 2890.1, being a combined entry / exit driveway of width 3.0 metres to 5.5 metres. In response, the development proposes a combined entry / exit driveway of width 5.5 metres between kerbs onto Hunter Street and therefore satisfies the minimum requirements under AS 2890.1.

The proposed arrangements have also been assessed using swept path analysis, with the results included in **Appendix D** for reference. These results confirm compliance with AS 2890.1 and that the proposed access arrangements will operate safely and efficiently.

Internally, it is noted that the vehicle ramp will reduce to 3.2 metres in width between kerbs and will therefore accommodate two-way, one-lane traffic flow. Clause 3.5 of AS 2890.1 was taken into consideration to determine the requirement for a waiting / passing bay. This Clause stipulates that developments are required to accommodate the 98th percentile queue on-site, ensuring that there is a negligible probability for any vehicle to extent onto a public roadway. In response, the development incorporates a waiting bay within the internal driveway on Ground Floor which complies with Clause 3.5 of AS 2890.1 and is considered acceptable.

The waiting bay will be accommodated within the driveway width of 5.5 metres, which is maintained for the first 6.0 metres into the site measured along the shortest edge. The swept path drawings included in **Appendix D** demonstrate satisfactory passing of vehicles at the vehicle access and operation of the waiting bay, and that the waiting vehicle can be wholly accommodated within the site.

The proposed design of the access is therefore considered acceptable and complies with the relevant requirements of AS 2890.1.

6.2. Internal Design

The proposed internal parking arrangements comply with the relevant requirements of AS 2890.1, AS 2890.3 and AS 2890.6, with the following design aspects considered noteworthy:

6.2.1. Roadway / Ramp

- The driveway has a grade of 5% (1 in 20) for the first 8.0 metres inside the property boundary when measured along the kerbside of the egress lane, and therefore satisfies Clause 3.3 of AS 2890.1.
- The vehicular ramp has a maximum grade of 25% (1 in 4) with transition of 12.5% (1 in 8) provided at both ends, thereby satisfying Clause 2.5.3 of AS 2890.1.

- The vehicular access has a width of 5.5 metres between kerbs for the first 6.0 metres inside the property boundary and will narrow to 3.2 metres internally. The ramp will therefore accommodate one-lane, two-way traffic flow, as demonstrated by the swept path analysis results included in **Appendix D**. This arrangement complies with AS 2890.1 and is considered acceptable given the low traffic generation and tidal nature, with most vehicles departing the site in the morning and arriving at the site in the evening.

- Due to the one-lane, two-way vehicle ramps and constrained intervisibility from one end of the ramp to the other, the use of traffic signals is required to manage the use of the ramp. In this regard, the architectural plans, provided in **Appendix A**, show that traffic signals will be provided at the vehicle access and within the basement level to manage traffic flow and ensure that vehicle movements occur safely and efficiently.

- The proposed internal arrangements have also been assessed using swept path analysis which confirms compliance with AS 2890.1, and that the proposed internal arrangements will operate safely and efficiently. It is noted that swept path analysis has been undertaken using a B99 design vehicle, which is able to circulate to access the basement level but is required to perform a 3-point turn manoeuvre at the bottom of the ramp. The results of the swept path analysis are included in **Appendix D** for reference.

6.2.2. Parking Modules

- All car parking spaces are provided in accordance with the User Class 1A requirements of AS 2890.1, having a minimum space width of 2.4 metres and length of 5.4 metres, with an aisle width in excess of 6.1 metres.

- All accessible car parking spaces are provided with a minimum space width of 2.4 metres and length of 5.4 metres, with a minimum aisle width of 5.8 metres. Additionally, these spaces are located immediately adjacent to a 2.4-metre-wide and 5.4-metre-long shared area, thereby satisfying the requirements of AS 2890.6.

- All walls / columns are located outside of the space design envelope, as required under Figure 5.2 of AS 2890.1.

6.2.3. Head Heights

- A minimum clear head height of 2.2 metres is required above all traffic circulation and car parking areas in accordance with Clause 5.3.1 of AS 2890.1.

- A minimum clear head height of 2.5 metres is required above the accessible car parking space and shared areas, in accordance with Clause 2.4 of AS 2890.6.

6.2.4. Other Design Aspects

- A 2.5 metre by 2.0 metre visual splay is to be provided on the egress side of the driveway, at the property boundary, in accordance with Figure 3.3 of AS 2890.1.

- All bicycle parking spaces are provided as Security Level B facilities, in accordance with AS 2890.3, with bicycle parking specifications provided as **Appendix C**.

- All motorcycle spaces are provided in accordance with Clause 2.4.7 of AS 2890.1.

6.3. Traffic Signal System

To ensure that vehicle movements to / from the basement car park are managed safely and efficiently, a traffic signal system will be provided for the vehicle ramp. This will involve the provision of red / green traffic signals (traffic signals) and waiting bays at the access and within the basement level, as shown by the architectural drawings provided as Appendix A.

The signals provided at the vehicle access would be configured in a 'passive green' state such that vehicles entering the site would always be given a green signal on arrival. This will ensure that entering drivers would (generally) not experience any delays, minimising the potential for any on-street queuing to occur. The only exception to this would be if a driver were to enter the site at the same time that a driver was exiting from the basement level, which is a very low probability event. In this instance, the following would occur:

- The exiting driver would manoeuvre out of their parking space and into the waiting bay in the basement. This would trigger the traffic signal at the vehicle access to a 'red' state, such that both signals are now 'red'.
- After a safety delay period of approximately 10 seconds, the traffic signal in the basement would change to 'green' and remain in this state for a period of approximately 10 seconds whilst the driver exits the site. During this period the signal at the access would remain 'red'.
- The signal in the basement would then revert to 'red'.
- After a safety delay period of approximately 10 seconds, the signals would revert to their passive state whereby the signal at the access would revert to 'green' and the signal in the basements would remain 'red'.

It is noted that the times provided above are indicative only and would be confirmed with a signal specialist at Construction Certificate (CC) stage.

Induction loops will be provided within the waiting bays on the ground and basement levels. This would link the waiting bays to the traffic signals for automatic operation of the traffic signal system.

The proposed traffic signal system is considered acceptable for the management of the vehicle access and basement level. It is also common practice for small scale developments such as that proposed which are provided with one-lane, two-way ramps and generate minimal traffic volumes during peak periods.

In summary, the internal parking arrangements have been designed in accordance with AS 2890.1, AS 2890.3 and AS 2890.6. Any minor amendments considered necessary (if any) can be dealt with prior to the release of a Construction Certificate.

7. Conclusions

In summary:

