#### **TURNER**

#### **Schedule of Amendments**

Project No: 20059

Project: **273 - 275 Anzac Parade, Kingsford** 

Date: 19.11.2021

Drawing Number	Drawing Name	Development Application dated 11 September 2020	Current Revision dated 19 November 2021 Issued post s34 for Land & Environment Court	Description of Changes
DA-001-001	Cover Page	Revision A	Revision C	Date and drawing issue changed
DA-001-002	Contents	Revision A	Revision C	Revisions updated and list updated to reflect changes to drawing numbers and names
DA-001-003	Contents	-	Revision A	New sheet added for supplementary material
DA-010-010	Location Plan	Revision A	Revision C	Text 'site' added
DA-010-020	Site Analysis	Revision A	Revision C	Legend resized and drawing cropped
DA-010-040	Site Plan	Revision A	Revision C	Roof plan updated to reflect new changes and number of storeys added
DA-110-006	Basement 02	Revision C	-	Drawing and Basement level deleted
DA-110-006	Basement 01	Revision C	Revision E	Car parking reduced, additional motorbikes spaces and provision for future AWCS added Car parking uses and numbers added New lift for commercial added New garbage holding room and plantroom added
DA-110-006	Ground Level	Revision C	Revision E	Provision for future AWCS and commercial space added New lift for commercial added Garbage chutes for Houston Lane building added Additional entries off Anzac Parade provided to retail tenancies
DA-110-006	Ground Level Mezzanine	Revision A	Revision C	Updated changes to ground level reflected Colour to communal outdoor space deleted
DA-110-010	Level 01	Revision C	Revision E	Potential internal tenancy break up indicated Amenities amended New lift for commercial added New Foyer for tenancies added Provision for future AWCS and commercial space added Garbage chutes for Houston Lane building added Courtyard opening increased Setback to glazing adjacent to existing residential development to the north increased

01.09.2021 Page 1 of 9 20059\_Schedule of Amendments.docx Nominated Architect Nicholas Turner 6695

Drawing Number	Drawing Name	Development Application dated 11 September 2020	Current Revision dated 19 November 2021 Issued post s34 for Land & Environment Court	Description of Changes
DA-110-020	Level 02	Revision C	Revision E	Setback to glazing adjacent to existing residential development to the north increased Central communal indoor space to the north amended Additional rooms added to Houston Lane building Provision for future AWCS added (chutes increased from 2 to 3) Garbage chutes for Houston Lane building added Communal indoor area added to Houston Lane building Courtyard opening increased
DA-110-030	Level 03	Revision C	Revision E	Setback to glazing adjacent to existing residential development to the north increased Rooms increased to the Houston Lane street setback to provide a 4 storey street wall (from 3) Central communal outdoor space to the south amended Additional rooms added to Houston Lane building Provision for future AWCS added (chutes increased from 2 to 3) Garbage chutes for Houston Lane building added Communal indoor area added to Houston Lane building Courtyard opening increased
DA-110-040	Level 04	Revision C	Revision E	Setback to glazing adjacent to existing residential development to the north increased Central communal outdoor space to the south added Landscape area (LA1) to Houston Lane moved from Level 3 to 4 Additional rooms added to Houston Lane building Provision for future AWCS added (chutes increased from 2 to 3) Garbage chutes for Houston Lane building added Communal indoor area added to Houston Lane building Courtyard opening increased Balcony added to Anzac parade building (as part of façade adjustment)
DA-110-050	Level 05	Revision C	Revision E	Setback to glazing adjacent to existing residential development to the north increased Provision for future AWCS added (chutes increased from 2 to 3)
DA-110-060	Level 06	Revision C	Revision E	Setback to glazing adjacent to existing residential development to the north increased Provision for future AWCS added (chutes increased from 2 to 3)
DA-110-070	Level 07	Revision C	Revision E	Setback to glazing adjacent to existing residential development to the north increased Provision for future AWCS added (chutes increased from 2 to 3)
DA-110-080	Level 08	Revision C	Revision E	Setback to glazing adjacent to existing residential development to the north increased Provision for future AWCS added (chutes increased from 2 to 3)
DA-110-090	Level 09	Revision C	Revision E	Setback to glazing adjacent to existing residential development to the north increased Provision for future AWCS added (chutes increased from 2 to 3)

Drawing Number	Drawing Number Drawing Name Developed dated 1		Current Revision dated 19 November 2021 Issued post s34 for Land & Environment Court	Description of Changes		
DA-110-100	Level 10	Revision C	Revision E	Setback to glazing adjacent to existing residential development to the north increased Provision for future AWCS added (chutes increased from 2 to 3) Balcony added to Anzac parade building (as part of façade adjustment)		
DA-110-110	Level 11	Revision C	Revision E	Northern portion of tower deleted Rooms deleted Communal open space relocated from Level 15 Provision for future AWCS added (chutes increased from 2 to 3)		
DA-110-120	Level 12	Revision C	Revision E	Northern portion of tower deleted Rooms deleted Provision for future AWCS added (chutes increased from 2 to 3) Landscaped planters and green walls added Blank wall to north deleted		
DA-110-130	Level 13	Revision C	Revision E	Northern portion of tower deleted Rooms deleted Provision for future AWCS added (chutes increased from 2 to 3) Landscaped planters and green walls added Blank wall to north deleted		
DA-110-140	Level 14	Revision C	Revision E	Northern portion of tower deleted Rooms deleted Provision for future AWCS added (chutes increased from 2 to 3) Landscaped planters and green walls added Blank wall to north deleted		
DA-110-150	Level 15	Revision C	Revision E	Communal living area relocated Communal outdoor space relocated Rooms added Provision for future AWCS added (chutes increased from 2 to 3) Landscaped planters and green walls added Blank wall to north deleted		
DA-110-160 Renumbered for L& E DA-110-180	Plant Level	Revision C	Revision E	Plant room relocated		
DA-110-170 Renumbered for L& E DA-110-190	Roof Plan	Revision A	Revision E	Rooftop relocated		
DA-110-180	Level 16	-	Revision A	New drawing Additional height provided to southern portion of tower Rooms added Provision for future AWCS added (chutes increased from 2 to 3) Landscaped planters and green walls added		

Drawing Number	Drawing Name	Development Application dated 11 September 2020	Current Revision dated 19 November 2021 Issued post s34 for Land & Environment Court	Description of Changes
DA-110-190	Level 17	-	Revision A	New drawing Additional height provided to southern portion of tower Rooms added Provision for future AWCS added (chutes increased from 2 to 3) Landscaped planters and green walls added
DA-210-101	North Elevation	Revision B	Revision D	Northern portion of tower reduced from 15 storeys to 11 storeys Blank wall to north deleted Landscaped planters and green walls added Communal open space relocated from Level 15 to Level 11 Internal courtyard wall increased by 1 storey Houston Lane street wall increased from 3 storeys to 4 storeys Notation for DCP Flexible zone added DCP envelopes adjusted to reflect the current DCP (instead of the Draft DCP) Material codes amended to reflect façade adjustments
DA-210-201	East Elevation	Revision C	Revision E	Northern portion of tower reduced from 15 storeys to 11 storeys Southern portion of tower increased from 16 storeys to 18 storeys Façade adjustments to provide setback upper levels Landscaped planters and green walls added Material codes amended to reflect façade adjustments DCP envelopes adjusted to reflect the current DCP (instead of the Draft DCP)
DA-210-301	South Elevation	Revision B	Revision D	Southern portion of tower increased from 16 storeys to 18 storeys Internal courtyard wall increased by 1 storey Houston Lane street wall increased from 3 storeys to 4 storeys Notation for DCP Flexible zone added DCP envelopes adjusted to reflect the current DCP (instead of the Draft DCP) Material codes amended to reflect façade adjustments
DA-210-401	West Elevation	Revision C	Revision E	Houston Lane street wall increased from 3 storeys to 4 storeys  Notation for DCP Flexible zone added  DCP envelopes adjusted to reflect the current DCP (instead of the Draft DCP)  Façade adjustments to provide more consistent street wall alignment  Material codes amended to reflect façade adjustments
DA-210-501	Interior East Elevation	Revision A	Revision C	Northern portion of tower reduced from 15 storeys to 11 storeys Southern portion of tower increased from 16 storeys to 18 storeys Landscaped planters and green walls added Material codes amended to reflect façade adjustments Internal courtyard area to the south and north increased by 1 storey Courtyard opening increased Notation for DCP Flexible zone added DCP envelopes adjusted to reflect the current DCP (instead of the Draft DCP)

Drawing Number	Drawing Number  Drawing Name  Development Application dated 11 September 2020		Current Revision dated 19 November 2021 Issued post s34 for Land & Environment Court	Description of Changes			
DA-210-601	Interior West Elevation	Revision A	Revision C	Material codes amended to reflect façade adjustments Internal courtyard area to the south and north increased by 1 storey Courtyard opening increased Notation for DCP Flexible zone added DCP envelopes adjusted to reflect the current DCP (instead of the Draft DCP)			
DA-310-101	Section AA	Revision C	Revision E	Southern portion of tower increased from 16 storeys to 18 storeys Landscaped planters and green walls added Material codes amended to reflect façade adjustments Courtyard opening increased Houston Lane street wall increased from 3 storeys to 4 storeys Notation for DCP Flexible zone added DCP envelopes adjusted to reflect the current DCP (instead of the Draft DCP)			
DA-310-102	Detailed Sections	Revision A	Revision C	Landscaped planters added Houston Lane street wall increased from 3 storeys to 4 storeys Internal courtyard area to the south and north increased by 1 storey Notation for DCP Flexible zone added DCP envelopes adjusted to reflect the current DCP (instead of the Draft DCP) Basement 2 deleted			
DA-720-001	Solar Access: Ground to Level 05	Revision A	Revision C	Solar Access amended to reflect massing changes			
DA-720-002	Solar Access: Level 06 to Level 11	Revision A	Revision C	Solar Access amended to reflect massing changes			
DA-720-003	Solar Access: Level 12 to Level 14	Revision A	Revision C	Solar Access amended to reflect massing changes			
DA-720-021	Sun Eye Diagram 21 June: 8am to 11am	Revision A	Superseded	Drawing superseded by drawing numbers DA-796-001, DA-796-002, DA-796-003, DA-796-004 Separating each hour onto a single sheet at a larger scale as per comments from S34. Drawing sheet size amended from A3 to A1			
DA-720-022	Sun Eye Diagram 21 June: 12pm to 4pm	Revision A	Superseded	Drawing superseded by drawing numbers DA-796-005, DA-796-006, DA-796-007, DA-796-008, DA-796-009 Separating each hour onto a single sheet at a larger scale as per comments from S34 Drawing sheet size amended from A3 to A1			
DA-720-031	Communal Space Diagrams	Revision A	Revision C	Adjustments of communal space to reflect massing redistribution changes			
DA-720-032	Communal Space Diagrams	Revision A	Revision C	Adjustments of communal space to reflect massing redistribution changes			
DA-720-033	Communal Space Diagrams	Revision A	Revision C	Adjustments of communal space to reflect massing redistribution changes			

Drawing Number Drawing Name		Development Application dated 11 September 2020	Current Revision dated 19 November 2021 Issued post s34 for Land & Environment Court	Description of Changes				
DA-740-001	Landscape Area Diagrams	-	Revision C	New diagram added to provide calculations for Landscape replacement area				
DA-740-002	Landscape Area Diagrams	-	Revision C	New diagram added to provide calculations for Landscape replacement area				
DA-740-003	Landscape Area Diagrams	-	Revision C	New diagram added to provide calculations for Landscape replacement area				
DA-770-008	Ground to Level 08	Revision A	Revision C	Basement 1 plan included to include motorbike parking in GFA calculations as per Council comments. Level 9 and 10 plans included on sheet.				
DA-770-090	Level 09 to Level 15	Revision A	Revision C	Levels 16, 17 and plant, slight adjustment of GFA to reflect massing changes, no change to overall GFA ratio				
DA-790-001	21 June: 8am to 10am	Revision A	Superseded	Drawing superseded by drawing numbers DA-791-001, DA-791-002, DA-791-003 Separating each hour onto a single sheet at a larger scale as per comments from S34				
DA-790-002	21 June: 11am to 1pm	Revision A	Superseded	Drawing superseded by drawing numbers DA-791-004, DA-791-005, DA-791-006 Separating each hour onto a single sheet at a larger scale as per comments from S34				
DA-790-003	21 June: 2pm to 4pm	Revision A	Superseded	Drawing superseded by drawing numbers DA-791-007, DA-791-008, DA-791-009 Separating each hour onto a single sheet at a larger scale as per comments from S34				
DA-791-001	21 June: 8am	-	Revision A	New drawing				
DA-791-002	21 June: 9am	-	Revision A	New drawing				
DA-791-003	21 June: 10am	-	Revision A	New drawing				
DA-791-004	21 June: 11am	-	Revision A	New drawing				
DA-791-005	21 June: 12pm	-	Revision A	New drawing				
DA-791-006	21 June: 1pm	-	Revision A	New drawing				
DA-791-007	21 June: 2pm	-	Revision A	New drawing				
DA-791-008	21 June: 3pm	-	Revision A	New drawing				
DA-791-009	21 June: 4pm	-	Revision A	New drawing				
DA-796-001	21 June: 8am	-	Revision A	New drawing				
DA-796-002	21 June: 9am	-	Revision A	New drawing				

Drawing Number	Drawing Name	Development Application dated 11 September 2020	Current Revision dated 19 November 2021 Issued post s34 for Land & Environment Court	Description of Changes
DA-796-003	21 June: 10am	-	Revision A	New drawing
DA-796-004	21 June: 11am	-	Revision A	New drawing
DA-796-005	21 June: 12pm	-	Revision A	New drawing
DA-796-006	21 June: 1pm	-	Revision A	New drawing
DA-796-007	21 June: 2pm	-	Revision A	New drawing
DA-796-008	21 June: 3pm	-	Revision A	New drawing
DA-796-009	21 June: 4pm	-	Revision A	New drawing
DA-796-010	21 December: 8am	-	Revision A	New drawing
DA-796-011	21 December: 9am	-	Revision A	New drawing
DA-796-012	21 December: 10am	-	Revision A	New drawing
DA-796-013	21 December: 11am	-	Revision A	New drawing
DA-796-014	21 December: 12pm	-	Revision A	New drawing
DA-796-015	21 December: 1pm	-	Revision A	New drawing
DA-796-016	21 December: 2pm	-	Revision A	New drawing
DA-796-017	21 December: 3pm	-	Revision A	New drawing
DA-796-018	21 December: 4pm	-	Revision A	New drawing
DA-796-019	23 September: 8am	-	Revision A	New drawing
DA-796-020	23 September: 9am	-	Revision A	New drawing
DA-796-021	23 September: 10am	-	Revision A	New drawing
DA-796-022	23 September: 11am	-	Revision A	New drawing

Drawing Number	Jumber Drawing Name Development Applic dated 11 September		Current Revision dated 19 November 2021 Issued post s34 for Land & Environment Court	Description of Changes		
DA-796-023	23 September: 12pm	-	Revision A	New drawing		
DA-796-024	23 September: 1pm	-	Revision A	New drawing		
DA-796-025	23 September: 2pm	-	Revision A	New drawing		
DA-796-026	23 September: 3pm	-	Revision A	New drawing		
DA-796-027	23 September: 4pm	-	Revision A	New drawing		
DA-810-001	A-Type Rooms	Revision A	Revision C	Additional 5 room types added		
DA-810-002	B-Type Rooms	Revision A	Revision C	Additional 1 room type added		
DA-810-003	B-Type Rooms	Revision A	Drawing deleted	Room types combined onto page DA 810-001		
DA-810-003	C- and D-Type and Manager Rooms	Revision A	Revision C	Additional 1 room type added		
DA-890-001	External Materials & Finishes	Revision A	Revision C	Additional image for CPC1, updated image for CPC 2 and 3 to provide scale of GRC pattern.  Additional image for PCF5a, PCF5b  Additional image for AWN3 showing design intent of perforated pattern.		
DA-890-101	FT1 - FT3 Colouring	Revision A	Revision C	Updated diagram to reflect amended heights and façade changes		
DA-890-102	SCN1 and SCN2 Colouring	Revision A	Revision C	Updated to reflect reduced extent of brick screen		
DA-910-001	Perspective 01	Revision A	Revision C	Updated to reflect design changes outlined above		
DA-910-002	Perspective 02	Revision A	Revision C	Updated to reflect design changes outlined above		
DA-910-003	Perspective 03	Revision A	Revision C	Updated to reflect design changes outlined above		
DA-910-004	Perspective 04	Revision A	Revision C	Updated to reflect design changes outlined above		
DA-910-005	Perspective 05	Revision A	Revision C	Updated to reflect design changes outlined above		
DA-910-006	Perspective 06	Revision A	Revision C	Updated to reflect design changes outlined above		
DA-910-007	Perspective 07	Revision A	Revision C	Updated to reflect design changes outlined above		

Drawing Number	Drawing Name	Development Application dated 11 September 2020		Description of Changes
DA-910-008	Perspective 08	Revision A	Revision C	Updated to reflect design changes outlined above
DA-910-009	Perspective 09	Revision A	Revision C	Updated to reflect design changes outlined above
DA-910-010	Perspective 010	-	Revision B	New drawing showing lower level design updates

# 273-275 ANZAC PARADE

## **DEVELOPMENT APPLICATION**

STUDENT HOUSING DEVELOPMENT

ISSUED POST S.34 FOR LAND AND ENVIRONMENT COURT NOVEMBER 2021



Cover Page

## **Drawing List**

Series	Drawing No.	Drawing Name	Scale	Rev	Size	Series	Drawing No.	Drawing Name	Scale	Rev	Size
GENERAL						Landscape Diagrams					
	DA-001-001	Cover Page		С	A1		DA-740-001	Landscape Area Diagrams	1:250	С	A1
	DA-001-002	Contents		С	A1		DA-740-002	Landscape Area Diagrams	1:250	С	A1
	DA-001-003	Contents		Α	A1		DA-740-003	Landscape Area Diagrams	1:250	С	A1
Siteworks						GFA Diagrams					
	DA-010-010	Location Plan		С	A1		DA-770-008	Basement to Level 10	1:400	С	A1
	DA-010-020	Site Analysis		С	A1		DA-770-090	Level 08 to Plant Level	1:400	С	A1
	DA-010-040	Site Plan		С	A1	Suplementary s34 Drawing	s - Shadow Diagra	ıms			
GA Plans						Suprementary 55-4 Brawning	DA-791-001	21 June: 8am		А	A1
	DA-110-007	Basement 01	1:100	Е	A1		DA-791-002	21 June: 9am		A	A1
	DA-110-008	Ground Level	1:100	E	A1		DA-791-003	21 June: 10am		A	A1
	DA-110-009	Ground Level Mezzanine	1:100	C	A1		DA-791-004	21 June: 11am		A	A1
	DA-110-010	Level 01	1:100	F	A1		DA-791-005	21 June: 12pm		A	A1
	DA-110-020	Level 02	1:100	E	A1		DA-791-006	21 June: 1pm		A	A1
	DA-110-030	Level 03	1:100	E	A1		DA-791-007	21 June: 2pm		Α	A1
	DA-110-040	Level 04	1:100	E	A1		DA-791-008	21 June: 3pm		A	A1
	DA-110-050	Level 05	1:100	E	A1		DA-791-009	21 June: 4pm		A	A1
	DA-110-060	Level 06	1:100	E	A1						
	DA-110-070	Level 07	1:100	Е	A1	Suplementary s34 Drawing	s - Sun Eye view				
	DA-110-080	Level 08	1:100	Е	A1		DA-796-001	21 June: 8am		Α	A1
	DA-110-090	Level 09	1:100	Е	A1		DA-796-002	21 June: 9am		Α	A1
	DA-110-100	Level 10	1:100	Е	A1		DA-796-003	21 June: 10am		Α	A1
	DA-110-110	Level 11	1:100	Е	A1		DA-796-004	21 June: 11am		Α	A1
	DA-110-120	Level 12	1:100	Е	A1		DA-796-005	21 June: 12pm		Α	A1
	DA-110-130	Level 13	1:100	Е	A1		DA-796-006	21 June: 1pm		Α	A1
	DA-110-140	Level 14	1:100	Е	A1		DA-796-007	21 June: 2pm		Α	A1
	DA-110-150	Level 15	1:100	Е	A1		DA-796-008	21 June: 3pm		Α	A1
	DA-110-160	Level 16	1:100	Е	A1		DA-796-009	21 June: 4pm		Α	A1
	DA-110-170	Level 17	1:100	С	A1		DA-796-010	21 December: 8am		Α	A1
	DA-110-180	Plant Level	1:100	Α	A1		DA-796-011	21 December: 9am		Α	A1
	DA-110-190	Roof Plan	1:100	Α	A1		DA-796-012	21 December: 10am		Α	A1
CA Flavations							DA-796-013	21 December: 11am		Α	A1
GA Elevations							DA-796-014	21 December: 12pm		Α	A1
	DA-210-101	North Elevation	1:200	D	A1		DA-796-015	21 December: 1pm		Α	A1
	DA-210-201	East Elevation	1:200	Е	A1		DA-796-016	21 December: 2pm		Α	A1
	DA-210-301	South Elevation	1:200	D	A1		DA-796-017	21 December: 3pm		Α	A1
	DA-210-401	West Elevation	1:200	Е	A1		DA-796-018	21 December: 4pm		Α	A1
	DA-210-501	Interior East Elevation/Section	1:200	С	A1		DA-796-019	23 September: 8am		Α	A1
	DA-210-601	Interior West Elevation	1:200	С	A1		DA-796-020	23 September: 9am		Α	A1
GA Sections							DA-796-021	23 September: 10am		Α	A1
OA Sections							DA-796-022	23 September: 11am		Α	A1
	DA-310-101	Section AA	1:200	Е	A1		DA-796-023	23 September: 12pm		Α	A1
	DA-310-102	Detailed Sections	1:100	С	A1		DA-796-024	23 September: 1pm		Α	A1
Amenity Diagrams							DA-796-025	23 September: 2pm		Α	A1
							DA-796-026	23 September: 3pm		Α	A1
	DA-720-001	Solar Access: Ground to Level 05	1:250	С	A1		DA-796-027	23 September: 4pm		Α	A1
	DA-720-002	Solar Access: Level 06 to Level 11	1:250	С	A1						
	DA-720-003	Solar Access: Level 12 to Level 16	1:250	С	A1						
	DA-720-031	Communal Space Diagrams	1:250	С	A1						
	DA-720-032	Communal Space Diagrams	1:250	С	A1						
	DA-720-033	Communal Space Diagrams	1:250	С	A1						

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Fusion Development Pty Ltd

**273-275 Anzac Parade**273-275 Anzac Parade, Kensington Sydney NSW 2032 Drawing Title **GENERAL** 

Contents

C 19.11.21 CH Issued post s.34 for Land and Environment Court
Rev Date Approved by Revision Notes Scale

@A1, 50%@A3

\*\*Tatils

Dwg No.

DA-001-002 20059 ML, TL, SW

#### **Drawing List**

Series	Drawing No.	Drawing Name	Scale	Rev	Size
Room Typologies					
	DA-810-001	A-Type Rooms	1:50	С	A1
	DA-810-002	B-Type Rooms	1:50	С	A1
	DA-810-004	C- and D- Type and Manager Rooms	1:50	С	A1
Materials & Finishes Board					
	DA-890-001	External Materials & Finishes		С	A1
	DA-890-101	FT1 - FT3 Colouring	1:200	С	A1
	DA-890-102	SCN1 and SCN2 Colouring	1:50	С	A1
3D Views					
	DA-910-001	Perspective 01		С	A1
	DA-910-002	Perspective 02		С	A1
	DA-910-003	Perspective 03		С	A1
	DA-910-004	Perspective 04		С	A1
	DA-910-005	Perspective 05		С	A1
	DA-910-006	Perspective 06		С	A1
	DA-910-007	Perspective 07		С	A1
	DA-910-008	Perspective 08		С	A1
	DA-910-009	Perspective 09		С	A1
	DA-910-010	Perspective 10		В	A1

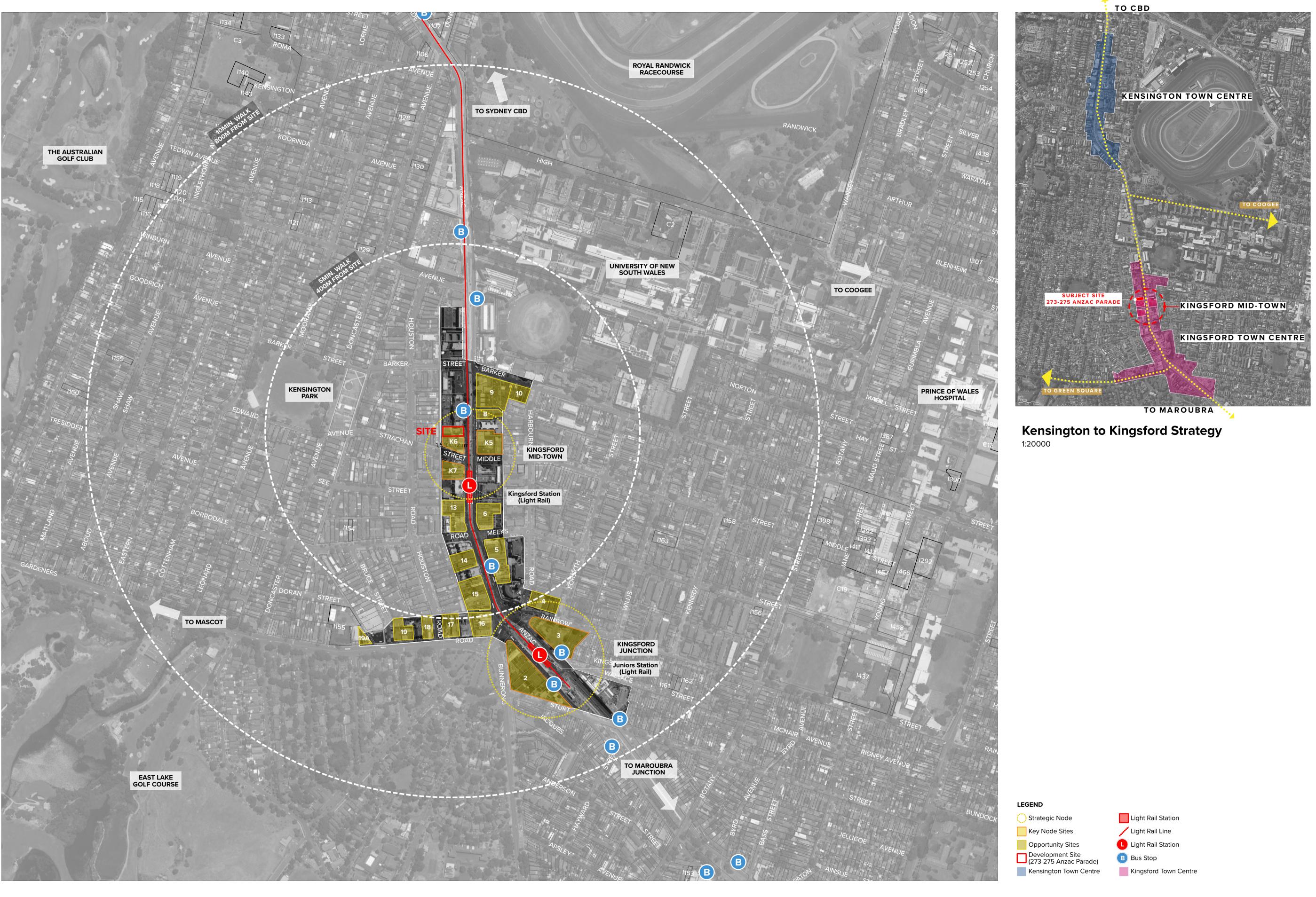
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Fusion Development Pty Ltd

**273-275 Anzac Parade**273-275 Anzac Parade, Kensington Sydney NSW 2032 Drawing Title **GENERAL** 

Contents



**Kingsford Town Centre** 

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CLIENT
Fusion Development Pty Ltd

Project Title

273-275 Anzac Parade
273-275 Anzac Parade, Kensington Sydney NSW 2032

Drawing Title

Siteworks
Location Plan

Rev Date Approved by Focale 1:4000 @A1, 50%@A3
Status Dwg No Post s34 for L& E Court

TURNER

 C
 19.11.21
 CH
 Issued post s.34 for Land and Environment Court

 Rev
 Date
 Approved by Revision Notes

 Scale
 Project No.
 Drawn by ML, TL, SW Rev
 North

 1:4000 @A1, 50%@A3 Status
 Dwg No.
 DA-010-010
 C



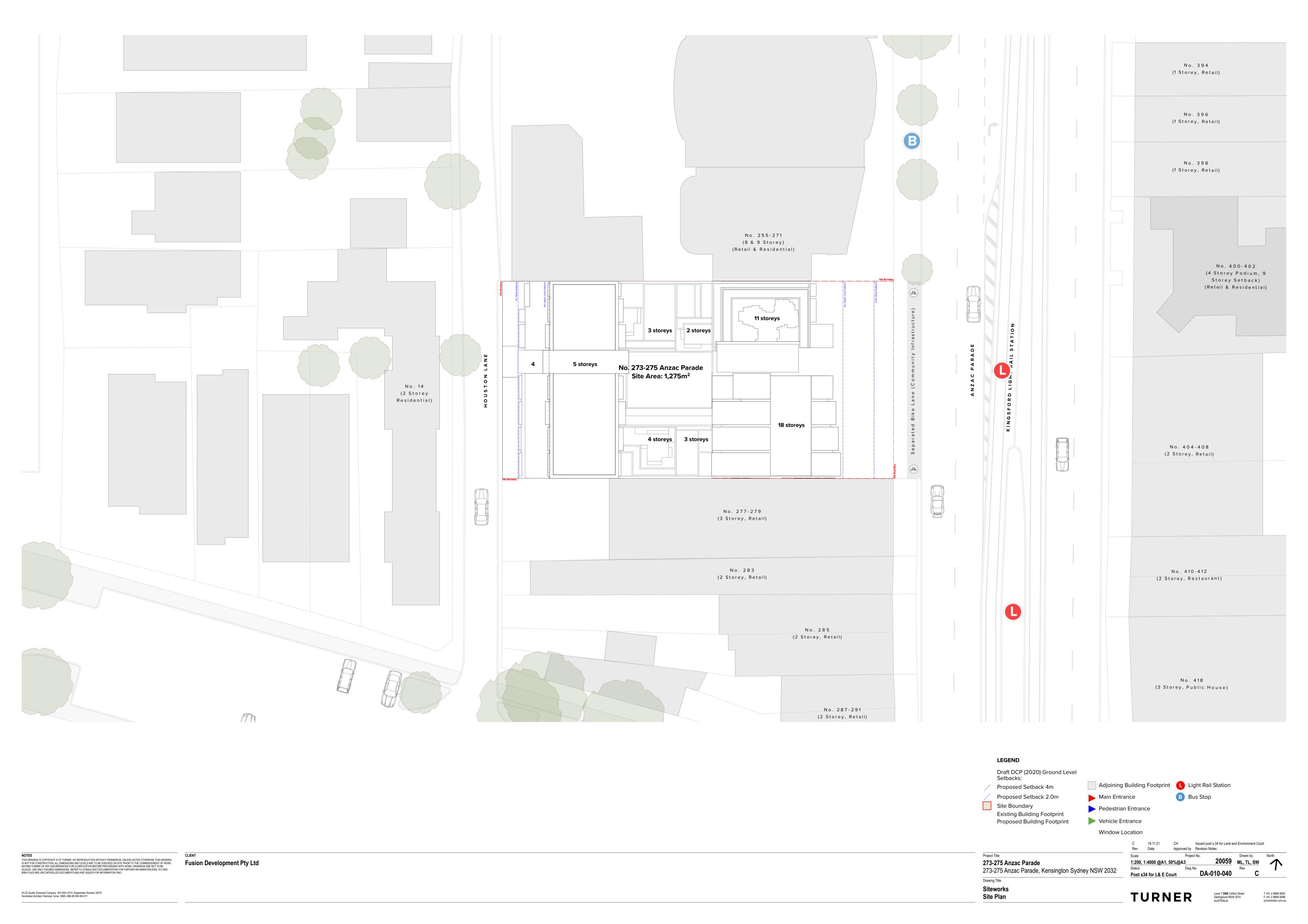
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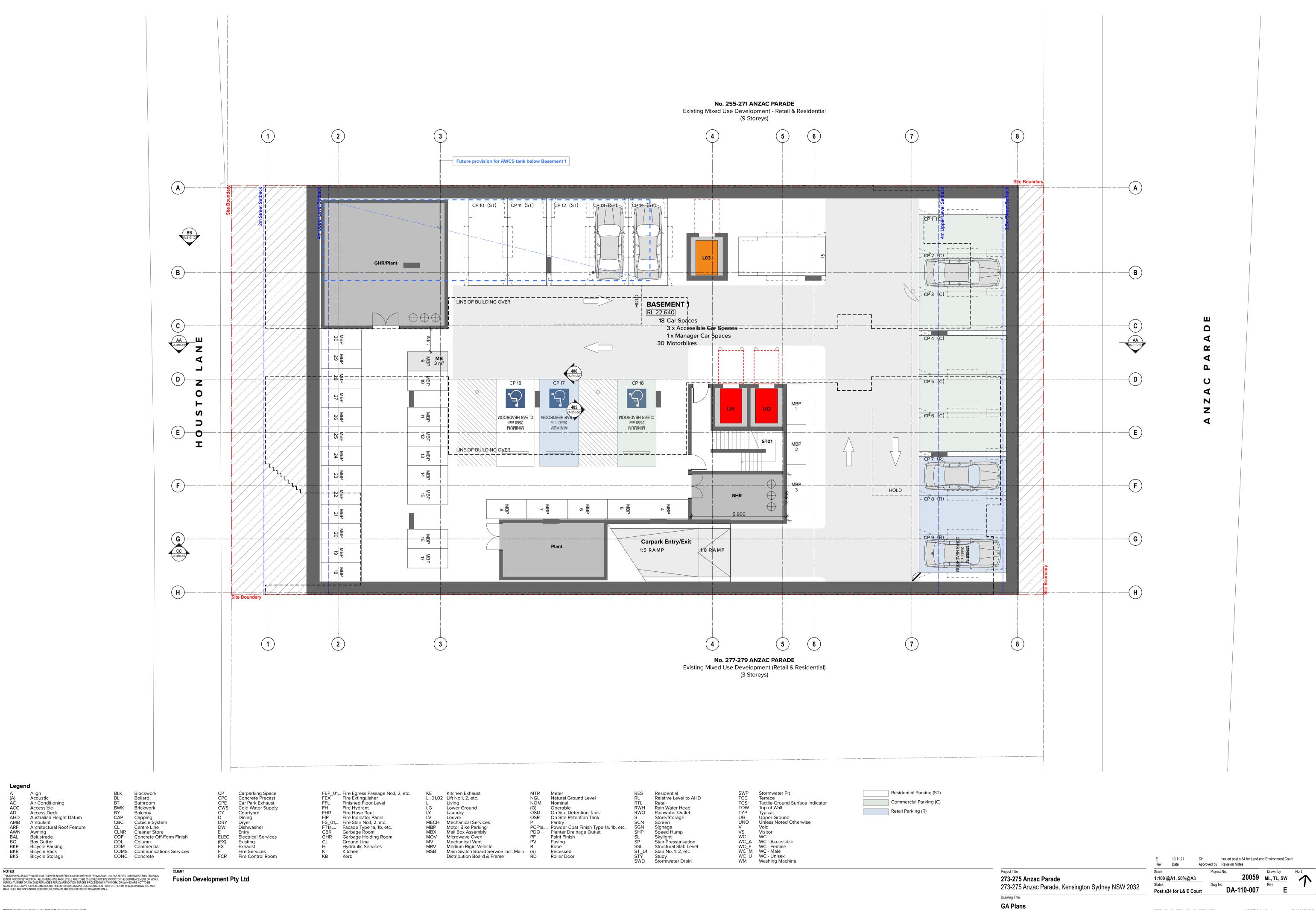
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273-275 Anzac Parade 273-275 Anzac Parade, Kensington Sydney NSW 2032 Siteworks Site Analysis

20059 ML, TL, SW Rev Dwg No. **DA-010-020** Post s34 for L& E Court **TURNER** 

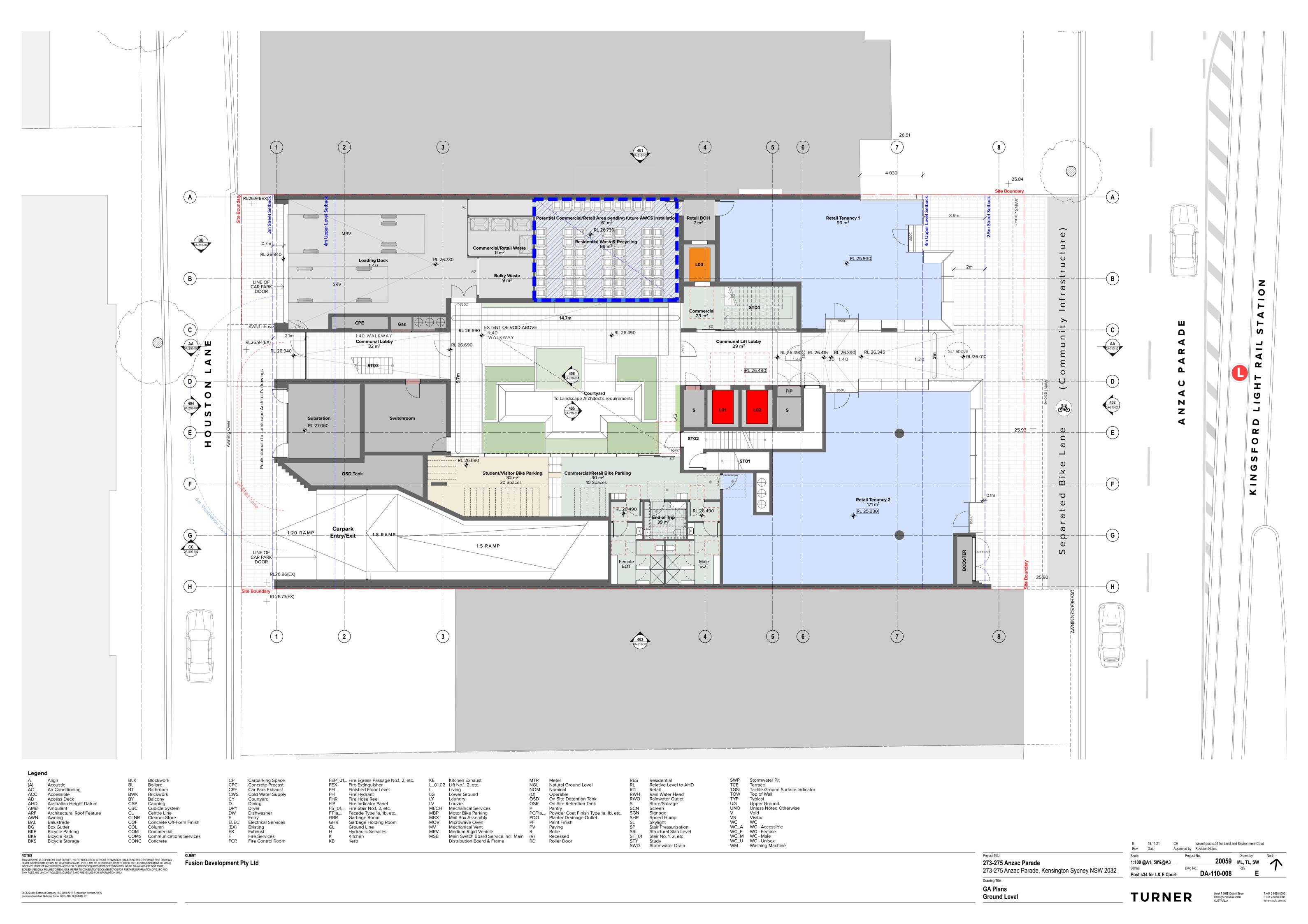
DLCS Quality Endorsed Company ISO 9001:2015, Registration Number 20476 Nominated Architect: Nicholas Turner 6695, ABN 86 064 084 911

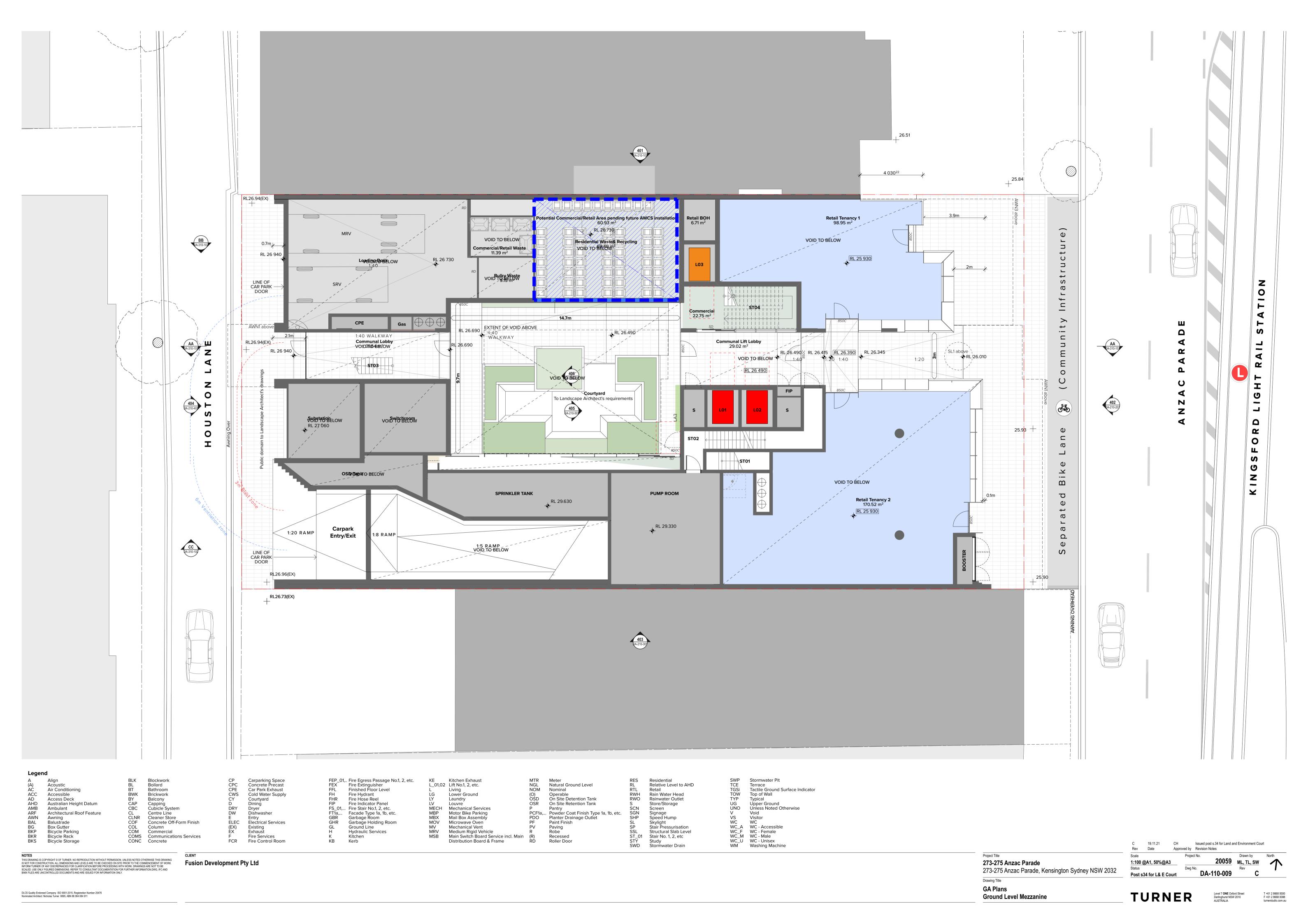


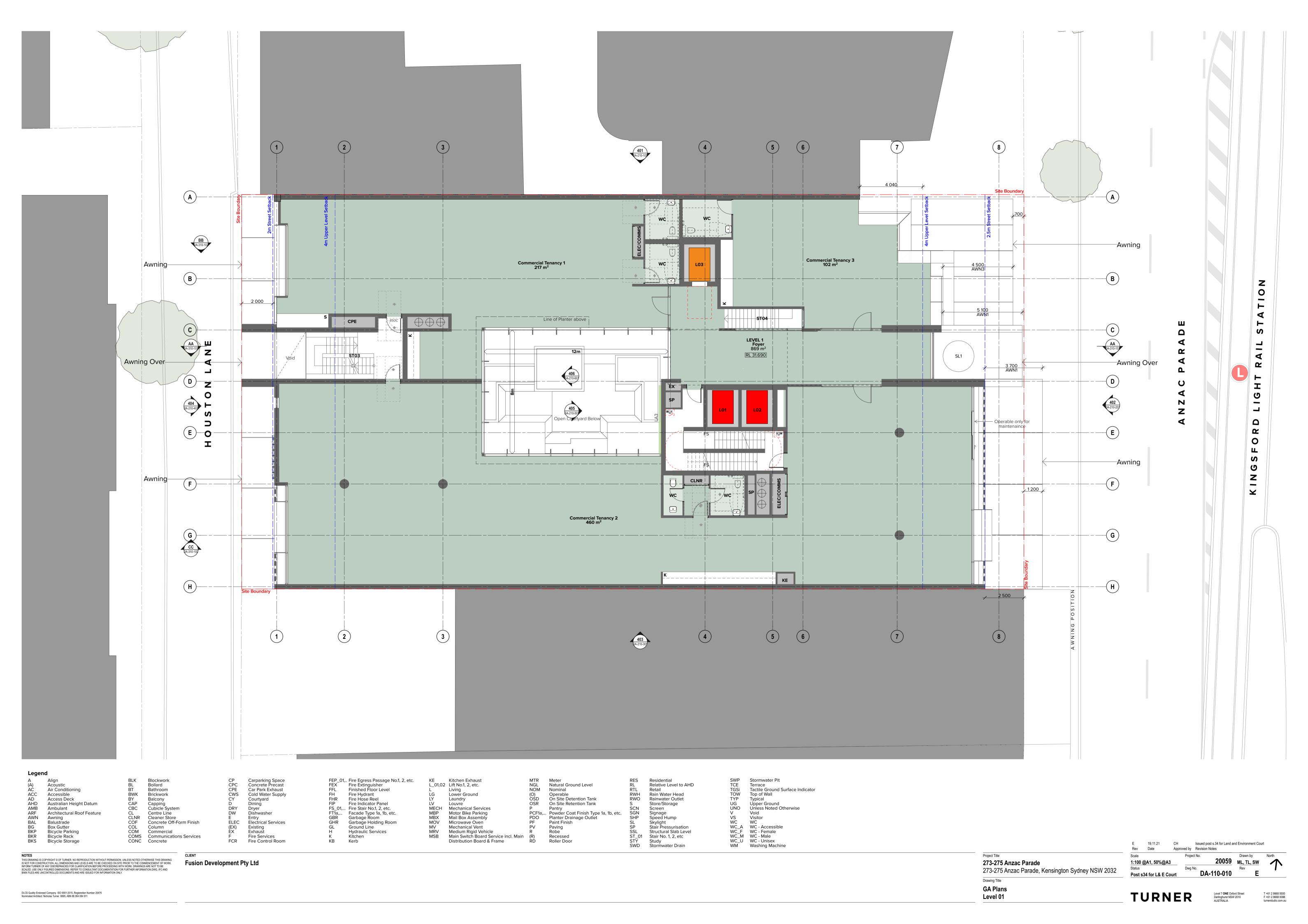


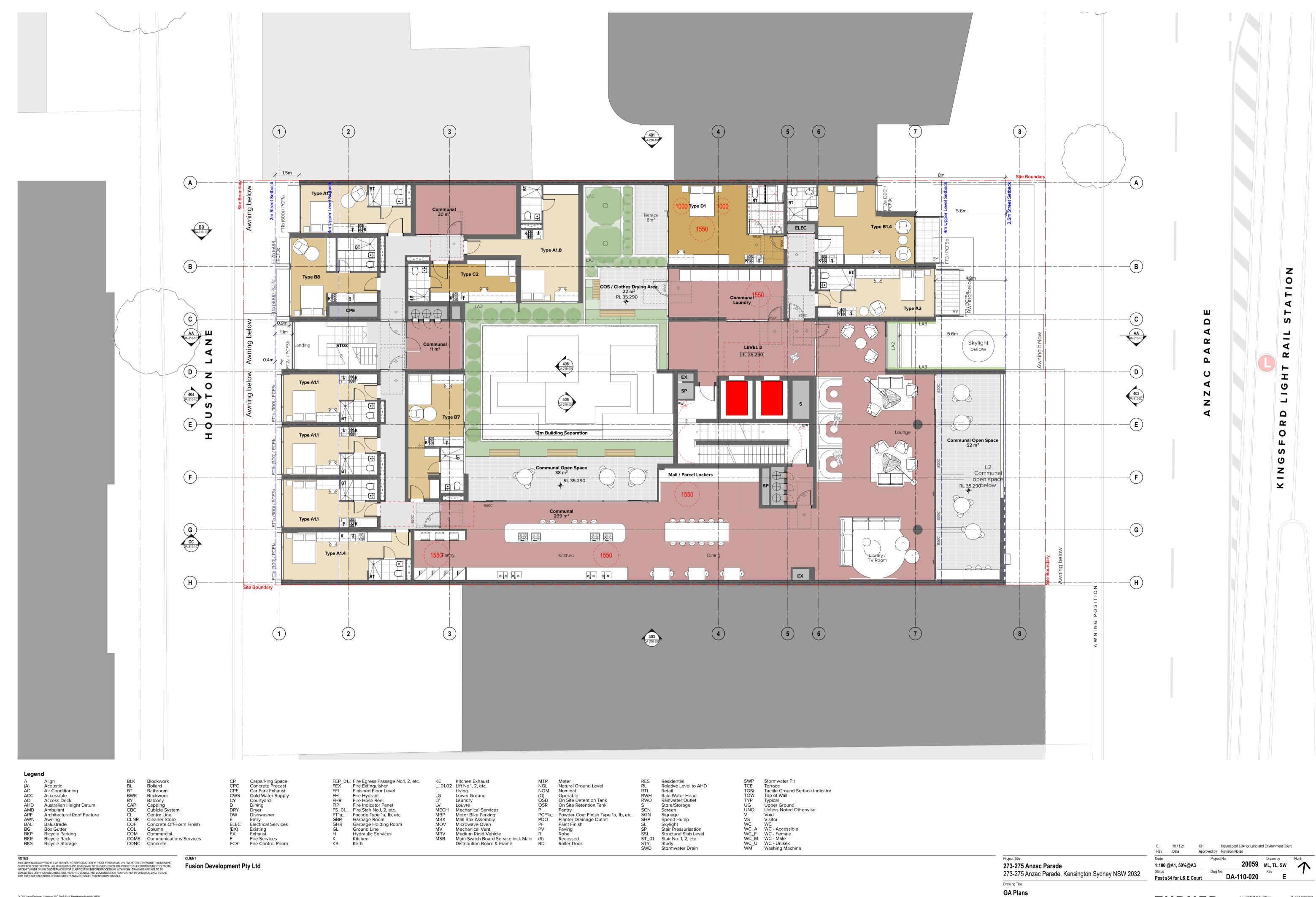
Basement 01

**TURNER** 









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Level 02

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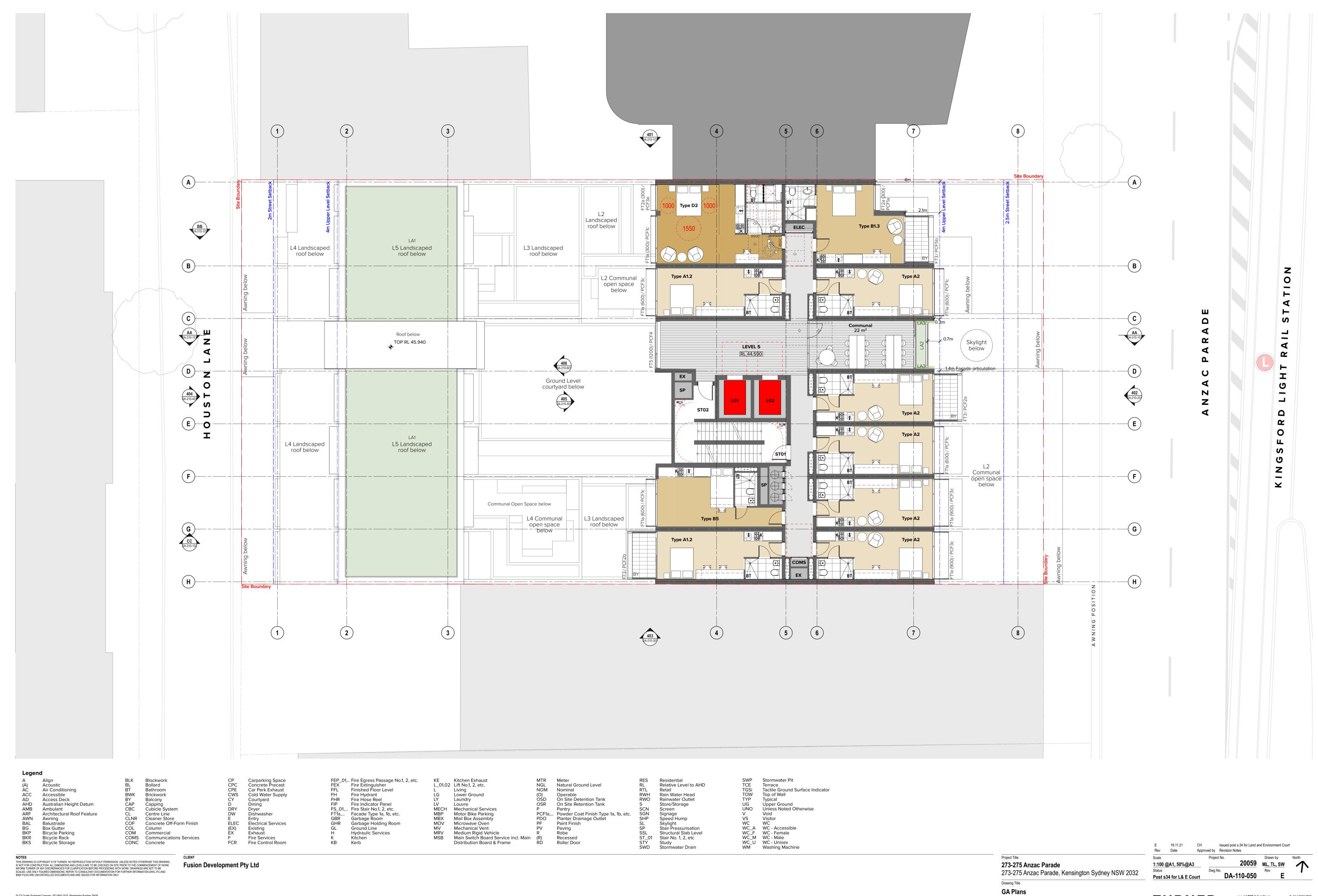


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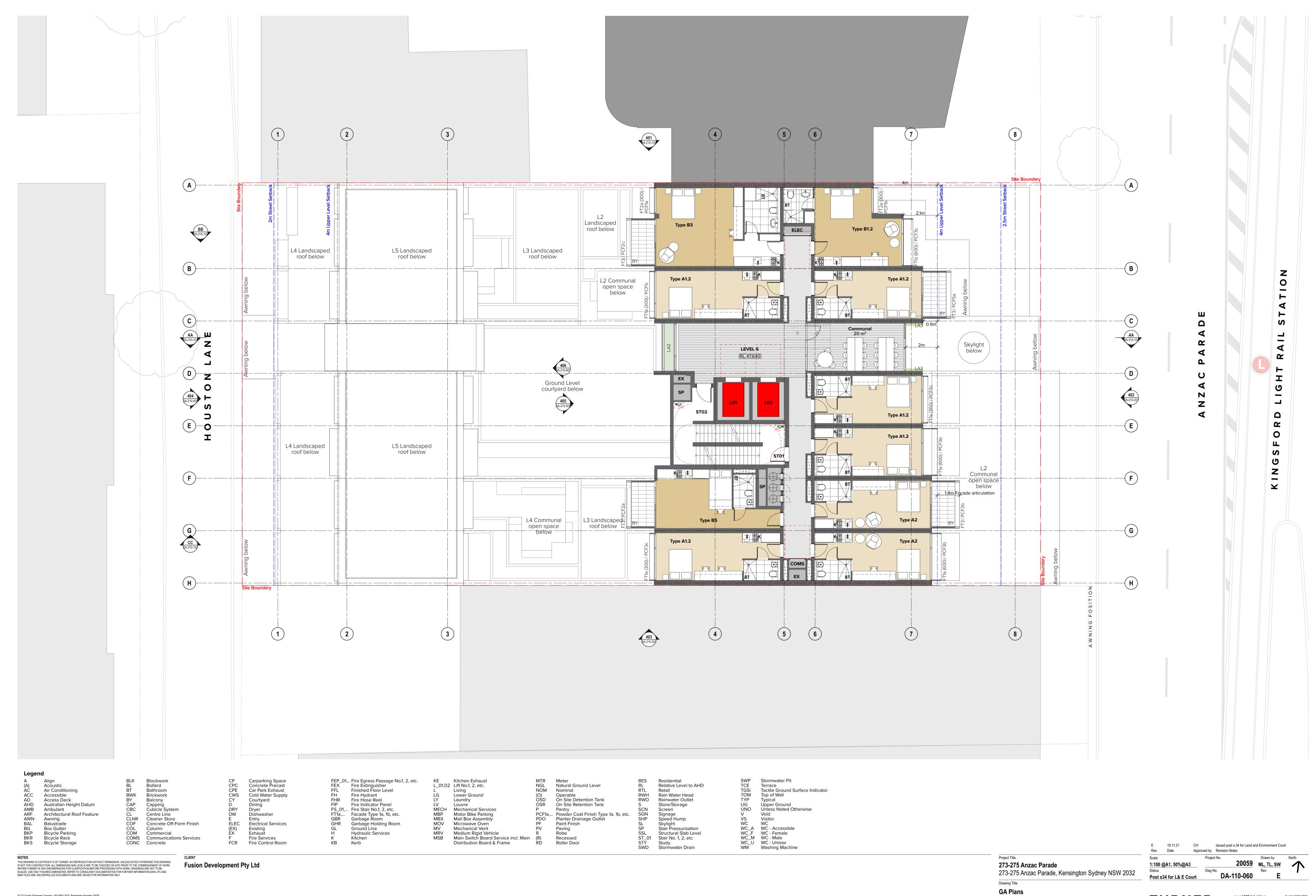
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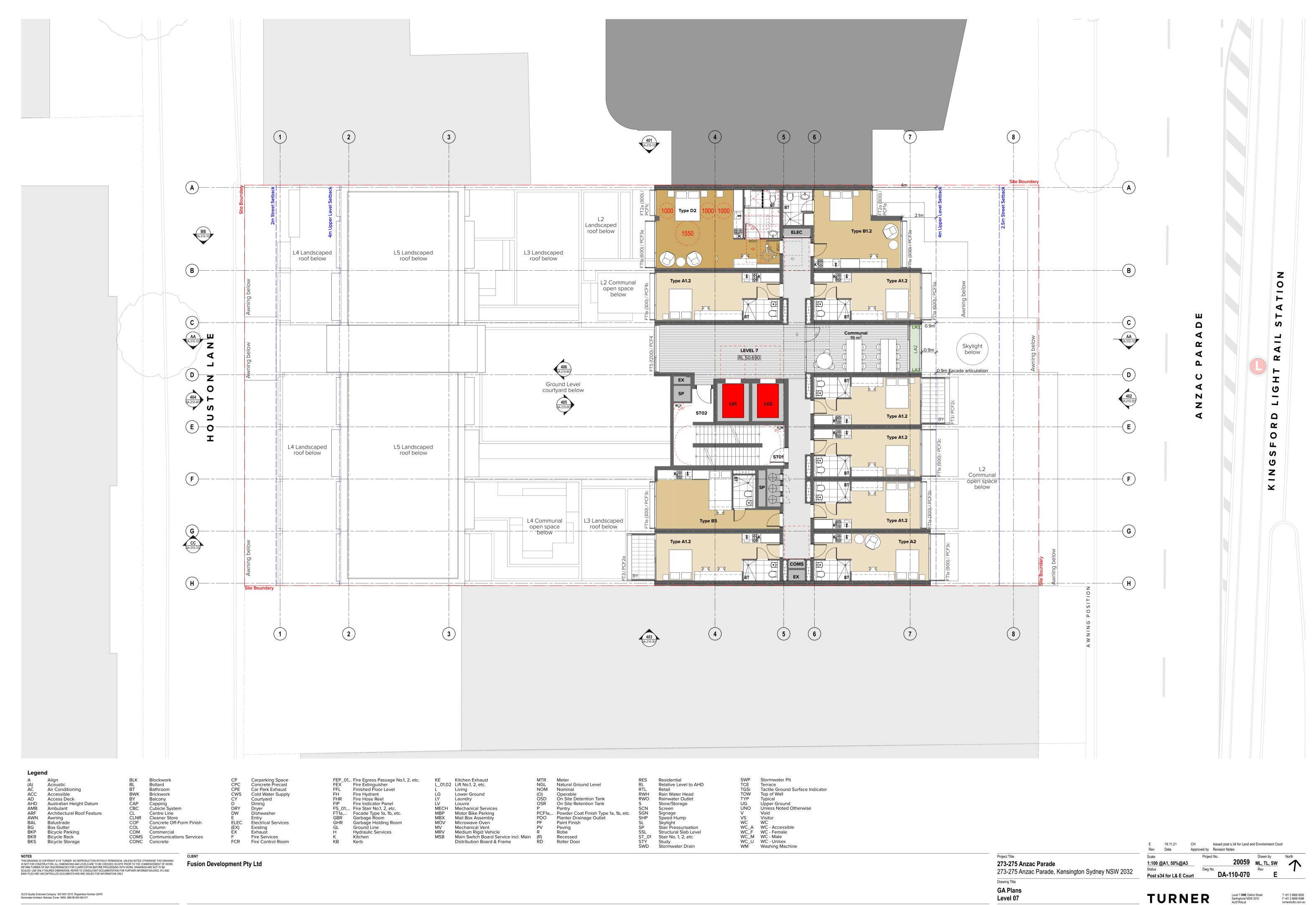
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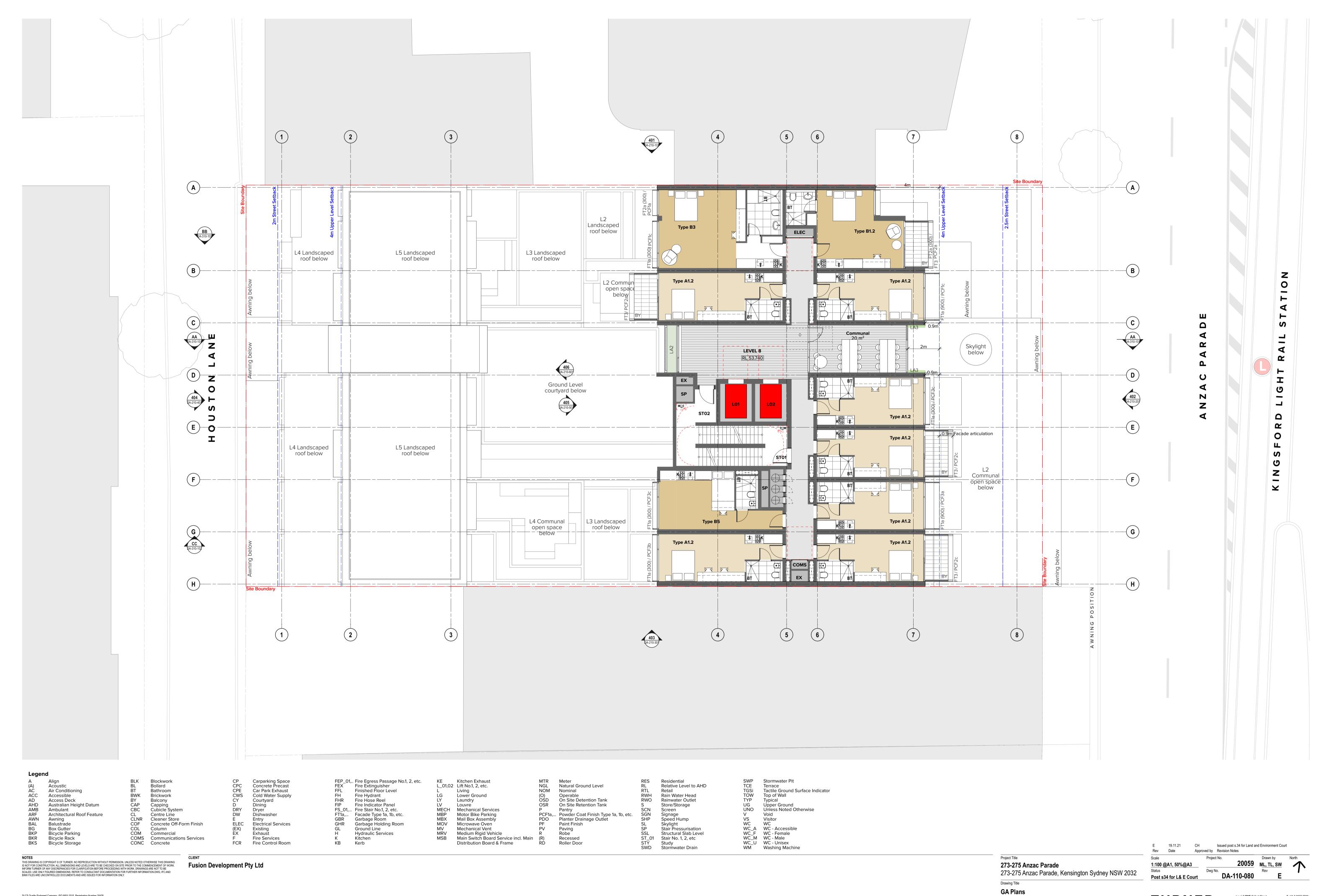
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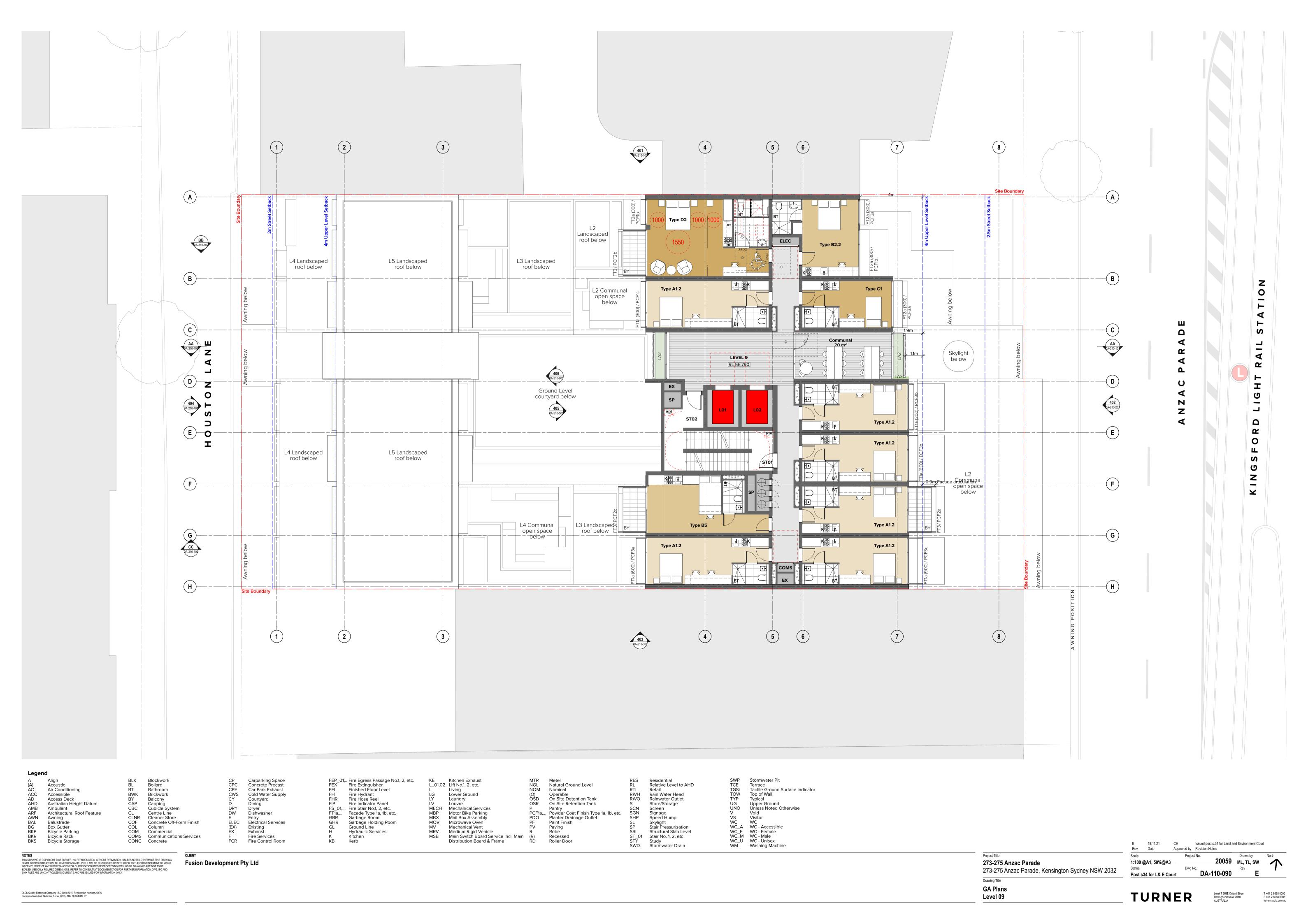


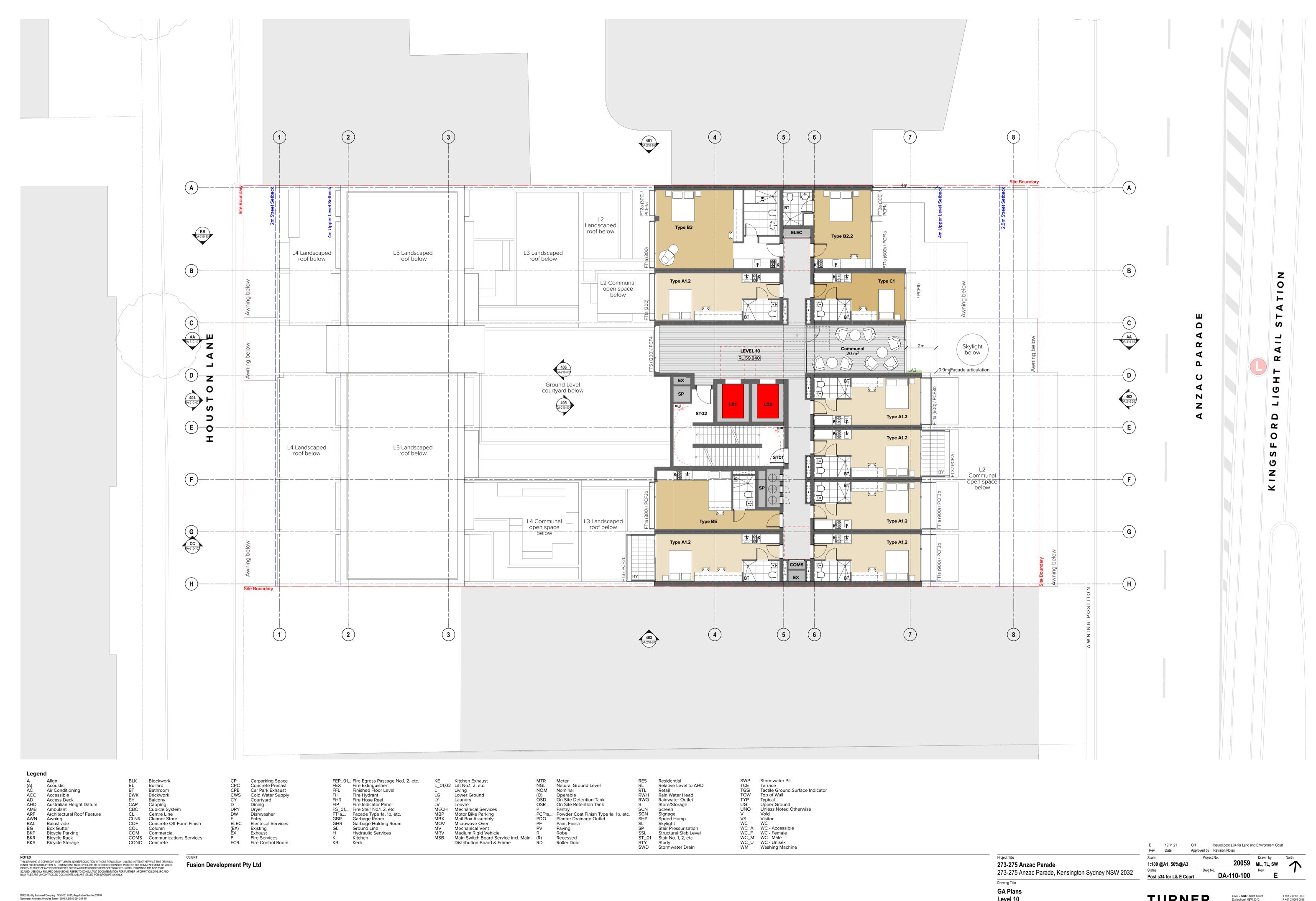
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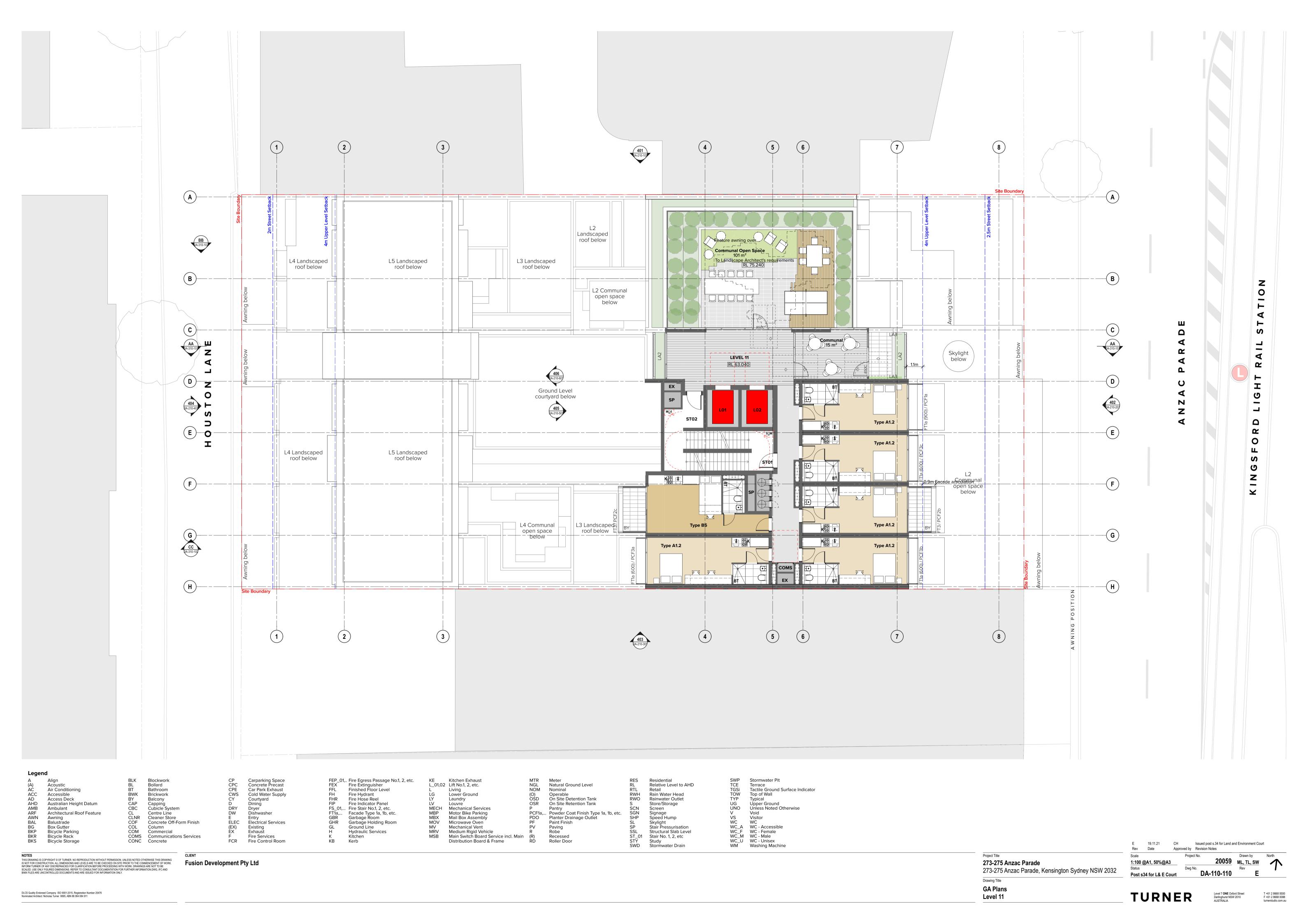
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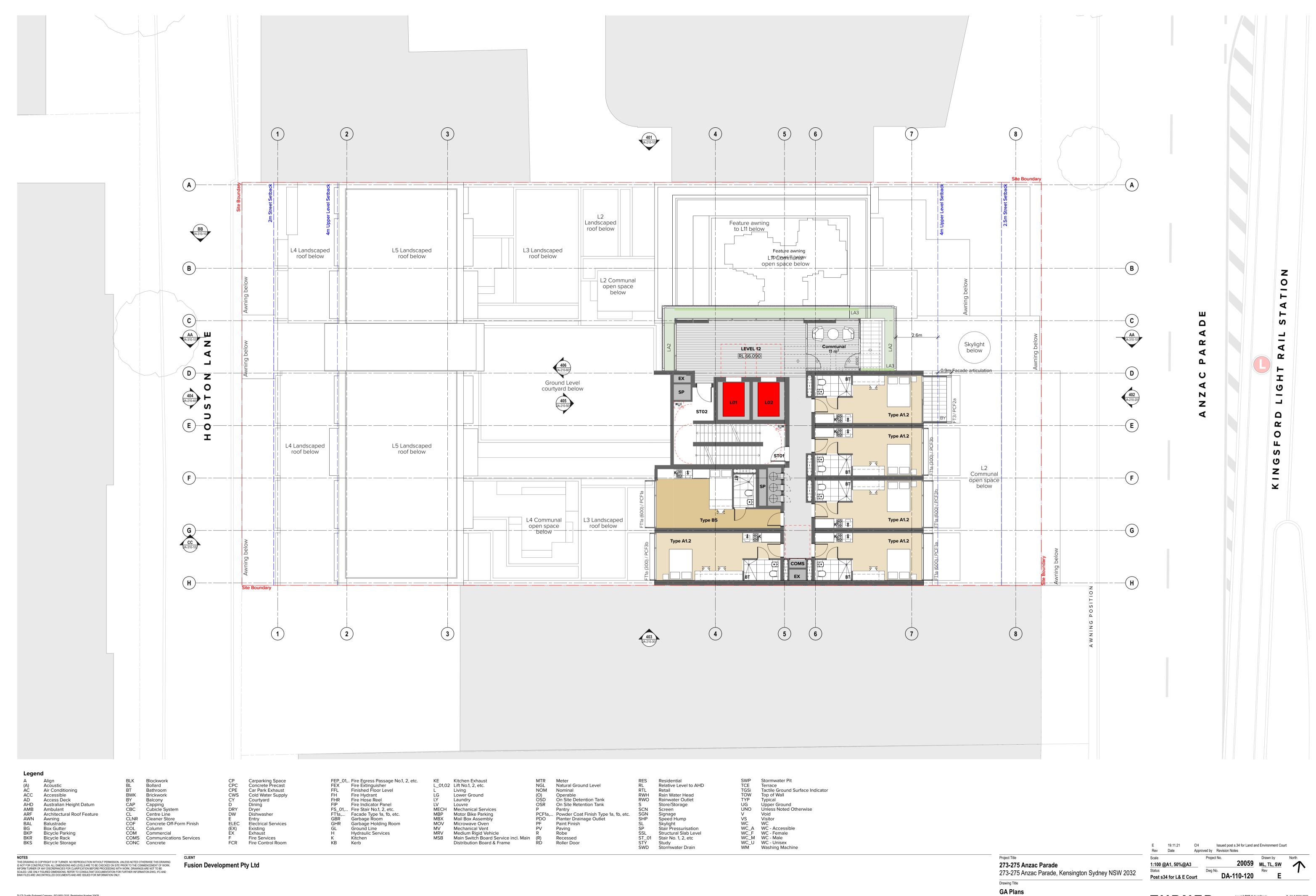
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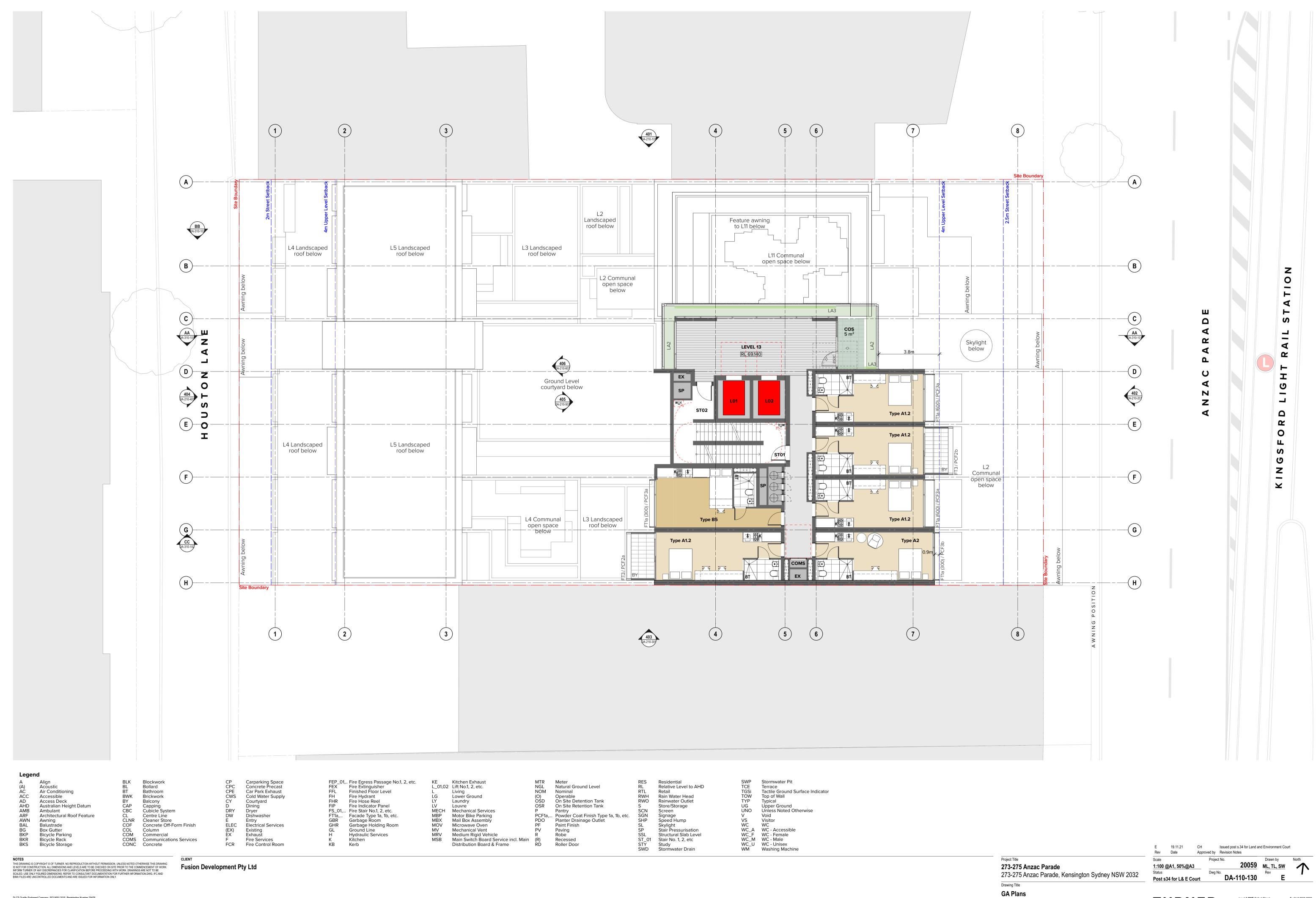


Level 12

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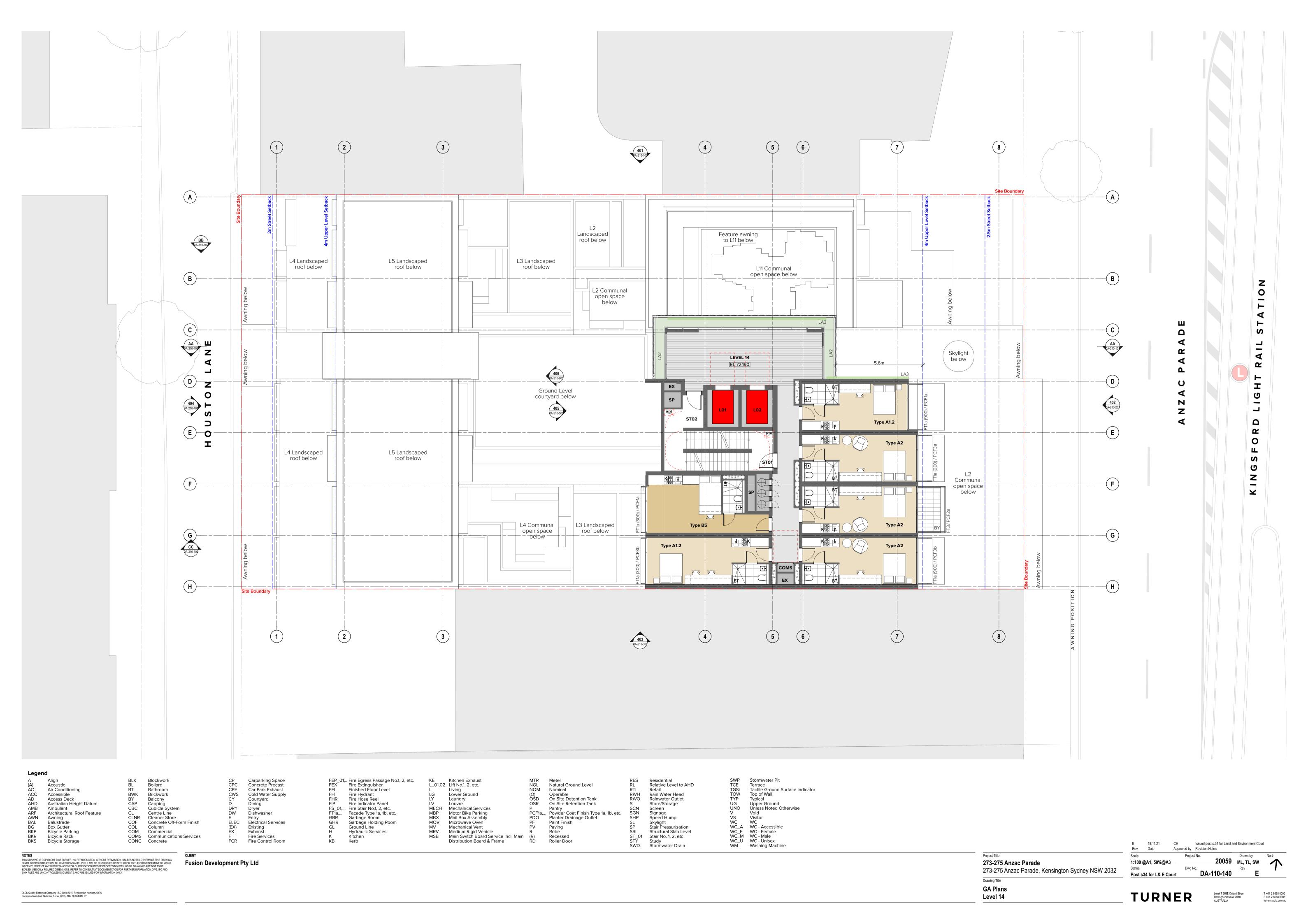
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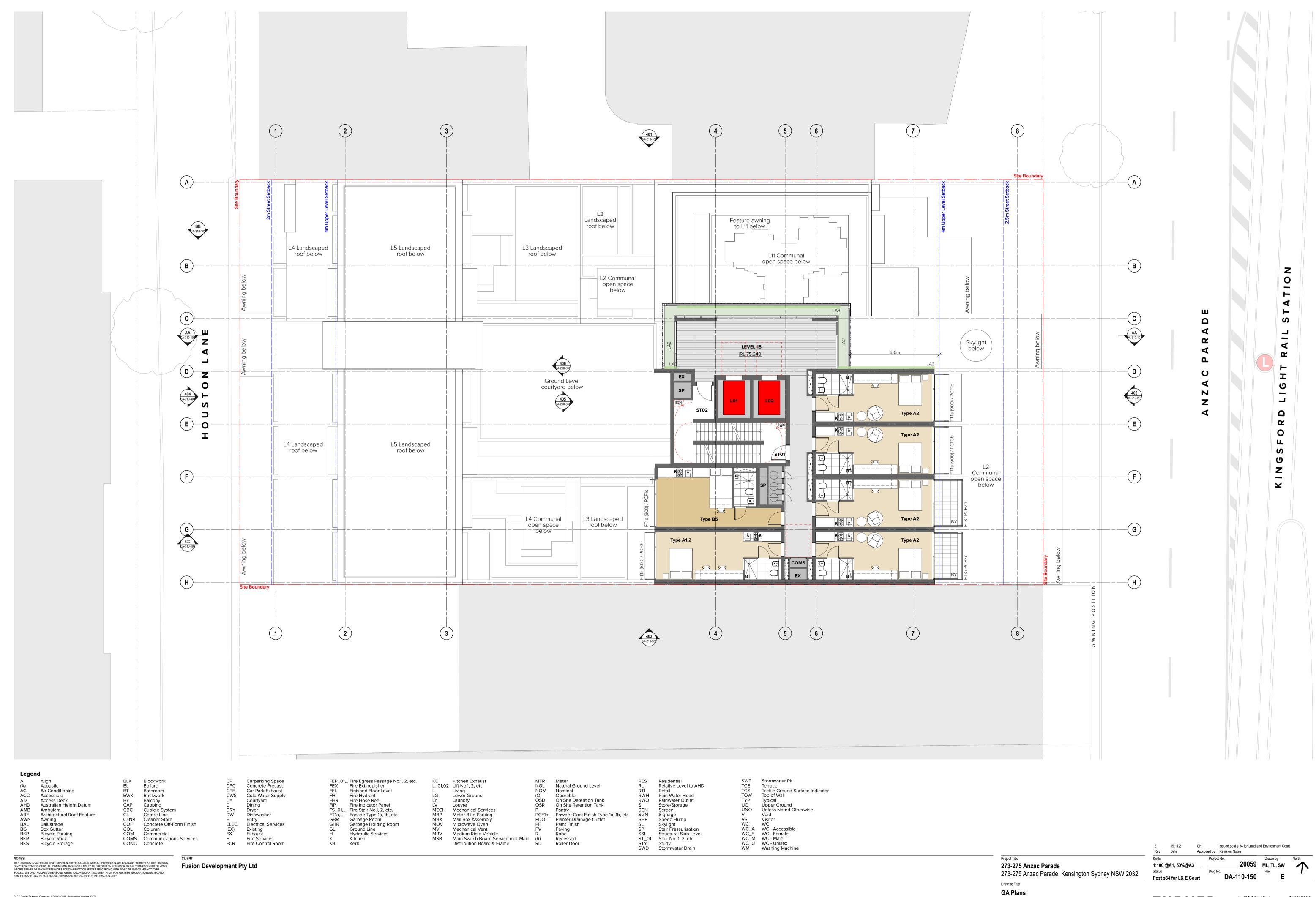


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Level 13

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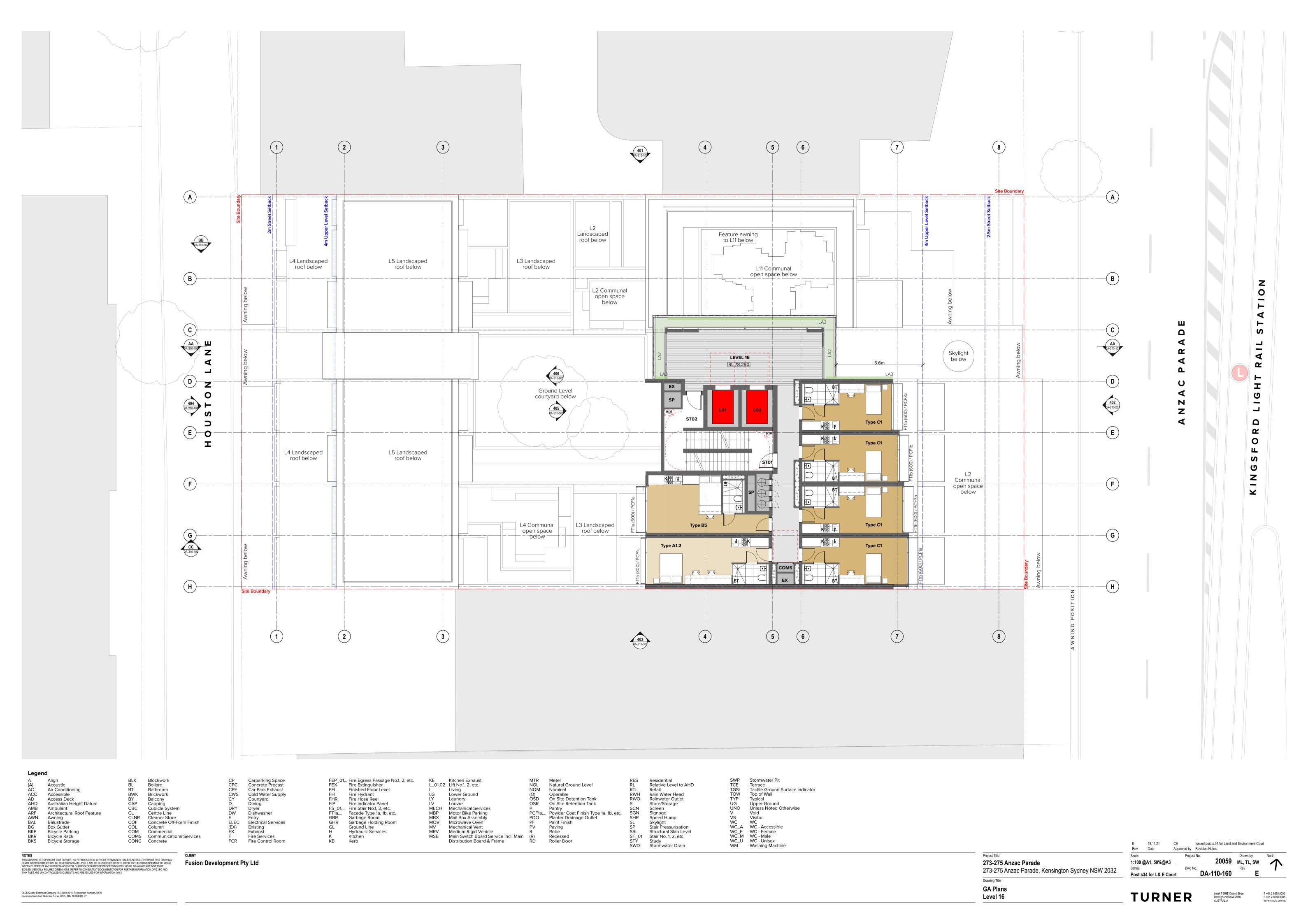


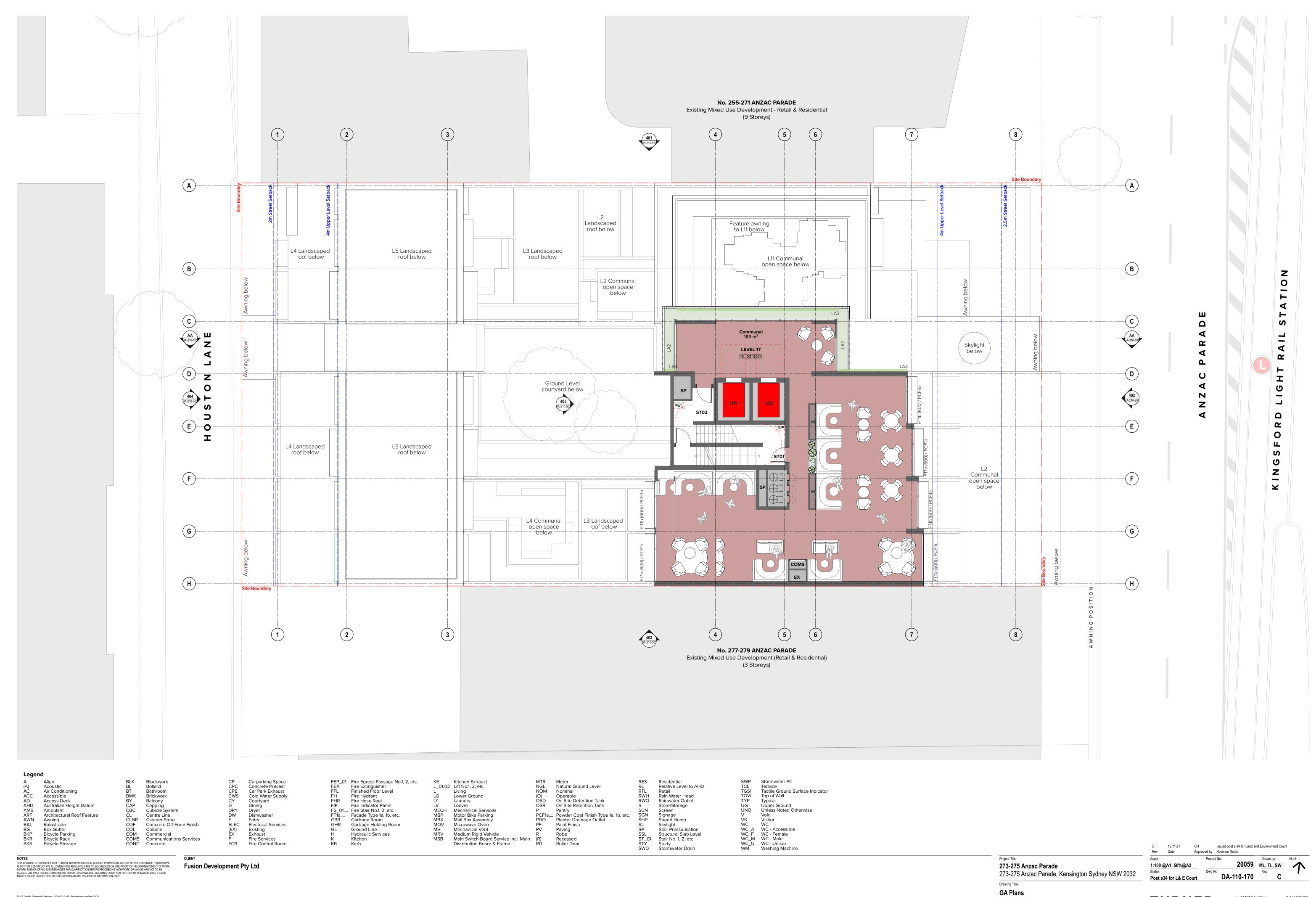


Level 15

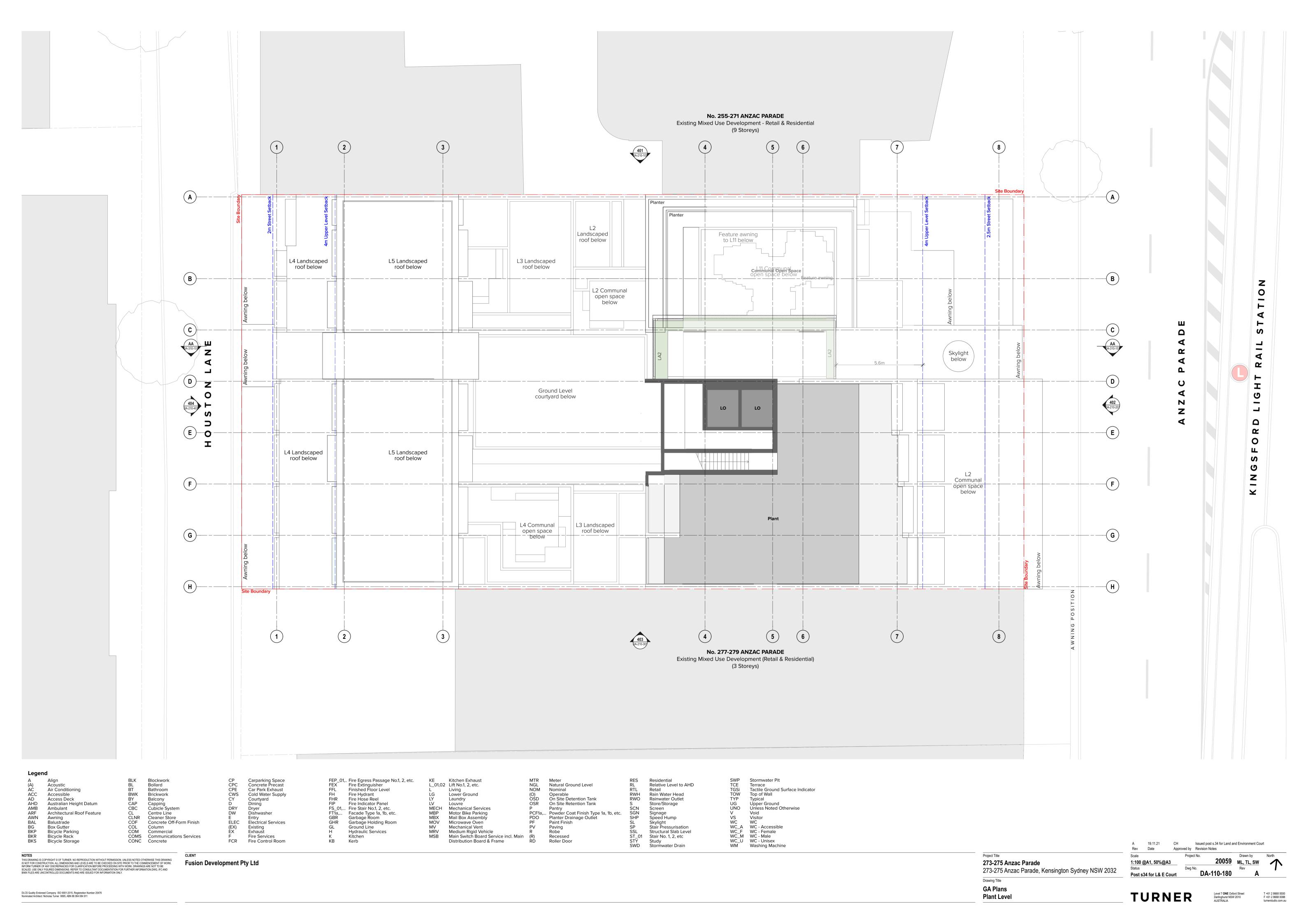
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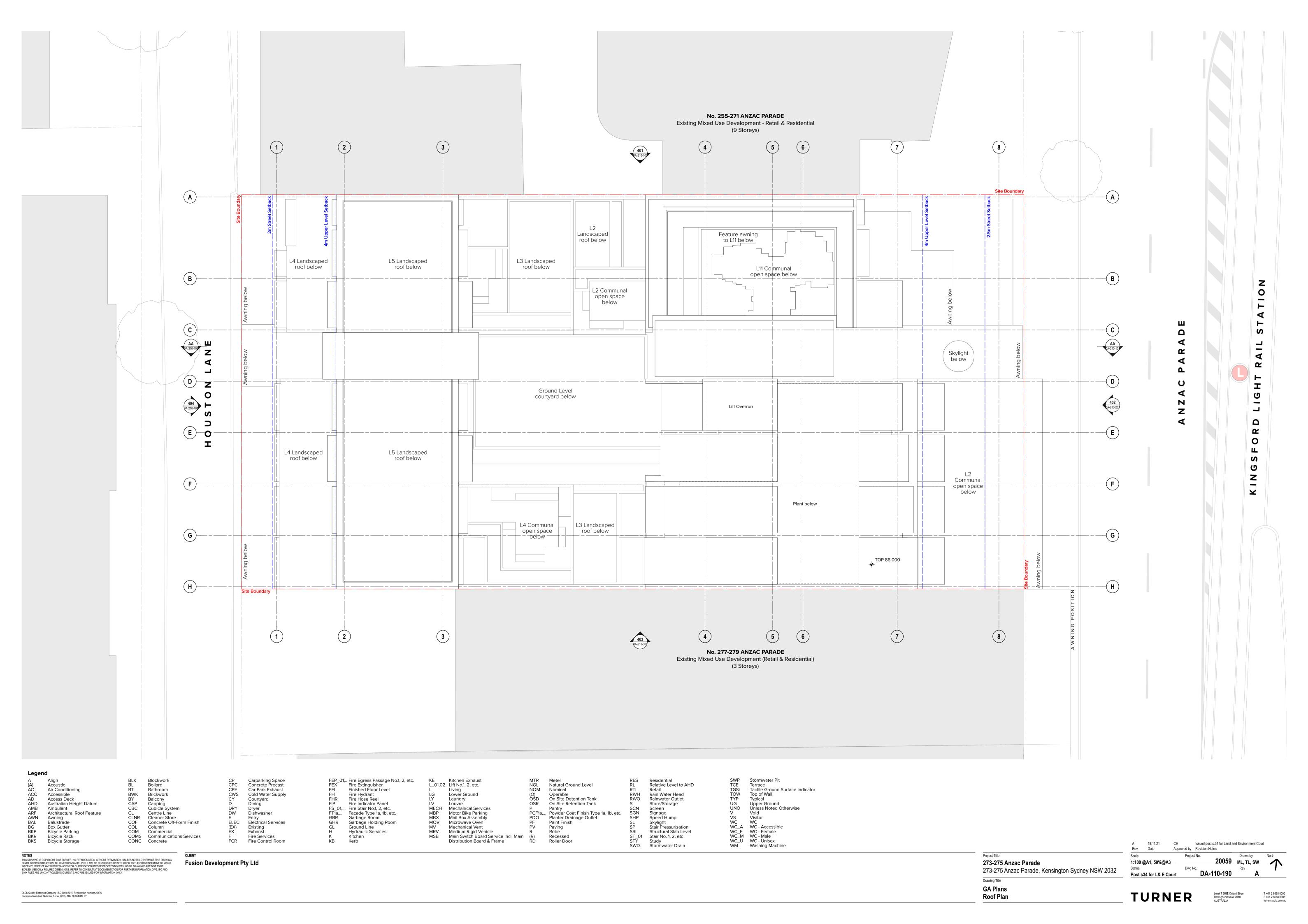
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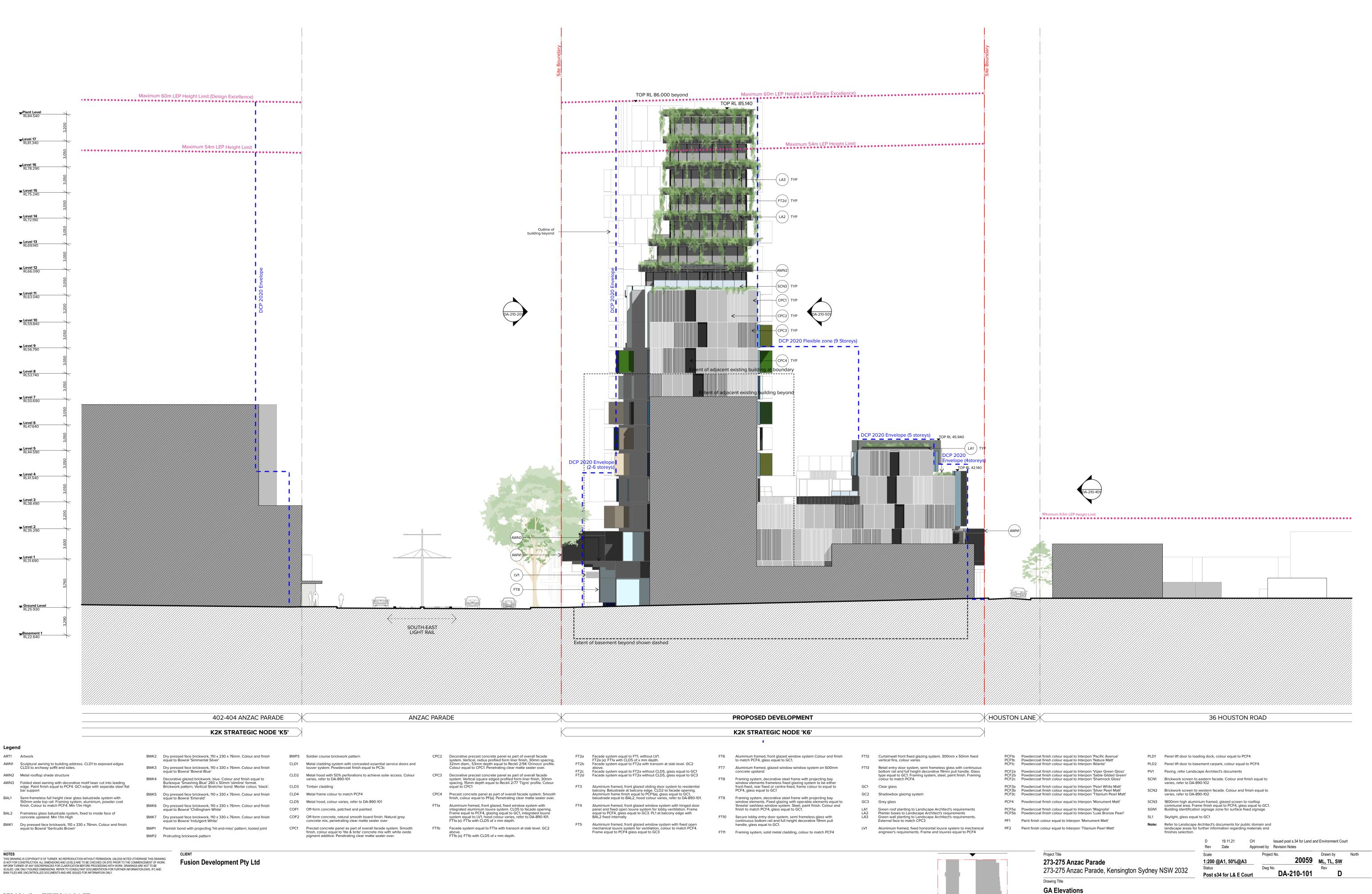




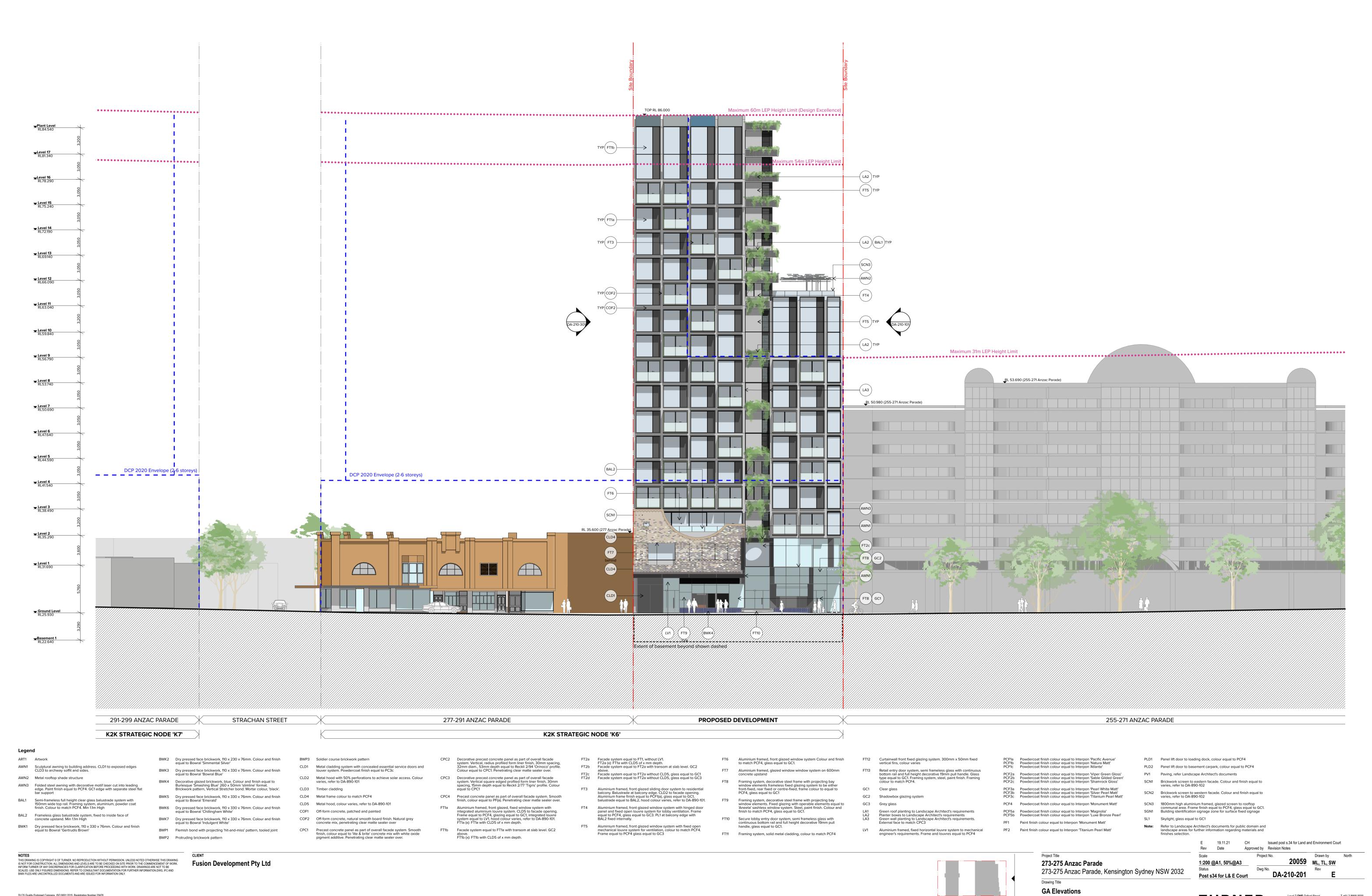
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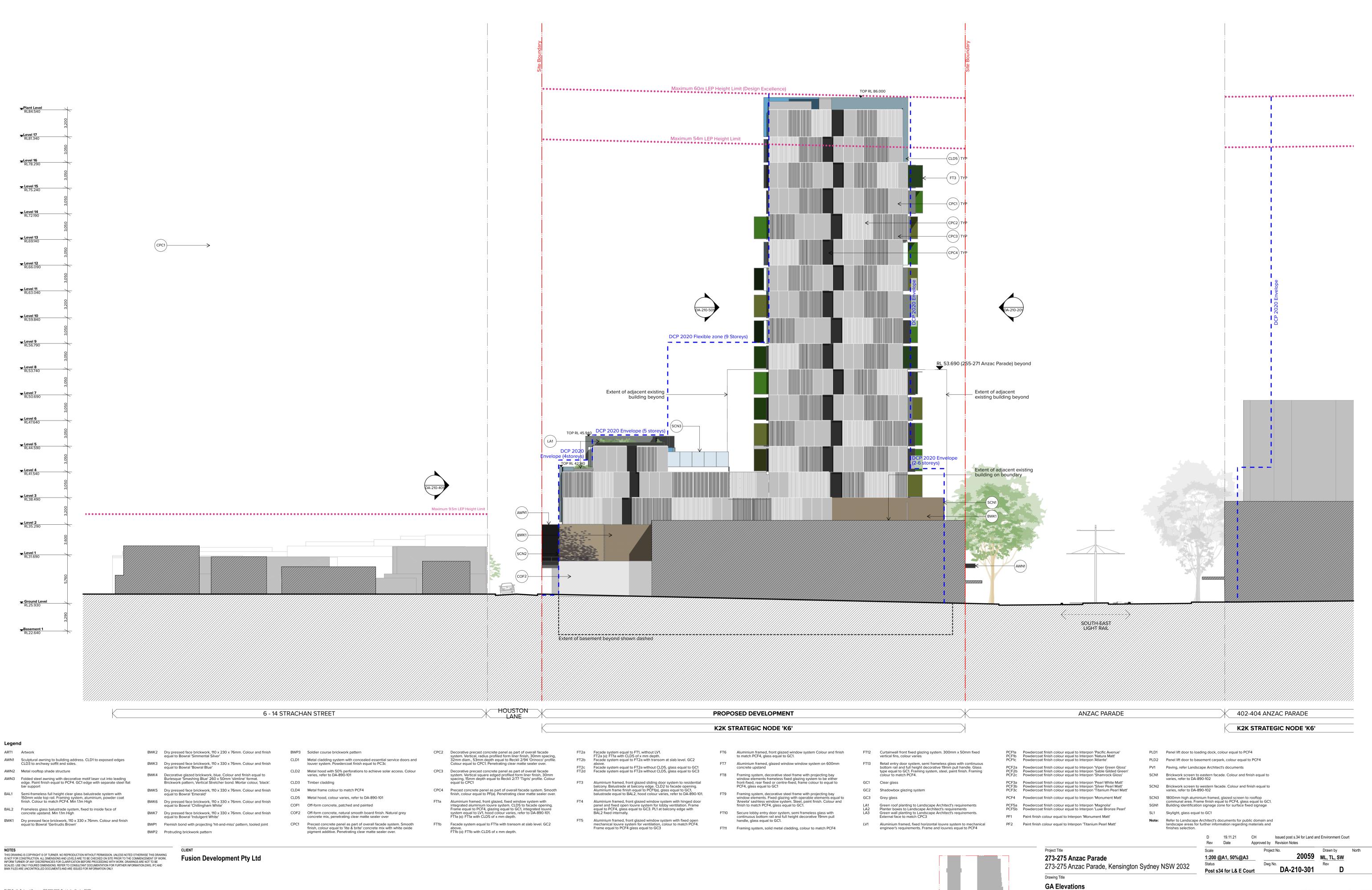




**North Elevation** 

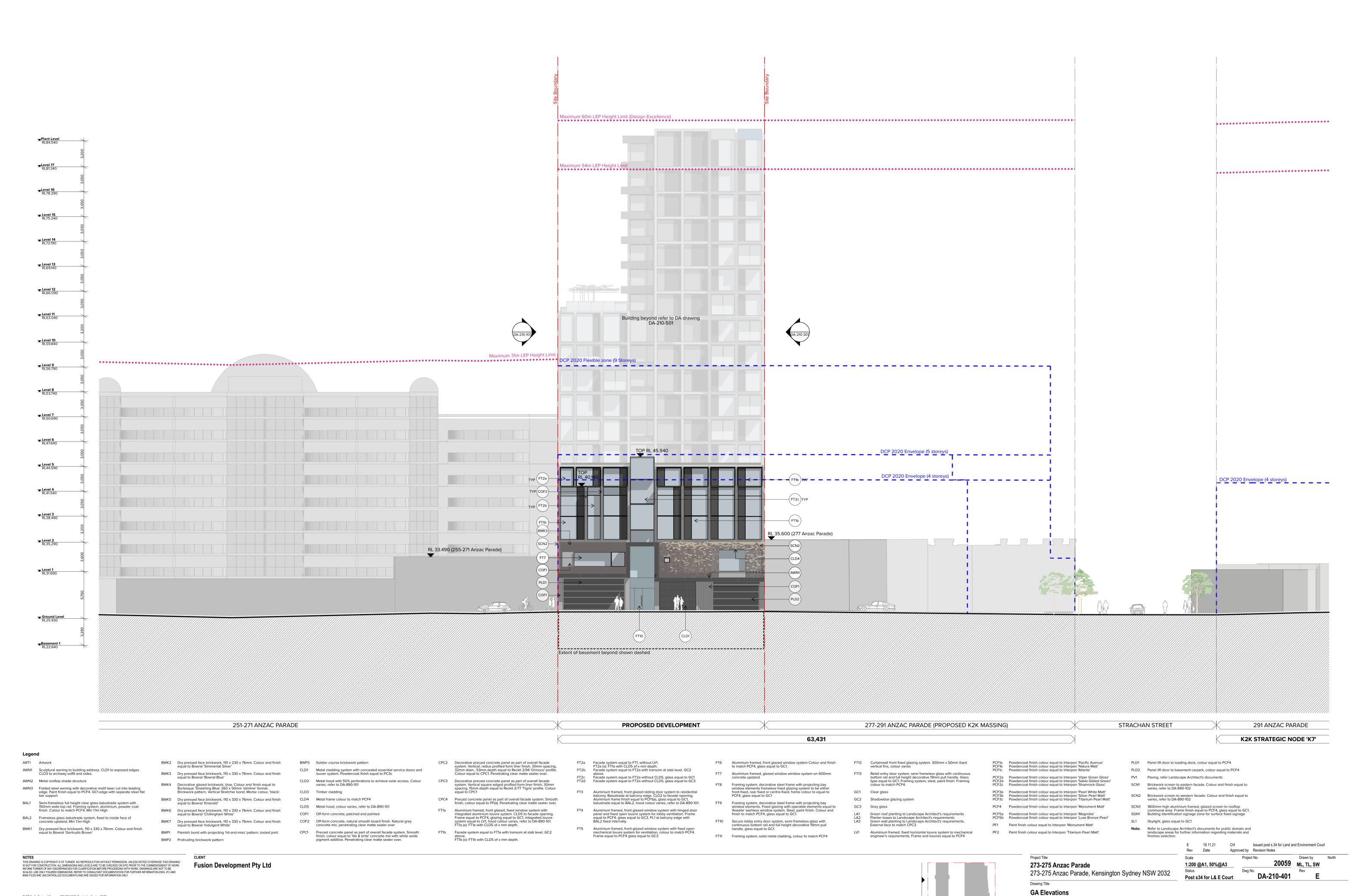


**East Elevation** 



TURNER

**South Elevation** 

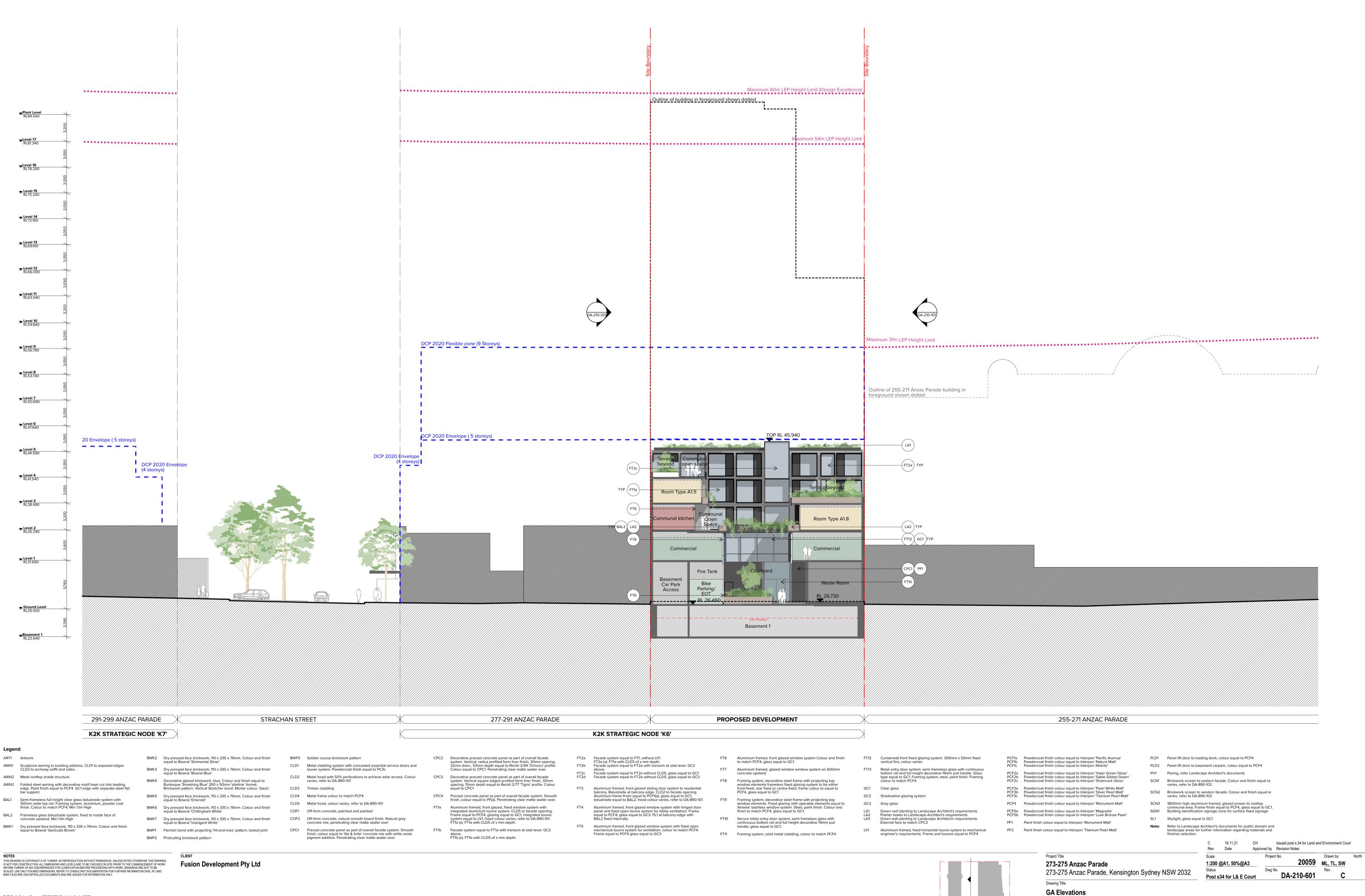


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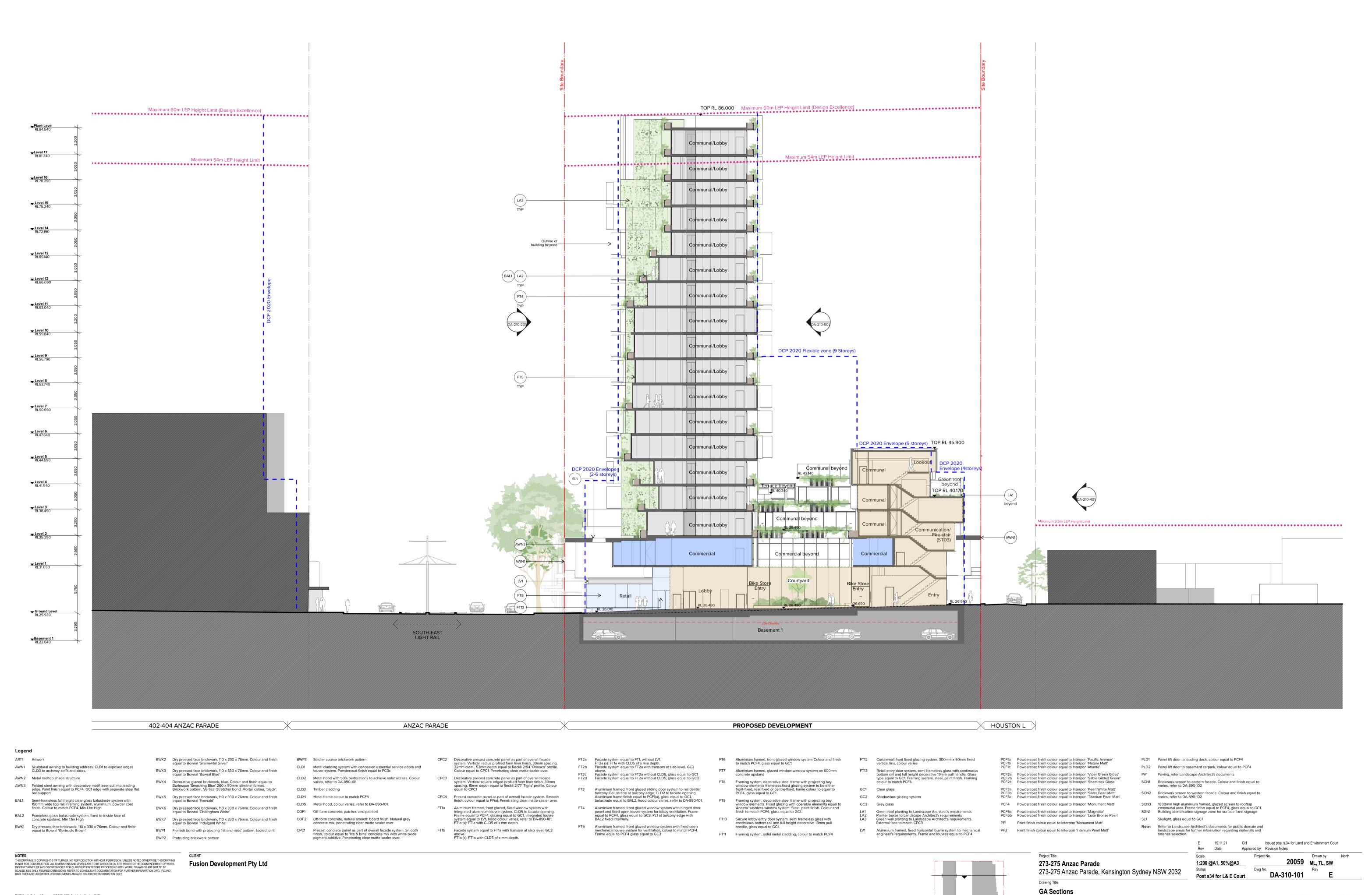
**West Elevation** 



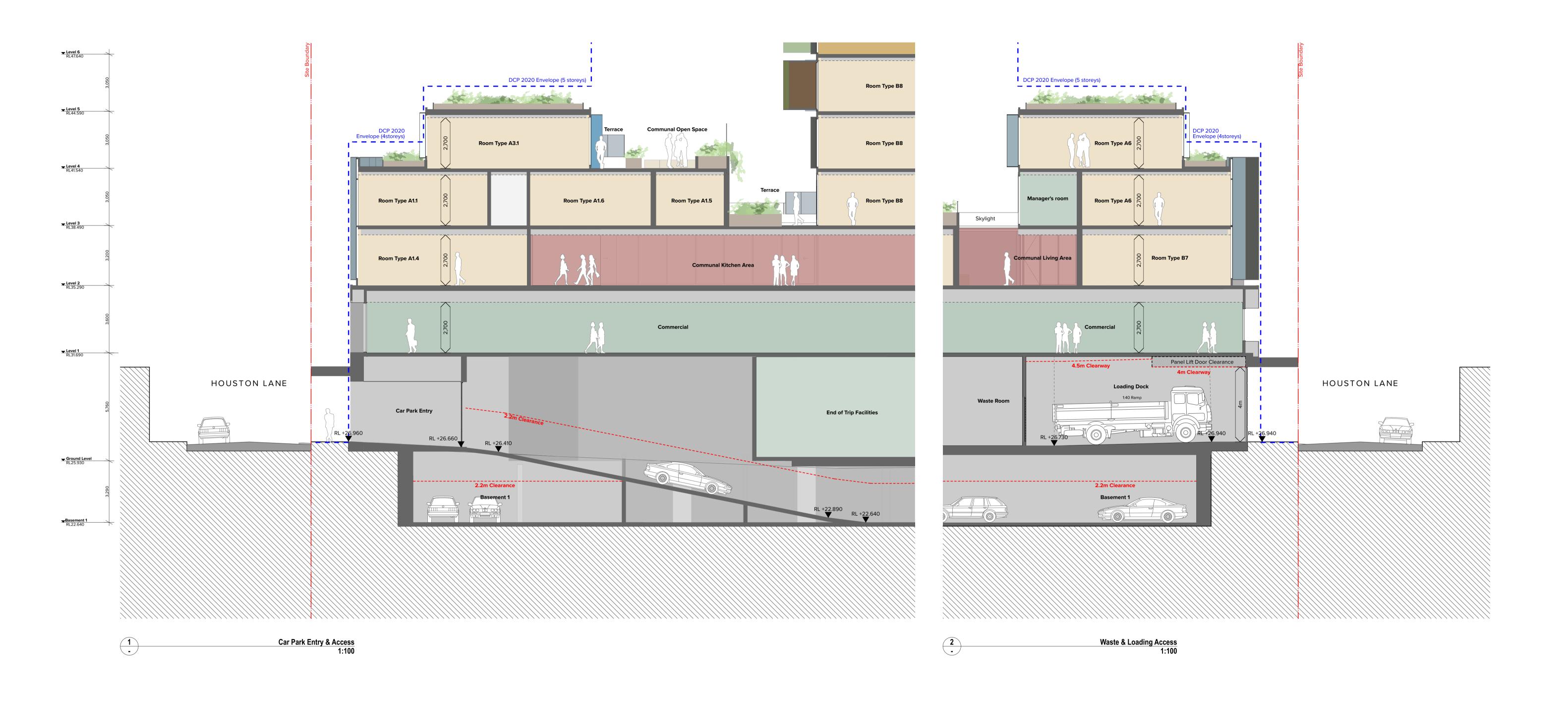
Interior East Elevation/Section



**Interior West Elevation** 



**Section AA** 



AWN1 Sculptural awning to building address. CLD1 to exposed edges CLD3 to archway soffit and sides.

AWN2 Metal rooftop shade structure AWN3 Folded steel awning with decorative motif laser cut into leading edge. Paint finish equal to PCF4. GC1 edge with separate steel flat bar support

BAL1 Semi-frameless full height clear glass balustrade system with 150mm wide top rail. Framing system, aluminium, powder coat finish. Colour to match PCF4. Min 1.1m High

BAL2 Frameless glass balustrade system, fixed to inside face of concrete upstand. Min 1.1m High BWK1 Dry pressed face brickwork, 110 x 330 x 76mm. Colour and finish equal to Bowral 'Gertrudis Brown'

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BWK2 Dry pressed face brickwork, 110 x 230 x 76mm. Colour and finish equal to Bowral 'Simmental Silver' BWK3 Dry pressed face brickwork, 110 x 330 x 76mm. Colour and finish equal to Bowral 'Bowral Blue'

BWK4 Decorative glazed brickwork, blue. Colour and finish equal to Burlesque 'Smashing Blue' 260 x 50mm 'slimline' format. Brickwork pattern, Vertical Stretcher bond. Mortar colour, 'black'. BWK5 Dry pressed face brickwork, 110 x 330 x 76mm. Colour and finish equal to Bowral 'Emerald'

BWK6 Dry pressed face brickwork, 110 x 330 x 76mm. Colour and finish equal to Bowral 'Chillingham White'

BWK7 Dry pressed face brickwork, 110 x 330 x 76mm. Colour and finish equal to Bowral 'Indulgent White' BWP1 Flemish bond with projecting 'hit-and-miss' pattern, tooled joint BWP2 Protruding brickwork pattern

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BWP3 Soldier course brickwork pattern

CLD1 Metal cladding system with concealed essential service doors and louver system. Powdercoat finish equal to PC3c CLD2 Metal hood with 50% perforations to achieve solar access. Colour varies, refer to DA-890-101

CLD4 Metal frame colour to match PCF4

CLD5 Metal hood, colour varies, refer to DA-890-101 COF1 Off-form concrete, patched and painted

COF2 Off-form concrete, natural smooth board finish. Natural grey concrete mix, penetrating clear matte sealer over Precast concrete panel as part of overall facade system. Smooth finish, colour equal to 'lite & brite' concrete mix with white oxide pigment additive. Penetrating clear matte sealer over. CPC2 Decorative precast concrete panel as part of overall facade system. Vertical, radius profiled form liner finish, 30mm spacing, 32mm diam, 53mm depth equal to Reckil 2/94 'Orinoco' profile. Colour equal to CPC1. Penetrating clear matte sealer over.

CPC3 Decorative precast concrete panel as part of overall facade system. Vertical square edged profiled form liner finish, 30mm spacing, 15mm depth equal to Reckli 2/77 'Tigris' profile. Colour equal to CPC1

CPC4 Precast concrete panel as part of overall facade system. Smooth finish, colour equal to PF(a). Penetrating clear matte sealer over. FT1a Aluminium framed, front glazed, fixed window system with integrated aluminium louvre system. CLD5 to facade opening. Frame equal to PCF4, glazing equal to GC1, integrated louvre system equal to LV1, hood colour varies, refer to DA-890-101. FT1a (x): FT1a with CLD5 of x mm depth.

FT1b Facade system equal to FT1a with transom at slab level. GC2 FT1b (x): FT1b with CLD5 of x mm depth.

FT2a Facade system equal to FT1, without LV1. FT2a (x): FT1a with CLD5 of x mm depth.

FT2b Facade system equal to FT2a with transom at slab level. GC2 FT2c Facade system equal to FT2a without CLD5

Aluminium framed, front glazed sliding door system to residential balcony. Balustrade at balcony edge. CLD2 to facade opening. Aluminium frame finish equal to PCF1(a), glass equal to GC1, balustrade equal to BAL2, hood colour varies, refer to DA-890-101. Aluminium framed, front glazed window system with hinged door panel and fixed open louvre system for lobby ventilation. Frame equal to PCF4, glass equal to GC3. PL1 at balcony edge with BAL2 fixed internally.

Aluminium framed, front glazed window system with fixed open mechanical louvre system for ventilation, colour to match PCF4. Frame equal to PCF4 glass equal to GC3

FT6 Aluminium framed, front glazed window system Colour and finish to match PCF4, glass equal to GC1.

FT7 Aluminium framed, glazed window window system on 600mm concrete upstand FT8 Framing system, decorative steel frame with projecting bay window elements frameless fixed glazing system to be either front-fixed, rear fixed or centre-fixed, frame colour to equal to PCF4, glass equal to GC1

FT9 Framing system, decorative steel frame with projecting bay window elements. Fixed glazing with operable elements equal to 'Aneeta' sashless window system. Steel, paint finish. Colour and finish to match PCF4, glass equal to GC1.

FT10 Secure lobby entry door system, semi frameless glass with continuous bottom rail and full height decorative 19mm pull handle, glass equal to GC1. FT11 Framing system, solid metal cladding, colour to match PCF4

FT12 Curtainwall front fixed glazing system. 300mm x 50mm fixed vertical fins, colour varies

Retail entry door system, semi frameless glass with continuous bottom rail and full height decorative 19mm pull handle. Glass type equal to GC1. Framing system, steel, paint finish. Framing colour to match PCF4.

GC2 Shadowbox glazing system

GC3 Grey glass Green roof planting to Landscape Architect's requirements Planter boxes to Landscape Architect's requirements Green wall planting to Landscape Architect's requirements. External face to match CPC3

Aluminium framed, fixed horizontal louvre system to mechanical engineer's requirements. Frame and louvres equal to PCF4

PCF1a Powdercoat finish colour equal to Interpon 'Pacific Avenue'
PCF1b Powdercoat finish colour equal to Interpon 'Natura Matt'
PCF1c Powdercoat finish colour equal to Interpon 'Atlante'

PCF2a Powdercoat finish colour equal to Interpon 'Viper Green Gloss' Powdercoat finish colour equal to Interpon 'Sable Gilded Green' Powdercoat finish colour equal to Interpon 'Shamrock Gloss' PCF3a Powdercoat finish colour equal to Interpon 'Pearl White Matt'
PCF3b Powdercoat finish colour equal to Interpon 'Silver Pearl Matt'
Powdercoat finish colour equal to Interpon 'Titanium Pearl Matt' PCF4 Powdercoat finish colour equal to Interpon 'Monument Matt'

PCF5a Powdercoat finish colour equal to Interpon 'Magnolia' PCF5b Powdercoat finish colour equal to Interpon 'Luxe Bronze Pearl' PF1 Paint finish colour equal to Interpon 'Monument Matt' PF2 Paint finish colour equal to Interpon 'Titanium Pearl Matt'

PLD1 Panel lift door to loading dock, colour equal to PCF4

PLD2 Panel lift door to basement carpark, colour equal to PCF4 PV1 Paving, refer Landscape Architect's documents

SCN1 Brickwork screen to eastern facade. Colour and finish equal to varies, refer to DA-890-102 SCN2 Brickwork screen to western facade. Colour and finish equal to varies, refer to DA-890-102

SCN3 1800mm high aluminium framed, glazed screen to rooftop communal area. Frame finish equal to PCF4, glass equal to GC1.
SGN1 Building identification signage zone for surface fixed signage SL1 Skylight, glass equal to GC1

Note: Refer to Landscape Architect's documents for public domain and landscape areas for further information regarding materials and finishes selection.

Project Title 273-275 Anzac Parade 273-275 Anzac Parade, Kensington Sydney NSW 2032 Drawing Title

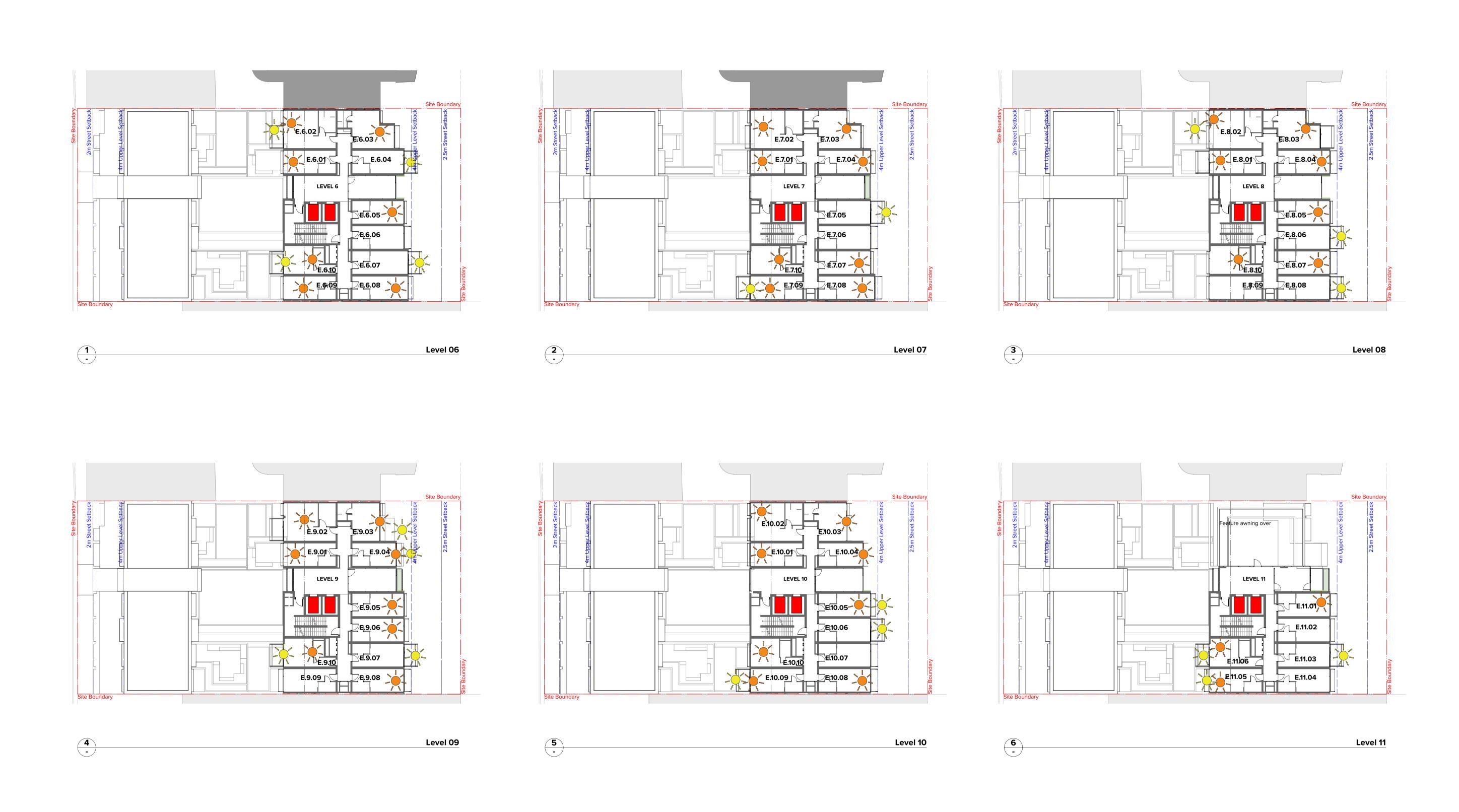
C 19.11.21 CH Issued post s.34 for Land and Environment Court Approved by Revision Notes Rev Date 20059 ML, TL, SW 1:100 @A1, 50%@A3 DA-310-102 Post s34 for L& E Court **TURNER** 

DLCS Quality Endorsed Company ISO 9001:2015, Registration Number 20476 Nominated Architect: Nicholas Turner 6695, ABN 86 064 084 911

**GA Sections Detailed Sections** 



Room receives >2hrs direct solar access 9am-3pm mid-winter



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CLIENT
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Balcony receives >2hrs direct solar access 9am-3pm mid-winter

C Rev
Project Title

273-275 Anzac Parade
273-275 Anzac Parade, Kensington Sydney NSW 2032

Drawing Title

Amenity Diagrams

Room receives >2hrs direct solar access 9am-3pm mid-winter

 C
 19.11.21 Park
 CH Approved by Project No.
 Issued post s.34 for Land and Environment Court Revision Notes

 Scale
 Project No.
 Drawn by Post No.
 Drawn by Post No.

 1:250 @A1, 50%@A3
 Dwg No.
 DA-720-002
 C

Amenity Diagrams
Solar Access: Level 06 to Level 11

T



E.16.02

Level 16

**Summary: Solar Access** 

Total no. of rooms: 144
Total no. of balconies: 40

Total: 100 (70%)

Total: 38 (95%)

£.16.05

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£.15.03

Level 15

3

E.15.06

E.15.04

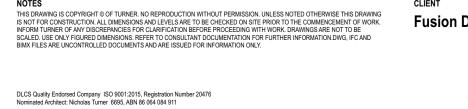
Balcony receives >2hrs direct solar access 9am-3pm mid-winter **273-275 Anzac Parade**273-275 Anzac Parade, Kensington Sydney NSW 2032

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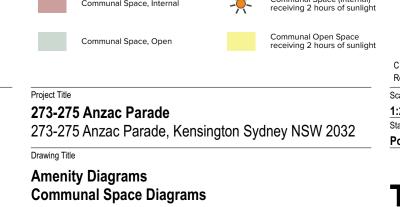
Amenity Diagrams Solar Access: Level 12 to Level 16

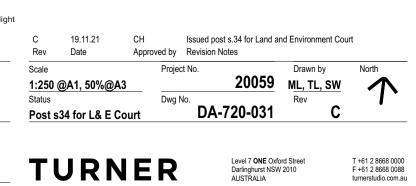
Room receives >2hrs direct solar access 9am-3pm mid-winter

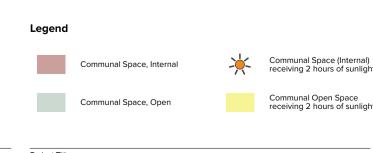
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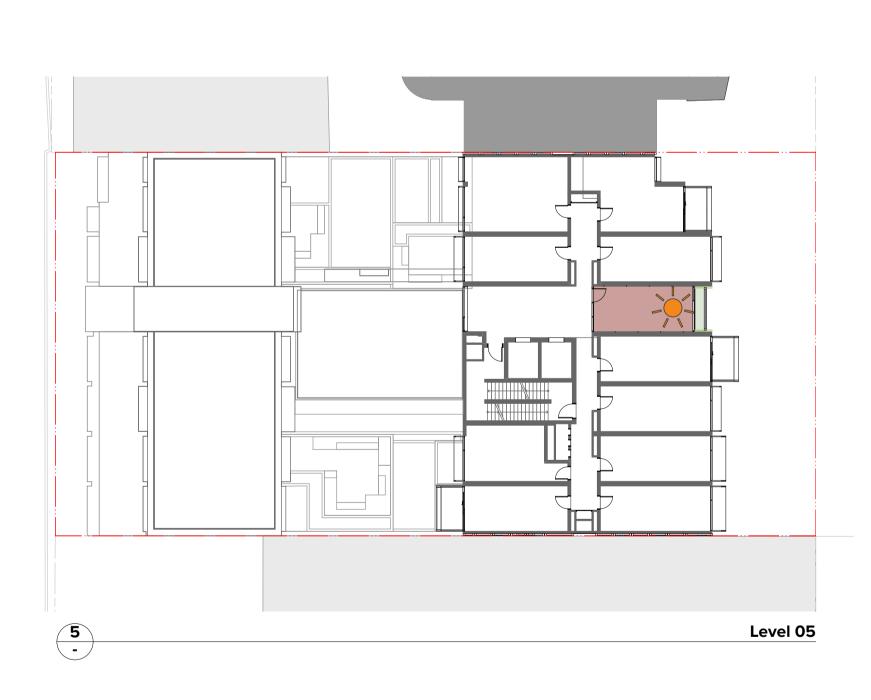


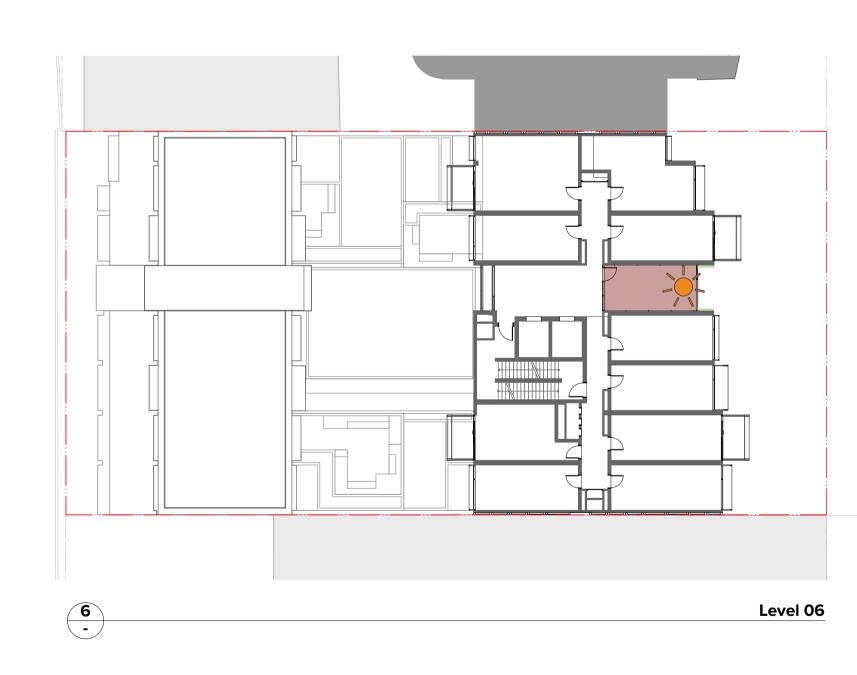


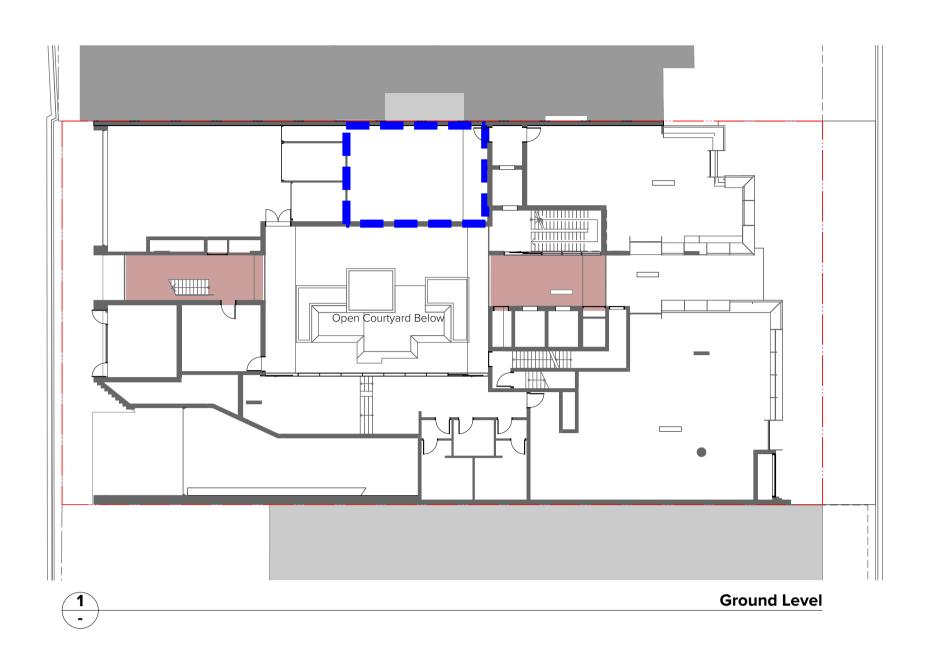


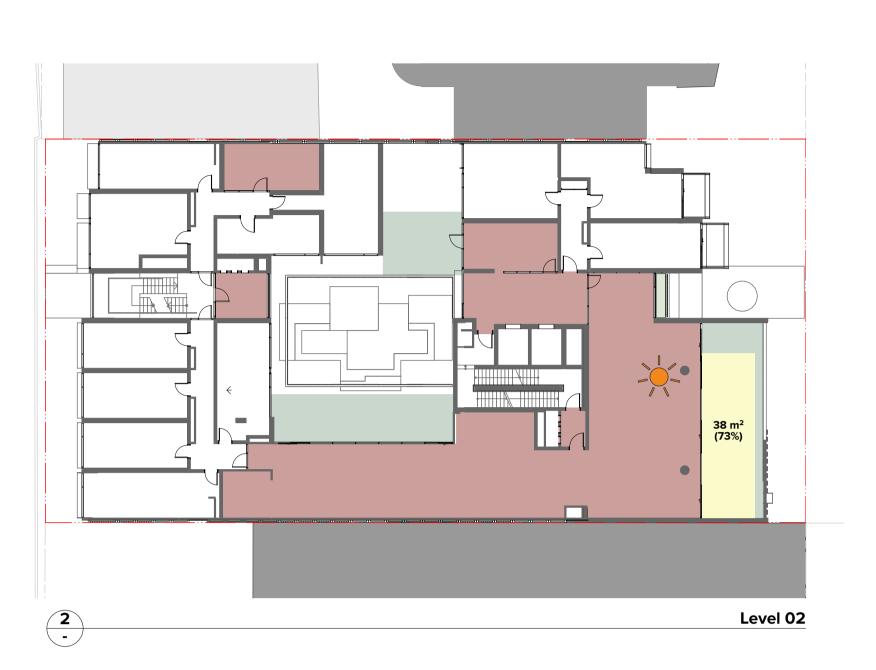


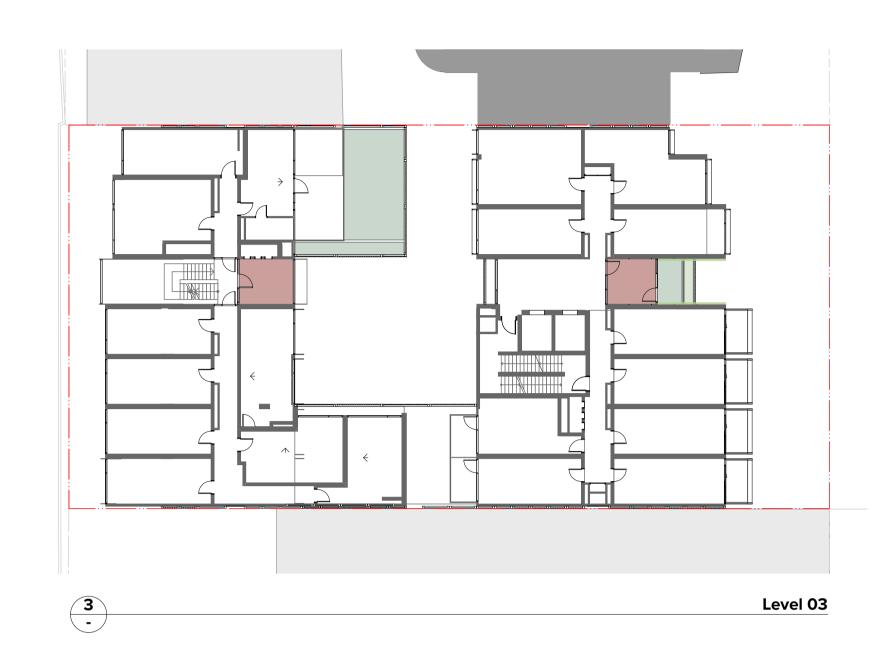








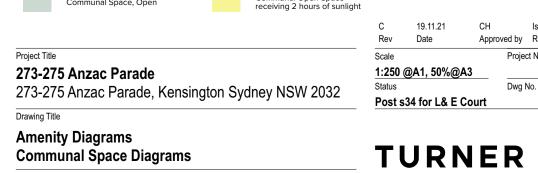






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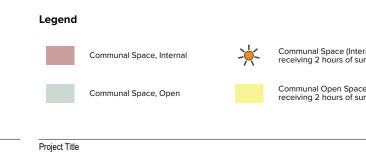
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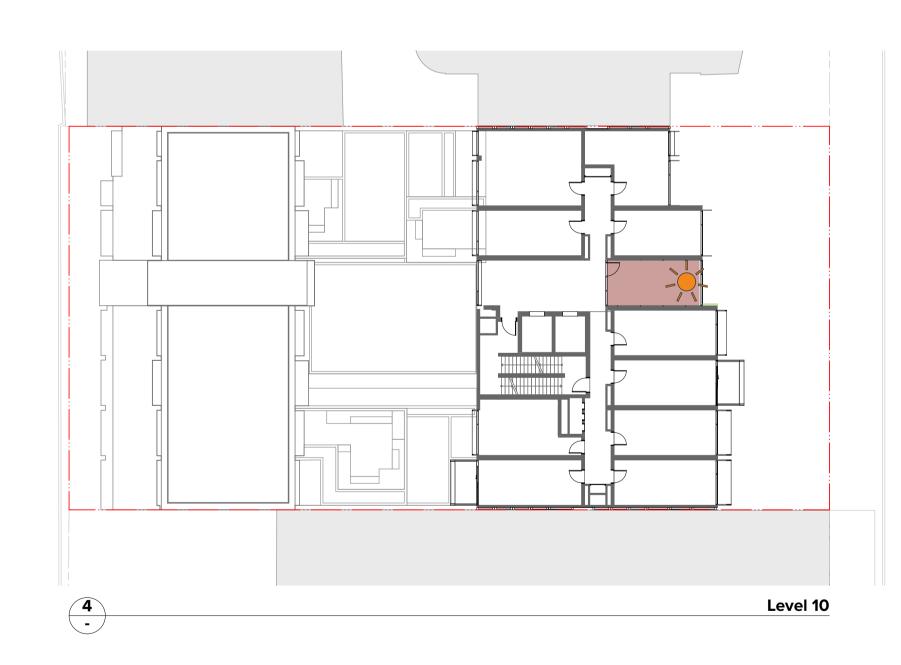
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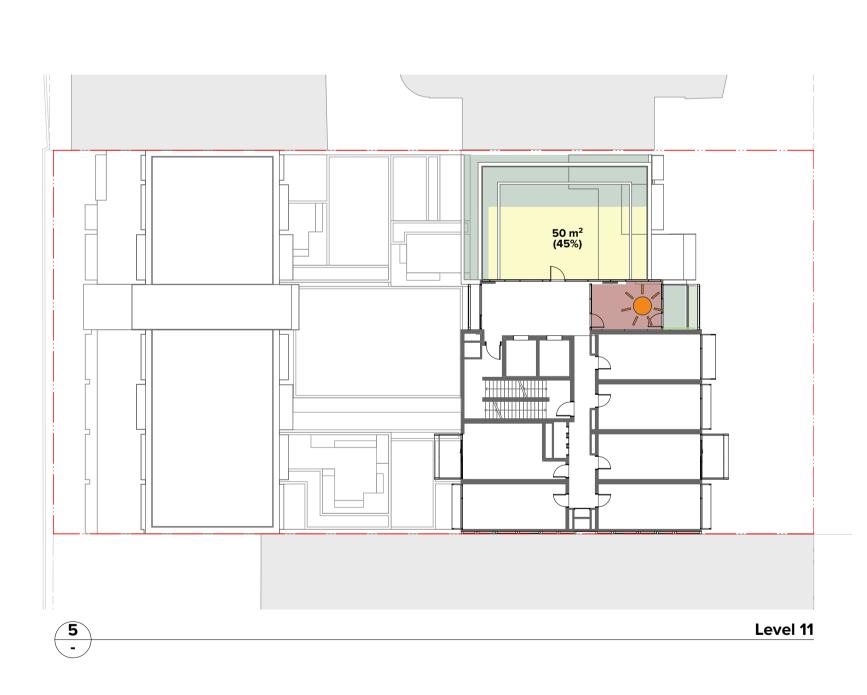
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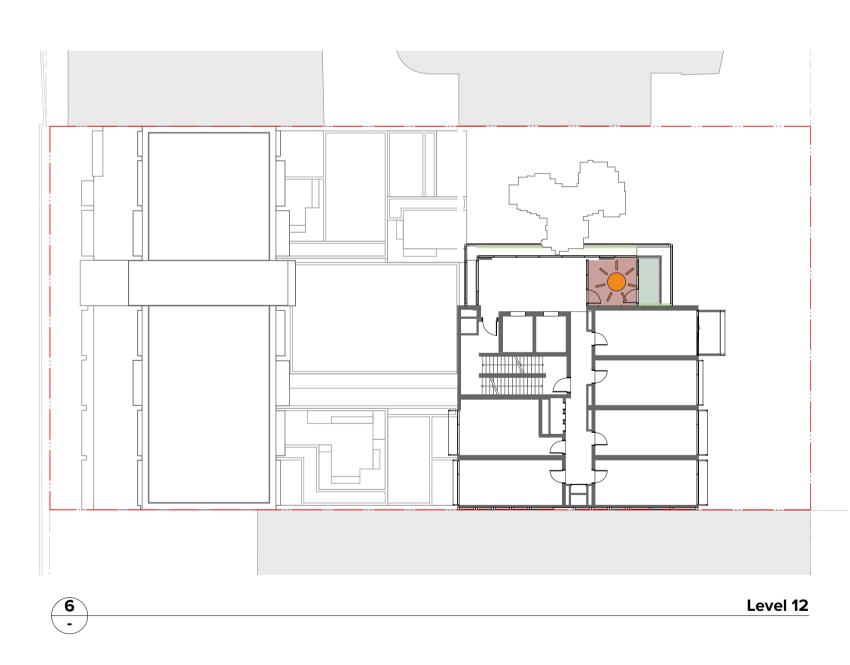
Rev Drawn by ML, TL, SW
Rev C

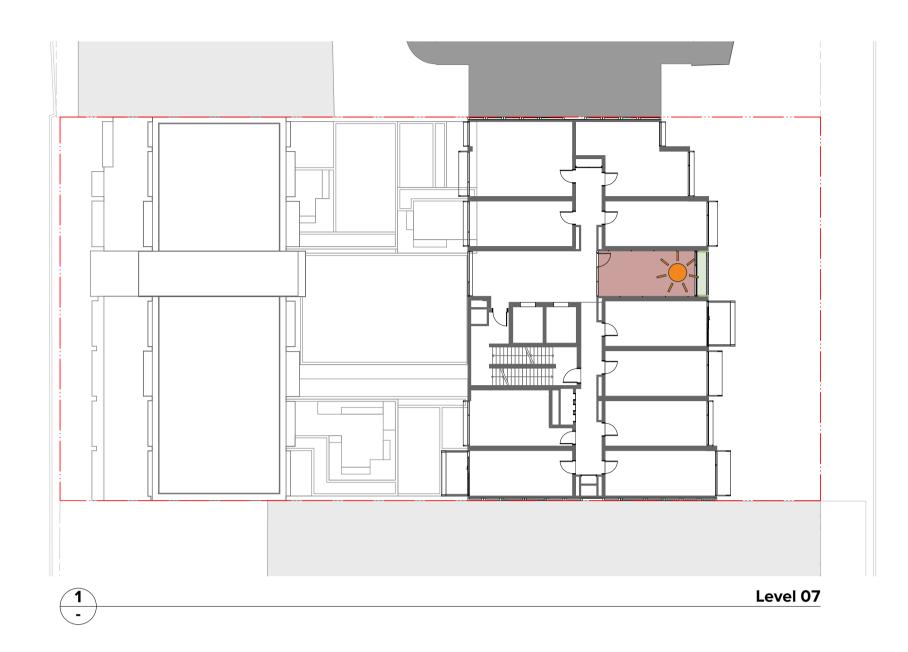
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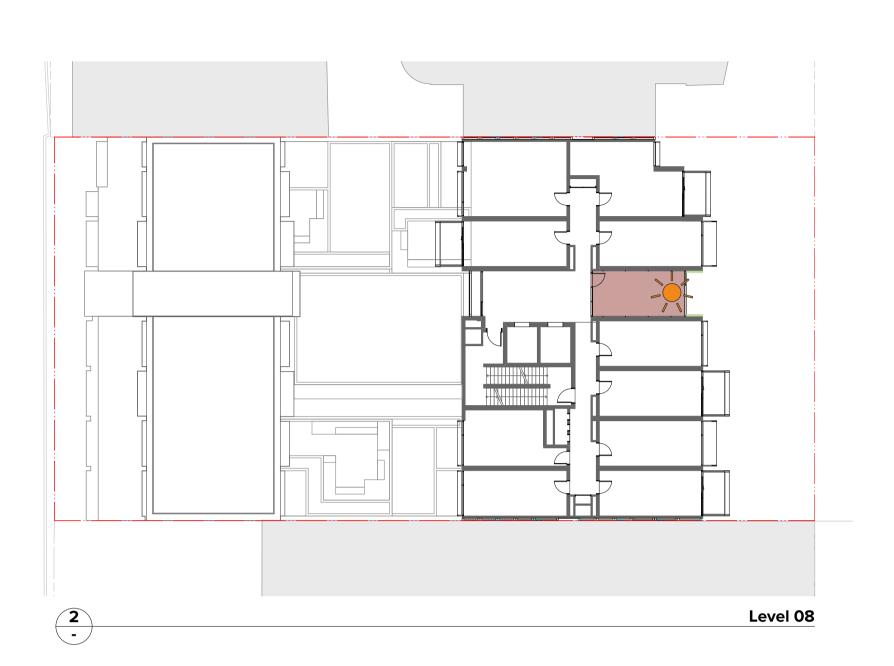


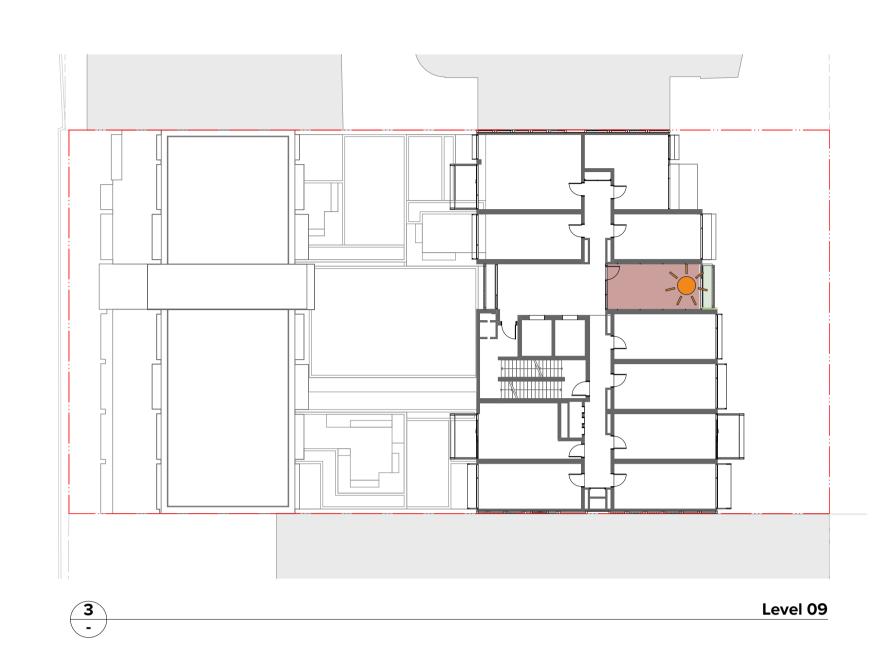


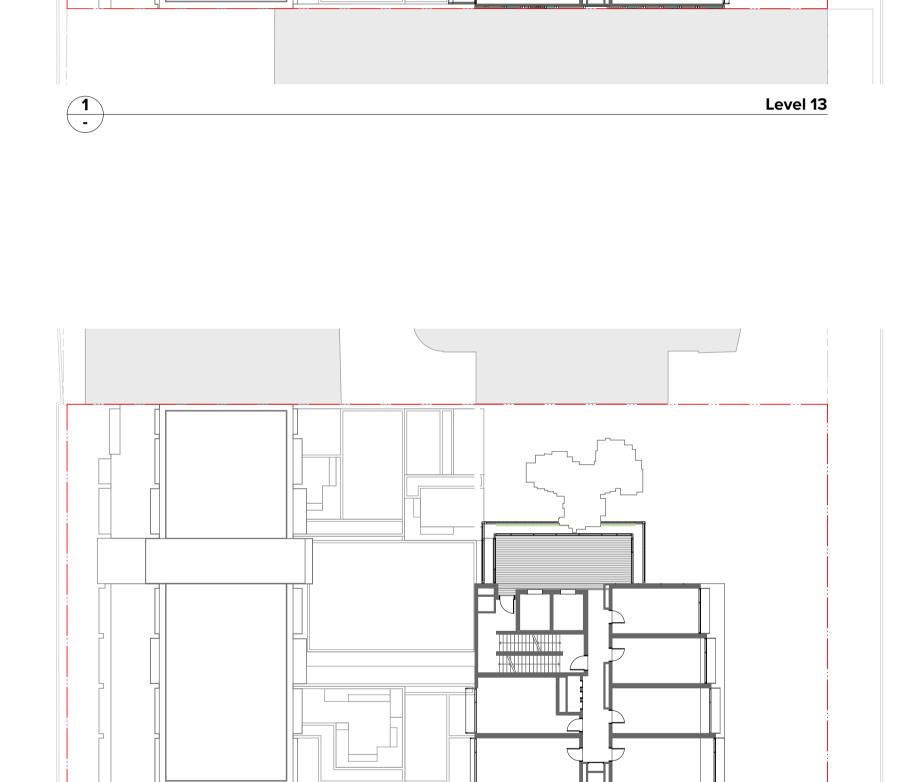


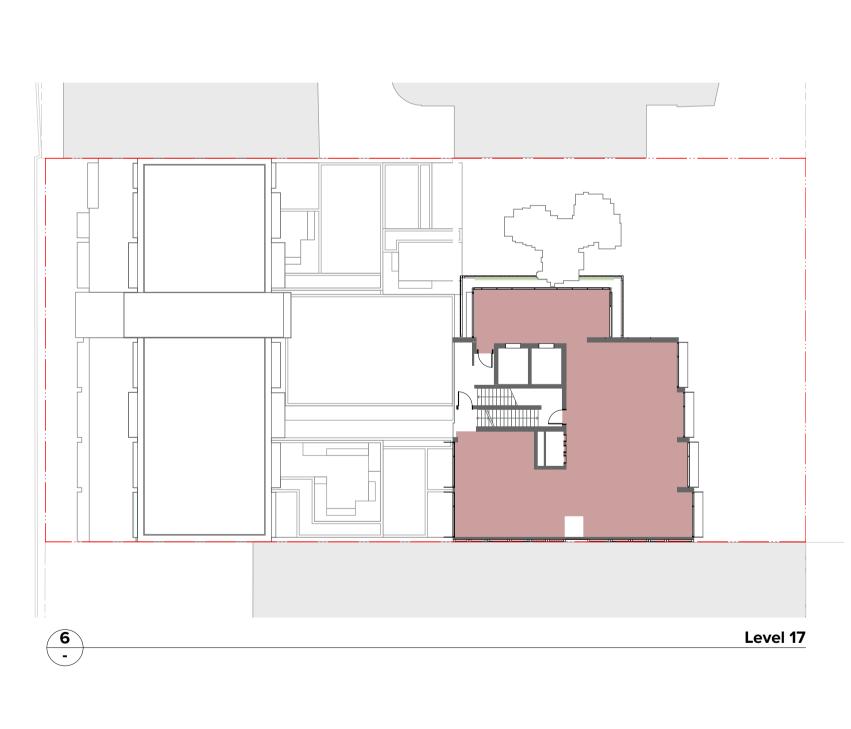






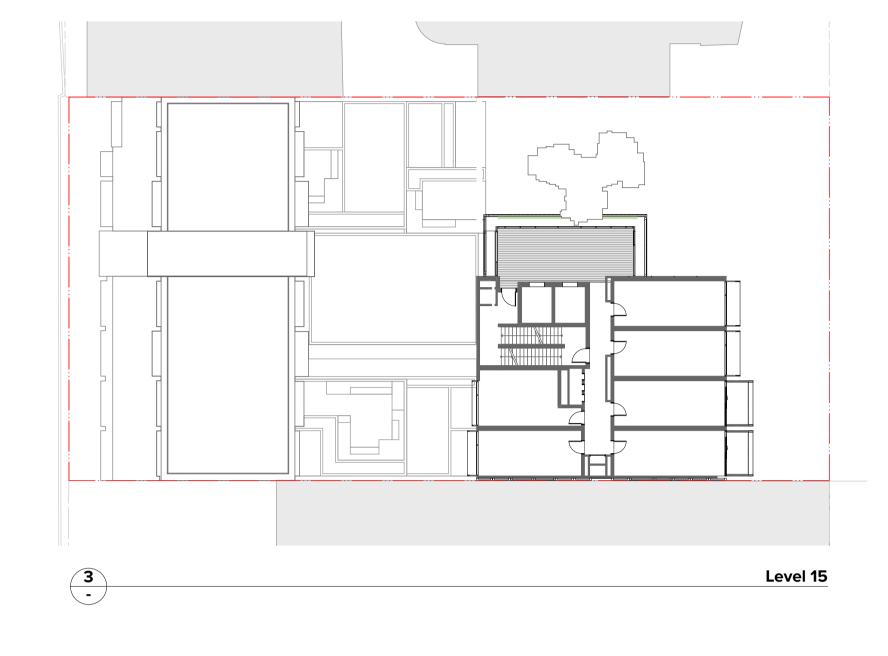






2

Level 16



Summary: Communal Space

Site Area: 1,275 m<sup>2</sup>

Level 14

Communal Space, Internal: 780 m<sup>2</sup>

460 m<sup>2</sup> including shared Ground level (36% of site area) Communal Space, Open:

Total Communal Space: 1,240m<sup>2</sup>

Total Residents: Ratio per resident 4.4m<sup>2</sup>: 1 Resident

\*K2K DCP 2020 Clause 26.1 d requires a minimum 1.25m² per resident

Communal Space, Internal Communal Space, Open **273-275 Anzac Parade**273-275 Anzac Parade, Kensington Sydney NSW 2032

C 19.11.21 CH Issued post s.34 for Land and Environment Court Approved by Revision Notes Scale
1:250 @A1, 50%@A3

Clothis

Dwg No.

DA-720-033 20059 ML, TL, SW Rev

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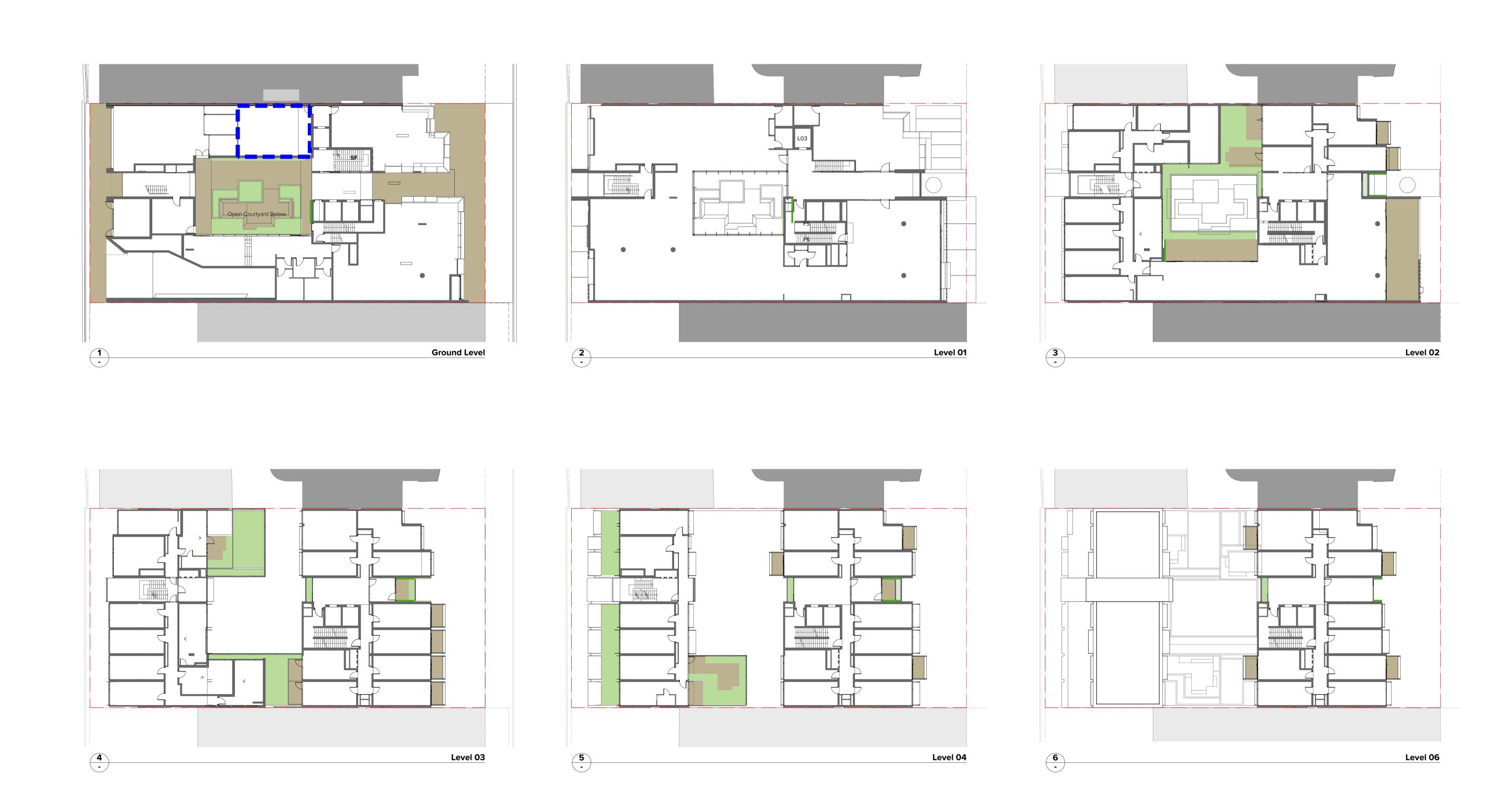
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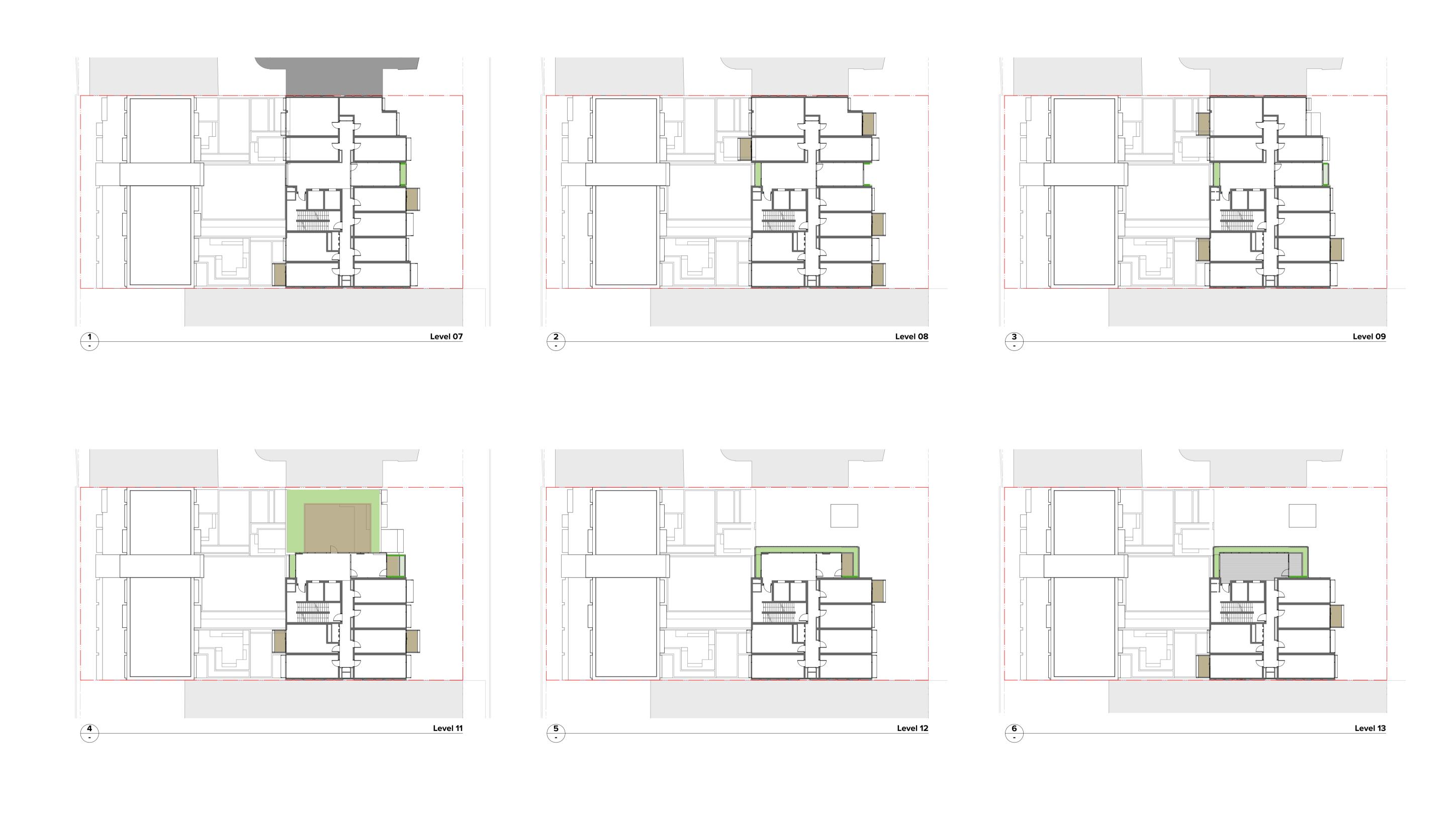
Amenity Diagrams Communal Space Diagrams

**TURNER** 



Hardscape

Softscape (Planting)



NOTES

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**273-275 Anzac Parade** 273-275 Anzac Parade, Kensington Sydney NSW 2032 Landscape Diagrams Landscape Area Diagrams

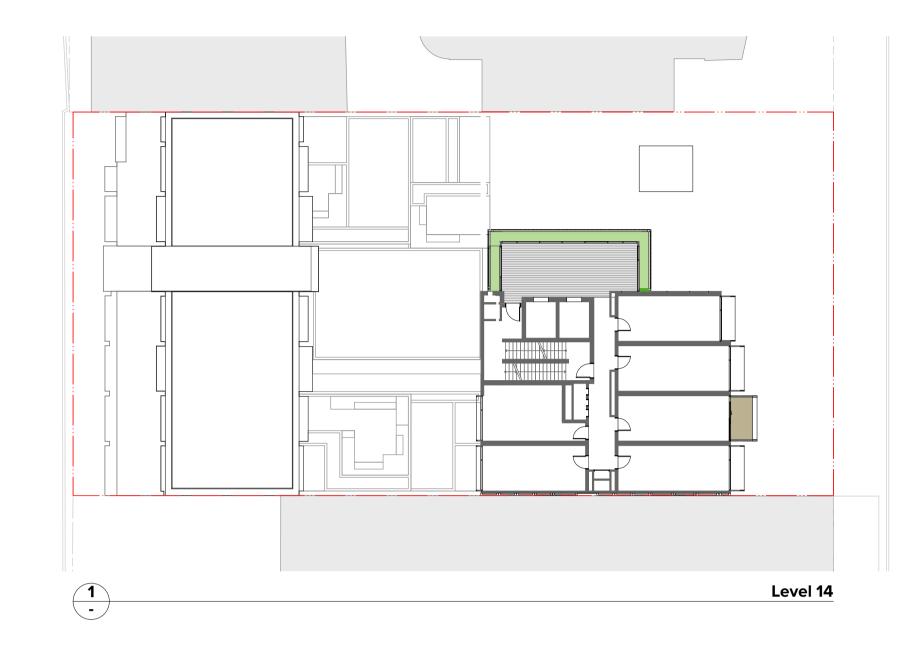
Hardscape

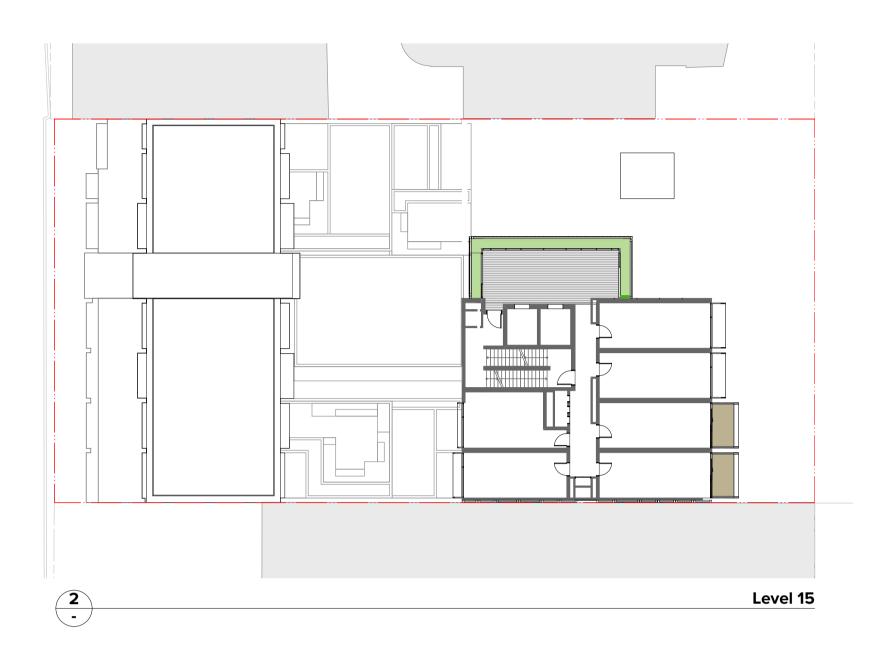
Green walls

Softscape (Planting)

**TURNER** 

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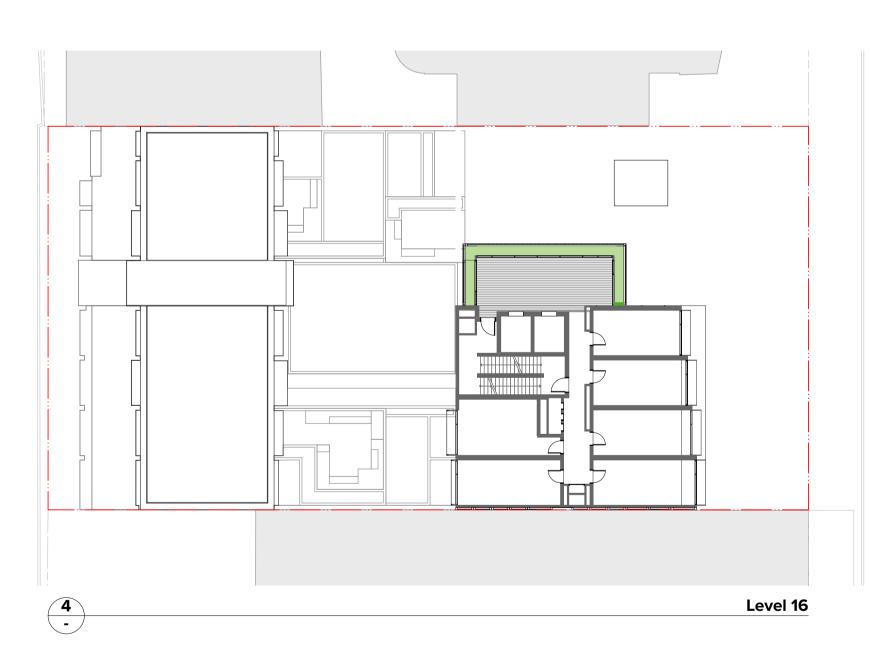


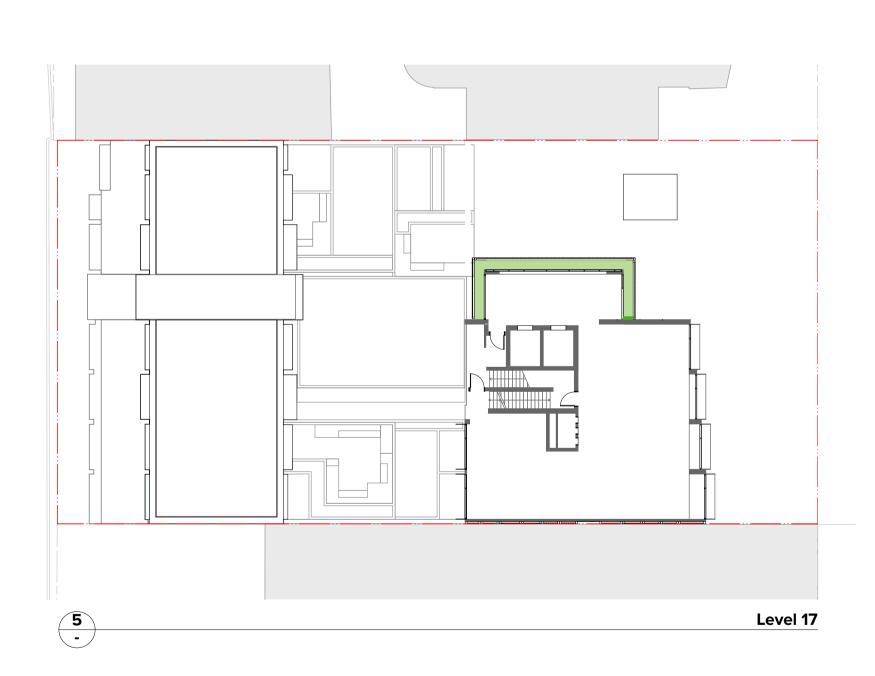
## Summary: Landscape Area

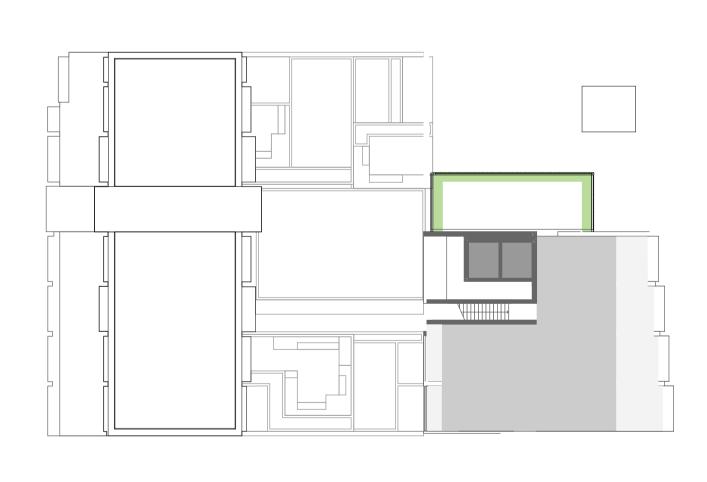
Total Landscape Area:

Softscape (Planting) Area: 580 m<sup>2</sup> 460 m<sup>2</sup> Hardscape Area: 235 m² (18.4% site area) Green walls: 1,275 m<sup>2</sup> Site Area:

1275m² (100% of site area)







6 **Plant Level** 

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Hardscape Softscape (Planting) Green walls **273-275 Anzac Parade** 273-275 Anzac Parade, Kensington Sydney NSW 2032

Landscape Diagrams Landscape Area Diagrams

C 19.11.21 CH Issued post s.34 for Land and Environment Court Approved by Revision Notes Scale

1:250 @A1, 50%@A3

Status

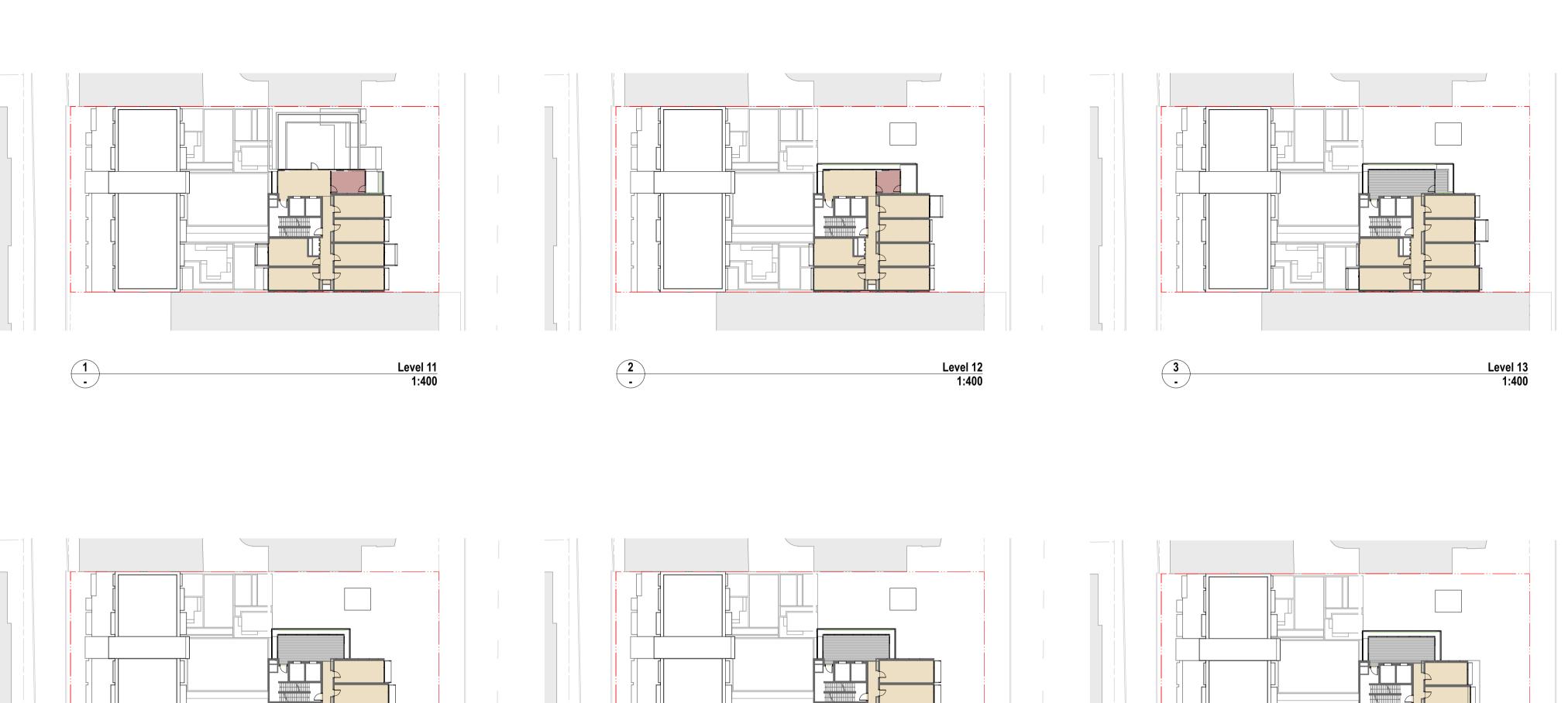
Dwg No.