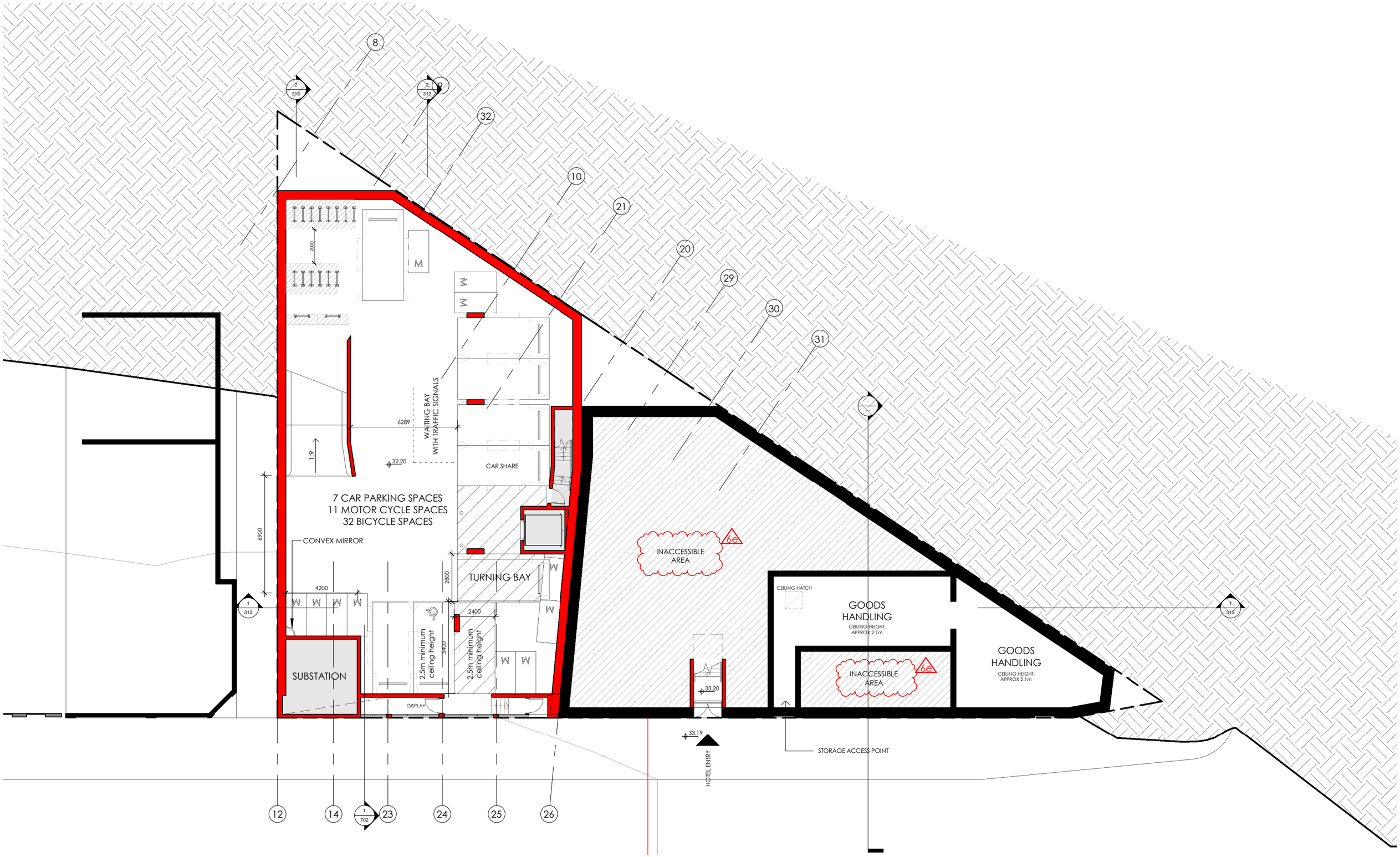
- PDC Consultants has been commissioned by Emag Apartments Pty Ltd to undertake a traffic impact assessment of a DA relating to a proposed mixed-use development at 123 – 133 New Canterbury Road, Lewisham. The DA proposes the demolition of the existing building and the construction of a new four-storey mixed-use development consisting of:
    - 586 m^2 gross floor area (GFA) of hotel / pub use on Ground Floor.
    - 53 boarding rooms and associated communal area across Levels 1 – 3.
    - One (1) manager's room on Level 1.
    - Basement Level parking accommodating a total of seven (7) car parking spaces including one (1) car share space.
    - A 6.1-metre-wide combined entry / exit driveway onto Hunter Street.
- The traffic generation assessment confirms that the development will generate a net increase of up to nine (9) vehicle trips / hour during the AM and PM peak periods. This equates to approximately one (1) additional vehicle trip every 6-7 minutes which will have negligible impacts on the performance of the external road network and accordingly, no external improvements will be required to facilitate the development. The traffic impacts of the proposed development are therefore considered acceptable.
- The development requires a maximum of 28 car parking spaces under the MDCP 2011 and 27 car parking spaces under the SEPP ARH 2009.
- The SSROC, which includes Inner West Council, undertook occupant surveys of dozens of recent boarding house developments to better understand occupant characteristics, with the results demonstrating a 33% car ownership rate for boarding house households. Applying this rate to the 53 rooms proposed generates a parking demand for 18 car parking spaces, with no additional car parking required for the hotel under the MDCP 2011.
- In response, the development provides seven (7) car parking spaces for boarding house residents including one (1) car share space, which equates to an effective provision of 16 to 19 car parking spaces. This level of provision satisfies the expected parking demand of the development and ensures all parking demands are accommodated on-site. The provision is also considered acceptable having regard for:
    - Parking credits from the existing development.
    - Proximity to public transport.
    - Proximity to amenities.
    - Implementation of a Green Travel Plan.
    - Restrictions on parking permit.

- The development provides a total of 32 bicycle and 11 motorcycle parking spaces, and therefore satisfies the minimum requirements of the SEPP ARH 2009. The proposed bicycle and motorcycle parking provisions are therefore considered acceptable.

- The proposed access and internal parking arrangements comply with the relevant requirements of AS 2890.1, AS 2890.3 and AS 2890.6. Any minor amendments considered necessary (if any) can be dealt with prior to the release of a Construction Certificate.

It is therefore concluded that the proposed development is supportable on traffic planning grounds.

Appendix A



6e - THE AREAS NOTED ON THE PLANS ARE INACCESSIBLE SEE SHEET 902 FOR PHOTOS OF GOODS HANDLING AREA

WALL TO BE RETAINED
WALL TO BE REMOVED
NEW WALL

SINGLE ROOM
DOUBLE ROOM
MANAGERS ROOM
COMMUNAL INDOOR AREA
HOTEL/BAR
PARKING/SERVICES

ISSUE	DATE	DESCRIPTION
C	08/10/2021	AMENDED PLANS FOR COURT
B	07/09/2021	AMENDED PLANS FOR COURT
A	18/01/2021	DEVELOPMENT APPLICATION

LOWER GROUND FLOOR PLAN

TIER ARCHITECTS

N

CLIENT	EMAG APARTMENTS	DATE 08/10/2021	SCALE indicated
PROJECT	123-133 New Canterbury Rd LEWISHAM	DRAWN PV	CHECKED NN
TITLE	LOWER GROUND FLOOR PLAN	DWG No —	301

DO NOT SCALE. USE FIGURED DIMENSIONS IN PREFERENCE TO SCALED. CHECK ALL DIMENSIONS ON SITE BEFORE FABRICATION.

1c - LIGHTING AND BREAKS IN BUILDING ARTICULATION TO LANEWAY PROVIDED
3f - LOBBY INCREASED IN WIDTH AND AIR LOCK ADDED TO GARBAGE ROOM
5a - ROLLER SHUTTER PROVIDED TO BASEMENT

GROUND FLOOR PLAN

WALL TO BE RETAINED
WALL TO BE REMOVED
NEW WALL

SINGLE ROOM
DOUBLE ROOM
MANAGERS ROOM
COMMUNAL INDOOR AREA
HOTEL/BAR
PARKING/SERVICES

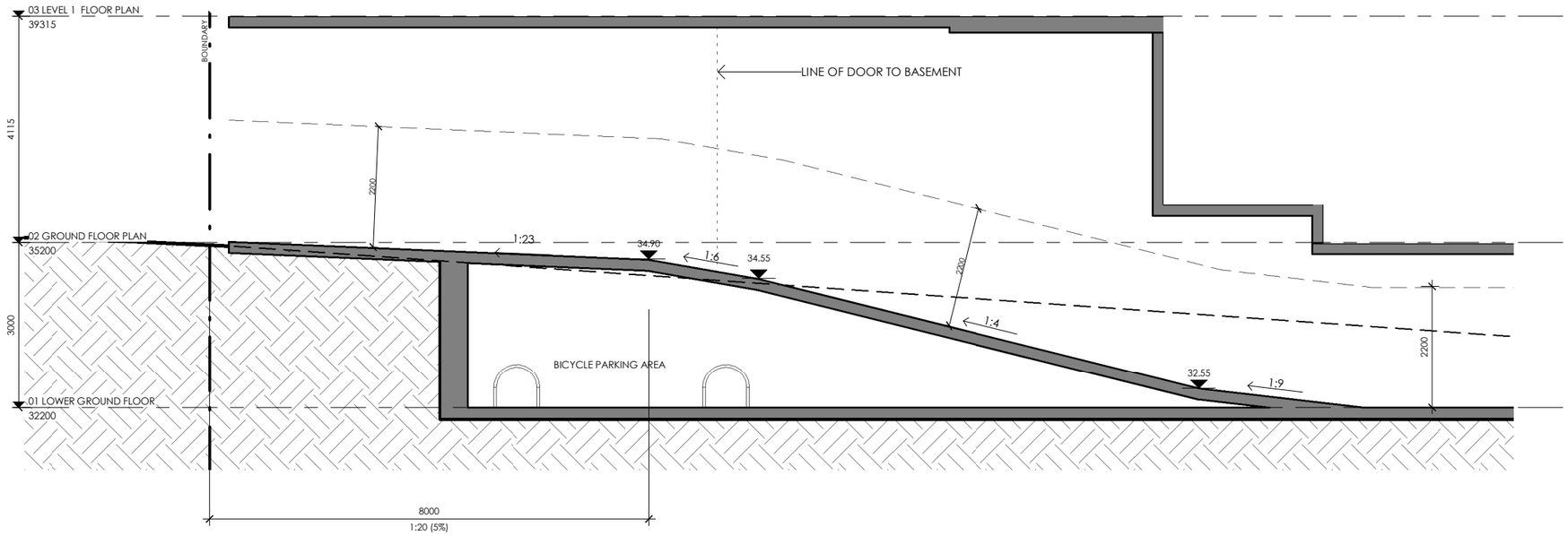
ISSUE	DATE	DESCRIPTION
C	08/10/2021	AMENDED PLANS FOR COURT
B	07/09/2021	AMENDED PLANS FOR COURT
A	18/01/2021	DEVELOPMENT APPLICATION

TIER ARCHITECTS

CLIENT	EMAG APARTMENTS	DATE 08/10/2021	SCALE indicated
PROJECT	123-133 New Canterbury Rd LEWISHAM	DRAWN PV	CHECKED NN
TITLE	GROUND FLOOR PLAN	DWG No 302	

1 SECTION BB

1 : 200



2 SECTION CC - DRIVEWAY SECTION

1 : 100

SECTIONS

SINGLE ROOM
DOUBLE ROOM
MANAGERS ROOM
COMMUNAL INDOOR AREA
HOTEL/BAR
PARKING/SERVICES

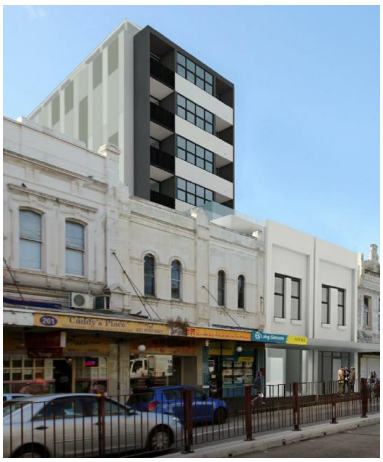
ISSUE	DATE	DESCRIPTION
C	08/10/2021	AMENDED PLANS FOR COURT
B	07/09/2021	AMENDED PLANS FOR COURT
A	18/01/2021	DEVELOPMENT APPLICATION

TIER ARCHITECTS

CLIENT	EMAG APARTMENTS	DATE 08/10/2021	SCALE indicated
PROJECT	123-133 New Canterbury Rd LEWISHAM	DRAWN PV	CHECKED NN
TITLE	SECTIONS	DWG No ---	313

DO NOT SCALE. USE FIGURED DIMENSIONS IN PREFERENCE TO SCALED. CHECK ALL DIMENSIONS ON SITE BEFORE FABRICATION.