DA-740-003



GFA Diagrams Basement to Level 10

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Commercial End of Trip/Facilities Residential End of Trip

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Level 11 Level 12 Level 17 Back Building\_L2-3 11 Back Building\_L2 **787** m<sup>2</sup> Residential 402 Level 02 637 Level 03 533 Level 04 339 Level 05 334 Level 06 332 Level 07 327 Level 08 317 Level 09 322 Level 10 197 Level 11 197 Level 12 204 Level 13 208 Level 14 210 Level 15 196 Level 16 4 755 m² Residential Motorbike 85 Basement 01 85 m² **Residential Waste Ground Level** 10 m<sup>2</sup> **Total Residential GFA** 5 637 m<sup>2</sup> Total GFA 6,950 m<sup>2</sup> Site Area 1,275 m<sup>2</sup> **FSR** 5.45 : 1 C 19.11.21 CH Issued post s.34 for Land and Environment Court Approved by Revision Notes 20059 ML, TL, SW 1:400 @A1, 50%@A3 273-275 Anzac Parade 273-275 Anzac Parade, Kensington Sydney NSW 2032 Post s34 for L& E Court GFA Diagrams Level 08 to Plant Level **TURNER** 

Summary: GFA

Non-residential GFA

**Commercial Motorbike** 

Commercial/Retail End of Trip

Total Non-residential GFA

Level

**Ground Level** 

Basement 01

**Ground Level** 

**Ground Level** 

**Ground Level** 

**Ground Level Ground Level** 

**Ground Level Ground Level** 

Level

**Ground Level** 

Level 02

Level 03

Level 04

Level 05

Level 06 Level 07

Level 08 Level 09

Level 10

Level 01

Area

23

869

3 m²

30 39

99

171 331 m<sup>2</sup>

18 m²

Area

61

330

22

13

22

20

19 20

20

**1 313 m<sup>2</sup>** (1:1 Site area)

69 m²

892 m<sup>2</sup>

Usage

Retail

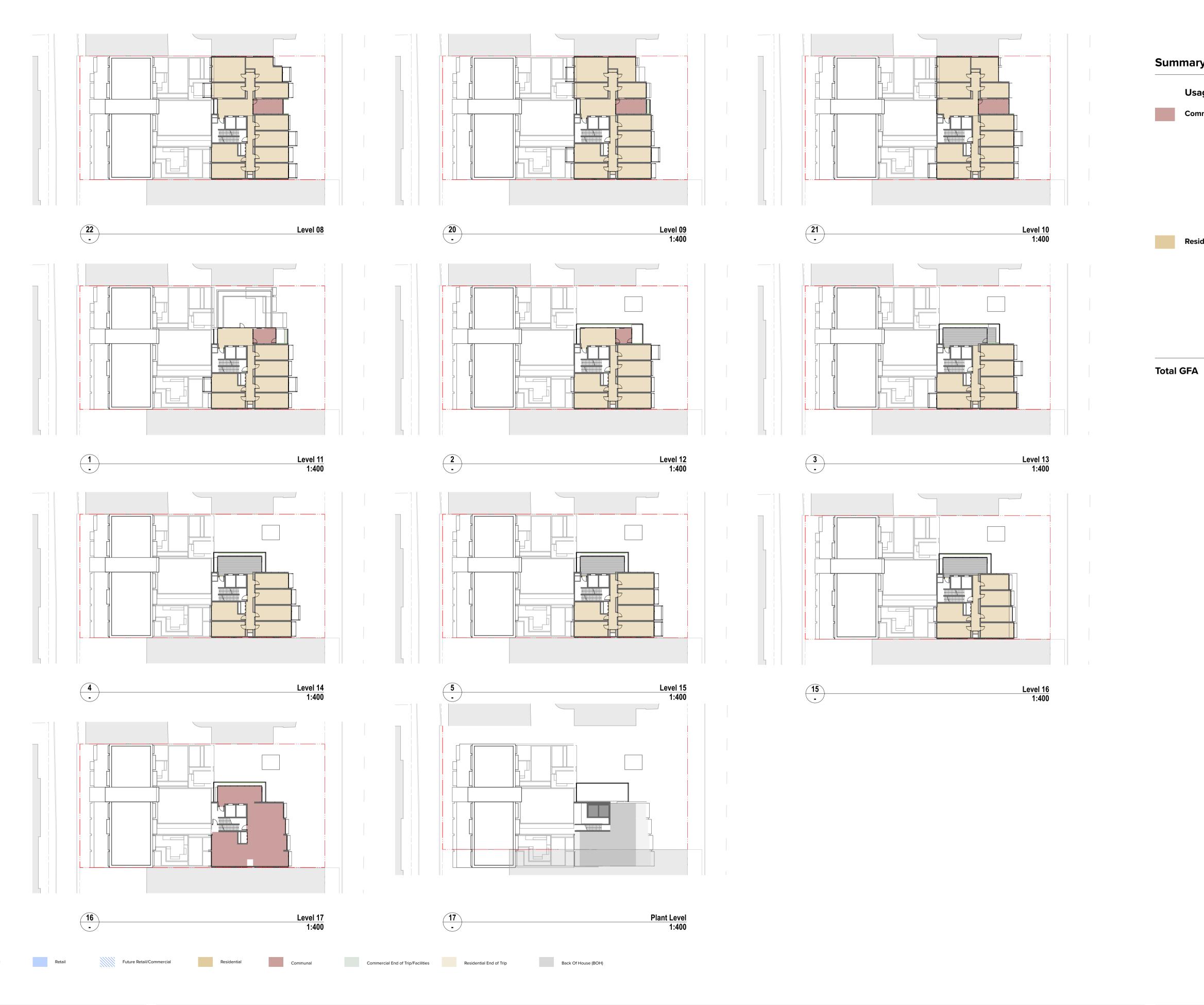
Retail BOH

Residential GFA

Usage

**Communal Space** 

Level 15 1:400 Level 16 1:400



Summary: GFA above 24m

		_
Usage	Level	Area
Communal Space		
	Level 07	19
	Level 08	20
	Level 09	20
	Level 10	20
	Level 11	15
	Level 12	11
	Level 17	183
Residential		
	Level 07	332
	Level 08	327
	Level 09	317
	Level 10	322
	Level 11	197
	Level 12	197
	Level 13	204
	Level 14	208
	Level 15	210
	Level 16	196

2,798 m<sup>2</sup>

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**273-275 Anzac Parade** 273-275 Anzac Parade, Kensington Sydney NSW 2032

GFA Diagrams GFA Calculation above 24m

1:400 @A1, 50%@A3
Status

Post s34 for L& E Court

Project No.

Drawn by

ML, TL, SW

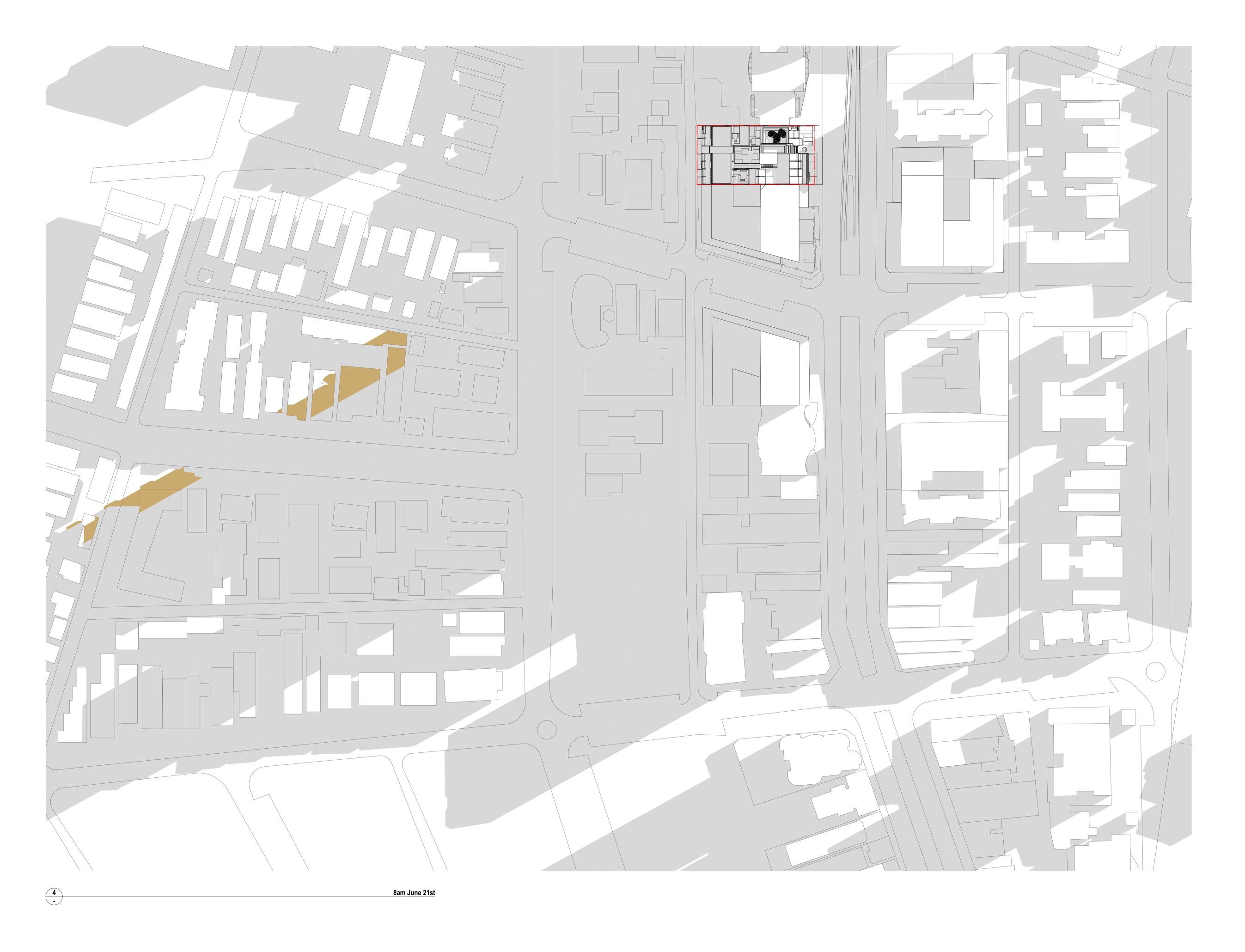
Rev

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DLCS Quality Endorsed Company ISO 9001:2015, Registration Number 20476 Nominated Architect: Nicholas Turner 6695, ABN 86 064 084 911

Fusion Development Pty Ltd LEGEND

Additional shadows of proposed envelope to DCP envelope 273-275 Anzac Parade site boundary

**273-275 Anzac Parade** 273-275 Anzac Parade, Kensington Sydney NSW 2032 Suplementary s34 Drawings - Shadow Diagrams 21 June: 8am

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Fusion Development Pty Ltd LEGEND

Additional shadows of proposed envelope to DCP envelope 273-275 Anzac Parade site boundary

**273-275 Anzac Parade** 273-275 Anzac Parade, Kensington Sydney NSW 2032 Suplementary s34 Drawings - Shadow Diagrams 21 June: 9am

A 19.11.21 CH Issued post s.34 for Land and Environment Court Scale

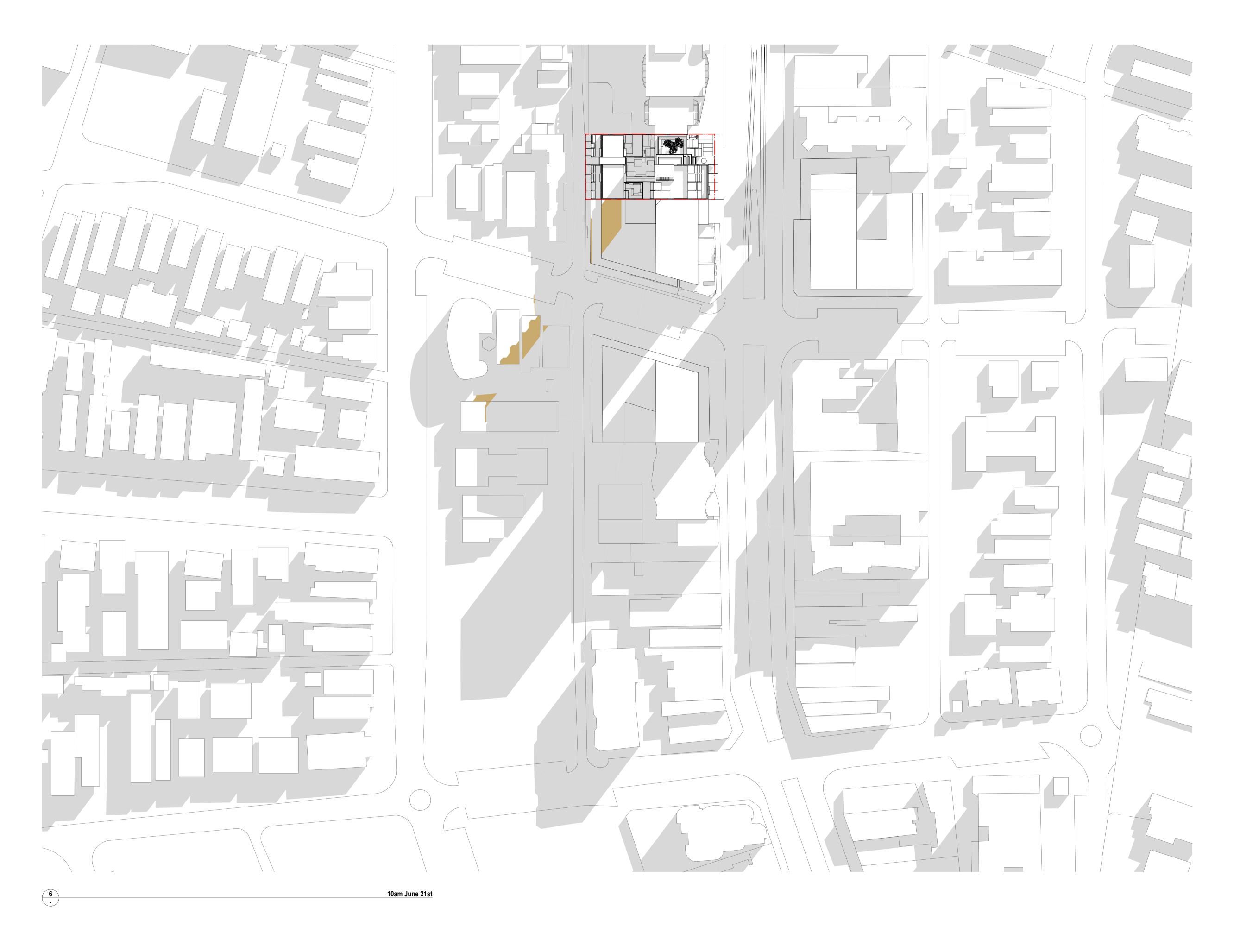
@A1, 50%@A3

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Dwg No.

DA-791-002

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DLCS Quality Endorsed Company ISO 9001:2015, Registration Number 20476 Nominated Architect: Nicholas Turner 6695, ABN 86 064 084 911

Fusion Development Pty Ltd LEGEND

Additional shadows of proposed envelope to DCP envelope 273-275 Anzac Parade site boundary

**273-275 Anzac Parade** 273-275 Anzac Parade, Kensington Sydney NSW 2032 Suplementary s34 Drawings - Shadow Diagrams 21 June: 10am

A 19.11.21 CH Issued post s.34 for Land and Environment Court



Additional shadows of proposed envelope to DCP envelope 273-275 Anzac Parade site boundary

**273-275 Anzac Parade** 273-275 Anzac Parade, Kensington Sydney NSW 2032 Suplementary s34 Drawings - Shadow Diagrams 21 June: 11am

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Post s34 for L& E Court

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**273-275 Anzac Parade**273-275 Anzac Parade, Kensington Sydney NSW 2032 Post s34 for L& E Court

A 19.11.21 CH Issued post s.34 for Land and Environment Court



Additional shadows of proposed envelope to DCP envelope
273-275 Anzac Parade site boundary

Project Title

273-275 Anzac Parade
273-275 Anzac Parade, Kensington Sydney NSW 2032

Drawing Title

Suplementary s34 Drawings - Shadow Diagrams
21 June: 2pm

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Additional shadows of proposed envelope to DCP envelope
273-275 Anzac Parade site boundary

273-275 Anzac Parade
273-275 Anzac Parade, Kensington Sydney NSW 2032

Drawing Title

Suplementary s34 Drawings - Shadow Diagrams
21 June: 3pm

A 19.11.21 CH Issued post s.34 for Land and Environment Court

Rev Date Approved by Revision Notes

Scale Project No. Drawn by North

@A1, 50%@A3
Status DA-791-008

Post s34 for L& E Court DA-791-008

Approved by Revision Notes

Drawn by North

Rev Rev A

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Darlinghurst NSW 2010



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Additional shadows of proposed envelope to DCP envelope
273-275 Anzac Parade site boundary

Project Title

273-275 Anzac Parade

273-275 Anzac Parade, Kensington Sydney NSW 2032

Drawing Title

Suplementary s34 Drawings - Shadow Diagrams

21 June: 4pm

A 19.11.21 CH Issued post s.34 for Land and Environment Court

Rev Date Approved by Revision Notes

Scale Project No.

@A1, 50%@A3
Status
Dwg No.

Post s34 for L& E Court

DA-791-009

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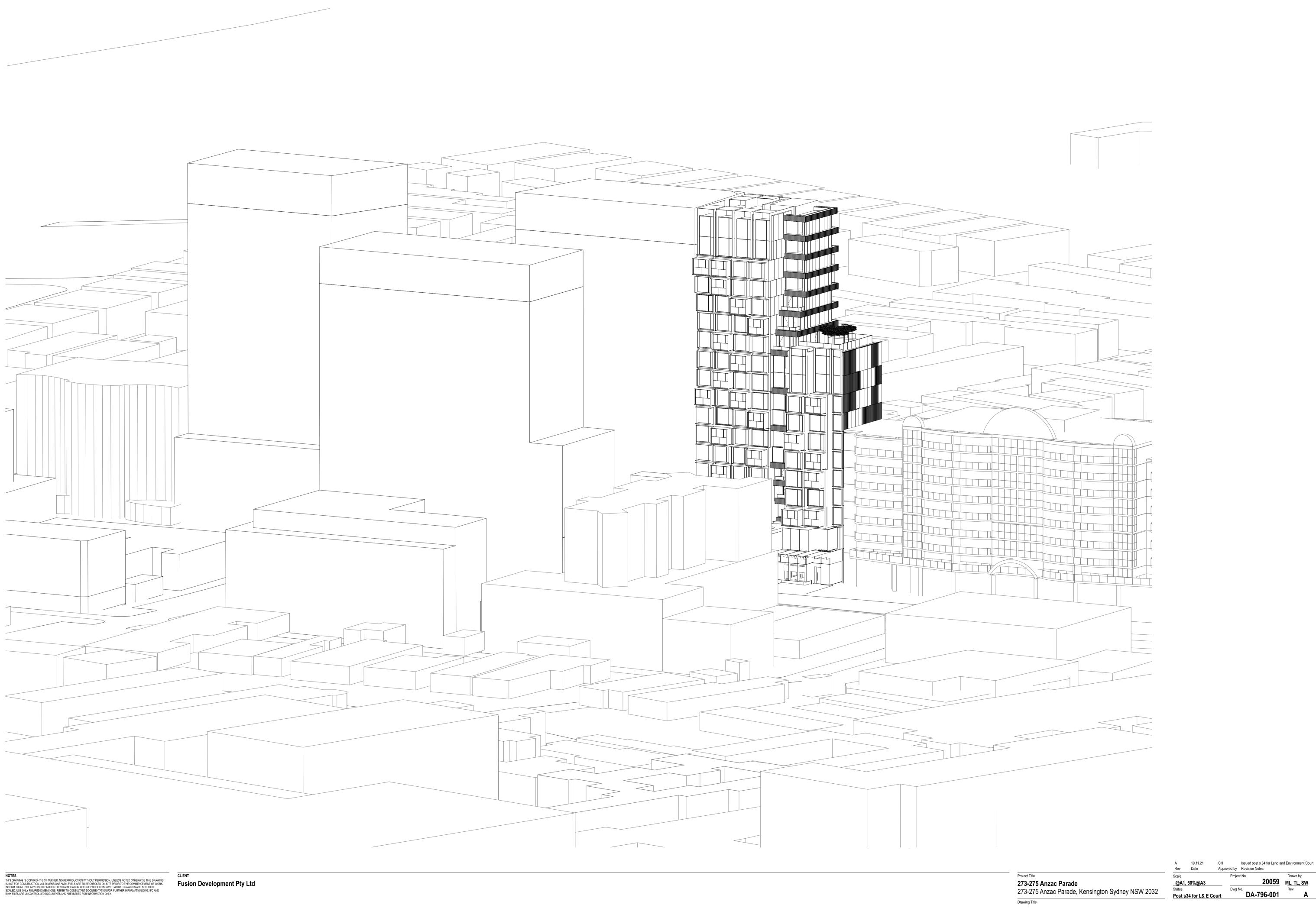
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Suplementary s34 Drawings - Sun Eye view 21 June: 8am

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20059 ML, TL, SW

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Project Title

273-275 Anzac Parade

273-275 Anzac Parade, Kensington Sydney NSW 2032

Drawing Title

Suplementary s34 Drawings - Sun Eye view 21 June: 9am

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**273-275 Anzac Parade** 273-275 Anzac Parade, Kensington Sydney NSW 2032 Suplementary s34 Drawings - Sun Eye view 21 June: 10am

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Suplementary s34 Drawings - Sun Eye view 21 June: 11am

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Suplementary s34 Drawings - Sun Eye view 21 June: 12pm

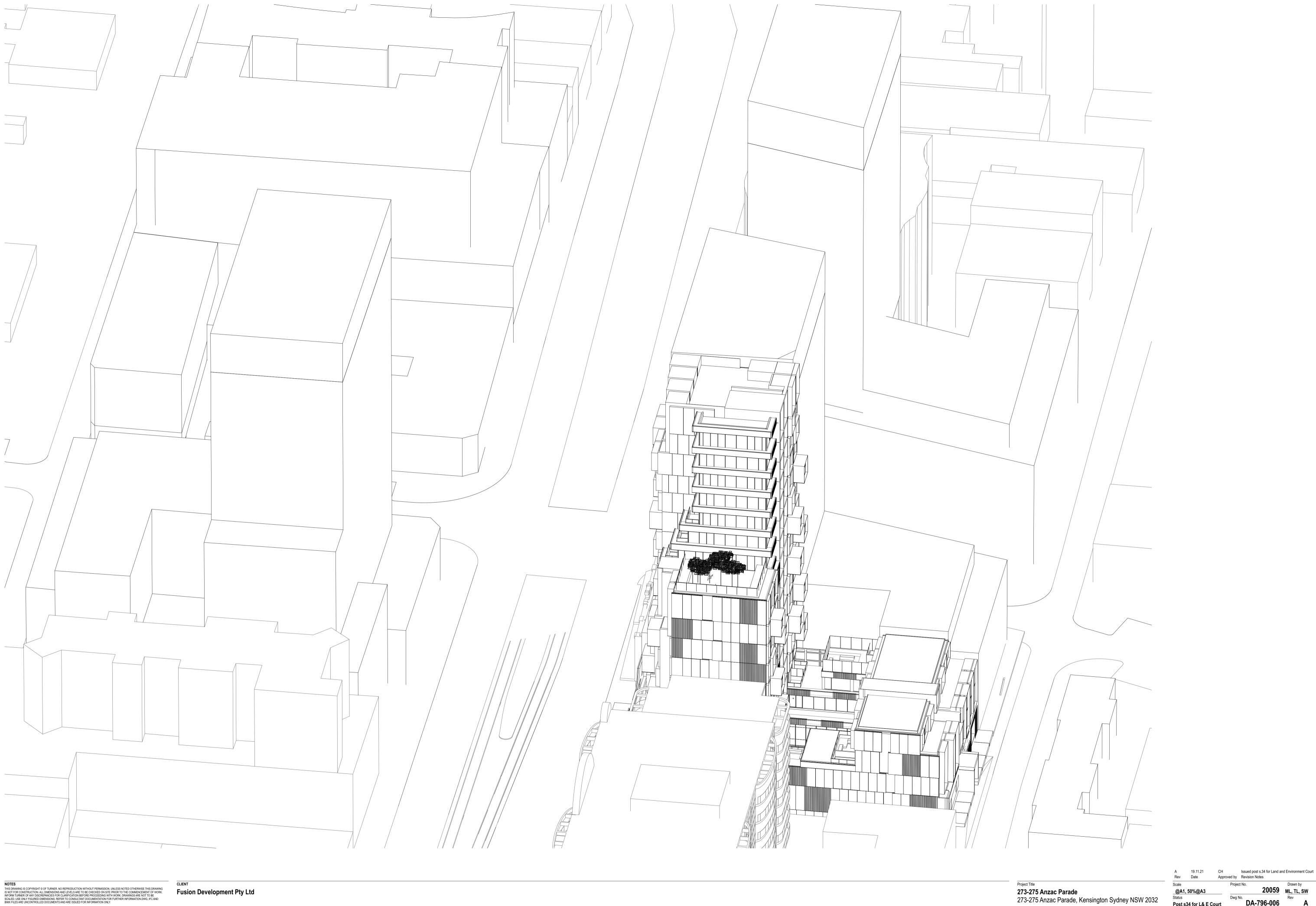
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Suplementary s34 Drawings - Sun Eye view 21 June: 1pm

Scale

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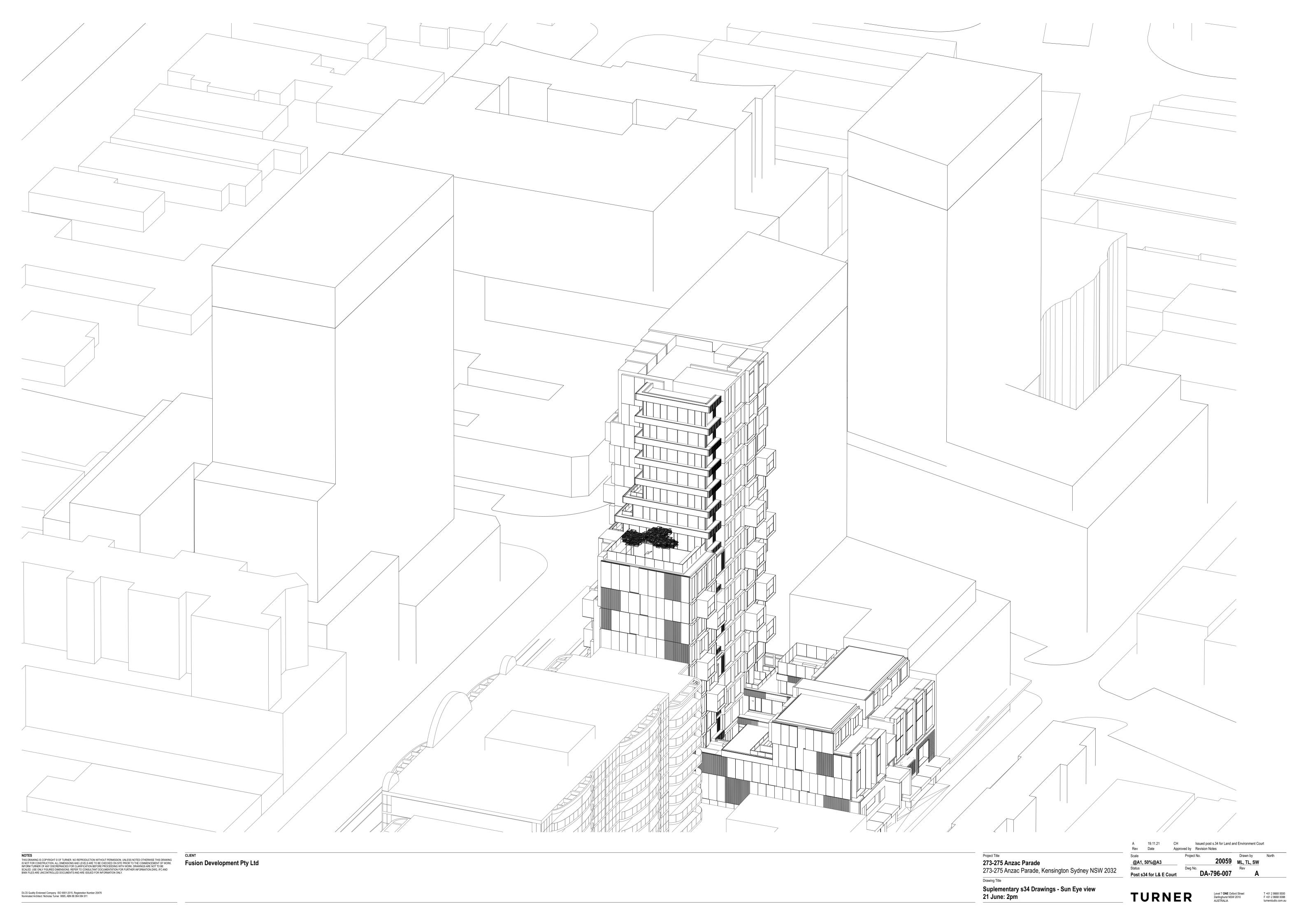
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Project Title

273-275 Anzac Parade

273-275 Anzac Parade, Kensington Sydney NSW 2032

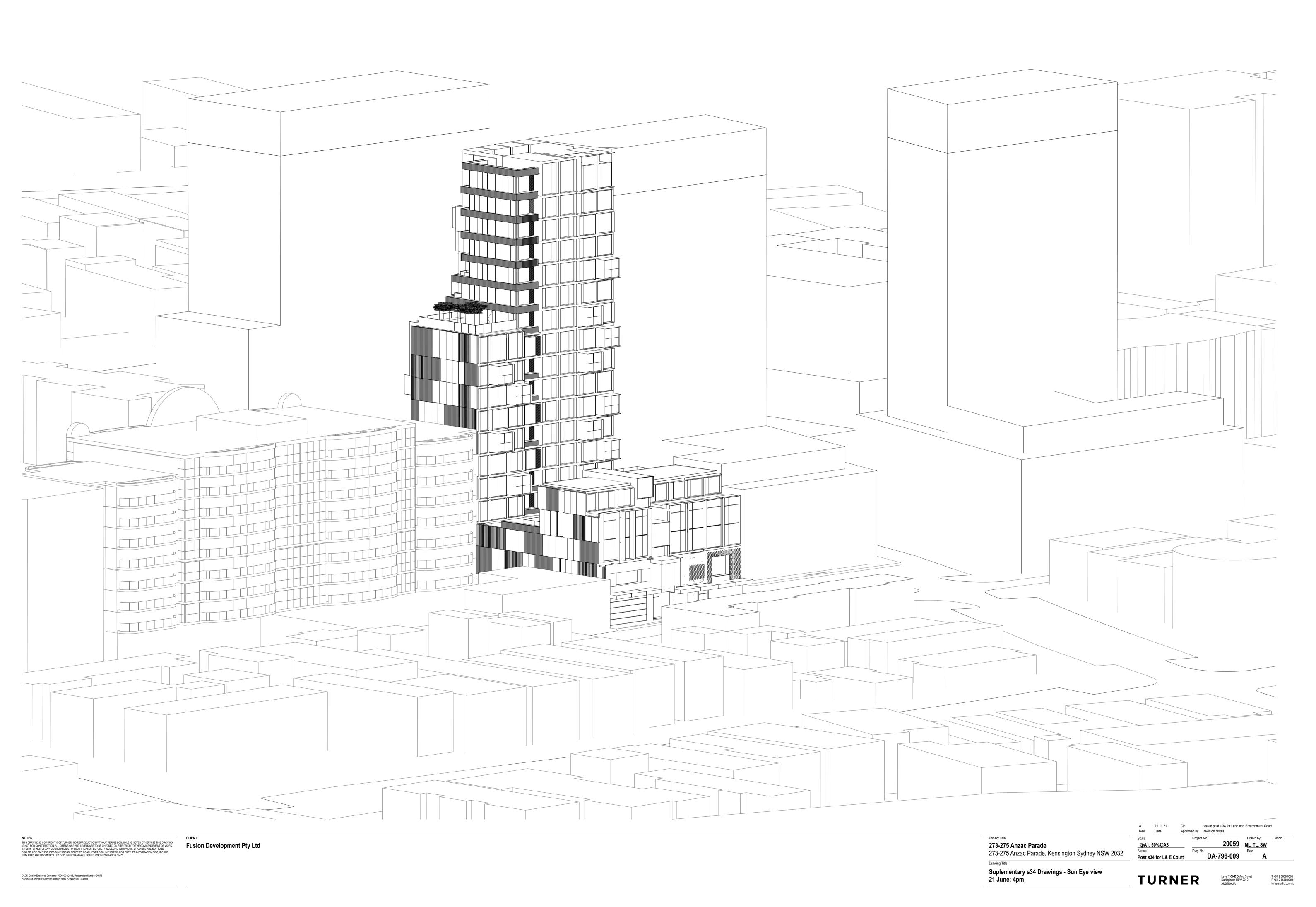
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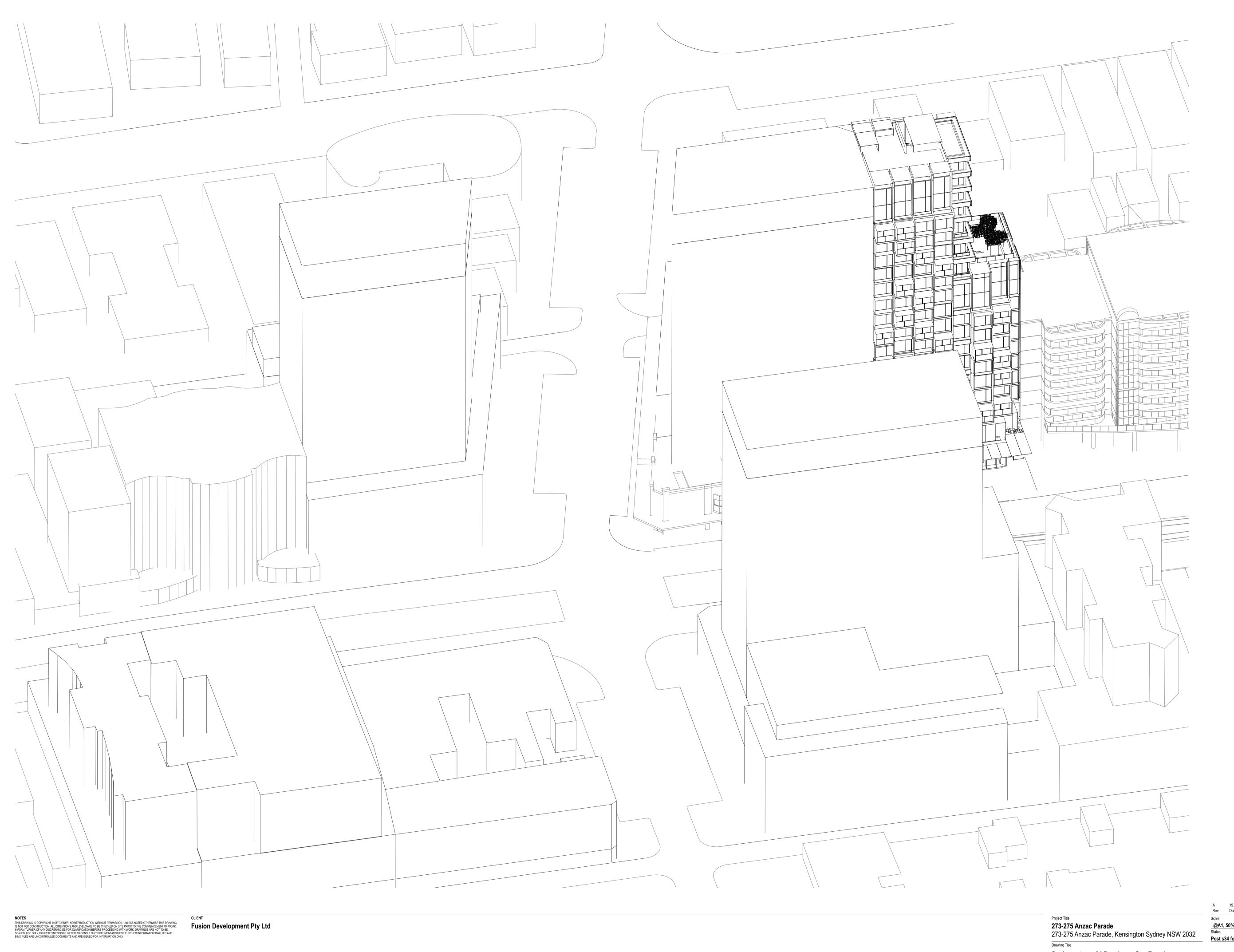
Suplementary s34 Drawings - Sun Eye view
21 June: 3pm

A 19.11.21 CH Issued post s.34 for Land and Environment Court

Rev Date Approved by Revision Notes

| Scale | Project No. | Drawn by North
| @A1, 50%@A3 | Dwg No. | Dwg No. | Rev
| Post s34 for L& E Court | DA-796-008 | A





Suplementary s34 Drawings - Sun Eye view 21 December: 8am

A 19.11.21 CH Issued post s.34 for Land and Environment Court Approved by Revision Notes Scale

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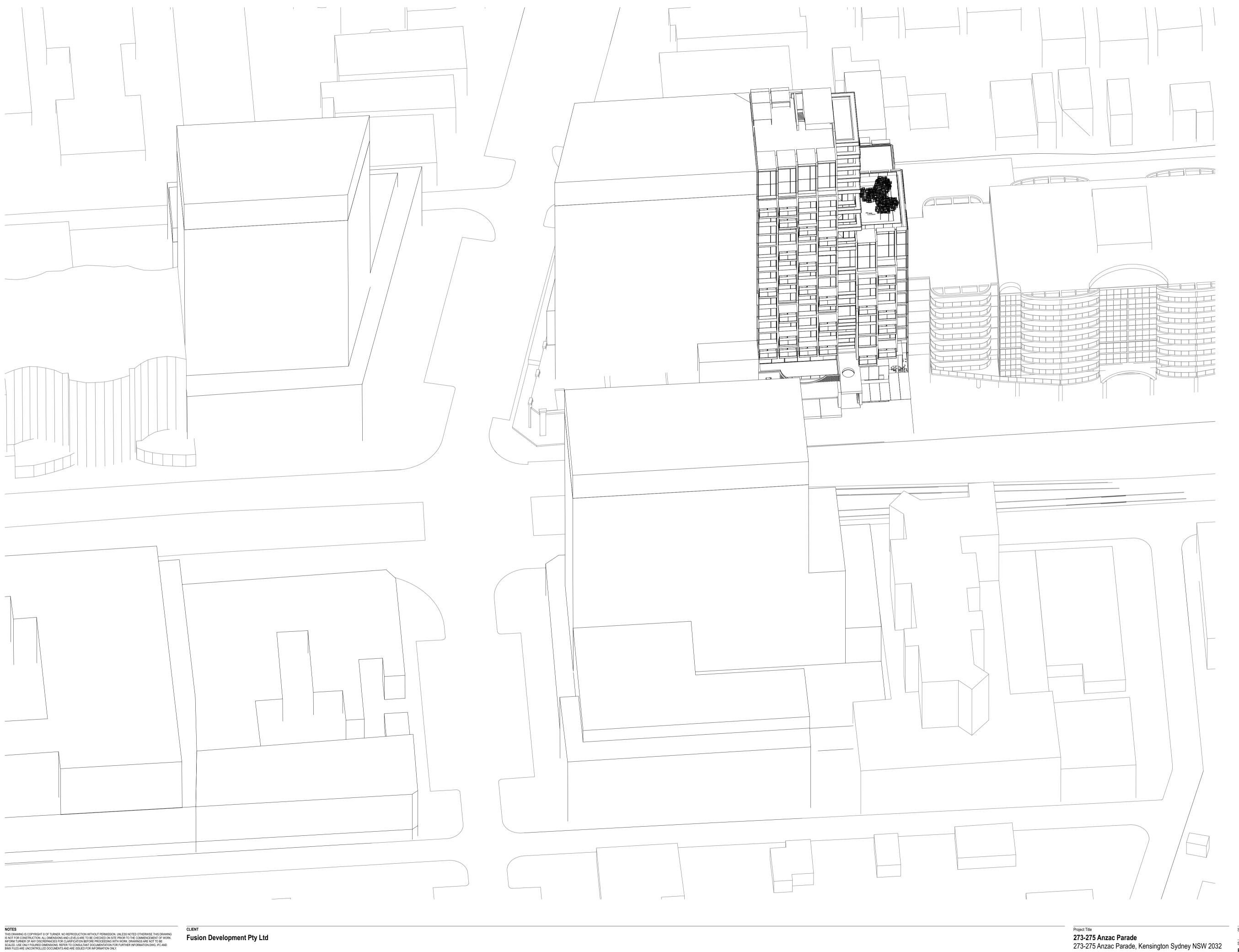
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Dwg No.

DWG No.

DWG No.

DA-796-010



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**273-275 Anzac Parade** 273-275 Anzac Parade, Kensington Sydney NSW 2032

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DWG No.

DWG No.

DWG No. 20059 ML, TL, SW

Suplementary s34 Drawings - Sun Eye view 21 December: 9am **TURNER** 



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**273-275 Anzac Parade** 273-275 Anzac Parade, Kensington Sydney NSW 2032

Suplementary s34 Drawings - Sun Eye view 21 December: 10am

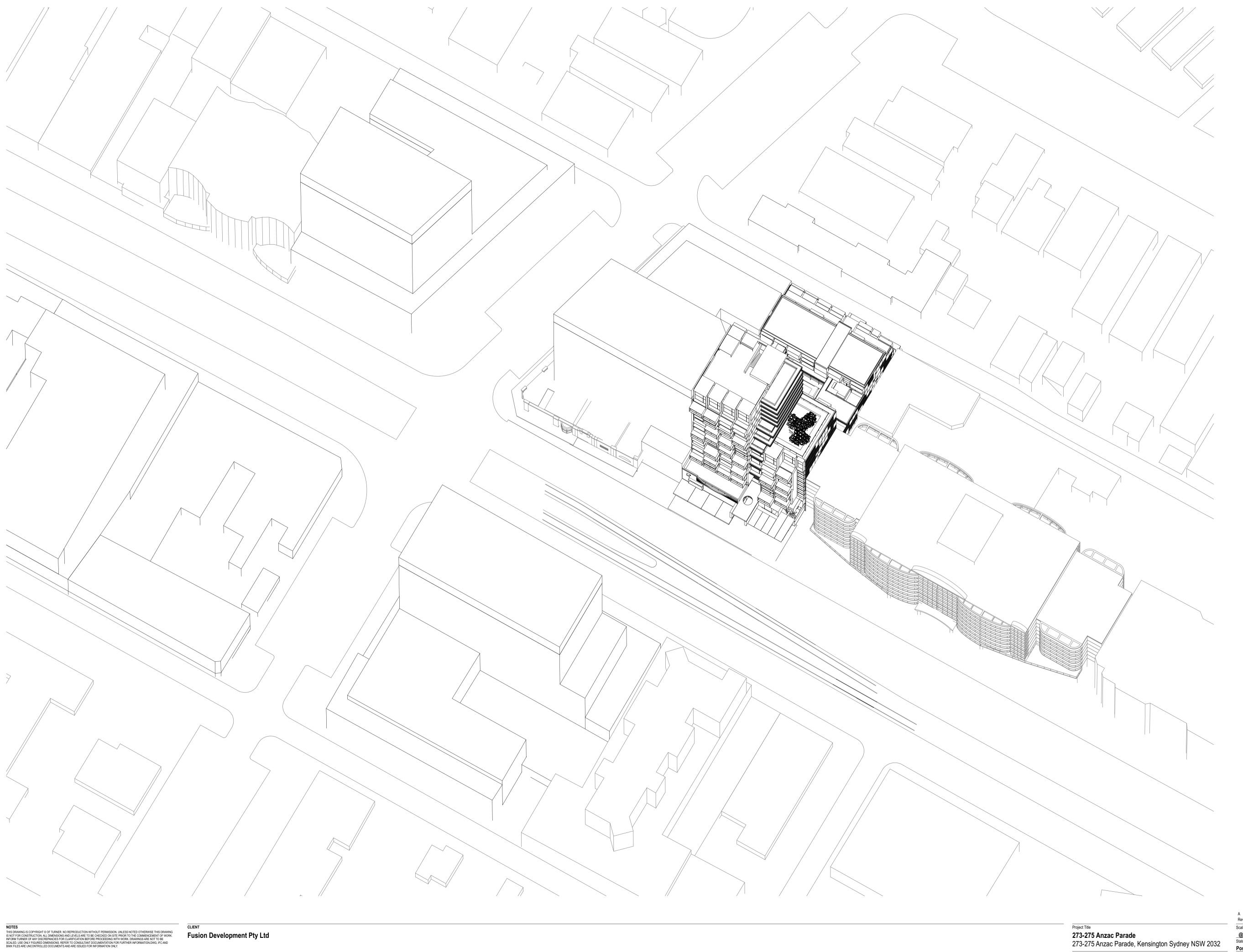
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@A1, 50%@A3

Status

Dwg No.

DA-796-012 20059 ML, TL, SW



273-275 Anzac Parade
273-275 Anzac Parade, Kensington Sydney NSW 2

Drawing Title

Suplementary s34 Drawings - Sun Eye view
21 December: 11am

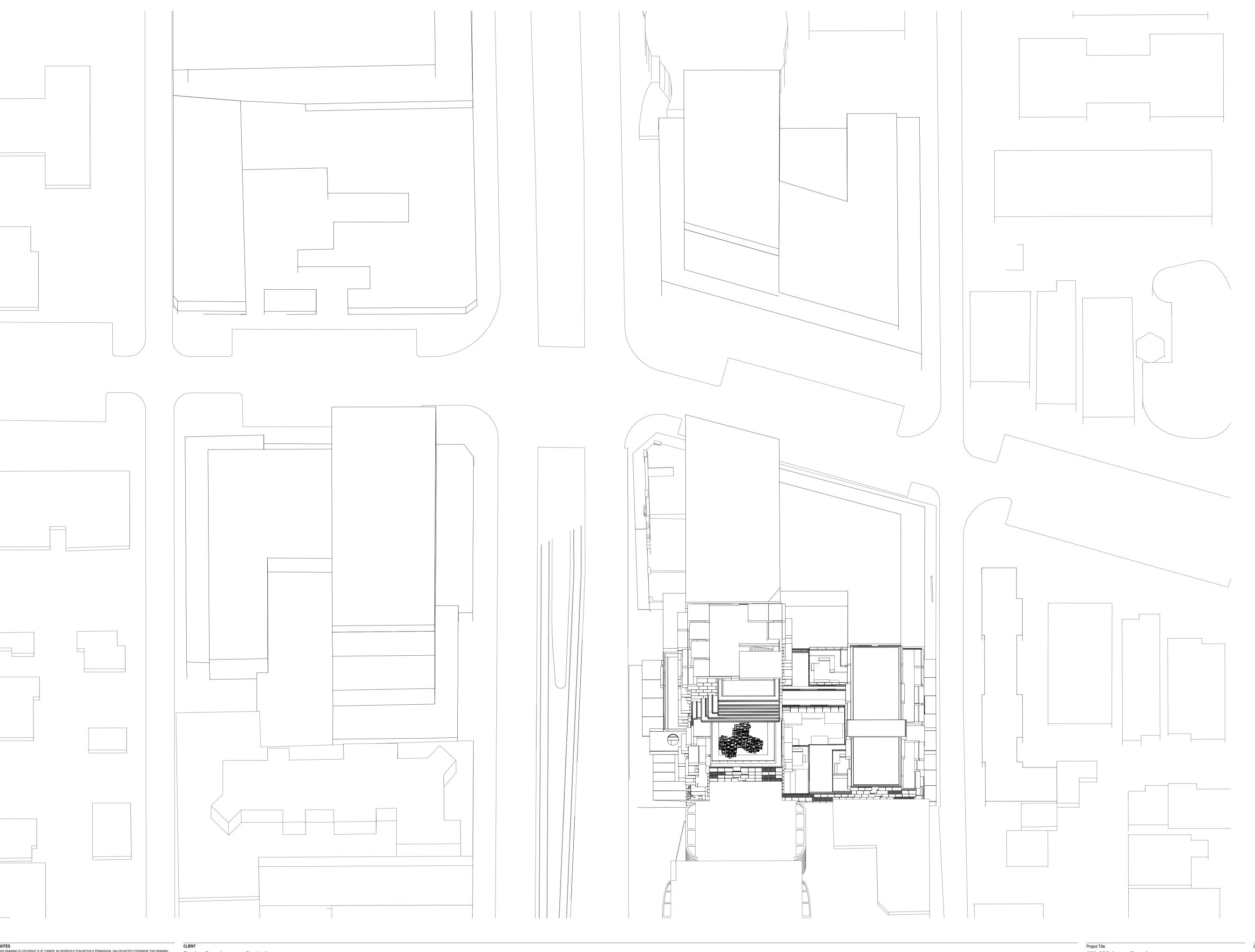
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| Post s34 for L& E Court | DA-796-013 | A

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**273-275 Anzac Parade** 273-275 Anzac Parade, Kensington Sydney NSW 2032

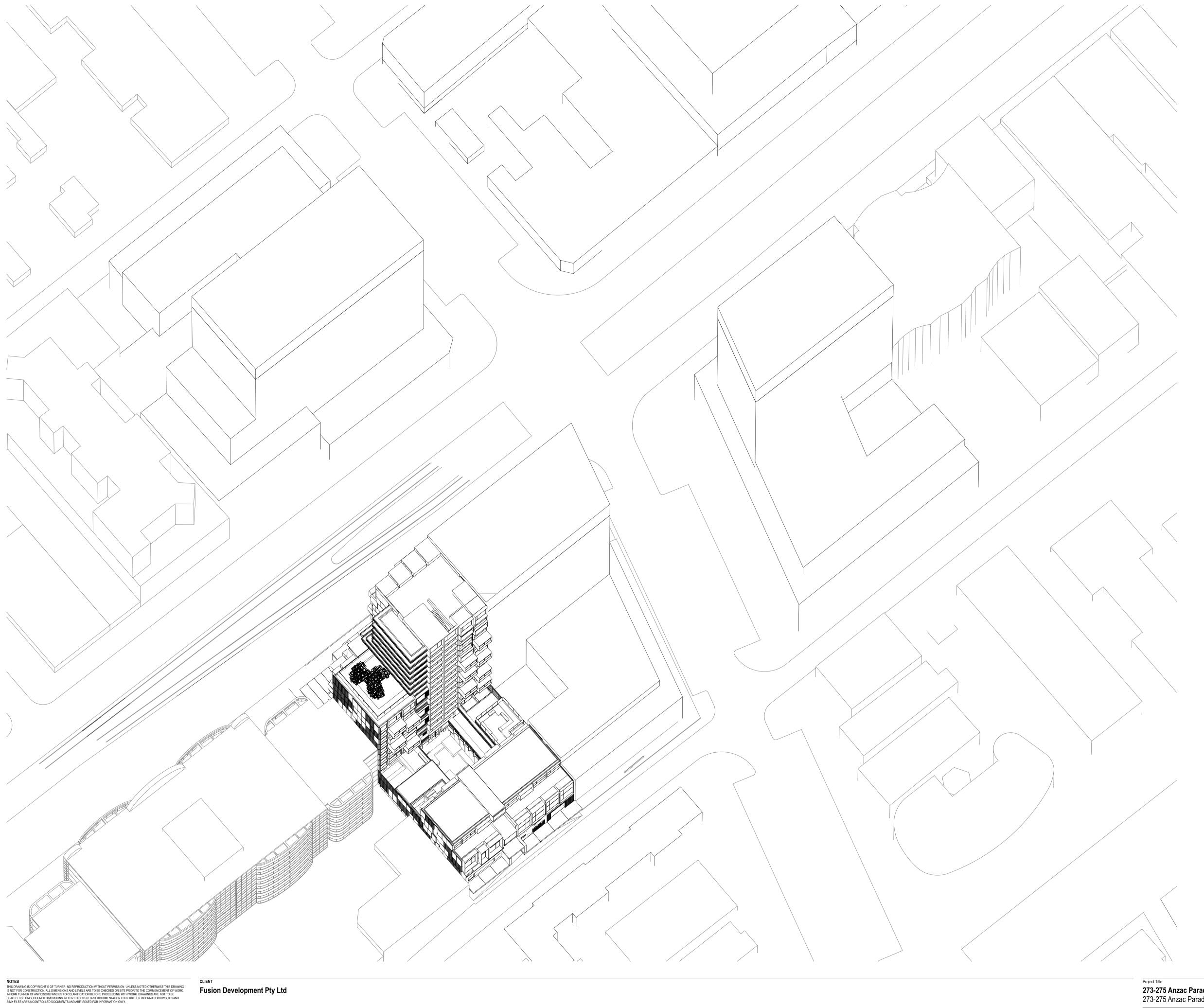
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@A1, 50%@A3

Status

Dwg No.

DA-796-014 20059 ML, TL, SW Suplementary s34 Drawings - Sun Eye view 21 December: 12pm



273-275 Anzac Parade
273-275 Anzac Parade, Kensington Sydney NSW 2032

Drawing Title

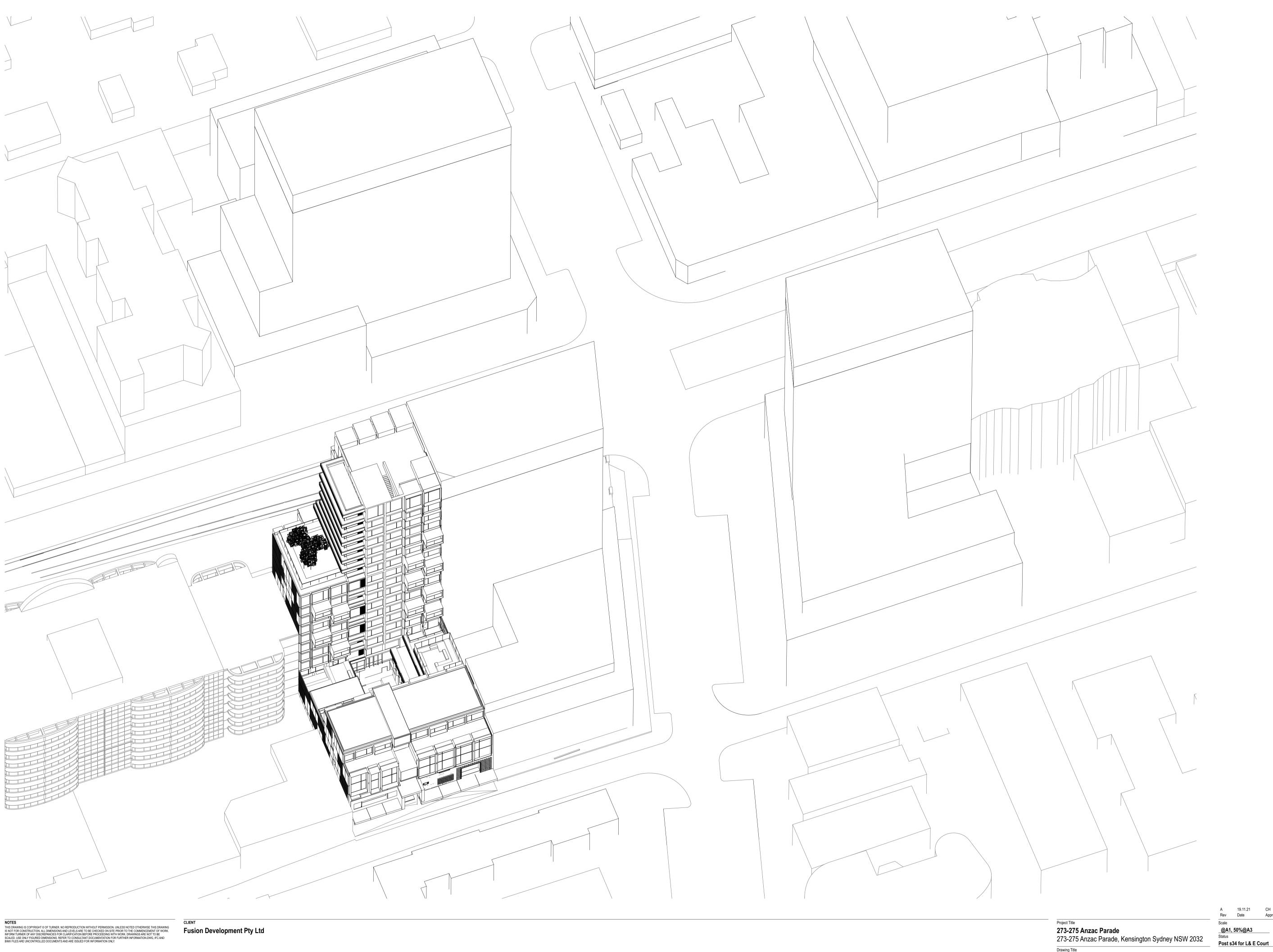
Suplementary s34 Drawings - Sun Eye view
21 December: 1pm

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Rev Date Approved by Revision Notes

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Status Dwg No.
Post s34 for L& E Court DA-796-015

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Suplementary s34 Drawings - Sun Eye view 21 December: 2pm

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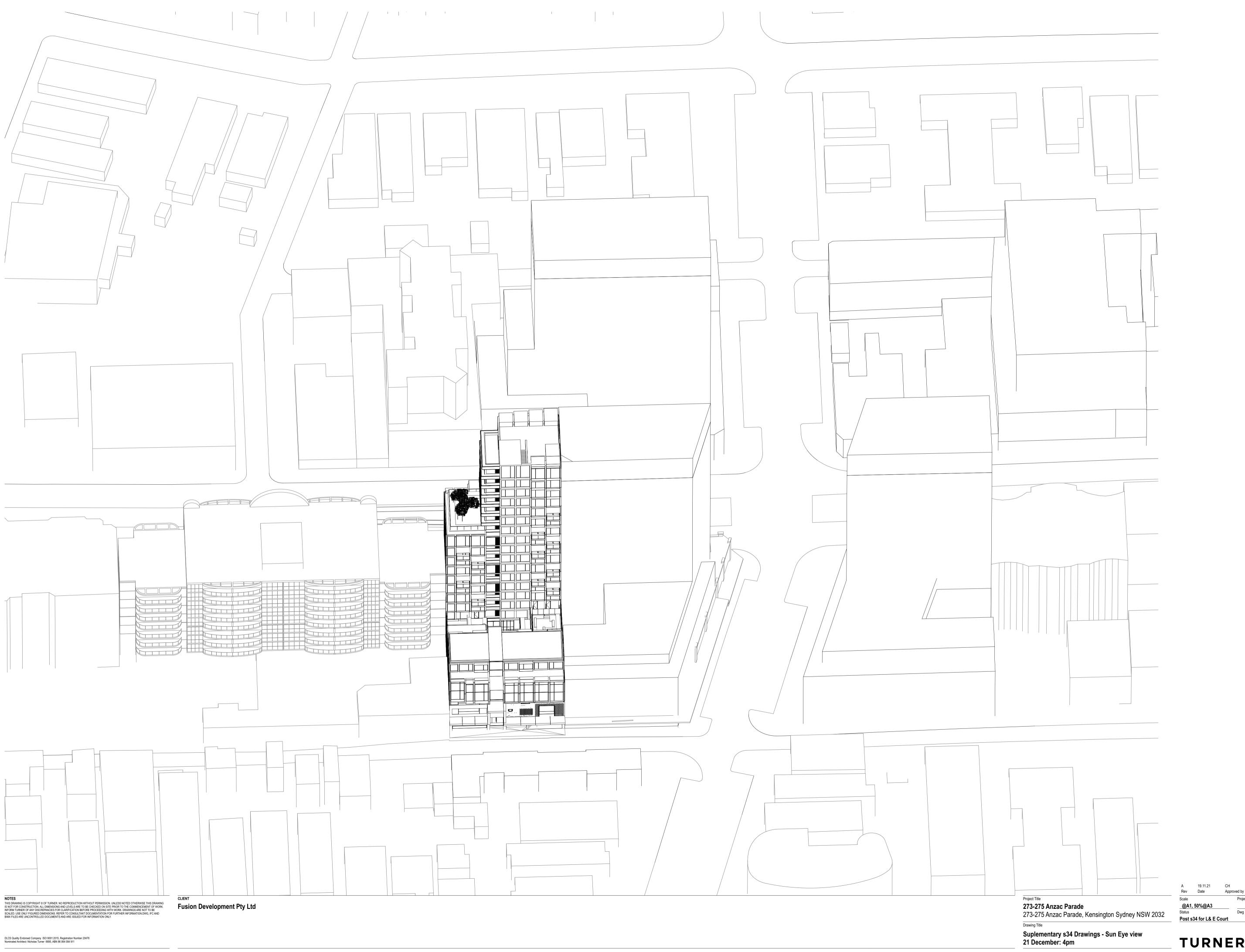
Suplementary s34 Drawings - Sun Eye view 21 December: 3pm

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Status
Post s34 for L& E Court

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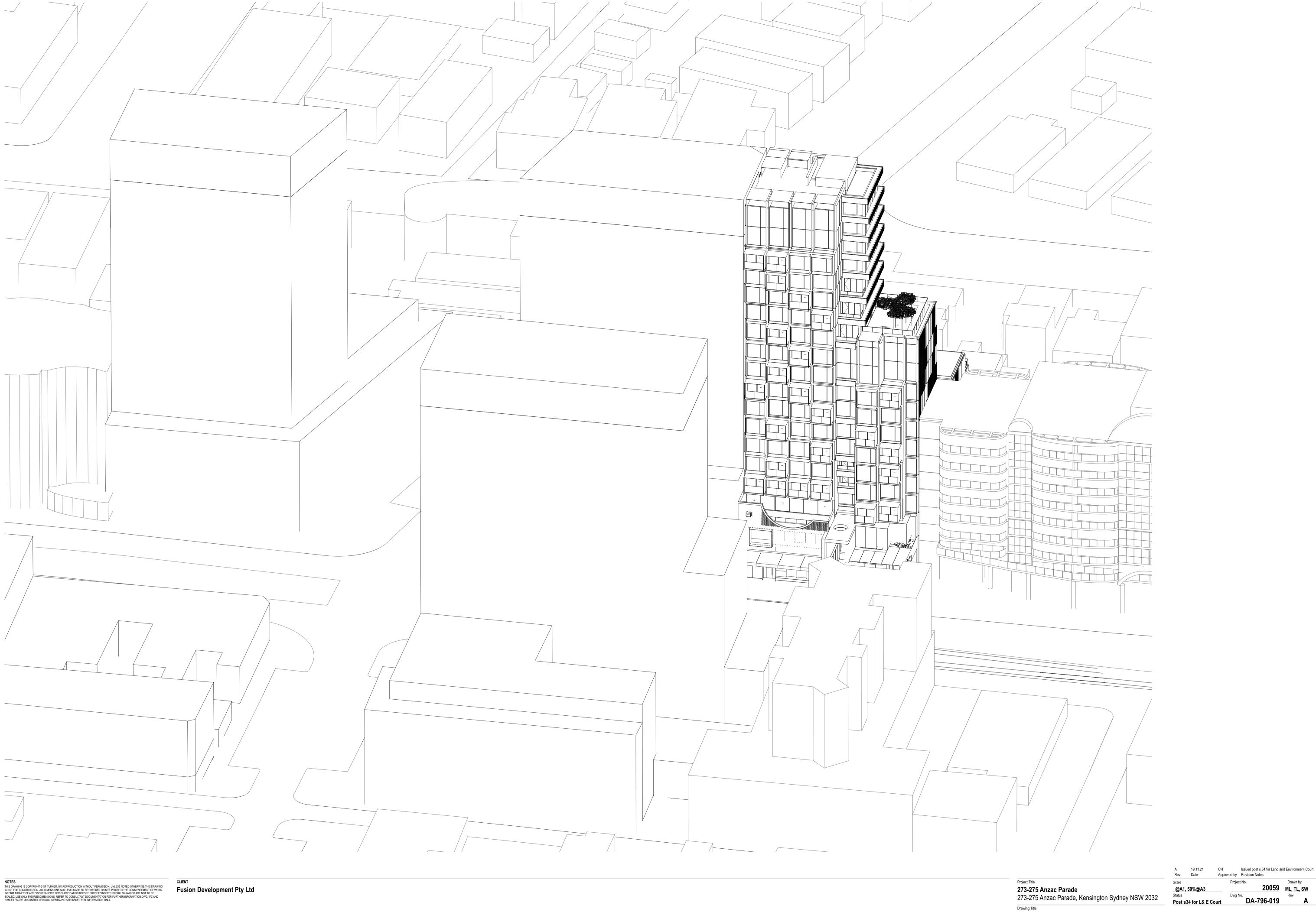


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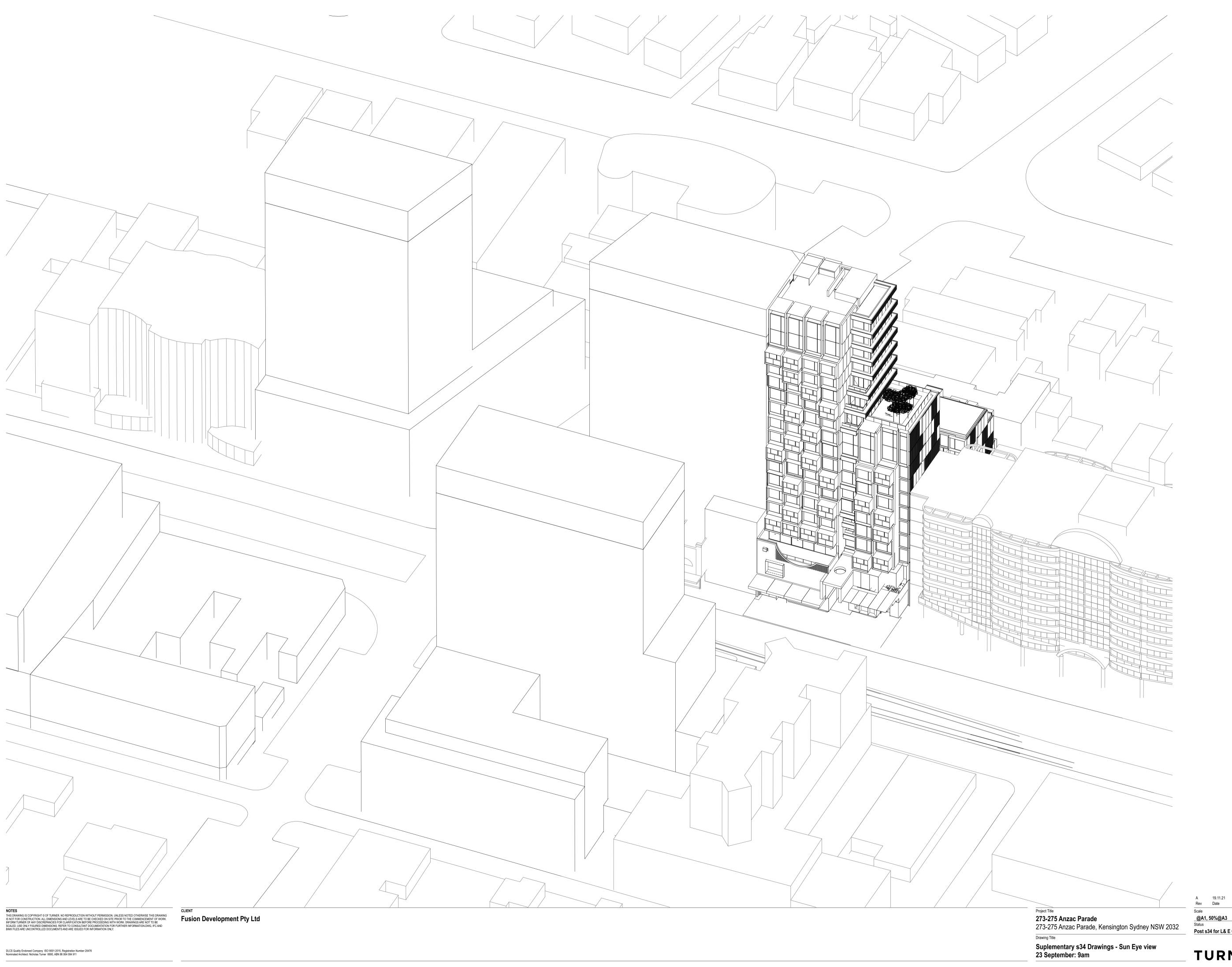


Suplementary s34 Drawings - Sun Eye view 23 September: 8am

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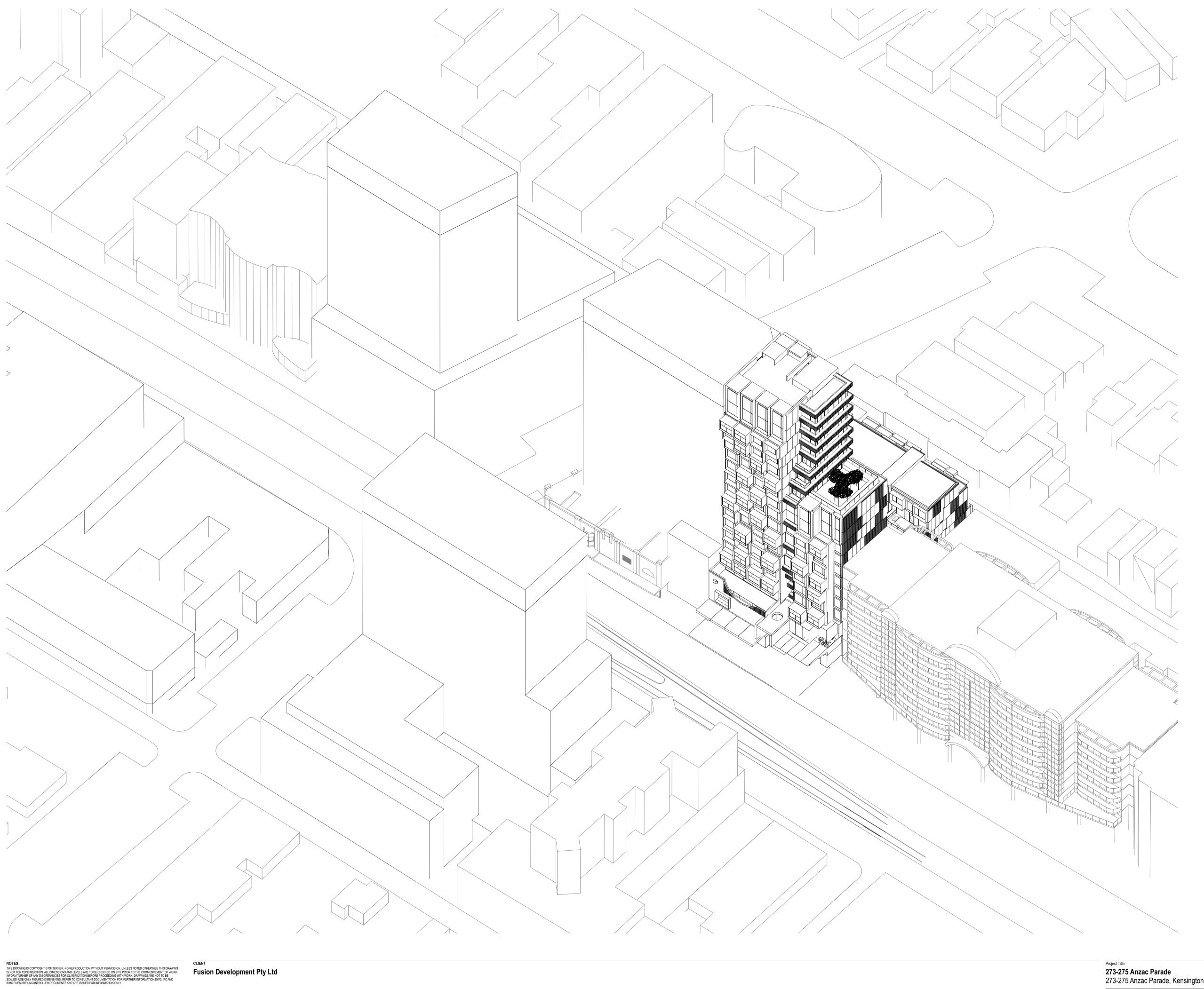
20059 ML, TL, SW



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**273-275 Anzac Parade** 273-275 Anzac Parade, Kensington Sydney NSW 2032 Suplementary s34 Drawings - Sun Eye view 23 September: 10am

20059 ML, TL, SW **TURNER** 

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Post s34 for L& E Court

DLCS Quality Endorsed Company ISO 9001:2015, Registration Number 20476 Nominated Architect: Nicholas Turner 6695, ABN 86 064 084 911

Suplementary s34 Drawings - Sun Eye view 23 September: 11am

20059 ML, TL, SW

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DLCS Quality Endorsed Company ISO 9001:2015, Registration Number 20476 Nominated Architect: Nicholas Turner 6695, ABN 86 064 084 911

**273-275 Anzac Parade** 273-275 Anzac Parade, Kensington Sydney NSW 2032 Suplementary s34 Drawings - Sun Eye view 23 September: 12pm **TURNER** 

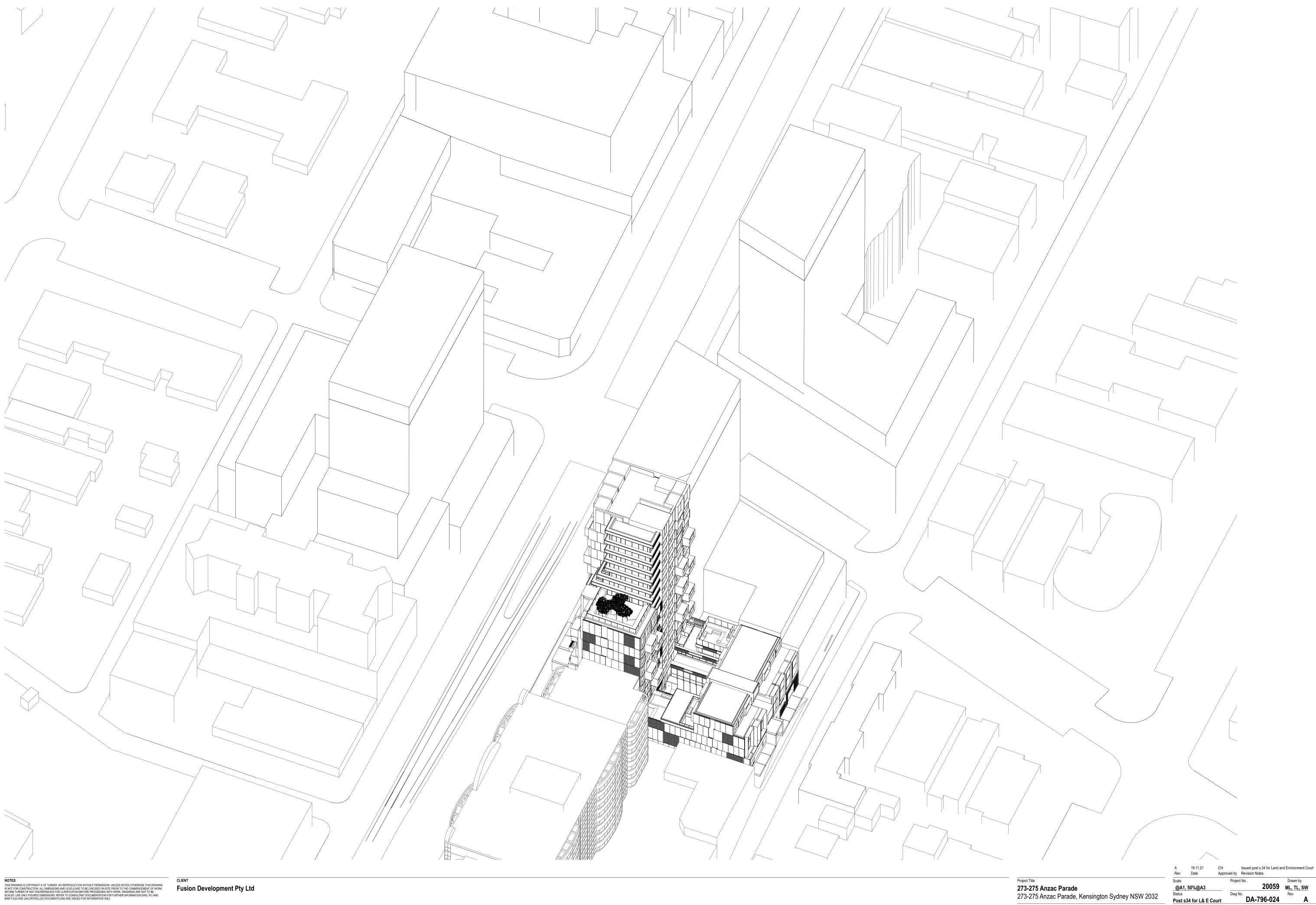
A 19.11.21 CH Issued post s.34 for Land and Environment Court Approved by Revision Notes Scale

@A1, 50%@A3

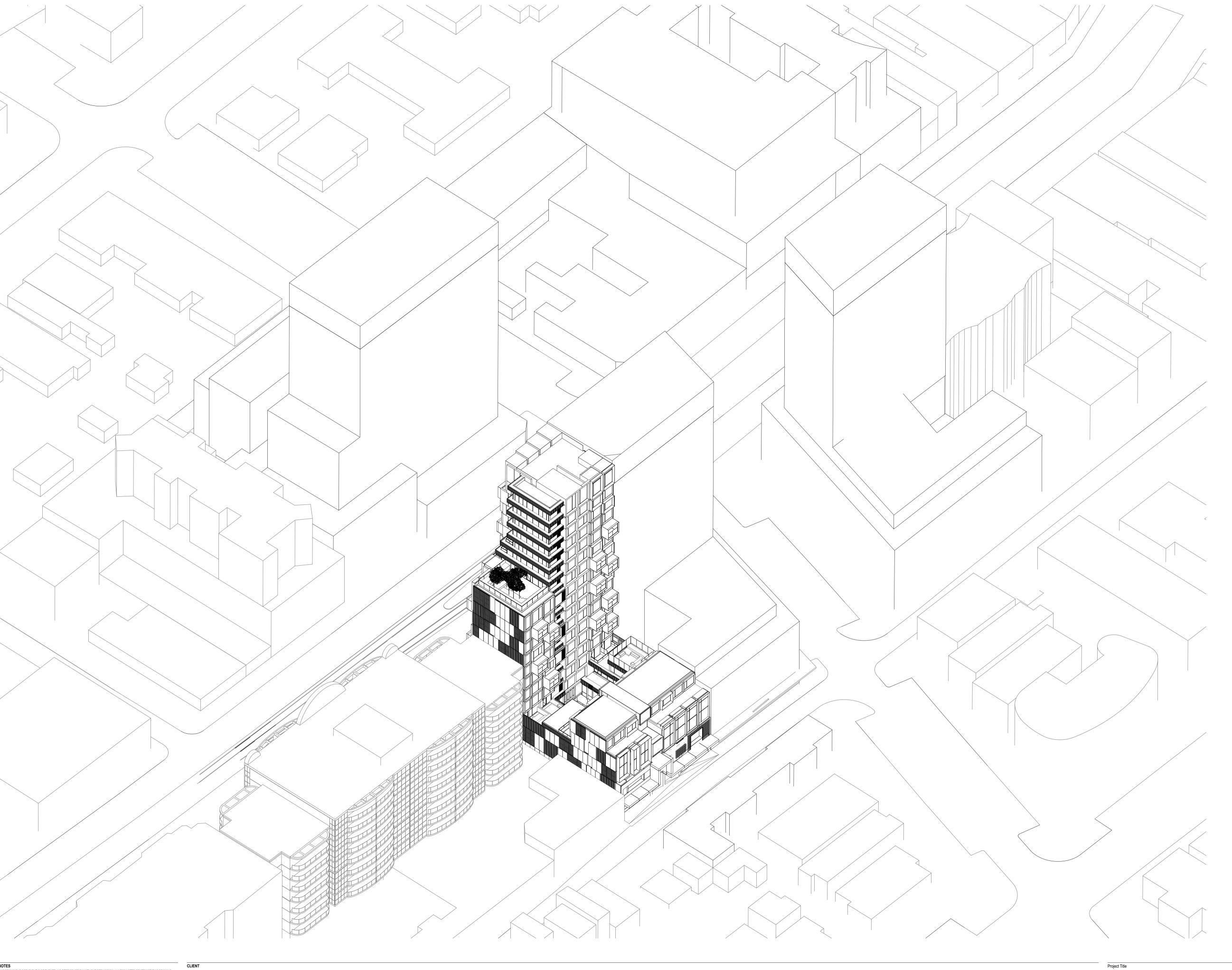
Petrics

Dwg No.

DA-796-023 20059 ML, TL, SW



Suplementary s34 Drawings - Sun Eye view 23 September: 1pm



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DLCS Quality Endorsed Company ISO 9001:2015, Registration Number 20476 Nominated Architect: Nicholas Turner 6695, ABN 86 064 084 911 Fusion Development Pty Ltd

Project Title

273-275 Anzac Parade

273-275 Anzac Parade, Kensington Sydney NSW 2032

Drawing Title

Suplementary s34 Drawings - Sun Eye view

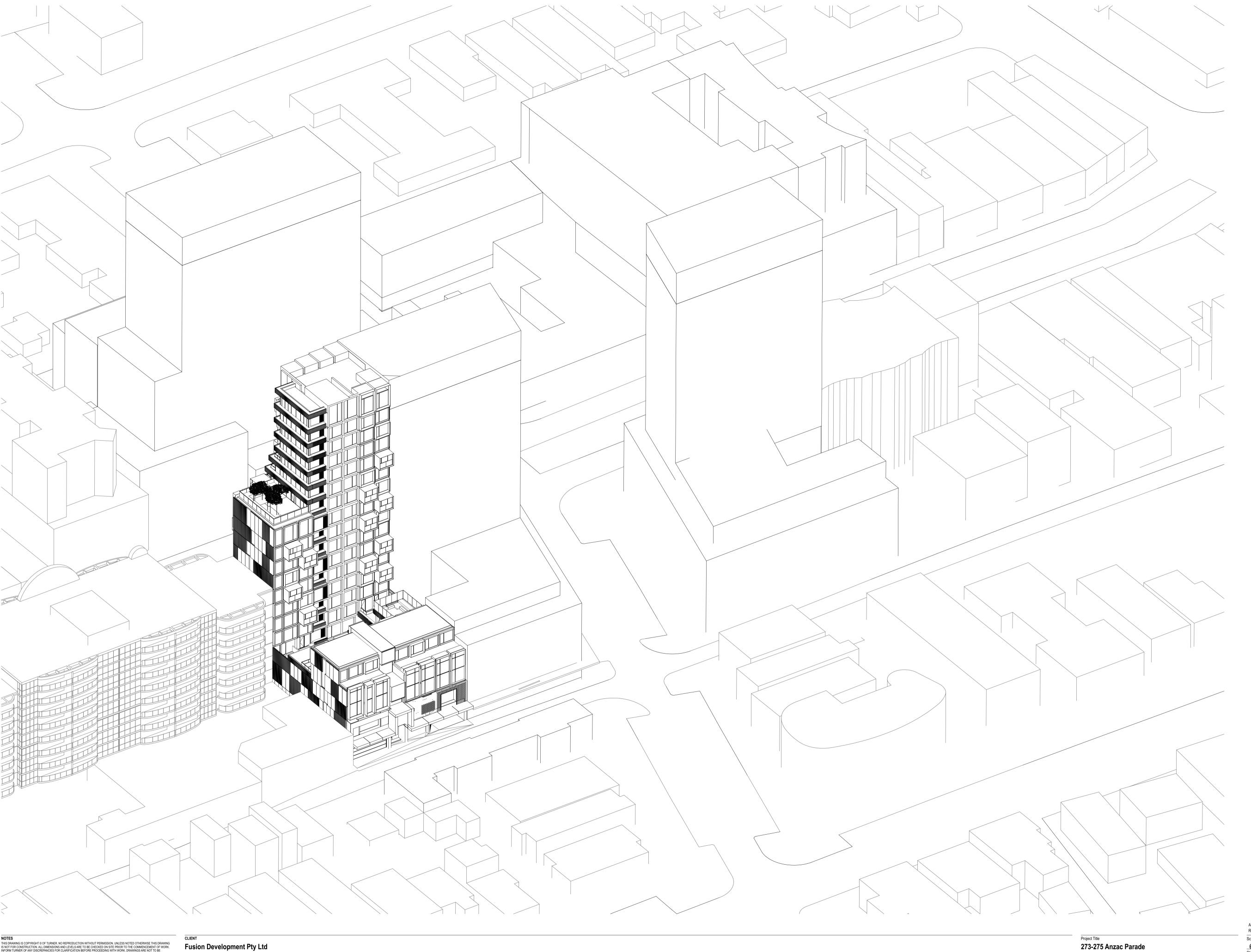
23 September: 2pm

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 19.11.21 Rev
 CH Date
 Issued post s.34 for Land and Environment Court Revision Notes

 Scale
 Project No.
 Drawn by
 North

 @A1, 50%@A3
 20059
 ML, TL, SW
 Rev

 Status
 Dwg No.
 Rev
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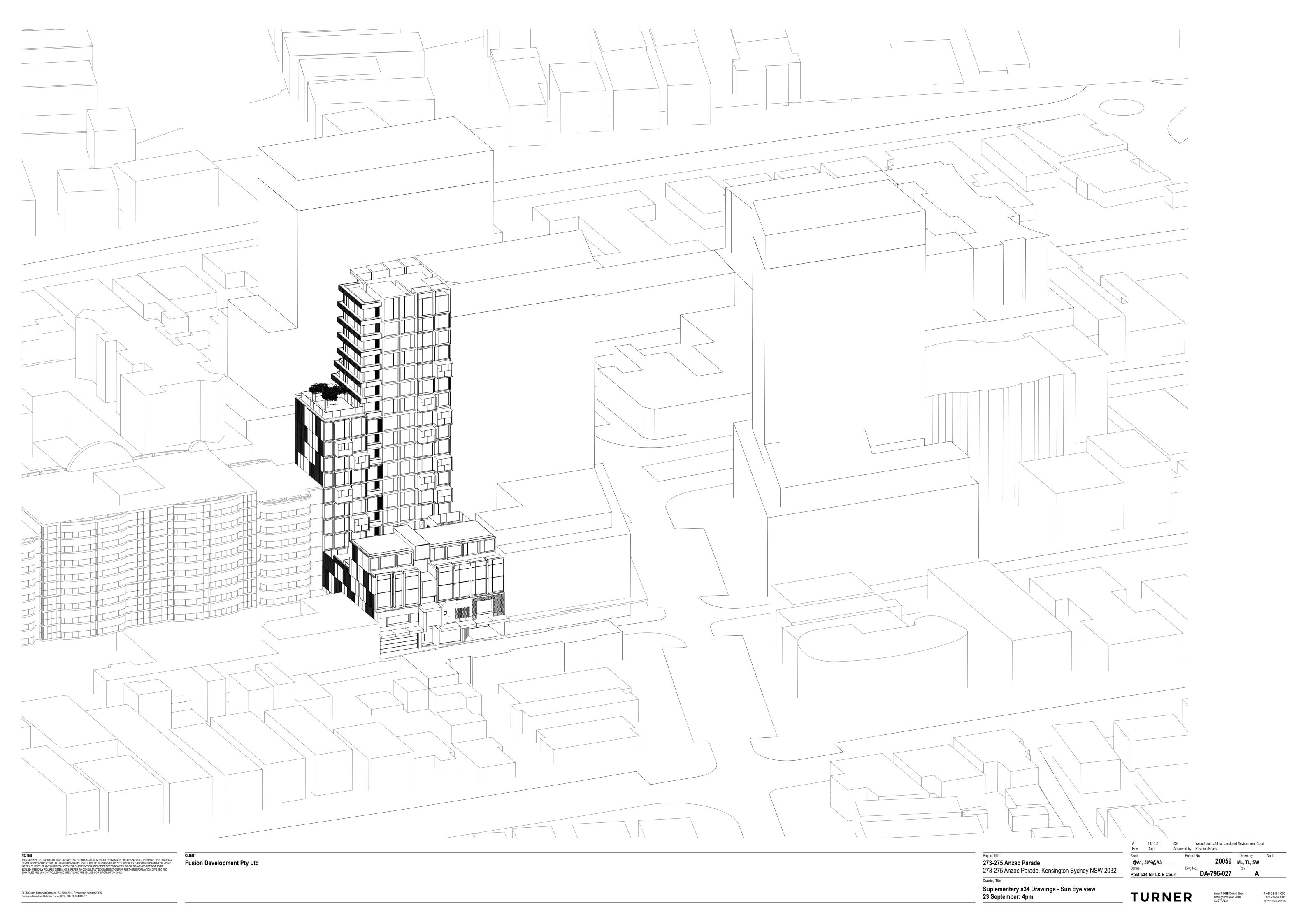
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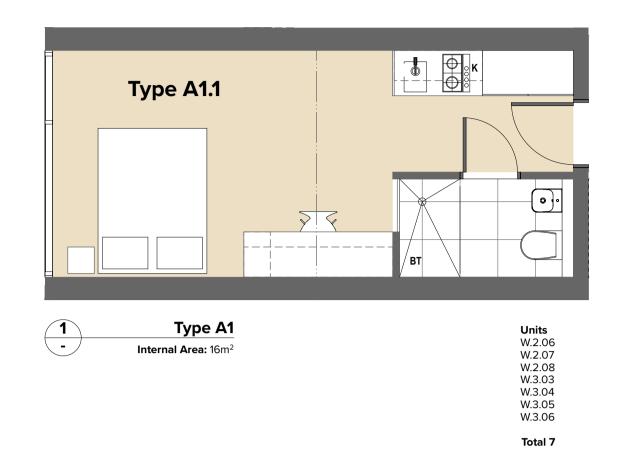
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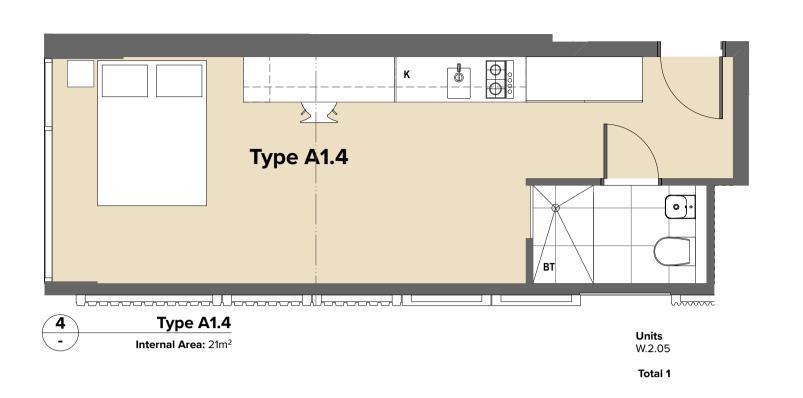
DLCS Quality Endorsed Company ISO 9001:2015, Registration Number 20476 Nominated Architect: Nicholas Turner 6695, ABN 86 064 084 911

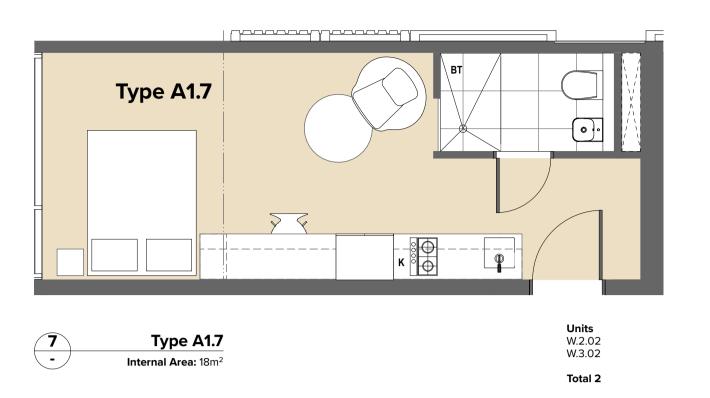
**273-275 Anzac Parade** 273-275 Anzac Parade, Kensington Sydney NSW 2032 Suplementary s34 Drawings - Sun Eye view 23 September: 3pm

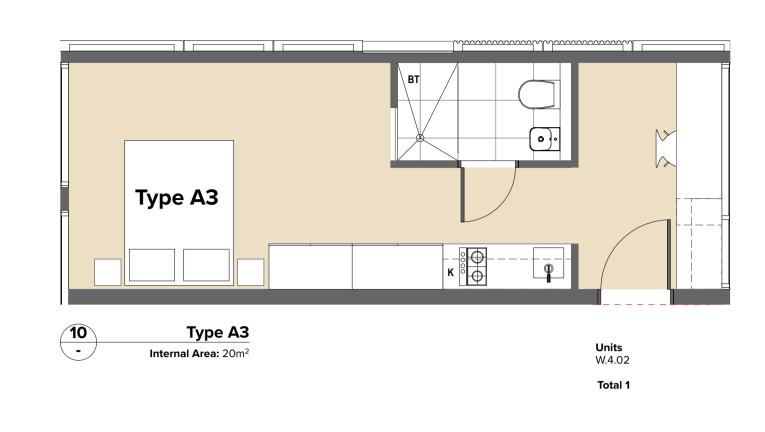
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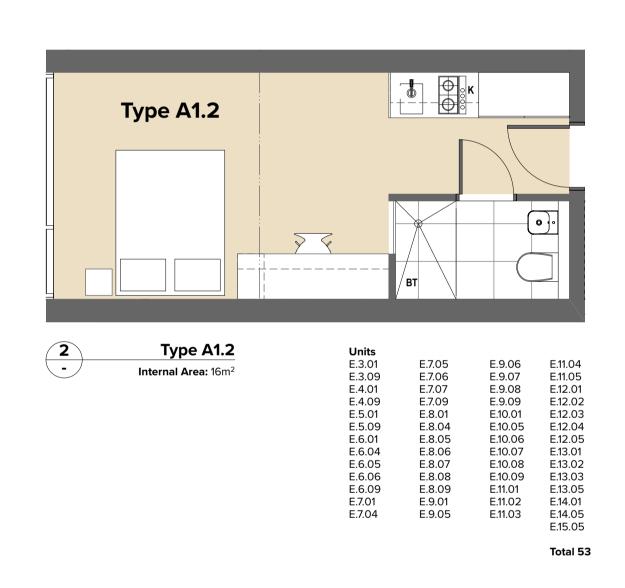


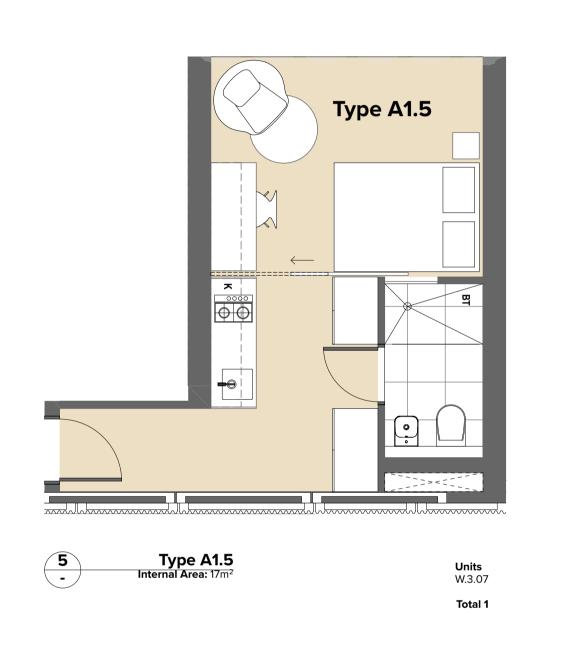


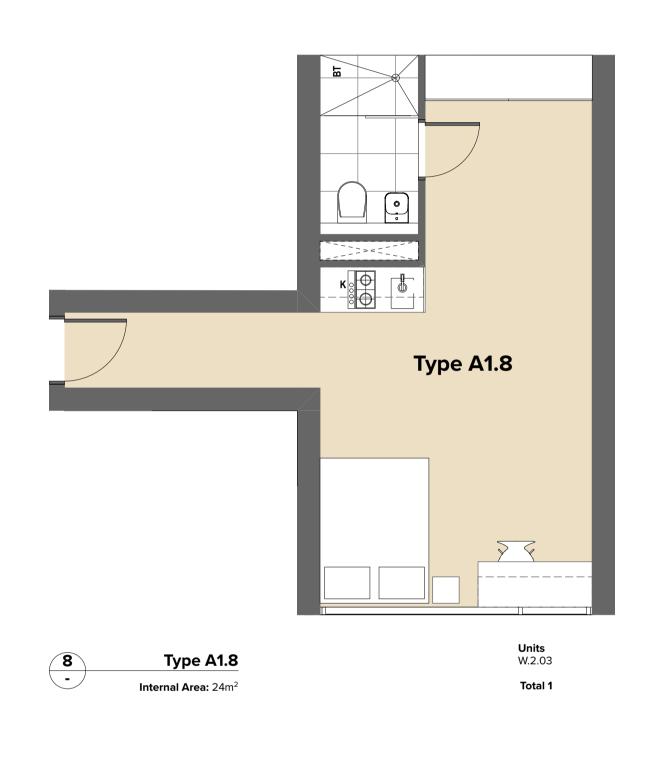


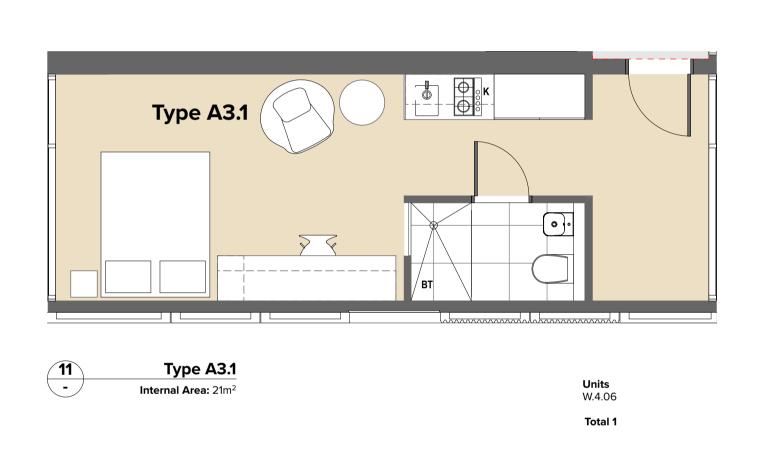


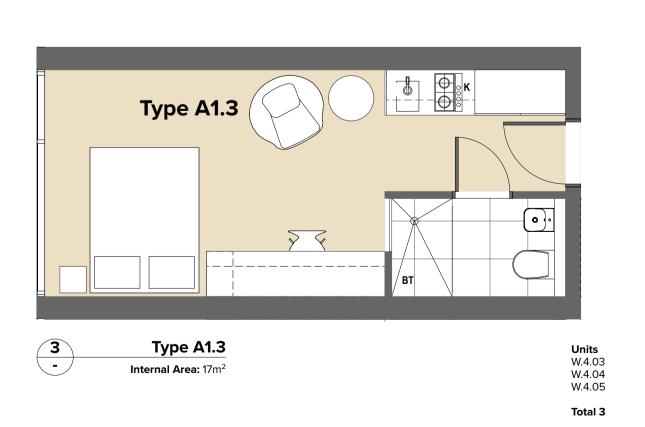


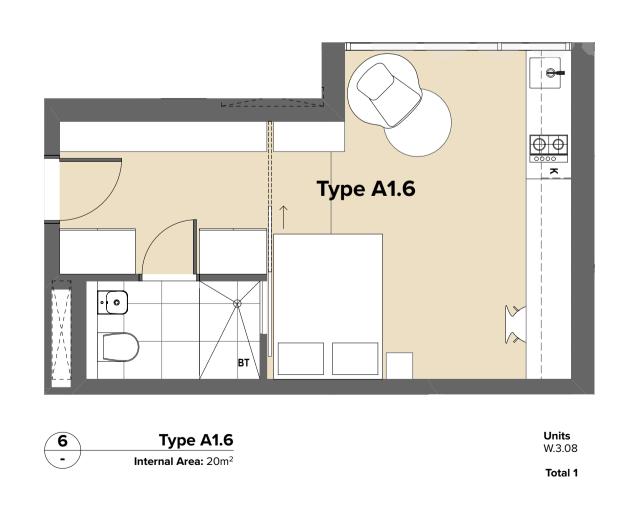


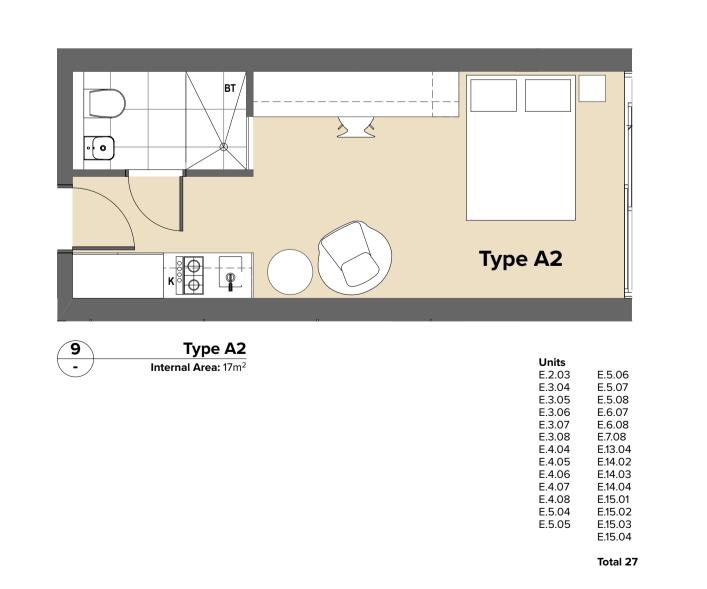












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Fusion Development Pty Ltd

Project Title

273-275 Anzac Parade

273-275 Anzac Parade, Kensington Sydney NSW 2032

Drawing Title

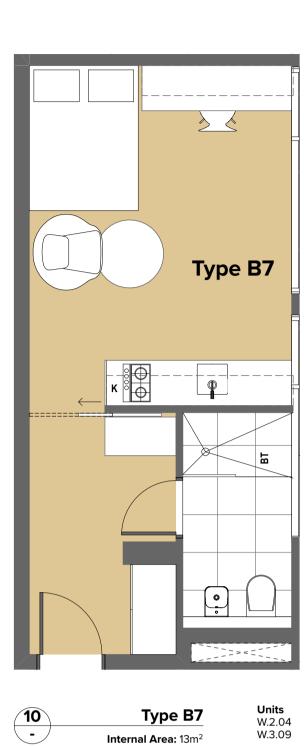
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Scale Project No. Drawn by North

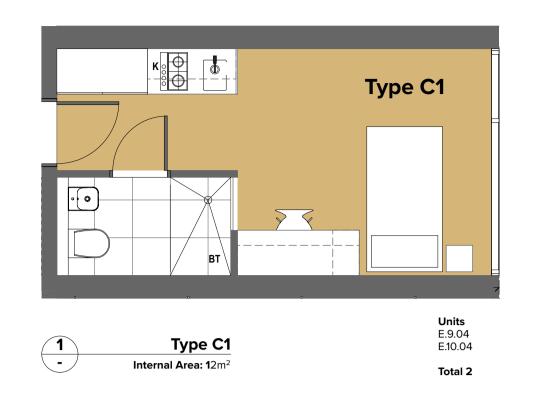
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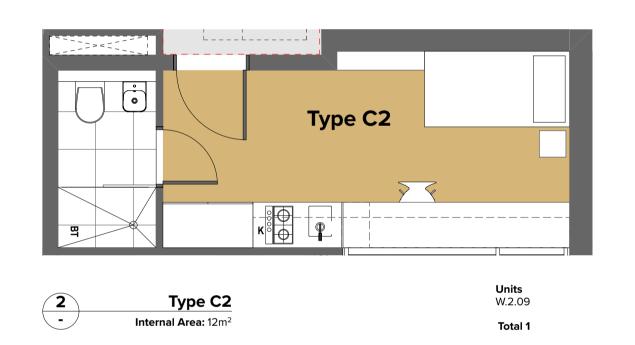
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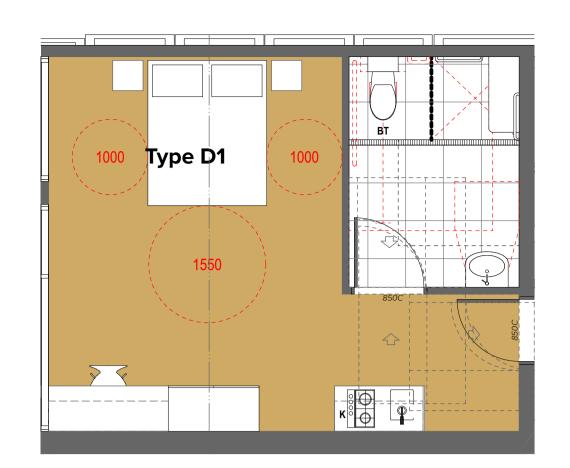




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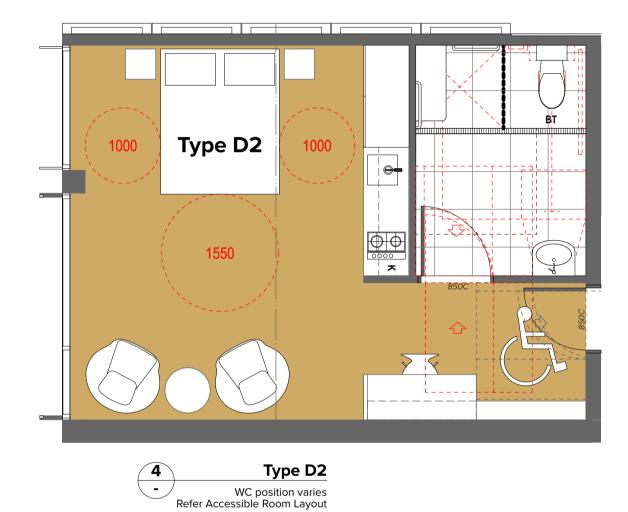






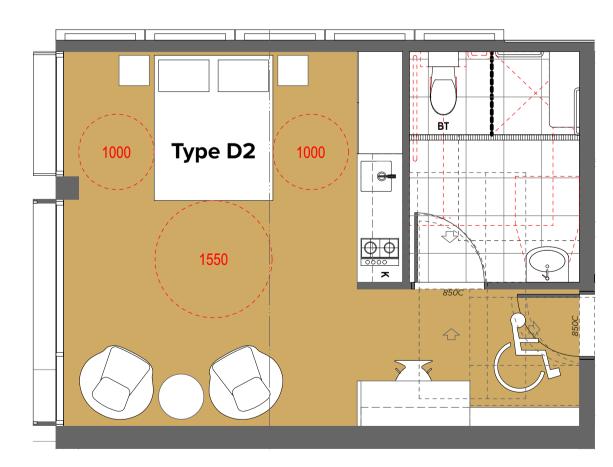


Units E.2.01 Total 1



Internal Area: 24m<sup>2</sup>

Units E.3.02 E.7.02

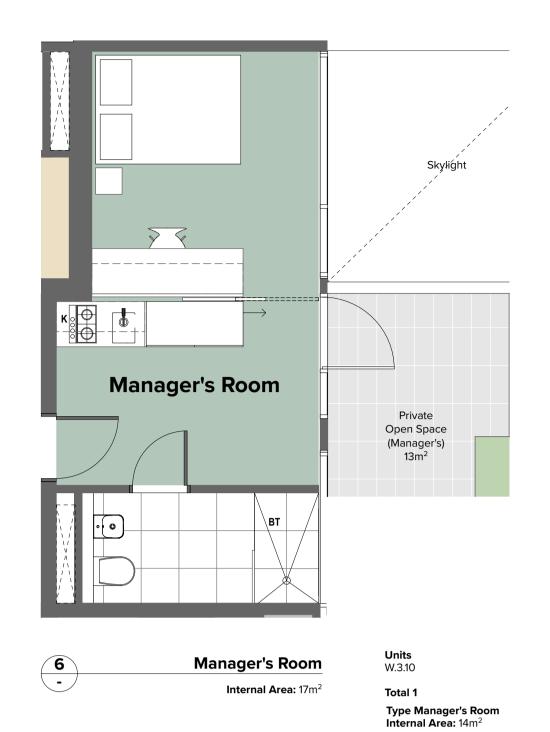


Type D2 (Mirrored BT)

Right hand transfer
(3 no. off)

Internal Area: 24m<sup>2</sup>

Units E.5.02 E.9.02



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Fusion Development Pty Ltd

Project Title

273-275 Anzac Parade

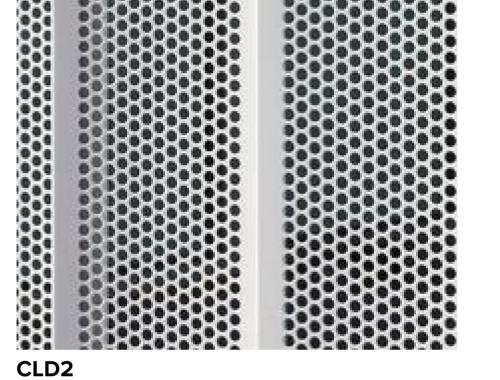
273-275 Anzac Parade, Kensington Sydney NSW 2032

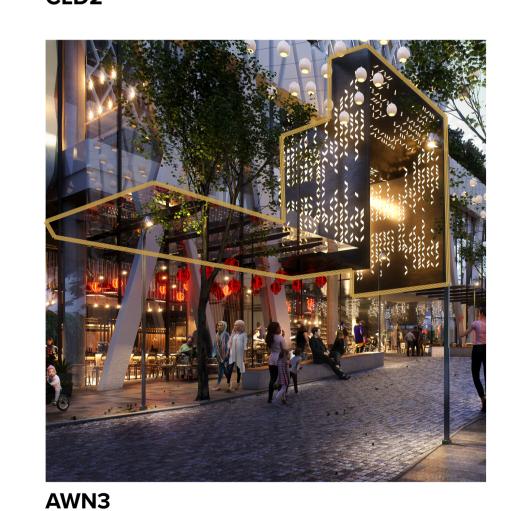
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Room Typologies

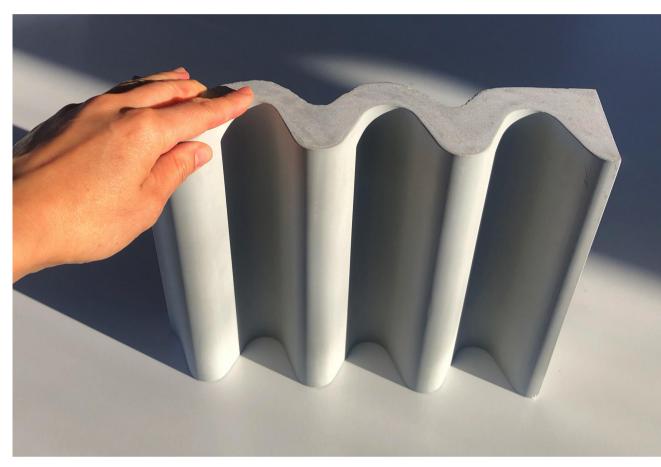
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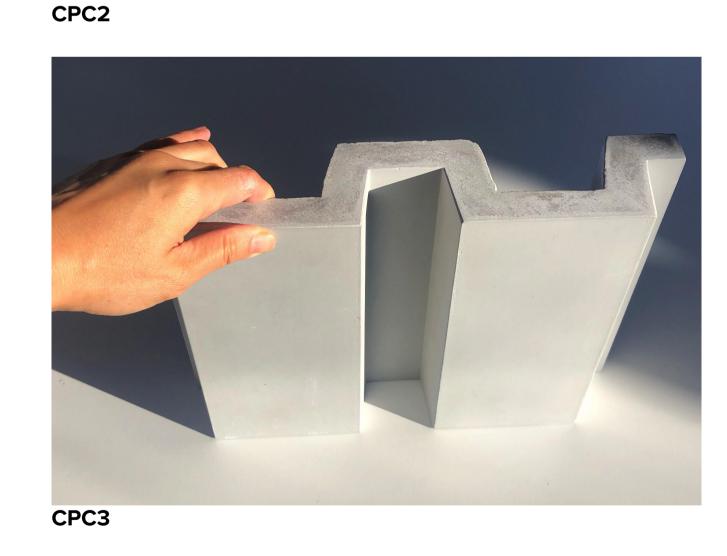


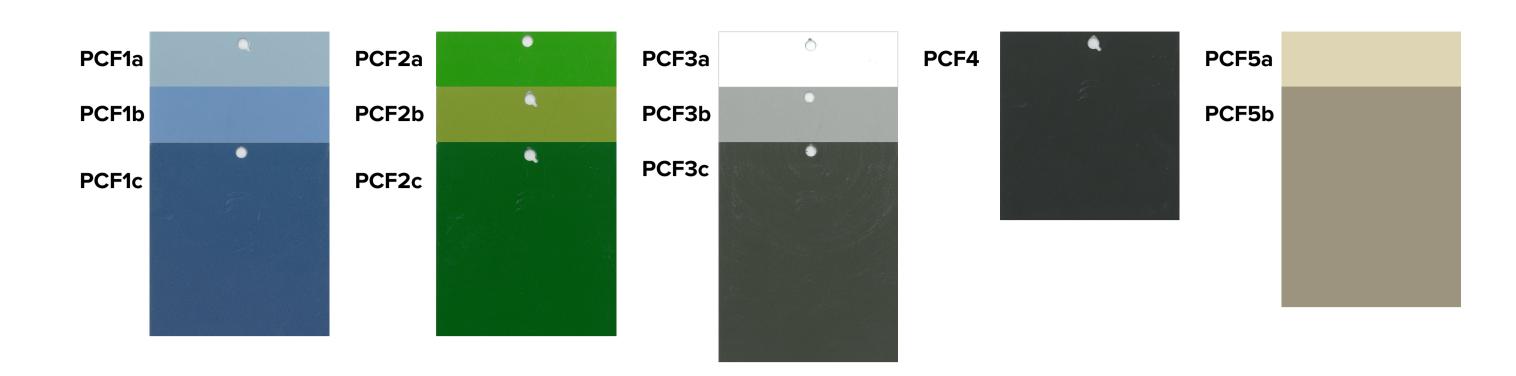


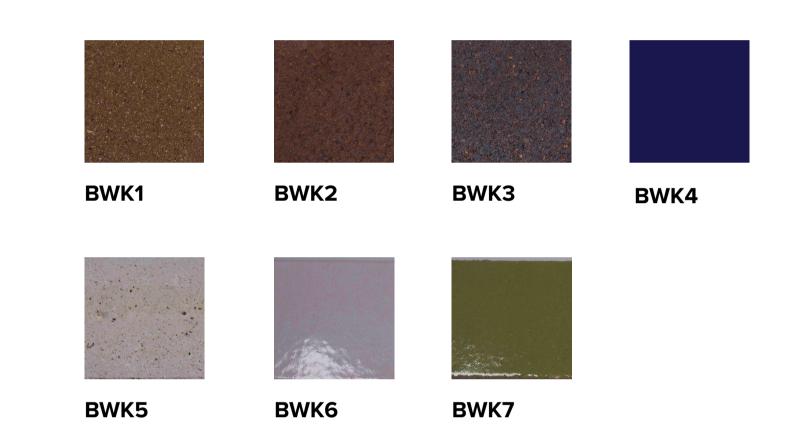






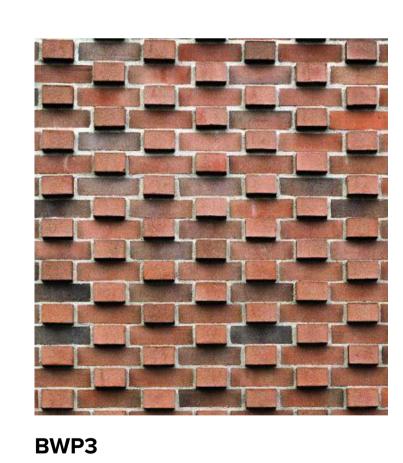












- AWN1 Sculptural awning to building address. CLD1 to exposed edges CLD3 to archway soffit and sides.
- AWN2 Metal rooftop shade structure
- AWN3 Folded steel awning with decorative motif laser cut into leading edge. Paint finish equal to PCF4. GC1 edge with separate steel flat bar support
- BAL1 Semi-frameless full height clear glass balustrade system with 150mm wide top rail. Framing system, aluminium, powder coat finish. Colour to match PCF4. Min 1.1m High
- BAL2 Frameless glass balustrade system, fixed to inside face of concrete upstand. Min 1.1m High
- BWK1 Dry pressed face brickwork, 110 x 330 x 76mm. Colour and finish equal to Bowral 'Gertrudis Brown'
- BWK2 Dry pressed face brickwork, 110 x 230 x 76mm. Colour and finish equal to Bowral 'Simmental Silver'
- BWK3 Dry pressed face brickwork, 110 x 330 x 76mm. Colour and finish equal to Bowral 'Bowral Blue' BWK4 Decorative glazed brickwork, blue. Colour and finish equal to Burlesque 'Smashing Blue' 260 x 50mm 'slimline' format. Brickwork pattern, Vertical Stretcher bond. Mortar colour, 'black'.
- BWK5 Dry pressed face brickwork, 110 x 330 x 76mm. Colour and finish equal to Bowral 'Emerald'
- BWK6 Dry pressed face brickwork, 110 x 330 x 76mm. Colour and finish equal to Bowral 'Chillingham White' BWK7 Dry pressed face brickwork, 110  $\times$  330  $\times$  76mm. Colour and finish equal to Bowral 'Indulgent White'
- BWP1 Flemish bond with projecting 'hit-and-miss' pattern, tooled joint BWP2 Protruding brickwork pattern

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- BWP3 Soldier course brickwork pattern CLD1 Metal cladding system with concealed essential service doors and louver system. Powdercoat finish equal to PC3c
- CLD2 Metal hood with 50% perforations to achieve solar access. Colour varies, refer to DA-890-101
- CLD4 Metal frame colour to match PCF4
- CLD5 Metal hood, colour varies, refer to DA-890-101
- COF1 Off-form concrete, patched and painted
- COF2 Off-form concrete, natural smooth board finish. Natural grey concrete mix, penetrating clear matte sealer over Precast concrete panel as part of overall facade system. Smooth finish, colour equal to 'lite & brite' concrete mix with white oxide pigment additive. Penetrating clear matte sealer over.
- - CPC2 Decorative precast concrete panel as part of overall facade system. Vertical, radius profiled form liner finish, 30mm spacing, 32mm diam., 53mm depth equal to Reckli 2/94 'Orinoo' profile. Colour equal to CPC1. Pene CPC3 Decorative precast concrete panel as part of overall facade system. Vertical square edged profiled form liner finish, 30mm spacing, 15mm depth equal to Reckli 2/77 'Tigris' profile. Colour equal to CPC1
  - CPC4 Precast concrete panel as part of overall facade system. Smooth finish, colour equal to PF(a). Penetrating clear matte sealer over.
  - Aluminium framed, front glazed, fixed window system with integrated aluminium louvre system. CLD5 to facade opening. Frame equal to PCF4, glazing equal to GC1, integrated louvre system equal to LV1, hood colour varies, refer to DA-890-101. FT1a (X): FT1a with CLD5 of x mm depth. FT1b Facade system equal to FT1a with transom at slab level. GC2 above. FT1b (x): FT1b with CLD5 of x mm depth.
- FT2a Facade system equal to FT1, without LV1. FT2a (x): FT1a with CLD5 of x mm depth.
- FT2b Facade system equal to FT2a with transom at slab level. GC2
- FT2c Facade system equal to FT2a without CLD5
- Aluminium framed, front glazed sliding door system to residential balcony. Balustrade at balcony edge. CLD2 to facade opening. Aluminium frame finish equal to PCF1(a), glass equal to GC1, balustrade equal to BAL2, hood colour varies, refer to DA-890-101. Aluminium framed, front glazed window system with hinged door panel and fixed open louvre system for lobby ventilation. Frame equal to PCF4, glass equal to GC3. PL1 at balcony edge with BAL2 fixed internally.
- Aluminium framed, front glazed window system with fixed open mechanical louvre system for ventilation, colour to match PCF4. Frame equal to PCF4 glass equal to GC3
- FT6 Aluminium framed, front glazed window system Colour and finish to match PCF4, glass equal to GC1.
- FT7 Aluminium framed, glazed window window system on 600mm concrete upstand
- FT8 Framing system, decorative steel frame with projecting bay window elements frameless fixed glazing system to be either front-fixed, rear fixed or centre-fixed, frame colour to equal to PCF4, glass equal to GC1
- FT9 Framing system, decorative steel frame with projecting bay window elements. Fixed glazing with operable elements equal to 'Aneeta' sashless window system. Steel, paint finish. Colour and finish to match PCF4, glass equal to GC1. FT10 Secure lobby entry door system, semi frameless glass with continuous bottom rail and full height decorative 19mm pull handle, glass equal to GC1.
  - FT11 Framing system, solid metal cladding, colour to match PCF4
- FT12 Curtainwall front fixed glazing system. 300mm x 50mm fixed vertical fins, colour varies

BWP2

- Retail entry door system, semi frameless glass with continuous bottom rail and full height decorative 19mm pull handle. Glass type equal to GC1. Framing system, steel, paint finish. Framing colour to match PCF4.
- GC2 Shadowbox glazing system
- GC3 Grey glass Green roof planting to Landscape Architect's requirements Planter boxes to Landscape Architect's requirements Green wall planting to Landscape Architect's requirements. External face to match CPC3
- Aluminium framed, fixed horizontal louvre system to mechanical engineer's requirements. Frame and louvres equal to PCF4
- PCF1a Powdercoat finish colour equal to Interpon 'Pacific Avenue'
  PCF1b Powdercoat finish colour equal to Interpon 'Natura Matt'
  Powdercoat finish colour equal to Interpon 'Atlante'
- PCF2a Powdercoat finish colour equal to Interpon 'Viper Green Gloss' Powdercoat finish colour equal to Interpon 'Sable Gilded Green' Powdercoat finish colour equal to Interpon 'Shamrock Gloss' PCF3a Powdercoat finish colour equal to Interpon 'Pearl White Matt'
  PCF3b Powdercoat finish colour equal to Interpon 'Silver Pearl Matt'
  PCF3c Powdercoat finish colour equal to Interpon 'Titanium Pearl Matt'
- PCF4 Powdercoat finish colour equal to Interpon 'Monument Matt' PCF5a Powdercoat finish colour equal to Interpon 'Magnolia' PCF5b Powdercoat finish colour equal to Interpon 'Luxe Bronze Pearl' PF1 Paint finish colour equal to Interpon 'Monument Matt'

PF2 Paint finish colour equal to Interpon 'Titanium Pearl Matt'

- PLD1 Panel lift door to loading dock, colour equal to PCF4
- PLD2 Panel lift door to basement carpark, colour equal to PCF4 PV1 Paving, refer Landscape Architect's documents
- SCN1 Brickwork screen to eastern facade. Colour and finish equal to varies, refer to DA-890-102
- SCN2 Brickwork screen to western facade. Colour and finish equal to varies, refer to DA-890-102 SCN3 1800mm high aluminium framed, glazed screen to rooftop communal area. Frame finish equal to PCF4, glass equal to GC1.
  SGN1 Building identification signage zone for surface fixed signage
- SL1 Skylight, glass equal to GC1 Note: Refer to Landscape Architect's documents for public domain and landscape areas for further information regarding materials and finishes selection.

273-275 Anzac Parade 273-275 Anzac Parade, Kensington Sydney NSW 2032 Drawing Title

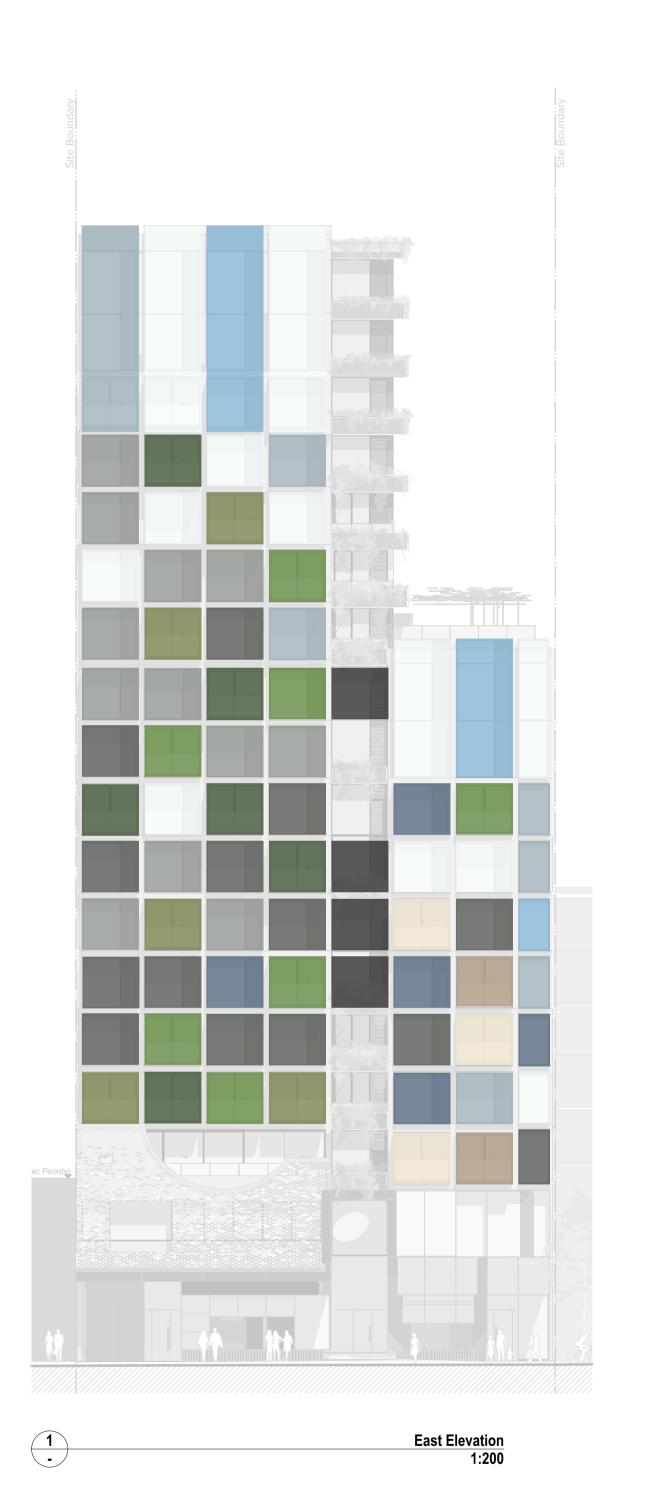
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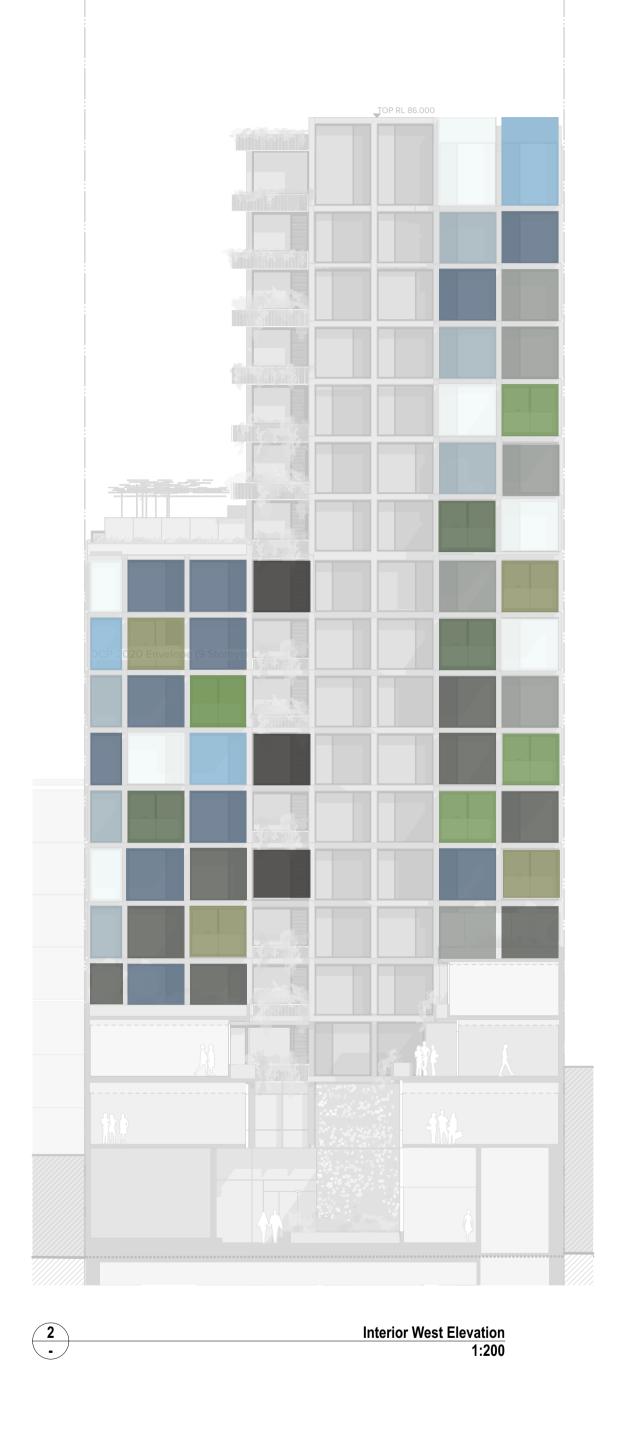
**External Materials & Finishes** 

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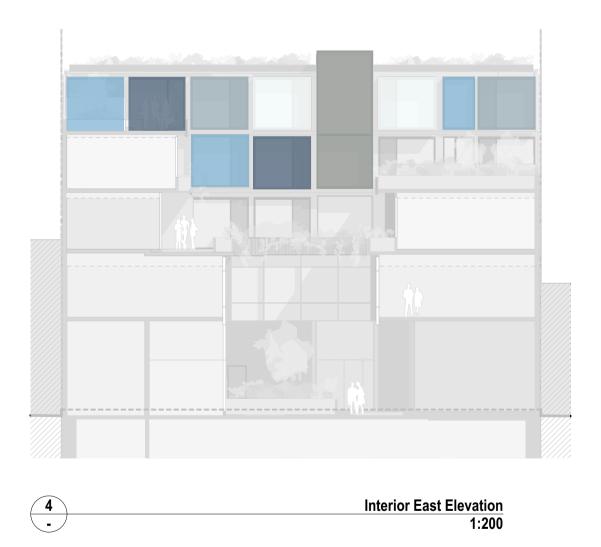
DLCS Quality Endorsed Company ISO 9001:2015, Registration Number 20476 Nominated Architect: Nicholas Turner 6695, ABN 86 064 084 911

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AWN2 Metal rooftop shade structure

AWN1 Sculptural awning to building address. CLD1 to exposed edges CLD3 to archway soffit and sides.

AWN3 Folded steel awning with decorative motif laser cut into leading edge. Paint finish equal to PCF4. GC1 edge with separate steel flat bar support

BAL1 Semi-frameless full height clear glass balustrade system with 150mm wide top rail. Framing system, aluminium, powder coat finish. Colour to match PCF4. Min 1.1m High

BAL2 Frameless glass balustrade system, fixed to inside face of concrete upstand. Min 1.1m High

BWK1 Dry pressed face brickwork, 110 x 330 x 76mm. Colour and finish equal to Bowral 'Gertrudis Brown'

BWP2 Protruding brickwork pattern THIS DRAWING IS COPYRIGHT © OF TURNER. NO REPRODUCTION WITHOUT PERMISSION. UNLESS NOTED OTHERWISE THIS DRAWING IS NOT FOR CONSTRUCTION. ALL DIMENSIONS AND LEVELS ARE TO BE CHECKED ON SITE PRIOR TO THE COMMENCEMENT OF WORK. INFORM TURNER OF ANY DISCREPANCIES FOR CLARIFICATION BEFORE PROCEEDING WITH WORK. DRAWINGS ARE NOT TO BE SCALED. USE ONLY FIGURED DIMENSIONS. REFER TO CONSULTANT DOCUMENTATION FOR FURTHER INFORMATION.DWG, IFC AND BIMX FILES ARE UNCONTROLLED DOCUMENTS AND ARE ISSUED FOR INFORMATION ONLY.

BWK2 Dry pressed face brickwork, 110 x 230 x 76mm. Colour and finish equal to Bowral 'Simmental Silver'

BWK3 Dry pressed face brickwork, 110 x 330 x 76mm. Colour and finish equal to Bowral 'Bowral Blue' BWK4 Decorative glazed brickwork, blue. Colour and finish equal to Burlesque 'Smashing Blue' 260 x 50mm 'slimline' format. Brickwork pattern, Vertical Stretcher bond. Mortar colour, 'black'.

BWK5 Dry pressed face brickwork, 110 x 330 x 76mm. Colour and finish equal to Bowral 'Emerald'

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BWK6 Dry pressed face brickwork, 110 x 330 x 76mm. Colour and finish equal to Bowral 'Chillingham White' BWK7 Dry pressed face brickwork, 110  $\times$  330  $\times$  76mm. Colour and finish equal to Bowral 'Indulgent White'

BWP1 Flemish bond with projecting 'hit-and-miss' pattern, tooled joint

BWP3 Soldier course brickwork pattern CLD1 Metal cladding system with concealed essential service doors and louver system. Powdercoat finish equal to PC3c

CLD2 Metal hood with 50% perforations to achieve solar access. Colour varies, refer to DA-890-101

CLD4 Metal frame colour to match PCF4 CLD5 Metal hood, colour varies, refer to DA-890-101

COF1 Off-form concrete, patched and painted COF2 Off-form concrete, natural smooth board finish. Natural grey concrete mix, penetrating clear matte sealer over Precast concrete panel as part of overall facade system. Smooth finish, colour equal to 'lite & brite' concrete mix with white oxide pigment additive. Penetrating clear matte sealer over. CPC2 Decorative precast concrete panel as part of overall facade system. Vertical, radius profiled form liner finish, 30mm spacing, 32mm diam, 53mm depth equal to Reckil 2/94 'Orinoco' profile. Colour equal to CPC1. Penetrating clear matte sealer over.

CPC3 Decorative precast concrete panel as part of overall facade system. Vertical square edged profiled form liner finish, 30mm spacing, 15mm depth equal to Reckli 2/77 'Tigris' profile. Colour equal to CPC1

CPC4 Precast concrete panel as part of overall facade system. Smooth finish, colour equal to PF(a). Penetrating clear matte sealer over. FT1a Aluminium framed, front glazed, fixed window system with integrated aluminium louvre system. CLD5 to facade opening. Frame equal to PCF4, glazing equal to GC1, integrated louvre system equal to LV1, hood colour varies, refer to DA-890-101. FT1a (x): FT1a with CLD5 of x mm depth.

FT1b Facade system equal to FT1a with transom at slab level. GC2 above. FT1b (x): FT1b with CLD5 of x mm depth.

FT2a Facade system equal to FT1, without LV1. FT2a (x): FT1a with CLD5 of x mm depth.

FT2b Facade system equal to FT2a with transom at slab level. GC2 FT2c Facade system equal to FT2a without CLD5

Aluminium framed, front glazed sliding door system to residential balcony. Balustrade at balcony edge. CLD2 to facade opening. Aluminium frame finish equal to PCF1(a), glass equal to GC1, balustrade equal to BAL2, hood colour varies, refer to DA-890-101.

Aluminium framed, front glazed window system with fixed open mechanical louvre system for ventilation, colour to match PCF4. Frame equal to PCF4 glass equal to GC3

FT6 Aluminium framed, front glazed window system Colour and finish to match PCF4, glass equal to GC1.

FT7 Aluminium framed, glazed window window system on 600mm concrete upstand

FT8 Framing system, decorative steel frame with projecting bay window elements frameless fixed glazing system to be either front-fixed, rear fixed or centre-fixed, frame colour to equal to PCF4, glass equal to GC1

FT9 Framing system, decorative steel frame with projecting bay window elements. Fixed glazing with operable elements equal to 'Aneeta' sashless window system. Steel, paint finish. Colour and finish to match PCF4, glass equal to GC1. Aluminium framed, front glazed window system with hinged door panel and fixed open louvre system for lobby ventilation. Frame equal to PCF4, glass equal to GC3. PL1 at balcony edge with BAL2 fixed internally.

FT10 Secure lobby entry door system, semi frameless glass with continuous bottom rail and full height decorative 19mm pull handle, glass equal to GC1. FT11 Framing system, solid metal cladding, colour to match PCF4

Curtainwall front fixed glazing system. 300mm x 50mm fixed vertical fins, colour varies

Retail entry door system, semi frameless glass with continuous bottom rail and full height decorative 19mm pull handle. Glass type equal to GC1. Framing system, steel, paint finish. Framing colour to match PCF4.

GC1 Clear glass

GC2 Shadowbox glazing system

GC3 Grey glass Green roof planting to Landscape Architect's requirements Planter boxes to Landscape Architect's requirements Green wall planting to Landscape Architect's requirements. External face to match CPC3

Aluminium framed, fixed horizontal louvre system to mechanical engineer's requirements. Frame and louvres equal to PCF4

PCF1a Powdercoat finish colour equal to Interpon 'Pacific Avenue'
PCF1b Powdercoat finish colour equal to Interpon 'Natura Matt'
PCF1c Powdercoat finish colour equal to Interpon 'Atlante'

PCF2a Powdercoat finish colour equal to Interpon 'Viper Green Gloss' Powdercoat finish colour equal to Interpon 'Sable Gilded Green' Powdercoat finish colour equal to Interpon 'Shamrock Gloss'

PCF3a Powdercoat finish colour equal to Interpon 'Pearl White Matt'
PCF3b Powdercoat finish colour equal to Interpon 'Silver Pearl Matt'
PCF3c Powdercoat finish colour equal to Interpon 'Titanium Pearl Matt' PCF4 Powdercoat finish colour equal to Interpon 'Monument Matt'

Materials & Finishes Board

FT1 - FT3 Colouring

PCF5a Powdercoat finish colour equal to Interpon 'Magnolia' PCF5b Powdercoat finish colour equal to Interpon 'Luxe Bronze Pearl' PF1 Paint finish colour equal to Interpon 'Monument Matt' PF2 Paint finish colour equal to Interpon 'Titanium Pearl Matt'

PLD1 Panel lift door to loading dock, colour equal to PCF4

PCF3a PCF3b PCF3c

PCF5a PCF5b

PCF2a PCF2b PCF2c

PLD2 Panel lift door to basement carpark, colour equal to PCF4 PV1 Paving, refer Landscape Architect's documents

SCN1 Brickwork screen to eastern facade. Colour and finish equal to varies, refer to DA-890-102 SCN2 Brickwork screen to western facade. Colour and finish equal to varies, refer to DA-890-102

SCN3 1800mm high aluminium framed, glazed screen to rooftop communal area. Frame finish equal to PCF4, glass equal to GC1.
SGN1 Building identification signage zone for surface fixed signage

SL1 Skylight, glass equal to GC1 Note: Refer to Landscape Architect's documents for public domain and landscape areas for further information regarding materials and finishes selection.

Project Title 273-275 Anzac Parade 273-275 Anzac Parade, Kensington Sydney NSW 2032 Drawing Title

20059 ML, TL, SW 1:200 @A1, 50%@A3 DA-890-101 Post s34 for L& E Court

Approved by Revision Notes

DLCS Quality Endorsed Company ISO 9001:2015, Registration Number 20476 Nominated Architect: Nicholas Turner 6695, ABN 86 064 084 911

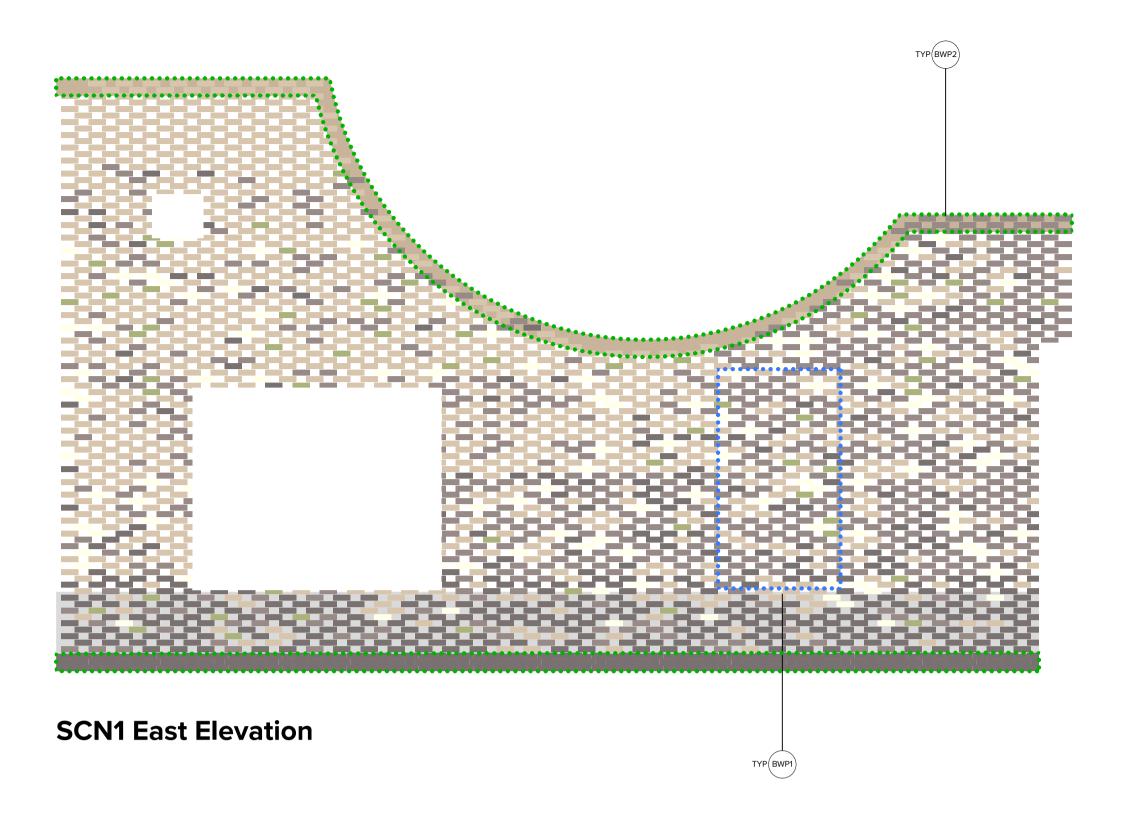
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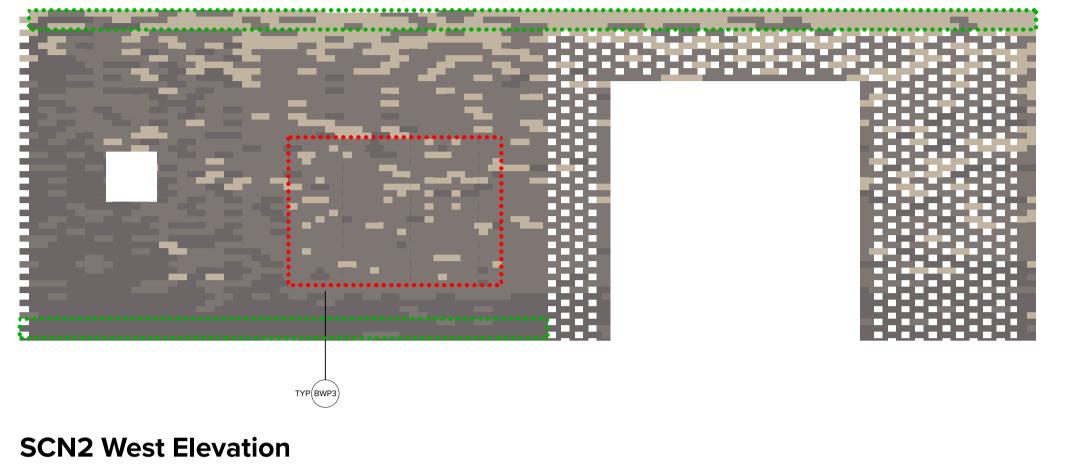
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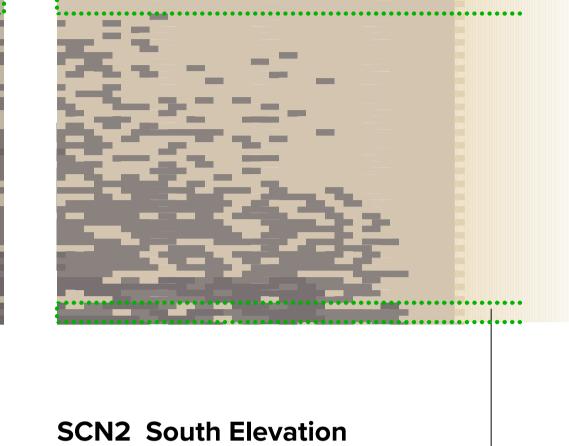
Rev Date

Issued post s.34 for Land and Environment Court









Brick wall continues as BWK1

AWN1 Sculptural awning to building address. CLD1 to exposed edges CLD3 to archway soffit and sides.

AWN2 Metal rooftop shade structure AWN3 Folded steel awning with decorative motif laser cut into leading edge. Paint finish equal to PCF4. GC1 edge with separate steel flat bar support

BAL1 Semi-frameless full height clear glass balustrade system with 150mm wide top rail. Framing system, aluminium, powder coat finish. Colour to match PCF4. Min 1.1m High

BWK1 Dry pressed face brickwork, 110 x 330 x 76mm. Colour and finish equal to Bowral 'Gertrudis Brown'

BWK2 Dry pressed face brickwork, 110 x 230 x 76mm. Colour and finish equal to Bowral 'Simmental Silver'

BWK3 Dry pressed face brickwork, 110 x 330 x 76mm. Colour and finish equal to Bowral 'Bowral Blue' BWK4 Decorative glazed brickwork, blue. Colour and finish equal to Burlesque 'Smashing Blue' 260 x 50mm 'slimline' format.
Brickwork pattern, Vertical Stretcher bond. Mortar colour, 'black'.

BWK5 Dry pressed face brickwork, 110 x 330 x 76mm. Colour and finish equal to Bowral 'Emerald' BWK6 Dry pressed face brickwork, 110 x 330 x 76mm. Colour and finish equal to Bowral 'Chillingham White'

BWK7 Dry pressed face brickwork, 110 x 330 x 76mm. Colour and finish equal to Bowral 'Indulgent White' BWP1 Flemish bond with projecting 'hit-and-miss' pattern, tooled joint BWP2 Protruding brickwork pattern

CLD1 Metal cladding system with concealed essential service doors and louver system. Powdercoat finish equal to PC3c

CLD2 Metal hood with 50% perforations to achieve solar access. Colour varies, refer to DA-890-101 CLD4 Metal frame colour to match PCF4

CLD5 Metal hood, colour varies, refer to DA-890-101 COF1 Off-form concrete, patched and painted

COF2 Off-form concrete, natural smooth board finish. Natural grey concrete mix, penetrating clear matte sealer over Precast concrete panel as part of overall facade system. Smooth finish, colour equal to 'lite & brite' concrete mix with white oxide pigment additive. Penetrating clear matte sealer over. CPC2 Decorative precast concrete panel as part of overall facade system. Vertical, radius profiled form liner finish, 30mm spacing, 32mm diam, 53mm depth equal to Reckil 2/94 'Orinoco' profile. Colour equal to CPC1. Penetrating clear matte sealer over.

CPC3 Decorative precast concrete panel as part of overall facade system. Vertical square edged profiled form liner finish, 30mm spacing, 15mm depth equal to Reckli 2/77 'Tigris' profile. Colour equal to CPC1

CPC4 Precast concrete panel as part of overall facade system. Smooth finish, colour equal to PF(a). Penetrating clear matte sealer over. FT1a Aluminium framed, front glazed, fixed window system with integrated aluminium louvre system. CLD5 to facade opening. Frame equal to PCF4, glazing equal to GC1, integrated louvre system equal to LV1, hood colour varies, refer to DA-890-101. FT1a (x): FT1a with CLD5 of x mm depth. FT1b Facade system equal to FT1a with transom at slab level. GC2

FT1b (x): FT1b with CLD5 of x mm depth.

FT2b Facade system equal to FT2a with transom at slab level. GC2 above. FT2c Facade system equal to FT2a without CLD5

Aluminium framed, front glazed sliding door system to residential balcony. Balustrade at balcony edge. CLD2 to facade opening. Aluminium frame finish equal to PCF1(a), glass equal to GC1, balustrade equal to BAL2, hood colour varies, refer to DA-890-101. Aluminium framed, front glazed window system with hinged door panel and fixed open louvre system for lobby ventilation. Frame equal to PCF4, glass equal to GC3. PL1 at balcony edge with BAL2 fixed internally.

Aluminium framed, front glazed window system with fixed open mechanical louvre system for ventilation, colour to match PCF4. Frame equal to PCF4 glass equal to GC3

FT6 Aluminium framed, front glazed window system Colour and finish to match PCF4, glass equal to GC1.

FT7 Aluminium framed, glazed window window system on 600mm concrete upstand FT8 Framing system, decorative steel frame with projecting bay window elements frameless fixed glazing system to be either front-fixed, rear fixed or centre-fixed, frame colour to equal to PCF4, glass equal to GC1

FT9 Framing system, decorative steel frame with projecting bay window elements. Fixed glazing with operable elements equal to 'Aneeta' sashless window system. Steel, paint finish. Colour and finish to match PCF4, glass equal to GC1.

FT10 Secure lobby entry door system, semi frameless glass with continuous bottom rail and full height decorative 19mm pull handle, glass equal to GC1. FT11 Framing system, solid metal cladding, colour to match PCF4

FT12 Curtainwall front fixed glazing system. 300mm x 50mm fixed vertical fins, colour varies

Retail entry door system, semi frameless glass with continuous bottom rail and full height decorative 19mm pull handle. Glass type equal to GC1. Framing system, steel, paint finish. Framing colour to match PCF4.

GC2 Shadowbox glazing system

GC3 Grey glass Green roof planting to Landscape Architect's requirements Planter boxes to Landscape Architect's requirements Green wall planting to Landscape Architect's requirements. External face to match CPC3

Aluminium framed, fixed horizontal louvre system to mechanical engineer's requirements. Frame and louvres equal to PCF4

PCF1a Powdercoat finish colour equal to Interpon 'Pacific Avenue'
PCF1b Powdercoat finish colour equal to Interpon 'Natura Matt'
PCF1c Powdercoat finish colour equal to Interpon 'Atlante'

PCF2a Powdercoat finish colour equal to Interpon 'Viper Green Gloss' Powdercoat finish colour equal to Interpon 'Sable Gilded Green' Powdercoat finish colour equal to Interpon 'Shamrock Gloss' PCF3a Powdercoat finish colour equal to Interpon 'Pearl White Matt'
PCF3b Powdercoat finish colour equal to Interpon 'Silver Pearl Matt'
Powdercoat finish colour equal to Interpon 'Titanium Pearl Matt'

PF1 Paint finish colour equal to Interpon 'Monument Matt' PF2 Paint finish colour equal to Interpon 'Titanium Pearl Matt'

PLD2 Panel lift door to basement carpark, colour equal to PCF4

PV1 Paving, refer Landscape Architect's documents

PCF4 Powdercoat finish colour equal to Interpon 'Monument Matt' PCF5a Powdercoat finish colour equal to Interpon 'Magnolia' PCF5b Powdercoat finish colour equal to Interpon 'Luxe Bronze Pearl'

273-275 Anzac Parade

Materials & Finishes Board

SCN1 and SCN2 Colouring

PLD1 Panel lift door to loading dock, colour equal to PCF4

SCN1 Brickwork screen to eastern facade. Colour and finish equal to varies, refer to DA-890-102

SCN2 Brickwork screen to western facade. Colour and finish equal to varies, refer to DA-890-102 SCN3 1800mm high aluminium framed, glazed screen to rooftop communal area. Frame finish equal to PCF4, glass equal to GC1.
SGN1 Building identification signage zone for surface fixed signage

Note: Refer to Landscape Architect's documents for public domain and landscape areas for further information regarding materials and finishes selection. Rev Date

C 19.11.21 CH Issued post s.34 for Land and Environment Court Approved by Revision Notes 20059 ML, TL, SW 1:50 @A1, 50%@A3 273-275 Anzac Parade, Kensington Sydney NSW 2032 DA-890-102 Post s34 for L& E Court

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BAL1 Semi-frameless full height clear glass balustrade system with 150mm wide top rail. Framing system, aluminium, powder coat finish. Colour to match PCF4. Min 1.1m High

BAL2 Frameless glass balustrade system, fixed to inside face of concrete upstand. Min 1.1m High

BWK1 Dry pressed face brickwork, 110 x 330 x 76mm. Colour and finish equal to Bowral 'Gertrudis Brown'

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BWK6 Dry pressed face brickwork, 110 x 330 x 76mm. Colour and finish equal to Bowral 'Chillingham White'

BWK7 Dry pressed face brickwork, 110 x 330 x 76mm. Colour and finish equal to Bowral 'Indulgent White' BWP1 Flemish bond with projecting 'hit-and-miss' pattern, tooled joint BWP2 Protruding brickwork pattern

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COF1 Off-form concrete, patched and painted COF2 Off-form concrete, natural smooth board finish. Natural grey concrete mix, penetrating clear matte sealer over Precast concrete panel as part of overall facade system. Smooth finish, colour equal to 'lite & brite' concrete mix with white oxide pigment additive. Penetrating clear matte sealer over. Aluminium framed, front glazed, fixed window system with integrated aluminium louvre system. CLD5 to facade opening. Frame equal to PCF4, glazing equal to GC1, integrated louvre system equal to LV1, hood colour varies, refer to DA-890-101. FT1a (X): FT1a with CLD5 of x mm depth.

FT1b Facade system equal to FT1a with transom at slab level. GC2 FT1b (x): FT1b with CLD5 of x mm depth.

Aluminium framed, front glazed window system with hinged door panel and fixed open louvre system for lobby ventilation. Frame equal to PCF4, glass equal to GC3. PL1 at balcony edge with BAL2 fixed internally.

Aluminium framed, front glazed window system with fixed open mechanical louvre system for ventilation, colour to match PCF4. Frame equal to PCF4 glass equal to GC3

FT9 Framing system, decorative steel frame with projecting bay window elements. Fixed glazing with operable elements equal to 'Aneeta' sashless window system. Steel, paint finish. Colour and finish to match PCF4, glass equal to GC1. FT10 Secure lobby entry door system, semi frameless glass with continuous bottom rail and full height decorative 19mm pull handle, glass equal to GC1.

FT11 Framing system, solid metal cladding, colour to match PCF4

Aluminium framed, fixed horizontal louvre system to mechanical engineer's requirements. Frame and louvres equal to PCF4

Green roof planting to Landscape Architect's requirements Planter boxes to Landscape Architect's requirements Green wall planting to Landscape Architect's requirements. External face to match CPC3

PCF4 Powdercoat finish colour equal to Interpon 'Monument Matt' PCF5a Powdercoat finish colour equal to Interpon 'Magnolia' PCF5b Powdercoat finish colour equal to Interpon 'Luxe Bronze Pearl' PF1 Paint finish colour equal to Interpon 'Monument Matt'

PF2 Paint finish colour equal to Interpon 'Titanium Pearl Matt'

Perspective 01

SCN3 1800mm high aluminium framed, glazed screen to rooftop communal area. Frame finish equal to PCF4, glass equal to GC1.
SGN1 Building identification signage zone for surface fixed signage

SL1 Skylight, glass equal to GC1 Note: Refer to Landscape Architect's documents for public domain and landscape areas for further information regarding materials and finishes selection.

273-275 Anzac Parade 273-275 Anzac Parade, Kensington Sydney NSW 2032 Drawing Title 3D Views

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DLCS Quality Endorsed Company ISO 9001:2015, Registration Number 20476 Nominated Architect: Nicholas Turner 6695, ABN 86 064 084 911



AWN2 Metal rooftop shade structure

AWN3 Folded steel awning with decorative motif laser cut into leading edge. Paint finish equal to PCF4. GC1 edge with separate steel flat bar support

BAL1 Semi-frameless full height clear glass balustrade system with 150mm wide top rail. Framing system, aluminium, powder coat finish. Colour to match PCF4. Min 1.1m High

BAL2 Frameless glass balustrade system, fixed to inside face of concrete upstand. Min 1.1m High

BWK1 Dry pressed face brickwork, 110 x 330 x 76mm. Colour and finish equal to Bowral 'Gertrudis Brown'

BWK3 Dry pressed face brickwork, 110 x 330 x 76mm. Colour and finish equal to Bowral 'Bowral Blue' BWK4 Decorative glazed brickwork, blue. Colour and finish equal to Burlesque 'Smashing Blue' 260 x 50mm 'slimline' format. Brickwork pattern, Vertical Stretcher bond. Mortar colour, 'black'.

BWK5 Dry pressed face brickwork, 110 x 330 x 76mm. Colour and finish equal to Bowral 'Emerald' BWK6 Dry pressed face brickwork, 110 x 330 x 76mm. Colour and finish equal to Bowral 'Chillingham White'

BWK7 Dry pressed face brickwork, 110 x 330 x 76mm. Colour and finish equal to Bowral 'Indulgent White' BWP1 Flemish bond with projecting 'hit-and-miss' pattern, tooled joint

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BWP2 Protruding brickwork pattern

CLD1 Metal cladding system with concealed essential service doors and louver system. Powdercoat finish equal to PC3c

CLD2 Metal hood with 50% perforations to achieve solar access. Colour varies, refer to DA-890-101

CLD4 Metal frame colour to match PCF4 CLD5 Metal hood, colour varies, refer to DA-890-101

COF1 Off-form concrete, patched and painted COF2 Off-form concrete, natural smooth board finish. Natural grey concrete mix, penetrating clear matte sealer over

Precast concrete panel as part of overall facade system. Smooth finish, colour equal to 'lite & brite' concrete mix with white oxide pigment additive. Penetrating clear matte sealer over.

CPC3 Decorative precast concrete panel as part of overall facade system. Vertical square edged profiled form liner finish, 30mm spacing, 15mm depth equal to Reckli 2/77 'Tigris' profile. Colour equal to CPC1

CPC4 Precast concrete panel as part of overall facade system. Smooth finish, colour equal to PF(a). Penetrating clear matte sealer over. Aluminium framed, front glazed, fixed window system with integrated aluminium louvre system. CLD5 to facade opening. Frame equal to PCF4, glazing equal to GC1, integrated louvre system equal to LV1, hood colour varies, refer to DA-890-101. FT1a (X): FT1a with CLD5 of x mm depth.

above. FT1b (x): FT1b with CLD5 of x mm depth.

FT1b Facade system equal to FT1a with transom at slab level. GC2

above. Facade system equal to FT2a without CLD5, glass equal to GC1 Facade system equal to FT2a without CLD5, glass equal to GC3 Aluminium framed, front glazed sliding door system to residential balcony. Balustrade at balcony edge. CLD2 to facade opening. Aluminium frame finish equal to PCF1(a), glass equal to GC1, balustrade equal to BAL2, hood colour varies, refer to DA-890-101.

Aluminium framed, front glazed window system with hinged door panel and fixed open louvre system for lobby ventilation. Frame equal to PCF4, glass equal to GC3. PL1 at balcony edge with BAL2 fixed internally. Aluminium framed, front glazed window system with fixed open mechanical louvre system for ventilation, colour to match PCF4. Frame equal to PCF4 glass equal to GC3

FT8 Framing system, decorative steel frame with projecting bay window elements frameless fixed glazing system to be either front-fixed, rear fixed or centre-fixed, frame colour to equal to PCF4, glass equal to GC1

FT9 Framing system, decorative steel frame with projecting bay window elements. Fixed glazing with operable elements equal to 'Aneeta' sashless window system. Steel, paint finish. Colour and finish to match PCF4, glass equal to GC1. FT10 Secure lobby entry door system, semi frameless glass with continuous bottom rail and full height decorative 19mm pull handle, glass equal to GC1.

FT11 Framing system, solid metal cladding, colour to match PCF4

concrete upstand

Retail entry door system, semi frameless glass with continuous bottom rail and full height decorative 19mm pull handle. Glass type equal to GC1. Framing system, steel, paint finish. Framing colour to match PCF4.

GC2 Shadowbox glazing system

GC3 Grey glass Green roof planting to Landscape Architect's requirements Planter boxes to Landscape Architect's requirements Green wall planting to Landscape Architect's requirements. External face to match CPC3

Aluminium framed, fixed horizontal louvre system to mechanical engineer's requirements. Frame and louvres equal to PCF4

PCF2a Powdercoat finish colour equal to Interpon 'Viper Green Gloss' Powdercoat finish colour equal to Interpon 'Sable Gilded Green' Powdercoat finish colour equal to Interpon 'Shamrock Gloss' PCF3a Powdercoat finish colour equal to Interpon 'Pearl White Matt'
PCF3b Powdercoat finish colour equal to Interpon 'Silver Pearl Matt'
Powdercoat finish colour equal to Interpon 'Titanium Pearl Matt' PCF4 Powdercoat finish colour equal to Interpon 'Monument Matt'

PCF5a Powdercoat finish colour equal to Interpon 'Magnolia' PCF5b Powdercoat finish colour equal to Interpon 'Luxe Bronze Pearl' PF1 Paint finish colour equal to Interpon 'Monument Matt' PF2 Paint finish colour equal to Interpon 'Titanium Pearl Matt'

PV1 Paving, refer Landscape Architect's documents SCN1 Brickwork screen to eastern facade. Colour and finish equal to varies, refer to DA-890-102

SCN2 Brickwork screen to western facade. Colour and finish equal to varies, refer to DA-890-102 SCN3 1800mm high aluminium framed, glazed screen to rooftop communal area. Frame finish equal to PCF4, glass equal to GC1.
SGN1 Building identification signage zone for surface fixed signage

SL1 Skylight, glass equal to GC1 Note: Refer to Landscape Architect's documents for public domain and landscape areas for further information regarding materials and finishes selection.

273-275 Anzac Parade 273-275 Anzac Parade, Kensington Sydney NSW 2032 Drawing Title 3D Views Perspective 02

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DLCS Quality Endorsed Company ISO 9001:2015, Registration Number 20476 Nominated Architect: Nicholas Turner 6695, ABN 86 064 084 911

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- BAL1 Semi-frameless full height clear glass balustrade system with 150mm wide top rail. Framing system, aluminium, powder coat finish. Colour to match PCF4. Min 1.1m High
- BAL2 Frameless glass balustrade system, fixed to inside face of concrete upstand. Min 1.1m High
- BWK1 Dry pressed face brickwork, 110 x 330 x 76mm. Colour and finish equal to Bowral 'Gertrudis Brown'

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- BWK5 Dry pressed face brickwork, 110 x 330 x 76mm. Colour and finish equal to Bowral 'Emerald'
- BWK6 Dry pressed face brickwork, 110 x 330 x 76mm. Colour and finish equal to Bowral 'Chillingham White'
- BWK7 Dry pressed face brickwork, 110 x 330 x 76mm. Colour and finish equal to Bowral 'Indulgent White'
- BWP1 Flemish bond with projecting 'hit-and-miss' pattern, tooled joint BWP2 Protruding brickwork pattern

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- CLD4 Metal frame colour to match PCF4 CLD5 Metal hood, colour varies, refer to DA-890-101
- COF1 Off-form concrete, patched and painted
- COF2 Off-form concrete, natural smooth board finish. Natural grey concrete mix, penetrating clear matte sealer over Precast concrete panel as part of overall facade system. Smooth finish, colour equal to 'lite & brite' concrete mix with white oxide pigment additive. Penetrating clear matte sealer over.
- CPC4 Precast concrete panel as part of overall facade system. Smooth finish, colour equal to PF(a). Penetrating clear matte sealer over. Aluminium framed, front glazed, fixed window system with integrated aluminium louvre system. CLD5 to facade opening. Frame equal to PCF4, glazing equal to GC1, integrated louvre system equal to LV1, hood colour varies, refer to DA-890-101. FT1a (X): FT1a with CLD5 of x mm depth.
  - FT1b Facade system equal to FT1a with transom at slab level. GC2 above. FT1b (x): FT1b with CLD5 of x mm depth.
- Aluminium framed, front glazed sliding door system to residential balcony. Balustrade at balcony edge. CLD2 to facade opening. Aluminium frame finish equal to PCF1(a), glass equal to GC1, balustrade equal to BAL2, hood colour varies, refer to DA-890-101. Aluminium framed, front glazed window system with hinged door panel and fixed open louvre system for lobby ventilation. Frame equal to PCF4, glass equal to GC3. PL1 at balcony edge with BAL2 fixed internally.
- Aluminium framed, front glazed window system with fixed open mechanical louvre system for ventilation, colour to match PCF4. Frame equal to PCF4 glass equal to GC3
- FT8 Framing system, decorative steel frame with projecting bay window elements frameless fixed glazing system to be either front-fixed, rear fixed or centre-fixed, frame colour to equal to PCF4, glass equal to GC1
- FT9 Framing system, decorative steel frame with projecting bay window elements. Fixed glazing with operable elements equal to 'Aneeta' sashless window system. Steel, paint finish. Colour and finish to match PCF4, glass equal to GC1.
- FT10 Secure lobby entry door system, semi frameless glass with continuous bottom rail and full height decorative 19mm pull handle, glass equal to GC1. FT11 Framing system, solid metal cladding, colour to match PCF4

GC3 Grey glass

- GC2 Shadowbox glazing system
- Green roof planting to Landscape Architect's requirements Planter boxes to Landscape Architect's requirements Green wall planting to Landscape Architect's requirements. External face to match CPC3
- Aluminium framed, fixed horizontal louvre system to mechanical engineer's requirements. Frame and louvres equal to PCF4
- PCF3a Powdercoat finish colour equal to Interpon 'Pearl White Matt'
  PCF3b Powdercoat finish colour equal to Interpon 'Silver Pearl Matt'
  PCF3c Powdercoat finish colour equal to Interpon 'Titanium Pearl Matt'
- PCF4 Powdercoat finish colour equal to Interpon 'Monument Matt' PCF5a Powdercoat finish colour equal to Interpon 'Magnolia' PCF5b Powdercoat finish colour equal to Interpon 'Luxe Bronze Pearl'

PF1 Paint finish colour equal to Interpon 'Monument Matt'

PF2 Paint finish colour equal to Interpon 'Titanium Pearl Matt'

Perspective 03

- SCN2 Brickwork screen to western facade. Colour and finish equal to varies, refer to DA-890-102 SCN3 1800mm high aluminium framed, glazed screen to rooftop communal area. Frame finish equal to PCF4, glass equal to GC1.
  SGN1 Building identification signage zone for surface fixed signage
- SL1 Skylight, glass equal to GC1 Note: Refer to Landscape Architect's documents for public domain and landscape areas for further information regarding materials and finishes selection.

273-275 Anzac Parade 273-275 Anzac Parade, Kensington Sydney NSW 2032 Drawing Title 3D Views

C 19.11.21 Issued post s.34 for Land and Environment Court Approved by Revision Notes 20059 ML, TL, SW @A1, 50%@A3 DA-910-003 Post s34 for L& E Court

DLCS Quality Endorsed Company ISO 9001:2015, Registration Number 20476 Nominated Architect: Nicholas Turner 6695, ABN 86 064 084 911



AWN2 Metal rooftop shade structure

- AWN1 Sculptural awning to building address. CLD1 to exposed edges CLD3 to archway soffit and sides.
- AWN3 Folded steel awning with decorative motif laser cut into leading edge. Paint finish equal to PCF4. GC1 edge with separate steel flat bar support
- BAL1 Semi-frameless full height clear glass balustrade system with 150mm wide top rail. Framing system, aluminium, powder coat finish. Colour to match PCF4. Min 1.1m High
- BAL2 Frameless glass balustrade system, fixed to inside face of concrete upstand. Min 1.1m High
- BWK1 Dry pressed face brickwork, 110 x 330 x 76mm. Colour and finish equal to Bowral 'Gertrudis Brown'
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- BWK2 Dry pressed face brickwork, 110 x 230 x 76mm. Colour and finish equal to Bowral 'Simmental Silver' BWK3 Dry pressed face brickwork, 110 x 330 x 76mm. Colour and finish equal to Bowral 'Bowral Blue'
- BWK4 Decorative glazed brickwork, blue. Colour and finish equal to Burlesque 'Smashing Blue' 260 x 50mm 'slimline' format. Brickwork pattern, Vertical Stretcher bond. Mortar colour, 'black'. BWK5 Dry pressed face brickwork, 110 x 330 x 76mm. Colour and finish equal to Bowral 'Emerald'
- BWK6 Dry pressed face brickwork, 110 x 330 x 76mm. Colour and finish equal to Bowral 'Chillingham White'
- BWK7 Dry pressed face brickwork, 110  $\times$  330  $\times$  76mm. Colour and finish equal to Bowral 'Indulgent White' BWP1 Flemish bond with projecting 'hit-and-miss' pattern, tooled joint BWP2 Protruding brickwork pattern

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- - - - COF1 Off-form concrete, patched and painted
- BWP3 Soldier course brickwork pattern
- CLD1 Metal cladding system with concealed essential service doors and louver system. Powdercoat finish equal to PC3c CLD2 Metal hood with 50% perforations to achieve solar access. Colour varies, refer to DA-890-101
  - CLD4 Metal frame colour to match PCF4
  - CLD5 Metal hood, colour varies, refer to DA-890-101
  - COF2 Off-form concrete, natural smooth board finish. Natural grey concrete mix, penetrating clear matte sealer over
    - Precast concrete panel as part of overall facade system. Smooth finish, colour equal to 'lite & brite' concrete mix with white oxide pigment additive. Penetrating clear matte sealer over.
- CPC2 Decorative precast concrete panel as part of overall facade system. Vertical, radius profiled form liner finish, 30mm spacing, 32mm diam, 53mm depth equal to Reckil 2/94 'Orinoco' profile. Colour equal to CPC1. Penetrating clear matte sealer over.
- CPC3 Decorative precast concrete panel as part of overall facade system. Vertical square edged profiled form liner finish, 30mm spacing, 15mm depth equal to Reckli 2/77 'Tigris' profile. Colour equal to CPC1
- CPC4 Precast concrete panel as part of overall facade system. Smooth finish, colour equal to PF(a). Penetrating clear matte sealer over. Aluminium framed, front glazed, fixed window system with integrated aluminium louvre system. CLD5 to facade opening. Frame equal to PCF4, glazing equal to GC1, integrated louvre system equal to LV1, hood colour varies, refer to DA-890-101. FT1a (X): FT1a with CLD5 of x mm depth.
  - FT1b Facade system equal to FT1a with transom at slab level. GC2 above. FT1b (x): FT1b with CLD5 of x mm depth.
- FT2a Facade system equal to FT1, without LV1.
  FT2a (x): FT1a with CLD5 of x mm depth.
  FT2b Facade system equal to FT2a with transom at slab level. GC2
- above.
  Facade system equal to FT2a without CLD5, glass equal to GC1
  Facade system equal to FT2a without CLD5, glass equal to GC3
- Aluminium framed, front glazed sliding door system to residential balcony. Balustrade at balcony edge. CLD2 to facade opening. Aluminium frame finish equal to PCF1(a), glass equal to GC1, balustrade equal to BAL2, hood colour varies, refer to DA-890-101. Aluminium framed, front glazed window system with hinged door panel and fixed open louvre system for lobby ventilation. Frame equal to PCF4, glass equal to GC3. PL1 at balcony edge with BAL2 fixed internally.
- Aluminium framed, front glazed window system with fixed open mechanical louvre system for ventilation, colour to match PCF4. Frame equal to PCF4 glass equal to GC3
- FT6 Aluminium framed, front glazed window system Colour and finish to match PCF4, glass equal to GC1.

FT7 Aluminium framed, glazed window window system on 600mm

- concrete upstand FT8 Framing system, decorative steel frame with projecting bay window elements frameless fixed glazing system to be either front-fixed, rear fixed or centre-fixed, frame colour to equal to PCF4, glass equal to GC1
- FT9 Framing system, decorative steel frame with projecting bay window elements. Fixed glazing with operable elements equal to 'Aneeta' sashless window system. Steel, paint finish. Colour and finish to match PCF4, glass equal to GC1. FT10 Secure lobby entry door system, semi frameless glass with continuous bottom rail and full height decorative 19mm pull handle, glass equal to GC1.
- FT11 Framing system, solid metal cladding, colour to match PCF4
- Curtainwall front fixed glazing system. 300mm x 50mm fixed vertical fins, colour varies
- Retail entry door system, semi frameless glass with continuous bottom rail and full height decorative 19mm pull handle. Glass type equal to GC1. Framing system, steel, paint finish. Framing colour to match PCF4.
- GC2 Shadowbox glazing system
- GC3 Grey glass Green roof planting to Landscape Architect's requirements Planter boxes to Landscape Architect's requirements Green wall planting to Landscape Architect's requirements. External face to match CPC3
- Aluminium framed, fixed horizontal louvre system to mechanical engineer's requirements. Frame and louvres equal to PCF4
- PCF1a Powdercoat finish colour equal to Interpon 'Pacific Avenue'
  PCF1b Powdercoat finish colour equal to Interpon 'Natura Matt'
  PCF1c Powdercoat finish colour equal to Interpon 'Atlante'
- PCF2a Powdercoat finish colour equal to Interpon 'Viper Green Gloss' PCF2b Powdercoat finish colour equal to Interpon 'Sable Gilded Green' Powdercoat finish colour equal to Interpon 'Shamrock Gloss' PCF3a Powdercoat finish colour equal to Interpon 'Pearl White Matt'
  PCF3b Powdercoat finish colour equal to Interpon 'Silver Pearl Matt'
  PCF3c Powdercoat finish colour equal to Interpon 'Titanium Pearl Matt'
- PCF4 Powdercoat finish colour equal to Interpon 'Monument Matt' PCF5a Powdercoat finish colour equal to Interpon 'Magnolia' PCF5b Powdercoat finish colour equal to Interpon 'Luxe Bronze Pearl'

PF1 Paint finish colour equal to Interpon 'Monument Matt'

PF2 Paint finish colour equal to Interpon 'Titanium Pearl Matt'

- PLD1 Panel lift door to loading dock, colour equal to PCF4 PLD2 Panel lift door to basement carpark, colour equal to PCF4
- PV1 Paving, refer Landscape Architect's documents SCN1 Brickwork screen to eastern facade. Colour and finish equal to varies, refer to DA-890-102
- SCN2 Brickwork screen to western facade. Colour and finish equal to varies, refer to DA-890-102
- SCN3 1800mm high aluminium framed, glazed screen to rooftop communal area. Frame finish equal to PCF4, glass equal to GC1.
  SGN1 Building identification signage zone for surface fixed signage
- SL1 Skylight, glass equal to GC1 Note: Refer to Landscape Architect's documents for public domain and landscape areas for further information regarding materials and finishes selection.

C 19.11.21 Issued post s.34 for Land and Environment Court Approved by Revision Notes Project Title 20059 ML, TL, SW 273-275 Anzac Parade @A1, 50%@A3 273-275 Anzac Parade, Kensington Sydney NSW 2032 DA-910-004 Post s34 for L& E Court Drawing Title 3D Views Perspective 04

DLCS Quality Endorsed Company ISO 9001:2015, Registration Number 20476 Nominated Architect: Nicholas Turner 6695, ABN 86 064 084 911



- AWN1 Sculptural awning to building address. CLD1 to exposed edges CLD3 to archway soffit and sides.
- AWN2 Metal rooftop shade structure
- AWN3 Folded steel awning with decorative motif laser cut into leading edge. Paint finish equal to PCF4. GC1 edge with separate steel flat bar support
- BAL1 Semi-frameless full height clear glass balustrade system with 150mm wide top rail. Framing system, aluminium, powder coat finish. Colour to match PCF4. Min 1.1m High
- BAL2 Frameless glass balustrade system, fixed to inside face of concrete upstand. Min 1.1m High BWK1 Dry pressed face brickwork, 110 x 330 x 76mm. Colour and finish equal to Bowral 'Gertrudis Brown'
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- BWK2 Dry pressed face brickwork, 110 x 230 x 76mm. Colour and finish equal to Bowral 'Simmental Silver'
- BWK3 Dry pressed face brickwork, 110 x 330 x 76mm. Colour and finish equal to Bowral 'Bowral Blue' BWK4 Decorative glazed brickwork, blue. Colour and finish equal to Burlesque 'Smashing Blue' 260 x 50mm 'slimline' format. Brickwork pattern, Vertical Stretcher bond. Mortar colour, 'black'.
- BWK5 Dry pressed face brickwork, 110 x 330 x 76mm. Colour and finish equal to Bowral 'Emerald'
- BWK6 Dry pressed face brickwork, 110 x 330 x 76mm. Colour and finish equal to Bowral 'Chillingham White'
- BWK7 Dry pressed face brickwork, 110 x 330 x 76mm. Colour and finish equal to Bowral 'Indulgent White' BWP1 Flemish bond with projecting 'hit-and-miss' pattern, tooled joint BWP2 Protruding brickwork pattern

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- CLD1 Metal cladding system with concealed essential service doors and louver system. Powdercoat finish equal to PC3c
- CLD2 Metal hood with 50% perforations to achieve solar access. Colour varies, refer to DA-890-101
- CLD4 Metal frame colour to match PCF4 CLD5 Metal hood, colour varies, refer to DA-890-101
- COF1 Off-form concrete, patched and painted COF2 Off-form concrete, natural smooth board finish. Natural grey concrete mix, penetrating clear matte sealer over
- Precast concrete panel as part of overall facade system. Smooth finish, colour equal to 'lite & brite' concrete mix with white oxide pigment additive. Penetrating clear matte sealer over.
- - CPC4 Precast concrete panel as part of overall facade system. Smooth finish, colour equal to PF(a). Penetrating clear matte sealer over.
    - FT1b Facade system equal to FT1a with transom at slab level. GC2
- CPC3 Decorative precast concrete panel as part of overall facade system. Vertical square edged profiled form liner finish, 30mm spacing, 15mm depth equal to Reckli 2/77 'Tigris' profile. Colour equal to CPC1
  - FT1a Aluminium framed, front glazed, fixed window system with integrated aluminium louvre system. CLD5 to facade opening. Frame equal to PCF4, glazing equal to GC1, integrated louvre system equal to LV1, hood colour varies, refer to DA-890-101. FT1a (x): FT1a with CLD5 of x mm depth.
    - above. FT1b (x): FT1b with CLD5 of x mm depth.
- FT2c Facade system equal to FT2a without CLD5, glass equal to GC1 FT2d Facade system equal to FT2a without CLD5, glass equal to GC3
- Aluminium framed, front glazed sliding door system to residential balcony. Balustrade at balcony edge. CLD2 to facade opening. Aluminium frame finish equal to PCF1(a), glass equal to GC1, balustrade equal to BAL2, hood colour varies, refer to DA-890-101. Aluminium framed, front glazed window system with hinged door panel and fixed open louvre system for lobby ventilation. Frame equal to PCF4, glass equal to GC3. PL1 at balcony edge with BAL2 fixed internally.
- Aluminium framed, front glazed window system with fixed open mechanical louvre system for ventilation, colour to match PCF4. Frame equal to PCF4 glass equal to GC3
- FT6 Aluminium framed, front glazed window system Colour and finish to match PCF4, glass equal to GC1. FT7 Aluminium framed, glazed window window system on 600mm
- concrete upstand FT8 Framing system, decorative steel frame with projecting bay window elements frameless fixed glazing system to be either front-fixed, rear fixed or centre-fixed, frame colour to equal to PCF4, glass equal to GC1
- FT9 Framing system, decorative steel frame with projecting bay window elements. Fixed glazing with operable elements equal to 'Aneeta' sashless window system. Steel, paint finish. Colour and finish to match PCF4, glass equal to GC1. FT10 Secure lobby entry door system, semi frameless glass with continuous bottom rail and full height decorative 19mm pull handle, glass equal to GC1.
  - FT11 Framing system, solid metal cladding, colour to match PCF4
- FT12 Curtainwall front fixed glazing system. 300mm x 50mm fixed vertical fins, colour varies
- Retail entry door system, semi frameless glass with continuous bottom rail and full height decorative 19mm pull handle. Glass type equal to GC1. Framing system, steel, paint finish. Framing colour to match PCF4.
- GC1 Clear glass

GC3 Grey glass

- GC2 Shadowbox glazing system
- Green roof planting to Landscape Architect's requirements Planter boxes to Landscape Architect's requirements Green wall planting to Landscape Architect's requirements. External face to match CPC3
- Aluminium framed, fixed horizontal louvre system to mechanical engineer's requirements. Frame and louvres equal to PCF4
- PCF1a Powdercoat finish colour equal to Interpon 'Pacific Avenue'
  PCF1b Powdercoat finish colour equal to Interpon 'Natura Matt'
  PCF1c Powdercoat finish colour equal to Interpon 'Atlante'
- PCF2a Powdercoat finish colour equal to Interpon 'Viper Green Gloss'
  PCF2b Powdercoat finish colour equal to Interpon 'Sable Gilded Green'
  Powdercoat finish colour equal to Interpon 'Shamrock Gloss' PCF3a Powdercoat finish colour equal to Interpon 'Pearl White Matt'
  PCF3b Powdercoat finish colour equal to Interpon 'Silver Pearl Matt'
  Powdercoat finish colour equal to Interpon 'Titanium Pearl Matt'
- PCF4 Powdercoat finish colour equal to Interpon 'Monument Matt' PCF5a Powdercoat finish colour equal to Interpon 'Magnolia' PCF5b Powdercoat finish colour equal to Interpon 'Luxe Bronze Pearl' PF1 Paint finish colour equal to Interpon 'Monument Matt'

PF2 Paint finish colour equal to Interpon 'Titanium Pearl Matt'

Perspective 05

- PLD2 Panel lift door to basement carpark, colour equal to PCF4 PV1 Paving, refer Landscape Architect's documents
- SCN1 Brickwork screen to eastern facade. Colour and finish equal to varies, refer to DA-890-102 SCN2 Brickwork screen to western facade. Colour and finish equal to varies, refer to DA-890-102
- SCN3 1800mm high aluminium framed, glazed screen to rooftop communal area. Frame finish equal to PCF4, glass equal to GC1.
  SGN1 Building identification signage zone for surface fixed signage
- SL1 Skylight, glass equal to GC1 Note: Refer to Landscape Architect's documents for public domain and landscape areas for further information regarding materials and finishes selection.

273-275 Anzac Parade 273-275 Anzac Parade, Kensington Sydney NSW 2032 Drawing Title 3D Views

C 19.11.21 Issued post s.34 for Land and Environment Court Approved by Revision Notes 20059 ML, TL, SW @A1, 50%@A3 DA-910-005 Post s34 for L& E Court

DLCS Quality Endorsed Company ISO 9001:2015, Registration Number 20476 Nominated Architect: Nicholas Turner 6695, ABN 86 064 084 911



- AWN2 Metal rooftop shade structure AWN3 Folded steel awning with decorative motif laser cut into leading edge. Paint finish equal to PCF4. GC1 edge with separate steel flat bar support
- BAL1 Semi-frameless full height clear glass balustrade system with 150mm wide top rail. Framing system, aluminium, powder coat finish. Colour to match PCF4. Min 1.1m High
- BAL2 Frameless glass balustrade system, fixed to inside face of concrete upstand. Min 1.1m High
- BWK1 Dry pressed face brickwork, 110 x 330 x 76mm. Colour and finish equal to Bowral 'Gertrudis Brown'
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- BWK4 Decorative glazed brickwork, blue. Colour and finish equal to Burlesque 'Smashing Blue' 260 x 50mm 'slimline' format. Brickwork pattern, Vertical Stretcher bond. Mortar colour, 'black'.
- BWK5 Dry pressed face brickwork, 110 x 330 x 76mm. Colour and finish equal to Bowral 'Emerald'
- BWK7 Dry pressed face brickwork, 110 x 330 x 76mm. Colour and finish equal to Bowral 'Indulgent White'

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- CLD5 Metal hood, colour varies, refer to DA-890-101 BWK6 Dry pressed face brickwork, 110 x 330 x 76mm. Colour and finish equal to Bowral 'Chillingham White'
- BWP1 Flemish bond with projecting 'hit-and-miss' pattern, tooled joint BWP2 Protruding brickwork pattern

- CLD4 Metal frame colour to match PCF4
- COF1 Off-form concrete, patched and painted
  - COF2 Off-form concrete, natural smooth board finish. Natural grey concrete mix, penetrating clear matte sealer over Precast concrete panel as part of overall facade system. Smooth finish, colour equal to 'lite & brite' concrete mix with white oxide pigment additive. Penetrating clear matte sealer over.
- CLD2 Metal hood with 50% perforations to achieve solar access. Colour varies, refer to DA-890-101

  - - FT1b Facade system equal to FT1a with transom at slab level. GC2 above. FT1b (x): FT1b with CLD5 of x mm depth.
- CPC3 Decorative precast concrete panel as part of overall facade system. Vertical square edged profiled form liner finish, 30mm spacing, 15mm depth equal to Reckli 2/77 'Tigris' profile. Colour equal to CPC1
- Aluminium framed, front glazed sliding door system to residential balcony. Balustrade at balcony edge. CLD2 to facade opening. Aluminium frame finish equal to PCF1(a), glass equal to GC1, balustrade equal to BAL2, hood colour varies, refer to DA-890-101. CPC4 Precast concrete panel as part of overall facade system. Smooth finish, colour equal to PF(a). Penetrating clear matte sealer over. Aluminium framed, front glazed, fixed window system with integrated aluminium louvre system. CLD5 to facade opening. Frame equal to PCF4, glazing equal to GC1, integrated louvre system equal to LV1, hood colour varies, refer to DA-890-101. FT1a (X): FT1a with CLD5 of x mm depth.
  - Aluminium framed, front glazed window system with fixed open mechanical louvre system for ventilation, colour to match PCF4. Frame equal to PCF4 glass equal to GC3
- FT8 Framing system, decorative steel frame with projecting bay window elements frameless fixed glazing system to be either front-fixed, rear fixed or centre-fixed, frame colour to equal to PCF4, glass equal to GC1
- FT9 Framing system, decorative steel frame with projecting bay window elements. Fixed glazing with operable elements equal to 'Aneeta' sashless window system. Steel, paint finish. Colour and finish to match PCF4, glass equal to GC1. Aluminium framed, front glazed window system with hinged door panel and fixed open louvre system for lobby ventilation. Frame equal to PCF4, glass equal to GC3. PL1 at balcony edge with BAL2 fixed internally.
  - FT10 Secure lobby entry door system, semi frameless glass with continuous bottom rail and full height decorative 19mm pull handle, glass equal to GC1. FT11 Framing system, solid metal cladding, colour to match PCF4
- Retail entry door system, semi frameless glass with continuous bottom rail and full height decorative 19mm pull handle. Glass type equal to GC1. Framing system, steel, paint finish. Framing colour to match PCF4.

GC3 Grey glass

- GC2 Shadowbox glazing system
- Green roof planting to Landscape Architect's requirements Planter boxes to Landscape Architect's requirements Green wall planting to Landscape Architect's requirements. External face to match CPC3
- Aluminium framed, fixed horizontal louvre system to mechanical engineer's requirements. Frame and louvres equal to PCF4
- PCF2a Powdercoat finish colour equal to Interpon 'Viper Green Gloss' PCF2b Powdercoat finish colour equal to Interpon 'Sable Gilded Green' Powdercoat finish colour equal to Interpon 'Shamrock Gloss' PCF3a Powdercoat finish colour equal to Interpon 'Pearl White Matt'
  PCF3b Powdercoat finish colour equal to Interpon 'Silver Pearl Matt'
  PCF3c Powdercoat finish colour equal to Interpon 'Titanium Pearl Matt'
- PCF4 Powdercoat finish colour equal to Interpon 'Monument Matt' PCF5a Powdercoat finish colour equal to Interpon 'Magnolia' PCF5b Powdercoat finish colour equal to Interpon 'Luxe Bronze Pearl'

Perspective 06

- PF1 Paint finish colour equal to Interpon 'Monument Matt' PF2 Paint finish colour equal to Interpon 'Titanium Pearl Matt'
- SCN1 Brickwork screen to eastern facade. Colour and finish equal to varies, refer to DA-890-102 SCN2 Brickwork screen to western facade. Colour and finish equal to varies, refer to DA-890-102
- SCN3 1800mm high aluminium framed, glazed screen to rooftop communal area. Frame finish equal to PCF4, glass equal to GC1.
  SGN1 Building identification signage zone for surface fixed signage
- SL1 Skylight, glass equal to GC1 Note: Refer to Landscape Architect's documents for public domain and landscape areas for further information regarding materials and finishes selection.

C 19.11.21 Approved by Revision Notes 273-275 Anzac Parade @A1, 50%@A3 273-275 Anzac Parade, Kensington Sydney NSW 2032 Post s34 for L& E Court Drawing Title 3D Views

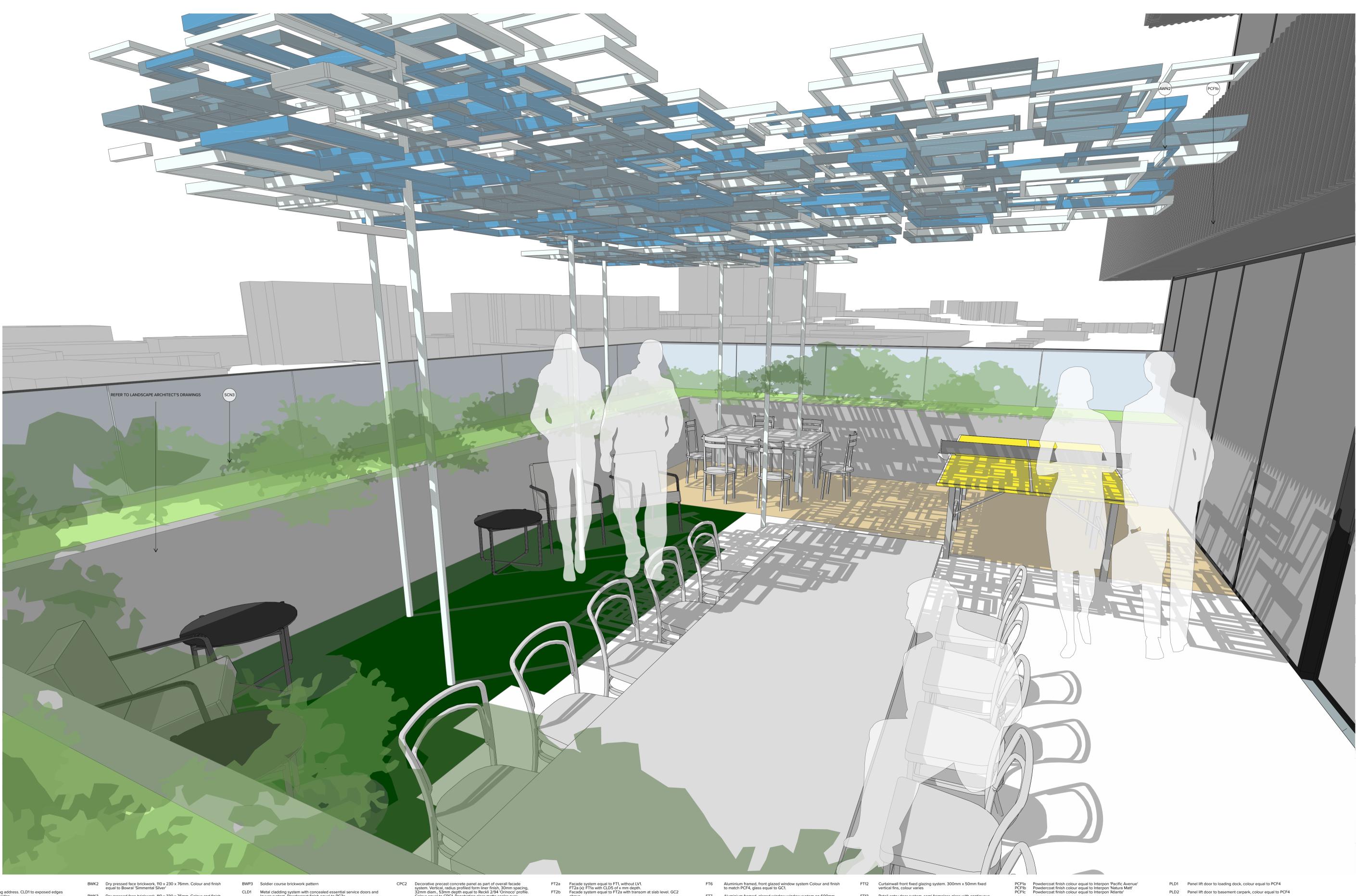
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20059 ML, TL, SW

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DA-910-006

DLCS Quality Endorsed Company ISO 9001:2015, Registration Number 20476 Nominated Architect: Nicholas Turner 6695, ABN 86 064 084 911



- AWN1 Sculptural awning to building address. CLD1 to exposed edges CLD3 to archway soffit and sides.
- AWN2 Metal rooftop shade structure
- AWN3 Folded steel awning with decorative motif laser cut into leading edge. Paint finish equal to PCF4. GC1 edge with separate steel flat bar support
- BAL1 Semi-frameless full height clear glass balustrade system with 150mm wide top rail. Framing system, aluminium, powder coat finish. Colour to match PCF4. Min 1.1m High

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- BAL2 Frameless glass balustrade system, fixed to inside face of concrete upstand. Min 1.1m High
- BWK1 Dry pressed face brickwork, 110 x 330 x 76mm. Colour and finish equal to Bowral 'Gertrudis Brown'
- BWK2 Dry pressed face brickwork, 110 x 230 x 76mm. Colour and finish equal to Bowral 'Simmental Silver'
- BWK4 Decorative glazed brickwork, blue. Colour and finish equal to Burlesque 'Smashing Blue' 260 x 50mm 'slimline' format. Brickwork pattern, Vertical Stretcher bond. Mortar colour, 'black'.
- BWK5 Dry pressed face brickwork, 110 x 330 x 76mm. Colour and finish equal to Bowral 'Emerald' BWK6 Dry pressed face brickwork, 110 x 330 x 76mm. Colour and finish equal to Bowral 'Chillingham White'
- BWK7 Dry pressed face brickwork, 110 x 330 x 76mm. Colour and finish equal to Bowral 'Indulgent White' BWP1 Flemish bond with projecting 'hit-and-miss' pattern, tooled joint BWP2 Protruding brickwork pattern

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- BWK3 Dry pressed face brickwork, 110 x 330 x 76mm. Colour and finish equal to Bowral 'Bowral Blue'
  - - COF1 Off-form concrete, patched and painted
    - COF2 Off-form concrete, natural smooth board finish. Natural grey concrete mix, penetrating clear matte sealer over
- CLD1 Metal cladding system with concealed essential service doors and louver system. Powdercoat finish equal to PC3c
- CLD2 Metal hood with 50% perforations to achieve solar access. Colour varies, refer to DA-890-101
  - CLD4 Metal frame colour to match PCF4
  - CLD5 Metal hood, colour varies, refer to DA-890-101
  - Precast concrete panel as part of overall facade system. Smooth finish, colour equal to 'lite & brite' concrete mix with white oxide pigment additive. Penetrating clear matte sealer over.
- CPC2 Decorative precast concrete panel as part of overall facade system. Vertical, radius profiled form liner finish, 30mm spacing, 32mm diam, 53mm depth equal to Reckil 2/94 'Orinoco' profile. Colour equal to CPC1. Penetrating clear matte sealer over. CPC3 Decorative precast concrete panel as part of overall facade system. Vertical square edged profiled form liner finish, 30mm spacing, 15mm depth equal to Reckli 2/77 'Tigris' profile. Colour equal to CPC1
- CPC4 Precast concrete panel as part of overall facade system. Smooth finish, colour equal to PF(a). Penetrating clear matte sealer over.
- Aluminium framed, front glazed, fixed window system with integrated aluminium louvre system. CLD5 to facade opening. Frame equal to PCF4, glazing equal to GC1, integrated louvre system equal to LV1, hood colour varies, refer to DA-890-101. FT1a (X): FT1a with CLD5 of x mm depth. FT1b Facade system equal to FT1a with transom at slab level. GC2

above. FT1b (x): FT1b with CLD5 of x mm depth.

- above.
  Facade system equal to FT2a without CLD5, glass equal to GC1
  Facade system equal to FT2a without CLD5, glass equal to GC3
  - Aluminium framed, front glazed sliding door system to residential balcony. Balustrade at balcony edge. CLD2 to facade opening. Aluminium frame finish equal to PCF1(a), glass equal to GC1, balustrade equal to BAL2, hood colour varies, refer to DA-890-101. Aluminium framed, front glazed window system with hinged door panel and fixed open louvre system for lobby ventilation. Frame equal to PCF4, glass equal to GC3. PL1 at balcony edge with BAL2 fixed internally.
- FT6 Aluminium framed, front glazed window system Colour and finish to match PCF4, glass equal to GC1.
- FT7 Aluminium framed, glazed window window system on 600mm concrete upstand FT8 Framing system, decorative steel frame with projecting bay window elements frameless fixed glazing system to be either front-fixed, rear fixed or centre-fixed, frame colour to equal to PCF4, glass equal to GC1
- FT9 Framing system, decorative steel frame with projecting bay window elements. Fixed glazing with operable elements equal to 'Aneeta' sashless window system. Steel, paint finish. Colour and finish to match PCF4, glass equal to GC1.
- FT10 Secure lobby entry door system, semi frameless glass with continuous bottom rail and full height decorative 19mm pull handle, glass equal to GC1. Aluminium framed, front glazed window system with fixed open mechanical louvre system for ventilation, colour to match PCF4. Frame equal to PCF4 glass equal to GC3 FT11 Framing system, solid metal cladding, colour to match PCF4
- Curtainwall front fixed glazing system. 300mm x 50mm fixed vertical fins, colour varies
- Retail entry door system, semi frameless glass with continuous bottom rail and full height decorative 19mm pull handle. Glass type equal to GC1. Framing system, steel, paint finish. Framing colour to match PCF4.