Appendix B

SITE	PHOTO	COMMENT
8 Pembroke Street Ashfield - 20 boarding house rooms - 1 car parking space - 4 motorcycle space Source: Cracknell & Lonergan Architects		Approved by the Land & Environment Court in 2012 (10906 of 2011).
59 Liverpool Road Ashfield - 31 boarding house rooms - 1 car parking space Souree: Jamisa Design		Approved by Council 11 May 2011
193 Liverpool Road Ashfield - 46 boarding house rooms - 6 car spaces - 300 metres to Ashfield Train Station Source: NUPD		Approved by the Land & Environment Court in 2017 (13 of 2017)

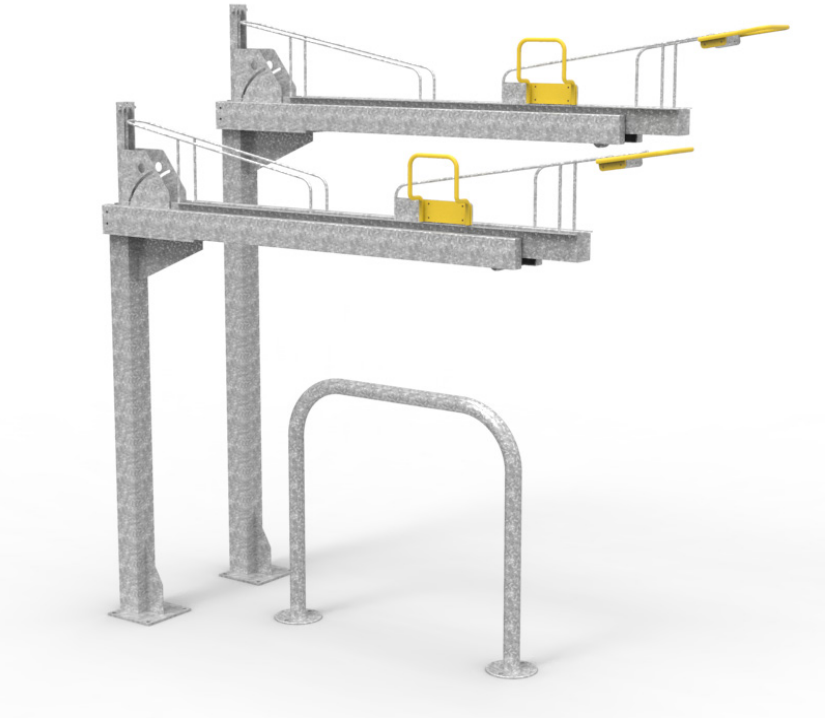
44 Liverpool Road Summer Hill - 20 boarding house rooms - No car parking spaces - 450 metres to Summer Hill Train Station Source: NUPD		Approved by Inner West Council
244 Wardell Road Dulwich Hill - 50 boarding house rooms - 2 car parking spaces - Adjacent to train station and bus services Source: Former Marrickville Council		Approved by the Land & Environment Court in 2012 (1288 of 2012)
62 Enmore Road Enmore - 15 boarding house rooms - 4 car parking spaces - Within 400 metres to Newtown train station Source: Former Marrickville Council		Approved 2011 by the former Marrickville Council
187-189 Parramatta Road Camperdown - 64 boarding house rooms - 4 tandem car parking spaces Source: Cracknell & Lonergan Architects		Approved 2012

Newtown RSL 52-60 Enmore Road Newtown - 80 boarding house rooms - 8 tandem car parking spaces Source: Tony Owen Architects		Approved 2012 by the former Marrickville Council
470 Wattle Street Ultimo - 58 boarding house rooms - 1 car parking spaces Source: City of Sydney Council		Approved February 2013 by City of Sydney Council

Appendix C

CORA BIKE RACK

PRODUCT SPECIFICATION SHEET



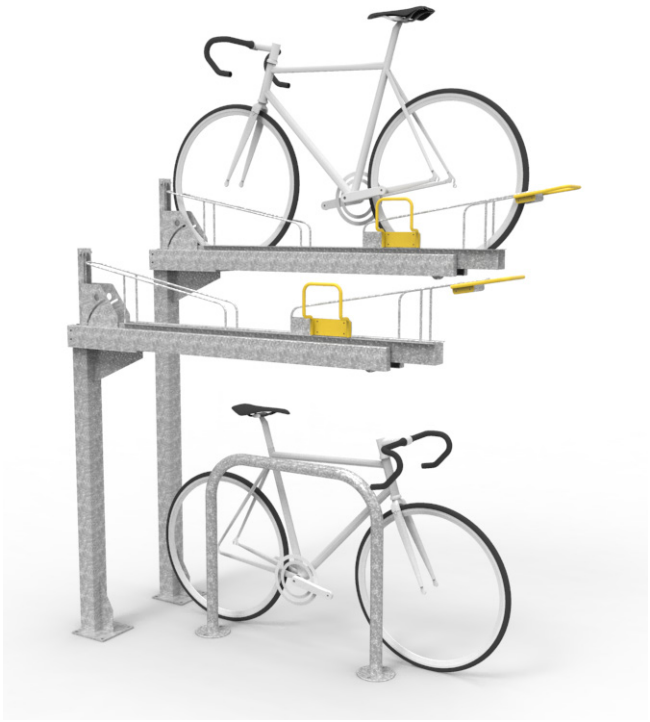
E3DT SERIES

E3DT-CBR

DYNAMIC UPPER TIER

STATIC LOWER TIER

A Dynamic upper tier combined with a static lower tier. Upper tier includes gas assist lift for ease of use and is available in alternating heights. Lower tier uses the CBR bike rail. CBR Series bike parking rails are designed to support the bike in a stable position and accommodate up to 2 bikes.



Capacity

- E3ST-H: 1 bike
- E3ST-L: 1 bike
- CBR1B: 2 bikes

Construction

- Heavy duty high quality steel

Fixings

- M10 anchor bolts with security nuts

Finishes

- CBR
  - In stock - galvanised
  - In stock - 316 stainless steel with electropolish
  - Option - 304 stainless steel
  - Option - colour powder coat (Cora standard colour range)
- E3ST-H and E3ST-L
  - Galvanised with powder coated accents on handles
  - Option - colour powder coat (Cora standard colour range)