GC3 Grey glass

- GC2 Shadowbox glazing system
- Green roof planting to Landscape Architect's requirements Planter boxes to Landscape Architect's requirements Green wall planting to Landscape Architect's requirements. External face to match CPC3
- Aluminium framed, fixed horizontal louvre system to mechanical engineer's requirements. Frame and louvres equal to PCF4
- PCF1a Powdercoat finish colour equal to Interpon 'Pacific Avenue'
  PCF1b Powdercoat finish colour equal to Interpon 'Natura Matt'
  Powdercoat finish colour equal to Interpon 'Atlante'
- PCF2a Powdercoat finish colour equal to Interpon 'Viper Green Gloss' PCF2b Powdercoat finish colour equal to Interpon 'Sable Gilded Green' Powdercoat finish colour equal to Interpon 'Shamrock Gloss' PCF3a Powdercoat finish colour equal to Interpon 'Pearl White Matt'
  PCF3b Powdercoat finish colour equal to Interpon 'Silver Pearl Matt'
  PCF3c Powdercoat finish colour equal to Interpon 'Titanium Pearl Matt'
- PCF4 Powdercoat finish colour equal to Interpon 'Monument Matt' PCF5a Powdercoat finish colour equal to Interpon 'Magnolia' PCF5b Powdercoat finish colour equal to Interpon 'Luxe Bronze Pearl'

PF1 Paint finish colour equal to Interpon 'Monument Matt'

PF2 Paint finish colour equal to Interpon 'Titanium Pearl Matt'

Perspective 07

- PLD1 Panel lift door to loading dock, colour equal to PCF4 PLD2 Panel lift door to basement carpark, colour equal to PCF4
- PV1 Paving, refer Landscape Architect's documents SCN1 Brickwork screen to eastern facade. Colour and finish equal to varies, refer to DA-890-102
- SCN2 Brickwork screen to western facade. Colour and finish equal to varies, refer to DA-890-102
- SCN3 1800mm high aluminium framed, glazed screen to rooftop communal area. Frame finish equal to PCF4, glass equal to GC1.
  SGN1 Building identification signage zone for surface fixed signage SL1 Skylight, glass equal to GC1
- Note: Refer to Landscape Architect's documents for public domain and landscape areas for further information regarding materials and finishes selection.

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273-275 Anzac Parade 273-275 Anzac Parade, Kensington Sydney NSW 2032 Drawing Title 3D Views

C 19.11.21 CH Issued post s.34 for Land and Environment Court Approved by Revision Notes 20059 ML, TL, SW @A1, 50%@A3 DA-910-007 Post s34 for L& E Court

DLCS Quality Endorsed Company ISO 9001:2015, Registration Number 20476 Nominated Architect: Nicholas Turner 6695, ABN 86 064 084 911



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Project Title

273-275 Anzac Parade

273-275 Anzac Parade, Kensington Sydney NSW 2032

Drawing Title

3D Views

Perspective 08



NOTES

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CLIENT
Fusion Development Pty Ltd

Project Title

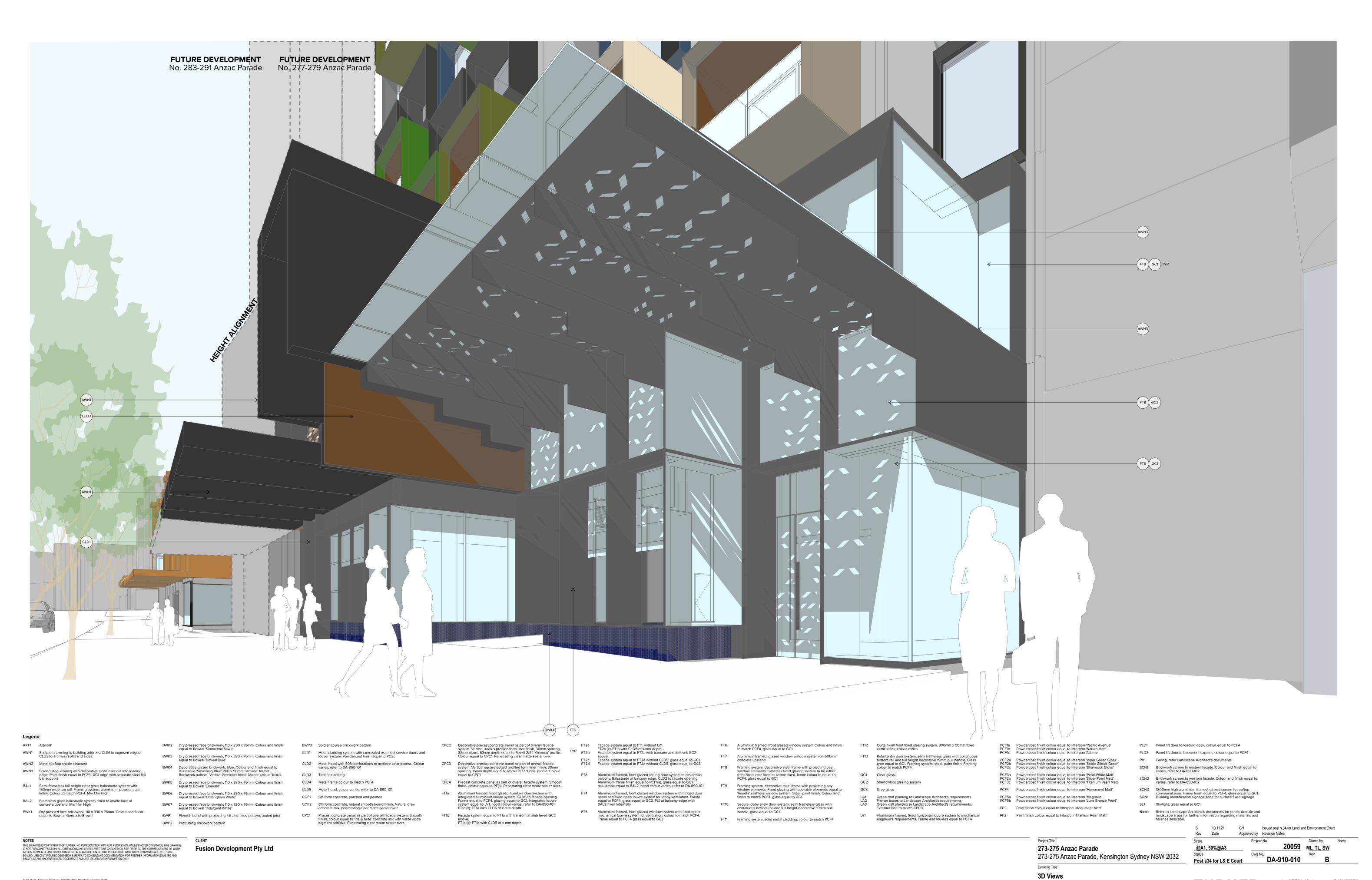
273-275 Anzac Parade

273-275 Anzac Parade, Kensington Sydney NSW 2032

Drawing Title

3D Views

Perspective 09



**TURNER** 

Perspective 10

DLCS Quality Endorsed Company ISO 9001:2015, Registration Number 20476 Nominated Architect: Nicholas Turner 6695, ABN 86 064 084 911



Our Ref: 0284/20 22 November 2021

The General Manager Randwick Council 30 Frances Street **RANDWICK NSW 2031** 

#### DESIGN EXCELLENCE RESPONSE TO STATEMENT OF FACTS AND CONTENTIONS UNDER DA/489/2020 273-275 Anzac Parade, Kingsford

We act as town planning consultants for the owner of the above property and in relation to the subject DA (no. DA/489/2020) and Class 1 Appeal (LEC no. 2021/200198).

We have been instructed to respond to Contention 6 - Design Excellence of the Respondent's Statement of Facts and Contentions ('SOFAC') filed on 31 August 2021. Specifically, Council contends that one of the reasons the proposed development does not exhibit design excellence is because the applicant has not provided evidence of an architectural design competition having been carried out prior to lodgement of the subject DA - as required by:

- Control 4.1(c) and (d); and
- Control 10.2(b) Kingsford Junction Precinct,

under Parts A and B of Part E6 of the Randwick Development Control Plan 2013 ('K2K DCP') and in accordance with Council's Architectural Competition Policy adopted on 10 December 2019.

The purpose of this document is to demonstrate that the proposed development is supportable and that it exhibits design excellence, even though a traditional competitive design process was not undertaken prior to lodgement of the subject DA. As is evidenced in detail below, the proposal has undergone an arguably more rigorous design review and critique process which has resulted in design modifications to ensure design excellence is achieved.

#### 1. Design Excellence and Competitive Design Process framework

On 14 August 2020, the Randwick Local Environmental Plan (Amendment No 8) ('RLEP 2012') formally commenced Broadly, in its SOFAC Council contends that the subject proposal does not exhibit design excellence in accordance with clauses 6.11 and 6.21 of the RLEP 2012.

Somewhat oddly, Council does not contend in its SOFAC that the proposal has failed to address clause 6.21(5) of the RLEP 2012, which suggests that, subject to what is relevantly contained in clause 6.21(6), consent must not be granted to the subject DA unless a competitive design process has been held.

Instead, in its SOFAC Council contends that the requirement for a competitive design process to be undertaken in relation to the subject DA arises from Control 4.1(c) and (d) under Part A of the K2K DCP; and Control 10.2(b) Kingsford Midtown Precinct under Part B of the K2K DCP, which came into effect on 20 November 2020.

As we understand it, there is a legal position arising from Section 3.43(5) of the Environmental Planning and Assessment Act 1979 ('EP&A Act'), that the competitive design competition controls which have been referenced by Council in the K2K DCP are patently inconsistent with Cl.6.21(5) and (6) of the RLEP 2012, and for this reason those K2K DCP controls 'have no effect'. This document does not seek to provide submissions on that legal topic. Instead, this document addresses both sets of controls even if the comments that are provided in response to the K2K DCP are required on a notional basis only.



We otherwise note that the design excellence provisions in clauses 6.11 and 6.21 of the *RLEP 2012* are remarkably similar - to the extent that they include identical/duplicated text. This document addresses both clauses.

#### Clause 6.11 - Design Excellence

Clause 6.11 of the RLEP 2012 provides the following:

- (1) The objective of this clause is to deliver the highest standard of architectural and urban design.
- (2) This clause applies to development involving the construction of a new building or external alterations to an existing building—
  - (a) on a site that has an area of 10,000 square metres or greater, or
  - (b) on land for which a development control plan is required to be prepared under clause 6.12, or
  - (c) that is, or will be, at least 15 metres in height.
- (3) Development consent must not be granted to development to which this clause applies unless the consent authority is satisfied that the proposed development exhibits design excellence.
- (4) In considering whether the development exhibits design excellence, the consent authority must have regard to the following matters—
  - (a) whether a high standard of architectural design, materials and detailing appropriate to the building type and location will be achieved,
  - (b) whether the form and external appearance of the development will improve the quality and amenity of the public domain,
  - (c) how the proposed development responds to the environmental and built characteristics of the site and whether it achieves an acceptable relationship with other buildings on the same site and on neighbouring sites,
  - (d) whether the building meets sustainable design principles in terms of sunlight, natural ventilation, wind, reflectivity, visual and acoustic privacy, safety and security and resource, energy and water efficiency,
  - (e) whether the proposed development detrimentally impacts on view corridors and landmarks.

The subject DA seeks consent for a building over 15m in height and therefore satisfies the relevant trigger in clause 6.11(2)(c) of the *RLEP 2012*.

Clause 6.11(3) is then the relevant precondition to consent and requires that a development must exhibit design excellence. Whilst design excellence is not a defined term, in considering whether a development exhibits design excellence the clause requires a consideration of the matters in subclause (4) in order to achieve the objective of the clause being delivery of "the highest standard of architectural and urban design".

As detailed in **Table 1** below, in satisfaction of the precondition provided in clause 6.11(3), the proposal is considered to achieve design excellence.

## Table 1 Clause 6.11(4) Clause Comment

(4) In considering whether the development exhibits design excellence, the consent authority must have regard to the following matters—

#### **Table** 1 Clause 6.11(4)

(a) whether a high standard of architectural design, materials and detailing appropriate to the building type and location will be achieved, The proposal provides a high-quality contemporary approach which incorporates a variety of design elements and associated materiality to ensure the public domain is significantly improved as envisaged within the locality. Specifically, the proposal provides a pedestrianised base with a highly articulated and modulated middle and upper portions. The design elements are integrated into the façade fronting both Anzac Parade and Houston Lane. Together these form a high standard of deep articulation, material selection and careful design that exhibits design excellence in relation to the standard of design materials and finishes

(b) whether the form and external appearance of the development will improve the quality and amenity of the public domain,

The form and external appearance of the design is considered to exhibit design excellence as it significantly improves the character of the site as viewed from the public domain at numerous scales, that is, at a pedestrianised and wider scale and will ultimately improve the street frontage to Anzac Parade and Houston Lane.

(c) whether the proposed development responds to the environmental and built characteristics of the site and whether it achieves an acceptable relationship with other buildings on the same site and on neighbouring sites

The subject site is located within the B2 Local Centre zone which provides nil setbacks to side boundaries. The proposed development has been designed to respond to the siting and location established mixed use development on the neighbouring property to the north. Similarly, the proposed development provides an appropriate transition of built form to the properties to the south, which are earmarked for redevelopment. The proposal, as discussed in the supporting documentation, represents an appropriate transition and will not impact the ability of the neighbouring properties to redevelop. Furthermore, the proposal will not have any adverse impact to the amenity of any existing or future development in terms of privacy, solar access and views.

The proposal is purposefully designed (with refinements made via the alternative design process) to provide a highly articulated façade with appropriate modulation to ensure the bulk and massing of the development, although varying from the DCP envisaged form, will achieve a high level of design excellence. Specifically, the proposal provides a defined base, middle and top section with a variety of architectural elements integrated throughout as to provide an architectural form consistent with the desired character of the locality. Of relevance to this development, the massing of the development has been heavily analysed (in accordance with the site and locality constraints) prior and post lodgement as to ensure the overall built form will achieve a high level of design excellence.

(d) whether the building meets sustainable design principles in terms of sunlight, natural ventilation, wind, reflectivity, visual and acoustic privacy, safety and security and resource, energy and water efficiency The proposal is designed to ensure a high level of internal amenity for residents and will not result in any adverse impacts to the solar access, ventilation and privacy of neighbours. The proposed

Table 1 Clause 6.11(4)	
	development is considered to perform acceptably with regards to the sustainability of the development.
(e) whether the proposed development detrimentally impacts on view corridors and landmarks	No significant view corridors or landmarks are afforded across or through the subject site from the neighbouring properties or the public domain. Accordingly, the proposed built form will not have any detrimental impacts and is acceptable in this regard. The quality of the proposed elevational design is considered to be an improvement compare to the existing building. Accordingly, it is considered that a consent authority can be satisfied that the proposed design exhibits design excellence in that it has no impact on public view corridors.

#### Clause 6.21 – Design Excellence at Kensington and Kingsford Town Centres

#### Clause 6.21 of the RLEP 2012 provides the following:

- (1) The objective of this clause is to ensure that development exhibits design excellence that contributes to the natural, cultural, visual and built character values of Kensington and Kingsford town centres.
- (2) This clause applies to development involving the erection of a new building or external alterations to an existing building on land identified as "Y1" or "Y2" on the Alternative Building Heights Map.
- (3) Development consent must not be granted to development to which this clause applies unless the consent authority considers that the development exhibits design excellence.
- (4) In considering whether the development exhibits design excellence, the consent authority must have regard to the following matters—
  - (a) whether a high standard of architectural design, materials and detailing appropriate to the building type and location will be achieved,
  - (b) whether the form and external appearance of the development will improve the quality and amenity of the public domain,
  - (c) whether the development detrimentally impacts on view corridors and landmarks,
  - (d) how the development addresses the following matters—
    - (i) the suitability of the land for development,
    - (ii) existing and proposed uses and use mix,
    - (iii) heritage issues and streetscape constraints,
    - (iv) the relationship of the development with other development (existing or proposed) on the same site or on neighbouring sites in terms of separation, setbacks, amenity and urban form,
    - (v) bulk, massing and modulation of buildings,
    - (vi) street frontage heights,
    - (vii) environmental impacts such as sustainable design, overshadowing, wind and reflectivity,

- (viii) the achievement of the principles of ecologically sustainable development,
- (ix) pedestrian, cycle, vehicular and service access and circulation requirements,
- (x) the impact on, and any proposed improvements to, the public domain,
- (xi) whether the building meets sustainable design principles in terms of sunlight, natural ventilation, wind, reflectivity and resource, energy and water efficiency,
- (xii) visual and acoustic privacy and safety and security of the building.
- (5) Development consent must not be granted to the development to which this clause applies unless a competitive design process has been held in relation to the proposed development.
- (6) A competitive design process is not required under subclause (5) if the consent authority is satisfied that such a process would be unreasonable or unnecessary in the circumstances of that development.
- (7) Despite clause 4.3, if-
  - (a) the design of a new building, or an external alteration to an existing building, is the winner of a competitive design process, and
  - (b) the consent authority is satisfied that the building or alteration exhibits design excellence,

the consent authority may grant development consent for development to which this clause applies with a building height that exceeds the maximum height shown for the land identified as "Y1" or "Y2" on the Alternative Building Heights Map by up to 6 metres.

- (8) Despite clause 4.4, if the consent authority considers the development exhibits design excellence and the proposed development includes community infrastructure, the amount of floor space of the community infrastructure is to be excluded from the total gross floor area of the development.
- (9) In this clause—

community infrastructure means development for the purposes of recreation facilities (indoor), recreation facilities (outdoor) and community facilities.

competitive design process means an architectural design competition carried out in accordance with procedures approved by the Planning Secretary.

The subject site is identified as 'Y2' on the Alternative Building Height Map Sheet HOB 002 and therefore satisfies the relevant trigger in clause 6.21(2) of the RLEP 2012.

Clause 6.21(3) is a relevant precondition to consent and requires that a development must exhibit design excellence. Again, whilst design excellence is not a defined term, in considering whether a development exhibits design excellence the clause requires a consideration of the matters in subclause (4) in order to achieve the objective of the clause being to contribute to "the natural, cultural, visual and built character values of Kensington and Kingsford town centres".

As detailed in the Table 2 below, in satisfaction of the precondition provided in clause 6.21(3), the proposal is considered to achieve design excellence.

<b>Table 2</b> Clause 6.21(4)	
Clause	Comment

273-275 Anzac Parade, Kingsford Planning Ingenuity Pty Ltd

#### **Table 2** Clause 6.21(4)

- (4) In considering whether the development exhibits design excellence, the consent authority must have regard to the following matters—
- (a) whether a high standard of architectural design, materials and detailing appropriate to the building type and location will be achieved,

As stated in Table 1 above in relation to clause 6.11(4)(a) - The proposal provides a high-quality contemporary approach which incorporates a variety of design elements and associated materiality to ensure the public domain is significantly improved as envisaged within the locality. Specifically, the proposal provides a pedestrianised base with a highly articulated and modulated middle and upper portions. The design elements are integrated into the façade fronting both Anzac Parade and Houston Lane. Together these form a high standard of deep articulation, material selection and careful design that exhibits design excellence in relation to the standard of design materials and finishes

(b) whether the form and external appearance of the development will improve the quality and amenity of the public domain,

As stated in Table 1 above in relation to clause 6.11(4)(b) - The form and external appearance of the design is considered to exhibit design excellence as it significantly improves the character of the site as viewed from the public domain at numerous scales, that is, at a pedestrianised and wider scale and will ultimately improve the street frontage to Anzac Parade and Houston Lane.

(c) whether the development detrimentally impacts on view corridors and landmarks,

As stated in Table 1 above in relation to clause 6.11(4)(e) - No significant view corridors or landmarks are afforded across or through the subject site from the neighbouring properties or the public domain. Accordingly, the proposed built form will not have any detrimental impacts and is acceptable in this regard. The quality of the proposed elevational design is considered to be an improvement compare to the existing building. Accordingly, it is considered that a consent authority can be satisfied that the proposed design exhibits design excellence in that it has no impact on public view corridors.

- (d) how the development addresses the following matters—
- (i) the suitability of the land for development,

The proposal involves the provision of a mixed use development which is permissible within the zone. This will include the provision of commercial tenancies, community infrastructure and residential accommodation in the form of student housing. The boarding house component is consistent with the desired future character of the area and provides suitable student housing in close proximity to universities.

(ii) existing and proposed uses and use mix,

The proposed development will replace the existing commercial premises and include the provision of additional retail and commercial uses, residential accommodation and community infrastructure in close proximity to various land uses and public transport.

(iii) heritage issues and streetscape constraints,

The proposed development is compatible with the contributory items to the south and heritage item located in proximity to the site.

273-275 Anzac Parade, Kingsford
Planning Ingenuity Pty Ltd 6

#### **Table 2** Clause 6.21(4)

Specifically, the proposal provides a defined podium along Anzac Parade which aligns with the nearby contributory items. The high quality design, as further amended through the alternative design process, represents a significant improvement over the existing building.

The proposal will positively contribute to the streetscape with richly articulated materials with recesses in the façade and carefully composed elements leading to a high quality interplay of light and shade.

(iv) the relationship of the development with other development (existing or proposed) on the same site or on neighbouring sites in terms of separation, setbacks, amenity and urban form, As stated in Table 1 above in relation to clause 6.11(4)(c) - The subject site is located within the B2 Local Centre zone which provides nil setbacks to side boundaries. The proposed development has been designed to respond to the siting and location established mixed use development on the neighbouring property to the north. Similarly, the proposed development provides an appropriate transition of built form to the properties to the south, which are earmarked for redevelopment. The proposal, as discussed in the supporting documentation, represents an appropriate transition and will not impact the ability of the neighbouring properties to redevelop. Furthermore, the proposal will not have any adverse impact to the amenity of any existing or future development in terms of privacy, solar access and views.

(v) bulk, massing and modulation of buildings,

As stated in Table 1 above in relation to clause 6.11(4)(c) - The proposal is purposefully designed (with refinements made via the alternative design process) to provide a highly articulated façade with appropriate modulation to ensure the bulk and massing of the development, although varying from the DCP envisaged form, will achieve a high level of design excellence. Specifically, the proposal provides a defined base, middle and top section with a variety of architectural elements integrated throughout as to provide an architectural form consistent with the desired character of the locality. Of relevance to this development, the massing of the development has been heavily analysed (in accordance with the site and locality constraints) prior and post lodgement as to ensure the overall built form will achieve a high level of design excellence.

It is noted that the ADG is not applicable as the development proposes to provide affordable student accommodation under the State Environmental Planning Policy (Affordable Rental Housing) 2009 ('SEPP ARH'). The proposal is demonstrably consistent with the core development standard and accords with the SEPP ARH.

In addition to the above, it is noted that clause 6.21(7) permits an additional height of 6m beyond the building height established by 'Y1' or 'Y2' per the Alternative Building Heights map. The proposal does not seek to benefit from this bonus. Furthermore, the proposal (as modified) will satisfy clause 6.21(8) whereby

<b>Table 2</b> Clause 6.21(4)	
	community infrastructure is provided on Level 1 of the proposed development.
(vi) street frontage heights,	As detailed, the proposal provides a variety of active uses along Anzac Parade with street frontage heights as envisaged by the DCP. The proposed uses at ground and the first floor will activate the streetscape and provide a continuity of the built form from the contributory buildings further to the south and established mixed use development to the north. The design also integrates the required awnings and materiality to reinforce the street frontage.
(vii) environmental impacts such as sustainable design, overshadowing, wind and reflectivity,	The proposal has been designed to ensure environmental sustainability in accordance with the BASIX Certificate. The development will not result in any adverse impacts to overshadowing or wind as detailed in this original Statement of Environmental Effects and supporting documentation.
(viii) the achievement of the principles of ecologically sustainable development,	The proposal has been designed to ensure environmental sustainability in accordance with the BASIX Certificate. The proposal will not result in any serious or irreversible environmental damage or degradation. The proposal will not affect the health diversity and productivity of the environment.
(ix) pedestrian, cycle, vehicular and service access and circulation requirements,	The proposed development will encourage active (walking and cycling) and public transport patronage as far as practicable Specifically, the proposal will only provide one level of basemen parking which will limit vehicular parking to the non-residential uses and staff of the residential component. The proposal will also provide clearly delineated pedestrian and vehicular access and circulation throughout the site from both frontages.
(x) the impact on, and any proposed improvements to, the public domain,	The proposed development will result in a significant improvement to the streetscape of Anzac Parade at a pedestrianised scale. As discussed in this document, the proposal will provide an articulated streetscape with a defined podium level.
(xi) whether the building meets sustainable design principles in terms of sunlight, natural ventilation, wind, reflectivity and resource, energy and water efficiency,	As stated in Table 1 above in relation to clause 6.11(4)(d) - The proposal is designed to ensure a high level of internal amenity for residents and will not result in any adverse impacts to the sola access, ventilation and privacy of neighbours. The proposed development is considered to perform acceptably with regards to the sustainability of the development.
(xii) visual and acoustic privacy and safety and security of the building.	As above, the proposal will provide nil setbacks to the side boundaries and has orientated openings to the front and rea boundary as to ensure the visual and acoustic privacy of future residents and neighbours. The proposal will also provide appropriate security measures and it is noted that the proposal will significantly improve casual surveillance over the public domain.

#### Part A of the K2K DCP

Section 4 in Part A of the K2K DCP is titled 'Design Excellence'.

Control 4.1(c) and (d) provide as follows:

- c) DAs involving the construction of a new building on the following strategic node sites are subject to an architectural design competition in accordance with Clause 6.21 of RLEP 2012:
- Todman Square Precinct
- Kingsford Midtown Precinct
- Kingsford Junction Precinct
- d) Prior to lodgement of DAs for strategic node sites, the architectural design competition process is to be undertaken in accordance with Council's "Architectural Competition Policy" adopted 10 December 2019

The subject site is identified as being part of the 'K6' strategic node site in the Kingsford Midtown Precinct and therefore satisfies the relevant trigger in Control 4.1(c) and (d) in Part A of the *K2K DCP*.

As stated above and further below, we consider that:

- a competitive design process is unreasonable and unnecessary on the basis that the development exhibits a high level of design excellence, which is reinforced by the subject DA having undergone its own informal 'alternative design process';
- there is a legal position arising from Section 3.43(5) of the *EP&A Act*, that the competitive design competition controls in the *K2K DCP* are patently inconsistent with Cl.6.21(6) of the *RLEP 2012*, and for this reason those *K2K DCP* controls 'have no effect'.

Otherwise, as we understand it there is an additional legal position arising from Section 4.15(3A) of the *EP&A Act*, that confirms a consent authority is to be flexible in applying *K2K DCP* controls if the proposed development achieves the objects of those controls.

As detailed in the **Table 3** below, the proposal is considered to achieve the objectives of the design excellence controls in Section 4 in Part A of the *K2K DCP*:

Table 3 Section 4 Part A	
Objective	Comment
To achieve outstanding architectural, urban and landscape design within the Kensington and Kingsford town centres	The proposal provides a high quality, contemporary development which will address both streetscapes and is reflective of the architectural character as is envisaged within the Kingsford locality and pert the K6 strategic node site. The architectural and urban design approach, as is evidenced in the supporting documentation, will appropriately address the public domain, activating the pedestrianised scale and nestling within the wider locality. The built form is integrated with landscaping which is equal to 100% of the site area to soften the built form and improve amenity of the futures occupants. The cumulative result of the abovementioned is the provision of a development which is appropriate to the envisaged desired future character per the K2K DCP.

#### Table 3 Section 4 Part A

To deliver high quality landmark buildings that contribute positivity to their surroundings and help to create a sense of place and identity

The proposal has been designed to nestle within the existing and future developments to the north and south of the subject site, respectively. That is, the proposal provides a high quality contemporary design with a defined base, middle and upper levels with articulated façades inclusive of purposeful modulation and undulation. This ensures that the development, which forms part of the Site K6, will deliver a landmark building on the corner of Anzac Parade and Strachan Street. Upon redevelopment of the properties to the south, the proposal will suitably adjoin the neighbouring development and will provide an appropriate transition of form to the north. In this regard, the proposed development will create a sense of place and identity at a pedestrian scale, through activation of the street frontage and relationship to the contributory buildings, and at a wider scale, through a high articulated and visually interesting built form.

To enhance the character, aesthetic quality, functionality, and amenity of the Kensington and Kingsford town centres

As stipulated above, the proposal will provide a contemporary development which is highly articulated to the facades as they address Anzac Parade and Houston Lane. The character of the development, which is generally consistent with the K2K DCP, incorporates numerous design features with complementary materiality and a neutral colour scheme. Functionally, the development will activate the street frontages, include the provision of non-residential uses at ground level and the first floor (including community facilities) and will improve pedestrian permeability through the site. It follows that the development will assist in revitalising the Anzac Parade corridor as it relates to the light rail system. With regards to amenity and as demonstrated in the architectural set, solar access, privacy and ventilation to the proposed residential accommodation and neighbouring properties is provided proportionate to the scale of the development. That is, the development (including the parts which extent beyond the DCP envelope) will not impact the amenity of existing and future occupants on the subject site, surrounding properties or public domain.

To encourage higher energy, water and waste performance ratings for residential development and

The residential component of the development achieves an acceptable performance with regards to energy, water and waste in accordance with the supporting documentation.

To facilitate the delivery of place-based social infrastructure.

The proposed development includes the provision of a 102m<sup>2</sup> community room on Level 1. This is situated in a prominent location fronting Anzac Parade, will be easily accessible from the ground floor plane and will be capable of accommodating a variety of uses. The proposal will therefore facilitate the delivery of additional social infrastructure in a highly accessible location and prominent site.

273-275 Anzac Parade, Kingsford
Planning Ingenuity Pty Ltd 10

#### Part B of the K2K DCP

Section 10 in Part B of the K2K DCP is titled 'Block Controls'.

Section 10.2 is applicable to the 'Strategic Node Sites'.

As stated above, the subject site is identified as being part of the 'K6' strategic node site in the Kingsford Midtown Precinct and therefore satisfies the relevant trigger in Control 10.2 in Part B of the K2K DCP.

Control 10.2(b) of the Kingsford Midtown Precinct provides as follows:

b) DAs for strategic node sites are to be undertaken in accordance with an architectural design competition

Again, we consider that:

- a competitive design process is unreasonable and unnecessary;
- there is a legal position arising from Section 3.43(5) of the EP&A Act, that the competitive design competition controls in the K2K DCP are patently inconsistent with Cl.6.21(6) of the RLEP 2012, and for this reason those K2K DCP controls 'have no effect';
- there is an additional legal position arising from Section 4.15(3A) of the EP&A Act, that confirms a consent authority is to be flexible in applying K2K DCP controls if the proposed development achieves the objects of those controls.

As detailed in the Table 4 below, the proposal is considered to achieve the objectives of the design excellence controls in Section 10.2 in Part B of the K2K DCP:

Table 4 Section 10.2 Part B	
Objective	Comment
To ensure design excellence and provide for redevelopment that addresses the future desired character and cohesiveness of the Precinct	As is stipulated throughout this document, the proposed development is designed to provide a highly articulated and visually interesting built form which is responsive to the desired future character of the locality. The proposal will nestle comfortably within the existing built form to the north, and future redevelopment of the properties to the south which form the remainder of the K6 strategic site. The proposal will also provide an appropriate transition of built form at a pedestrianised and wider scale and will reflect the desired increase of density as envisaged by the LEP and DCP.  The design in a vertical sense, has responded to and is compatible with, the:  a) existing streetscape; and b) streetscape interfaces anticipated for the medium to
	long term
To provide taller landmark buildings that respond sensitively to the scale, proportions, form and detailing of nearby heritage, contributory buildings and other properties	The proposal provides a development which is responsive and proportionate to the strategic location of the subject site and its characterisation as a strategic node. Despite the variation in building envelope, the proposal will provide a landmark building

#### Table 4 Section 10.2 Part B

which will seamlessly merge into the future redevelopment of the properties to the south and transition to the existing development to the north. In accordance with Table 3 above, the proposal defines the base, middle and upper portions of the building as to respond to the desired pedestrianised scale along Anzac Parade and achieve a landmark building in a prominent location. Of relevance and per the architectural plans, the proposal is consistent with the scale and pattern of the contributory items to the south whilst aligning with the established building footprint of the development to the north. Façade materiality and composition is highly articulated including the use of a range of textures with an emphasis on verticality. It follows that the proposal will achieve the desired character of the K6 strategic node site.

To provide for high quality development comprising a mix of uses including commercial, residential, innovation spaces, retail and cultural facilities The proposal provides a mixed use development which includes the provision of retail, commercial and community facilities, in addition to affordable residential accommodation, in a highly accessible site. The residential component will be bolstered through the provision of generous communal areas which will encourage improved social interaction for future users of the site.

A high level of amenity, diversity of room sizes and types, a high level of natural light and solar access, a variety of outdoor spaces – private and communal. Integration of landscape as part of the building design and occupant experience. A central communal courtyard space linking all users together and providing a connection to both Anzac Parade and Houston Lane. All these elements will provide a high amenity and diversity of uses that is consistent with the DCP objectives for the site.

To ensure the Anzac Parade façade retains a human scale with strong vertical articulation and fine grain character

As detailed, the proposal has been designed to provide an articulated pedestrian interface along Anzac Parade which is consistent with the grain and character of the contributory buildings to the south. This includes the integration of retail tenancies fronting the public domain and awnings which are consistent with the properties to the north and south of the subject site. The above mentioned is improved through the strongly defined base which utilises complementary architectural elements, materiality and colour scheme. Above the defined base, the proposal provides a highly modulated and articulated middle portion which is capped through the recessed uppermost levels.

To provide excellent pedestrian amenity through continuous awnings and high quality well landscaped public domain. Per the above, the pedestrian amenity along Anzac Parade will be significantly improved through the provision of awnings, streetscape activation and landscaping where practicable.

Planning Ingenuity Pty Ltd

273-275 Anzac Parade, Kingsford

#### Table 4 Section 10.2 Part B

Consistency with the scale from the contributory items to the south ensures that whilst the existing scale and character will be maintained, the proposed development will improve amenity and activation through the contemporary development. The proposal seeks to provide a transition between existing and future built form.

#### **Alternative Design Process**

As detailed in the Statement of Environmental Effects prepared by Planning Ingenuity dated 21 September 2021, the proposed development was originally designed to respond to the requirements of clause 6.21(4) and therefore it was considered that the competitive design process required under clause 6.21(5) was unreasonable and unnecessary on the basis that the development exhibited a high level of design excellence.

Our position finds its support in clause 6.21(5) of the RLEP 2012, which provides:

(6) A competitive design process is not required under subclause (5) if the consent authority is satisfied that such a process would be unreasonable or unnecessary in the circumstances of that development.

This primary position is maintained. As we understand it, a similar position was accepted by the Land and Environment Court in the matters of MGT 6 Pty Ltd v The Council of the City of Sydney [2017] NSWLEC 1211 ('MGT') and One Forty William Pty Ltd v Council of the City of Sydney [2019] NSWLEC 1290.

However, to reinforce that design excellence is achieved in both process and outcome, the applicant has required the subject DA to undergo its own rigorous 'alternative design process'. The specific process that has been undertaken is detailed below and is in our opinion, arguably a more rigorous design review and critique process than in comparison to a traditional design competition process contemplated by clause6.21 and the K2K DCP.

As stated above, it is our understanding that if the precondition in clause 6.21(3) of the RLEP 2012 is satisfied, then it is open to the relevant consent authority to be satisfied that, by operation of subclause (6), that a competitive design process otherwise required by subclause (5) is unreasonable or unnecessary (MGT at [87]). This discretion invites an assessment of each development on its own merits and confirms that design excellence can be achieved and demonstrated through alternative design processes, not merely by undertaking a traditional competitive design process.

The same reasoning equally applies in relation to any DCP control which requires competitive design process - for example, Control 4.1(c) and (d) under Part A of the K2K DCP; and Control 10.2(b) Kingsford Midtown Precinct under Part B of the K2K DCP.

In MGT, Senior Commissioner Dixon was satisfied that a competitive design process was not required under Cl.6.21(5) of the Sydney Local Environmental Plan 2012 because such a process would have been "unreasonable or unnecessary" in the circumstances (at [94]). In reaching that conclusion, the Senior Commissioner preferred evidence from the Applicant's town planning expert who opined that the design competition process and architectural variety anticipated by clause 6.21 is aimed at larger sites and where a design aims to achieve the bonus FSR permitted under that provision, which was not applicable to the development application that was subject of the MGT appeal (at [89]). She also found that the development exhibited design excellence in any event, given the scrutiny that it had come under, and revisions made, during the appeal process.

In the circumstances of the subject DA, work on the scheme including the engagement of *Turner Studio* to design the proposal began before the requirement for a design competition was formally introduced into the *RLEP 2012* in August 2020 and into the *K2K DCP* in November 2020. Since the subject DA was lodged in September 2020, the proposal has nevertheless undergone critical urban design and architectural review to ensure that the proposal exhibits design excellence and delivers the highest standard of architectural, urban and landscape design. In addition, it is noted that the proposal does not seek to rely on the further additional building height that may be permitted by clause 6.21(7) of the *RLEP 2012*.

As detailed in Table 5 below, this has resulted in evolution of the scheme (further summarised in Section 3 of this document) to achieve the requirements of clause 6.21(3) and (4). In other words, the architectural design of the proposal has been further refined and modified to respond to the critical analysis provided by the registered architectural and urban design experts engaged, including:

- Shaun Carter (Registered Architect 7860) Carter Williamson Architects; and
- Antonio Pozzi (Registered Architect 11156) Hatch and RobertsDay.

It is also critical to note that the amended proposal has also considered the advice provided by the *Randwick Design Excellence Panel* which comprised three experienced architects, including;

- Jonathan Knapp SJB;
- Richard Nugent Conybeare Morrison; and
- Jon Johannsen AJA.

Accordingly, the proposal has been subject to the critical review of **five experienced architects and urban designers** which has resulted in a scheme that exhibits a diversity of architectural responses. The opportunity for multiple experienced consultants to provide an evaluative critique of the proposal has facilitated good design, high quality and innovative thinking to the proposal. Importantly, the architects involved in the design of the proposal from *Turner Studio*, have also, by virtue of experience, undertaken their own critical review of the application prior to and post lodgement.

The specific processes that were undertaken in the review and modification of the proposal are identified in **Table 5** below. Noting that we are of the opinion that the proposal exhibits design excellence and that it delivers the highest standard of architectural, urban and landscape design (as set out in detail above), the additional alternative design processes have been undertaken to shore up that position and so that the consent authority is able to be satisfied (without doubt) that a traditional competitive design process is unnecessary and unreasonable.

Table 5 Alternative design processes and collaboration			
Process and Method	Comment		
Initial design review meeting with Turner Studio, Carter Williamson Architects, Hatch and RobertsDay and Planning Ingenuity.	The original development proposal was presented by <i>Turner Studio</i> to the urban and architectural design panel engaged to provide critical analysis (Shaun Carter of <i>Carter Williamson Architects</i> and Antonio Pozzi of <i>Hatch and RobertsDay</i> ) with <i>Planning Ingenuity</i> guiding the meeting. The panel was given the opportunity to provide initial feedback on the development and Turner Studio the opportunity to provide verbal response.		

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Table 5 Alternative design processes and collaboration	
Written feedback and critical analysis prepared and issued by Carter Williamson Architects and Hatch and RobertsDay.	Written feedback on the original design was prepared by th experts and issued to <i>Turner Studio</i> for review and the opportunit to revise the architectural design to respond to the concerns an issues raised.
Written and architectural response prepared by <i>Turner Studios</i> .	Following the above, <i>Turner Studio</i> prepared an architectural response package which was issued to the experts prior to the second design panel.
Second design review meeting held with <i>Turner Studios</i> , <i>Carter Williamson Architects</i> , <i>Hatch and RobertsDay</i> and <i>Planning Ingenuity</i> .	The amended architectural design and response package was presented by <i>Turner Studio</i> to the urban and architectural panewith <i>Planning Ingenuity</i> again assisting in guiding the meeting. Given the experts were provided the amended architectural package in advance, they were given the opportunity to provide collaborated and organised response during the meeting. <i>Turne Studio</i> were given the opportunity to provide verbal responses and then to update the architectural design package.
Final amendments prepared by <i>Turner Studios</i> .	Turner Studio prepared a finalised architectural response to the critical analysis provided during the second design review meeting. The finalised architectural plans were issued to the experts to permit the preparation of their Design Excellence Reports.
Preparation of a Design Excellence Report by Carter Williamson Architects and Hatch and RobertsDay outlining achievement of design excellence.	Design Excellence Report prepared by the experts which outlin how the proposal achieves design excellence in accordance wit Clause 6.21 of the RLEP 2012. The Report demonstrates how th proposal responds to the site constraints, desired future character of the locality and evolution of the scheme.
	The Design Excellence Report reflects the expert feedback received at each of the workshops to review the design and documents the changes to the design to respond to each issuraised by the experts at both the urban design and architectural scale. The report documents the iterations to the design and how the expert feedback has helped to further shape the design the ensure the best outcome.

The collaborative and alternative design process employed is reflective of and if not more extensive than the steps ordinarily imposed by an architectural design competition. For example, the Council's Architectural Competition Policy adopted on 10 December 2019 provides the following process:

- 1) Preparation of a competitive process brief endorsed by the consent authority;
- 2) Minimum of three competitors participate in a process over 28 days and prepare architectural designs in response to the brief;
- The consent authority nominates an independent observer to verify the competitive process is being followed appropriately;

273-275 Anzac Parade, Kingsford
Planning Ingenuity Pty Ltd
15

- 4) The applicant will nominate an advisory panel and on the advice of the panel rank the competition submissions:
- 5) Once the designs have been prepared and submitted, the applicant is to submit an 'Architectural Competition Report' to the consent authority which sets out the rationale for the choice of preferred design;
- 6) The consent authority will then advise the applicant whether it endorses the process and outcome.

In our view, the proposal has been subject to critical refinement and evaluative processes which in substance is more rigorous than and, superior to a traditional competitive design process owing to the ability to ensure every detail of the proposal exhibits high quality design, rather than merely picking the preferred design and justifying its ability to meet the design excellence requirements. The above process detailed in **Table 5** included comparative evaluation of proposed massing schemes and alternative design outcomes which undoubtedly satisfies the intent of the requirement to undergo a competitive design competition and exceeds the design scrutiny that a design competition would afford.

Furthermore, it is our understanding that the subject architects Turner have been involved in a similar collaborative and alternative design excellence process in a prior project known as the 'Pemulwuy Precinct 3 Student Accommodation' (06\_0101 MOD 2 and SSD 8135).

In summary, that project concerned a proposed modification application to an approved state significant development concept plan for student accommodation at Precinct 3, Pemulwuy, The Block, Redfern.

The relevant Secretary's Environmental Assessment Requirements ('SEARs') dated 22 December 2016 provided as follows in relation to design excellence of the proposal:

#### Key Issues

2. Design Excellence

The proposal must demonstrate design excellence:

- through undertaking a design competition in accordance with the Director-General's Design Excellence Guidelines;
- through an alternative design excellence process that includes:
  - selection of an architect with a reputation for delivering buildings of the highest quality, in consultation with the Government Architect; and
  - establishment of a Design Review Panel (DRP) to:
    - meet to consider alternative design options during concept design and design development;
    - review and endorse the proposal and subsequent modifications as achieving design excellence;
    - be comprised of three architects / urban design experts meeting the requirements of the Director General's Design Excellence Guidelines for competition jury members, with representatives or nominees of:
      - a) the Department;
      - b) the applicant; and
      - c) Council or a person independent of the design team;

The applicant in this example elected to proceed with the alternative design excellence process that included the selection of an architect with a reputation for delivering buildings of the highest quality, in consultation with the Government Architect and establishment of a Design Review Panel.

Accordingly, Turner assisted the applicant to put together and establish a Design Review Panel consisting of:

- Kim Crestani
- Tony Caro

- Dillon Kombumerri
- Olivia Hyde
- Diana Snape

Turner then assisted the applicant to meet with the Design Review Panel in a series of 7 separate workshops to critique, refine and propose amendments to the modification proposal.

Following the series of workshops, the applicant, Turner and the Design Review Panel settled on a final design.

The Design Review Panel went onto prepare a report dated 10 August 2017, which confirmed that "in the view of the Panel, design excellence has been achieved." In reaching that conclusion, the report notes that the "DRP encouraged the design team to explore alternative massing arrangements from those in the SEAR's, including increases in height, to yield better amenity and internal relationships. A more elegant overall massing of the built form was also sought. Many versions of the building form were tested and reviewed by the DRP."

On 4 March 2019, development consent was granted in respect of the modification application.

A copy of the above documents can be provided to Council (or the Court) upon request.

Ultimately, the alternative design process that has been adopted in respect of the subject DA is consistent with the process adopted by the applicant and Turner in the above 'Pemulwuy Precinct 3 Student Accommodation' modification example - that is, an approach initially proffered, and subsequently endorsed, by the NSW Department of Planning and Environment.

As a result, and for the reasons discussed in this letter, it is undoubtedly clear that the proposal - as amended - exhibits high quality design and design excellence in both process and outcome even though a traditional competitive design process as required by either the RLEP 2012 or K2K DCP is has not been undertaken.

In addition to the above, the proposal has now been amended to reflect the design changes requested by the Respondent as part of these proceedings.

#### **Evolution of Scheme**

As discussed in Sections 1 and 2, as a result of the critical analysis and alternative design process initiated in response to clause 6.21 of the RLEP 2012, the proposal has undergone numerous iterations since lodgement. The following design amendments have been provided in response to the alternative design process undertaken up to the Land & Environment Court revision drawings dated 19 November 2021:

- The height of the northern portion of the site has been reduced by 4 storeys from 15 storeys to 11 storeys to provide a further transition the existing 9 storey residential development to the north.
- The height of the southern portion of the site has been increased by 2 storeys from 16 storeys to 18
- The street wall height to the 5 storey Houston Lane building has been increased by 1 storey from 3 storeys to 5 storeys
- Built form within the flexible zone has been increased in height by 1 storey. The northern portion has been increased from 2 storeys to 3 and the southern portion has been increased from 3 storeys to 4.
- An additional setback of 1m has been provided to Anzac Parade to provide a 2.5m street setback
- Additional entries to the ground level retail tenancies have been provided off Anzac Parade
- Provision for a future AWCS system has been included for future adaptation of the waste system
- Separate lift access to the commercial on level 1 has been provided
- A separated bike lane on Anzac Parade has been provided within the site as part of the community infrastructure

- Basement levels have been reduced from 2 levels to 1 and the parking has been reduced
- Additional motorbike parking has been provided (30 spaces in total)
- Additional setback to the ground level and upper levels next to the existing 9 storey residential development to the north to provide improved amenity
- The internal courtyard opening has been increased to improve amenity and daylight to the ground level shared courtyard
- The awning to Anzac Parade has been extended
- A new 1.8m deep awning to Houston Lane has been provided
- The landscape replacement area has been increased (by 26%) to provide 100% site replacement area consistent with the DCP objectives
- Flood planning levels have been addressed to provide the required free board levels at street level
- The Houston Lane façade treatment has been revised

#### Conclusion

The proposed development is of a high standard of architectural design, and the materials and detailing are appropriate to the building type and location. *Turner* is a reputable and award-winning confirm architectural firm with demonstrated experience in designing high quality buildings exhibiting design excellence. As detailed above, the consent authority can be satisfied that the proposal achieves design excellence pursuant to clause 6.21(3) of *RLEP 2012* and the relevant provisions of the *K2K DCP*. The proposal has undergone rigorous design review through the 'alternative design process' which has purposefully been undertaken to ensure it is consistent with (but more extensive than) the methods applied to a standard architectural design competition. Given the extent and depth of processes which have been undertaken prior to and post lodgement, the development satisfies clause 6.21(6) and a competitive design process is considered to be unreasonable and unnecessary in the circumstances. Furthermore, it is evident through the architectural design and supporting documentation that the requirements under Clause 6.21(4) are also satisfied. As such, the proposal is considered to achieve design excellence that satisfies the provisions of both the *RLEP 2012* and *K2K DCP*.

Yours faithfully, Planning Ingenuity Pty Ltd

J. Mead

Jeff Mead

MANAGING DIRECTOR

Planning Ingenuity Pty Ltd



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24 November 2021

The General Manager Randwick Council 30 Francis Street **RANDWICK NSW 2031** 

Dear Sir/Madam,

#### (Revised) LETTER OF OFFER - VOLUNTARY PLANNING AGREEMENT IN ASSOCIATION WITH DEVELOPMENT OF NOS. 273-275 ANZAC PARADE, KINGSFORD (DA/489/2020)

Fusion Development Pty Ltd ('Fusion') is the proponent of the mixed-use development application no. DA/489/2020 ('DA') made to Randwick City Council ('Council') for land that it owns at 273-275 Anzac Parade, Kingsford ('Site').

Following recent discussions with Council as part of the Land and Environment Court Proceedings no. 2021/200198 in relation to the DA, Fusion has prepared this (revised) letter of offer in accordance with section 7.4 of the Environmental Planning and Assessment Act 1979 ('EPA Act').

This letter demonstrates Fusion's offer to enter into a Voluntary Planning Agreement ('VPA') with Council in relation to the DA. It is proposed that the VPA will be finalised and executed following the grant of consent in relation to the DA. This letter provides adequate information to enable Council to consider the proposed VPA.

This offer replaces all previous offers made in relation to the DA. In particular, the previous offer made on 21 September 2020.

#### **SUMMARY**

Pursuant to clause 6.17 of the Randwick Local Environmental Plan 2012 ('RLEP 2012') and the Kensington and Kingsford Town Centres Community Infrastructure Contributions Plan adopted 10 December 2019 ('CIC Plan'). Fusion offers to enter into a VPA for the delivery of Community Infrastructure on the Site.

Fusion proposes to deliver Community Infrastructure as part Works-In-Kind and part Monetary Contribution on the terms set out below.

#### 1. PARTIES TO THE VPA

- Fusion Development Pty Ltd; and
- Randwick City Council

#### 2. / LAND TO WHICH THE VPA RELATES

Nos. 273-275 Anzac Parade, Kingsford (legally describes as Lot 1 in DP 129966 and Lot 1 in DP 940263).

#### 3. Development to which the VPA relates

The DA seeks consent for the demolition of existing structures and construction of a 17-storey mixed use development comprising commercial premises, student accommodation and basement parking at the Site.

#### 4. Nature and extent of development contributions and timing of delivery

In accordance with clause 6.17 of the *RLEP 2012* and the *CIC Plan*, Fusion offers to provide a Community Infrastructure Contribution calculated as follows:

Site Area	1,275m²
Amount of additional Gross Floor Area ('GFA') above the maximum building height plane	2,798m²
Community Infrastructure Contribution Rate	\$475 per 1m²
Community Infrastructure Contribution value of additional GFA (excl GST)	\$1,329,050

The above calculation for the proposed Community Infrastructure Contribution value is based on the 'GFA Calculations above 24m' plan, Drawing DA-770-100 (Rev A) prepared by Turner dated 19 November 2021, which is attached to this letter of offer as Annexure 'A'.

Annexure **A** is consistent with the Amended Architectural Plans (up to Rev E) prepared by Turner dated 19 November 2021.

A part Works-In-Kind and part Monetary Contribution is proposed for delivery of the above Community Infrastructure Contribution value as follows:

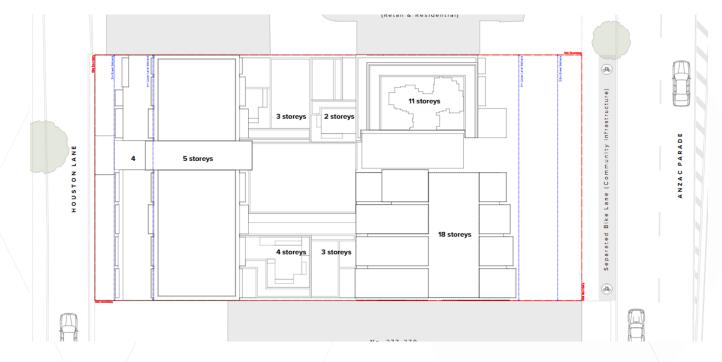
• With reference to the 'Schedule of Community Infrastructure - 2019' on page 8 of 13 of the *CIC Plan* and the 'Kingsford CIC Map' on page 10 of 13 of the *CIC Plan*, Fusion provides the below indicative values for the delivery of part Works-In-Kind and part Monetary Contribution associated with the DA and the Site:

Item	Proposed Works to be undertaken	Estimated Value	Proposed	Timeframe
		_	Delivery	14511: 26
1.	Separated bicycle	\$63,800	Works-in-	Within 36
	network – on	(i.e. 2.2%	Kind	months of
	Anzac Parade –	of the total		Construction
/	directly in front of	cost of the		Commencement
	the Site	Kingsford		
	(see <b>Figures 1</b> and	Separated		
	2 below)	Bike		
		Network		
		\$2.9m))		
	Monetary	\$1,265,250	Monetary	Prior to
2.	Contribution	$\Lambda$	Contribution	Occupational
	(Final value to be			Certificate
	confirmed			
	following costing	\		
	and scope			
	clarification of	<u> </u>		
	Item 1 with			
	Council)			
	Total Value	\$1,329,050		
	/	7-//		

• Figure 1: Extract of 'Kingsford CIC Map' on page 10 of 13 of the CIC Plan with Site outlined in red:



• Figure 2: Extract of Siteworks Site Plan, Drawing DA-010-040 (Rev C) prepared by Turner dated 19 November 2021 identifying proposed delivery of Separated Bike Lane (Community Infrastructure) to Anzac Parade:



- Fusion proposes to meet with Council to refine the detail and scope of item 1 (i.e. Separated Bike Lane) to confirm the estimated value of delivery.
- Should through the process of detailing the project scope, design and specifications of item 1 (i.e. Separated Bike Lane) it become apparent that the works are not feasible or cannot be conducted at a reasonable cost by Fusion or Council requires a superior standard of works beyond what is proposed by Fusion, than the equivalent value as outlined above will be paid via a monetary contribution instead of the Works-In-Kind currently proposed. This is offered on the proviso that any monetary contribution will be applied to the delivery of community infrastructure on the site in order to confirm that the DA will satisfy clause 6.17 of the *RLEP 2012* (to permit the additional FSR and Height).
- Following the final costing and agreement of Works-In-Kind delivered as an offset to the total Community Infrastructure Contribution value, Fusion proposes to pay any remaining amount as a monetary contribution.

#### 5. Application of SECTION 7.11 OR 7.12

This offer, and any subsequent VPA, does not have the effect of excluding the application of s.7.11, 7.12 and 7.24 of the *EP&A Act* in relation to the DA, as are lawfully applicable.

#### 6. Future VPA

• If development consent is granted in relation to the DA, it is intended that this offer be consolidated and crystallised into a VPA with Council.

- Any subsequent VPA will comply with the requirements of the EPA Act and Environmental Planning and
  Assessment Regulation 2000 and contain mechanisms for completion of any works and / or grant of
  proprietary interests (if necessary).
- The VPA may be registered by the Registrar-General.
- The VPA will contain mechanisms for the resolution of disputes and the enforcement of the agreement by the parties.
- The revised draft letter of offer is to form part of the DA lodged with Council (and the Court) is a matter that is required to be considered by the consent authority in the assessment of the DA pursuant to s.4.15(1)(a)(iiia) of the EPA Act.

#### 7. Costs

Each party shall bear its own costs of preparing, negotiating, executing and stamping the VPA and any documents related to the VPA.

Yours sincerely,

Tom Chou | Project Manager

Fusion Development Pty Ltd

## ANNEXURE 'A'

GFA Calculations above 24m, Drawing DA-770-100 (Rev A) prepared by Turner dated 19 November 2021

	19 November 2021			
	Summary: GFA above	24m		
	Usage	Level	Area	
	Communal Space	Level 07 Level 08 Level 09 Level 10 Level 11 Level 12 Level 17	19 20 20 20 15 11	
	Residential	Level 07 Level 08 Level 09 Level 10 Level 11 Level 12 Level 13 Level 14 Level 15 Level 16	332 327 317 322 197 197 204 208 210	
	Total GFA		2,798 m²	
22	Level 08	20	Level 09 1:400	21 Level 10 1:400
1	<u>Level 11</u> 1:400	2.	Level 12 1:400	3 Level 13 1:400
4.	Level 14 1:400	5.	Level 15 1:400	15 Level 16 1:400
			NINE TO A STATE OF THE PARTY OF	
<u>(6)</u>	Level 17 1:400	( <del>1</del> 7)	Plant Level 1:400	
Paris Mill Paris David Communical	Doolstanfiel			



# 273-275 ANZAC PARADE

## ISSUE FOR S34. RESPONSE

Drawing L	₋ist		
Sheet No.	Sheet Name	Rev. No.	Rev. Date
L.TD.1000	COVER SHEET	А	19/11/2021
L.TD.1001	GENERAL NOTES	Α	19/11/2021
L.TD.1010	PLANTING SCHEDULE	Α	19/11/2021
L.TD.4001	GROUND FLOOR PLAN	Α	19/11/2021
L.TD.4002	LEVEL 2 PLAN	Α	19/11/2021
L.TD.4003	LEVEL 3 PLAN	Α	19/11/2021
L.TD.4004	LEVEL 4 PLAN	Α	19/11/2021
L.TD.4005	LEVEL 5 PLAN	Α	19/11/2021
L.TD.4006	LEVEL 6 PLAN	Α	19/11/2021
L.TD.4007	LEVEL 7 PLAN	Α	19/11/2021
L.TD.4008	LEVEL 8 PLAN	Α	19/11/2021
L.TD.4009	LEVEL 9 PLAN	Α	19/11/2021
L.TD.4010	LEVEL 11 PLAN	Α	19/11/2021
L.TD.4011	LEVEL 12 PLAN	А	19/11/2021
L.TD.4012	LEVEL 13 PLAN	А	19/11/2021
L.TD.4013	LEVEL 14 PLAN	Α	19/11/2021
L.TD.4014	LEVEL 15 PLAN	Α	19/11/2021
L.TD.4015	LEVEL 16 PLAN	А	19/11/2021
L.TD.4016	LEVEL 17 PLAN	А	19/11/2021
L.TD.7001	TYPICAL DETAILS	А	19/11/2021
SK-01	SKETCH SHEET 1	Α	19/11/2021

PROJECT TEA

ISSUE	DATE	DESCRIPTION	BY	APP'
Α	19/11/2021	ISSUE FOR S34. RESPONSE	СТ	AL

NRRSARCHIT

NBRS & PARTNERS Pty Ltd
Level 2, 4 Glen Street, Milsons Point NSW 2061
T: 61 2 9922 2344 F: 61 2 9922 1308 W: www.nbrsarchitecture.com

E:architects@nbrsarchitecture.com

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20263

273-275 ANZAC PARADE

273-275 Anzac Parade, Kensington Sydney NSW 2032 for

DRAWING TITLE

COVER SHEET

PROJECT STAGE

ISSUE FOR S34. RESPONSE

NOT FOR CONSTRUCTION



### **GENERAL & LANDSCAPE NOTES**

All works to be undertaken in accordance with the relevant Australian Standards and as per the specifications.

Existing survey boxes and/or marks disturbed during construction shall be replaced to new positions as directed by Principal Contractor.

Do not use vibratory equipment, except for hand held machines, over the subsurface services. It is the Principal Contractor's responsibility to ensure there is no damage to the services during the works. Replace all materials/surface damaged to private/ public property. Ensure dated photographs are taken to kerbs and gutters to clearly indicate the existing conditions or any other structures before commencement of construction supply one set of photographs to The Principal and retain one set on site.

All existing service access pits, inspection pits and valve covers conflicting with finished surface levels are to be raised or lowered. The Principal Contractor is to ensure that these adjustments are undertaken in accordance with engineer's details.

#### **LEVELS**

- All Levels to be confirmed on site prior to construction. Setout all levels for construction and approve on site with marker stakes to which levels are notated and clearly marked
- Adjust all levels as instructed prior to final construction works
- All falls are to be established as uniform grades between spot heights and contours - Paving to all landings to be profiled to provide 1:100 fall for stormwater over land flow. Threshold to buildings to be flush with interface and fall away from building.

Confirm all levels on site prior to construction and notify landscape architect of any

Service access pits refer plans, schedule and specification for pit type and infill treatment

Refer to landscape plans and detail for make good pavement treatments associated within boundary works and utility relocations.

#### SHOP DRAWINGS

- Shop drawings are to be produced for furniture and fixtures.
- Shop drawings are to be reviewed and approved by engineer, landscape architect & architect before production commences.

#### **SET OUT**

- Do not scale off drawings.
- 2. Setout alignment and levels of all structures for approval by Principal Contractor prior to commencement of works. If any discrepancy is found or doubt exists between setout and levels as indicated on drawings and site conditions this shall be referred to the Principal with adequate notice for provision of advice prior to the continuation of works.
- 3. Benchmarks will be clearly marked on site by the Contractor. Benchmark shall be maintained by the Contractor during the course of the project
- 4. All setting out shall be established by the contractor who will be responsible for the accuracy of lines and levels of finished work. If any discrepancy is found or doubt exists between setout and levels as indicated on dwgs and site conditions this shall be referred to the Principal Contractor with adequate notice for provision of advice prior to the continuation of works.
- 5. Setout locations of furniture items are to be verified on site by Principal Contractor prior to the excavation of footings and installation.

## **SOIL MIX**

- Soil mix for planting areas refer to specification.

## **FERTILISERS**

- Refer to specification.

## **PLANT MATERIALS**

The Contractor shall be responsible for the procurement, nursery stocking and delivery of all plant material as specified including the advanced tree stock, unless otherwise advised by the Client

All grown or purchased plant stock must conform to all the conditions and requirements given in NATSPEC Guide: Specifying Trees and outlined in the specification.

Plants shall be vigorous, well established, of good form, hardened off, free from disease and pests with large healthy root systems. Not soft, forced or pot bound. The root system shall be well balanced in relation to the size of the plant. Plants shall have been grown in their final containers for not less than twelve (12) weeks. Plant containers shall be free of weeds. Plants shall not exhibit signs of having being stressed at any stage during their development due to inadequate watering, excessive shade or sunlight, physical damage or have restricted growth due to nursery rows. No substitution shall be made unless approved in writing. At least one plant of each species in a batch shall be

Advanced trees are to be planted in accordance with relevant advanced tree planting details. Stakes to be carefully aligned in a straight line. Refer to planting detail on Landscape Plans.

### TREES TO BE RETAINED / REMOVED

- Mark trees and shrubs to be removed using suitable non-injurious, easily visible and removable means of identification.
- Protect from damage the trees and shrubs to be retained, including those beyond the site area, both above and below ground.
- Provide temporary protective enclosures or guards at the drip line. Keep the area within the dripline free of construction material and debris. Do not place bulk materials and harmful materials under or near trees. Do not place spoil from excavations against tree trunks. Prevent wind-blown materials such as cement from harming trees and plants.
- Where excavations are to be made near trees, add continuous 900 mm high corrugated galvanized steel sheeting, bedded 150 mm into the ground, wired to the enclosure.
- Do not remove topsoil from, or add topsoil to, the area within the dripline of the trees. If excavation is required near trees to be retained, give notice and obtain instructions. Open up excavations under tree canopies for as short a period as possible.
- Use non-destructive methods to locate, expose and cleanly remove the roots on the line of excavation. If it is necessary to excavate within the drip line, use non-destructive methods such that root systems are preserved intact and undamaged.
- Do not cut tree roots exceeding 50 mm diameter. Where it is necessary to cut tree roots, use means such that the cutting does not unduly disturb the remaining root system. Immediately after cutting, apply a bituminous fungicidal sealant to the cut surface to prevent the incursion of rot or
- Backfill to excavations around tree roots with a mixture consisting of three parts by volume of topsoil and one part of well-rotted compost with a neutral pH value, free from weed growth and harmful materials. Place the backfill layers, each of 300 mm maximum depth, compacted to a dry density similar to that of the original or surrounding soil. Do not backfill around tree trunks to a height greater than 300 mm above the original ground surface. Immediately after backfilling, thoroughly water the root zone surrounding the tree.
- Water trees as necessary, including where roots are exposed at ambient temperature > 35oC.

### IRRIGATION PERFORMANCE NOTES

### GENERAL

The Scope of the irrigation supply and installation is;

1. Mass planted areas of the main swale and the surrounding central area.

The irrigation system should be designed, supplied and installed by an experienced specialist irrigation sub-Landscape Contractor, nominated by the Landscape Contractor and approved by the Principal Contractor. After selection they will be required to prepare detailed irrigation plans and specification for approval by the Principal Contractor prior to commencing work. The Landscape Contractor will co-ordinate the irrigation installation to the Principal Contractor's approval. Ensure completion of the irrigation system before the commencement of any other landscape works, so as to provide a readily available supply of water to planting areas.

A plan must be prepared within 21 days of the contract been let to show the comprehensive irrigation system as specified, including detailed locations of all conduits as required under paved surfaces throughout the site. The information must be suitable to permit the location and installation of such conduits during hardworks preparation.

The Landscape Contractor is to liaise with Principal Contractor as required and to coordinate locations for conduit sleeves or wall penetrations for later installation of irrigation.

The work is to be provided by an experienced, reputable and approved irrigation Landscape Contractor. The irrigation Landscape Contractor shall be responsible for determining water pressure, flow rate and locations of water connection and electrical supply.

#### Conduits

All irrigation conduits are the responsibility of the Principal Contractor. Landscape Contractor to prepare D/C irrigation design drawings indicating locations of irrigation conduits. Drawings to be submitted to Principal Contractor for approval prior to installation. Once approved, the drawings to be issued for coordination and construction. Conduits are to be placed in the locations as required in accordance with future installation of irrigation control lines to the Irrigation designer's details. Ensure that these conduits are supplied with a draw cord and remain clearly marked throughout construction.

Obtain all necessary approvals from relevant authorities. The Landscape Contractor is also responsible for complying with the requirements of all authorities connected with the works.

## - Standards and authorities

All workmanship and materials must conform to the relevant Australian Standards and all Sydney Water requirements

The Landscape Contractor shall be responsible for the co-ordination of the irrigation systems with other services throughout the site. The central electrical control box and timer shall be positioned in locations to be approved by Principal's Authorised Person.

## - Execution

## Irrigation design

Provide the following documents for approval within 3 weeks of approval of the proposed Landscape Subcontractor:.

## SUBSOIL DRAINAGE

All softscape to have subsoil drainage, detail refer to Civil Engineers Drawings.

#### OVERALL LANDSCAPE WATERING SYSTEM

Design plan at 1:200 scale indicating the overall layout of the proposed irrigation installation to the entire irrigated area including pipework and supply, defining pipe layout, control box location, type, and electricity supply. Ensure that all areas are fitted with an automated time controlled irrigation system.

All relevant information including the following details:

- 1. Product data
- 2. Performance data
- 3. System description
- 4. Water demands

The irrigations system shall be approved by the Principal Contractor prior to installation. The irrigation system shall be supplied and installed in accordance with the manufacturer's recommendations. However the following general principles apply:

## 1. Water supply connections

Connections to water supply points to be made in copper and piping is to remain in copper until isolation valve.

### 2. Isolation and master valve

An isolation valve of approved type (Brass gate or ball) is to be installed in an approved thermoplastic valve box. A master solenoid valve shall be installed downstream in the same box.

## 3. Backflow prevention

Backflow prevention will be obtained by the installation of a brass swing check valve downstream of the master valve and shall be in a separate thermoplastic valve box.

### 4. Controller

The controller shall have a minimum of 2 programs (winter and summer) and shall be of approved type, Richdel, Irritrol, Rainbird, Hardie or Toro. There will be sufficient stations to run lawn and garden areas independently. A 240 volt general purpose outlet will be provided at designated locations.

## 5. Piping

All piping sizes are to be established from allowable water velocities of no greater than 2m/s and the minimum pressure losses required to operate the sprays or drippers according to manufacturer's specifications. PVC piping to be CL 12 and to be set at minimum depth of 300mm below finished

### 6. Wiring

grade.

Wiring to be in conduit when above ground or any areas where there is no associated piping. In all other areas wire is to be fastened to irrigation pipes. Wire to be stranded multi core and all splices are to be watertight. 7. Valves

Valves to be of solenoid type (Rainbird, Richdel, Toro or Hardie) located in approved dark green or black coloured thermoplastic valve boxes set at grade in garden beds only.

## 8. Drip system

Any drip system to have adequate filtration and pressure regulation provided in line, in accordance with the manufacturers specifications. Filter and pressure regulator shall be located together in separate valve box downstream from and adjacent to solenoid valve operating drip system. Dripper placement and numbers to provide adequate application rate for plant requirements as related to size and type. Low density polyethylene tubing on in-line tubing to be set 50mm below top of soil level. If drippers on micro-tube are to be used the dripper is to be located between mulch and soil level and is to be held in position with 150mm wire stakes. Drippers shall be diaphragm or turbulent flow (labyrinth) type.

## 9. Spares

Provide spares at completion of irrigation work, properly packaged and labelled, and delivered to the Principal's Authorised Person or as directed Allow 5% of risers/heads for spares.

## 10. Guarantees and warranties

Relating to the installation and products are to be handed to the Principal Contractor on completion of the works.

## Works as executed drawing

Provide complete dimension drawings, based on the approved design plan of the entire irrigation system as executed, clearly indicating the type and location of all sprinkler lines, heads, etc. Obtain approval and revise as required. Hand the WAE Drawings to the Principal Contractor upon completion of the works.

## Completion

Completion and maintenance

Upon completion Landscape Contractor is to run through system to ensure system is operating correctly and instruct the client's representative in the correct operation and maintenance of the system. All instructions and programs are to be typed. Manuals, warranties, and a minimum of two programs, summer and winter to be provided to the Landscape Architect and the client's representative at the time of completion.

## **Practical completion certificate**

Upon practical completion Landscape contractor is to provide a certificate to the Principal Contractor to confirm all landscape works have been carried out in accordance with all landscape documentation drawings and landscape specifications.

Upon practical completion (and following final inspection) Landscape architect is to provide a certificate to the Principal Contractor to confirm that the landscape works have been completed in accordance with landscape documentation drawings and landscape specifications

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## 273-275 ANZAC PARADE

Landscape Architect

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**GENERAL NOTES** 

PROJECT STAGE

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SHEET SIZE SCALE NTS

DRAWING NUMBER L.TD.1001

ISSUE



	PLANTING SCHEDU	JLE [MASS PLANTING BEI	0]	
ID	Latin Name	Common Name	Pot Size	Quantity
PLANTING				
TREE				
HOWfos	Howea fosteriana	Kentia Palm	100L	2
			TOTAL	2
MASS PLA	NTING			
ALPzer	Alpinia zerumbet 'Variegata'	Variegated Shell Ginger	5L	38
ANIfla	Anigozanthos flavidus	Evergreen Kangaroo Paw	5L	142
ASPaus	Asplenium australasicum	Birds Nest Fern	150mm	26
ASPela	Aspidistra elatior	Cast iron plan	5L	49
BLEgib	Blechnum gibbum	Silver Lady Fern	150mm	38
CALgre	Callistemon 'Green John'	Bottlebrush cvs	5L	106
CALvIj	Callistemon viminalis 'Little John'	Little John	5L	37
CARgla	Carpobrotus glaucescens	Pigface	150mm	129
CASgla	Casuarina glauca	Grey (Swamp) She-oak	5L	107
CGCI	Philodendron 'Xanadu'	Purple Fountain Grass	200mm	49
CHAatr	Chamaedorea atrovirens	Cascade Palm	45L	20
CORgla	Cordyline Glauca	Green Ti Plant	5L	12
CYCrev	Cycas revoluta	Sago Palm	25L	51
DICrep	Dichondra repens	Kidney Weed	150mm	84
GARjas	Gardenia jasminoides 'Radicans'	Miniature Gardenia	5L	12
HEBins	Hebe inspiration	Inspiration	5L	12
HIBscan	Hibbertia scandens	Snake Vines	5L	66
LIRmus	Liriope muscari 'Evergreen Giant'	Evergreen Giant	150mm	93
LOMsha	Lomandra 'Shara'	Dwarf Lomandra	150mm	85
LOMtan	Lomandra 'Tanika'	Dwarf Lomandra	150mm	61
MYOpar	Myoporum parvifolium	Creeping boobialla	150mm	249
PENalo	Pennisetum alopecuroides	Swamp Foxtail Grass	5L	94
PENnaf	Pennisetum 'Nafray'	Chinese Fountain Grass	150mm	118
PHIxan	Philodendron 'Xanadu'	Xanadu	200mm	94
RAPexc	Raphis excelsa	Lady Palm	15L	14
RAPini	Raphiolepsis indica	Indian hawthorn	5L	93
RHAsno	Rhaphiolepis 'Snow Maiden'	Indian Hawthorn	150mm	23
SENrow	Senecio rowleyanus	String of Pearls	5L	139
SENser	Senecio serpens	Blue Chalkstick	150mm	148
SYZcas	Syzygium australe 'Cascade'	Lillypilly	25L	16
TRAasi	Trachelospermum asiaticum	Asian Jasmine	150mm	103
VIOhed	Viola hederacea	Native Violet	150mm	11
WESgre	Westringia fruticosa 'Grey Box'	Dwarf Coastal Rosemary	5L	283
vvLogic	Westingia naticosa Orey box	Dwarr Goastai (Gocillary	TOTAL	2602
CDEEN W	ALL PLANTING		TOTAL	2002
HIBscan	Hibbertia scandens	Snake Vines	5L	158
TRAasi		Asian Jasmine	150mm	22
	Trachelospermum jasminoides		5LT	37
TRAjas	Trachelospermum jasminoides	Star Jasmine		
			TOTAL	217
			GRAND TOTAL	2821

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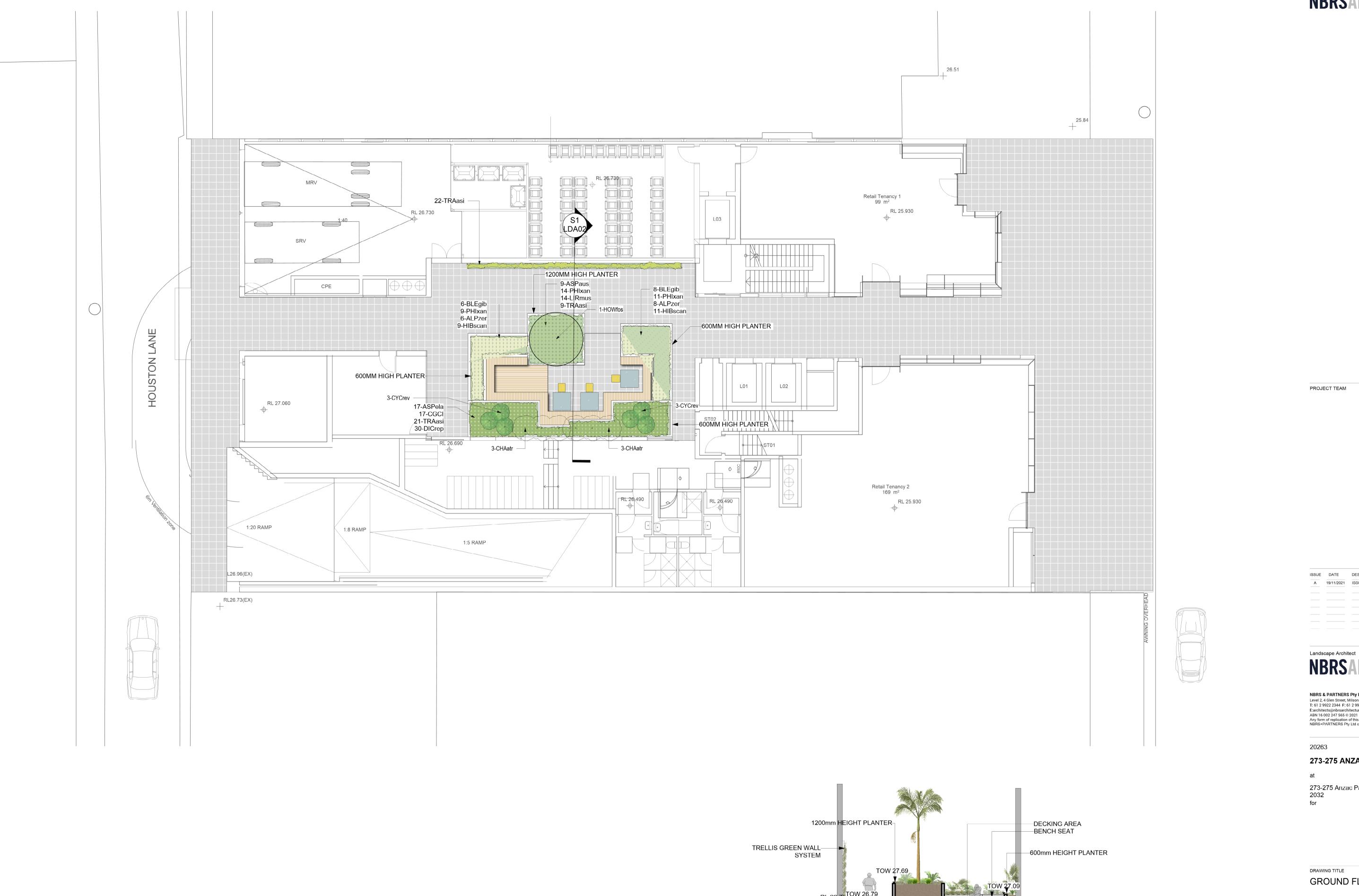
PLANTING SCHEDULE

PROJECT STAGE

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NORTH	SCALE	SHEET SIZE
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DETAIL SECTION 01 Scale: 1:100@A1



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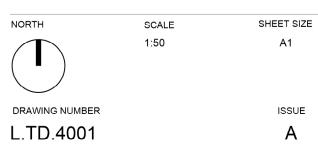
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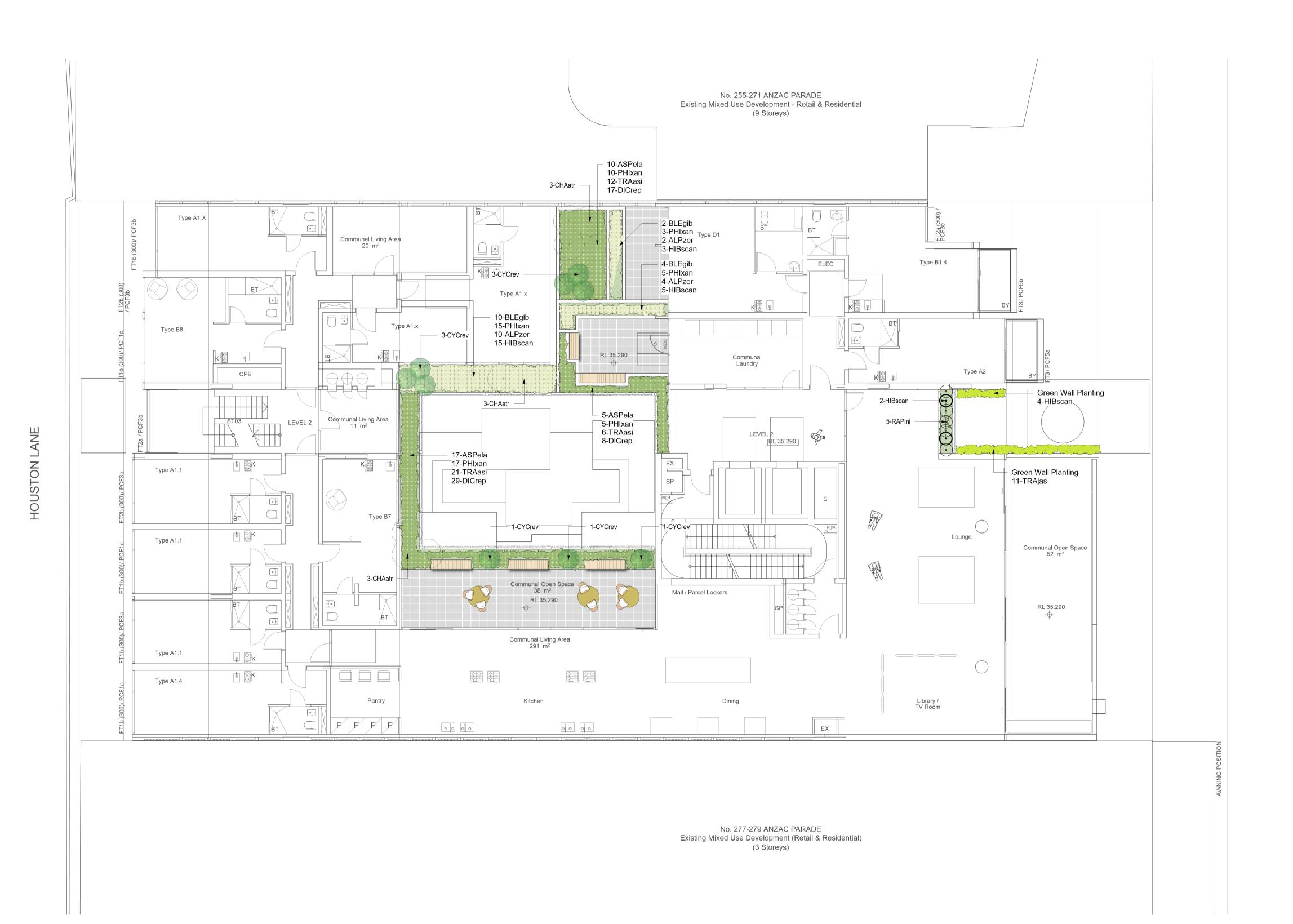
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LEVEL 2 PLAN

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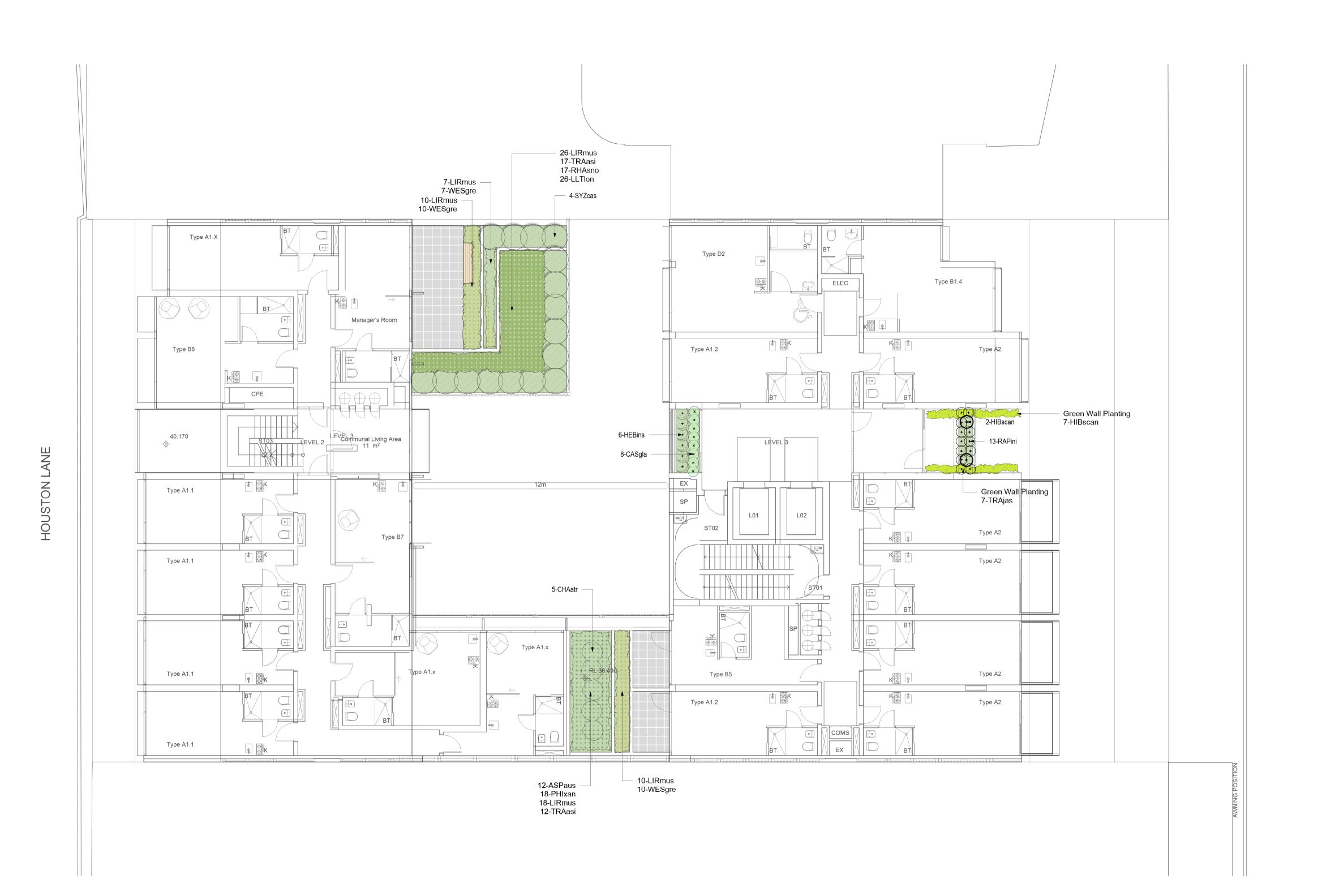
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LEVEL 3 PLAN

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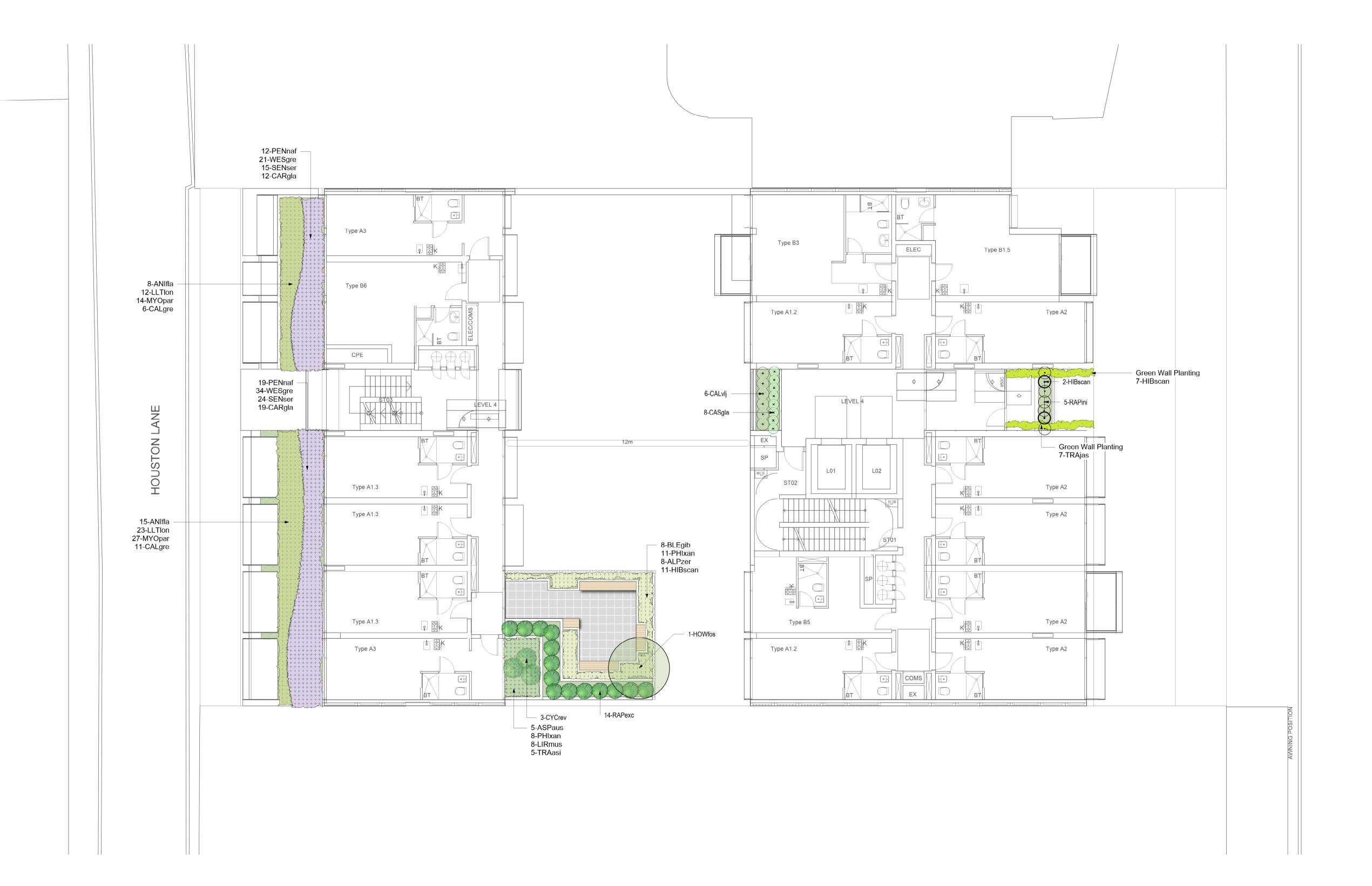
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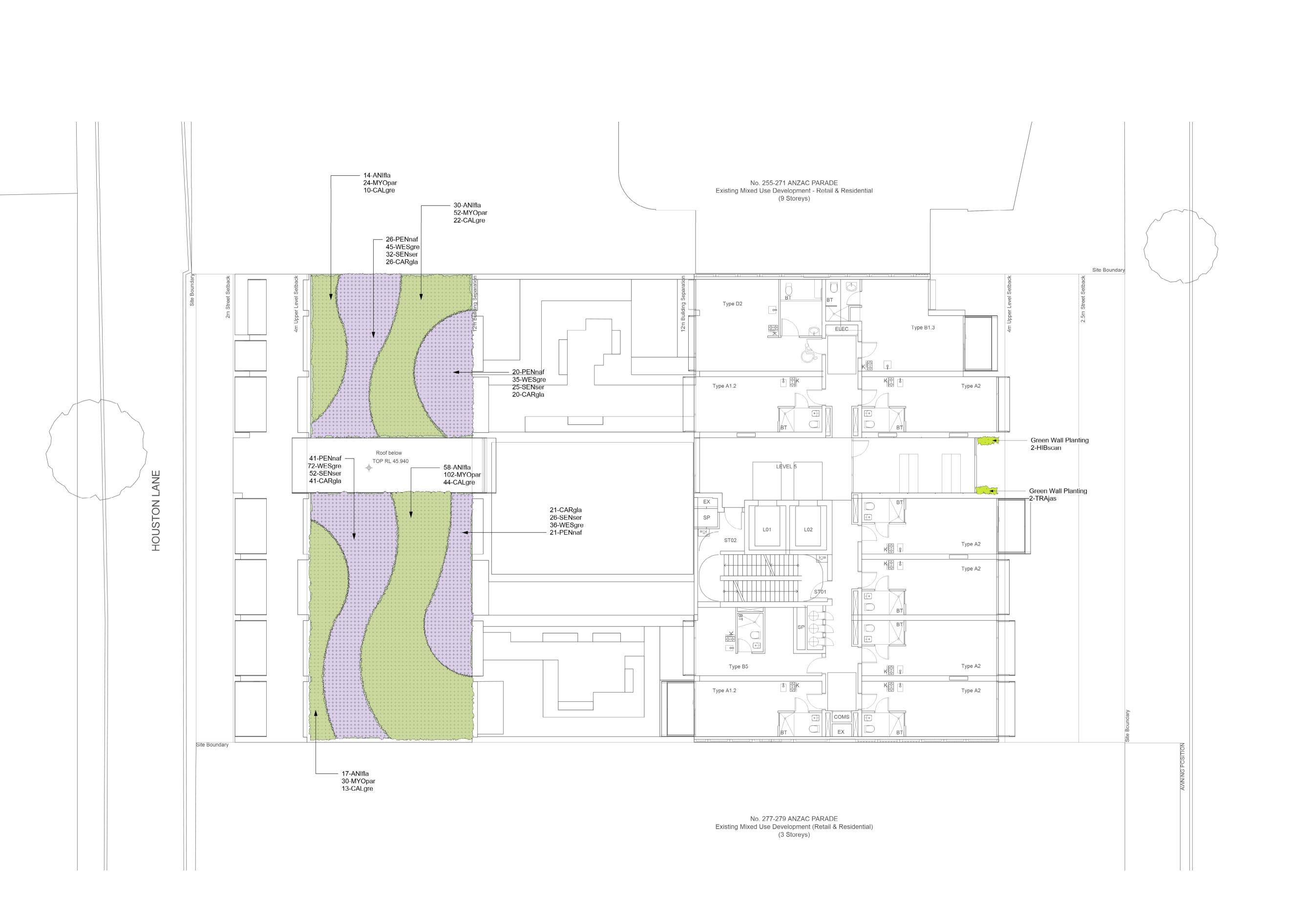
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LEVEL 5 PLAN

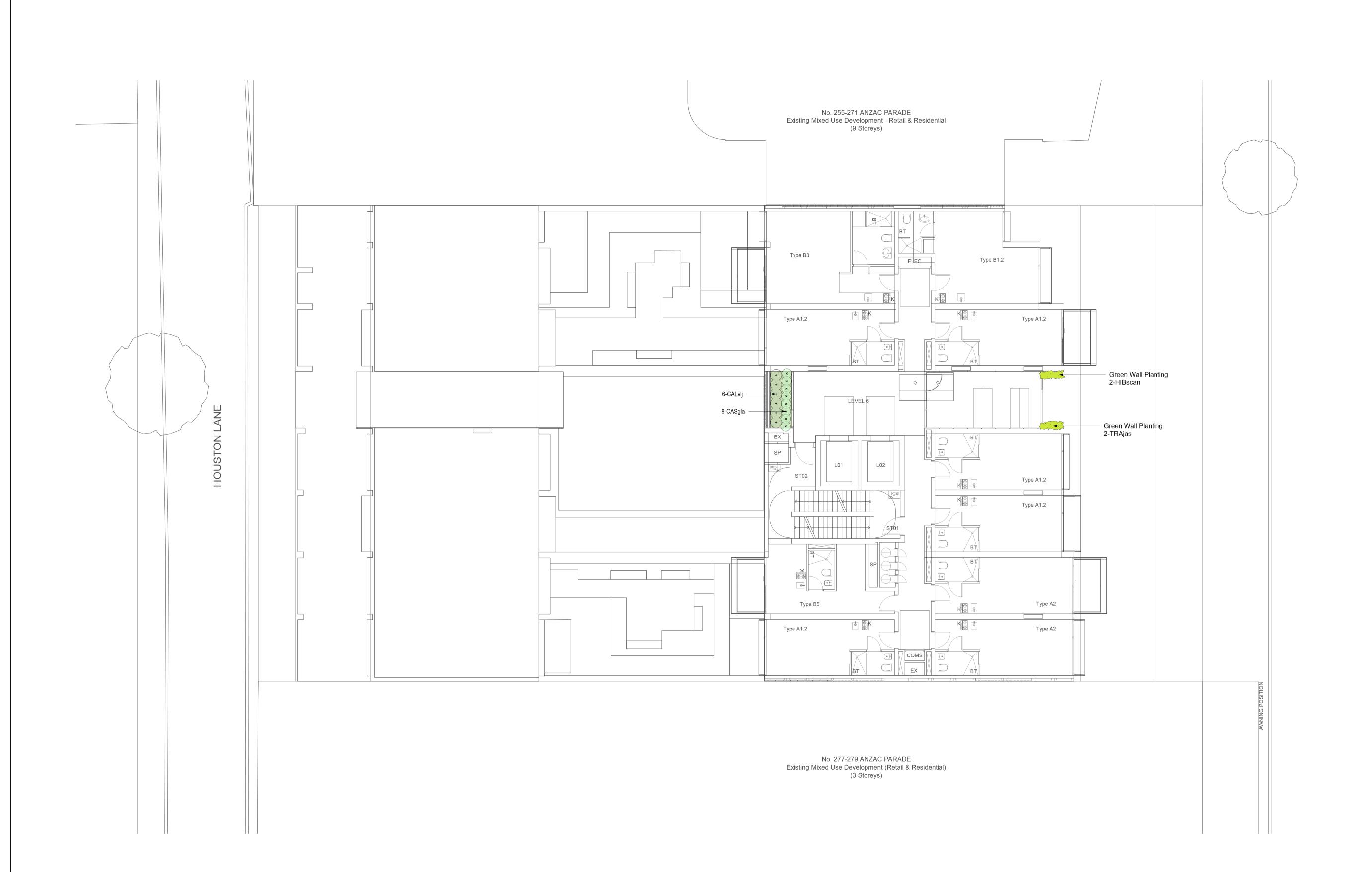
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LEVEL 6 PLAN

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LEVEL 7 PLAN

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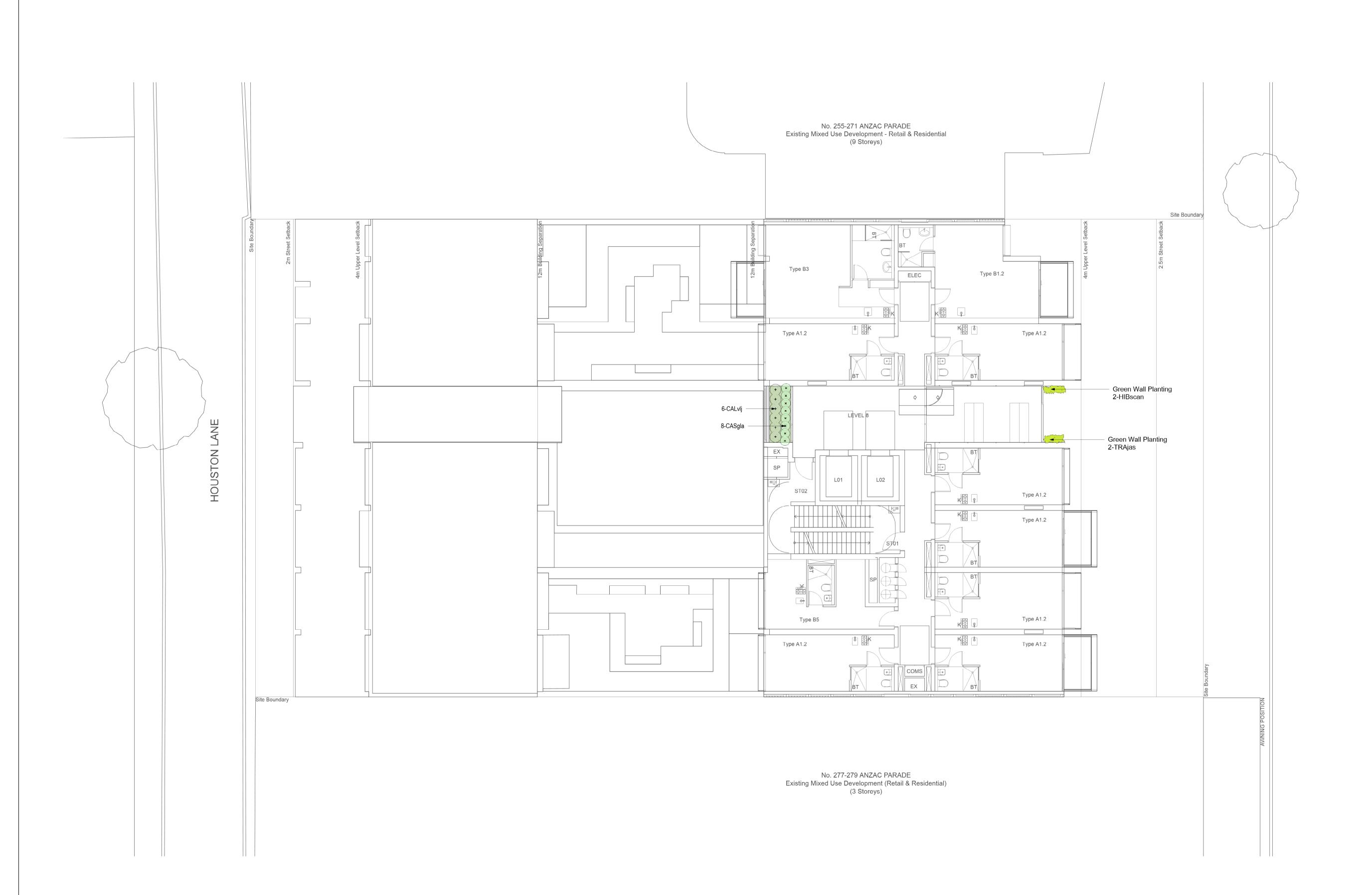
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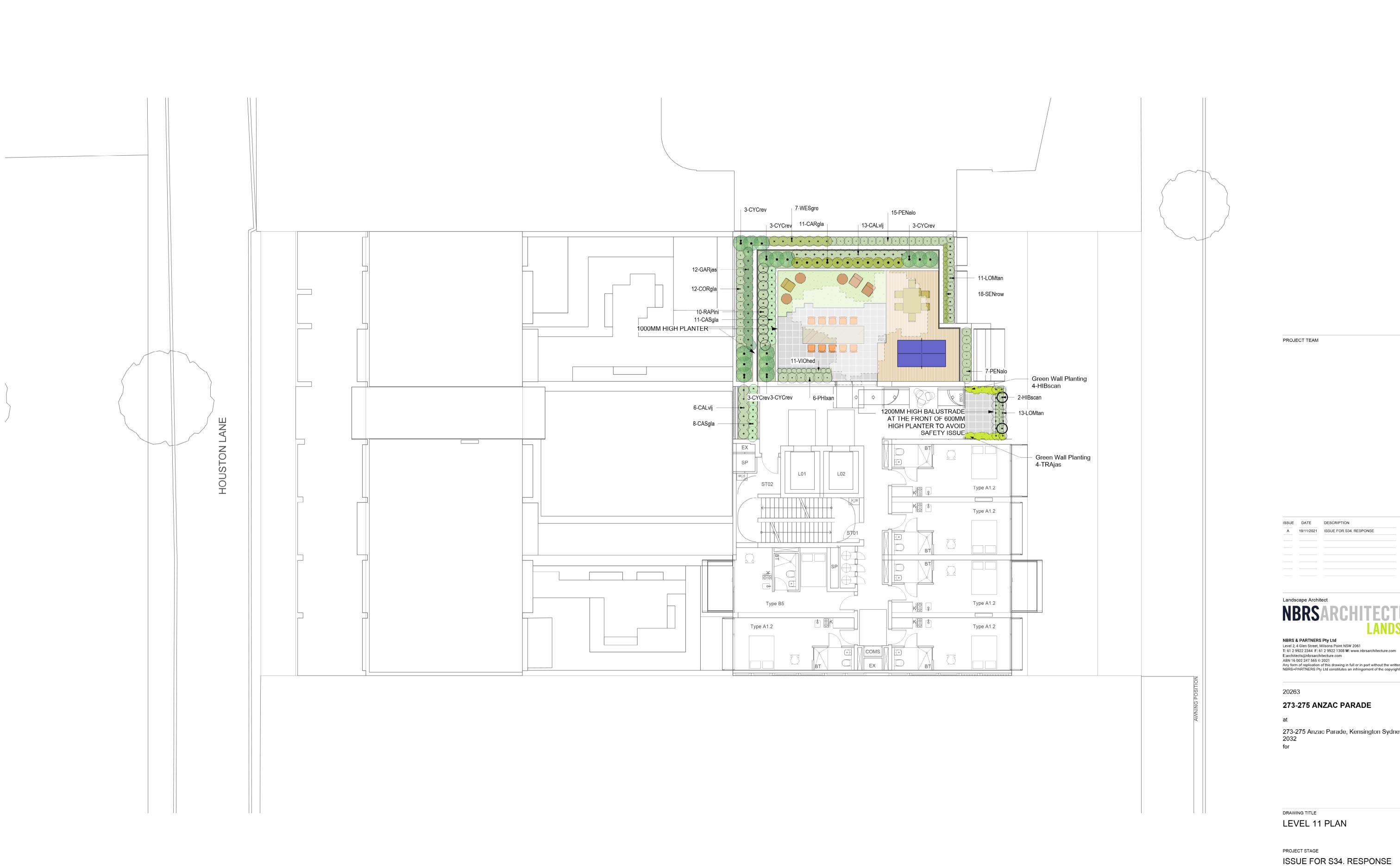
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LEVEL 9 PLAN

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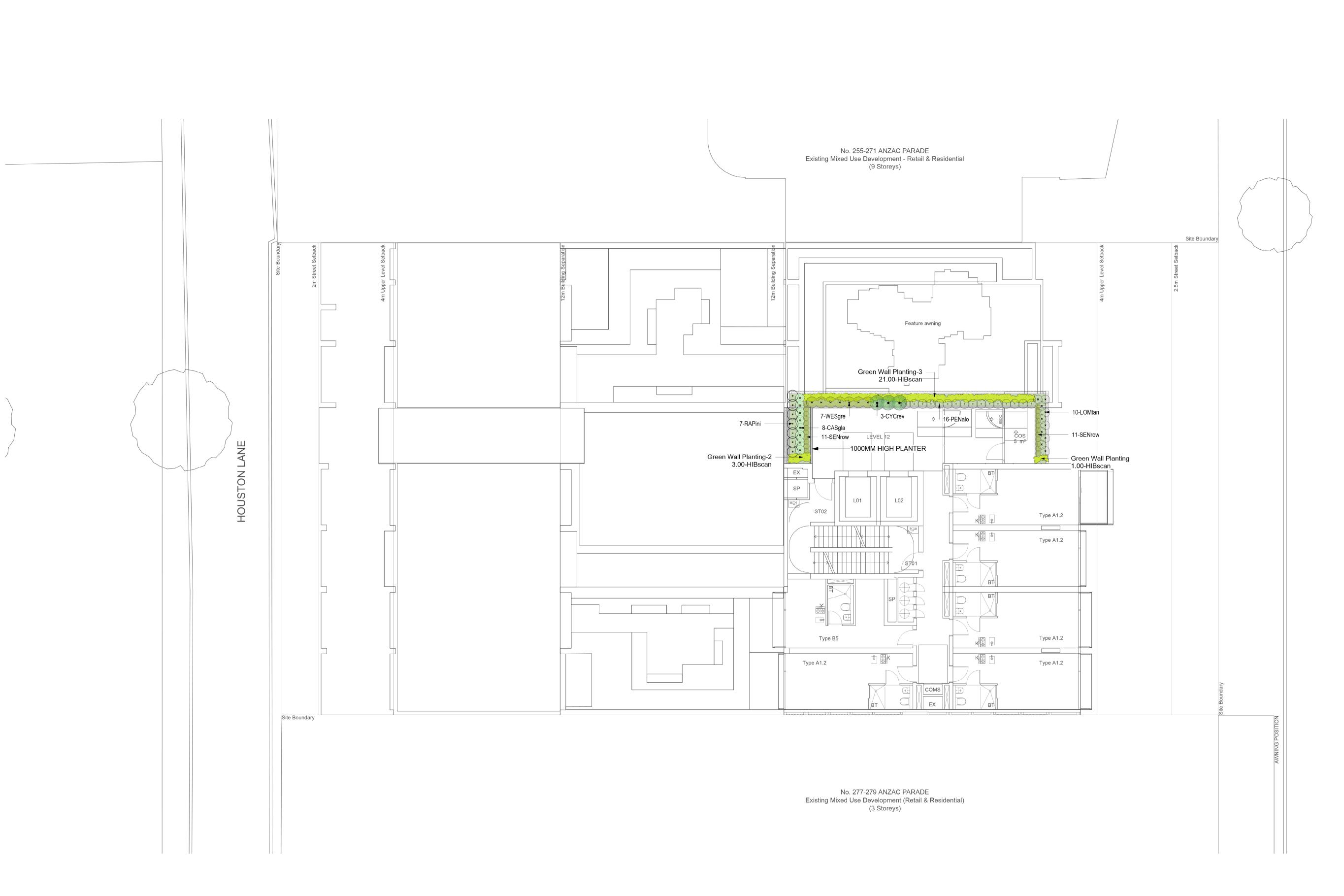
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Landscape Architect

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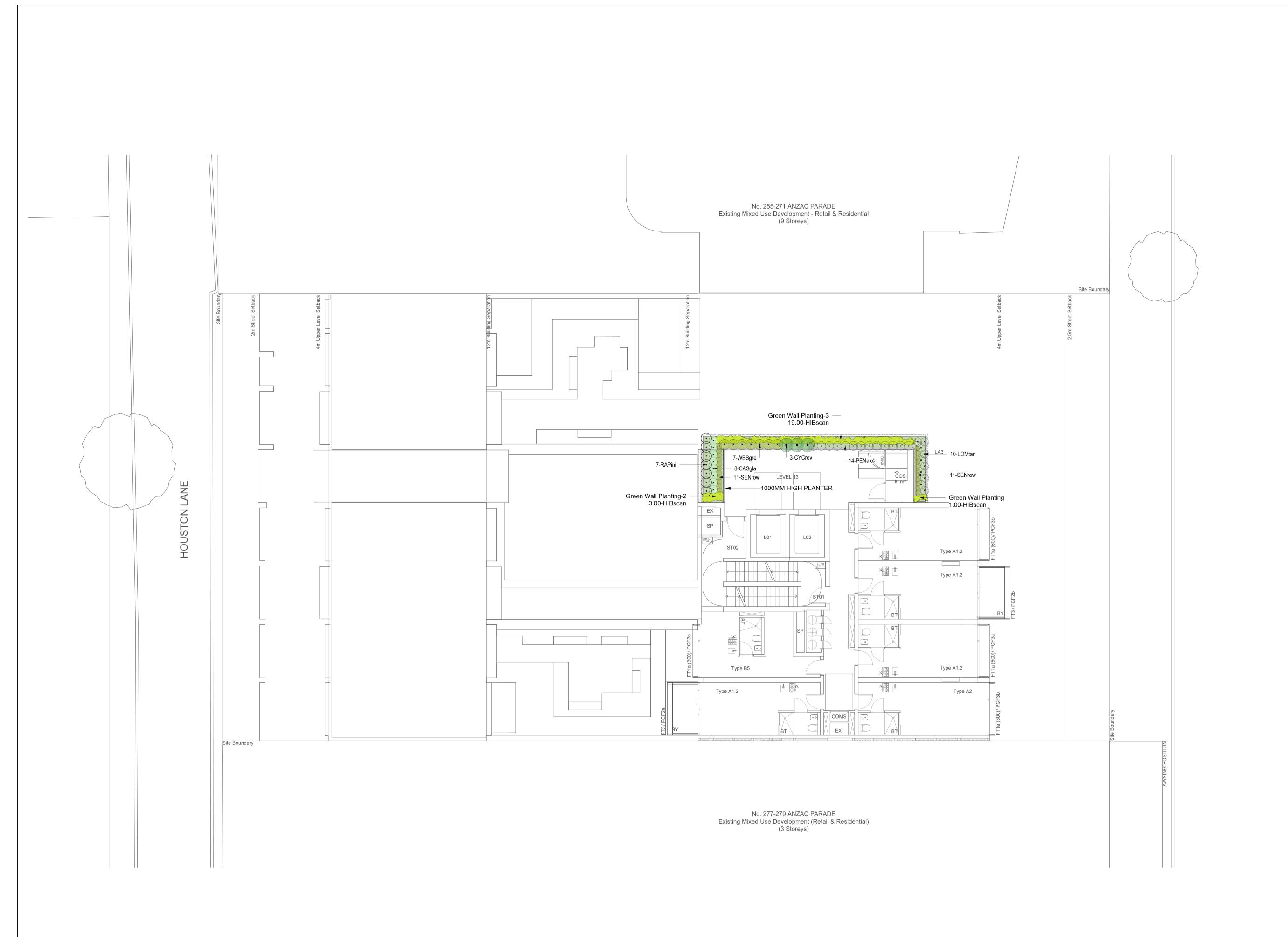
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LEVEL 13 PLAN

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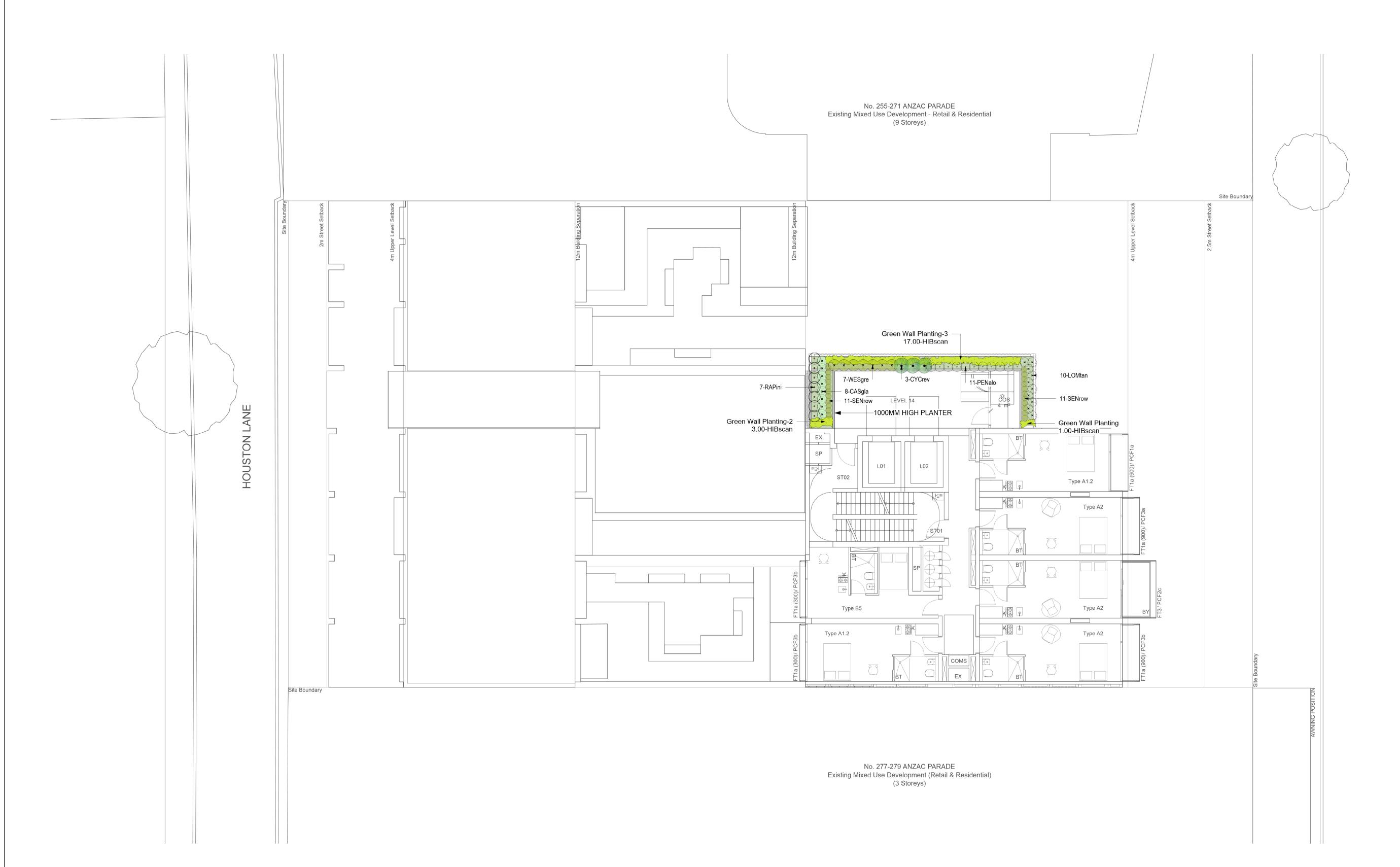
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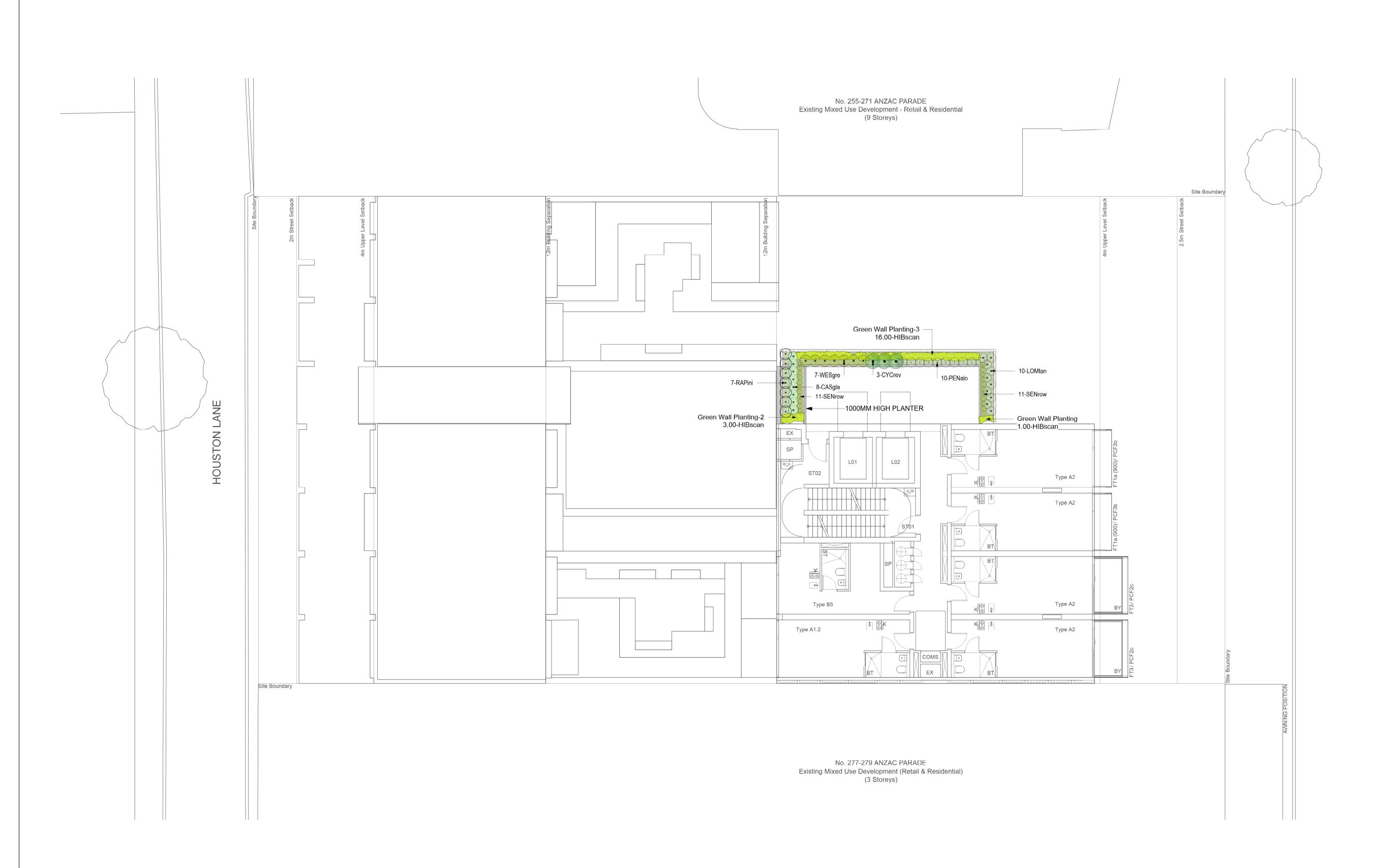
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LEVEL 14 PLAN

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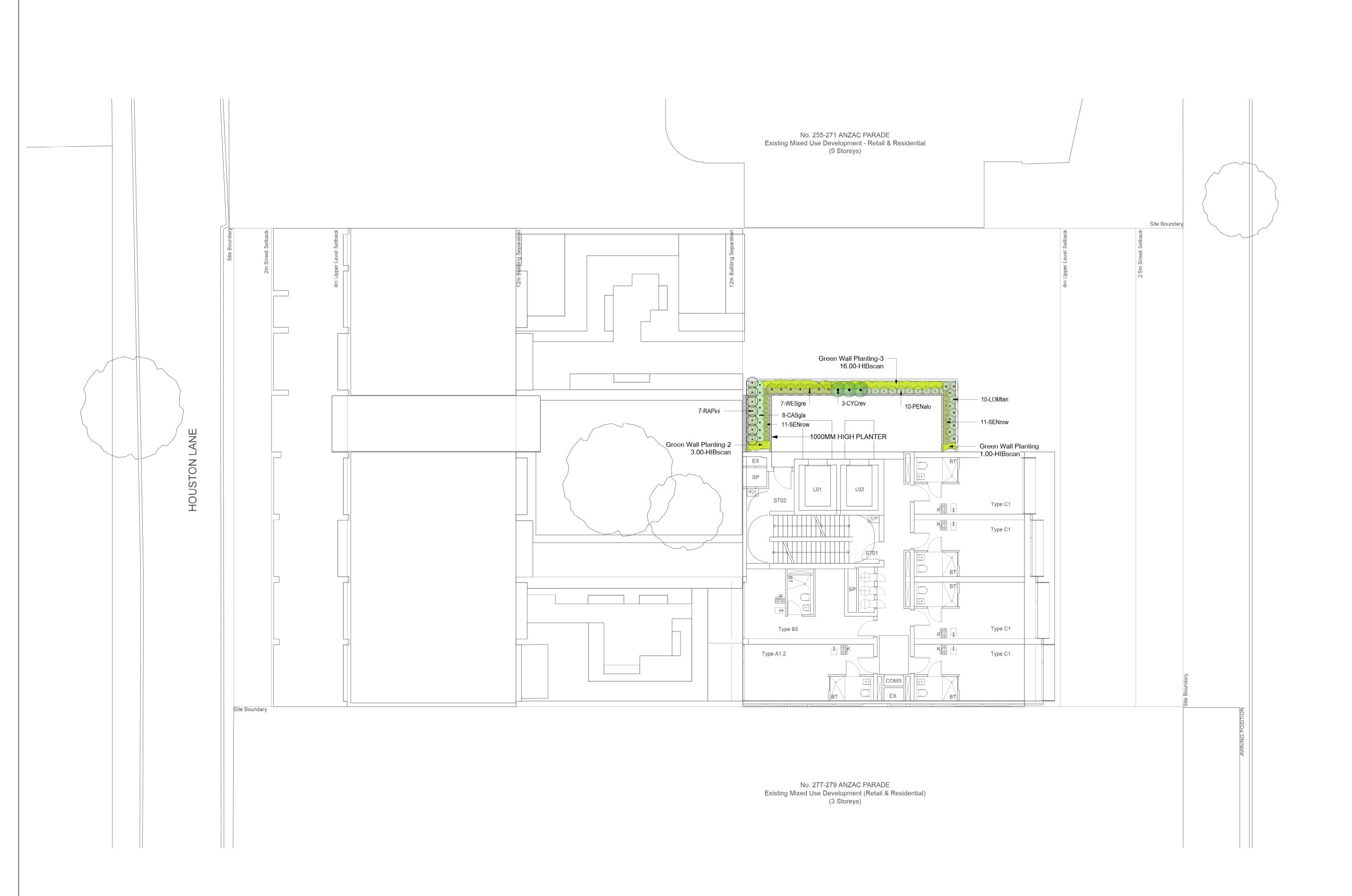
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LEVEL 15 PLAN

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LEVEL 16 PLAN

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20263

## 273-275 ANZAC PARADE

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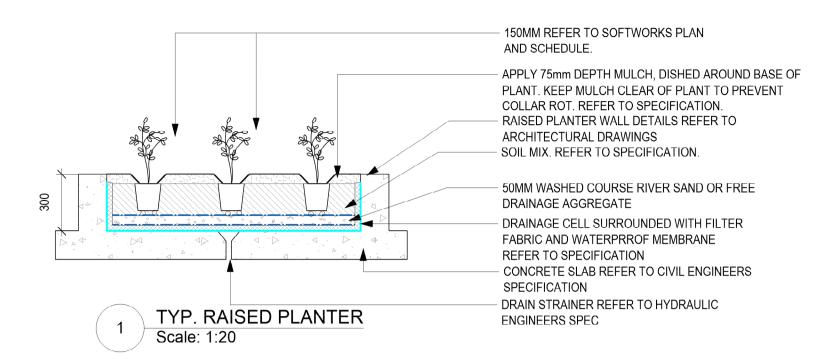
273-275 Anzac Parade, Kensington Sydney NSW 2032 for

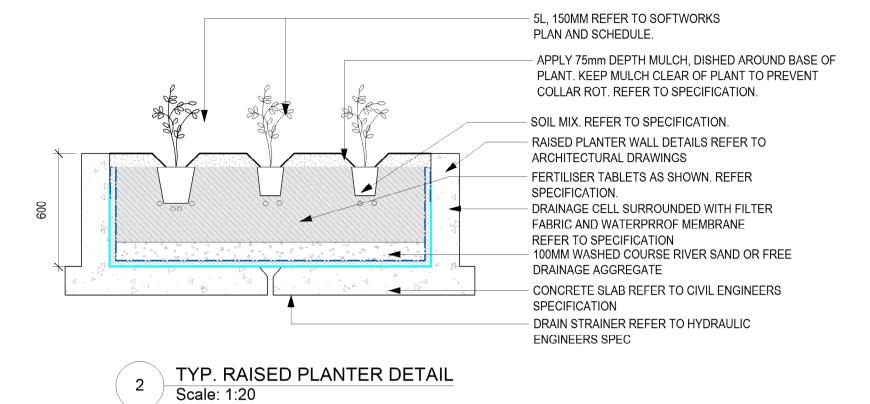
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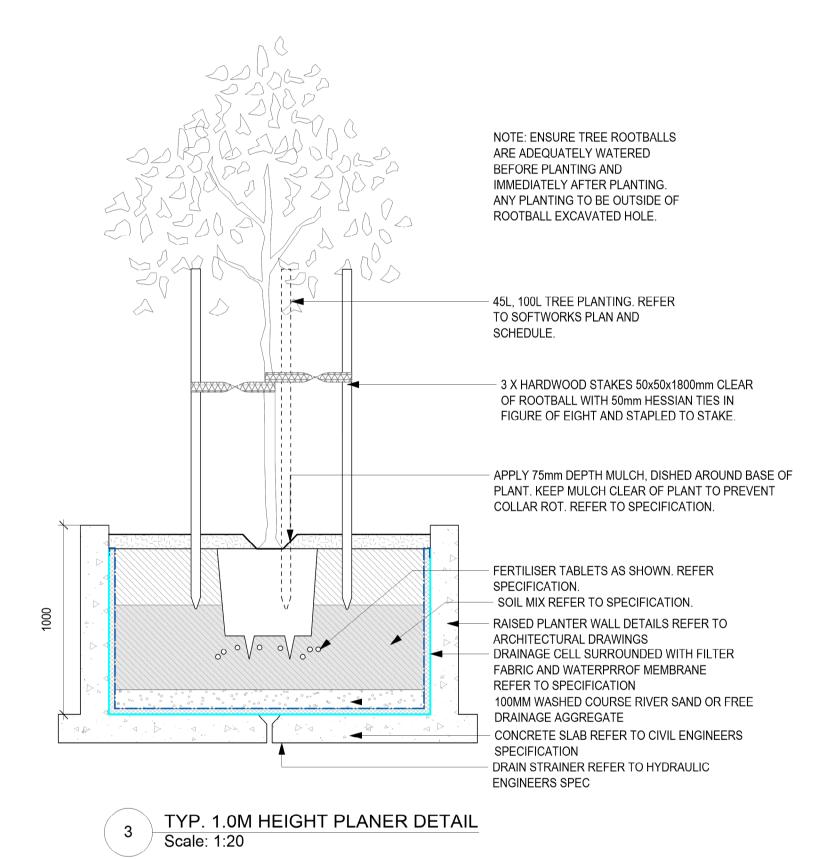
LEVEL 17 PLAN

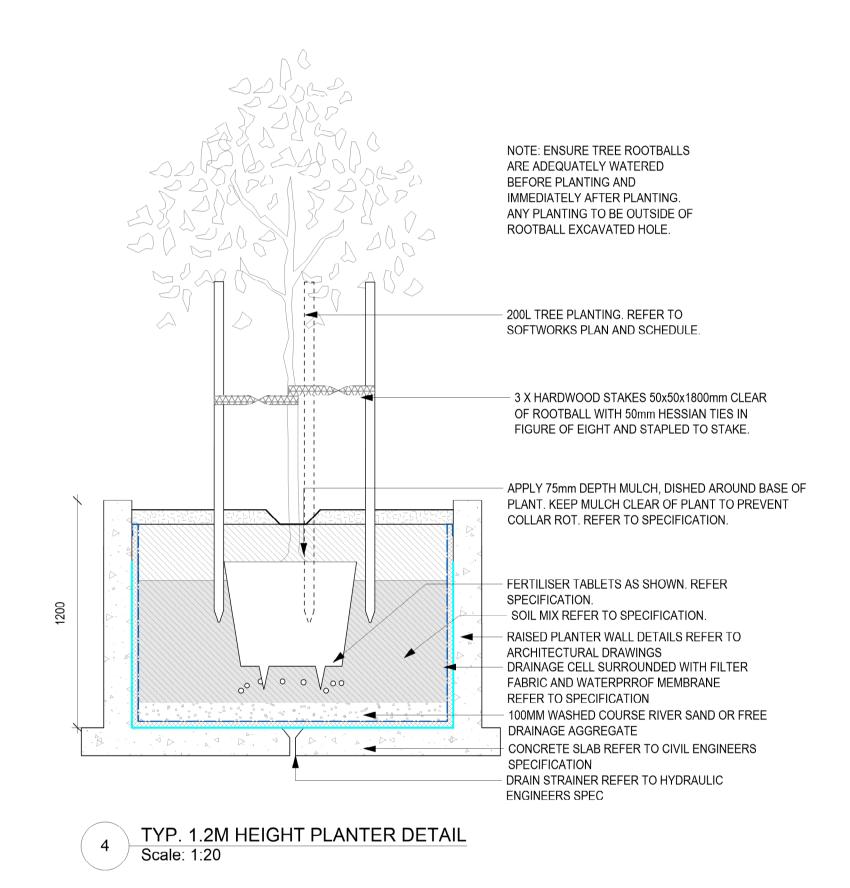
PROJECT STAGE
ISSUE FOR S34. RESPONSE

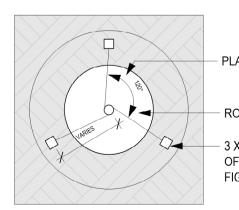
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- PLANTING HOLE TWICE THE WIDTH OF ROOTBALL.

ROOTBALL SIZE AT INSTALLATION.

3 X HARDWOOD STAKES 50x50x2400mm CLEAR OF ROOTBALL WITH 50mm HESSIAN TIES IN FIGURE OF EIGHT AND STAPLED TO STAKE.

6 TYP. TREE STAKING PLAN
Scale: 1:20

PROJECT TEAM

SSUE	DATE	DESCRIPTION	BY	APP'E
Α	19/11/2021	ISSUE FOR \$34. RESPONSE	СТ	AL

## NBRSARCHITECTURE

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20263

### 273-275 ANZAC PARADE

273-275 Anzac Parade, Kensington Sydney NSW 2032 for

DRAWING TITLE

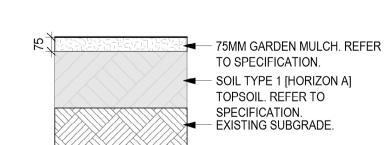
TYPICAL DETAILS

PROJECT STAGE

ISSUE FOR S34. RESPONSE

### NOT FOR CONSTRUCTION

NORTH	SCALE	SHEET SIZE
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L.TD.7001		Α
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5 TYP. GARDEN MULCH DETAIL Scale: 1:20

#### DICKENS SOLUTIONS PTY LTD 1214 Botany Road, Botany, NSW, 2019

E-Mail garry@dickenssolutions.com.au Mobile 0400 388 996

## WASTE MANAGEMENT REPORT SECTION 34 - CONCILIATION CONFERENCE

## PROPOSED BOARDING HOUSE & COMMERCIAL DEVELOPMENT 273-275 ANZAC PARADE, KINGSFORD

Correspondence has been received from Council in relation to a proposed Section 34 Conciliation Conference for the DA submitted for the proposed development.

As part of this process Council has provided list of contentions that need to be resolved. One of these contentions relates to a waste management (sustainability) issue – Contention No 17 – Sustainability. The details of the contention are provided below in **BOLD FACE TYPE** with the response following it.

#### **Contention 17 – Sustainability**

The development application should be refused because it has not complied with the relevant controls in Section 22 of the K2K DCP including how the building will achieve the future provision of an Automated Waste Collection System (AWCS).

#### **Particulars**

- a) Part C Section 22 of the K2K DCP control (h) requires an Automated Waste Collection System, which has not been provided.
- b) Necessary infrastructure requirements associated with a AWCS such as waste chutes have not been provided
- c) It has not been satisfactorily demonstrated that the site will be accessible by a Council waste collection vehicle in regards to swept paths, turning manoeuvres and overhead clearances.
- d) In consideration of the requirements of K2K DCP, the proposed private collection of residential is not acceptable in this instance.

#### RESPONSE – Contention 17 (a) – Automated Waste Collection System

In order for this Contention to be adequately addressed it is considered that a background into the proposed ACWS needs to be provided, so that the Court can have a better understanding of the impact of such a system, not only on this development, but also on the Randwick community as a whole.

Council appointed SLR Consulting Pty Ltd, to undertake a scoping and feasibility analysis to investigate the feasibility of introducing an automated underground waste collection system (AWCS) in the Kensington and Kingsford areas, to reduce the number of garbage bins on the streets and the number of collection vehicles as well as increasing recycling and reducing litter in the town centres, Council appointed SLR Consulting Pty Ltd, to undertake a scoping and feasibility analysis for an underground AWCS.

An AWCS collects waste and transports it at high speeds through underground pneumatic pipes or tubes to a collection station where it is compacted into bulk

containers. The bulk containers are then collected from the collection station and transported to downstream waste management treatment or disposal systems. Mobile vacuum vehicles can also be used. These collect from purpose-built outlets, compact waste and transport it to facilities for treatment or disposal.

According to SLR's study, there are two basic AWCS designs, an area-wide system or a local system.

- Area-wide collection systems involves conveyance of waste from connected buildings to a remote collection point, a fixed collection station, for bulking into containers prior to collection. Collection stations are positioned at a convenient location which can be above or below ground and can be located up to 2.5 km from the furthest point of the network.
- Local collection systems focussed on one building or a small number of proximate buildings the waste is held in underground tanks below each inlet while awaiting collection. Multiple fractions can be collected, each with its own underground tank, and a separate collection vehicle. Containers are emptied using a waste collection vehicle fitted with automatic suction equipment2. The collection docking points are typically located in, or at the edge of, the development at a convenient access point for the vehicles. Each docking point can be connected to a number of tanks. Examples are shown below.



Local Collection System Underground Tanks and Mobile Vacuum Truck



## Local Collection System Using a Mobile Vacuum Collection Vehicle and Docking Point

According to the study, it is understood that potential costs to install an AWCS range from \$32million to \$49.5million.

The study concluded that a single integrated AWCS scheme could be delivered, or two separate AWCS schemes. Two sites were identified by Council in Rainbow Street and at Randwick Racecourse, and the study indicated that both appear to be of sufficient size to accommodate a collection station. It is unknown whether additional costs would be needed to secure these locations.

#### The study also concluded that:

- At the maximum quantities estimated two collection stations would be required and would ensure best practice and system resilience. A single collection station could be used in an integrated scheme, however, the viability of this would need to be tested further
- The light rail system has presented engineering challenges for the installation of a pipe from west to east under Anzac Parade. Tunnelling may be possible. However, installation methods and costs would need to be understood from suppliers
- Construction and installation of an AWCS along Anzac Parade is not viable. As a result, a system would need to be installed in the rear shared laneways. Proposed rear shared laneways in Kensington would assist with implementation of a local AWCS, however, an area-wide AWCS for Kensington is unviable. An area-wide AWCS is a viable option for Kingsford subject to certain assumptions.
- Certain waste streams, such as bulky waste, cannot be managed using AWCS. Alternative systems will need to be made for these waste streams.

#### The study provided the following recommendations to the Council:

- Develop and refine the waste generation estimates (residential and commercial) to confirm the quantity of waste generated in the proposed areas
- Develop and refine the potential residential unit estimates to confirm the number of apartments which may join an AWCS scheme
- Develop an understanding of the types of commercial waste being generated and its appropriateness for an AWCS
- Consider whether the scheme would be operated for residential waste only or residential and commercial waste
- Develop a time line for future development of apartments and commercial space to understand timing for additional users and quantities to access the AWCS
- Consult with various parties including suppliers, NSW EPA, resident groups and others
- Confirm the viability of the Rainbow Street site as a collection station location
- Review the services installed in the rear shared laneways, pavements and roads to determine whether and where an underground pneumatic pipe network
- review the location and size of service conduits constructed in the light rail scheme to confirm whether crossing under Anzac Parade and the light rail system is viable without requiring the use of boring or directional drilling
- Collate current waste management costs of servicing the study area (residential)

and commercial) to support development of a business case.

Based on discussions with Council, it is understood that none of these recommendations have been undertaken. It is also understood from discussions with industry sources that from the initial approval stage of any AWCS to the commencement of operations would take several years — based on this it could reasonably be assumed that a Kensington-Kingsford AWCS could be as long as 10 to 15 years away.

In view of the above information, it is considered that the Waste Management Plan provided for the proposal provides a practical and efficient waste transportation system, and as such it is requested that Council reconsider its requirement to provide this system.

Notwithstanding any of the above, should Council reaffirm its position, the building will need to be substantially redesigned in order to accommodate this system. This may have potential impact on other matters of contention.

In order to address this contention fully, the Applicants architects, Turners Studio, have put together a set of drawings, detailing the basic requirements for a proposed interim and future strategy in terms of Council's proposed AWCS. Copy provided below.

At this there are still a number of unknowns that need to be made clear. For example, Council has still not indicated whether there will be a localized system or a central facility for collection, disposal and processing, in addition to advising how this all comes together, timelines and the like. To this end, it is considered that Council should provide some clear direction and quantifiable data on what we are required to provide.

This is a costly process and has wider impacts over the entire Randwick community. The provision of supporting infrastructure, sourcing of sites for end-of-process facilities (if required), digging up roads to lay pipes for underground tanks, and provision of on-site facilities for vehicle access and collection activities, all needs to be clarified.

What the Applicant has provided in the attached plans, considered to be an accurate detail of the generic requirements for an AWCS. However, it is further considered that Council should provide a more prescriptive account of the infrastructure, technical and spatial requirements that are needed to be incorporated into the development, as none of this, at this stage is known.

The Applicants concern at this stage is that by providing both interim and future AWCS solutions based on the current information Council has provided, may result in costly and unnecessary changes to the building in the event of any new technical processes, additional infrastructure requirements, change in strategic direction by Council – and at worst abandonment of the project. In order to be 'AWCS ready', this information is critical.

Based on current arrangements, the AWCS proposed is for a localized system.

#### RESPONSE – Contention 17 (b) – Provision of a Chute System

Subject to Council's confirmation, full Implementation of the AWCS for the boarding house component upon commencement of operations/occupation of the boarding house will be provided. This is conditional based on the provision and installation of all required infrastructure to be provided by Council to support the system.

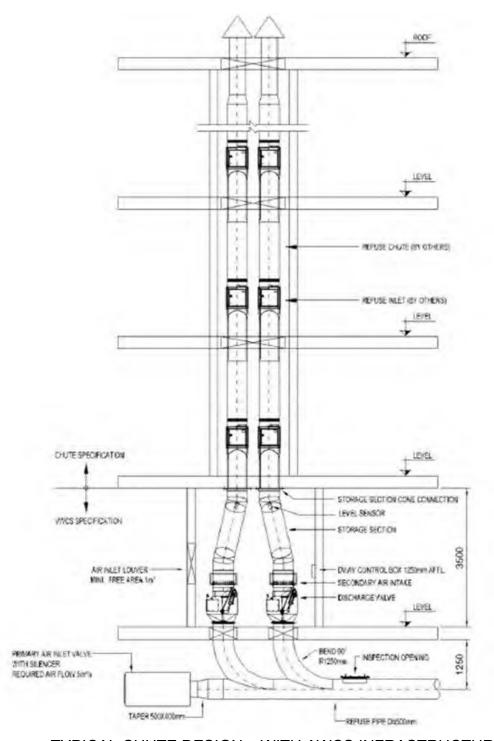
In the case of this particular development a conventional waste collection system has not been provided. However, a chute system will be provided. It will be designed and installed in accordance with current Australian Standards and manufacturers specifications.

The chute will be for the reception of both waste and recycling material. For it to be retrofitted to this new technology the chute will be extended to the basement slab level for connection to the ACSW. A third waste chute of minimum diameter 0.22m immediately adjacent to the two proposed waste chutes, for future use for food/organic waste will also be provided.

Subject to Council requirements, a space will be identified adjacent to the Houston Lane Street entry to the site, possibly utilising the loading bay for a future connection point to enable collection by a designated Council Collection Vehicle. Appropriate space for associated Tanks & Pipe infrastructure to the collection point will also be provided.

Confirmation of the above and other requirements will be obtained by a suitably qualified AWCS Waste consultant to the satisfaction of the Principal Certifier.

Based on discussions with Council officers from both the Strategic Planning and Waste Departments, it is understood that the proposal is in its early formative stage and there are a number of elements that need to be considered in order to develop the AWCS further. These include the location, design and arrangement of intermediate collection facilities, processing technologies, the type of waste streams that will be accepted into the system, infrastructure and cost.



TYPICAL CHUTE DESIGN - WITH AWCS INFRASTRUCTURE

#### RESPONSE – Contention 17 (c) – Collection Vehicle Access to the Site

Entry to the site will be provided to accommodate Council's rear loading waste collection vehicles, which based on information provided by Council, will be a MRV, with the following approximate dimensions:

- Length 8.8m,
- Operational Height 3.5m; and,
- Width 2.82m (mirror to mirror).

#### RESPONSE – Contention 17 (d) – Collection Service Provider

As required by Council all waste and recycling services to the boarding house component of the building will be provided by Randwick City Council.

Garry Dickens
Waste Management Consultant
Dickens Solutions
29 September 2021.



## TRANSPORT AND TRAFFIC PLANNING ASSOCIATES

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27 September 2021

Ref: 20218

Fusion Development Pty Ltd Mr. Tom Chou, c/o- Cecilia Huang Senior Associate T U R N E R

By Email: chuang@turnerstudio.com.au

Dear Mr. Tom

Proposed Mixed-Use Development 273-275 Anzac Parade, Kensington Case No - 2021/00200198

I have assessed the following traffic and parking-related contentions for the above site against the revised architectural plans prepared by Turner. The revised development comprises 143 rooms (278 beds), 677m<sup>2</sup> commercial GFA and 268m<sup>2</sup> retail GFA.

The contentions and associated TTPA's response are provided below.

#### Contention 14 – Transport, Traffic, Access and Parking

The development application should be refused as there is uncertainty in the car parking provision required and the layout makes excessive use of tandem carparking which is inappropriate.

#### **Particulars**

For parking to the boarding house Clause 29(2)(e) of SEPP ARH provides as follows in relation to the car parking standards envisaged for development to which Division 3 applies:

- "29 Standards that cannot be used to refuse consent
- (2) A consent authority must not refuse consent to development to which this Division applies on any of the following grounds:

#### (e) parking if:

- (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,
- (b) The proposed boarding house will not be carried out by or on behalf of a social housing provider. Accordingly, pursuant to clause 29(2)(e)(ii)(a) of SEPP ARH, if the proposed development provides parking at a rate of 0.5 spaces for each boarding room, it cannot be refused on the ground of parking.
- (c) Having regard to the 142 boarding rooms + managers room proposed, the proposed development would not be refused on the grounds of parking pursuant to clause 29(2)(e)(ii)(a) of SEPP ARH if 72 spaces were provided for the boarding house. This standard has not been met.
- (d) Notwithstanding, Council does have the discretion to vary the parking requirements in accordance with Clause 29(4) of the AHSEPP. In this regard it is noted the K2K DCP specifies a zero parking rate for student accommodation however this DCP clause is not applicable to parking requirements for key worker accommodation and academics (i.e., not students).
- (e) There is an inconsistency between the Statement of Environmental Effects and the Traffic and Parking report in how much of the boarding house accommodation will be dedicated to key-worker accommodation and academics creating uncertainty in the amount of parking required for the boarding house.
- (f) For the proposed three commercial tenancies the K2K DCP specifies a parking rate of 1 space per 125m2 for business premises and 1 space per 100m2 for a café. This would generate a parking demand of around 9 spaces for the commercial component (total GFA of 1119m2) or 11 spaces if they are all cafes/restaurants. For the purposes of assessment, a requirement of 10 spaces has been adopted for the commercial component.
- (g) When considering all components of the development the parking requirements of AHSEPP (for boarding house) and K2K RDCP (for commercial) suggests a total parking provision of approximately 82 spaces is required. A total of 76 car parking spaces are proposed for the entire development resulting in a shortfall of 6 spaces (7.3%). The shortfall may be acceptable depending on the proportion of accommodation to be solely dedicated to students and issues with the layout have been resolved.

(h) The submitted plans indicate 6 parking spaces on Basement level 1 and 12 spaces on basement level 2 are to be provided in tandem arrangements. The accompanying traffic report indicates the tandem spaces will be allocated to the retail component however this will then result in an allocation of 18 spaces to the commercial component (despite 9 being incorrectly stated in traffic report), which is an over allocation and may create a parking shortfall for the boarding house. It may therefore be necessary to allocate some of the tandem parking to the boarding house which is impractical and not supported.

Some of the tandem spaces may need to be converted to normal spaces or independently mechanical stacked spaces to maintain the current parking provision. This will have implications on head clearances and swept paths in the basement levels.

#### TTPA's Response:

It is noted that the boarding house component will only be utilised for student accommodations.

Based on the above, the development will now propose 18 car parking spaces with the following breakdown on Basement 1 (see revised plan on Appendix A):

- 7 spaces for boarding house use (including 1 disabled space)
- 7 spaces for commercial use (including 1 disabled space)
- 4 spaces for retail use (including 1 disabled space)

The above car parking provision is in full compliance with the Council's DCP parking requirements.

#### Contention 15 – Motorcycle Parking

The development application should be refused because insufficient motorcycle parking has been provided, which is inconsistent with the requirements of clause 30 in SEPP ARH.

#### **Particulars**

- (a) Clause 30 'Standards for boarding houses' of SEPP ARH relevantly states: "30 Standards for boarding houses
- (1) A consent authority must not consent to development to which this Division applies unless it is satisfied of each of the following:
- (h) at least one parking space will be provided for a bicycle, and one will be provided for a motorcycle, for every 5 boarding rooms."

- (b) The proposed development contains 142 rooms + manager thereby generating a compulsory requirement for 28 spaces.
- (c) The proposed development provides 19 motorcycle parking spaces, which falls short of the minimum number required by the development standard by 9 spaces, or 32%, which is unacceptable.
- (d) The Applicant has not submitted a written request pursuant to clause 4.6 of RLEP 2012 seeking to justify the contravention of the development standard in clause 30(1)(h) of SEPP ARH.

The development application must be refused because the proposed development does not provide adequate motorcycle parking and, in that regard, does not comply with the standards in section 30(1)(h) of SEPP ARH.

#### **TTPA's Response:**

The development now proposes 29 motorcycle parking spaces (28 spaces for boarding house use and 1 space for commercial/retail use). Such provisions are now in accordance with SEPP (for boarding house use) and Council's DCP (for commercial/retail use) requirements.

Swept path assessments provided in Appendix B demonstrate satisfactory manoeuvring for all design vehicles entering and exiting the site.

Should you have any questions or require any further information, please do not hesitate to contact me on (02) 9411 5660.

Yours faithfully

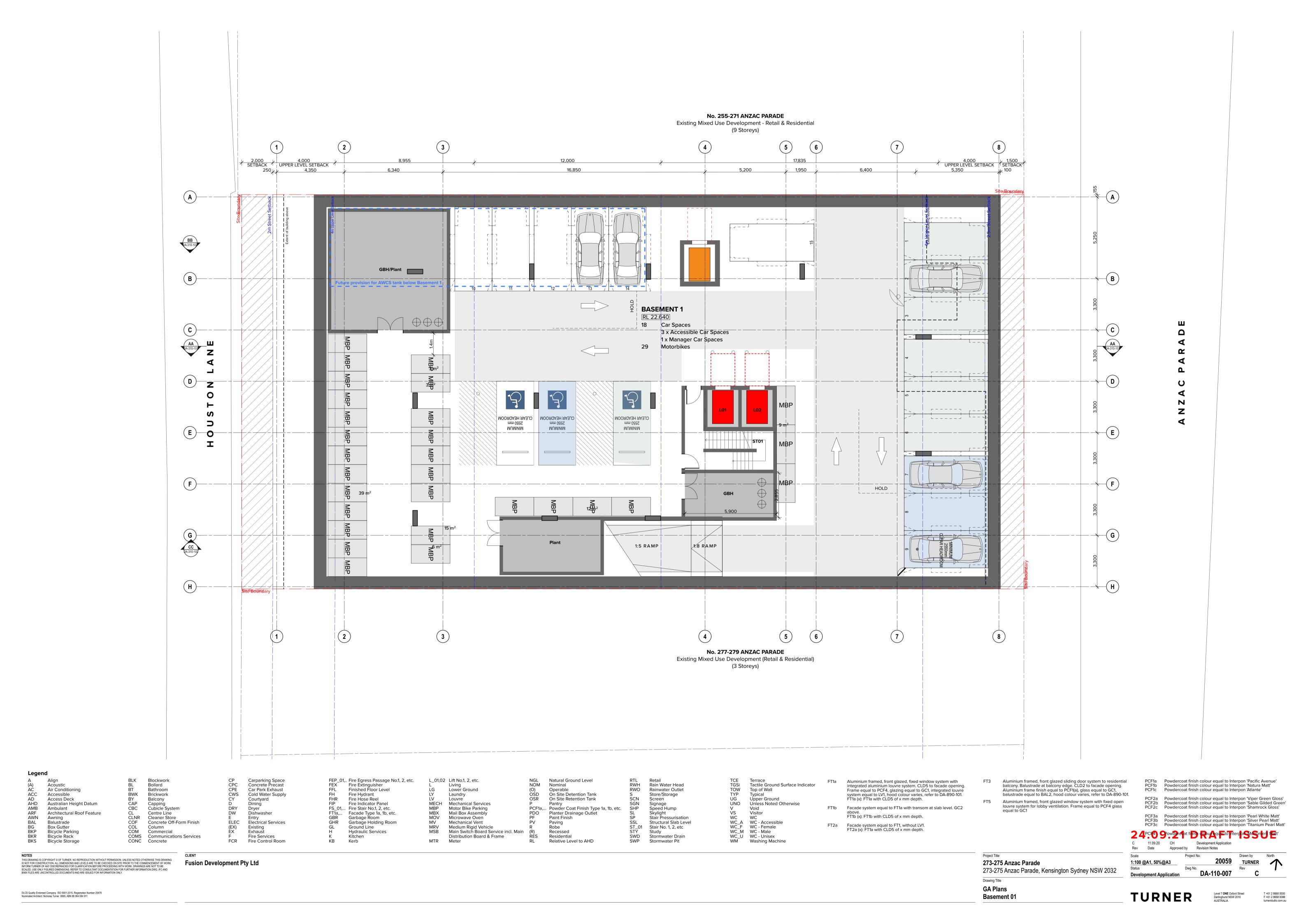
Meg Kong Siew Hwee, BSc, MSc Civil Engineering

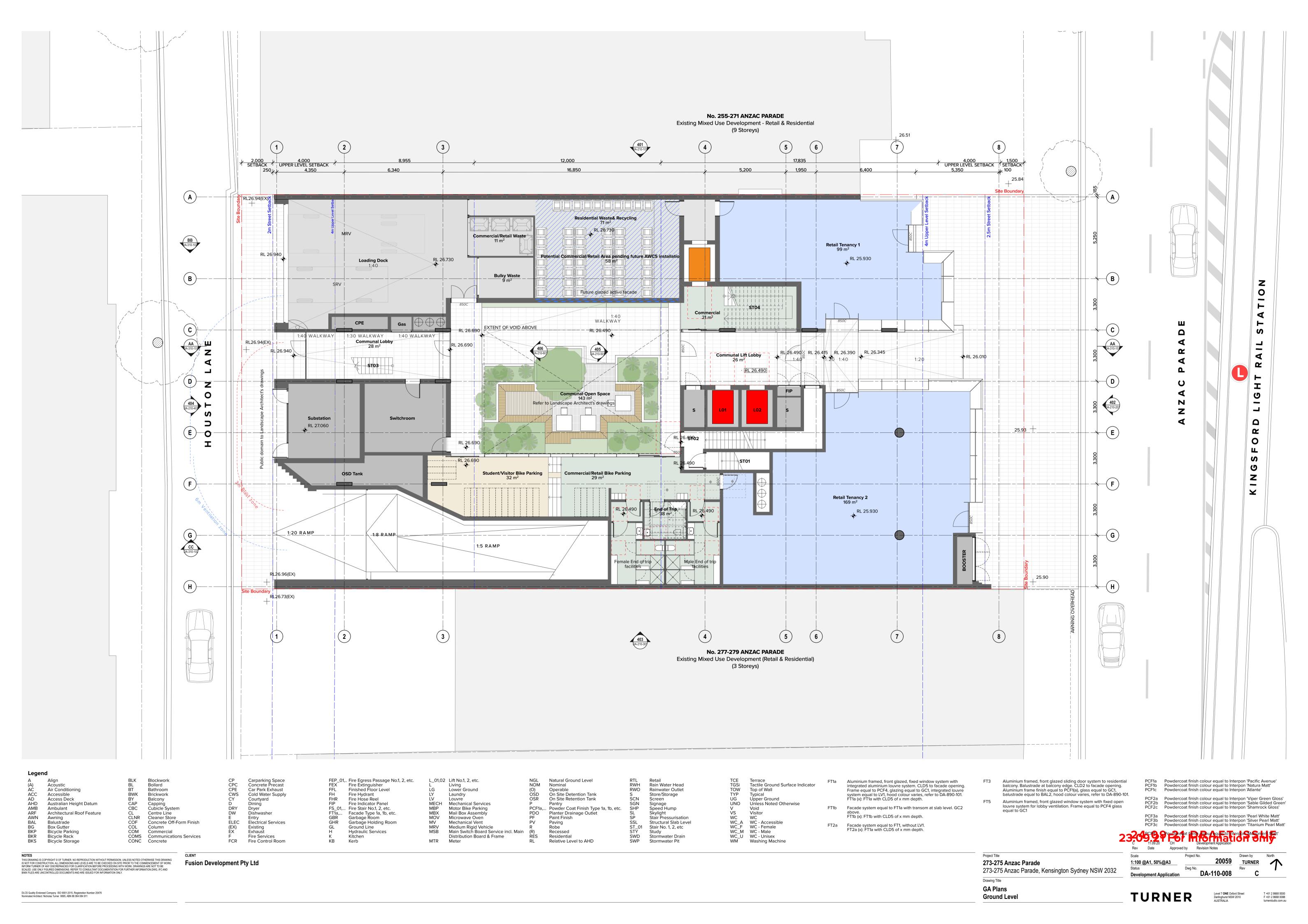
Associate

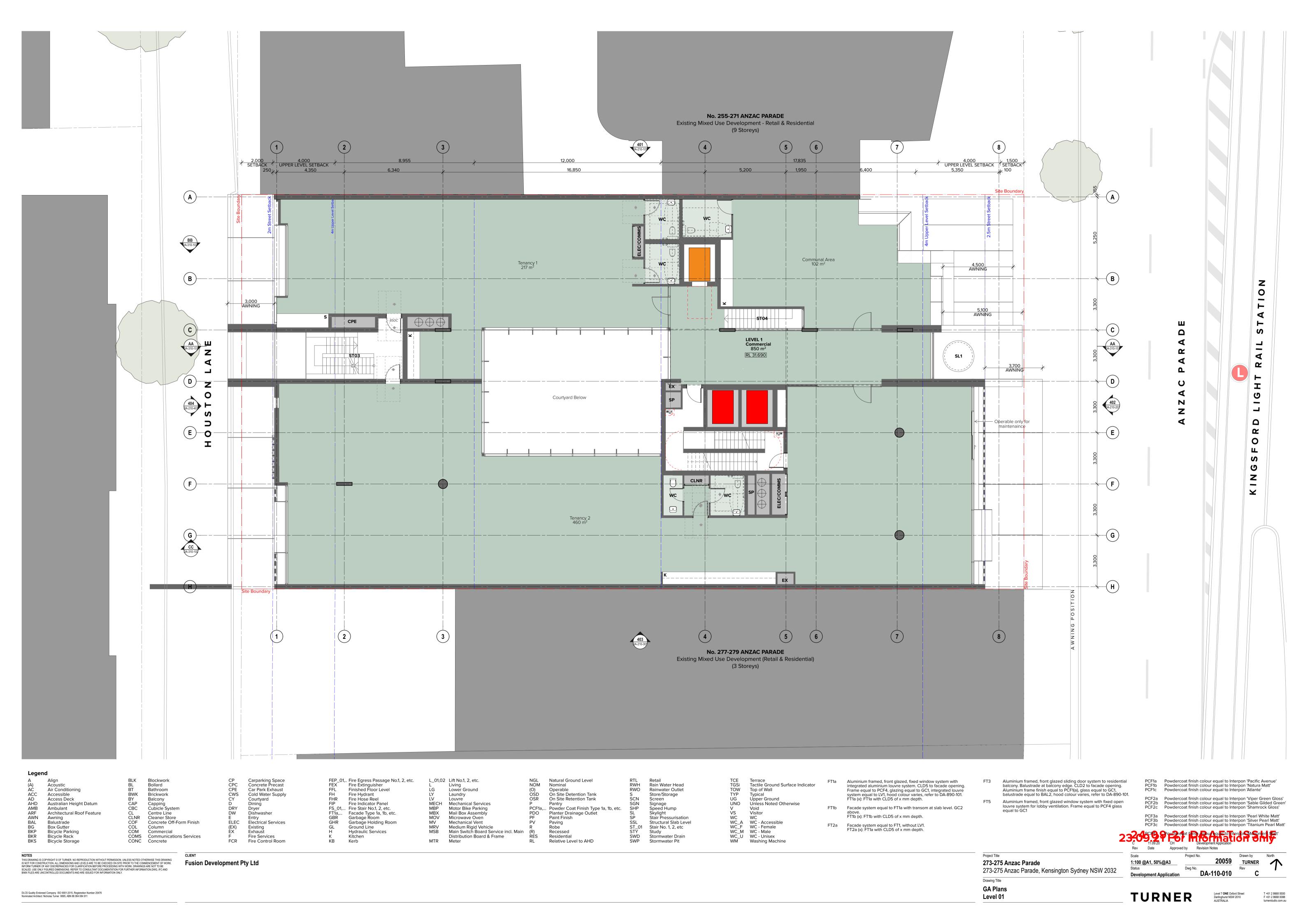
Transport and Traffic Planning Associates

Design Practitioner Registration Number: DEP0000127 Professional Engineer Registration Number: PRE0000121

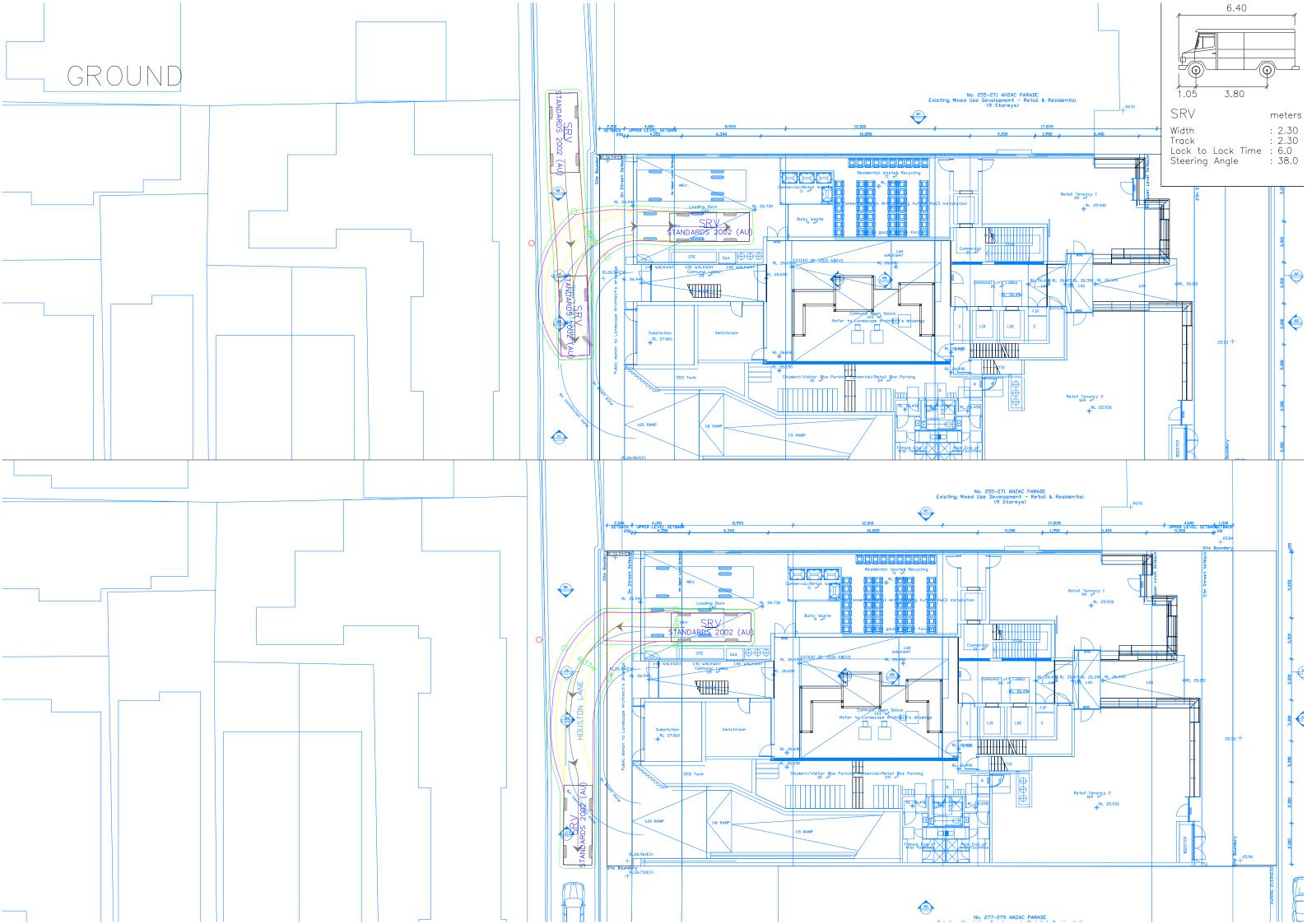
# Appendix A Revised Architectural Plans

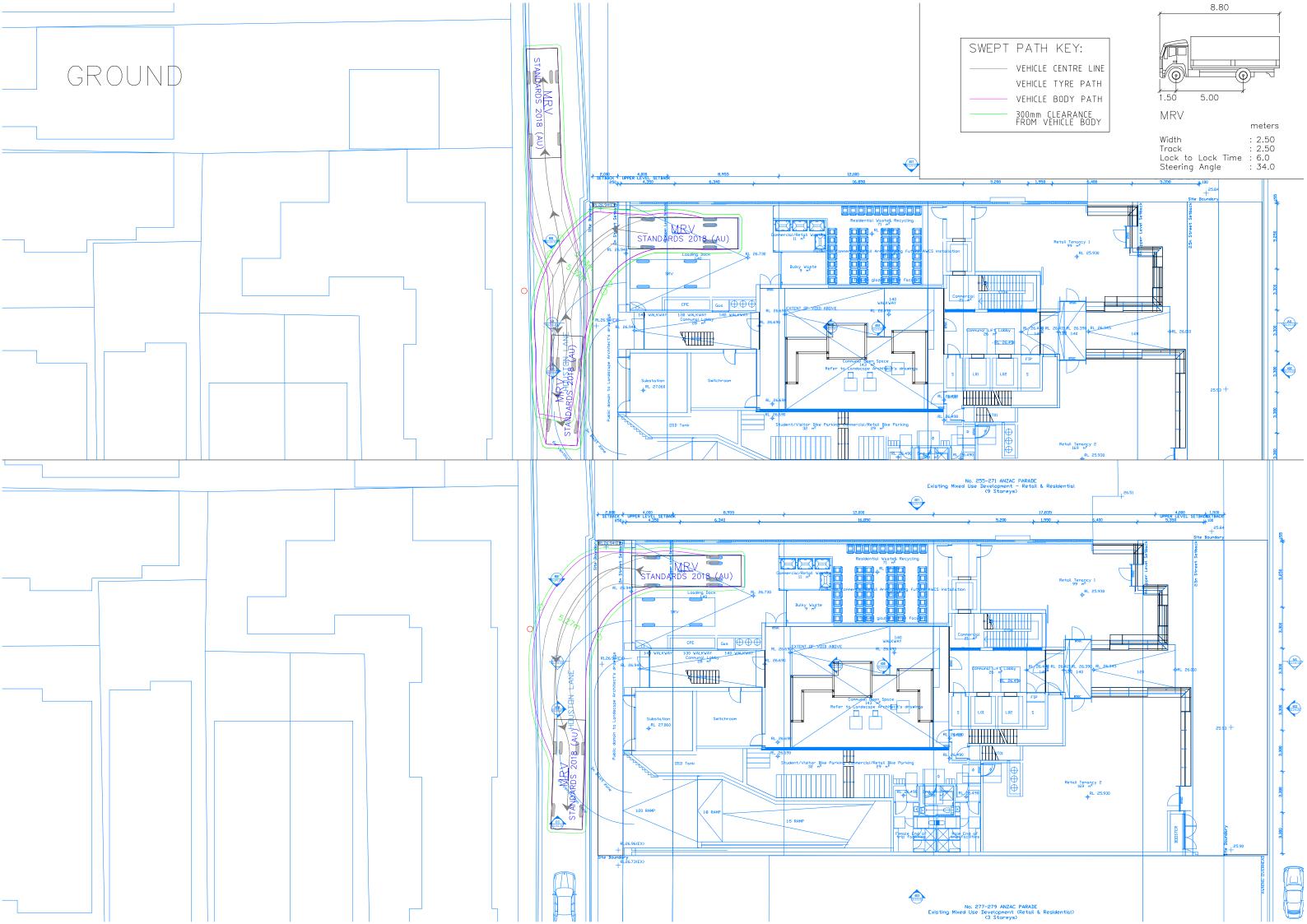


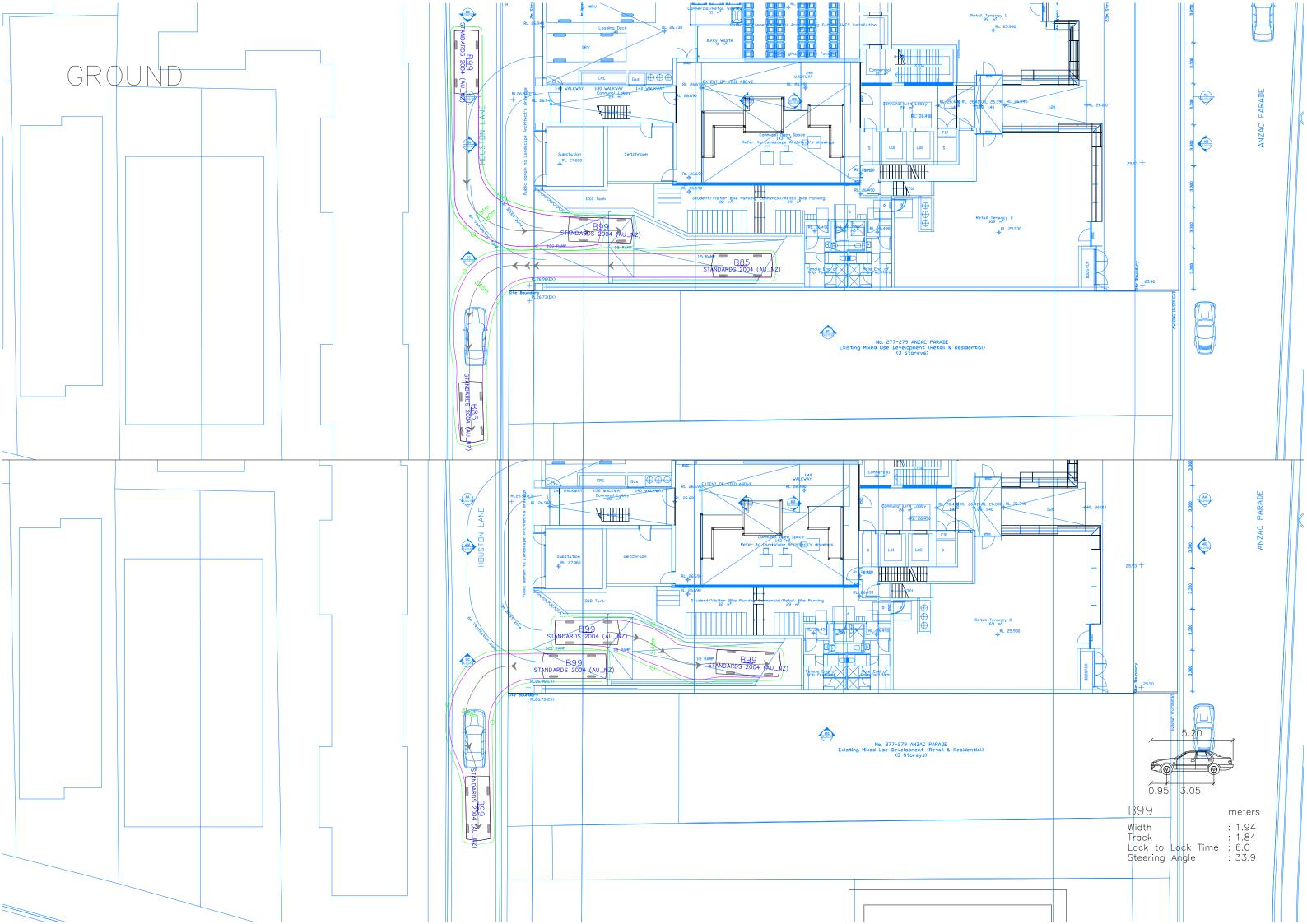


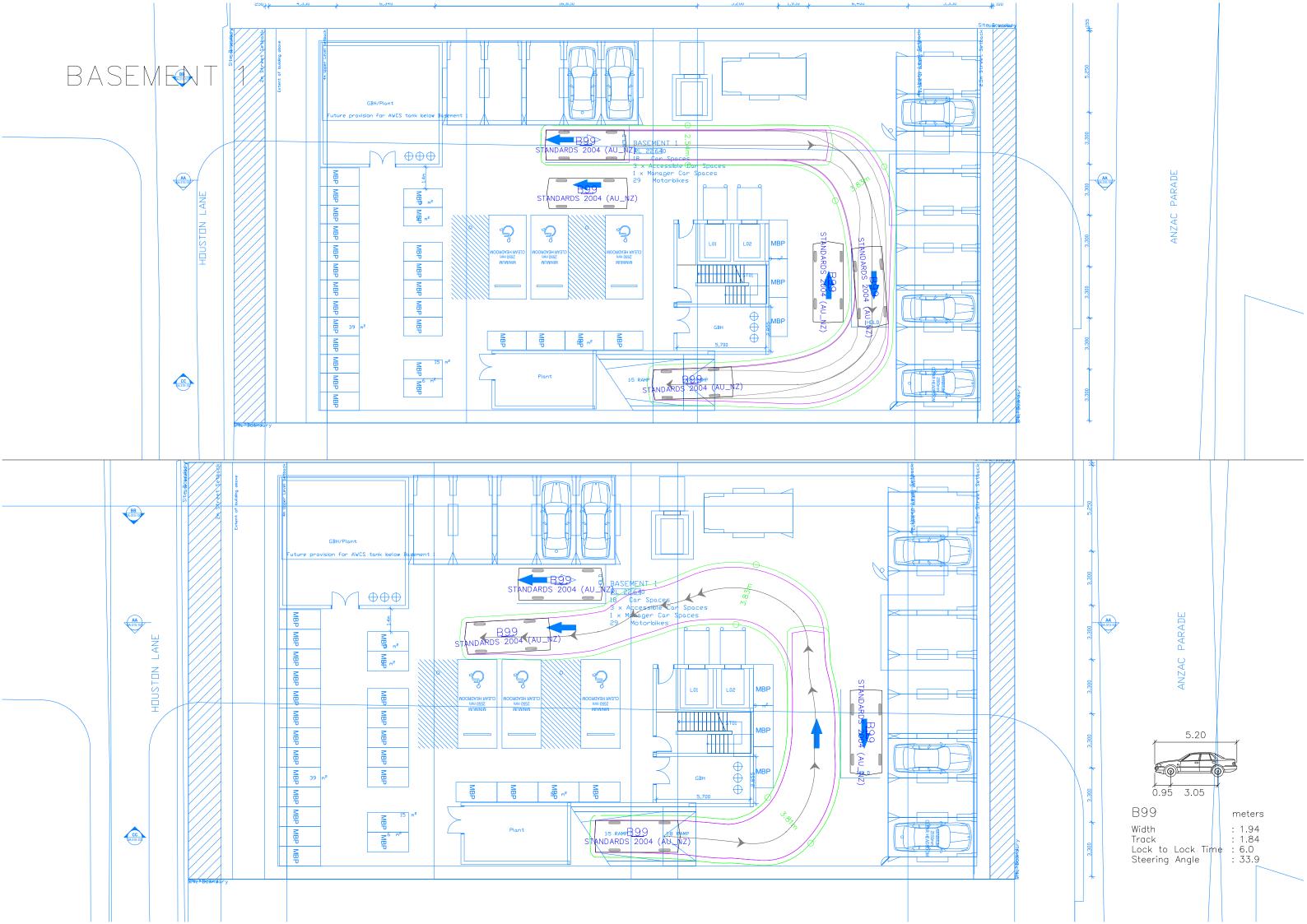


# Appendix B Swept Path Assessments











### 273-275 Anzac Parade Kingsford

### Noise and Vibration Impact Assessment

White Noise Acoustics 303, 74 Pitt Street, Sydney NSW 2000

#### ABN: 35 632 449 122

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#### **Document Control**

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Project Number	20158	
Document Type	Noise Impact Assessment	
Reference Number	20158_200817_Noise Impact	
	Assessment_BW_R1	
Attention	Turner	

Revision	Date	Reference Number	Drafted By	Approved By
0	17/8/2020	20158_200817_Noise Impact Assessment_BW_R0	BW	BW
1	3/9/2021	20158_200817_Noise Impact Assessment_BW_R1	BW	BW

### **Table of Contents**

1 1.1	Development Description	
2	Proposed Development	6
<b>3</b> 3.1	Existing Acoustic Environment Noise Survey Results	
4	Council DCP Requirements	10
5	Internal Noise Level Criteria	12
6	Environmental Noise Intrusion Assessment	13
6.1	External Glass Elements	. 13
6.2	External Building Elements	. 15
6.3	External Roof	
6.4	External Opening and Penetrations	
6.5	Alternative Ventilation Requirements	. 15
7	Light Rail Pass-By Vibration	16
7.1		
	7.1.1 Tactile Vibration Impacts	
7	7.1.2 Structure Borne Noise	
7.2	Light Rail Pass Bye Vibration Measurements	. 17
7	7.2.1 Vibration Measurements	. 18
8	External Noise Emission Assessment	19
8.1		
8.2		
-	3.2.1 Communal Area	
9	Construction Noise and Vibration Management Plan	23
9.1	Proposed Appliances	
9.2	1 11	
	9.2.1 Interim Construction Noise Guideline	
9.3		
Ç	9.3.1 Vibration Criteria – Human Comfort	
Ç	9.3.2 Vibration Criteria – Building Contents and Structure	. 29
Ç	9.3.3 Standard BS 7385 Part 2 - 1993	. 30
9.4	$\boldsymbol{\mathcal{C}}$	
9.5	· · · · · · · · · · · · · · · · · · ·	
9.6	Construction Vibration	. 34
10	Conclusion	35
11	Appendix A – Glossary of Terms	36
12	Appendix B – Noise Logging Results	38

#### 1 Introduction

White Noise Acoustics has been engaged to undertake the Noise Impact Assessment of the proposed residential development located at 273-275 Anzac Parade, Kingsford.

The proposed project includes the following:

- 1. Two levels of podium commercial and retail tenancies.
- 2. A fifteen-story residential development including two buildings on the site.

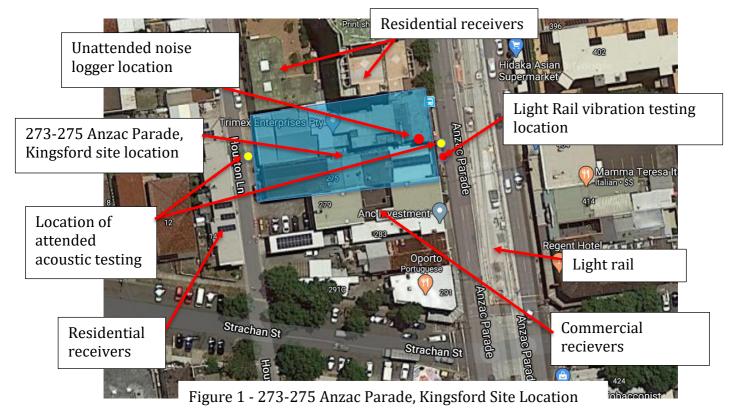
This assessment includes the acoustic investigation into the potential for noise impacts from the operation of the completed project as well as potential noise impacts from existing noise sources within the vicinity of the site which predominantly includes traffic noise from Anzac Parade, the light rail using Anzac Parade and potential vibration from the use of the light rail.

This assessment has been undertaken with the architectural drawings including the Turner Architects and dated 5/8/2020.

#### 1.1 Development Description

The 273-275 Anzac Parade, Kingsford site is located on the western side of Anzac Parade. The surrounding receivers to the site include residential and retail/commercial receivers.

The site location is detailed in Figure 1 below.



#### 2 Proposed Development

The proposed project is located at 273-275 Anzac Parade, Kingsford. The proposed development will include the following:

- 1. Two levels of podium retail and commercial tenancies.
- 2. A fifteen-story building including residential dwellings including two buildings on the site.

The site is located within the Randwick City Local Government area.

The assessment has been based on the Turner Architect drawings, including the drawings dated 5/8/2020.

The proposed development is included in the figure below.

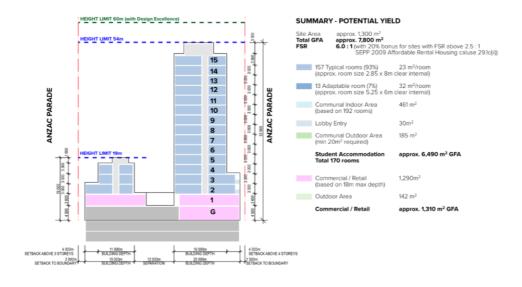


Figure 2 - Proposed Development

The site is located on Anzac Parade which is defined as a busy road carrying over 40,000 Annual Average Daily Traffic (AADT) number as defined in Map 16 of the RTA's *Traffic Volume Maps for Noise Assessment for Buildings on Land Adjacent to Busy Roads*.

See the Figure below which includes the site location included on Map 16 as detailed above.

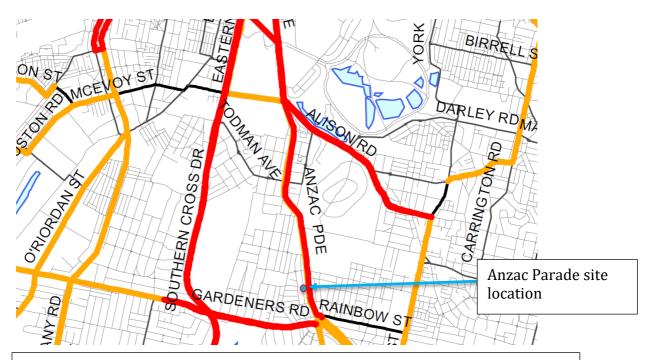


Figure 3 – Site Location of Map 16 of the RTA's *Traffic Volume Maps for Noise Assessment for Buildings on Land Adjacent to Busy Roads* 

# 3 Existing Acoustic Environment

The 273-275 Anzac Parade, Kingsford site is located to the western side of Anzac Parade which would be classified as a *Urban* area. The exiting noise levels at the site are predominantly as a result from traffic noise within the vicinity of the site from Anzac Parade including traffic movements (including heavy vehicles and buses) as well as the light rail which is located in the middle of Anzac Parade.

As part of this assessment an acoustic survey of the existing acoustic environment at the site was undertaken. The survey included attended noise level measurements at the site, during various times of the day on the 17<sup>th</sup> August, 2020 as well as long term unattended noise logging which was undertaken between the 7<sup>th</sup> and the 17<sup>th</sup> August 2020. During the testing periods the periods of inclement weather periods have not been included in the assessment of noise levels at the site.

Noise logging was undertaken using a Rion NL-42EX type noise monitor with serial number 396932 and calibration with calibration number C19465. The noise logger was located to the eastern boundary of the site facing Anzac Parade as detailed in Figure 1 above to obtain representative background noise levels. The logger was positioned such that it did not include façade corrects.

Attended noise level testing was conducted using a Bruel and Kjaer 2236C type meter. The meter was calibrated before and after testing and no significant drift was recorded.

## 3.1 Noise Survey Results

The attended and unattended noise locations were selected to obtain suitable noise levels for the assessment of background noise levels ( $L_{90\ (t)}$ ) as well as the impact from traffic movements ( $Leq_{(t)}$ ). The results of the acoustic survey are detailed in the tables below which have been used as the basis of this assessment.

Table 1 – Results of the Attended Noise Survey at the Site

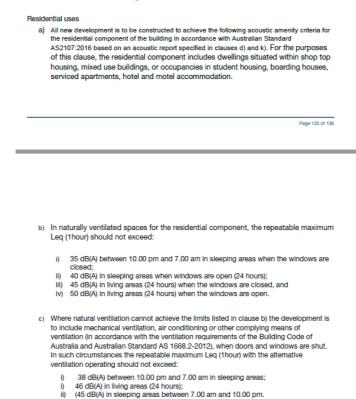
Measurement Location	Time of Measurement	L <sub>Aeq, 15min</sub> dB(A)	L <sub>A90, 15min</sub> dB(A)	Comments
Attended noise measurement location, Anzac Parade	8.05am to 8.20am	68	59	Noise level at the site dominated by vehicle and light rail movements
Attended noise measurement location, Houston Lane	8.25am to 8.40am	59	55	on Anzac Parade

Table 2 – Results of the Noise Logging at the Site

Measurement Location	Time of Measurement	Maximum Repeatable L <sub>Aeq, 15min</sub> dB(A)	Representable Background noise Level (RBL) LA90, 15min dB(A)
Noise logger location, see figure 1 above	Day	68	60
	Evening	61	51
	Night	59	46

# 4 Council DCP Requirements

The project has been assessed in accordance with the town centre DCP. The Randwick City Council *Kensigton and Kingsford Town Centre* DCP Part E6 dated 20 November 2020 includes requirements for the design of internal noise levels of future residential development. Section 14 (Acoustic Privacy) of the DCP which include the following:



In addition to the items above, which are relevant for the project other items in the DCP are discussed below:

- 1. Item d) Includes criteria for the assessment and design of places of entertainment and is not relevant for the development. Any future use of the proposed commercial areas for entertainment will be required to undertake the normal planning process including DA approvals. If this is to occur a detailed noise impact assessment of the place of entertainment will be undertaken once the details (if they exist) are known.
- 2. Item e) The existing acoustic environment has been assessed at the site including an acoustic survey which is included in this assessment and includes the surrounding sources including environmental elements, traffic and the light rail.
- 3. Item f) the design of building will include the required separation between dwellings including the minimum requirements of Part F5 of the BCA.
- 4. Item g) To comply with the DCP acoustic seals to entry doors with access from common corridors will be required to be included in the design and construction of the project.

- 5. Item h) The required building constructions to ensure required internal noise levels will be achieved are detailed in this report.
- 6. Item i) Building requirements for the mitigation of places of entertainment are not required for this project. Any future use of the proposed commercial areas for places of entertainment will be required to undertake the normal planning process including DA approvals. If this is to occur a detailed noise impact assessment of the place of entertainment will be undertaken once the details (if they exist) are known.
- 7. Item j) The required noise emission criteria for the operation of building services associated with the project are detailed in this assessment including day, evening and night time periods.
- 8. Item k) This report includes the *noise and vibration assessment report* for the site.

#### 5 Internal Noise Level Criteria

Internal noise levels within the future residential occupancies have been based on the relevant noise levels as detailed within the Australian Standard AS2107:2000 Acoustics - Recommended design sound levels and reverberation times for building interiors and the Department of Planning Development Near Rail Corridor and Busy Roads – Interim Guideline (DNRCBR).

The DNRCBR includes the following requirements for the relevant design of internal areas of residential developments near busy roads:

#### For Clause 102 (Road):

If the development is for the purpose of a building for residential use, the consent authority must be satisfied that appropriate measures will be taken to ensure that the following  $LA_{eq}$  levels are not exceeded:

- in any bedroom in the building: 35dB(A) at any time 10pm–7am
- anywhere else in the building (other than a garage, kitchen, bathroom or hallway): 40dB(A) at any time.

The recommended levels for various areas of the project are detailed in the following table. The recommended noise levels for residential dwellings near major roadways detailed within AS2107:2016 and DNRCBR have been used as the basis of this assessment.

Table 3 - design Recommended design sound levels and reverberation times

Type of Occupancy/Activity	Design Internal Noise Level			
Apartment common areas (e.g. foyer, lift lobby)	55 L <sub>Aeq 24 hour</sub>			
Residential - Living areas	40 L <sub>Aeq 24 hour</sub>			
Residential - Sleeping areas (night time)	35 L <sub>Aeq 9 hour</sub> 1			
Toilets	55 L <sub>Aeq 24 hour</sub>			
Retail/Commercial areas 50 Laeq 24 hour				
Note 1: The relevant time period for bedrooms include the period of 10pm to 7am				

#### 6 Environmental Noise Intrusion Assessment

This section of the report details the assessment of environmental noise intrusion into the proposed development and the recommended acoustic treatments to ensure the recommended internal noise levels detailed in the Sections above (including traffic and light rail noise intrusion) are achieved.

Internal noise levels within the future areas of the development will result from the noise intrusion into the building through the external façade including glass, masonry and other façade elements. Typically, the acoustic performance of building elements including the relatively light weight elements of the building façade, including glass and/or plasterboard constructions, will be the determining factors in the resulting internal noise levels.

Calculations of internal noise levels have been undertaken based on the measured traffic and light rail environmental noise levels at the site and the characteristics of the building, including window openings, buildings constructions and the like.

#### 6.1 External Glass Elements

The recommended acoustic constructions to the buildings external façade glass elements are detailed in the table below to ensure the recommended internal noise levels detailed above are achieved, with the façade building openings closed.

Table 4 – External Glass Acoustic Requirements

Building	Façade Orientation	Room Type	Recommended Glass Thickness	Minimum Façade Acoustic Performance <sup>1</sup>
Closest to Anzac	Facing Anzac Parade	Bedrooms	12.38mm Laminated	Rw 36
Parade		Living Rooms	10.38mm Laminated	Rw 35
		Wet areas	6.38mm Laminated	Rw 30
		Common Areas	10.38mm Laminated	Rw 35
		Retail Aras	10.38mm Laminated	Rw 35
	North and Southern	Bedrooms	10.38mm Laminated	Rw 35
	Facades	Living Rooms	6.38mm Laminated	Rw 30
		Wet areas	6.38mm Laminated	Rw 30
		Common Areas	6.38mm Laminated	Rw 30
		Retail Aras	6.38mm Laminated	Rw 30
	Western Façade	Bedrooms	6.38mm Laminated	Rw 30
		Living Rooms	6.38mm Laminated	Rw 30
		Wet areas	6.38mm Laminated	Rw 30
		Common Areas	6.38mm Laminated	Rw 30
		Retail Aras	6.38mm Laminated	Rw 30
Western Building	Eastern façade	Bedrooms	10.38mm Laminated	Rw 35
		Living Rooms	6.38mm Laminated	Rw 30
		Wet areas	6.38mm Laminated	Rw 30
		Common Areas	6.38mm Laminated	Rw 30
		Retail Aras	6.38mm Laminated	Rw 30
	All other facades	Bedrooms	6.38mm Laminated	Rw 30
		Living Rooms	6.38mm Laminated	Rw 30
		Wet areas	6.38mm Laminated	Rw 30
		Common Areas	6.38mm Laminated	Rw 30
	N. d. Ti	Retail Aras	6.38mm Laminated	Rw 30
	installed glazing	oustic performance of g and frame including e. All external glazing bulb seals.	(but not limited to) ti	he façade systems

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The recommended glass constructions detailed in the table above include those required to ensure the acoustic requirements of the project are achieved. Thicker glazing may be required to achieve other project requirements such as structural, thermal, safety or other requirements and is to be advised by others.

## **6.2 External Building Elements**

The proposed external building elements including masonry or concrete external walls and roof are acoustically acceptable without additional acoustic treatment.

Any light weight external pasteboard walls should be constructed from a construction with a minimum acoustic performance of Rw 55.

#### 6.3 External Roof

The required external roof and ceiling constructions for the project are required to include the following:

1. Concrete external roof construction – no additional treatments required.

#### 6.4 External Opening and Penetrations

All openings and penetrations are required to be acoustically treated such that the performance of the building construction is not compromised. This may require lining of duck work behind mechanical service openings/grills, treatments to ventilation opening and the like.

#### **6.5** Alternative Ventilation Requirements

The internal design sound levels detailed above are achieved with the external building openings closed.

As it is necessary for the windows and doors to remain closed to achieve compliance with specified internal noise levels an alternative method of providing outside air ventilation will be required to all units within the development.

The method of providing an alternative method of outside air ventilation is required to be provided in accordance with relevant regulations including the Building Code of Australia and AS1668.

The installation of the ventilation should not compromise the acoustic performance of the external building shell and is required to comply with the noise emission criteria detailed in the following section.

# 7 Light Rail Pass-By Vibration

This section of the report details the suitable vibration criteria for possible impacts from the light railway line located to the east of the project within the centre of Anzac Parade on future residential residence.

#### 7.1 Vibration Impact Criteria

The potential for vibration impact from a light rail pass-bys on the line to the east of the site has been assessed for both tactile vibration impact as well as ground borne vibration resulting in structure borne noise.

The suitable criteria for the assessment of tactile vibration and structure borne noise are detailed in the following sections.

#### 7.1.1 Tactile Vibration Impacts

The Department of Planning Development Near Rail Corridor and Busy Roads – Interim Guideline (DNRCBR) references to "Assessing Vibration – A Technical Guideline".

Vibration effects relating specifically to the human comfort aspects of the project are taken from the guideline titled "Assessing Vibration – A Technical Guideline". (AVTG). The AVTG recommends that habitable rooms should comply with the criteria therein which is in line with the requirements of British Standard BS 6472:1992 "Evaluation of Human Exposure to Vibration in Buildings (1Hz to 80Hz)".

The British Standard details suitable criteria for the assessment of intermittent vibrations to prevent advise impacts on future residence.

Table 5 Intermittent vibration impacts criteria (m/s1.75) 1 Hz-80 Hz, Vibration Dose Values (VDV)

Location	Daytime		Night-time	
	Preferred Values	Maximum Values	Preferred Values	Maximum Values
Residences	0.20	0.40	0.13	0.26

For the purpose of this assessment the *Preferred Values* detailed in the standard have been used as the criteria used in this assessment.

#### 7.1.2 Structure Borne Noise

The borne vibration is the potential for audible noise to be generated as the result of vibration transferred through the building structure and emanating from the building surfaces (such as walls, ceilings and the like) as audible noise within the future residential dwellings within the development.

Potential structure borne noise impacts as a result of the proposed light rail has been assessed in accordance with the criteria detailed within the DNRCBR which includes the following:

Generally, ground borne noise is associated more closely with rail operations than roads. Where buildings are constructed over or adjacent to land over tunnels, ground-borne noise may be present without the normal masking effect of airborne noise.

In such cases, residential buildings should be designed so that the 95th percentile of train pass-bys complies with a ground-borne LAmax noise limit of 40dBA (daytime) or 35dBA (night-time) measured using the "slow" response time setting on a sound level meter.

As the railway line located to the east of the site is an above ground line and not within a tunnel the requirements for ground borne vibration is not required to be assessed based on the DNRCBR as detailed above.

As existing light rail is above ground the impact of airborne noise on the future residence will be greater than the potential for structure borne noise levels. Providing suitable treatments for airborne noise impacts are included in the design of the project and tactile vibration levels comply with the relevant criteria then all relevant acoustic requirements will be achieved.

#### 7.2 Light Rail Pass Bye Vibration Measurements

As part of the assessment measurements of vibration impacts from a light rail pass bye on the railway line to the east of the site has been conducted.

To assess potential noise and vibration impacts on the proposed development measurements of light rail pass byes (at a representative location of the future building façade) has been conducted in this assessment.

Vibration measurements have been undertaken at the location detailed in Figure 1 above.

#### 7.2.1 Vibration Measurements

This section of the report details the measured vibration levels associated with rail pass byes at the location detailed in Figure 1 of this report.

The assessment included attended vibration measurements conducted on the 17<sup>th</sup> August, 2020 between 9.30am and 10.30am. Vibration levels were undertaken using a Svan 958 type vibration meter and analyzer fitted with a triaxial accelerometer and included a minimum of 9 light rail pass byes.

Obtained vibration levels included a number of light rail pass beys which have been used to determine the period vibration exposure for the daytime and night-time periods Vibration Dose Values (VDV).

The results of the vibration level measurements including the calculations for VDV are detailed in the table below.

Table 6 Calculated VDV

Location	Period	Criteria VDV m/s1.75	Calculated VDV m/s1.75
Future Residential Dwellings	Daytime	0.20	0.10
	Night-Time	0.13	0.07

Based on the results of the assessment of tactile vibration no additional acoustic treatment (or building vibration isolation) is required to comply with the relevant standards and ensure a suitable acoustic amenity for future occupants of the development.

#### 8 External Noise Emission Assessment

This section of the report details the relevant noise level criteria for noise emissions generated on the site once completed.

The relevant authority which provides the required noise level criteria for noise levels generated on the site includes the NSW Environmental Protection Authority's (EPA) Noise Policy for Industry (NPfI).

#### 8.1 NSW Environmental Protection Authority, Noise Policy for Industry

The NSW Environmental Protection Authority (EPA) Noise Policy for Industry (NPfI), previously Industrial Noise Policy, details noise criteria for the control of noise generated from the operation of developments and the potential for impact on surrounding receivers.

The NPfI includes both intrusive and amenity criteria which are summarised below.

1. Intrusive noise level criteria, The NPfI states the following:

'The intrusiveness of an industrial noise source may generally be considered acceptable if the level of noise from the source (represented by the LAeq descriptor), measured over a 15minute period, does not exceed the background noise level by more than 5 dB when beyond a minimum threshold. This intrusiveness noise level seeks to limit the degree of change a new noise source introduces to an existing environment.'

#### 2. Amenity noise level criteria, The NPfI states the following:

To limit continuing increases in noise levels from application of the intrusiveness level alone, the ambient noise level within an area from all industrial noise sources combined should remain below the recommended amenity noise levels specified in Table 2.2 where feasible and reasonable. The recommended amenity noise levels will protect against noise impacts such as speech interference, community annoyance and some sleep disturbance.'

Project amenity noise level for industrial developments = recommended amenity noise level (Table 2.2) minus 5 dB(A)

Where the resultant project amenity noise level is 10 dB or more lower than the existing industrial noise level. In this case the project amenity noise levels can be set at 10 dB below existing industrial noise levels if it can be demonstrated that existing industrial noise levels are unlikely to reduce over time.

The LAeq is determined over a 15-minute period for the project intrusiveness noise level and over an assessment period (day, evening and night) for the project amenity noise level. This leads to the situation where, because of the different averaging periods, the same numerical value does not necessarily represent the same amount of noise heard by a person for different time periods. To standardise the time periods for the intrusiveness and amenity noise levels, this policy assumes that the LAeq,15min will be taken to be equal to the LAeq, period + 3 decibels (dB), unless robust evidence is provided for an alternative approach for the particular project being considered.

Project amenity noise level (ANL) is urban ANL (Table 2.1) minus 5 dB(A) plus 3 dB(A) to convert from a period level to a 15-minute level (dB = decibel; dB[A] = decibel [A-weighted]; RBL = rating background noise level).

Noise level used in the assessment of noise emission from the site have been based on the noise level survey conducted at the site and detailed in this section of the report.