Assembly

- Supplied partially assembled for assembly and mounting on site

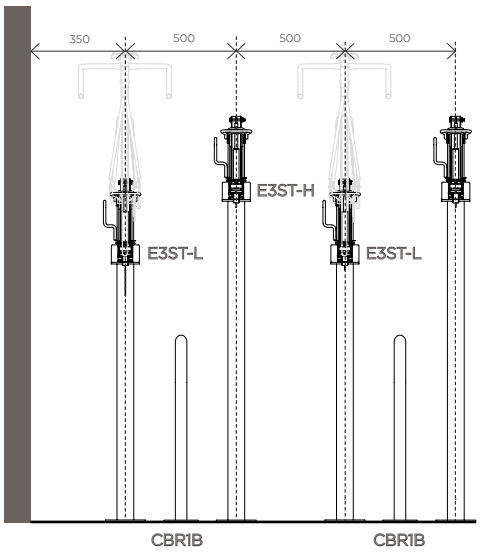
Compliance

- Rack is AS2890.3 (2015) compliant

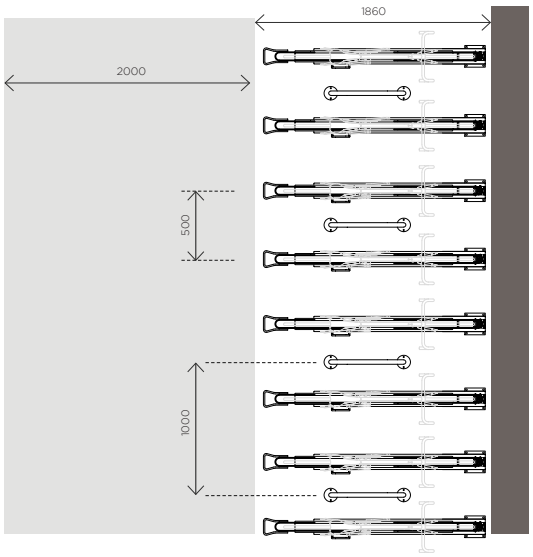
CORA BIKE RACK

PRODUCT SPECIFICATION SHEET

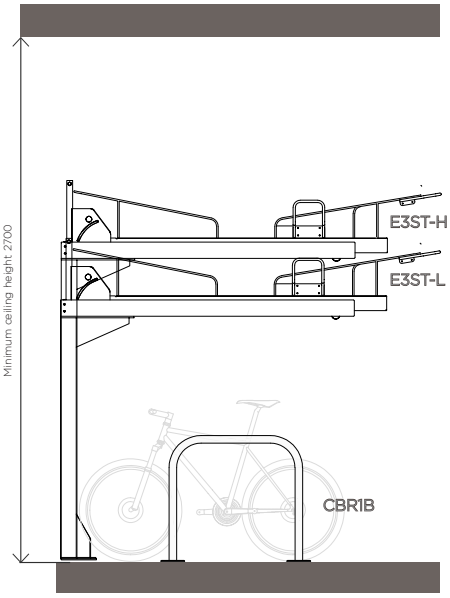
STAGGERED LAYOUT



Front view

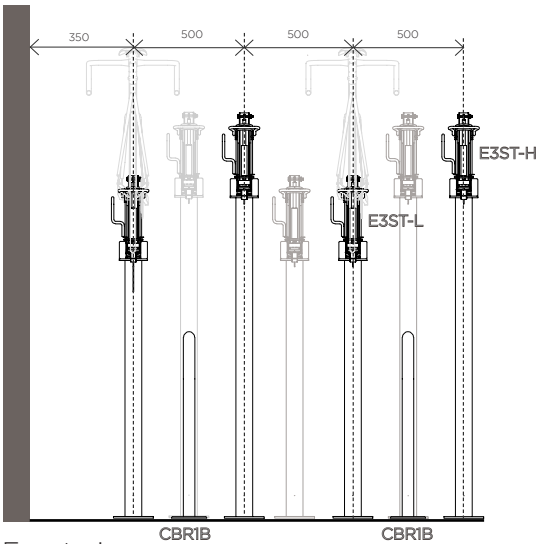


Top view

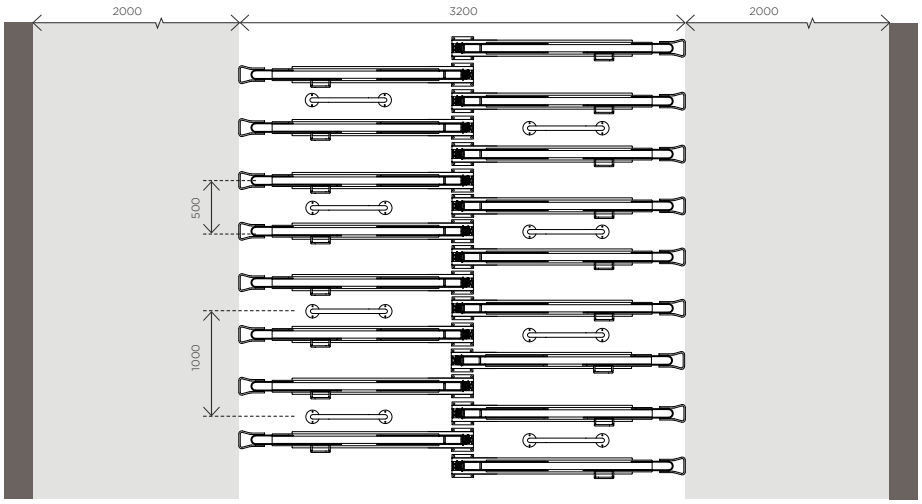


Side view

NESTED LAYOUT



Front view

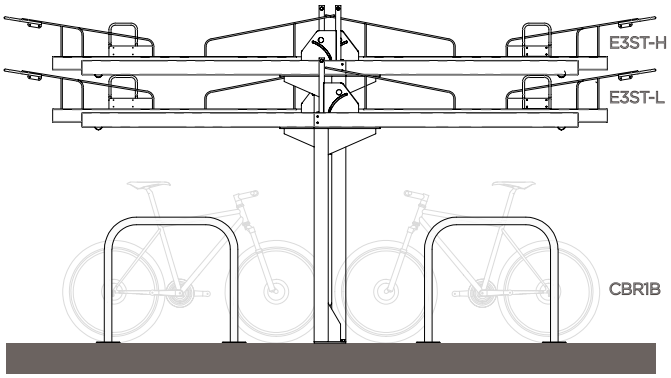


Top view

E3DT-CBR GROUND MOUNT LAYOUT GUIDE

For specific assembly and installation instructions relating to E3DT-CBR series racks, please refer to individual instruction information sheets.

Racks should not be installed, based on the information on this sheet alone.

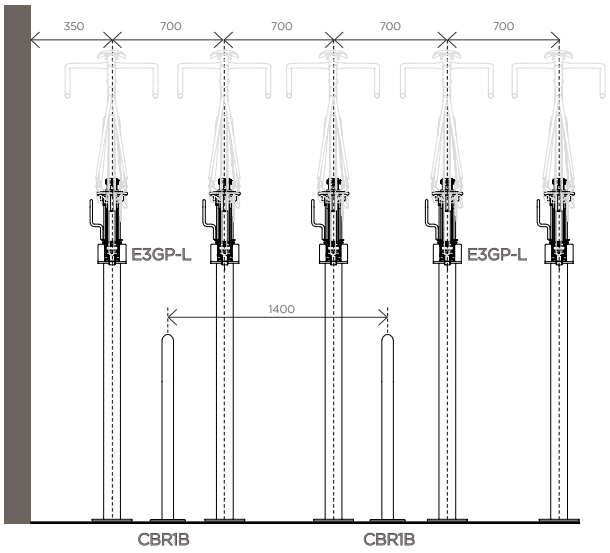


Side view

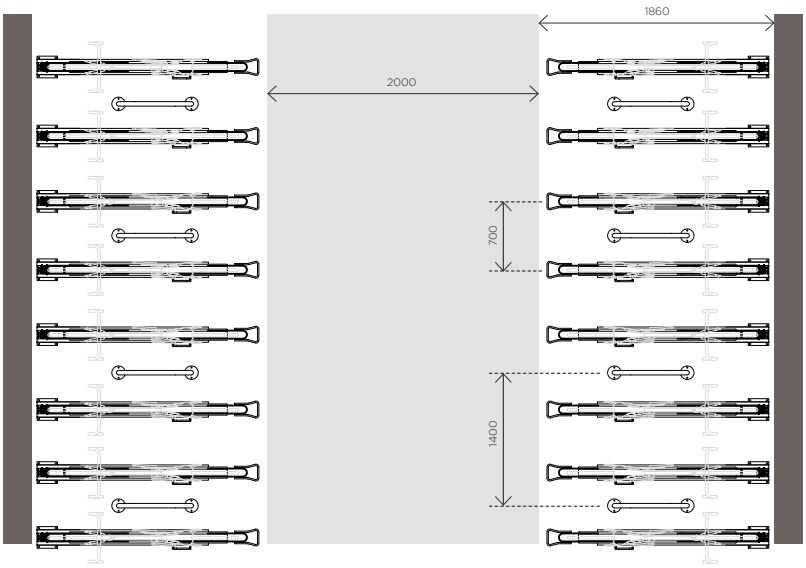
CORA BIKE RACK

PRODUCT SPECIFICATION SHEET

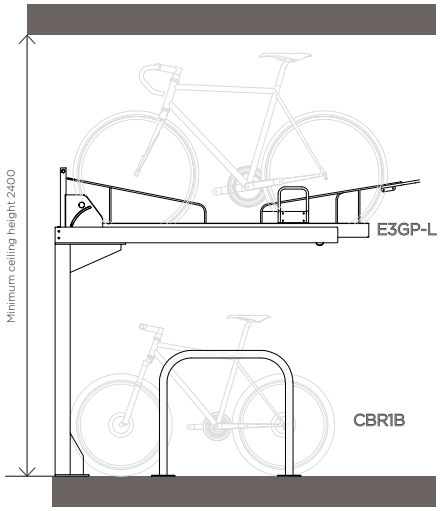
SINGLE LEVEL LAYOUT



Front view



Top view



Side view

E3DT-CBR GROUND MOUNT LAYOUT GUIDE

For specific assembly and installation instructions relating to E3DT-CBR series racks, please refer to individual instruction information sheets.

Racks should not be installed, based on the information on this sheet alone.

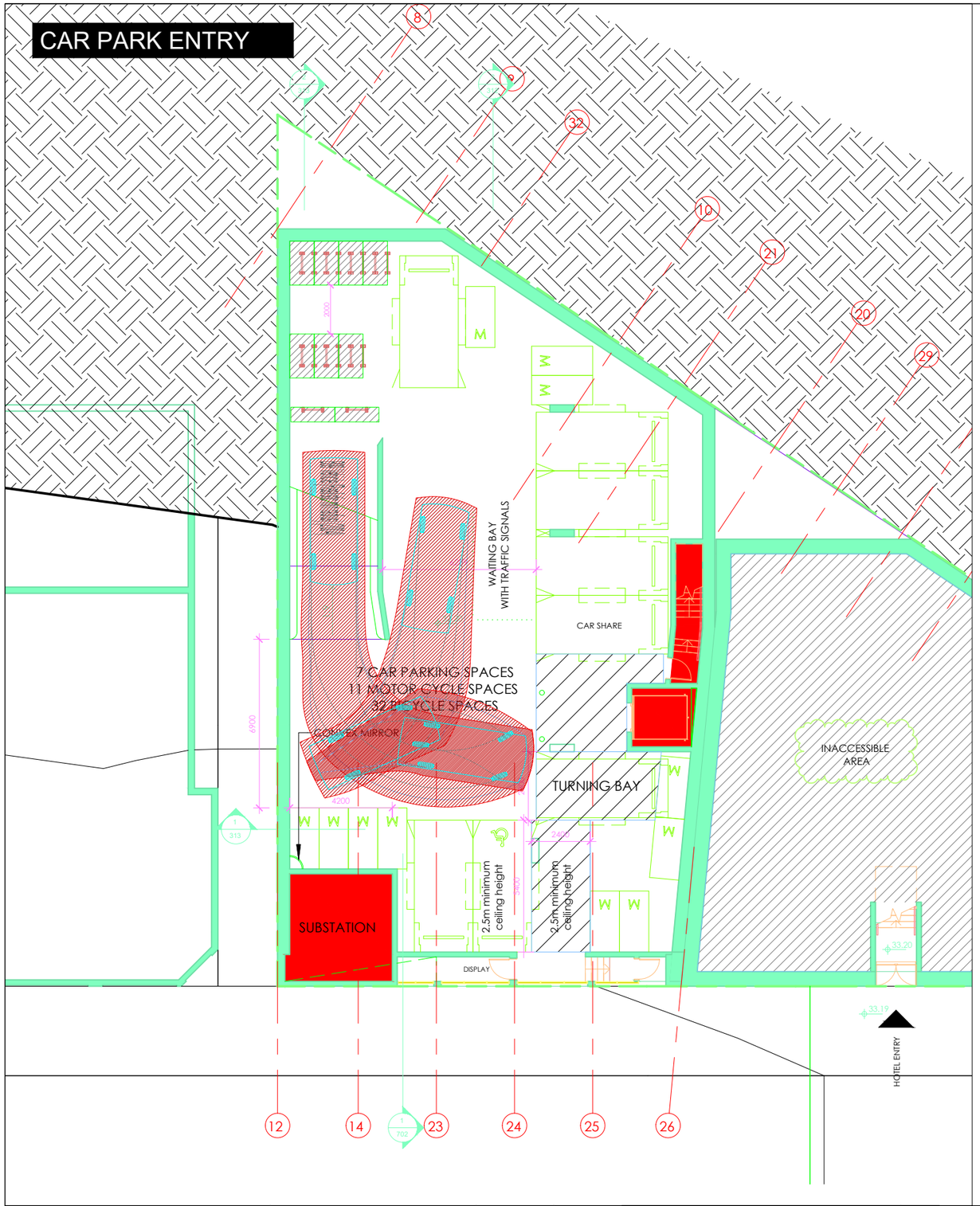
PH 1800 249 878

sales@cora.com.au

www.cora.com.au

Appendix D

CAR PARK ENTRY



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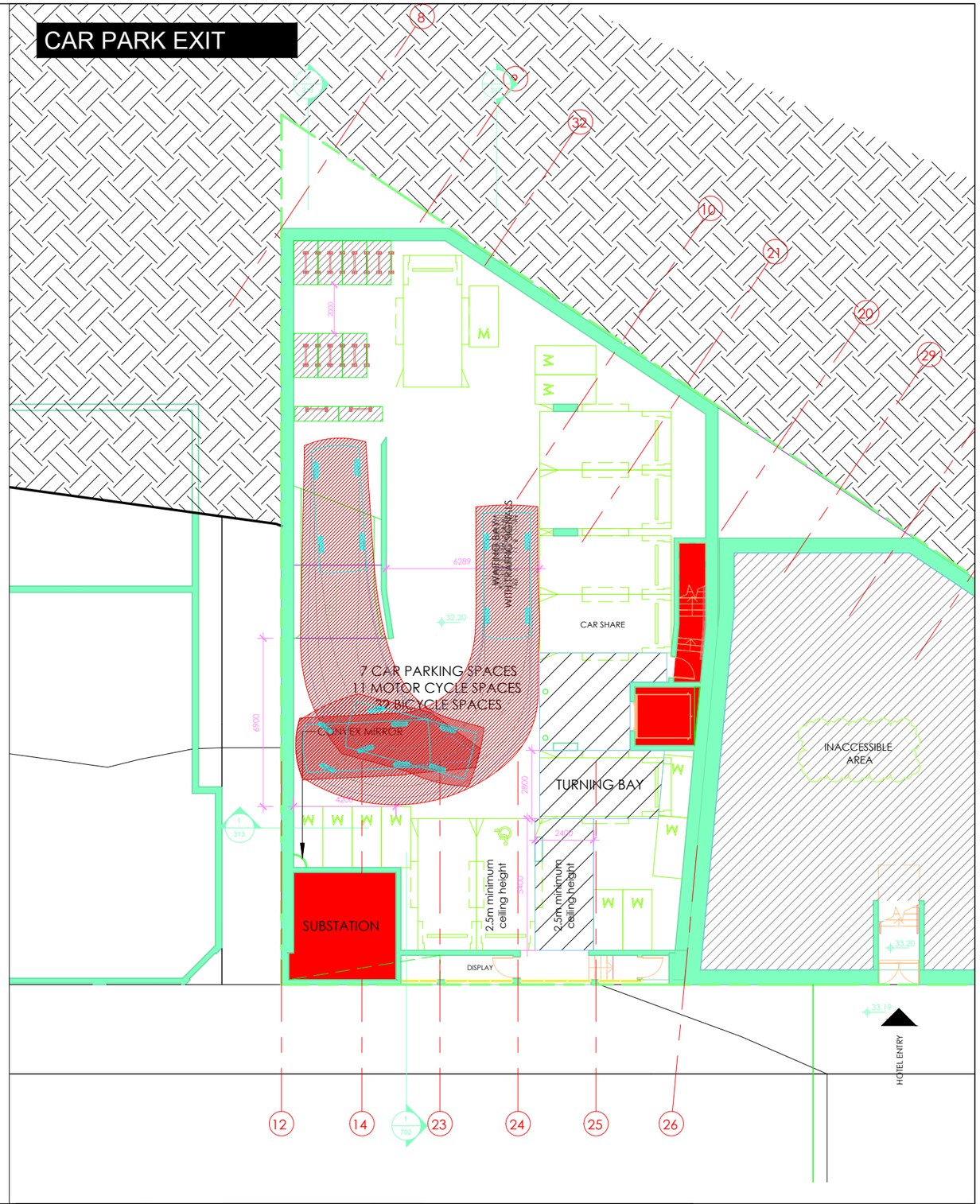

No.	Date	Description

Swept Path Key
- Vehicle Wheel Path
- Vehicle Body Envelope
- 300mm Vehicle Clearance

North

Drawing Prepared By

PDC Consultants
Level 14, 100 William Street
Woolloomooloo NSW 2011
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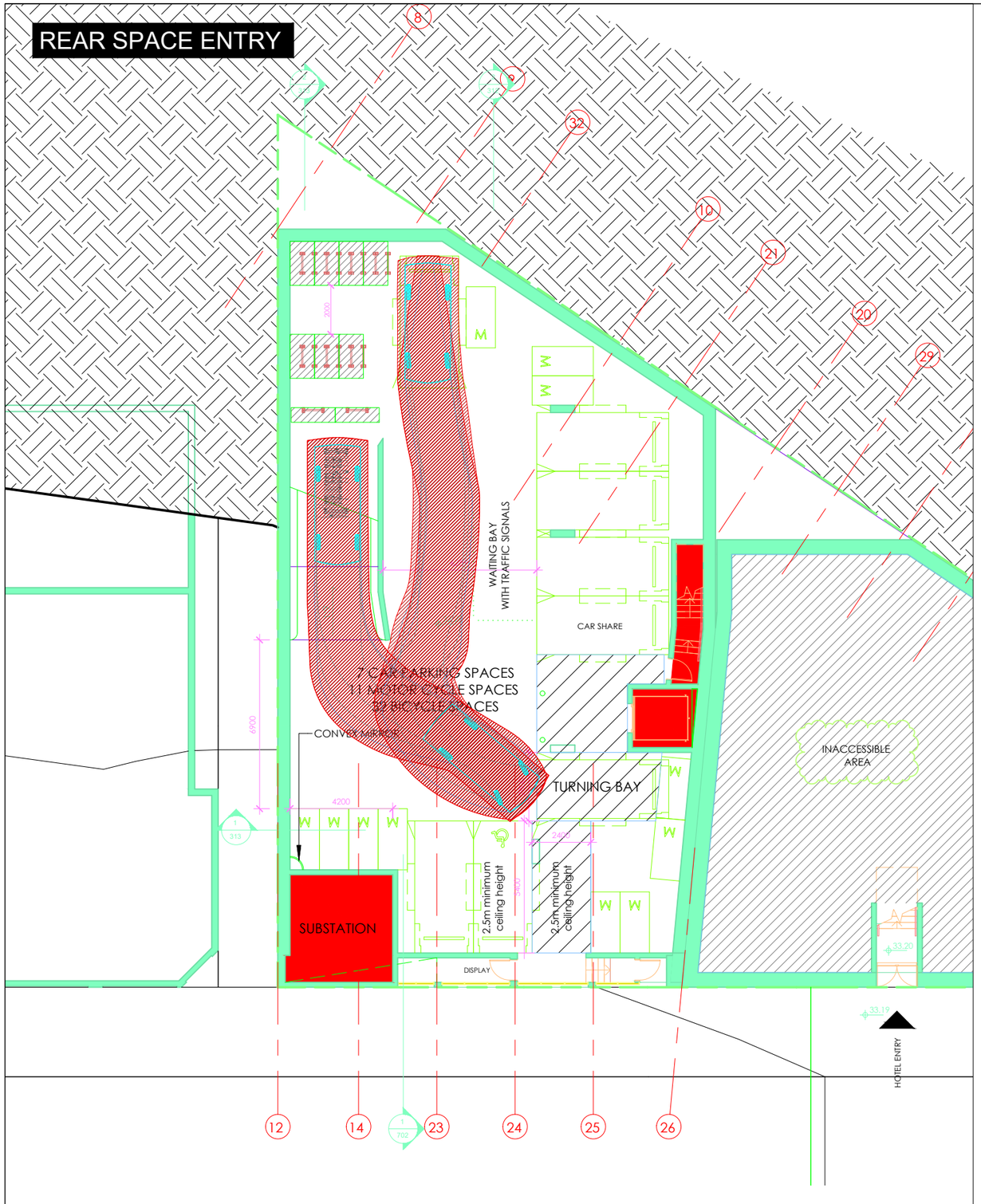
ABN: 70 615 064 670