Consequently, the resulting noise level criteria are summarised in the table below. The criteria are nominated for the purpose of determining the operational noise limits for the operation of the site including mechanical plant associated with the development which can potentially affect noise sensitive receivers and operational noise levels from the future tenancies. For each assessment period, the lower (i.e. the more stringent) of the amenity or intrusive criteria are adopted. The calculated *Project Amenity Noise Level* includes either the Recommended Amenity Noise Level minus 5 dB(A) plus 3 dB(A) (for a 15minum period) or the measured existing Leq noise level – 10 dB if this is greater as determined by the NPfI.

Table 7 - External Noise Level Criteria in Accordance with the NSW NPfl

Location	Time of Day	Project Amenity Noise Level, LAeq, period <sup>1</sup> (dBA)	Measured LA90, 15 min (RBL) <sup>2</sup> (dBA)	Measured LAeq, period Noise Level (dBA)	Intrusive LAeq, 15 min Criterion for New Sources (dBA)
Urban	Day	58	60	68	65
residences	Evening	48	51	61	56
	Night <sup>4</sup>	43	46	59	51
Commercial	When in use	65	N/A	N/A	N/A

- Note 1: Project Amenity Noise Levels corresponding to "Urban" areas, recommended noise levels.
- Note 2: Lago Background Noise or Rating Background Level including façade corrections
- Note 3: Project Noise Trigger Levels are shown in bold
- Note 4: Noise from the operation of residential condensers are to be inaudible within a neighbouring residential premises during night time hours

#### 8.2 Noise Impact Assessment

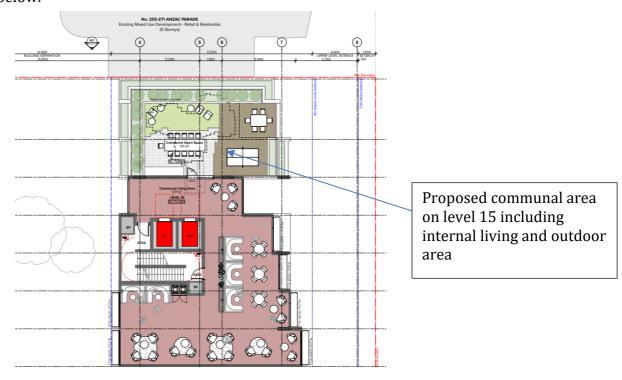
An assessment of noise generated on the site has been undertaken on this section of the report. The assessment of noise levels generated on the site are summaries below:

- 1. Mechanical Services Equipment –Detailed selections of the proposed mechanical plant and equipment to be used on the site are not available at this time. All future plant and equipment are to be acoustically treated to ensure the noise levels at all surrounding receivers comply with noise emission criteria detailed within this report. Experience with similar projects indicated that it is both possible and practical to treat all mechanical equipment such that the relevant noise levels are achieved. Examples of the possible acoustic treatments to mechanical equipment includes the following:
  - a. Supply and Exhaust Fans location of fans within the building are treated using internally lined ductwork or acoustic silencers.
  - b. General supply and exhaust fans general exhaust and supply fans such as toilet, kitchen, lobby and other small mechanical fans can be acoustically treated using acoustic flex ducting or internal lined ducting.

Details of the required mechanical services equipment and acoustic treatments to ensure the relevant noise level criteria is achieved will be provided as part of the CC submission of the project.

#### 8.2.1 Communal Area

The proposed development includes a communal living and out door area which is located on level 15 of the project, which is included in the figure below.



The proposed communal area includes an outdoor area for the use of residence. The communal open space includes orientation to Anzac Parade. The exiting acoustic environmental within the vicinity of the communal open space includes noise resulting from traffic and the light rail on Anzac Parade.

For the purpose of this assessment, we have assumed the following noise levels:

- Single person talking 69dBA
- Background music (for internal areas only) 65dBA

To mitigate noise levels from the proposed common area to within the required noise emission criteria detailed in this report the following acoustic mitigations are recommended:

- 1) External common areas is only to be used during the daytime and evening time including the following:
  - a) (For Monday to Saturday, Daytime 7:00 am 6:00 pm; Evening 6:00 pm 10:00 pm.
  - b) On Sundays and Public Holidays, Daytime 8:00 am 6:00 pm; Evening 6:00 pm 10:00 pm)
- 2) Use of the common area is permitted for communal activities. The area is not to be used for high noise generating activities such as large gatherings, playing of loud music or parties.
- 3) Amplified music is not permitted in the communal area or in the common room at any-time.
- 4) Signs must be installed within the area outlining the recommendations above.

Providing the recommended acoustic mitigations detailed in the points above are included in the design and operation of the proposed communal area will comply with the noise emission criteria detailed in this report and will be acoustically acceptable.

# 9 Construction Noise and Vibration Management Plan

This section of the report details the assessment of noise associated with the proposed demolition activities associated with the development. The assessment has been undertaken to assess the potential noise impacts from construction and demolition on surrounding receivers to the site.

The proposed construction and demolition activities to be undertaken on the site include the removal of the existing buildings and construction of the new development. The development will then be constructed using normal construction processes.

The EPA's Interim Construction Noise Guideline defines normal day time hours as the following:

#### 2.2 Recommended standard hours

The recommended standard hours for construction work are shown in Table 1; however, they are not mandatory. There are some situations, as described below, where construction work may need to be undertaken outside of these hours. The likely noise impacts and the ability to undertake works during the recommended standard hours should be considered when scheduling work.

Table 1: Recommended standard hours for construction work

Work type	Recommended standard hours of work*
Normal construction	Monday to Friday 7 am to 6 pm Saturday 8 am to 1 pm No work on Sundays or public holidays
Blasting	Monday to Friday 9 am to 5 pm Saturday 9 am to 1 pm No blasting on Sundays or public holidays

<sup>\*</sup> The relevant authority (consent, determining or regulatory) may impose more or less stringent construction hours.

It is noted that alternative construction hours may be approved for the site and include the project's *Conditions of Consent*.

## 9.1 Proposed Appliances

The proposed appliances which will be used as part of the demolition required as part of the development are detailed in the table below (including internal strip out/demolition):

Table 8 - Noise Level from Expected Demotion Appliances

Tasks	Equipment	Sound Power Levels per task dB(A) L <sub>10</sub>	Aggregate Sound Power Level per Task dB(A) L <sub>10</sub>	
Site Demolition	Jack hammer mounted on skid steer	118	122	
and Earth works	Hand held jack hammer	111	_	
	Concrete saw	119	_	
	Skid steer	110	_	
	Power hand tools	109	-	
	Excavators	115	_	
	Trucks	110	_	
	Earth Rollers	112		
Construction	Piling	115	120	
Works	Welder	101	_	
	Saw cutter	109	_	
	Dump truck	109	_	
	Concrete saw	119	_	
	Power hand tools	109	_	
	Cranes	110	_	

Notes: Noise levels of proposed equipment to be used on the site based on the Australian Standard AS2436-2010 and noise level measurements previously undertaken of similar equipment on construction sites.

#### 9.2 Construction Noise Criteria

This section of the report details the relevant construction noise criteria which is applicable to the site.

#### 9.2.1 Interim Construction Noise Guideline

Noise criteria for construction and demolition activities are discussed in the *Interim Construction Noise Guideline* (ICNG). The ICNG also recommends procedures to address potential impacts of construction noise on residences and other sensitive land uses. The main objectives of the ICNG are summarised as follows:

- Promote a clear understanding of ways to identify and minimise noise from construction works;
- Focus on applying all "feasible" and "reasonable" work practices to minimise construction noise impacts;
- Encourage construction to be undertaken only during the recommended standard hours unless approval is given for works that cannot be undertaken during these hours;
- Streamline the assessment and approval stages and reduce time spent dealing with complaints at the project implementation stage; and
- Provide flexibility in selecting site-specific feasible and reasonable work practices in order to minimise noise impacts.

The ICNG contains a quantitative assessment method which is applicable to this project. Guidance levels are given for airborne noise at residences and other sensitive land uses.

The quantitative assessment method involves predicting noise levels at sensitive receivers and comparing them with the Noise Management Levels (NMLs). The NML affectation categories for receivers have been reproduced from the guideline and are listed in the table below.

Table 9 - Noise Management Levels from Construction - Quantitative Assessment

Receiver Type	Time of Day	Noise Management Level LAeq(15minute) <sup>1,2</sup>	How to Apply
Residential	Recommended standard hours: Monday to Friday 7 am to 6 pm Saturday 8 am to 1 pm No work on Sundays or public holidays	Noise affected RBL + 10 dB	The noise affected level represents the point above which there may be some community reaction to noise.  • Where the predicted or measured LAeq(15minute) is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level.  • The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as
		Highly noise affected 75 dBA	well as contact details.  The highly noise affected level represents the point above which there may be strong community reaction to noise.  • Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account:  1. Times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for works near residences.  2. If the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
	Outside recommended standard hours	Noise affected RBL + 5 dB	<ul> <li>A strong justification would typically be required for works outside the recommended standard hours.</li> <li>The proponent should apply all feasible and reasonable work practices to meet the noise affected level.</li> <li>Where all feasible and reasonable practices have been applied and noise is more than 5 dB above the noise affected level, the proponent should negotiate with the community.</li> </ul>

Table 9 - Continued

Receiver Type	Time of Day	Noise Management Level LAeq(15minute) <sup>1,2</sup>	How to Apply			
Industrial Receivers	When is use	LAeq (15 min) 75 dB(A)	During construction, the proponent should regularly update the occupants of the commercial and industrial premises regarding noise levels and hours of work.			
	Note 1 Noise levels apply at the property boundary that is most exposed to construction noise, and at a height of 1.5 m above ground level. If the property boundary is more than 30 m from the residence, the location for measuring or predicting noise levels is at the most noise-affected point within 30 m of the residence. Noise levels may be higher at upper floors of the noise affected residence.					
Note 2	, , , , , , , , , , , , , , , , , , , ,					

Based on the table above, the suitable construction noise management levels for works undertaken on the site are detailed in Table 14 below.

Table 10 - Site Construction Noise Management Levels

Noise Source	Time Period	Receiver Type	Construction Noise Management Level	'High Noise Affected' Level
Construction Noise	Recommended standard hours: Monday to Friday 7 am to 6 pm Saturday 8 am to 1 pm No work on Sundays or public holidays	Residential	70 dB(A) LAeq (15min)	75 dB(A) LAeq (15min)
	When in Use	Industrial Receivers	75 dB(A) Leq (15 min)	

Note 1: Construction noise management levels based on the Interim Construction Noise Guideline

#### 9.3 Construction Vibration Criteria

Effects of ground borne vibration on buildings may be segregated into the following three categories:

- Human comfort vibration in which the occupants or users of the building are inconvenienced or possibly disturbed. Refer to further discussion in Section 9.3.1.
- Effects on building contents where vibration can cause damage to fixtures, fittings and other non-building related objects. Refer to further discussion in Section 9.3.2 and 9.3.3.
- Effects on building structures where vibration can compromise the integrity of the building or structure itself. Refer to further discussion in Section 9.3.2 and 9.3.3.

#### 9.3.1 Vibration Criteria – Human Comfort

Vibration effects relating specifically to the human comfort aspects of the project are taken from the guideline titled "Assessing Vibration – A Technical Guideline". (AVTG) This type of impact can be further categorised and assessed using the appropriate criterion as follows:

- Continuous vibration from uninterrupted sources (refer to Table 11).
- Impulsive vibration up to three instances of sudden impact e.g., dropping heavy items, per monitoring period (refer to Table 12).
- Intermittent vibration such as from drilling, compacting or activities that would result in continuous vibration if operated continuously (refer to Table 13).

Table 11 Continuous vibration acceleration criteria (m/s2) 1 Hz-80 Hz

Location	Assessment period	Preferred Values		Maximum Values	
		z-axis	x- and y-axis	z-axis	x- and y-axis
Residences	Daytime	0.010	0.0071	0.020	0.014
	Night-time	0.007	0.005	0.014	0.010
Offices, schools, educational institutions and places of worship	Day or night-	0.020	0.014	0.040	0.028
	time	0.04	0.029	0.080	0.058
Workshops	Day or night- time	0.04	0.029	0.080	0.058

Table 12 Impulsive vibration acceleration criteria (m/s2) 1 Hz-80 Hz

Location	Assessment	Preferred Values		Maximum Values	
	period	z-axis	x- and y-axis	z-axis	x- and y-axis
Residences	Daytime	0.30	0.21	0.60	0.42
	Night-time	0.10	0.071	0.20	0.14
Offices, schools, educational institutions and places of worship	Day or night- time	0.64	0.46	1.28	0.92
Workshops	Day or night- time	0.64	0.46	1.28	0.92

Table 13 Intermittent vibration impacts criteria (m/s1.75) 1 Hz-80 Hz

Location	Daytime		Night-time	
	Preferred Values	Maximum Values	Preferred Values	Maximum Values
Residences	0.20	0.40	0.13	0.26
Offices, schools, educational institutions and places of worship	0.40	0.80	0.40	0.80
Workshops	0.80	1.60	0.80	1.60

## 9.3.2 Vibration Criteria – Building Contents and Structure

The vibration effects on the building itself are assessed against international standards as follows:

- For transient vibration: British Standard BS 7385: Part 2-1993 "Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration" (BSI 1993); and
- For continuous or repetitive vibration: German DIN 4150: Part 3 1999 "Effects of Vibration on Structure" (DIN 1999).

#### 9.3.3 Standard BS 7385 Part 2 - 1993

For transient vibration, as discussed in standard BS 7385 Part 2-1993, the criteria are based on peak particle velocity (mm/s) which is to be measured at the base of the building. These are summarised in Table 14 and illustrated in the figure below.

Line in Figure below	Type of Building	Peak Component Particle Velocity in Frequency Range of Predominant Pulse		
Delow		4 Hz to 15 Hz	15 Hz and Above	
1	Reinforced or framed structures Industrial and heavy commercial buildings	50 mm/s at 4 Hz and above		
2	Unreinforced or light framed structures Residential or light commercial type buildings	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above	

Table 14 Transient vibration criteria as per standard BS 7385 Part 2 - 1993

Standard BS 7385 Part 2 – 1993 states that the values in Table 14 relate to transient vibration which does not cause resonant responses in buildings. Where the dynamic loading caused by continuous vibration events is such as that results in dynamic magnification due to resonance (especially at the lower frequencies where lower guide values apply), then the values in Table 14 may need to be reduced by up to 50% (refer to Line 3 in the Figure below).

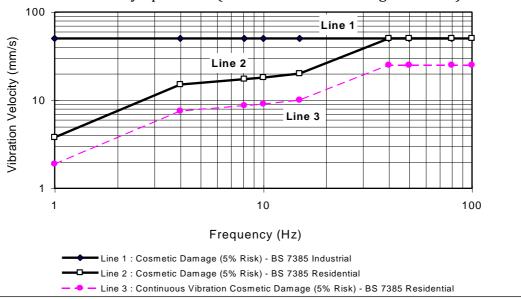


Figure 4 - BS 7385 Part 2 – 1993, graph of transient vibration values for cosmetic damage

In the lower frequency region where strains associated with a given vibration velocity magnitude are higher, the recommended values corresponding to Line 2 are reduced. Below a frequency of 4 Hz where a high displacement is associated with the relatively low peak component particle velocity value, a maximum displacement of 0.6 mm (zero to peak) is recommended. This displacement is equivalent to a vibration velocity of 3.7 mm/s at 1 Hz.

The standard also states that minor damage is possible at vibration magnitudes which are greater than twice those given in Table 14, and major damage to a building structure may occur at values greater than four times the tabulated values.

Fatigue considerations are also addressed in the standard and it is concluded that unless calculation indicates that the magnitude and number of load reversals is significant (in respect of the fatigue life of building materials) then the values in Table 14 should not be reduced for fatigue considerations.

#### 9.3.3.1 Standard DIN 4150 Part 3 - 1999

For continuous or repetitive vibration, standard DIN 4150 Part 3-1999 provides criteria based on values for peak particle velocity (mm/s) measured at the foundation of the building; these are summarised in Table 15. The criteria are frequency dependent and specific to particular categories of structures.

Table 15 Structural damage criteria as per standard DIN 4150 Part 3 - 1999

Peak Component Particle Velocity, mm/s				
Vibration at the	Vibration of			
1 Hz to 10 Hz	10 Hz to 50 Hz	50 Hz to 100 Hz <sup>1</sup>	horizontal plane of highest floor at all frequencies	
20	20 to 40	40 to 50	40	
5	5 to 15	15 to 20	15	
3	3 to 8	8 to 10	8	
	Vibration at the 1 Hz to 10 Hz	Vibration at the foundation at a fr 1 Hz to 10 Hz 10 Hz to 50 Hz 20 20 to 40 5 5 to 15	Vibration at the foundation at a frequency of           1 Hz to 10 Hz         10 Hz to 50 Hz         50 Hz to 100 Hz <sup>1</sup> 20         20 to 40         40 to 50           5         5 to 15         15 to 20	

#### 9.4 Construction Noise Management – Qualitative Assessment

Based on the assessment of the expected construction noise levels generated from the construction of the project, noise levels are generally expected to require the building contractor to engage in management of activities on the site.

The following management controls are recommended to mitigate construction noise levels on the site:

- 1. All plant and equipment are to be maintained such that they are in good working order.
- 2. A register of complaints is to be recorded in the event of complaints being received, including location, time of complaint, nature of the complaint and actions resulting from the complaint.
- 3. If required, a noise level measurement of the offending plant item generating complaints is to be conducted and noise mitigations undertaken to reduce noise levels to within Noise Management levels in the event magnitude of noise levels is found to be above suitable levels.
- 4. The use of high noise generating equipment including hydraulic hammers, rock cutters or the like should be minimised prior to 8am Monday to Friday or 8.30am Saturdays.
- 5. The loading of trucks should be conducted such that there is not a requirement to stack trucks on the roadways adjacent to the residential receivers.

In addition to the recommended mitigations above, details of the proposed construction (including demolition) works to be conducted on the site, including type of activities to be conducted as well as the expected duration of activities should be provided to the neighbouring receivers.

A detailed construction noise and vibration management plan is to be provided by the building contractor as part of the construction certificate.

## 9.5 Construction Noise Assessment – Quantitative Assessment

A quantitative assessment of the construction noise levels resulting from the proposed works has been undertaken.

The assessment has been based on the expected noise levels to be generated on the site including those detailed in Section 9.1 above. Calculations of the resulting construction noise levels at the residential receivers within proximity to the site are detailed in the table below.

Table 16 Quantitative Assessment of Construction Noise to Neighboring Residence

Source Noise	Equipment	Sound Power Levels dB(A) L <sub>10</sub>	Aggregate Sound Power Level dB(A) L <sub>10</sub>	Calculated Construction Noise Levels	
Site Demolition works	Jack hammer mounted on skid steer	118	122	Up to 55 dB(A) when items used externally	
	Hand held jack hammer	111			
	Concrete saw	119			
	Skid steer	110			
	Power hand tools	109			
	Excavators	115	_		
	Trucks	110	_		
	Earth Rollers	112			
Construction Works	Piling	115	_ 120 - - -	Up to 50 dB(A) when items used externally	
	Welder	101			
	Saw cutter	109			
	Dump truck	109			
	Concrete saw	119			
	Power hand tools	109	_		
	Cranes	110			

Based on the qualitative assessment of construction noise, suitable management controls and community notifications are required to be conducted.

The required management of construction noise impacts are included in Section 9.4 above.

Subject to the implementation of these management measures, acoustic impacts during construction of the proposal will be acceptable.

#### 9.6 Construction Vibration

Construction vibration may occur during the earthworks, particularly if outcrops of dolerite are encountered. Safe working distances for building damage will be complied with at all times and vibration monitoring will be undertaken to ensure acceptable levels of vibration are satisfied.

Based on the location of the site, there is significant separation of areas where construction activities will be conducted from surrounding building. Based on the location of works that will be conducted there will be safe working distances relating to continuous vibration from construction equipment. Most construction activities will have intermittent vibration emissions and, therefore, higher vibration levels occurring over shorter periods are acceptable for intermittent events.

Construction vibration is not expected to generate magnitudes of vibration with the potential to exceed the criteria applicable for human comfort and, therefore, the nearest residential receivers are not likely to experience adverse vibration impacts.

#### 10 Conclusion

This report details the Noise Impact Assessment of the proposed development at 273-275 Anzac Parade, Kingsford.

This report details the required acoustic constructions of the building's façade, including external windows, to ensure that the future internal noise levels comply with the relevant noise levels of the Australian Standard AS2107:2016 and the Department of Planning *Development Near Rail Corridors and Busy Roads* – *Interim Guideline* and the *Infrastructure SEPP* Providing the recommended constructions detailed in this report are included in the construction of the project the required internal noise levels will be achieved.

An assessment of the potential for noise and vibration impact from the operation of the light rail which is located on Anzac Parade and providing the recommendations in this report are included in the design and construction of the project compliance with the Department of Planning *Development Near Rail Corridors and Busy Roads – Interim Guideline* and the *Infrastructure SEPP* will be achieved.

External noise emissions from the site have been assessed and detailed in accordance with the NSW Environmental Protection Authorities Noise Policy for Industry (previously the Industrial Noise Policy). The future design and treatment of all building services associated with the project can be acoustically treated to ensure all noise emissions from the site comply with the EPA NPfI criteria. Details of the equipment and associated acoustic treatments will be provided as part of the CC submission of the project.

A construction noise and vibration management plan is included in this report.

For any additional information please do not hesitate to contact the person below.

Regards

Ben White Director

White Noise Acoustics

BG While

# 11 Appendix A – Glossary of Terms

Ambient The totally encompassing sound in a given situation at a given time, usually composed of

Sound sound from all sources near and far.

Audible Range The limits of frequency which are audible or heard as sound. The normal ear in young adults

detects sound having frequencies in the region 20 Hz to 20 kHz, although it is possible for

some people to detect frequencies outside these limits.

Character, The total of the qualities making up the individuality of the noise. The pitch or shape of a acoustic sound's frequency content (spectrum) dictate a sound's character.

Decibel [dB] The level of noise is measured objectively using a Sound Level Meter. The following are

examples of the decibel readings of every day sounds;

0dB the faintest sound we can hear
30dB a quiet library or in a quiet location in the country
45dB typical office space. Ambience in the city at night

60dB Martin Place at lunch time

70dB the sound of a car passing on the street

80dB loud music played at home

90dB the sound of a truck passing on the street

100dB the sound of a rock band

115dB limit of sound permitted in industry

120dB deafening

dB(A) A-weighted decibels The ear is not as effective in hearing low frequency sounds as it is

hearing high frequency sounds. That is, low frequency sounds of the same dB level are not heard as loud as high frequency sounds. The sound level meter replicates the human response of the ear by using an electronic filter which is called the "A" filter. A sound level measured with this filter switched on is denoted as dB(A). Practically all noise is measured using the A filter. The sound pressure level in dB(A) gives a close indication of the subjective

loudness of the noise.

Frequency Frequency is synonymous to pitch. Sounds have a pitch which is peculiar to the nature of the

sound generator. For example, the sound of a tiny bell has a high pitch and the sound of a bass drum has a low pitch. Frequency or pitch can be measured on a scale in units of Hertz

or Hz.

Loudness A rise of 10 dB in sound level corresponds approximately to a doubling of subjective

loudness. That is, a sound of 85 dB is twice as loud as a sound of 75 dB which is twice as

loud as a sound of 65 dB and so on

LMax The maximum sound pressure level measured over a given period.

LMin The minimum sound pressure level measured over a given period.

The sound pressure level that is exceeded for 1% of the time for which the given sound is

measured.

L10 The sound pressure level that is exceeded for 10% of the time for which the given sound is

measured.

L90 The level of noise exceeded for 90% of the time. The bottom 10% of the sample is the L90

noise level expressed in units of dB(A).

Leq The "equivalent noise level" is the summation of noise events and integrated over a selected

period of time.

Background The average of the lowest levels of the sound levels measured in an affected area in the Sound Low absence of noise from occupants and from unwanted, external ambient noise sources.

Usually taken to mean the LA90 value

Ctr A frequency adaptation term applied in accordance with the procedures described in ISO

717.

dB (A) 'A' Weighted overall sound pressure level

Noise Reduction The difference in sound pressure level between any two areas. The term "noise reduction" does not specify any grade or performance quality unless accompanied by a specification of the units and conditions under which the units shall apply

NR Noise Rating Single number evaluation of the background noise level. The NR level is normally around 5 to 6 dB below the "A" weighted noise level. The NR curve describes a spectrum of noise levels and is categorised by the level at 1000 Hz ie the NR 50 curve has a value of 50 dB at 1000 Hz. The NR rating is a tangential system where a noise spectrum is classified by the NR curve that just encompasses the entire noise spectrum consideration.

 $R_W$ 

Weighted Sound Reduction Index - Laboratory test measurement procedure that provides a single number indication of the acoustic performance of a partition or single element. Calculation procedures for Rw are defined in ISO 140-2:1991 "Measurement of Sound Insulation in Buildings and of Building Elements Part 2: Determination, verification and application of precision data".

R'w

Field obtained Weighted Sound Reduction Index - this figure is generally up to 3-5 lower than the laboratory test determined level data due to flanked sound transmission and imperfect site construction.

Sound Isolation A reference to the degree of acoustical separation between any two areas. Sound isolation may refer to sound transmission loss of a partition or to noise reduction from any unwanted noise source. The term "sound isolation" does not specify any grade or performance quality and requires the units to be specified for any contractual condition

Sound Pressure Level. Lp dB A measurement obtained directly using a microphone and sound level meter. Sound pressure level varies with distance from a source and with changes to the measuring environment. Sound pressure level equals 20 times the logarithm to the base 10 of the ratio of the rms sound pressure to the reference sound pressure of 20 micro Pascals.

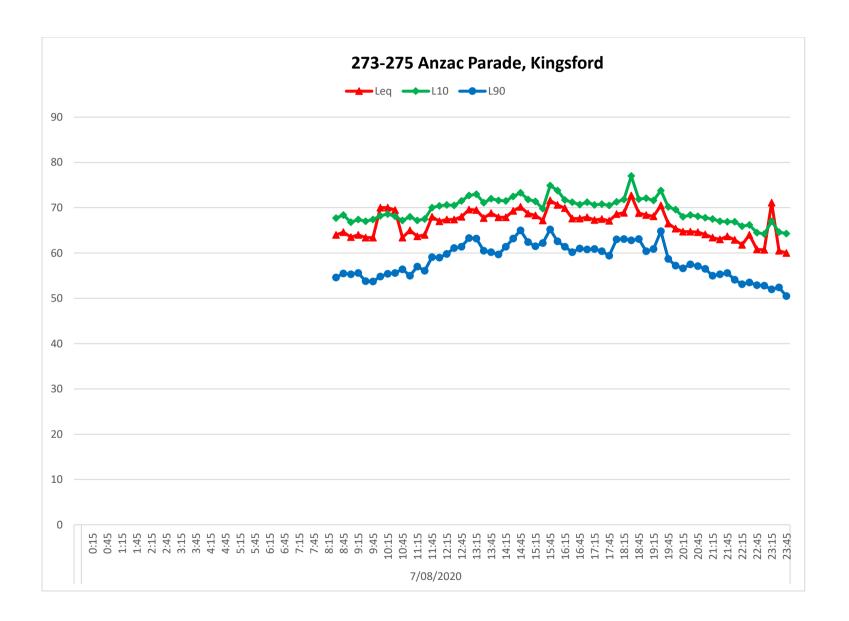
Sound Power Level, Lw dB Sound power level is a measure of the sound energy emitted by a source, does not change with distance, and cannot be directly measured. Sound power level of a machine may vary depending on the actual operating load and is calculated from sound pressure level measurements with appropriate corrections for distance and/or environmental conditions. Sound power levels is equal to 10 times the logarithm to the base 10 of the ratio of the sound power of the source to the reference sound power of 1 picoWatt

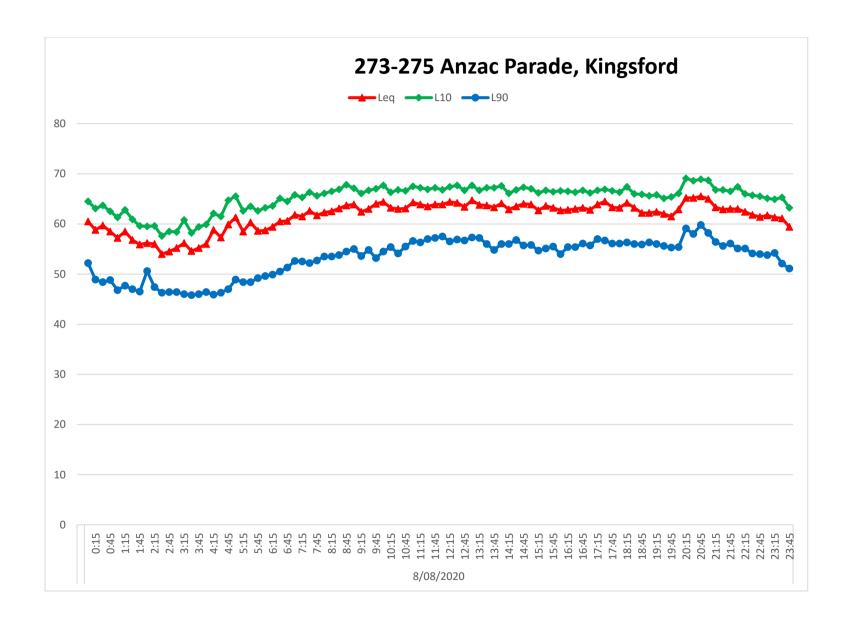
Speech Privacy A non-technical term but one of common usage. Speech privacy and speech intelligibility are opposites and a high level of speech privacy means a low level of speech intelligibility. It should be recognised that acceptable levels of speech privacy do not require that speech from an adjacent room is inaudible.

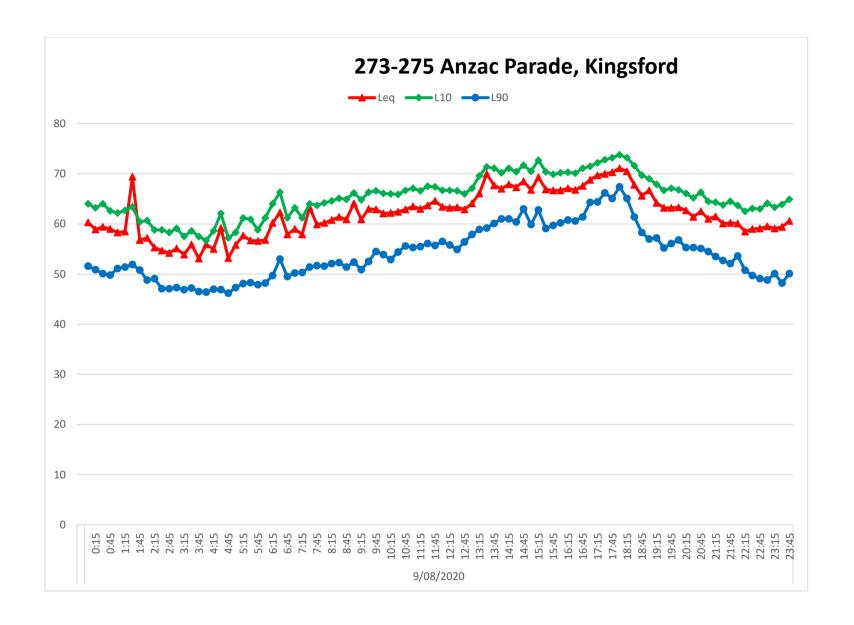
Transmission

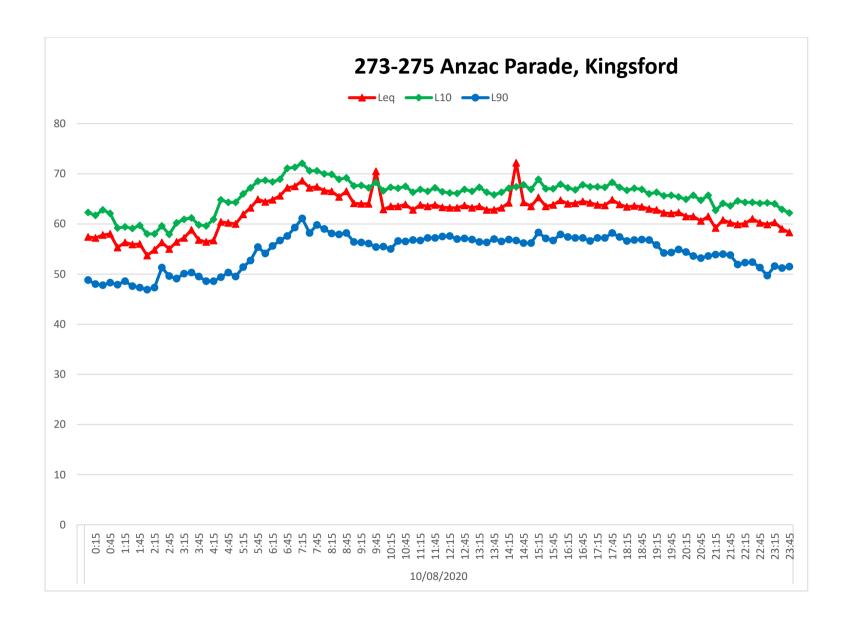
Equivalent to Sound Transmission Loss and to Sound Reduction Index in terminology used in countries other than Australia. A formal test rating of sound transmission properties of any construction, by usually a wall, floor, roof etc. The transmission loss of all materials varies with frequency and may be determined by either laboratory or field tests. Australian Standards apply to test methods for both situations.

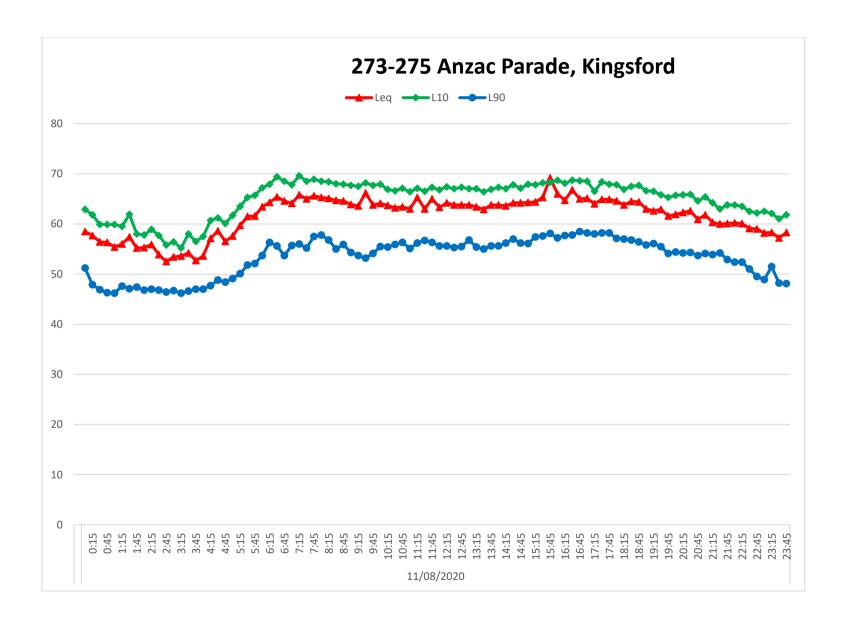
# 12 Appendix B – Noise Logging Results

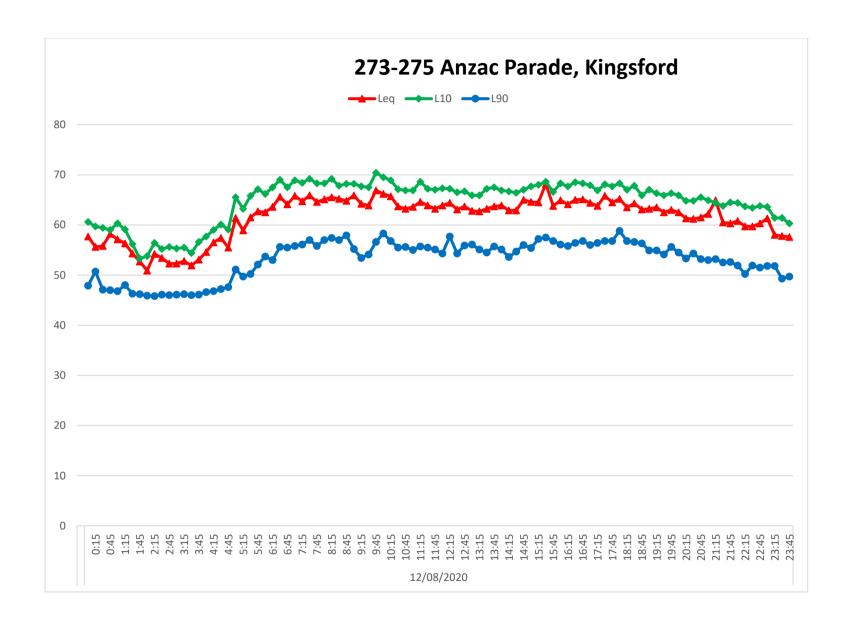


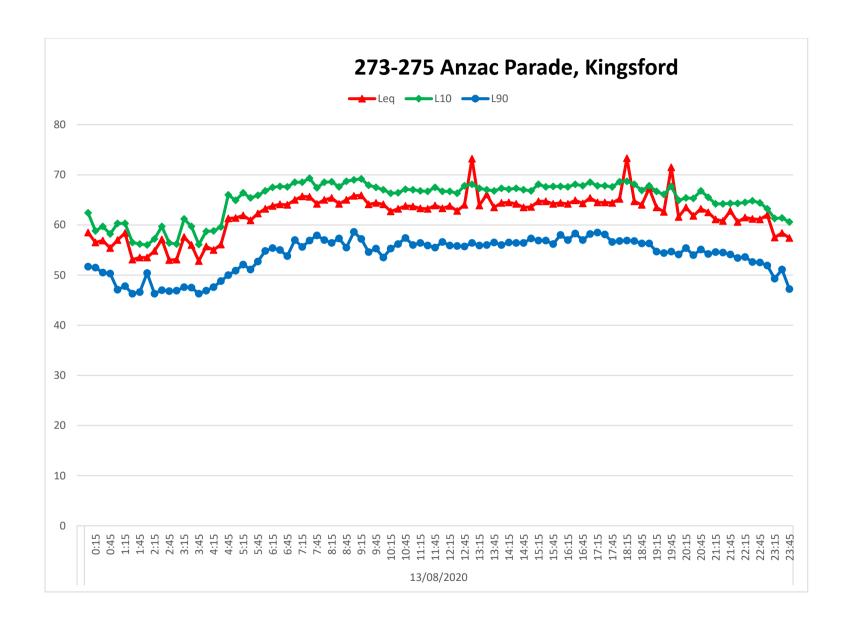


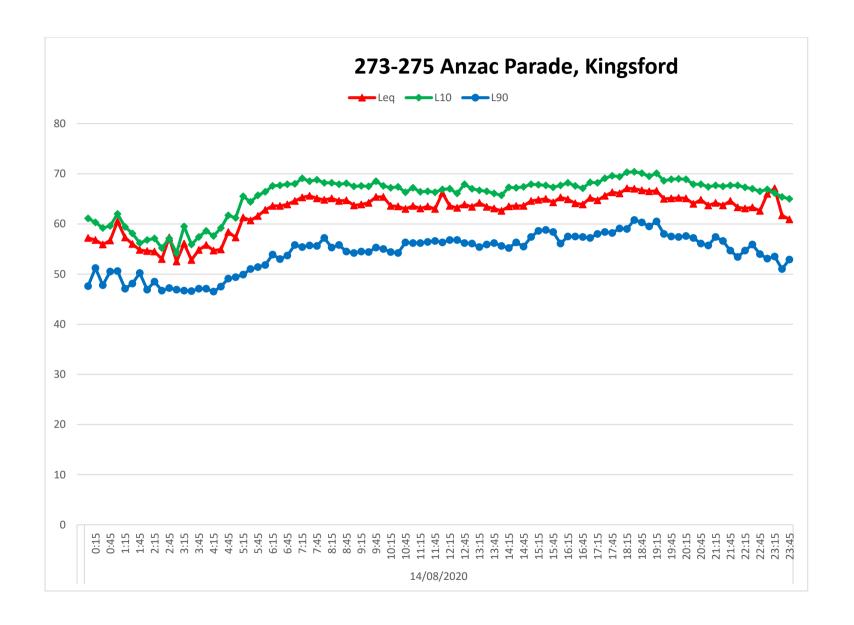


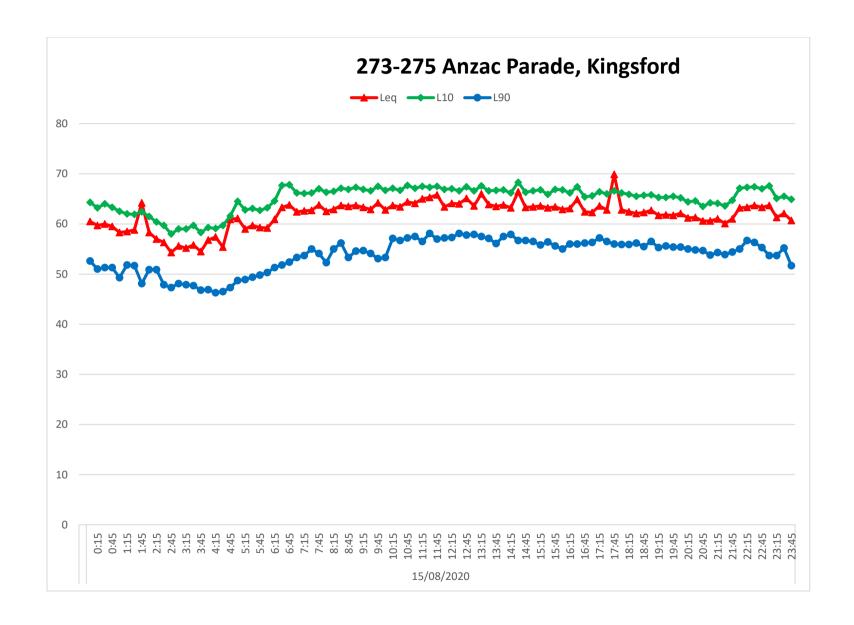


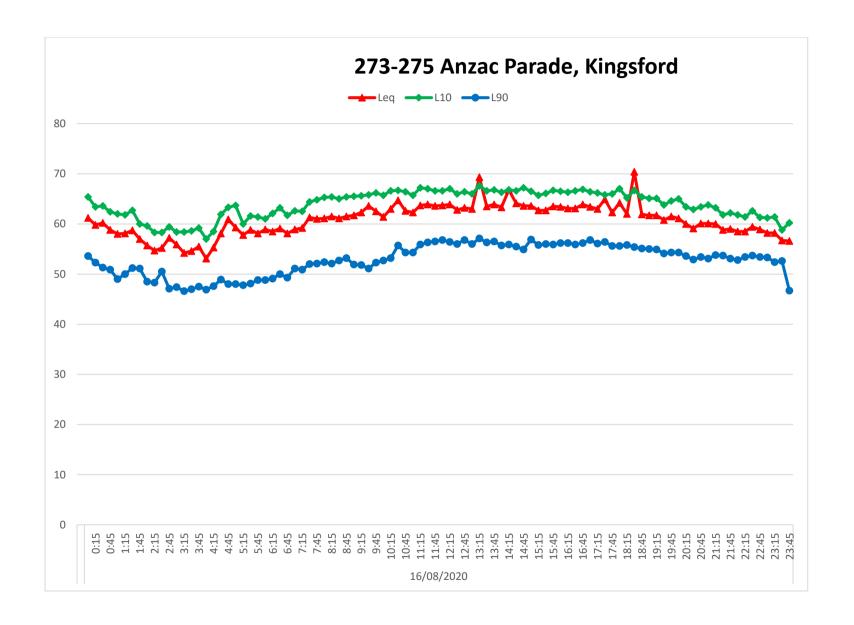


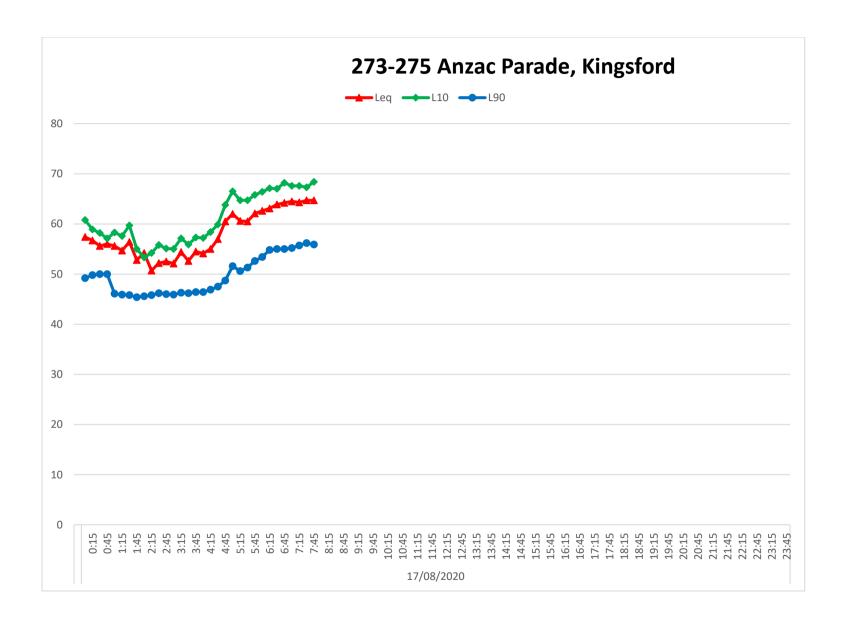












# **AIR QUALITY IMPACT ASSESSMENT**

273-275 Anzac Parade, Kingsford

# **Prepared for:**

Fusion Development Pty Ltd 151 Gale Road Maroubra 2035 NSW



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### **BASIS OF REPORT**

This report has been prepared by SLR Consulting Australia Pty Ltd (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Fusion Development Pty Ltd (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

#### **DOCUMENT CONTROL**

Reference	Date	Prepared	Checked	Authorised
610.30572-R01-v1.0	18 November 2021	A Naghizadeh, S Bagheri	K Lawrence	K Lawrence



Page 2 of 21

1	INTRODUCTION	7
2	PROJECT OVERVIEW	9
2.1	Site Location	9
2.2	The Proposal	9
3	PROJECT SETTING	11
3.1	Local Topography	11
3.2	Climate and Meteorology	12
3.2.1	Temperature	12
3.2.2	Rainfall	12
3.2.3	Relative Humidity	12
3.2.4	Wind Speed and Direction	12
3.3	Surrounding Land Use	15
4	AIR QUALITY POLICY AND GUIDANCE	16
4.1	Approved Methods	16
4.2	Infrastructure SEPP	16
4.3	Kensington and Kingsford Town Centres Development Control Plan	17
5	IDENTIFIED POLLUTANTS AND RELEVANT AIR QUALITY CRITERIA	19
5.1	Identified Pollutants	19
5.2	Relevant Air Quality Criteria	19
5.2.1	Suspended Particulate Matter	20
5.2.2	Oxides of Nitrogen	21
5.2.3	Carbon Monoxide	21
5.2.4	Sulphur Dioxide	21
5.2.5	Volatile Organic Compounds	22
5.2.6	Summary	23
6	BACKGROUND AIR QUALITY	24
7	ASSESSMENT METHODOLOGY	28
7.1	Estimation of Traffic Emissions	28
7.1.1	Assumptions Used to Compile COPERT Input Parameters	30
7.1.2	Peak Traffic Volumes	31
7.1.3	Road Gradients and Lengths	33
7.1.4	COPERT Emission Factors	33
7.1.5	Adjustment of COPERT Emission Factors	33
7.2	Dispersion Modelling	34



7.2.1	Model Selection	34
7.2.2	Accuracy of Modelling	35
7.2.3	Dispersion Model Configuration	36
7.3	NO <sub>x</sub> to NO <sub>2</sub> conversion	38
7.4	Meteorological Modelling	38
7.4.1	Selection of the Meteorological Year	38
7.4.2	TAPM	39
7.4.3	GRAMM	39
7.5	Meteorological Data Used in Modelling	40
7.5.1	Wind Speed and Direction	40
7.5.2	Temperature	42
8	ASSESSMENT OF AIR QUALITY AT THE PROJECT SITE	44
8.1	PM <sub>10</sub>	44
8.2	PM <sub>2.5</sub>	47
8.3	NO <sub>2</sub>	49
9	MITIGATION MEASURES	52
10	CONCLUSIONS	53
11	REFERENCES	54



# **DOCUMENT REFERENCES**

#### TABLES

Table 1	EPA Impact Assessment Criteria for Particulates	21
Table 2	Air Quality Assessment Criteria Adopted for this Study	23
Table 3	Summary of Randwick AQMS Data (2016 – 2020)	25
Table 4	COPERT Australia Vehicle Classifications	30
Table 5	Maximum Estimated Hourly Emission Rates	33
Table 6	TRAQ Emission Factors	34
Table 7	Parameters used in GRAL	37
Table 8	Meteorological Parameters used for the AQA – TAPM	
Table 9	GRAMM Meteorological Parameters	40
Table 10	Meteorological Conditions Defining PGT Stability Classes	42
Table 11	Predicted PM <sub>10</sub> Concentrations	45
Table 12	Predicted PM <sub>2.5</sub> Concentrations	47
Table 13	Predicted NO <sub>2</sub> Concentrations	
Table 14	Air Quality Design Considerations for the Project	52
FIGURES		
Eiguro 1	Project Location	
Figure 1	Topography of Area Surrounding the Project Site	
Figure 2 Figure 3	Long Term Temperature Data for Sydney Airport AWS	
Figure 3	Long Term Monthly Rainfall Data for Sydney Airport AWS	
Figure 5	Long Term Humidity Data for Sydney Airport AWS	
Figure 6	Rose of Wind Direction Vs Wind Speed for Sydney Airport AWS (1929 -2021)	
Figure 7	Surrounding Land Use	
Figure 8	1-Hour Average Ambient CO Concentrations - Rozelle AQMS (2016 – 2020)	
Figure 9	1-Hour Average Ambient CO concentrations - Rozelle AQMS (2016 – 2020)	
Figure 10	Ambient 1-Hour Average SO <sub>2</sub> Concentrations - Randwick AQMS (2016 – 2020)	
Figure 10	24-Hour Average Ambient PM <sub>10</sub> Concentrations - Randwick AQMS (2017)	
Figure 12	Ambient 24-Hour Average PM <sub>2.5</sub> Concentrations - Randwick AQMS (2017)	
Figure 13	Predicted Peak AM and PM Traffic Flows	
Figure 14	Diurnal Variation of Traffic on Syd Einfeld Drive Westbound (2009 – 2021	51
rigare 14	mean)	. 32
Figure 15	Modelled Road Sources and Buildings	
Figure 16	Modelled Discrete Receptors	
Figure 17	Predicted Seasonal Wind Roses for the Project Site (TAPM predictions, 2017)	
Figure 18	Predicted Stability Class Frequencies at the Project Site (TAPM predictions,	
	2017)	43
Figure 19	Predicted Temperatures at the Project Site (TAPM predictions, 2017)	
Figure 20	Maximum Predicted Cumulative 24-Hour Average PM <sub>10</sub> Concentrations	
Figure 21	Predicted Cumulative Annual Average PM <sub>10</sub> Concentrations	
Figure 22	Maximum Predicted Cumulative 24-Hour Average PM <sub>2.5</sub> Concentrations	
Figure 23	Predicted Cumulative Annual Average PM <sub>2.5</sub> Concentrations	



Figure 24	Maximum Predicted Cumulative 1-Hour Average NO <sub>2</sub> Concentrations	50
Figure 25	Predicted Cumulative Annual Average NO <sub>2</sub> Concentrations	50

#### **APPENDICES**

Appendix A	Site	Layout
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Appendix B COPERT Australia Input Parameters

Appendix C Selection of Representative Meteorological Data

Appendix D Predicted Pollutant Isopleth Plots – Incremental Concentrations



### 1 Introduction

SLR Consulting Australia Pty Ltd (SLR) was commissioned by Fusion Development Pty Ltd to perform an Air Quality Assessment (AQA) for the proposed development of a mixed-use building located at 273 – 275 Anzac Parade, Kingsford (the Project).

The Development Application (DA) for the Project lodged with Randwick City Council (Council) on 22 September 2020 was not approved for a number of reasons, including not addressing the requirements of *Part D, Section 34 – Air Quality* of the Kensington and Kingsford Development Control Plan (K2K DCP).

On 18 February 2021, the Client was advised by Council to withdraw the DA. On 13 July 2021 the Client appealed to the Land and Environment Court of NSW against the Council's deemed refusal of the DA. The Council's Statement of Facts and Contentions (SOFACs) were filed by the Land and Environment Court of NSW on 31 August 2021. In relation to air quality, the SOFACs state:

#### 20. Air Quality

The development application should be refused because the proposal has failed to address the requirements of Part D, Section 34 – Air Quality of the K2K DCP.

#### **Particulars**

- (a) The proposal fails to demonstrate compliance and no relevant report from a suitably qualify (sic) air quality consultant that addresses building design solutions and construction measures that reduces air pollution and improve indoor air quality for occupants and statement which explains how the proposal has addressed the 'Development near rail corridors and busy roads Interim Guideline'.
- (b) Part D, Section 34 of the K2K DCP outlines the following objectives and controls to ensure adequate air quality and requires:

#### **Objectives**

- To encourage both new and existing developments to be designed to provide good indoor air quality for occupants
- To protect residents from the harmful effects of air pollution

#### **Controls**

- a) DAs are to include a report from a suitably qualified air quality consultant that addresses building design solutions and construction measures that reduce air pollution and improve indoor air quality for occupants
- b) DAs are to submit a statement which explains how the proposal has addressed the NSW Government 'Development near rail corridors and busy roads Interim Guideline'
- c) Air intakes for proposals are to be sited well away from Anzac Parade or the pollution source (e.g on top of tall buildings) or provided with filtration to remove particulates; and
- d) DAs for sensitive land uses such as childcare centres, schools or aged care facilities must submit an air quality study prepared by a suitably qualified expert demonstrating how air pollution exposure and health risks will be mitigated.
- (c) The proposal fails to address the above objectives and controls.



Page 7 of 21

This assessment has been performed to address the above requirements, with reference to relevant standards, guidelines and resources, including:

- Approved Methods for Modelling and Assessment of Air Pollutants in NSW (NSW EPA, 2017), (the Approved Methods)
- The State Environmental Planning Policy (Infrastructure) 2007 (NSW Government, 2007), (the Infrastructure SEPP)
- Development near Rail Corridors and Busy Roads Interim Guideline (NSW DoP, 2008), (the Rail and Road Guideline)

The requirements of these documents as they pertain to the Project are discussed in detail in **Section 4** of this report.

The purpose of this AQA is to:

- Quantify air pollutant emissions from nearby busy roads.
- Model the dispersion of the quantified emissions in order to characterise cumulative maximum concentrations of air pollutants across the building facade and outdoor areas.
- Compare the model results against relevant guidelines to provide an assessment of air quality for the proposed development.
- Identify appropriate mitigation measures to reduce the likelihood of exceedances of air quality impact assessment criteria at potentially sensitive locations (if required).
- Address the air quality matters outlined in the SOFACs



Page 8 of 21

# 2 Project Overview

### 2.1 Site Location

The Project site, which has a total area of 1,275 square metres (m²), is located on the western side of Anzac Parade, north of Strachan Street and is legally identified as Lot 1 in DP 129966 and DP 940263. The Project site falls within the Randwick Local Government Area and is located approximately 6 kilometres (km) south-southwest of the Sydney CBD. **Figure 1** illustrates the location of the Project site.

Figure 1 Project Location



### 2.2 The Proposal

The Project involves the demolition of all existing structures and construction of a part 5, part 16 storey mixed use development comprising commercial tenancies, student accommodation and one (1) level of basement parking.



Specifically, the proposal includes four commercial and retail tenancies and one Community room located on ground floor and Level 1, shared communal living areas on level 2 and 143 student rooms located on Levels 2 to 15.

A description of each level is provided below:

- The basement level includes 18 car spaces and 29 motorcycle spaces. It is also proposed to include ramp access to the Ground Floor as well as a lobby with lift and stair accessibility.
- The ground floor (with a pedestrian entrance from Anzac Parade and vehicular access off Houston Lane) is proposed to include 2 retail tenancies fronting Anzac Parade and a centralised communal open space. Bike parking spaces are available for visitors and retail with a total area of 62 m<sup>2</sup>. The ground floor includes a loading dock accessible from Houston Lane and a through-site pedestrian walk connecting Houston Lane with Anzac Parade. The Mezzanine at ground level includes a pumproom and sprinkler tank.
- Level 1 is proposed to include 3 commercial tenancies with distributed amenities and a commercial/goods lift.
- Level 2 includes 10 double residential rooms including an accessible room, manager accommodation with its own private open space, a communal living area including kitchen, dining, library and living areas, and three communal open space areas. Lift and stair access, laundry room, mail and parcel lockers, and a waste storage area are also located within level 2.
- Levels 3 and 4 are composed of 2 separate towers, front towers (including 10 double rooms) facing Anzac Parade and rear towers (including 6 double rooms) facing Houston Lane, separated by a central void.
- Levels 5 to 14 are composed of a single front tower facing Anzac Parade with relatively similar layouts, including 10 rooms (single and double) per level, connected with other floors through stairs and lifts.
- Level 15 is proposed to include an indoor communal living area connected to outdoor communal open space.
- Level 16 is proposed to include a plant room.



Page 10 of 21

# 3 Project Setting

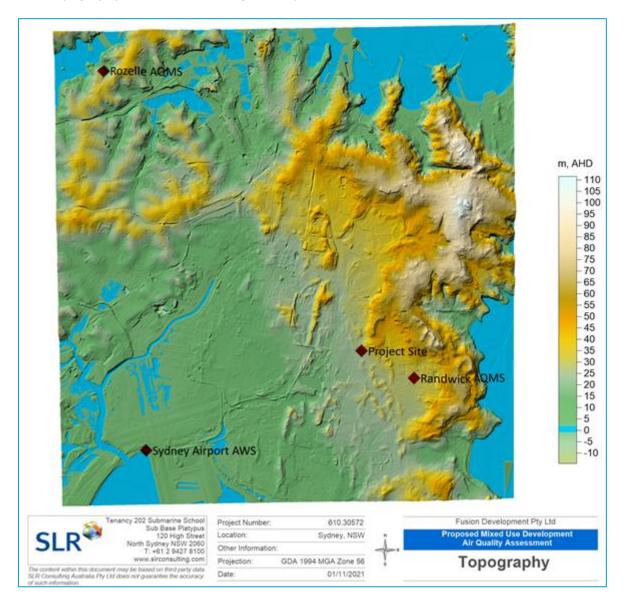
# 3.1 Local Topography

Topography is important in air quality studies as local atmospheric dispersion can be influenced by night-time katabatic (downhill) drainage flows from elevated terrain or channelling effects in valleys or gullies.

A three-dimensional representation of the region is given in **Figure 2**. The topography within the illustrated area ranges from an approximate elevation of -10 m to 110 m Australian Height Datum (AHD).

The Project site itself is reasonably flat. The stretch of Anzac Parade that runs past the Project site has a gradient of less than 2%, which would have an insignificant potential to increase or decrease vehicular emissions (i.e. depending on the direction of travel).

Figure 2 Topography of Area Surrounding the Project Site





### 3.2 Climate and Meteorology

The Bureau of Meteorology (BoM) maintains and publishes data from weather stations across Australia. The closest such station to the Project site is the Sydney Airport Automatic Weather Station (AWS) (Station ID 66037), located approximately 5 km southwest of the Project site.

Sydney Airport AWS has data available for the following parameters:

- Temperature (°C)
- Rainfall (mm)
- Relative humidity (%)
- Wind speed (m/s) and wind direction (degrees).

A review of the long-term data collected by this station is provided in the following sections.

#### 3.2.1 Temperature

Long-term temperature statistics for the Sydney Airport AWS are summarised in **Figure 3**. Mean maximum temperatures range from 17.2°C in winter to 26.7°C in summer, while mean minimum temperatures range from 7.3°C in winter to around 19.1°C in summer. Maximum temperatures above 45°C and minimum temperatures as low as 0°C have been recorded.

#### 3.2.2 Rainfall

Long-term rainfall statistics for the Sydney Airport AWS are summarised in **Figure 4.** The average monthly rainfall is relatively high in mid-summer to early-winter, reducing from mid-winter to late-spring with the lowest average of 59.7 mm/month recorded during September. An average of over ten days of rain days per month have been recorded for all months except July, August and September. The highest average monthly rainfall of 124.8 mm/month occurs in June, with an average of 11.4 rain days recorded in this month. The highest daily rainfall recorded over the time period examined was 216.2 mm recorded in February 1990.

#### 3.2.3 Relative Humidity

Long-term humidity statistics (9 am and 3 pm monthly averages) for the Sydney Airport AWS are summarised in **Figure 5**. Morning humidity levels range from an average of around 61% in mid-spring to around 74% in winter. Afternoon humidity levels are lower, at around 63% in late summer and dropping to a low of 49% in late winter.

#### 3.2.4 Wind Speed and Direction

Long term wind data (9 am and 3 pm) for Sydney Airport AWS are presented as wind roses in **Figure 6**. The wind roses show a strong diurnal pattern, with winds from the west quadrant dominating during the morning and winds from the east quadrant dominating in the afternoon. Winds are also stronger in the afternoon than during the morning.



Figure 3 Long Term Temperature Data for Sydney Airport AWS

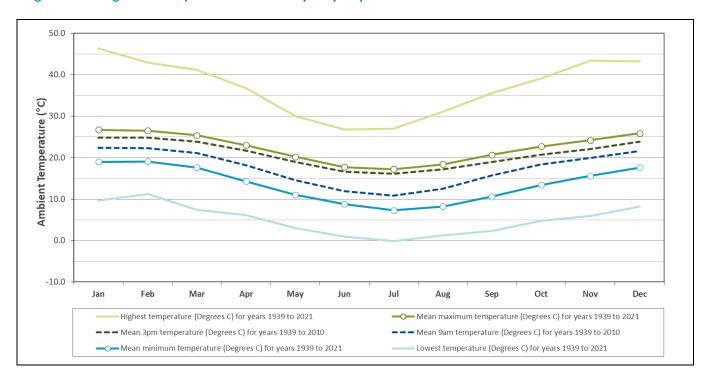


Figure 4 Long Term Monthly Rainfall Data for Sydney Airport AWS

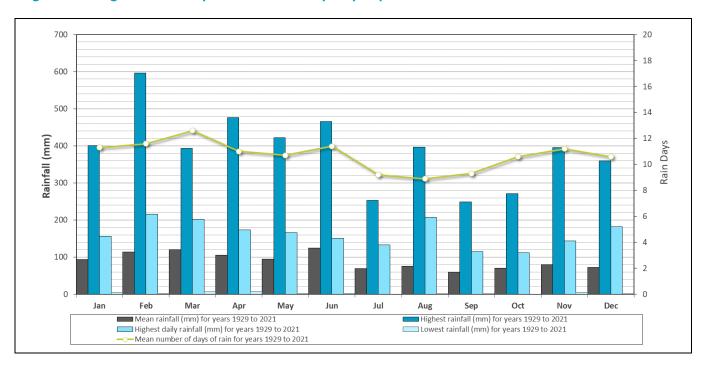


Figure 5 Long Term Humidity Data for Sydney Airport AWS

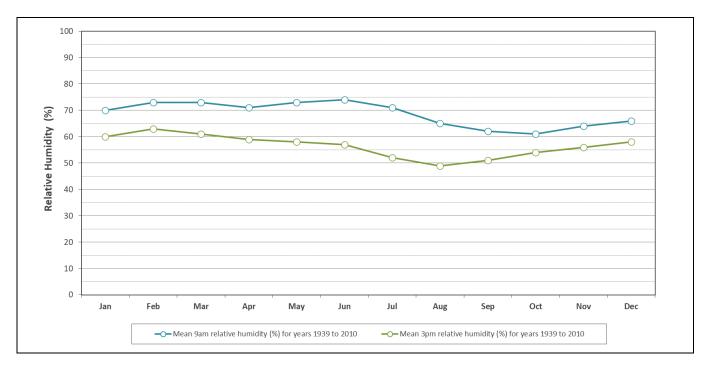
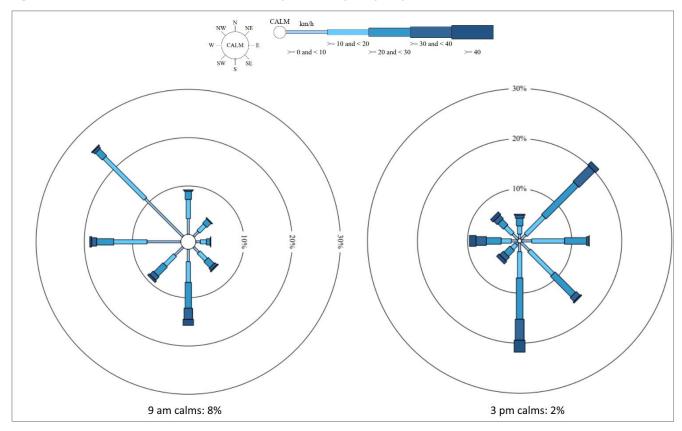


Figure 6 Rose of Wind Direction Vs Wind Speed for Sydney Airport AWS (1929 -2021)



### 3.3 Surrounding Land Use

As illustrated in **Figure 7**, the Project site is located within land zoned Local Centre (B2) and the surrounding locality generally consists of mixed-use developments to the north, south and east and residential dwellings to the west.

The lots immediately surrounding the Project site are zoned Medium Density Residential (R3), Local Centre (B2) and Infrastructure (SP2).

The Project site and surrounding properties are identified as being within Kingsford Midtown in the recently adopted Kensington and Kingsford Development Control Plan (DCP) (refer **Section 4.3**) and are expected to undergo a significant transformation in coming years as a result of the newly adopted planning controls, including an alternative maximum building height of 54 m and alternative floor space ratio (FSR) of 5:1.

Figure 7 Surrounding Land Use



# 4 Air Quality Policy and Guidance

The following air quality policy and guidance documents have been referenced within this assessment and have been used to identify the relevant assessment methodology and air quality criteria for the Project AQA.

### 4.1 Approved Methods

State air quality guidelines adopted by the NSW EPA are published in the Approved Methods (NSW EPA, 2017).

The Approved Methods lists the statutory methods for modelling and assessing air pollutants from stationary sources and specifies air quality assessment criteria that reflect the environmental outcomes adopted by the EPA. The Approved Methods are referred to in the *POEO* (Clean Air) Regulation 2002 for assessment of impacts of air pollutants.

The air quality assessment criteria set out in the Approved Methods relevant to the Project are reproduced and discussed in **Section 5**.

#### 4.2 Infrastructure SEPP

The Infrastructure SEPP refers to guidelines that must be taken into account where development is proposed in, or adjacent to, specific roads and railway corridors under clause 101 – Development with Frontage to a Classified Road<sup>1</sup>. The objective of clause 101 is to ensure that new development does not compromise the effective and ongoing operation and function of classified roads, and to reduce the potential for impacts from traffic noise and vehicle emissions on development adjacent to classified roads.

Reference is also made to the Rail and Road Guideline (DoP, 2008), which supports the specific rail and road provisions of the Infrastructure SEPP.

An aim of the Rail and Road Guideline is to assist in reducing the health impacts of adverse air quality from road traffic on sensitive adjacent development and to assist in the planning, design and assessment of development adjacent to busy roads. Section 4.4 of the Rail and Road Guideline provides the following guidance on when air quality should be a design consideration and some of the principles that should be considered at the design stage to achieve improved air quality:

#### When air quality should be a design consideration:

- Within 10 m of a congested collector road (traffic speeds of less than 40 km/h at peak hour) or a road grade > 4% or heavy vehicle percentage flows > 5%
- Within 20 m of a freeway or main road (with more than 2,500 vehicles per hour, moderate congestion levels of less than 5% idle time and average speeds of greater than 40 km/h)
- Within 60 m of an area significantly impacted by existing sources of air pollution (road tunnel portals, major intersection / roundabouts, overpasses or adjacent major industrial sources)
- As considered necessary by the approval authority based on consideration of site constraints, and associated air quality issues.

The NSW State Roads Act 1986 No. 85 defines 'Classified Road' as a main road, a secondary road, a state highway, a tourist road, a state work, a freeway or a controlled access road.



Page 16 of 21

#### Air quality design considerations:

- Minimising the formation of urban canyons that reduce dispersion. Having buildings of different heights interspersed with open areas and setting back the upper stories of multi-level buildings helps to avoid urban canyons.
- Incorporating an appropriate separation distance between sensitive uses and the road using broadscale site planning principles such as building siting and orientation. The location of living areas, outdoor space and bedrooms and other sensitive uses (such as childcare centres) should be as far as practicable from the major source of air pollution.
- Ventilation design and openable windows should be considered in the design of development located adjacent to roadway emission sources. When the use of mechanical ventilation is proposed, the air intakes should be sited as far as practicable from the major source of air pollution.
- Using vegetative screens, barriers or earth mounds where appropriate to assist in maintaining local ambient air amenity. Landscaping has the added benefit of improving aesthetics and minimising visual intrusion from an adjacent roadway.

### 4.3 Kensington and Kingsford Town Centres Development Control Plan

In 2016, Randwick City Council (the Council) commenced a comprehensive planning review of the Kensington and Kingsford town centres to update the planning controls. The review culminated in the Kensington and Kingsford Planning Proposal, which was endorsed by the Council in 2019 and forwarded to the Department of Planning, Industry and Environment (DPIE) requesting amendments be made to Randwick Local Environmental Plan (LEP). The proposed amendments were made to the LEP in August 2020; these amendments relate to:

- Greater building heights and densities tied to the delivery of community infrastructure and floor space
- A new affordable housing requirement calculated on 3% (increasing to 5% after 14 August 2022) of the total floor area used for residential purposes
- A minimum non-residential floor space component of at least 1% of gross floor area for key sites
- A requirement for ground floor premises to active street frontages to be used for commercial purposes
- Design excellence requirements and an architectural competition process for key sites
- The inclusion of new sites (currently zoned residential) to be rezoned B2 Local Centre

Following the amendments made to the LEP, the Development Control Plan for the Kensington and Kingsford town centres (the DCP) was adopted by Randwick City Council (the Council) on 27 October 2020.

In relation to air quality, the DCP aims to:

- encourage both new and existing developments to be designed to provide good indoor air quality for occupants
- protect residents from the harmful effects of air pollution

In order to achieve these objectives, the following controls are included in the DCP:

 a) DAs are to include a report from a suitably qualified air quality consultant that addresses building design solutions and construction measures that reduce air pollution and improve indoor air quality for occupants



- b) DAs are to submit a statement which explains how the proposal has addressed the NSW Government 'Development near rail corridors and busy roads – Interim Guideline'
- c) Air intake for proposals are to be sited well away from Anzac Parade or the pollution source (e.g on top of tall buildings) or provided with filtration to remove particulates; and
- d) DAs for sensitive land uses such as childcare centres, schools or aged care facilities must submit an air quality study prepared by a suitably qualified expert demonstrating how air pollution exposure and health risks will be mitigated.



Page 18 of 21

# 5 Identified Pollutants and Relevant Air Quality Criteria

#### 5.1 Identified Pollutants

The primary source of air emissions in the area immediately surrounding the Project is expected to be vehicles travelling along Anzac Parade, which is classified as a "Main Road" under the NSW Roads Act 1993 (Gazetted Road Number: 661). Emissions from vehicles travelling on other roads surrounding the Project site (e.g. Strachan Street and Houston Road), could also impact the future residents of the Project site, however at a lower level.

A review of the National Pollutant Inventory *Emission Estimation Technique Manual (NPI EET) for Combustion Engines* (DEWHA , 2008) identifies the primary pollutants from combustion engines as:

- Particulate matter less than 10 μm in aerodynamic diameter (PM<sub>10</sub>)
- Particulate matter less than 2.5 μm in aerodynamic diameter (PM<sub>2.5</sub>)
- Oxides of nitrogen (NO<sub>x</sub>)
- Carbon monoxide (CO)
- Sulfur dioxide (SO<sub>2</sub>)
- Volatile Organic Compounds (VOCs)

Other substances that are also emitted from vehicle exhausts in trace amounts include products of incomplete combustion, such as metallic additives that contribute to the particulate content of the exhaust (DEWHA, 2008).

The rate and composition of air pollutant emissions from road vehicles is a function of a number of factors, including the type, size and age of vehicles within the fleet, the type of fuel combusted, number and speed of vehicles and the road gradient.

### **5.2** Relevant Air Quality Criteria

Section 7.1 of the Approved Methods outlines the impact assessment criteria for the air pollutants identified in **Section 5.1**. The criteria listed in the Approved Methods are derived from a range of sources (including NHMRC, NEPC, WHO, ANZEEC and DoE). The criteria specified in the Approved Methods are the defining ambient air quality criteria for NSW and are considered to be appropriate for the setting.

The criteria outlined in the sections below present the current ambient air quality criteria adopted by the NSW Government. It is noted that these criteria are based on the standards set out in the National Environment Protection (Ambient Air Quality) Measure (the AAQ NEPM). On 15 April 2021, The National Environmental Protection Council agreed to vary the AAQ NEPM, and on 18 May 2021 the ambient air standards for NO<sub>2</sub> and SO<sub>2</sub> were amended. These changes to the ambient air quality standards for NO<sub>2</sub> and SO<sub>2</sub> include:

- SO<sub>2</sub>:
  - The 1-hour standard for SO<sub>2</sub> in the AAQ NEPM is retained, however the numerical value of the standard has been reduced to 100 ppb (previously 200 ppb).
  - A future 1-hour SO<sub>2</sub> standard of 75 ppb will be implemented from 2025.
  - The 24-hour standard for SO<sub>2</sub> in the AAQ NEPM will be retained, however the numerical value of the standard has been reduced to 20 ppb (previously 80 ppb).



- No future target for 24-hour average SO<sub>2</sub> concentrations is proposed at this stage.
- The current annual mean standard for SO<sub>2</sub> has been removed from the AAQ NEPM.
- The form of both the revised 1-hour and 24-hour SO<sub>2</sub> standards are as maximum values with no allowable exceedances.

#### NO<sub>2</sub>:

- The 1-hour standard for NO<sub>2</sub> in the AAQ NEPM is retained, however the numerical value of the standard has been reduced to 80 ppb (previously 120 ppb).
- The annual standard for NO<sub>2</sub> in the AAQ NEPM is retained, however the numerical value of the standard has been reduced to 15 ppb (previously 30 ppb).
- The form of both the 1-hour and annual NO<sub>2</sub> standards are as maximum values with no allowable exceedances.

It is not yet known if or when the Approved Methods will be amended to reflect the recent changes to the AAQ NEPM. The assessment presented in this report is therefore based on the current ambient air quality criteria adopted by DPIE.

#### **5.2.1** Suspended Particulate Matter

Airborne contaminants that can be inhaled directly into the lungs can be classified on the basis of their physical properties as gases, vapours or particulate matter. In common usage, the terms "dust" and "particulates" are often used interchangeably. The term "particulate matter" refers to a category of airborne particles, typically less than 30 microns ( $\mu$ m) in diameter and ranging down to 0.1  $\mu$ m and is termed total suspended particulate (TSP).

The annual criterion for TSP recommended by the NSW EPA is 90 micrograms per cubic metre of air ( $\mu g/m^3$ ). The TSP criterion was developed before the more recent results of epidemiological studies which suggested a relationship between health impacts and exposure to concentrations of finer particulate matter.

Emissions of particulate matter less than 10  $\mu$ m and 2.5  $\mu$ m in diameter (referred to as PM<sub>10</sub> and PM<sub>2.5</sub> respectively) are considered important pollutants due to their ability to penetrate into the respiratory system. In the case of the PM<sub>2.5</sub> category, recent health research has shown that this penetration can occur deep into the lungs. Potential adverse health impacts associated with exposure to PM<sub>10</sub> and PM<sub>2.5</sub> include increased mortality from cardiovascular and respiratory diseases, chronic obstructive pulmonary disease and heart disease, and reduced lung capacity in asthmatic children.

The NSW EPA PM<sub>10</sub> impact assessment criteria set out in the Approved Methods are as follows:

- 24-hour average maximum of 50 µg/m³
- Annual average of 25 µg/m³.

The NSW EPA PM<sub>2.5</sub> impact assessment criteria set out in the Approved Methods are as follows:

- 24-hour average maximum of 25 μg/m³
- Annual average of 8 μg/m³.

A summary of the particulate impact assessment criteria is shown in **Table 1**.



 Table 1
 EPA Impact Assessment Criteria for Particulates

Pollutant	Averaging Time	Impact Assessment Criteria
TSP	Annual	90 μg/m³
PM <sub>10</sub>	24-Hour Annual	50 μg/m³ 25 μg/m³
PM <sub>2.5</sub>	24-Hour Annual	25 μg/m³ 8 μg/m³

#### 5.2.2 Oxides of Nitrogen

 $NO_X$  is a general term used to describe any mixture of nitrogen oxides formed during combustion. In atmospheric chemistry  $NO_X$  generally refers to the total concentration of nitric oxide (NO) and nitrogen dioxide (NO<sub>2</sub>). NO will be converted to  $NO_2$  in the atmosphere after leaving a car exhaust.

NO is a colourless and odourless gas that does not significantly affect human health. However, in the presence of oxygen, NO can be oxidised to form  $NO_2$  which can have significant health effects including damage to the respiratory tract and increased susceptibility to respiratory infections and asthma. Long term exposure to  $NO_2$  can lead to lung disease.

The impact assessment criteria specified within the Approved Methods for NO<sub>2</sub> are as follows:

- 1-hour average of 12 parts per hundred million (pphm) (246 μg/m³)
- Annual average of 3 pphm (62 μg/m³)

#### 5.2.3 Carbon Monoxide

CO is an odourless, colourless gas formed from the incomplete burning of fuels in motor vehicles. CO bonds to the haemoglobin in the blood and reduces the oxygen carrying capacity of red blood cells, thus decreasing the oxygen supply to the tissues and organs, in particular the heart and the brain.

It can be a common pollutant at the roadside and highest concentrations are found at the kerbside with concentrations decreasing rapidly with increasing distance from the road. CO in urban areas results almost entirely from vehicle emissions and its spatial distribution follows that of traffic flow. The impact assessment criteria specified within the Approved Methods for CO are as follows:

- 15-minute average of 87 parts per million (100 mg/m³)
- 1-hour average of 25 ppm (30 mg/m³)
- 8-hour average of 9 ppm (10 mg/m³)

#### 5.2.4 Sulphur Dioxide

SO<sub>2</sub> is a colourless, pungent gas with an irritating smell. When present in sufficiently high concentrations, exposure to SO<sub>2</sub> can lead to impacts on the upper airways in humans (i.e. the noise and throat irritation). SO<sub>2</sub> can also mix with water vapour to form sulphuric acid (acid rain) which can damage vegetation, soil quality and corrode materials.



The main sources of SO<sub>2</sub> in the air are industries that process materials containing sulphur (i.e. wood pulping, paper manufacturing, metal refining and smelting, textile bleaching, wineries etc.). SO<sub>2</sub> is also present in motor vehicle emissions, however since Australian fuels are relatively low in sulphur, high ambient concentrations are not common.

The impact assessment criteria specified within the Approved Methods for SO<sub>2</sub> are as follows:

- 10-minute average of 25 pphm (712 μg/m³)
- 1-hour average of 20 pphm (570 µg/m³)
- 24-hour average of 8 pphm (228 μg/m³)
- Annual average of 2 pphm (60 μg/m³)

#### **5.2.5** Volatile Organic Compounds

VOCs are organic compounds (i.e. contain carbon) that have high vapour pressure at normal room-temperature conditions. Their high vapour pressure leads to evaporation from liquid or solid form and emission release to the atmosphere.

VOCs are emitted by a variety of sources, including motor vehicles, chemical plants, automobile repair services, painting/printing industries, and rubber/plastics industries. VOCs that are often typical of these sources include benzene, toluene, ethylbenzene and xylenes (often referred to as 'BTEX'). Biogenic (natural) sources of VOC emissions are also significant (e.g. vegetation).Impacts due to emissions of VOCs can be health or nuisance (odour) related. Benzene is a known carcinogen and a key VOC linked with the combustion of motor vehicle fuels.

The impact assessment criteria specified within the Approved Methods for BTEX compounds are as follows:

Benzene: 1-hour average of 0.029 mg/m³

Toluene: 1-hour average of 0.36 mg/m<sup>3</sup>

Ethylbenzene: 1-hour average of 8.0 mg/m<sup>3</sup>

Xylenes: 1-hour average of 0.19 mg/m³



### **5.2.6 Summary**

The criteria adopted for the AQA are summarised in **Table 2**.

 Table 2
 Air Quality Assessment Criteria Adopted for this Study

Pollutant	Averaging Period	Criterion	
TSP	Annual	90 μg/m³	
DNA	24-Hour	50 μg/m³	
PM <sub>10</sub>	Annual	25 μg/m³	
DM	24-Hour	25 μg/m³	
PM <sub>2.5</sub>	Annual	8 μg/m³	
NO <sub>2</sub>	1-hour	246 μg/m³	
	Annual	62 μg/m³	
СО	15-minutes	100 mg/m <sup>3</sup>	
	1-hour	30 mg/m³	
	8-hour	10 mg/m <sup>3</sup>	
SO <sub>2</sub>	10-minutes	712 μg/m³	
	1-hour	570 μg/m³	
	24-hour	228 μg/m³	
	Annual	60 μg/m³	
Benzene	1-hour	0.029 mg/m <sup>3</sup>	
Toluene	1-hour	0.36 mg/m <sup>3</sup>	
Ethylbenzene	1-hour	8.0 mg/m <sup>3</sup>	
Xylenes	1-hour	0.19 mg/m <sup>3</sup>	



# 6 Background Air Quality

Air quality is generally good in Sydney, based on information from the 43 station ESS Air Quality Monitoring Network. For 2000-2019, the air quality was 'very good', 'good' or 'fair' for 94% of days in the Sydney Central-East region. During this time, exceedances of the national air quality standards for particle pollution have usually been associated with regional dust storms and vegetation fires (NSW Government, 2017) (NSW OEH, 2017b) (NSW OEH, 2019).

The nearest ESS AQMSs to the Project is located at Randwick (refer to **Figure 2**). The Randwick AQMS was commissioned in February 1995 and is located in the grounds of the Randwick Army Barracks, on the corner of Avoca and Bundock Streets, Randwick. It is situated in the eastern suburbs of Sydney in a residential area approximately 1.9 km southeast of the Project site.

The Randwick AQMS monitors the following air pollutants:

- PM<sub>10</sub>
- PM<sub>2.5</sub>
- NO, NO<sub>2</sub> & NO<sub>X</sub>
- SO<sub>2</sub>

As the Randwick AQMS does not monitor CO concentrations, data from the next closest AQMS to the Project site (Rozelle AQMS, located 8.5 km northwest of the Project site) has been used to establish background concentrations of this pollutant.

Air pollutant data recorded by the Randwick AQMS and Rozelle AQMS (for CO only) were obtained for the calendar years 2016 - 2020. The data are summarised in **Table 3** (red font/shading indicates an exceedance of the relevant criterion), and are presented graphically in **Figure 8** to **Figure 12**. To be consistent with the annual NSW compliance monitoring reports, the data for gaseous pollutants are presented in parts per hundred million (pphm) or parts per million (ppm), rather than  $\mu g/m^3$  and  $mg/m^3$ .

A review of the Randwick AQMS data shows that exceedances of the 24-hour average  $PM_{10}$  and  $PM_{2.5}$  criteria were recorded by the Randwick AQMS in all years with data available except for 2016. A review of the available compliance monitoring reports indicates that the exceedances recorded by the Randwick AQMS were primarily due to exceptional events, such as bushfire emergencies, dust storms and hazard reduction burns. The high number of exceedances recorded by the Randwick AQMS in late 2019 and early 2020 was due to the bushfire smoke that affected Sydney and the surrounding areas for a number of weeks over this period.

Exceedances of the annual average  $PM_{2.5}$  criterion were recorded by the Randwick AQMS in 2019, which was primarily due to the abovementioned bushfires in the areas surrounding Sydney in late 2019. The annual average  $PM_{10}$  criterion was not exceeded in the years investigated.

Ambient concentrations of the gaseous pollutants SO<sub>2</sub>, NO<sub>2</sub>, and CO were all well below the relevant criteria for all years investigated.

Based on the data presented in **Figure 8** to **Figure 12**, it can be observed that overall, pollutant concentrations recorded between March 2020 and December 2020 are generally lower when compared to the long term trends. This is expected to be due to the recent COVID-19 pandemic and the subsequent travel restrictions imposed by the NSW Government, which led to a reduction in traffic volumes on many roads across Sydney.



Ambient air quality data recorded by the Randwick AQMS for the year 2017 was used in the cumulative assessment to be consistent with the representative meteorological year adopted for the study (refer **Section 7.4.1**). For days with missing data, the 70<sup>th</sup> percentile value of all available datapoints for the year was conservatively used.

Table 3 Summary of Randwick AQMS Data (2016 – 2020)

Pollutant	СО	NO:	2	SO <sub>2</sub>		PM <sub>1</sub>	.0	PM <sub>2</sub>	.5
Averaging Period	Maximum 1-hour	Maximum 1-hour	Annual	Maximum 1-hour	Annual	Maximum 24-hour	Annual	Maximum 24-hour	Annual
Units	ppm	pphm	pphm	pphm	pphm	μg/m³	μg/m³	μg/m³	μg/m³
2016	1.7	4.4	0.8	3.4	0.1	44.1	18.0	ND*	ND*
2017	1.2	4.1	0.7	2.9	0.1	56.1	19.2	48.7	6.9
2018	1.0	4.0	0.7	2.1	0.1	95.5	21.2	31.8	7.6
2019	5.2	5.1	0.7	2.9	0.1	127.7	24.1	95.2	10.8
2020	3.3	3.7	0.5	1.4	0.1	137.3	19.5	114.8	7.6
Criterion	25	12	3	20	2	50	25	25	8

#### Notes:

- \* ND = NO Data, PM<sub>2.5</sub> monitoring at Randwick AQMS commenced late March 2017.
- For 2017, one (1) exceedance of the 24-hour average PM<sub>10</sub> and one (1) exceedance of the 24-hour average PM<sub>2.5</sub> were recorded.
- $^3$  For 2018, five (5) exceedances of the 24-hour average PM<sub>10</sub> and one (1) exceedance of the 24-hour average PM<sub>2.5</sub> were recorded.
- <sup>4</sup> For 2019, 19 exceedances of the 24-hour average PM<sub>10</sub> and 18 exceedances of the 24-hour average PM<sub>2.5</sub> were recorded.
- For 2020, eight (8) exceedances of the 24-hour average  $PM_{10}$  and nine (9) exceedances of the 24-hour average  $PM_{2.5}$  were recorded.

Figure 8 1-Hour Average Ambient CO Concentrations - Rozelle AQMS (2016 – 2020)

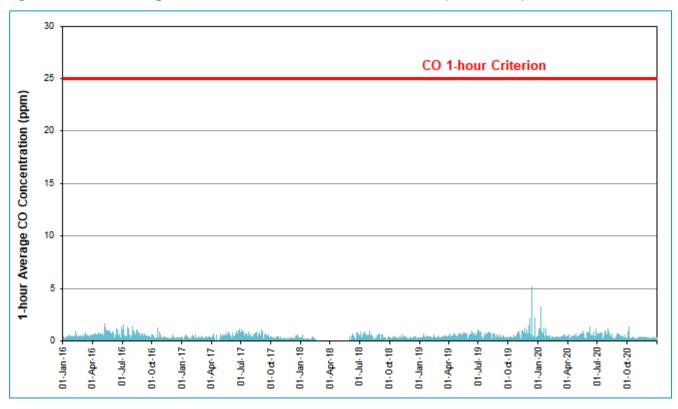




Figure 9 1-Hour Average Ambient NO<sub>2</sub> Concentrations - Randwick AQMS (2016 – 2020)

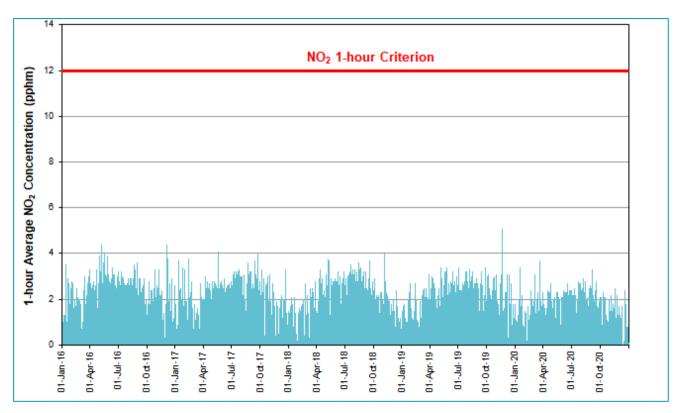


Figure 10 Ambient 1-Hour Average SO<sub>2</sub> Concentrations - Randwick AQMS (2016 – 2020)

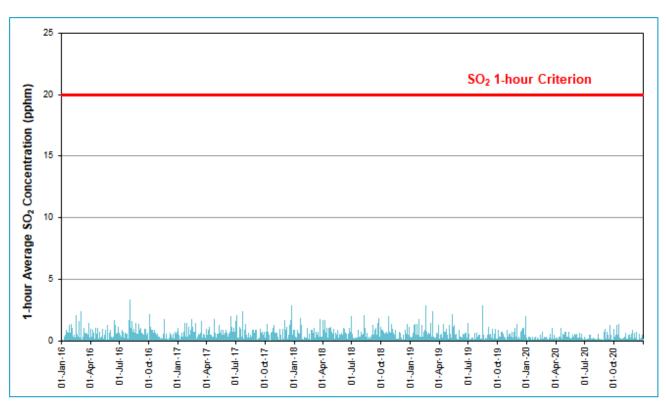




Figure 11 24-Hour Average Ambient PM<sub>10</sub> Concentrations - Randwick AQMS (2017)

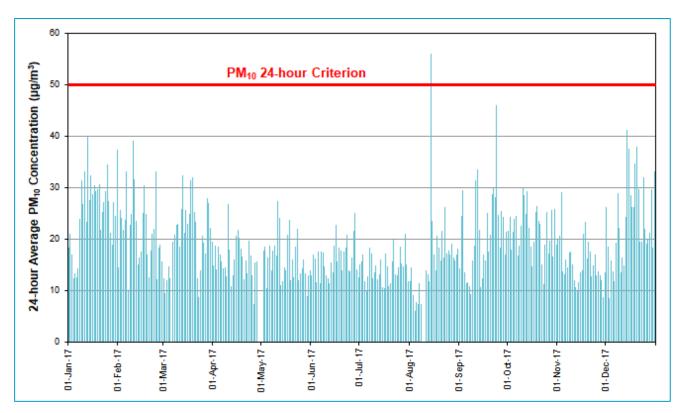
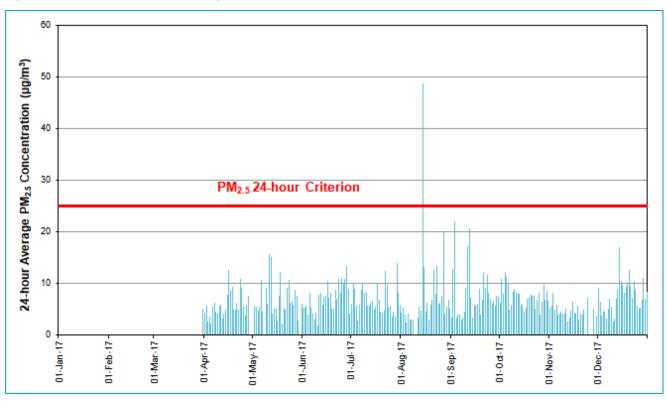


Figure 12 Ambient 24-Hour Average PM<sub>2.5</sub> Concentrations - Randwick AQMS (2017)





# 7 Assessment Methodology

The key potential air quality issues identified for the Project site are emissions of combustion products and particulate matter from the surrounding road network. Emissions from the closest main road (Anzac Parade) were modelled using the GRAMM/GRAL modelling system to predict the incremental impact of these emissions across the Project site. Regional monitoring data available from the NSW EES ambient monitoring networks (see **Section 6**) were then used to assess the potential cumulative concentrations of these pollutants that future occupants of the Project site would potentially be exposed to, and to assess compliance against relevant air quality guidelines.

As outlined in **Section 5**, atmospheric pollutants emitted from road traffic include  $PM_{10}$ ,  $PM_{2.5}$ ,  $NO_x$ , CO,  $SO_2$  and TVOCs. Given the low level of CO and  $SO_2$  emissions from vehicles and the low ambient concentrations recorded in the region (see **Section 6**), it is reasonable to assume that CO and  $SO_2$  emissions from road traffic are unlikely to result in any exceedances of the relevant criteria at the Project site. SLR's experience in modelling VOC emissions from roads has also shown that kerbside concentration of VOCs are typically well below the relevant air quality guidelines. Moreover, a review of the Air Quality Impact Assessment prepared for M4 East (Pacific Environment, 2015), which will have significantly higher traffic volumes than the roads surrounding the Project site, showed that ground level VOC concentrations at the nearest receptors were predicted to be well below the relevant assessment criteria.

Given the above, CO,  $SO_2$  and VOC traffic emissions have not been considered further in this assessment and only emissions of  $NO_x$ ,  $PM_{10}$  and  $PM_{2.5}$  have been modelled.

#### 7.1 Estimation of Traffic Emissions

Individual vehicle emissions are a combination of emissions produced by:

- the engine
- the fuel system
- the braking system
- materials from the road surface disturbed by the wheels and by air movement around the vehicle.

The principal factors that influence the generation of traffic air pollution, and thus the potential for air quality impacts, are:

- Traffic volume the total numbers of cars on the road and diurnal pattern of traffic numbers throughout the day.
- Vehicle type pollutant emission rates are different for different vehicle types (e.g. passenger cars versus heavy duty vehicles).
- Vehicle age older vehicles will tend to produce higher emission rates than newer vehicles. Newer
  vehicles are subject to more stringent emission standards, and also vehicles will tend to become less
  efficient as they age and engine components wear.
- Fuel type the combustion of petrol, diesel, ethanol-blends, natural gas fuels emit the various constituent pollutants at different rates, and therefore the rate of emissions will vary by the fleet engine composition.



- Road gradient driving uphill results in a greater load on the engine and thus higher pollutant emission
  rates. If the average road gradient is larger than a value of about 2%, the emissions of ascending and
  descending vehicles do not balance each other, even if the traffic is the same in the two directions.
  That is, the lower emissions in the downhill direction do not balance the higher emissions of the uphill
  direction.
- Driving conditions and average traffic speed vehicle speed is normally assumed to be represented by the posted speed limit. Emissions from congested traffic are greater than for free-flowing traffic.
- Other driver behaviour and vehicle operating conditions, such as:
  - air conditioner use
  - braking and acceleration patterns
  - gear operations
  - maintenance
  - engine temperature
  - ambient temperature.

A spatial emissions inventory was developed for the emissions of  $NO_X$ ,  $PM_{10}$  and  $PM_{2.5}$  from vehicles travelling along the surrounding road network using emission factors derived using the 'Computer Programme to calculate Emissions from Road Transport' (COPERT) Australia software. The most important input to COPERT Australia is a detailed breakdown of the total number of on-road vehicles for 226 vehicle classes (Uniquest, 2014). The vehicle classifications used in COPERT Australia are presented in **Table 4**. As detailed vehicle classifications representative of the current NSW fleet is not available, classifications representative of the 2010 NSW vehicle fleet were used in COPERT Australia.

Multiplying the hourly traffic volumes by the length of the road segment gives an estimate of the hourly vehicle kilometres travelled (VKT). The information on VKT is then used by the COPERT software to estimate emission levels based on emission factors in g/km or g/VKT. Information on the parameters used as input to COPERT Australia in this study is presented in detail in **Appendix B.** 



Page 29 of 21

Table 4 COPERT Australia Vehicle Classifications

Main Category	Sub-Category	Fuel Type	Emission Control Standard
Passenger car	Small (<2.0 litre) Medium (2.0-3.0 litre) Large (>3.0 litre)	Petrol Diesel LPG E10	Uncontrolled ADR27 ADR37/00-01 ADR79/00-05
SUV	Compact (< 4.0 litre) Large (>4.0 litre)	Petrol Diesel E10	Similar to PC +ADR36 (SUV-L) +ADR30 (SUV-Diesel)
Light Commercial Vehicle	Gross Vehicle Mass < 3.5 tonnes	Petrol Diesel	Uncontrolled ADR36 (P) ADR30(D) ADR37/00-01 ADR79/00-05
Heavy Duty Truck	Medium (MCV 3.5-12.0 tonnes) Heavy (HCV 12.0-25.0 tonnes) Articulated (AT >25 tonnes)	Petrol Diesel LPG	Uncontrolled ADR30 ADR70
Bus	Light bus (<8.5 tonnes) Heavy bus (>8.5 tonnes)	Diesel	ADR80/00 ADR80/02-05
Moped	2-stroke 4 stroke	Petrol	Conventional; Euro 1-3
Motorcycle	2-Stroke; 4-Stroke <250 cc 4-Stroke 250-750 cc 4-Stroke >750 cc		

#### 7.1.1 Assumptions Used to Compile COPERT Input Parameters

COPERT Australia requires detailed information on vehicle counts within each vehicle sub-category, fuel type and emission control standard listed in **Table 4**. Detailed information on the distribution of vehicles is not publicly available for the roads surrounding the Project site and therefore, in order to compile the COPERT Australia input files, the following assumptions were applied:

- The annual vehicle counts were subdivided into each sub category, fuel type and emission control standard using statistical data compiled for NSW by the National Pollutant Inventory (NPI) team of the Australian Government Department of the Environment (DSITIA, 2014), for use in preparing the Australian Motor Vehicle Emission Inventory for the NPI (see Appendix B).
- Emission factors were derived for a nominal 1 km length of the road.
- Emission factors were derived for two vehicle speed scenarios:
  - Low vehicle speed of 10 km/hr (potential worst case emission rate that would be representative of congested traffic conditions). These emission factors were applied to vehicles travelling along the surrounding road network for all hours with total traffic volumes greater than 70% of the peak hour traffic volume (ie from 7 am to 7 pm).

Page 30 of 21 SLR

- Posted speed limit (50 km/hr), representative of non-congested traffic conditions. These emission factors were applied to vehicles travelling along all roads for all hours with total traffic volumes less than 70% of the peak hour traffic volume (ie from 7 pm to 7 am).
- Meteorological conditions, including maximum and minimum temperature and relative humidity were estimated based on available long-term average data for the Sydney region.