Architect: Tier Architects	Project: 123 - 133 New Canterbury Road Lewisham	Drawing Title: Swept Path Analysis Basement B99 Design Vehicle	Drawing No.: 001 / Revision No.: -
Client: Emag Apartments	Project No: 0351	Sheet Status: NOT FOR CONSTRUCTION	Drawn By: BM / Date: 12/10/2021
			Scale: 1:200 @ A3

REAR SPACE ENTRY



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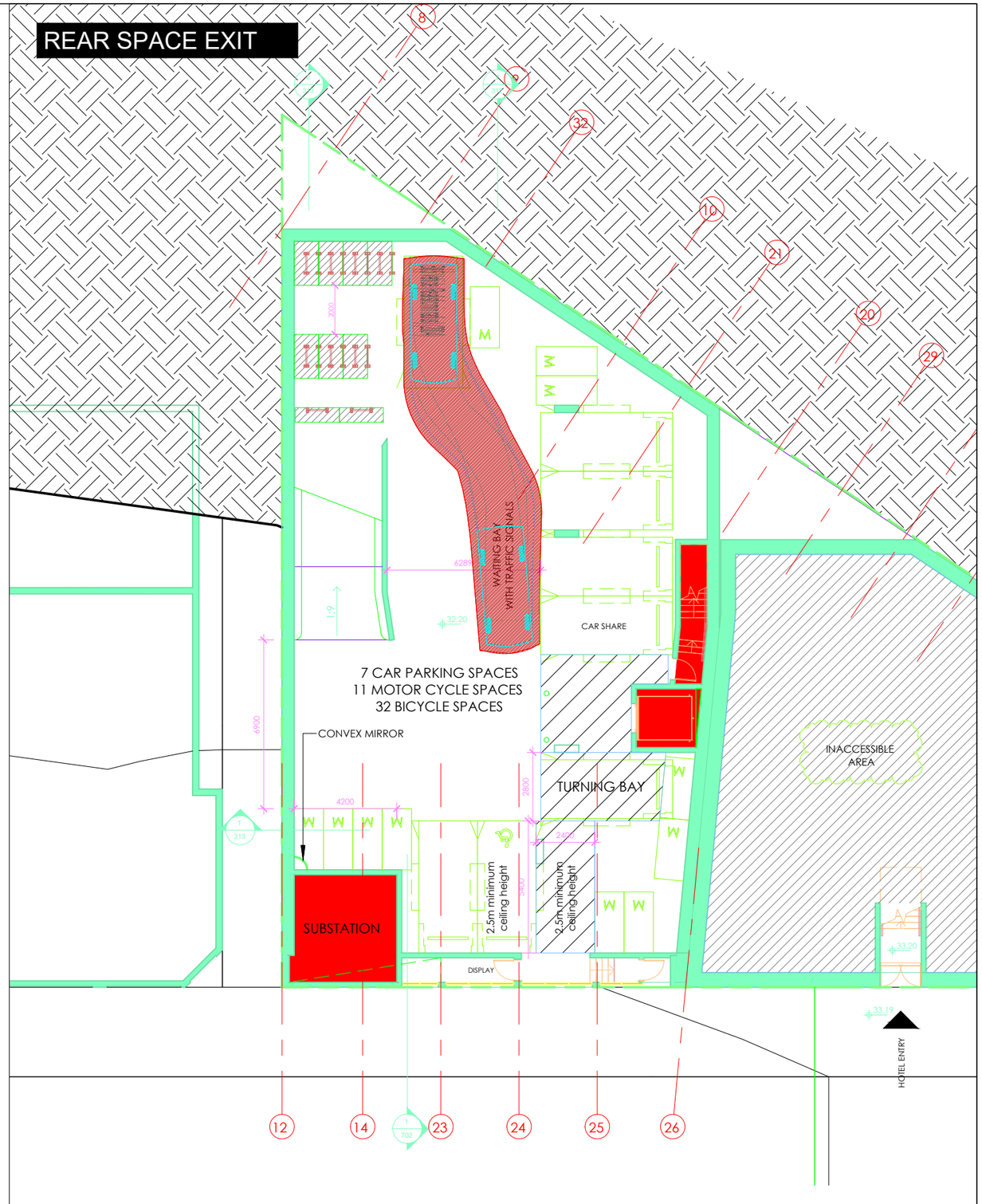

No.	Date	Description

Swept Path Key
- Vehicle Wheel Path
- Vehicle Body Envelope
- 300mm Vehicle Clearance

North

Drawing Prepared By

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Level 14, 100 William Street
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w: www.pdcconsultants.com.au
ABN: 70 615 064 670

Architect: Tier Architects	Project: 123 - 133 New Canterbury Road Lewisham	Drawing Title: Swept Path Analysis Basement B85 Design Vehicle	Drawing No.: 002 / Revision No.: -
Client: Emag Apartments	Project No: 0351	Sheet Status: NOT FOR CONSTRUCTION	Drawn By: BM / Date: 12/10/2021
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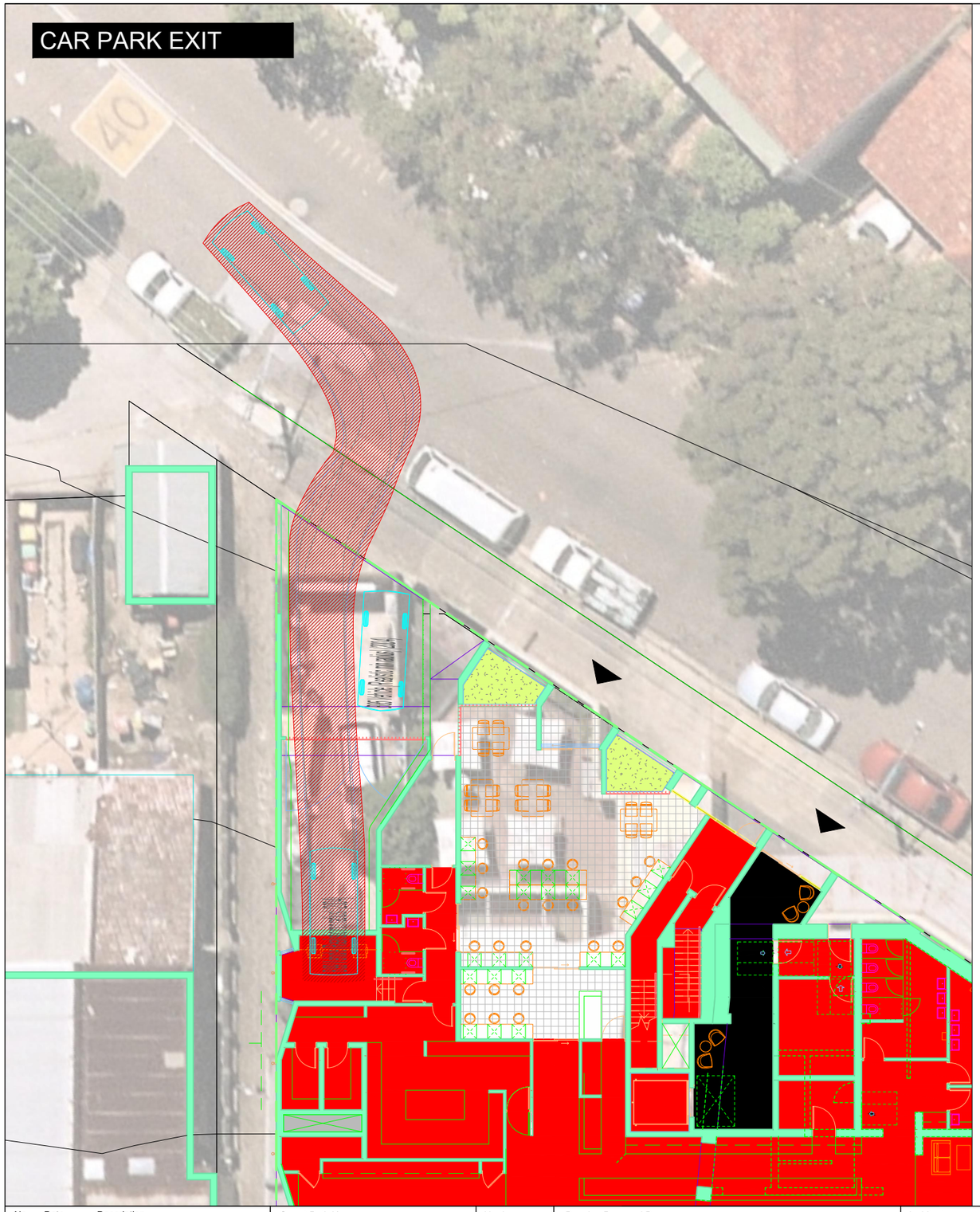
CAR PARK EXIT



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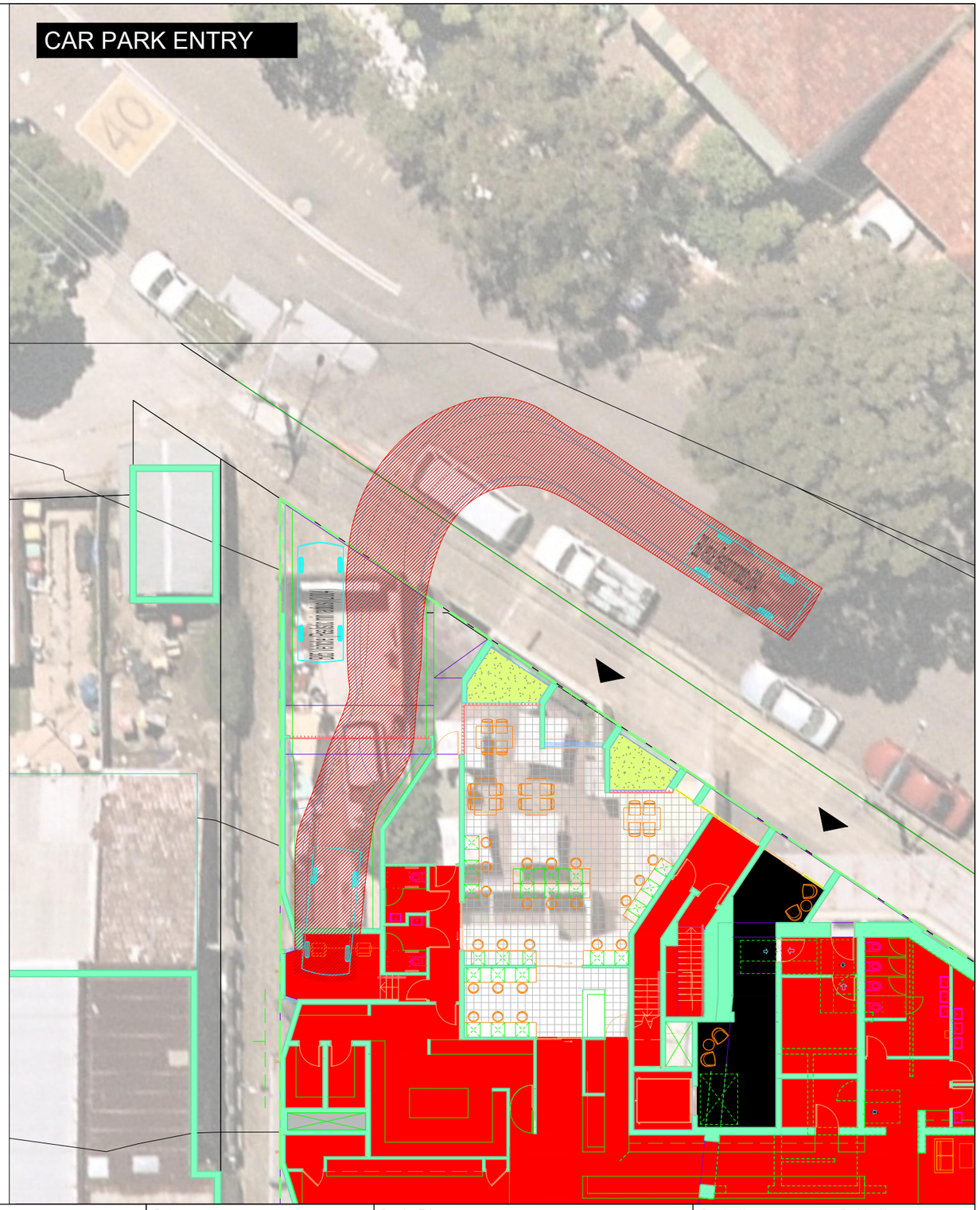

No.	Date	Description

Swept Path Key
- Vehicle Wheel Path
- Vehicle Body Envelope
- 300mm Vehicle Clearance

North

Drawing Prepared By

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ABN: 70 615 064 670

Architect
Tier Architects

Client
Emag Apartments

Project
123 - 133 New Canterbury Road
Lewisham

Project No
0351

Drawing Title
Swept Path Analysis
Ground Level
B99 Passing B85 Design Vehicle

Sheet Status
NOT FOR CONSTRUCTION

Drawing No.
003

Revision No.
-

Drawn By
BM

Date
12/10/2021

Scale
1:200 @ A3

0m 2 4 6 8

PDC CONSULTANTS
+61 2 7900 6514 | pdcconsultants.com.au

25-10-2021

NUPD
Wil Nino

145 Edgeware Road,
Enmore NSW 2042

Subject: Ground floor accessibility, 123-133 New Canterbury Rd, Lewisham NSW 2049

I, Farah Madon, have reviewed the updated ground floor plan,

Drawing number 302 Revision D 21-10-2021

and I find the provisions on the ground floor to be compliant with the spatial requirements of the Disability Access to Premises Standards and the Access related requirements of the BCA.

Kind regards,

Farah Madon
Accredited Access Consultant and LHA Assessor
ACAA Accredited Membership number 281
LHA Assessor Licence number 10032
NDIS Accredited SDA Assessor number SDA00001
Vista Access Architects Pty. Ltd.

Project Reference number 20353

0412 051 876
www.accessarchitects.com.au
admin@accessarchitects.com.au
PO Box 353, Kingswood
NSW 2747

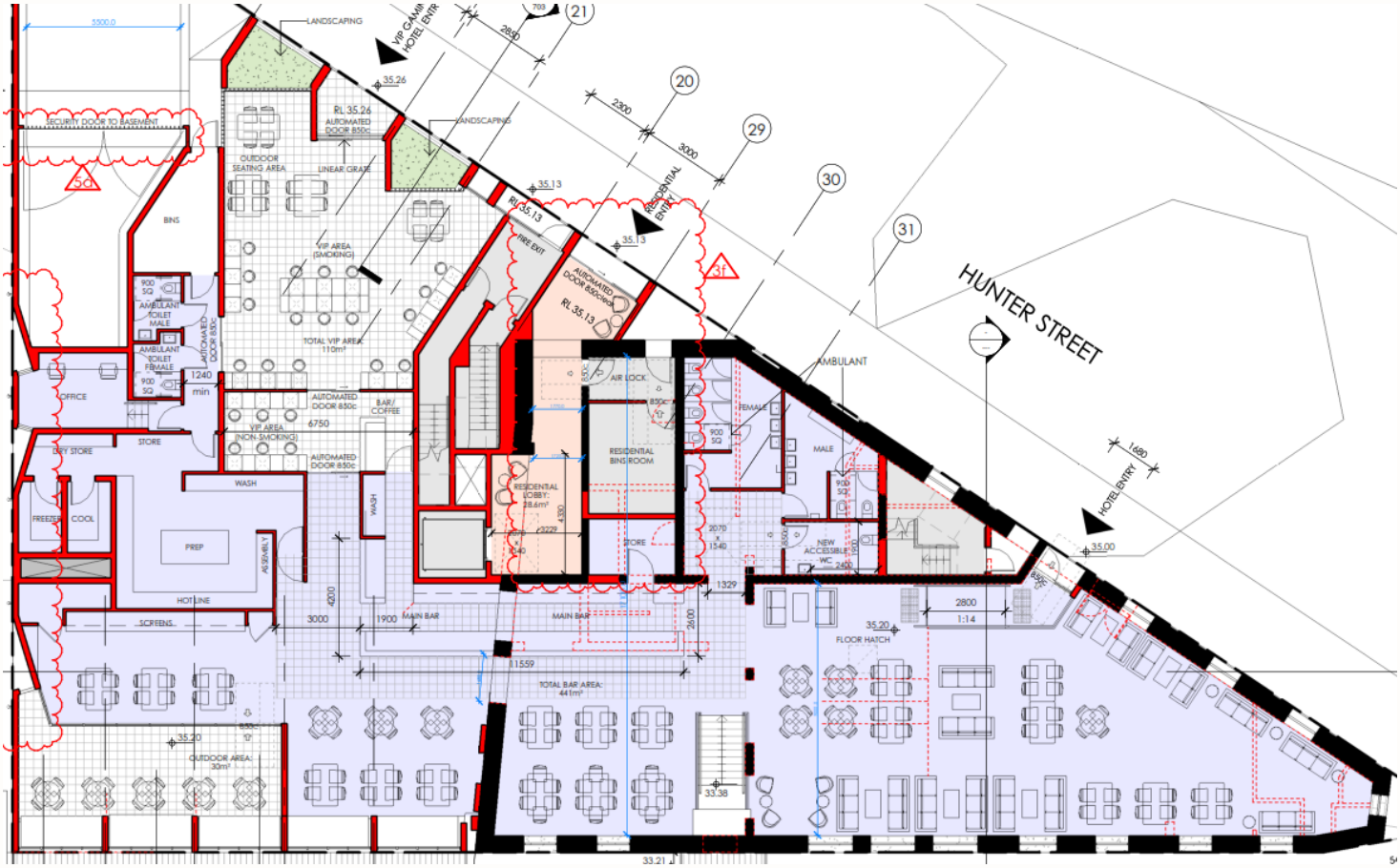

Image of Drawing number 302 Revision D 21-10-2021 shown above

Statement of Experience

Vista Access Architects specialises in access consultancy services, including, Access requirements and Access Performance Solutions under the NCC, NDIS SDA Certifications, Livable Housing Certifications and Changing Places Certifications.

vista access architects

Farah Madon - Director

ACAA Accredited Access Consultant
NDIS Accredited SDA Assessor
Livable Housing Assessor
Changing Places Assessor

- Accredited member of the Association of Consultants in Access Australia (ACAA) - Member 281
- NDIS Accredited SDA (Specialist Disability Accommodation) Assessor SDA00001
- Architect registered with the NSW Architect's Registration Board - Registration 6940
- Member of Australian Institute of Architects (RAIA), A+ Practice Member 49397
- Registered Assessor of Livable Housing Australia - Registration 10032
- Global Alliance on Accessible Technologies and Environments (GAATES) - Member BE-02-021-20
- Registered Assessor of Changing Places Australia - Registration CP006

Farah's Educational Profile and Qualifications include:

- Bachelor of Architecture Degree with Honours (B.Arch.)
- International Certification of Accessibility Consultants – Built Environment (ICAC-BE) Program, Level 2 Advanced Accessibility Consultant
- Diploma of Access Consulting
- Standards Australia's course on 'Writing Australian Standards'

Farah has 20 years of experience of working in the field of Architecture and Access.

Farah is the lead author of the NDIS SDA Design Standard. She has been invited on multiple occasions as an expert witness for Access related matters in the NSW Land and Environment Court.

Farah currently participates on the following key committees concerning access for people with disabilities, on an honorary basis:

- Member of Standards Australia's ME-064 Committee responsible for the AS4299 and AS1428 suite of standards.
- Vice President of Association of Consultants in Access Australia (ACAA)
- Community Representative Member of the Penrith City Council's Access Committee
- Member of Australian Institute of Architect's National Access Work Group (NAWG)
- Management Committee member of NSW Network of Access Consultants
- Livable Housing Australia's Industry Reference Group (IRG) Member
- Member of Changing Places Australia Technical Advisory Team

Some Recent Awards presented to Farah Include:

- 2019 Penrith Citizen of the Year
- 2019 Access Inclusion Award
- 2019 Australian Access Awards Finalist for Educational App of the Year- LRV App to calculate luminance contrast

ACAA ACCREDITED MEMBER Farah Madon: 281

ndis SDA Accredited Assessor Farah Madon SDA00001

Changing Places Assessor CP006

Assessor Livable Housing Design Farah Madon

PENRITH FARAH MADON 2019 Penrith Citizen of the Year

GAATES Global Alliance on Accessible Technologies and Environments Member no BE-02-021-20

2019 ACAA Association of Consultants in Access Australia Inc Access Inclusion Award Winner

LRV Contrast

AUSTRALIAN ACCESS AWARDS FINALIST 2019 Education App

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Plan of Management for The Huntsbury Hotel

October 2021

125-133 New Canterbury Rd, Lewisham NSW 2049

1. PURPOSE OF PLAN

This plan has been prepared to accompany a development application for boarding house incorporating the existing Huntsbury Hotel.

The purpose of this Plan of Management is to establish performance criteria for the operation of the existing Hotel in conjunction with the use above having regard to the relevant matters under the Environmental Planning and Assessment Act, 1979.

The primary purpose of this plan is to ensure the development maintains a high level of amenity for neighbouring properties and for all residents. To achieve this, the following matters have been considered:

- Hours of Operation
- Amenity of Neighbourhood
- Noise
- Behaviour of customers
- Use of security cameras
- Surveillance and fire safety measures
- Parking
- Waste management

All staff shall be made familiar with, understand and abide by this Plan of Management.

2. HOURS OF OPERATION

The trading hours of the Hotel are:

- Monday – Saturday: 10:00am – 12:00 midnight
- Sunday: 10:00am – 10:00pm

3. AMENITY OF NEIGHBOURHOOD

The hotel manager shall consider the amenity of the neighbours and shall take all reasonable measures to ensure the conduct of the hotel business does not impact adversely on the surrounding area.

In this regard the manager will take all reasonable measures to ensure that the behaviours of staff and patrons when entering and leaving the premises do not detrimentally affect the amenity of the residential component of the development and the neighbourhood.

- A sign shall be placed at the exit from the premises reminding customers that the neighbourhood includes residential and requesting that they leave in a quiet, orderly and respectful manner.

- Staff shall strictly follow the approved plan of management to ensure that the use of the premises does not cause any interference to residential amenity.

- The business shall be conducted in such a manner as not to interfere with, or materially affect, the amenity of the neighbourhood by reason of noise, vibration, smells, fumes, vapour, steam, soot, ash, dust, waste, products, grit, oil or otherwise.

- Waste management will be undertaken in accordance with the approved waste management plan and as arranged with Council's Waste Division.

- Uniformed security are to patrol the area in the vicinity of the hotel, including the area from New Canterbury Road to the corner of the school boundary, to ensure that patrons of the premises do not loiter or linger in the area or cause nuisance or annoyance to the neighbourhood. Such patrols are to commence at 10:00pm and continue until the last patron has left the area.

4. NOISE

The LA10 noise level emitted from the premises shall not exceed the background noise level in any Octave Band Centre Frequency (31.5Hz - 8kHz inclusive) by more than 5dB at the boundary of any affected residence between 7.00am and 12 midnight at the boundary of any affected residence.

The LA10 noise level emitted from the licenced premises shall not exceed the background noise level in any Octave Band Centre Frequency (31.5Hz - 8kHz inclusive) between 12 midnight and 7.00am at the boundary of any affected residence.

Notwithstanding compliance with the above, noise from the licensed premises shall not be audible within any habitable room in any residential premises between the hours of 12 midnight and 7.00am.

5. BEHAVIOUR OF CUSTOMERS

Staff shall take all reasonable steps to control the behaviour of customers at night as they enter and leave the premises in order to maintain the quiet and good order of the locality.

The manager and staff shall take all reasonable steps to control the behaviours of patrons of the premises and ensure that there is no loitering by persons leaving or waiting to enter the premises.

The manager shall require all staff employed at the premises with security duties to:

i) be dressed in readily identifiable clothing.

ii) fill in a time sheet (start and finish times) which is to be initialled by the manager/licensee on duty.

iii) report to the manager/owner to obtain a briefing on any specific duties to be addressed on the evening before commencing duty.

iv) note details of any incidents which required intervention within the premises or in the vicinity of the premises in log books .

v) prevent any person, detected as intoxicated, entering the premises and bring to notice of the manager, any person on the premises who might be considered intoxicated.

vi) monitor customer behaviour in, and in the vicinity of, the premises until all patrons have left them, taking all practical steps to ensure the quiet and orderly departure of patrons.

vii) ensure that all customers comply with smoking regulations both in, and in the vicinity of, the premises.

viii) collect any rubbish on the streets that may be associated with the business.

ix) co-operate with the Police and any other private security personnel operating in the vicinity of the premises.

For the purpose of the above “the vicinity of the premises” shall be the footpath immediately in front of the subject premises on Hunter Street and New Canterbury Road.

6. USE OF SECURITY CAMERAS

Security cameras will be in operation at all times and will provide footage of the entrance and service areas of the premises.

Management will ensure that the footage is to an acceptable level that allows for face recognition. Footage will be saved for a period of one month and will be available to the Police on request.

Signs will be placed within the premises alerting patrons that CCTV is in operation.

In the event of any malfunctioning of any CCTV equipment, the manager shall ensure that it is rectified as quickly as is reasonably possible.

7. HANDLING OF COMPLAINTS

A Complaints Register will be maintained on site, which includes the following information:

- Complaint date and time
- Name, address and contact details of person making the complaint
- Nature of complaint
- Action undertaken by premises to resolve the complaint
- Follow up and outcome.

In addition, details of training and induction procedures to ensure staff are aware of the provisions of the Management Plan and emergency procedures are to be maintained.

8. SURVEILLANCE & FIRE SAFETY MEASURES

The manager shall ensure that all essential services installed at the premises are certified annually and shall ensure that they remain in good working order.

In the event of any malfunctioning of any essential service, the manager shall ensure that it is rectified as quickly as is reasonably possible.

Lists of the telephone numbers of all relevant emergency agencies shall be kept near all telephones.

All managers and other permanent staff shall be made aware of fire safety requirements and the procedures to be followed in the event of an emergency at the premises.

9. WASTE MANAGEMENT

Details regarding waste minimisation, recycling and collection arrangements, including the servicing of sharps and sanitary napkin receptacles are included in the waste management plan and management will be undertaken in accordance with this approved plan.

10. DISPLAY OF DEVELOPMENT CONSENT

A copy of the current Development Consent with the approved hours of operation shall be kept in the premises and shall be produced upon demand for inspection to any member of the Police Service, Council or Special Investigator.