#### 7.1.2 Peak Traffic Volumes

Transport for NSW publishes hourly traffic volumes at certain locations around Sydney on the Traffic Volume Viewer website, however there are no permanent traffic counting stations on Anzac Parade.

A transport modelling report prepared by Arup as part of the Kensington and Kingsford Planning Proposal Gateway Review Submission (Arup, 2017) (the Transport Modelling Report), includes modelled peak vehicle volumes for the roads in the area surrounding the Project site. The modelled traffic volumes account for the proposed dwelling growth and road closures within the town centres, along with the addition of the CBD South East Light Rail through the area. The predicted traffic flows are presented in **Figure 13**.

Figure 13 Predicted Peak AM and PM Traffic Flows



Source: (Arup, 2017)

The traffic modelling presented in the Transport Modelling Report covered the morning and afternoon peak periods only and did not contain information on the diurnal variation in traffic flows for the modelled roads. Information on the diurnal variation of traffic flows recorded by three of the nearby TfNSW stations were therefore reviewed. These included:

- Wentworth Avenue Station ID: 16129
- O'riordan Street Station ID: 02309
- Syd Einfeld Drive Station ID: 10052

The review found that the Morning to Afternoon Peak ratio of the 'Syd Einfeld Drive' station westbound most closely resembles that of Anzac Parade (based on the Arup model results) and as such, data from this station was used to estimate a 'diurnal multiplier' for the roads assessed in this study. As illustrated in **Figure 14**, the diurnal multiplier for each hour of day is the ratio of the reported traffic volume for that hour to the morning peak hour traffic volume. The location of each corridor modelled is illustrated in **Figure 15**.



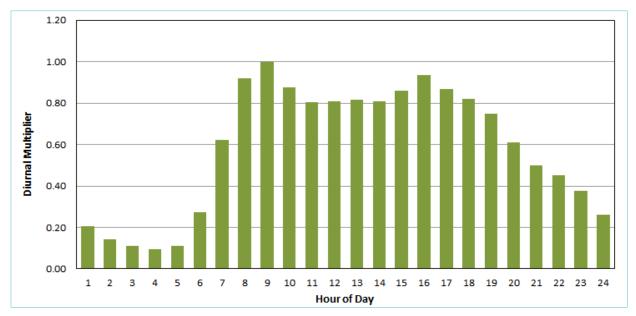


Figure 14 Diurnal Variation of Traffic on Syd Einfeld Drive Westbound (2009 – 2021 mean)





#### 7.1.3 Road Gradients and Lengths

The average gradient of each road was estimated using high-resolution terrain data obtained from the Foundation Spatial Data Framework website. Elevation above sea level at the start and end points for each road link was determined and the average gradient was estimated based on the difference in these heights (road rise) and the approximate length of the road. Estimated road gradients are presented in **Table 5.** Given the insignificant road gradients, and the minimal impact these estimated gradients will have on vehicle emissions, changes in emissions due to road gradients were not considered.

#### 7.1.4 COPERT Emission Factors

The peak hourly NO<sub>x</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> emission rates estimated using COPERT Australia derived emission factors for the road sections modelled in this assessment using the methodology outlined above are presented in **Table 5**. The GRAL model estimates hourly emission rates for each corridor modelled using the below emission rates and the length of the line sources, which are then scaled using the diurnal traffic profile (refer to **Figure 14**).

**Table 5** Maximum Estimated Hourly Emission Rates

ID	Corridor Name	Gradient	Emission Rates (kg/km/hr) 10 km/h			Emission Rates (kg/km/hr) 50 km/h		
			NO <sub>x</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	NO <sub>x</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>
100	ANZAC - NB	0.5 %	2.017	0.100	0.119	1.595	0.058	0.077
101	ANZAC - SB	-0.5 %	1.019	0.051	0.060	0.806	0.029	0.039
102	Barker St - EB	2.7 %	1.259	0.066	0.079	0.995	0.039	0.051
103	Barker St - WB	-2.6 %	0.093	0.005	0.006	0.074	0.003	0.004
104	Houston Rd - NB	-0.5 %	0.222	0.011	0.013	0.176	0.006	0.009
105	Houston Rd - SB	0.4 %	0.112	0.006	0.007	0.089	0.003	0.004
106	Middle St - EB	4.9 %	0.712	0.040	0.047	0.563	0.023	0.031
107	Middle St - WB	-5.0 %	0.299	0.019	0.023	0.237	0.011	0.015
108	Strachan St - EB	1.5 %	0.805	0.042	0.051	0.637	0.025	0.033
109	Strachan St - WB	-1.5 %	0.263	0.014	0.017	0.208	0.008	0.011

SB = Southbound, NB = Northbound, EB = Eastbound, WB = Westbound

#### **7.1.5** Adjustment of COPERT Emission Factors

As mentioned above, in the absence of detailed vehicle information representative of the current NSW fleet in a format suitable for use in the COPERT Australia model, the 2010 NSW vehicle fleet emission factors were derived.

In order to estimate the emission factors representative of the 2021 NSW vehicle fleet, the COPERT emission factors presented above were scaled using ratios calculated from 2016 and 2021 emissions factors derived from the Roads and Maritime air quality screening model TRAQ. It is noted that the current version of TRAQ does not estimate PM<sub>2.5</sub> emissions.



TRAQ, developed by NSW EPA, incorporates a simplified version of the emission model for surface roads developed by NSW EPA for the emissions inventory covering the Greater Metropolitan Region (GMR). The TRAQ model includes emission projections for several future years, taking into account anticipated improvements in the engine and emissions technology within the vehicle fleet. **Table 6** presents the emission factors estimated by TRAQ for the year 2016 and 2021 using the default fleet for NSW arterial roads, with cold start emissions included. Emission factors derived from COPERT have also been included for comparison. The numbers in brackets illustrate the percentage reduction in emissions estimated by TRAQ in future years compared to 2016.

As shown in **Table 6**, the TRAQ emission model estimates that NOx and PM $_{10}$  emissions have dropped an average of 64% and 79% respectively over the five year period.

**Table 6** TRAQ Emission Factors

Emission Model	Vehicle Fleet Year	Average Vehicle Speed (km/h)	NOx (g/VKT)	PM10 (g/VKT)
TRAQ	2016	10	1.26	0.08
	2016	50	0.53	0.06
	2021	10	0.8 (63%)	0.06 (75%)
	2021	50	0.34 (64%)	0.05 (83%)
COPERT	2010	10	1.25	0.07
	2010	50	0.99	0.05

### 7.2 Dispersion Modelling

#### 7.2.1 Model Selection

The GRAL modelling system was selected for the dispersion modelling of traffic emissions from roads surrounding the Project, primarily due to its ability to take account of the localised effects of buildings and obstacles. Like the US-EPA CALPUFF model, GRAL is suitable for regulatory applications, can utilise a full year of meteorological data and has the ability to handle low-wind-speed conditions.

GRAMM/GRAL is a coupled Eulerian (GRAMM, Graz Mesoscale Model wind fields) and Lagrangian (microphysics Graz Lagrangian Model) model, developed by the Graz University of Technology, Austria. It is designed to solve the sources accurately and to compute concentrations with a very high resolution in complex topographic and building configurations.

The Eulerian model GRAMM solves the conservation equations for mass, enthalpy, momentum and humidity. The surface energy balance is calculated in a surface module of GRAMM, where several different land use categories are used to define the surface roughness, the albedo, the emissivity, the soil moisture content, the specific heat capacity of the soil and the heat transfer coefficient.



The Lagrangian model GRAL uses 3D meteorological data generated by GRAMM and computes steady state concentration fields for classified meteorological conditions using 3-7 stability classes, 36 wind direction classes and several wind speed classes to reduce the computational time. Typically, 500-600 bins of meteorological scenarios are required to characterise the dispersion situations that may occur at a given site within a year. Each of the steady-state concentration fields is stored as a separate file. Based on these results, the concentration fields for the annual mean value, maximum daily mean value and maximum value are calculated using a post-processing routine. In this way, the annual average, maximum daily mean, or maximum concentration for defined periods can be computed rapidly. The pseudo time series of concentration field can be obtained by taking the corresponding time series of classified meteorological situations of a certain period and multiplying each concentration field corresponding to certain hours of that period with some emission modulation factors.

#### 7.2.2 Accuracy of Modelling

All atmospheric dispersion models, including GRAL, represent a simplification of the many complex processes involved in the dispersion of pollutants in the atmosphere. To obtain good quality results it is important that the most appropriate model is used and the quality of the input data (meteorological, terrain, source characteristics) is adequate.

The main sources of uncertainty in dispersion models, and their effects, are discussed below.

- Oversimplification of physics: This can lead to both under-prediction and over-prediction of ground level pollutant concentrations. Uncertainties are greater in Gaussian plume models as they do not include the effects of non-steady-state meteorology (i.e., spatially- and temporally-varying meteorology).
- Uncertainties in emission rates: Ground level concentrations are proportional to the pollutant
  emission rate. In addition, most modelling studies assume constant worst case emission levels or are
  based on the results of a small number of emission tests, however operations (and thus emissions) are
  often quite variable. Accurate measurement of emission rates and source parameters requires
  continuous monitoring.
- Uncertainties in source parameters: Plume rise is affected by source dimensions, temperature and
  exit velocity. Inaccuracies in these values will contribute to uncertainties in the predicted height of the
  plume centreline and thus ground level pollutant concentrations. This is not a significant issue for
  ground level area/volume sources like traffic emissions.
- Uncertainties in wind direction and wind speed: Wind direction affects the direction of plume travel, while wind speed affects plume rise and dilution of plume. Uncertainties in these parameters can result in errors in the predicted distance from the source of the plume impact, and magnitude of that impact. In addition, aloft wind directions commonly differ from surface wind directions. The preference to use rugged meteorological instruments to reduce maintenance requirements also means that light winds are often not well characterised.
- Uncertainties in mixing height: If the plume elevation reaches 80% or more of the mixing height, more
  interaction will occur, and it becomes increasingly important to properly characterise the depth of the
  mixed layer as well as the strength of the upper air inversion. This is not a significant issue for ground
  level area/volume sources like traffic emissions.
- Uncertainties in temperature: Ambient temperature affects plume buoyancy, so inaccuracies in the temperature data can result in potential errors in the predicted distance from the source of the plume impact, and magnitude of that impact.

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Uncertainties in stability estimates: Gaussian plume models use estimates of stability class, and 3D models use explicit vertical profiles of temperature and wind (which are used directly or indirectly to estimate stability class for Gaussian models). In either case, uncertainties in these parameters can cause either under-prediction or over-prediction of ground level concentrations.

The US EPA makes the following statement in its Modelling Guideline (US EPA, 2005) on the relative accuracy of models:

"Models are more reliable for estimating longer time-averaged concentrations than for estimating short-term concentrations at specific locations; and the models are reasonably reliable in estimating the magnitude of highest concentrations occurring sometime, somewhere within an area. For example, errors in highest estimated concentrations of  $\pm$  10 to 40% are found to be typical, i.e., certainly well within the often quoted factor-of-two accuracy that has long been recognised for these models. However estimates of concentrations that occur at a specific time and site, are poorly correlated with actually observed concentrations and are much less reliable."

To maximise the accuracy of the model predictions, this AQA utilises the GRAL dispersion model in prognostic mode, enabling the representation of dynamic effects due to local topography such as obstacle-influenced air flows, and accommodating complex topography with a high horizontal resolution. The meteorological dataset was compiled using observations from nearby automatic weather stations and a five-year period of meteorological data was reviewed to ensure that the year selected for use in the modelling is representative of long-term meteorological conditions. It was also conservatively assumed that congested conditions occurred on all days of the year between the hours of 7 am to 6 pm.

#### 7.2.3 Dispersion Model Configuration

Emissions from the vehicles travelling on Anzac Parade and the other adjacent roads modelled were represented by a series of line sources (see **Figure 15**). The proposed buildings at the Project site and existing buildings and structures that may affect the dispersion of pollutants through channelling and blocking effects, were included in the modelling. Outlines of these buildings are illustrated in **Figure 15** and the heights for all existing buildings were derived using high resolution Light Detection and Ranging (LIDAR) data. At the time of preparing this assessment, no Development Application has been approved for the development of lots immediately surrounding the Project site, which may impact the dispersion of pollutants from the surrounding road network, hence these effects have been unable to be included in the model.

A total of 730 discrete receptors were distributed across the Project site to predict the incremental impact of emissions from the modelled roads on pollutant concentrations at various locations within the Project site (including building facade and outdoor communal areas, see **Figure 16**). The time series of hourly average pollutant concentrations predicted by GRAL for these discrete receptor locations were then added to contemporaneous background time series data for the same period as the meteorological data used in the modelling to allow an assessment of potential cumulative impacts.

In addition to the discrete receptors discussed above, the GRAL model was set up to predict concentrations across the modelling domain based on a Cartesian grid of points with an equal spacing of 2 m in the x and y directions. This results in 316,905 grid locations across the domain.

In order to assess pollutant concentrations at various elevations (ie upper floors of the building), gridded receptors were located at 4 m, 7 m and 10 m, in addition to those located at 1 m above ground level (i.e. ground level receptors).



#### **Table 7** details the parameters used in GRAL for this assessment.

Table 7 Parameters used in GRAL

Parameter	Value
General	
Dispersion time	3,600 seconds
Particles per second	100
Obstacles	Prognostic GRAL
Concentration Grids	
Horizontal concentration grid resolution	3.0 m
Vertical dimension of concentration layers	2.0 m
Number of horizontal slices	5 (1.0 m, 6.0 m, 10.0 m, 13.0 m and 16.0 m)
Internal flow field grid	
Horizontal grid resolution	3.0 m
Vertical thickness of first layer	3.0 m
Vertical stretching factor	1.01
Number of cells in Z direction	40

**Figure 16 Modelled Discrete Receptors** 



### 7.3 NO<sub>x</sub> to NO<sub>2</sub> conversion

 $NO_x$  emitted from combustion processes mainly consist of NO with a small portion (approximately 10%) of  $NO_2$ . In the atmosphere however, NO emitted from the source oxidises to  $NO_2$  in the presence of ozone ( $O_3$ ) and sunlight as it travels further from the source. The rate of oxidation depends on a number of parameters, including the ambient  $O_3$  concentration. The following methods can be applied to take account the oxidation of  $NO_2$  in estimating downwind  $NO_2$  concentrations at receptor locations.

#### Method 1 - 100% Conversion

This method is usually used as a screening level assessment and assumes 100% conversion of NO to NO<sub>2</sub> before the plume arrives at the receptor location. Use of this method can significantly over-predict NO<sub>2</sub> concentrations at nearfield receptors.

#### Method 2 - Ambient Ozone Limiting Method (OLM)

This method assumes that all the available ozone in the atmosphere will react with NO in the plume until either all the  $O_3$  or all the NO is used up.  $NO_2$  concentrations can be estimated by this method using the following equation:

$$[NO_2]_{total} = \{0.1 \times [NO_x]_{pred}\} + MIN\{(0.9) \times [NO_x]_{pred} \text{ or } (46/48) \times [O3]_{bkgd}\} + [NO_2]_{bkgd} + [NO_2]_{bkgd}\}$$

Given the close proximity of Project site receptors to the sources of combustion gas emissions (vehicles travelling along Anzac Parade and the other adjacent roads modelled), the use of Method 1 (100% conversion) is not appropriate. Therefore Method 2 has been adopted using  $O_3$  data from the Randwick AQMS. This modelling approach is deemed conservative as it assumes that the atmospheric reaction is instantaneous. In reality, the reaction takes place over a number of hours. This approach will therefore provide a conservative assessment for near field locations at short transport distances and duration periods from the source.

### 7.4 Meteorological Modelling

To provide the meteorological data required by GRAL, information is needed on the prevailing wind regime, mixing depth and atmospheric stability and other parameters such as ambient temperature and relative humidity. In absence of any site-specific observed meteorological data, a site-representative meteorological dataset was compiled using the CSIRO model TAPM model and the GRAMM meteorological processor.

#### 7.4.1 Selection of the Meteorological Year

In order to determine a representative meteorological year for use in dispersion modelling, five years of meteorological data (2016-2020) from the closest meteorological monitoring station (Randwick AQMS) were analysed against the five-year average meteorological conditions. Specifically, the following parameters were analysed:

- frequency and distribution of the predominant wind directions
- hourly wind speeds observed
- hourly temperature



Based on this analysis, it was concluded that the years 2017 and 2020 were most representative of meteorological conditions experienced in the region. Given the significant number of air quality criteria exceedances in 2020 due to bushfires and the potential impact of the COVID pandemic (refer **Section 6**), the use of this year is not deemed appropriate, therefore the year 2017 was selected for use in meteorological/dispersion modelling. A detailed analysis is presented in **Appendix C**.

#### **7.4.2 TAPM**

The TAPM prognostic model, developed by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) was used to generate site representative data required for GRAMM modelling as outlined below.

TAPM predicts wind speed and direction, temperature, pressure, water vapour, cloud, rainwater and turbulence. The program allows the user to generate synthetic observations by referencing databases (covering terrain, vegetation and soil type, sea surface temperature and synoptic scale meteorological analyses) which are subsequently used in the model input to generate one full year of hourly meteorological observations at user-defined levels within the atmosphere.

Additionally, TAPM may assimilate actual local wind observations so that they can optionally be included in a model solution. The wind speed and direction observations are used to realign the predicted solution towards the observation values. Available observed meteorological data from the nearby BoM/OEH stations were incorporated into the TAPM setup. **Table 8** details the parameters used in the TAPM meteorological modelling for this assessment.

Table 8 Meteorological Parameters used for the AQA – TAPM

Parameter	Value
Modelling Period	1 January 2017 to 31 December 2017
Centre of analysis	335,928mE 6,244,741 mS (UTM Coordinates)
Number of grid points	25 × 25 × 25
Number of grids (spacing)	5 (30 km, 10 km, 3 km, 1 km, 0.3 km)
Data assimilation	DPIE Randwick AQMS Sydney Airport AWS (Station # 66037) Canterbury Racecourse AWS (Station # 66194) Sydney Olympic Park AWS (Station # 66212) Terry Hills AWS (Station # 66059) Manly (North Head) AWS (Station # 66197)
Terrain	AUSLIG 9 second DEM

#### **7.4.3 GRAMM**

The GRAMM domain was defined so that it covered the surrounding road network, with a sufficient buffer zone. Topographical data used in GRAMM were sourced from the Geoscience Australia database that has corrected Shuttle Radar Topography Mission (SRTM) topography data for Australia with a 1 arc second (approximately 30 m) spacing. The land use data for the modelling domain was defined by CORINE land use categories using values specified for urban land use.



Site-representative meteorological data extracted from the inner domain output from the TAPM model was used as input to the GRAMM model. **Table 9** details the parameters used in the GRAMM model.

**Table 9 GRAMM Meteorological Parameters** 

Parameter	Value
Number of wind speed classes	9
Wind speed classes (m/s)	0-0.5, 0.5-1.0, 1.0-2.0, 2.0-3.0, 3.0-4.0, 4.0-6.0, 6.0-9.0, 9.0-12.0, >12.0
Number of wind direction sectors	36
Number of classified weather situations	784
Horizontal grid resolution (m)	100
Vertical thickness of first layer (m)	10
Number of vertical layers	15
Vertical stretching factor	1.40
Relative top layer height	3,874
Maximum time step (s)	10
Modelling time	3,600
Relaxation velocity	0.10
Relaxation scalars	0.10

### 7.5 Meteorological Data Used in Modelling

#### 7.5.1 Wind Speed and Direction

A summary of the annual wind behaviour predicted by TAPM, extracted at a location near the Project site is presented as wind roses in **Figure 17**.

**Figure 17** indicates that winds predicted at the Project site are predominantly gentle to moderate (between 3.4 m/s and 7.9 m/s). Calm wind conditions (wind speed less than 0.5 m/s) were predicted to occur only 0.2% of the time throughout the modelling period.

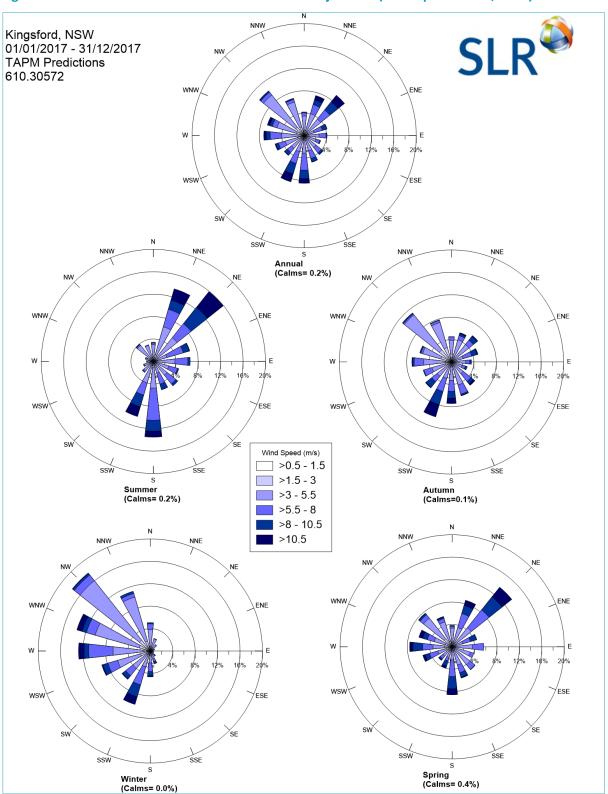
The seasonal wind roses indicate that:

- In summer, prevailing winds are from the northeast, north-northeast, south, and south-southwest with very low frequency of winds from the west. Calms were predicted to occur 0.2% of the time.
- In autumn, winds blow from all directions with the highest frequency of winds from the northwest and south-southwest directions. Calms were predicted 0.1% of the time.
- In winter, prevailing winds blow from between the west and northwest directions, with a very low frequency of winds from the eastern quadrant. Calms were predicted 0% of the time.
- In spring, winds blow from all directions with the highest frequency of winds from the northeast. Calm conditions were predicted 0.4% of the time.



It is noted that the wind conditions predicted by the model at other areas within the modelling domain may vary from the wind roses presented in **Figure 17** for one point within the Project site, and within GRAL, the dispersion of pollutants from each source within the model will reflect the local conditions.

Figure 17 Predicted Seasonal Wind Roses for the Project Site (TAPM predictions, 2017)





Atmospheric stability refers to the tendency of the atmosphere to resist or enhance vertical motion. The Pasquill-Gifford-Turner (PGT) assignment scheme identifies six stability classes, A to F, to categorise the degree of atmospheric stability as follows:

- A = Extremely unstable conditions
- B = Moderately unstable conditions
- C = Slightly unstable conditions
- D = Neutral conditions
- E = Slightly stable conditions
- F = Moderately stable conditions

The meteorological conditions defining each PGT stability class are shown in Table 10.

**Table 10** Meteorological Conditions Defining PGT Stability Classes

Surface wind speed	D	aytime Insolatio	n	Night-time Conditions		
(m/s)	Strong	Moderate	Slight	Thin overcast or > 4/8 low cloud	<= 4/8 cloudiness	
< 2	А	A - B	В	E	F	
2 - 3	A - B	В	С	Е	F	
3 - 5	В	B - C	С	D	Е	
5 - 6	С	C - D	D	D	D	
> 6	С	D	D	D	D	

Source: (NOAA, 2018)

#### Notes:

- 1. Strong insolation corresponds to sunny midday in midsummer in England; slight insolation to similar conditions in midwinter.
- 2. Night refers to the period from 1 hour before sunset to 1 hour after sunrise.
- 3. The neutral category D should also be used, regardless of wind speed, for overcast conditions during day or night and for any sky conditions during the hour preceding or following night as defined above.

The frequency of each stability class predicted by TAPM during the modelling period, extracted at a location within the Project site is presented in **Figure 18**. The results indicate a high frequency of conditions typical to Stability Classes D. Stability Class D is indicative of neutral conditions, conducive to a moderate level of pollutant dispersion due to mechanical mixing.

#### 7.5.2 Temperature

The modelled temperature variations as predicted at the Project site during the year 2017 are illustrated in **Figure 19**. The maximum temperature (37°C) was predicted on 24 January 2017 and the minimum temperature (8°C) was predicted on 1 July 2017.



Figure 18 Predicted Stability Class Frequencies at the Project Site (TAPM predictions, 2017)

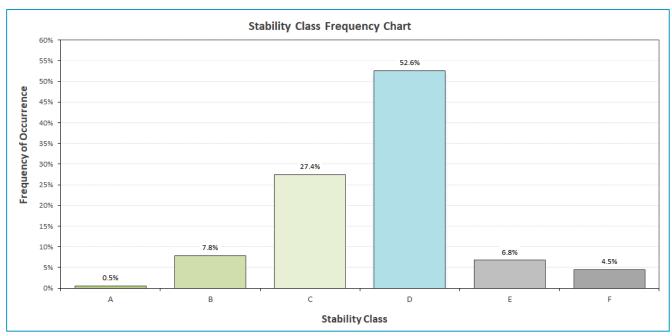
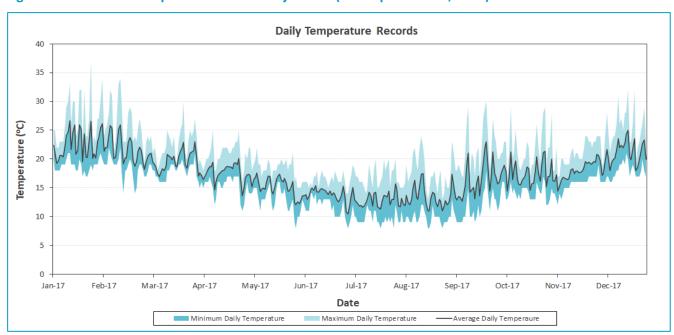


Figure 19 Predicted Temperatures at the Project Site (TAPM predictions, 2017)



## 8 Assessment of Air Quality at the Project Site

Ambient air quality monitoring performed in the Sydney area over the last few decades has shown that the city's air quality has improved and is continuing to improve. A major driver of this improvement in urban air quality is the fact that newer vehicles produce significantly less emissions than older vehicles. Despite the steady increases in VKT, more stringent vehicle emission standards in Australia, as well as the improved national fuel quality standards and improved engine designs have progressively resulted in significant reductions in the total fleet emissions. According the New South Wales Environmental Protection Authority (NSW EPA, 2017), cars built from 2013 onwards emit only 3% of the NO<sub>X</sub> emissions compared to vehicles built in 1976, and diesel trucks built from 2011 onwards emit just 8% of the particles emitted by vehicles built in 1996. Thus even as Sydney's population and total vehicle kilometres travelled each year have increased (NSW EPA, 2017), key measures of air pollution have dropped significantly and this trend is expected to continue.

This section presents a summary of the air quality impacts predicted by the modelling of vehicle emissions from the main roads surrounding the Project, based on the peak traffic flows predicted by the Transport Modelling Report, which accounts for the proposed dwelling growth and road closures within Kingsford town centre.

It is noted that due to improved vehicle emissions performance as outlined above, the current Sydney fleet can be expected to emit less pollutants than the 2010 fleet (which is what this study is based on). Further to this, future improvements in vehicle emissions will not only have an impact on the incremental concentration of air pollutants predicted by the modelling, but will also impact background levels of air pollution.

Further, regardless of the vehicle fleet, emissions from vehicles travelling on Anzac Parade and the other adjacent roads modelled are expected to be lower than those assumed by this study as the emission inventory conservatively assumes all vehicles will be traveling at a speed of 10 km/hr (congested conditions) for all hours with total traffic volumes greater than 70% of the peak hour traffic volume, every day of the year (refer **Section 7.1.1**).

Hourly varying air quality data recorded by the Randwick AQMS during the modelling period (2017) were used for the contemporaneous analysis of cumulative ground level concentrations.

It is noted that in circumstances where the existing ambient air pollutant concentrations exceed the impact assessment criteria, the Approved Methods requires the AQIA to demonstrate that no additional exceedances of the impact assessment criteria will occur as a result of the proposed activity. In line with this requirement this study focuses on additional exceedances above the ambient air quality criteria due to the incremental impacts from the modelled roads.

#### 8.1 $PM_{10}$

The maximum incremental and cumulative 24-hour and annual average  $PM_{10}$  concentrations predicted at various elevations along the building facades and within outdoor balconies are presented in **Table 11**.

Figure 20 illustrates the cumulative 24-hour average  $PM_{10}$  concentrations predicted for the modelled discrete receptors, while Figure 21 illustrates the cumulative annual average concentrations at these locations. Isopleth plots showing the predicted incremental impacts at ground level are presented in **Appendix D**. It should be noted that isopleth plots do not represent the dispersion pattern for any individual time period, but rather illustrate the maximum 24-hour average or annual average concentration that was predicted to occur at each model calculation point over the range of meteorological conditions occurring during the 2017 modelling period.



The predicted 24-hour average and annual average  $PM_{10}$  concentrations are in compliance with the relevant criteria at all modelled discrete receptor locations along the building facade and proposed outdoor areas. At the worst impacted receptors, the maximum cumulative 24-hour average  $PM_{10}$  concentrations are slightly below the relevant criterion. These elevated concentrations were all predicted for the 24 September 2017. According to the 2017 NSW Air Quality Statement (NSW OEH, 2017b), extensive hazard reduction burning in August and early September and widespread dust storms in late September following a very dry winter period resulted in elevated particle levels across much of the state. The background 24-hour average  $PM_{10}$  concentration recorded at Randwick AQMS on 24 September 2017 was 46.2  $\mu g/m^3$ , which is just below the relevant criterion of 50  $\mu g/m^3$ .

The predicted annual average  $PM_{10}$  concentrations are in compliance with the relevant criteria at all discrete receptors modelled along the building facade and outdoor areas.

Table 11 Predicted PM<sub>10</sub> Concentrations

-1 · ·		Maximum I Concentration		Maximum Cumulative Concentrations (μg/m³)	
Elevation	Location	24-Hour Average	Annual Average	24-Hour Average	Annual Average
Ground Level	Maximum at Building Facade	5.1	2.6	49.3	21.8
4 m Elevation	Maximum at Building Facade	4.3	2.2	49.0	21.4
7 m Elevation	Maximum at Building Facade	3.7	1.7	48.6	20.9
40 51	Maximum at Building Facade	6.5	1.5	48.4	20.7
10 m Elevation	Maximum at Outdoor Communal Area	3.0	1.1	48.1	20.3
44 51	Maximum at Building Facade	2.9	1.0	48.1	20.2
14 m Elevation	Maximum at Outdoor Communal Area	1.7	0.4	46.3	19.6
17 m Elevation	Maximum at Building Facade	2.6	0.9	48.1	20.1
Above 17 m Elevation	Maximum at Building Facade / Outdoor Areas / Rooftop	2.5	0.8	48.0	20.0
CRITERIA				50	25



Figure 20 Maximum Predicted Cumulative 24-Hour Average PM<sub>10</sub> Concentrations



Figure 21 Predicted Cumulative Annual Average PM<sub>10</sub> Concentrations



### 8.2 PM<sub>2.5</sub>

The maximum incremental and cumulative 24-hour and annual average PM<sub>2.5</sub> concentrations predicted at various elevations within the outdoor areas and along the building facades are presented in **Table 12**.

**Figure 22** illustrates the cumulative 24-hour average  $PM_{2.5}$  concentrations predicted for the modelled discrete receptors, while **Figure 23** illustrates the cumulative annual average concentrations at these locations. Isopleth plots showing the predicted incremental impacts at ground level are presented in **Appendix D**.

**Table 12** Predicted PM<sub>2.5</sub> Concentrations

Elevation		Maximum I Concentrati		Maximum Cumulative Concentrations (μg/m³)	
Elevation	Location	24-Hour Average	Annual Average	24-Hour Average	Annual Average
Ground Level	Maximum at Building Facade	4.2	2.1	25.0	9.0
4 m Elevation	Maximum at Building Facade	3.6	1.8	24.5	8.7
7 m Elevation	Maximum at Building Facade	3.0	1.4	23.9	8.3
40 51	Maximum at Building Facade	5.1	1.2	23.6	8.1
10 m Elevation	Maximum at Outdoor Communal Area	2.5	0.9	23.2	7.8
14 m Elevation	Maximum at Building Facade	2.4	0.9	23.0	7.8
14 m Elevation	Maximum at Outdoor Communal Area	1.4	0.3	22.2	7.2
17 m Elevation	Maximum at Building Facade	2.2	0.7	22.9	7.6
Above 17 m Elevation	Maximum at Building Facade / Outdoor Areas / Rooftop	2.0	0.6	22.7	7.5
CRITERIA				25	8

Note: Red text indicates exceedance of relevant ambient air quality criteria

The predicted 24-hour average PM<sub>2.5</sub> concentrations exceed the relevant criterion a single of location along the ground level building facade. This exceedance is predicted to occur only one day of the year on 3 September 2017, when the background PM<sub>2.5</sub> concentration was 22  $\mu$ g/m<sup>3</sup>, which is just below the relevant criterion of 25  $\mu$ g/m<sup>3</sup>.

Exceedances of the annual average  $PM_{2.5}$  criterion of 8 µg/m³ are predicted at 33 out of the 996 facade receptors modelled (approximately 3%). These exceedances are predicted to occur on the building facade facing Anzac Parade at ground level up to 10 m elevation. It is noted that no residential units are proposed to be located at the ground level or Level 1. Further, the southern wall of the building is proposed to be a solid wall with no operable windows as there will be a future adjacent building to the south. No air intakes are proposed at locations with predicted exceedances.

Exceedances of the annual average PM<sub>2.5</sub> criterion are frequently recorded in the Sydney metropolitan region.



Figure 22 Maximum Predicted Cumulative 24-Hour Average PM<sub>2.5</sub> Concentrations



Figure 23 Predicted Cumulative Annual Average PM<sub>2.5</sub> Concentrations



### 8.3 NO<sub>2</sub>

The maximum incremental and cumulative 1-hour and annual average  $NO_2$  concentrations predicted at various elevations within the along the building facades and outdoor areas are presented in **Table 13**. These  $NO_2$  concentrations were derived from the ground level  $NO_X$  concentrations predicted by the modelling using the Ozone Limiting Method and contemporaneous hourly-varying 1-hour average ozone concentration data from the Randwick AQMS, as described in **Section 7.2**.

Figure 24 illustrates the cumulative 1-hour average  $NO_2$  concentrations predicted for the modelled discrete receptors, while Figure 25 illustrates the cumulative annual average ground level concentrations for these locations. Isopleth plots showing the predicted incremental impacts at ground level and 2 m elevation are presented in Appendix D.

The predicted 1-hour and annual average NO<sub>2</sub> concentrations are in compliance with the relevant criteria at all locations modelled within the outdoor areas and building facade.

**Table 13** Predicted NO<sub>2</sub> Concentrations

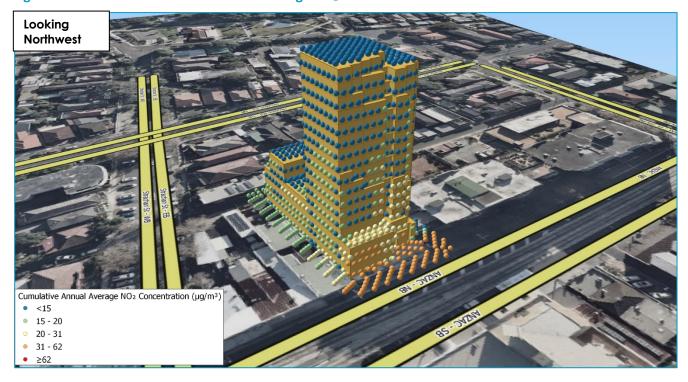
Elevation			ncremental ons (μg/m³)	Maximum Cumulative Concentrations (μg/m³)	
Elevation	Location	1-Hour Average	Annual Average	1-Hour Average	Annual Average
Ground Level	Maximum at Building Facade	113	26	124	39
4 m Elevation	Maximum at Building Facade	111	23	119	36
7 m Elevation	Maximum at Building Facade	111	19	120	32
10 m Flouration	Maximum at Building Facade	147	18	161	31
10 m Elevation	Maximum at Outdoor Communal Area	91.5	13	119	26
14 m Flouration	Maximum at Building Facade	90.1	12	121	25
14 m Elevation	Maximum at Outdoor Communal Area	67.0	5.8	94.1	19
17 m Elevation	Maximum at Building Facade	97.5	11	118	24
Beyond 17 m Elevation	Maximum at Building Facade / Outdoor Areas / Rooftop	85.9	9.4	116	23
CRITERIA				246	62



Figure 24 Maximum Predicted Cumulative 1-Hour Average NO<sub>2</sub> Concentrations



Figure 25 Predicted Cumulative Annual Average NO<sub>2</sub> Concentrations

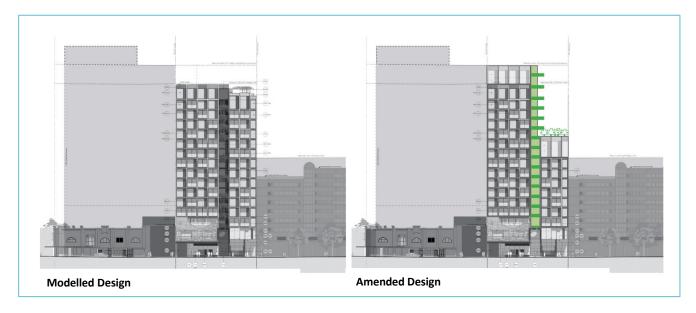


### 8.4 Changes to the Modelled Design

Since the completion of the air quality modelling, the design of the proposed building has been further refined and the massing of the proposed building has been redistributed. **Figure 1** illustrates a comparison of the Anzac Parade elevation for the modelled and proposed amended designs.

The proposed redistribution of massing includes a reduction of 4 storeys on the northern portion of the tower form, with the top two levels set back further. An additional 2 storeys on the southern portion of the tower form have also been set back further. The forms fronting the communal courtyard have been increased by 1 storey and the Houston Lane frontage has increased from 3 to 4 storeys. There are no proposed changes to the building use fronting Anzac Parade.

Figure 26 Anzac Parade Elevation Comparison



The proposed changes are in line with the recommended design considerations outlined in the Rail and Road Guideline and would help minimise urban canyon effects and enhance dispersion of pollutants for all locations across the Anzac Parade facade.

Based on the above, it is expected that the air quality impacts associated with the amended design will be less than those predicted for the modelled design for the worst impacted receptors, which face Anzac Parade.

# 9 Mitigation Measures

A number of design considerations are outlined within the Rail and Road Guideline (refer **Section 4**) in regard to mitigating air quality impacts. Those of relevance to this Project are presented in **Table 14**, along with comments as to how they have been incorporated into the Project design.

**Table 14** Air Quality Design Considerations for the Project

Rail and Roa	ad Guideline Air Quality Design Considerations	Project
Building Form	Minimising the formation of urban canyons that reduce dispersion. Having buildings of different heights interspersed with open areas, and setting back the upper stories of multi-level buildings helps to avoid urban canyons.	The upper stories of the proposed building are set back and the northern and southern portions of the tower form are proposed to be different in height. These features would assist in the dispersion of pollutants.
Separation	Incorporating an appropriate separation distance between sensitive uses and the road/pollution source using broad scale site planning principles such as building siting and orientation. The location of living areas, outdoor space and bedrooms and other sensitive uses (such as child care centres) should be as far as practicable from the major source of air pollution.	The lower two floors (ground and Level 1) are proposed to be used for commercial and retail purposes.  No sensitive receptors (residential units) are proposed within a 10 m radius of Anzac Parade.
Ventilation	Ventilation design and openable windows should be considered in the design of development located adjacent to roadway emission sources. When the use of mechanical ventilation is proposed, the air intakes should be sited as far as practicable from the major source of air pollution.	The carpark air intake, which is located on the ground level, faces Houston Lane, and is as far as possible from Anzac Parade.  The supply air intake for the centralised air conditioning system is proposed to be located on the rooftop.

While exceedances of the relevant criteria were predicted at some at locations within the Project site, additional mitigation measures are unlikely to significantly improve air quality as the exceedances are primarily due to high background concentrations of particulates (predominantly due to bushfires, hazard reduction burns or dust storms). It is noted that the abovementioned exceedances are restricted to non-residential areas of the proposed building.



### 10 Conclusions

The dispersion of  $PM_{10}$ ,  $PM_{2.5}$  and  $NO_2$  from traffic travelling on Anzac Parade and the other adjacent roads was modelled using the GRAMM/GRAL model and a 1-year site-representative meteorological dataset. The incremental  $PM_{2.5}$ ,  $PM_{10}$  and  $NO_2$  concentrations predicted by the modelling were added to background pollutant concentrations measured at the Randwick AQMS for a cumulative assessment.

The results of the modelling showed that the predicted cumulative PM<sub>2.5</sub>, PM<sub>10</sub> and NO<sub>2</sub> concentrations along the building facade and outdoor areas are below the relevant air quality criteria, with the exception of:

- 24-hour average PM<sub>2.5</sub> concentrations, which were predicted to exceed the relevant criterion at a single discrete receptor location on the ground floor facade. Exceedances were predicted for a single day in the year when background levels were significantly elevated.
- Annual average PM<sub>2.5</sub> concentrations, which exceed the relevant criterion at less than 2% of discrete receptors modelled. These exceedances occur at locations not proposed to be used for residential use.

It is noted that a number of conservative assumptions have been incorporated into the modelling, including the assumption that:

- Vehicles travel at a speed of 10 km/h (potential worst-case emission rate that would be representative
  of congested traffic conditions) for all hours with total traffic volumes greater than 70% of the peak
  hour traffic volume.
- NO converts to NO<sub>2</sub> instantaneously.

Given the above, any exceedances of air quality criteria at any indoor/outdoor areas of the Project site where sensitive receptors are present are concluded to be highly unlikely. It is therefore concluded that the air quality requirements specified by the Infrastructure SEPP and the Kensington and Kingsford Town Centres Development Control Plan have been satisfied and that air quality would not be a constraint for the proposed development.

It is noted that the proposed building design that this assessment was based on has been updated to redistribute the massing of the proposed building. The massing redistribution is in line with the Rail and Road Guideline recommended design considerations for mitigating air quality impacts. Therefore, it is expected that the air quality impacts associated with the updated design will be less than those predicted for the assessed design for the worst impacted receptors, which face Anzac Parade.



### 11 References

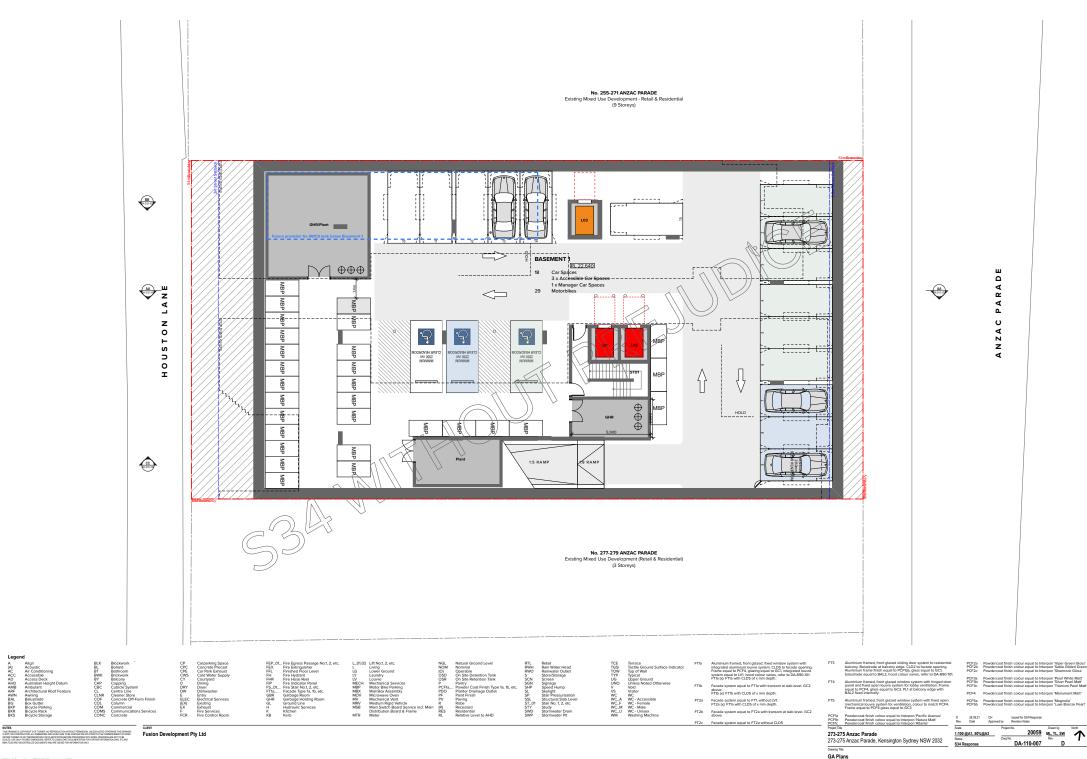
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# **APPENDIX A**

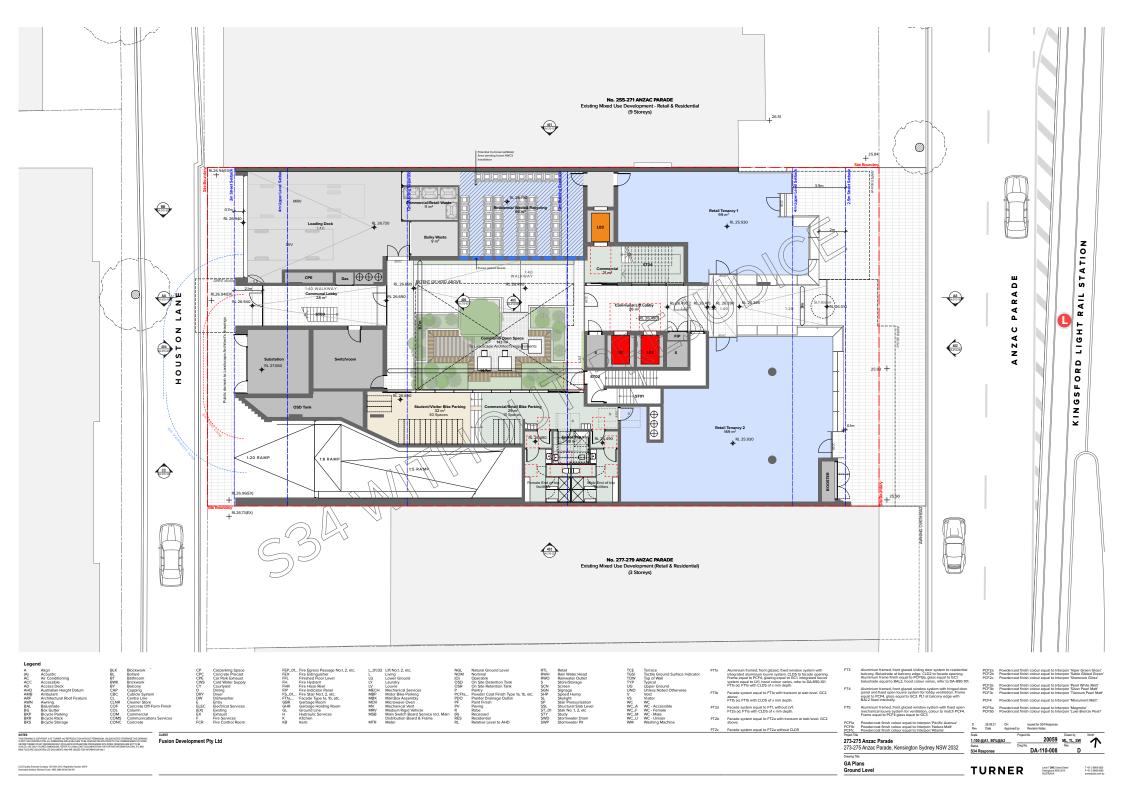
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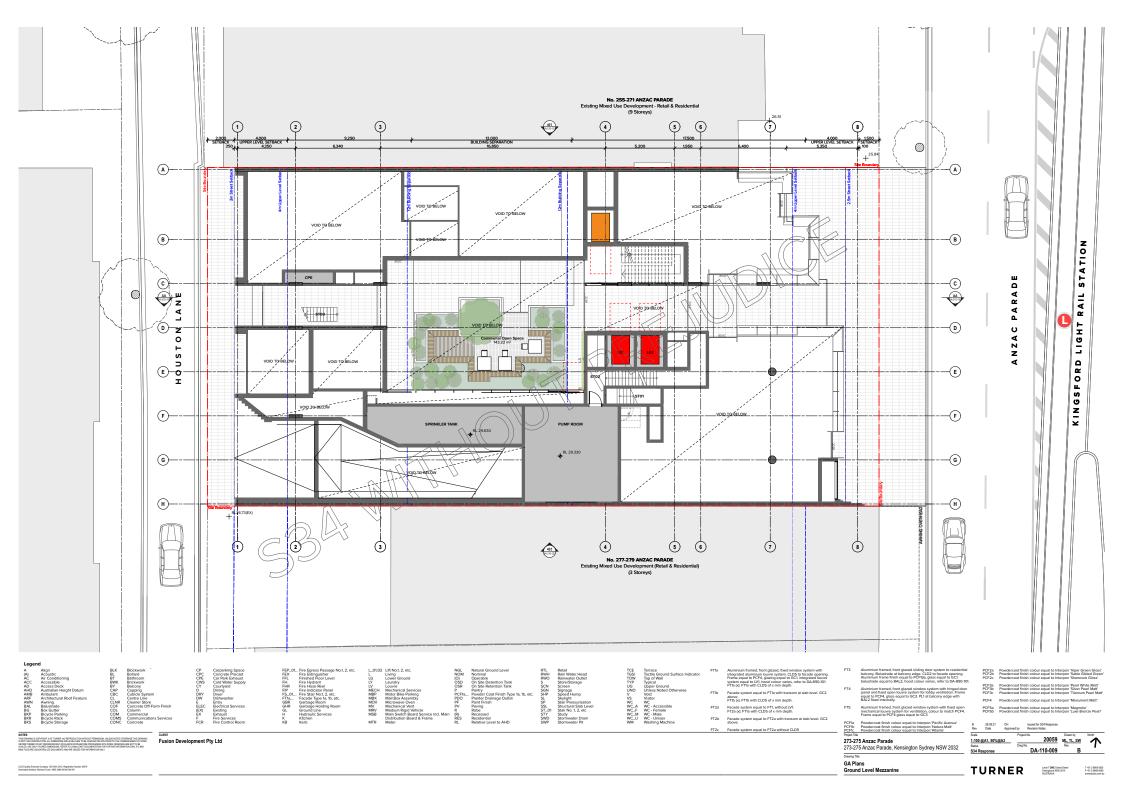


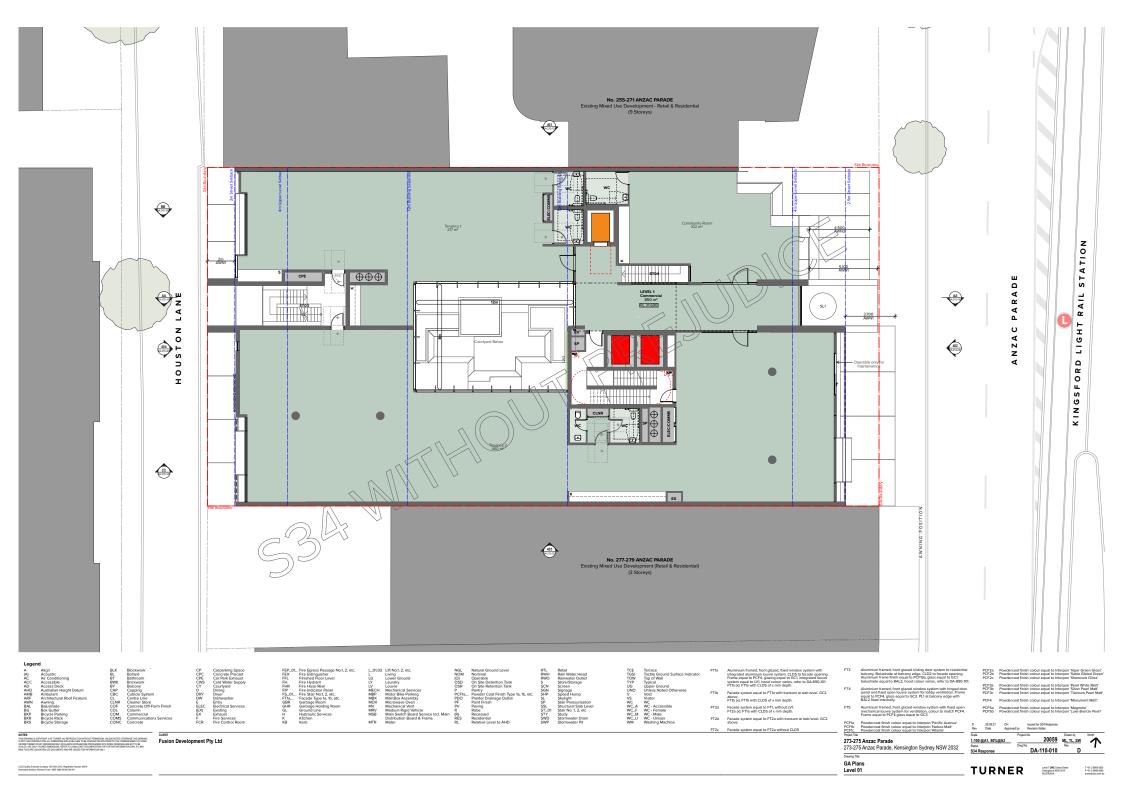


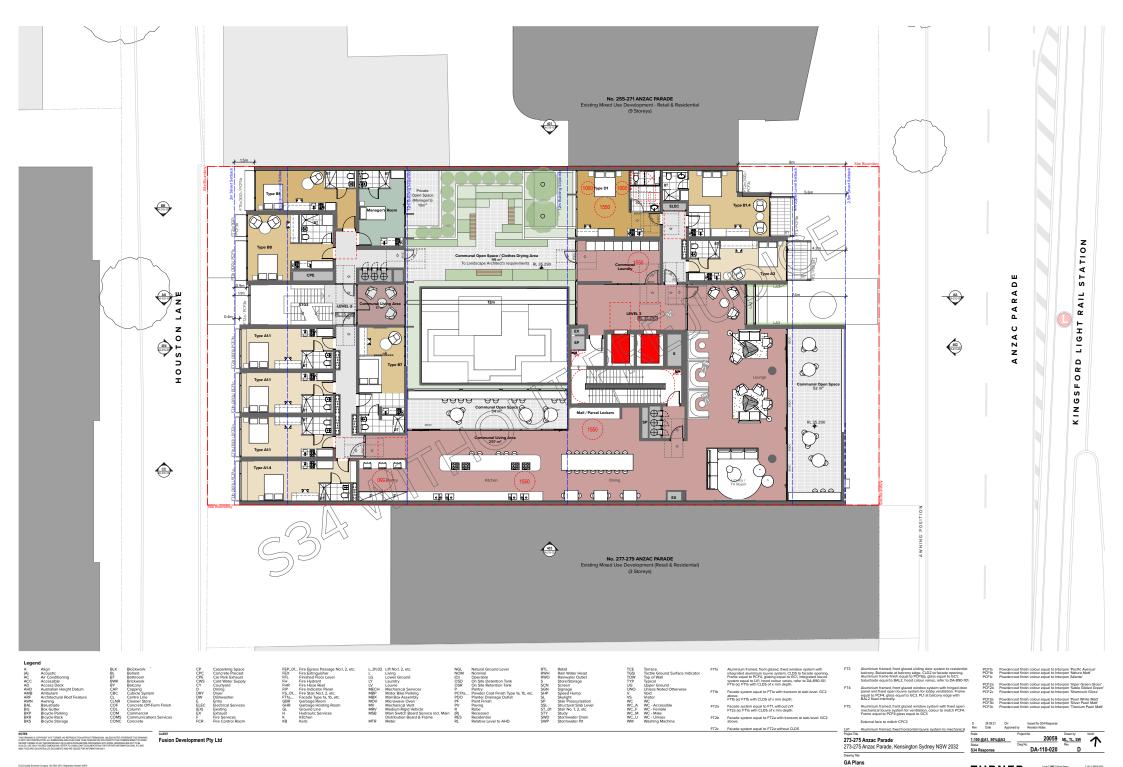
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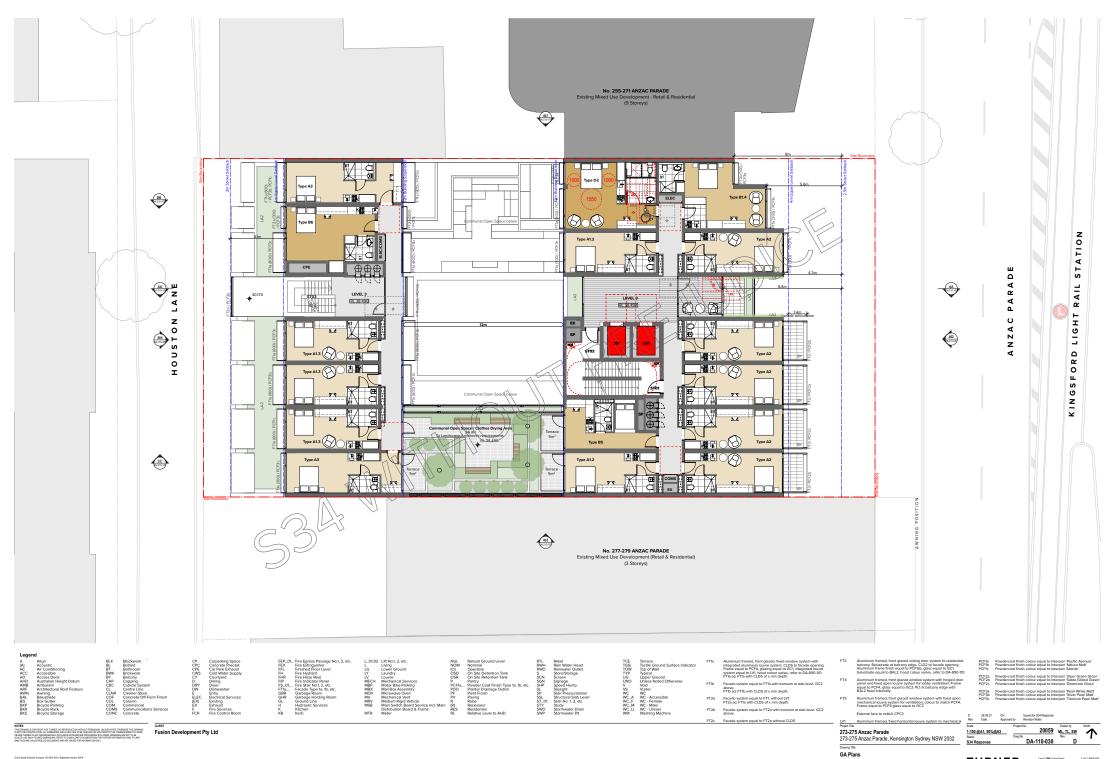






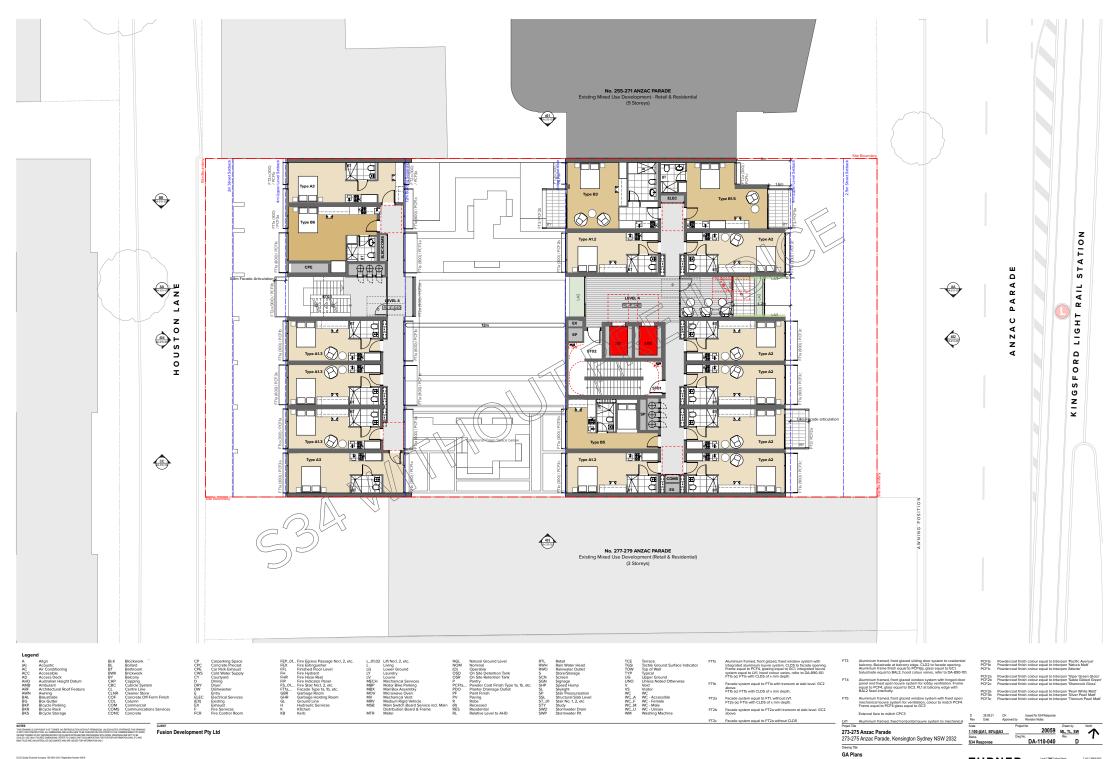
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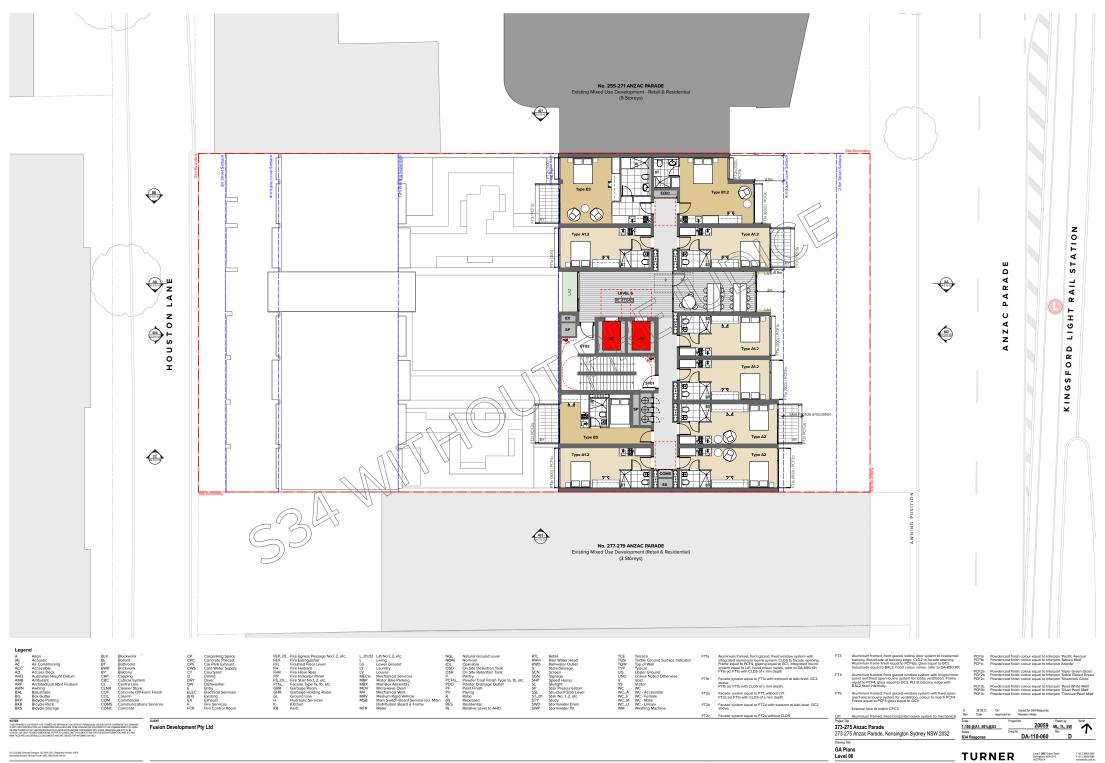
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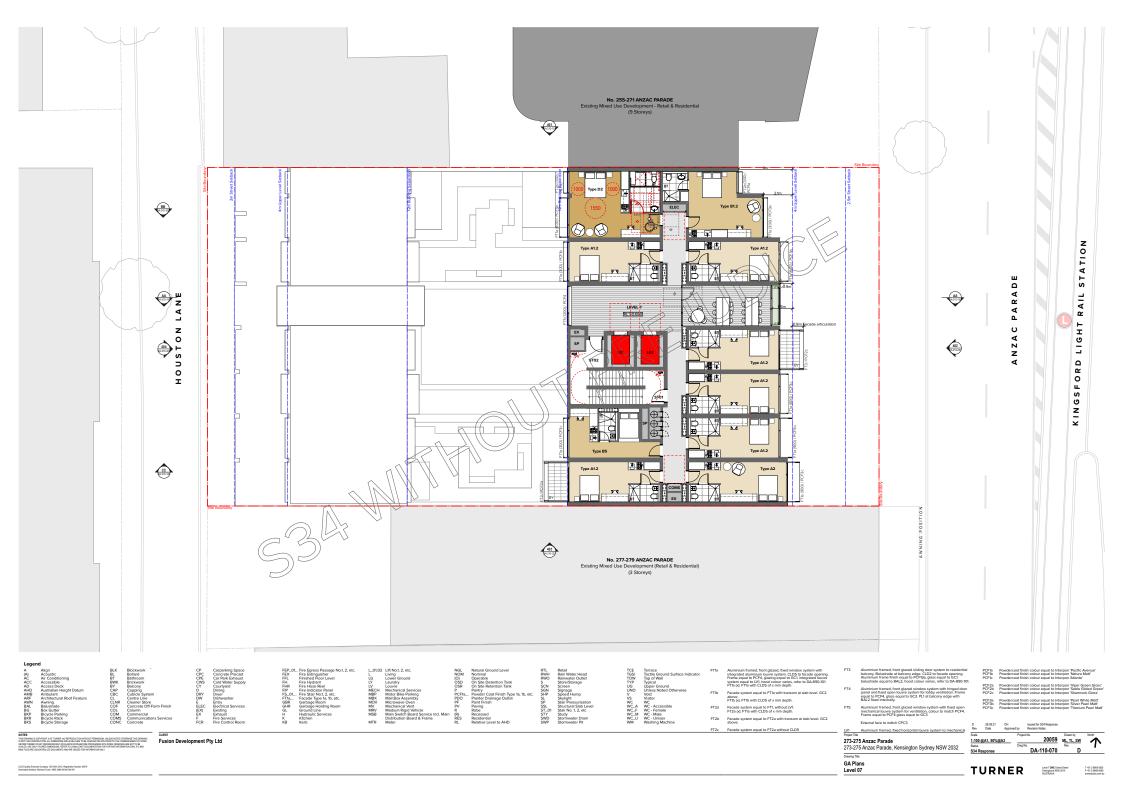
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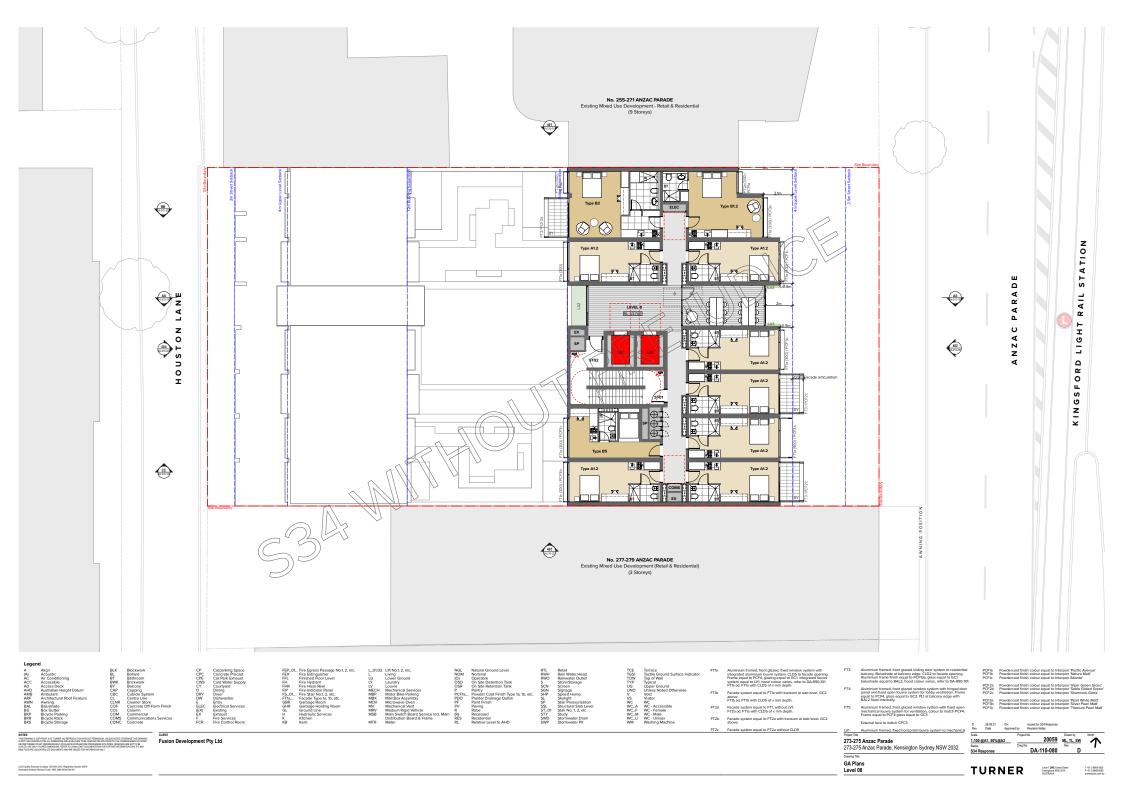


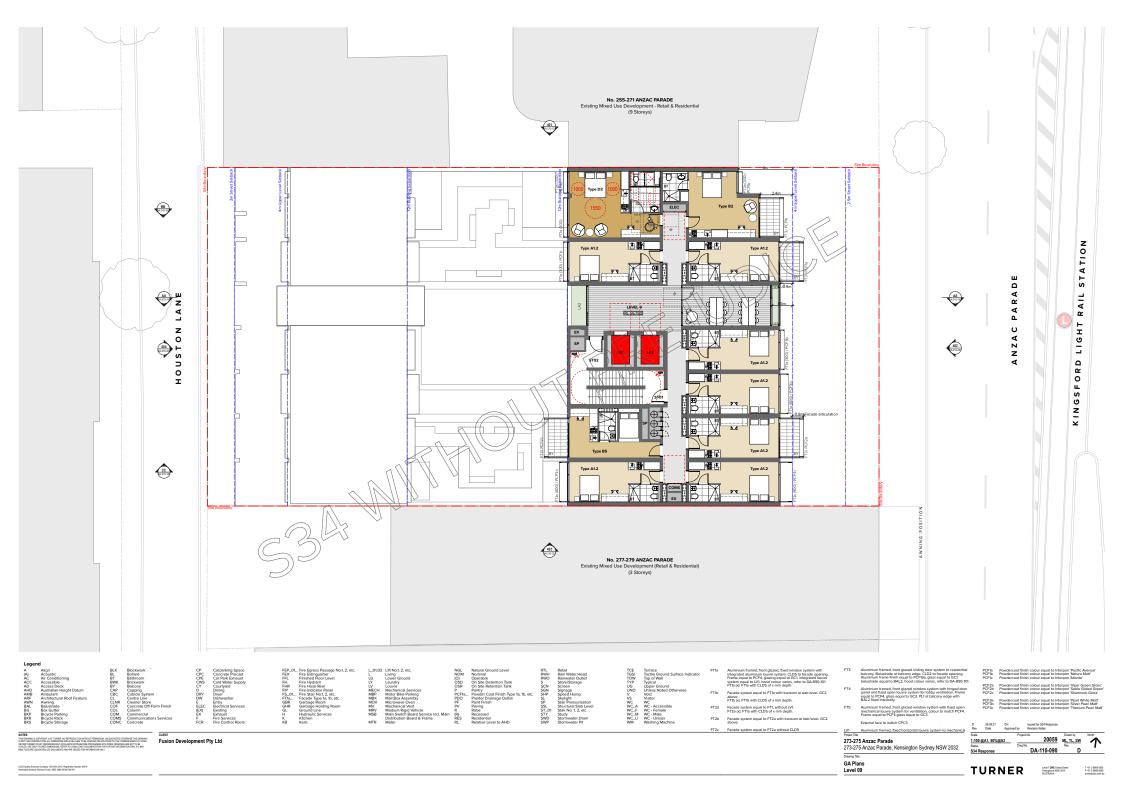
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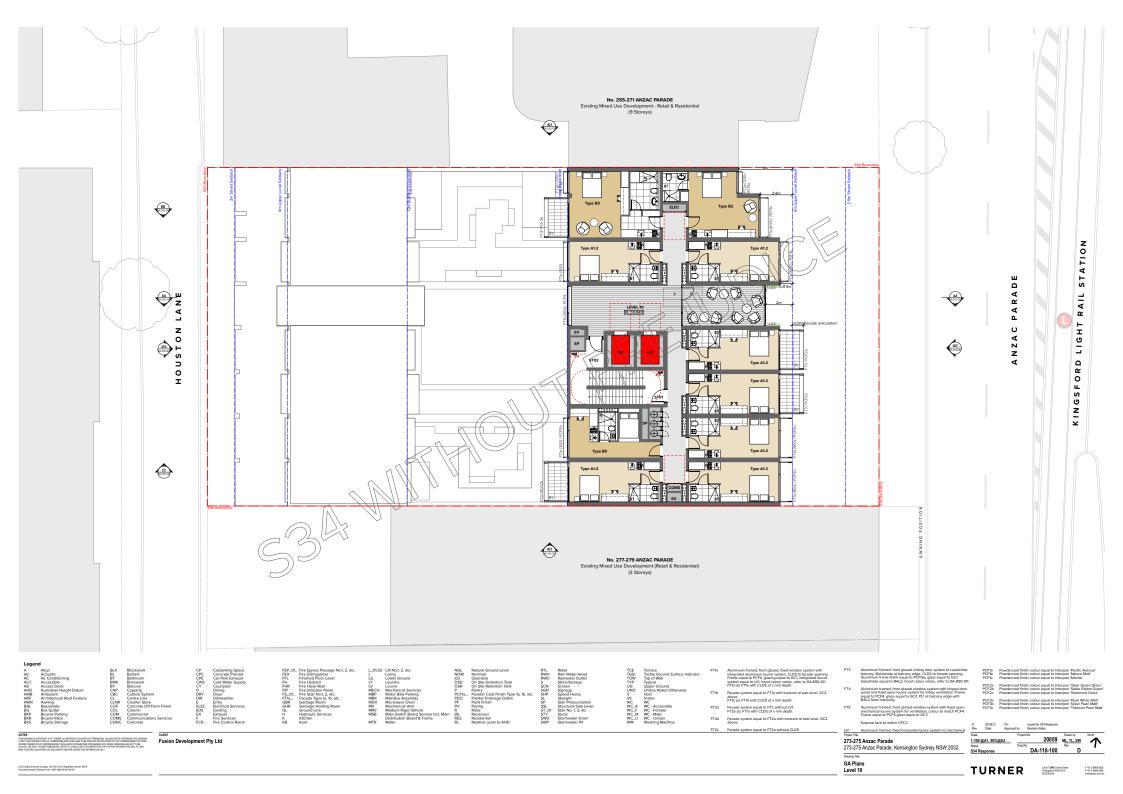
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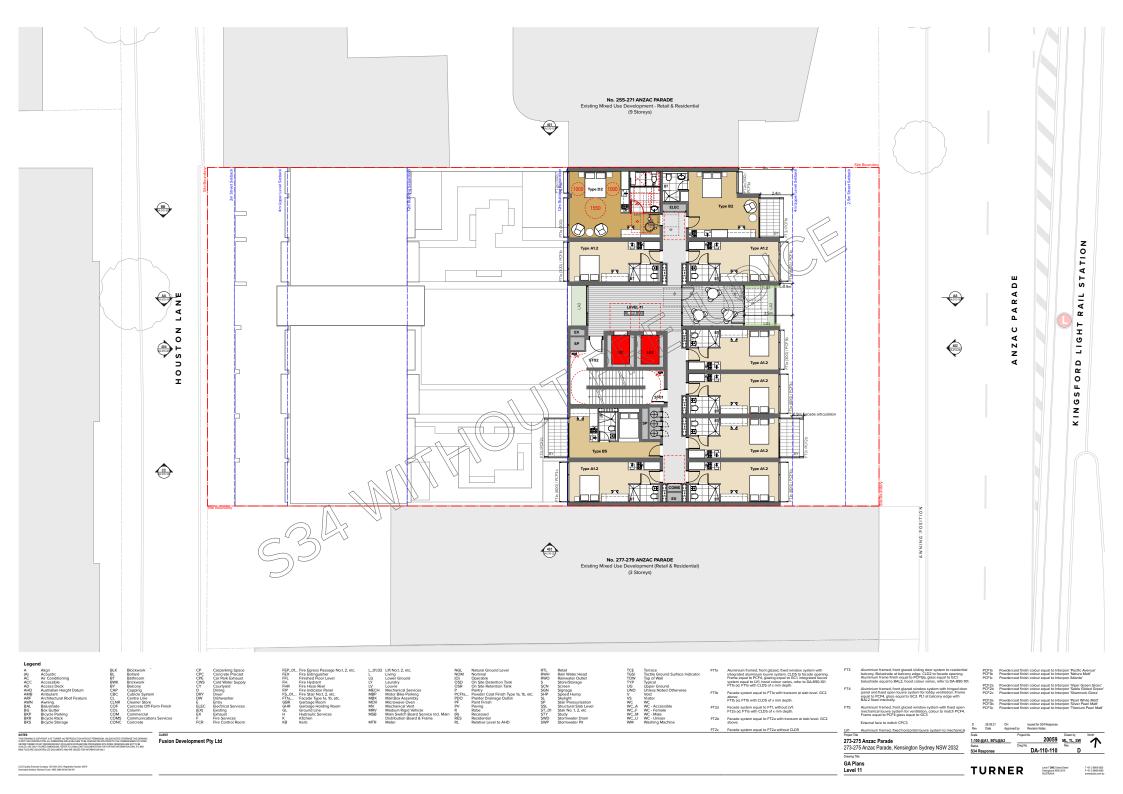


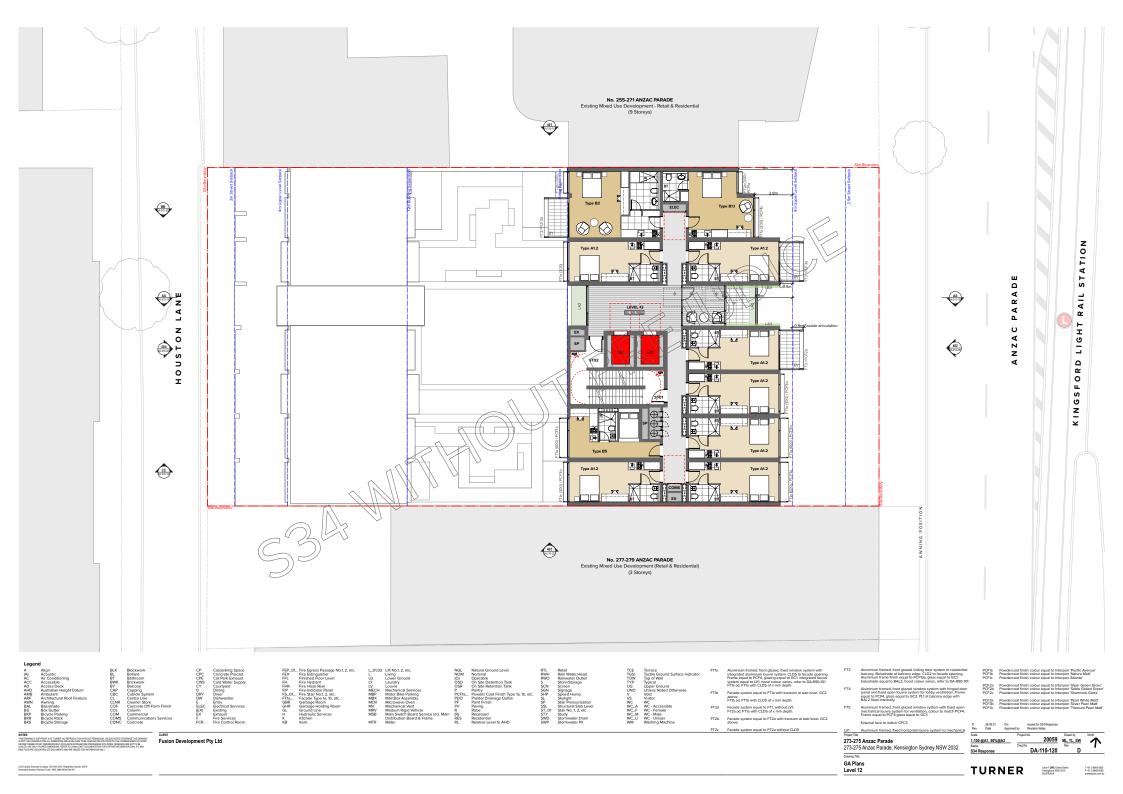


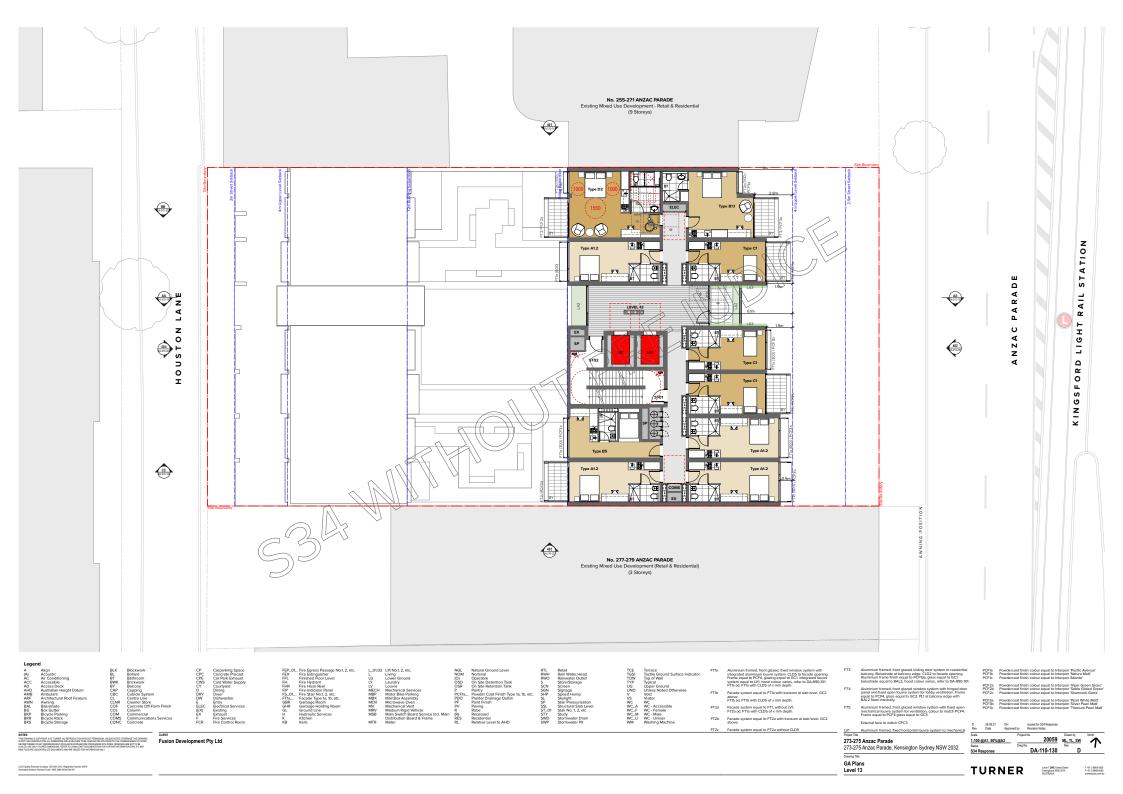


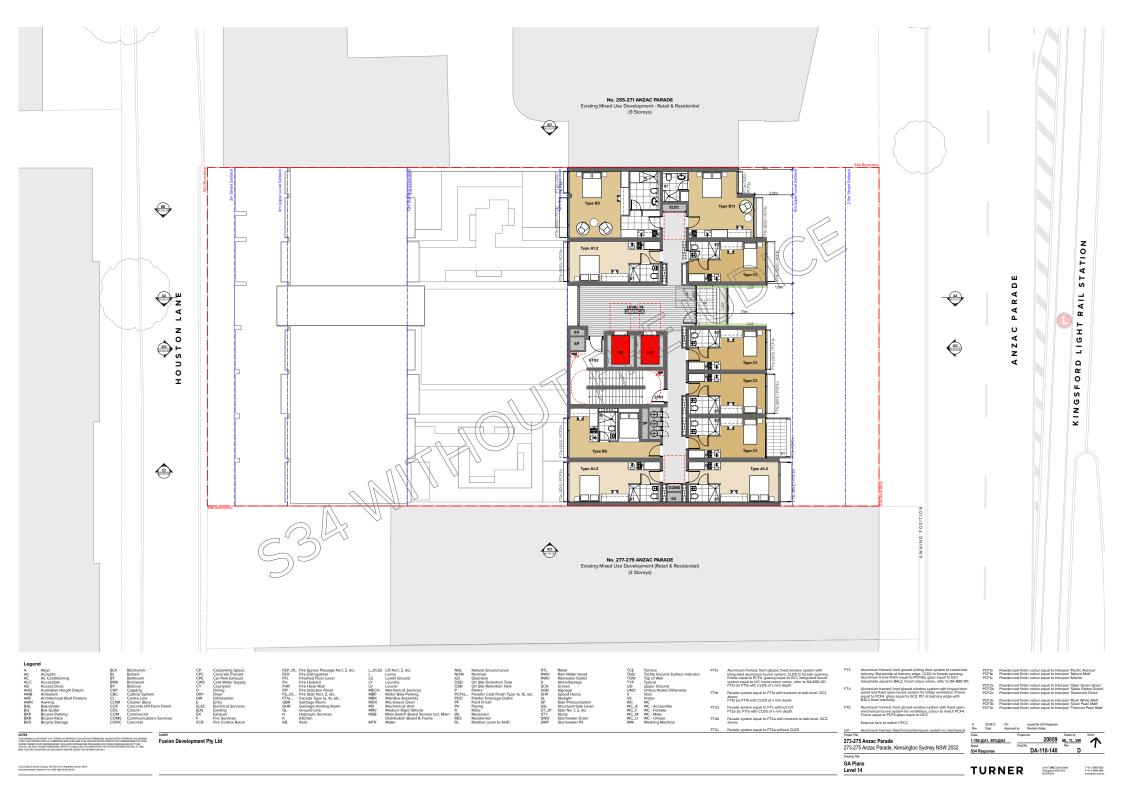


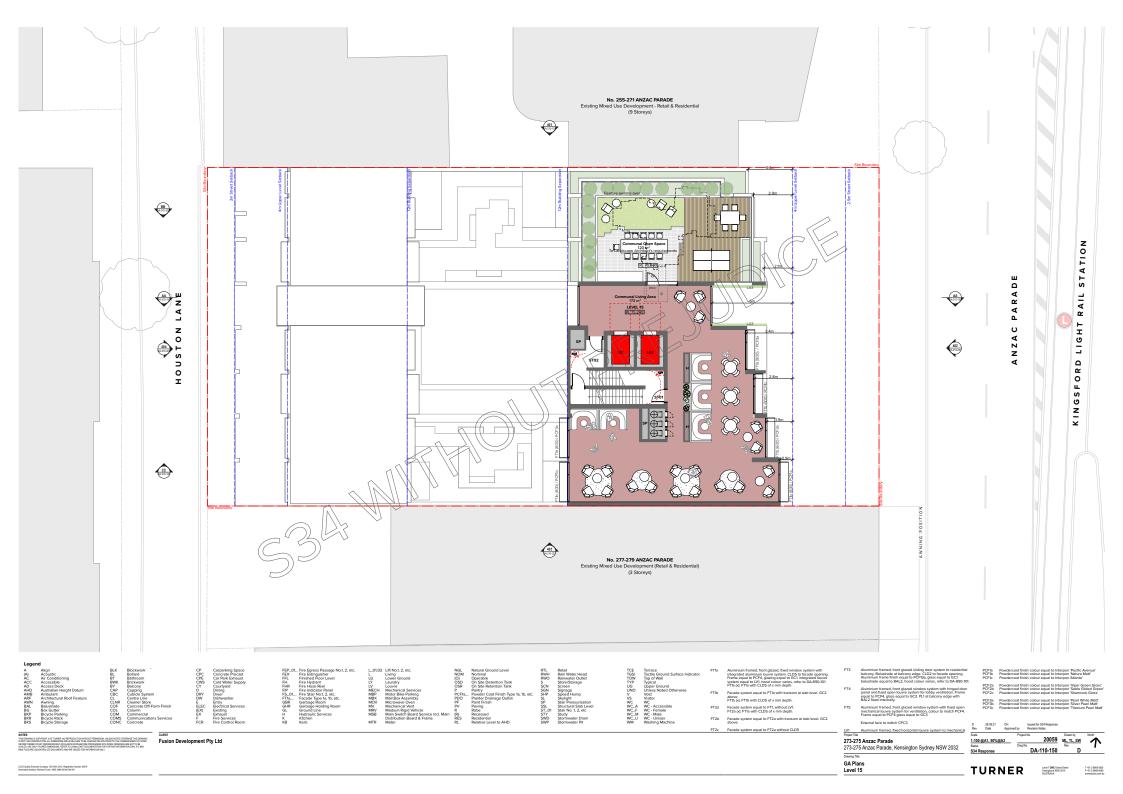


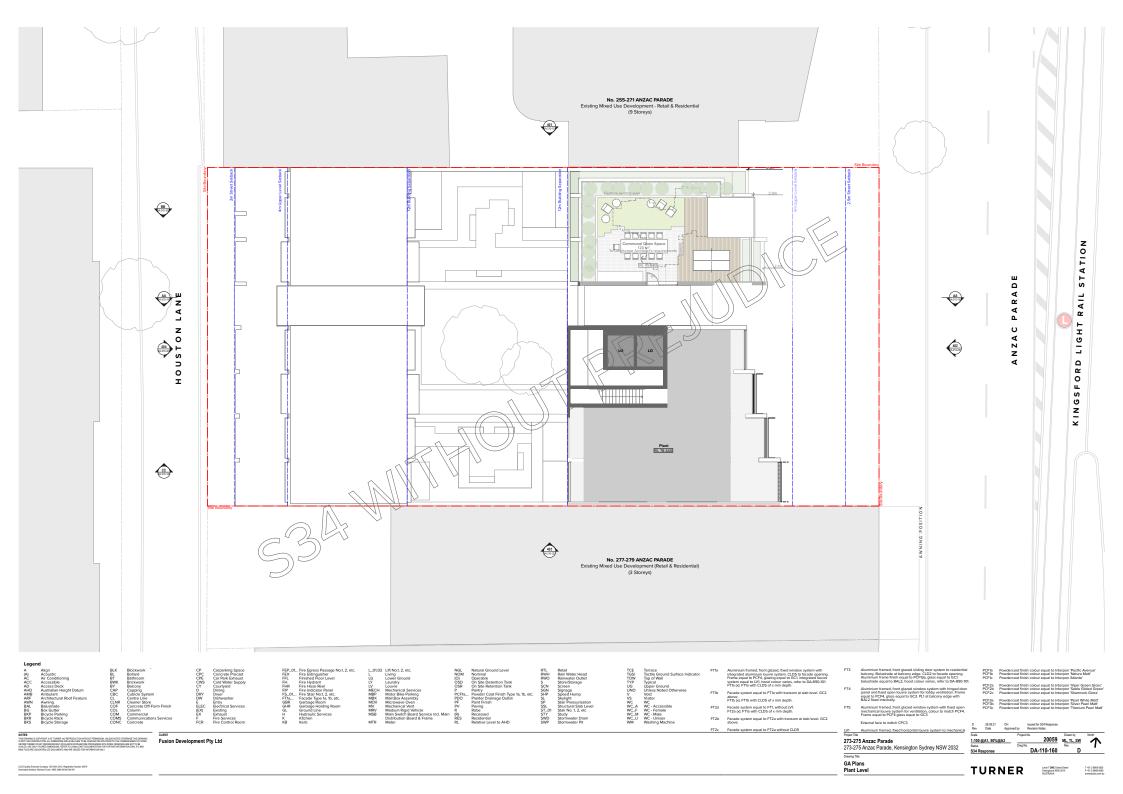


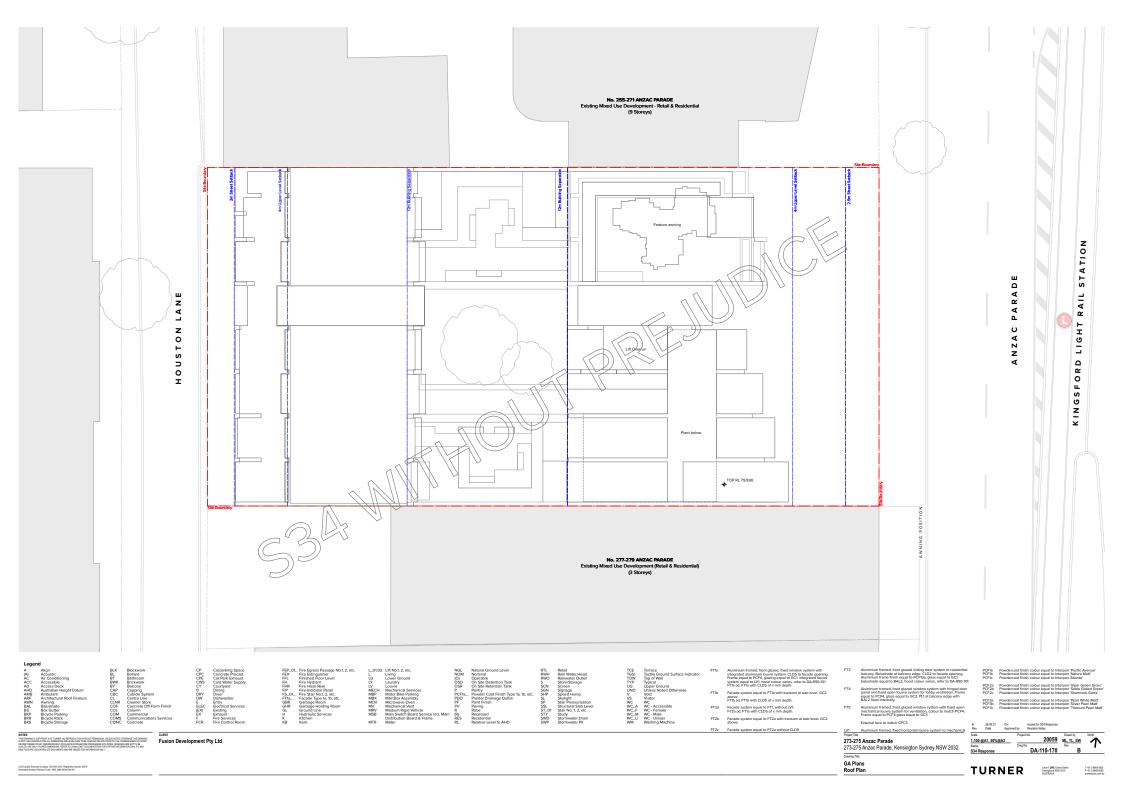












# **APPENDIX B**

**COPERT Australia Input Parameters** 



Table B-1 Long Term Average Ambient Temperature and Relative Humidity – Sydney Area

Month	Minimum Temperature (°C)	Maximum Temperature (°C)	Relative Humidity (%)
January	19.8	27.1	71.3
February	20.0	27.4	73.1
March	18.7	25.7	71.5
April	16.2	23.9	71.9
May	11.5	20.9	61.6
June	9.9	19.6	58.4
July	9.1	17.6	66.8
August	10.4	19.2	63.1
September	11.9	21.1	67.9
October	14.6	22.7	67.5
November	16.3	24.9	65.9
December	17.9	25.2	71.1

Table B-2 Estimated Distribution of Vehicles – Based on NSW Fleet Average

Vehicle Type	Percentage
Cars and motorcycles	82.9%
Light commercial vehicles	13.6%
Heavy vehicles	3.5%

Table B-3 Distribution of Vehicles – Sectors and Subsectors

Sector	Subsector	Technology	Population (Annual)	Percentage
Passenger Cars	PC-S-petrol	ADR00-UNC	0	0.0%
Passenger Cars	PC-S-petrol	ADR27	35,732	0.7%
Passenger Cars	PC-S-petrol	ADR37-00	240,222	5.0%
Passenger Cars	PC-S-petrol	ADR37-01	242,850	5.1%
Passenger Cars	PC-S-petrol	ADR79-00	106,648	2.2%
Passenger Cars	PC-S-petrol	ADR79-01	244,203	5.1%
Passenger Cars	PC-S-petrol	ADR79-02	60,297	1.3%
Passenger Cars	PC-S-petrol	ADR79-03	0	0.0%
Passenger Cars	PC-S-petrol	ADR79-04	0	0.0%
Passenger Cars	PC-S-petrol	ADR79-05	0	0.0%
Passenger Cars	PC-M-petrol	ADR00-UNC	0	0.0%
Passenger Cars	PC-M-petrol	ADR27	50,017	1.0%
Passenger Cars	PC-M-petrol	ADR37-00	145,356	3.0%

Sector	Subsector	Technology	Population (Annual)	Percentage
Passenger Cars	PC-M-petrol	ADR37-01	97,929	2.0%
Passenger Cars	PC-M-petrol	ADR79-00	43,833	0.9%
Passenger Cars	PC-M-petrol	ADR79-01	77,585	1.6%
Passenger Cars	PC-M-petrol	ADR79-02	16,603	0.3%
Passenger Cars	PC-M-petrol	ADR79-03	0	0.0%
Passenger Cars	PC-M-petrol	ADR79-04	0	0.0%
Passenger Cars	PC-M-petrol	ADR79-05	0	0.0%
Passenger Cars	PC-L-petrol	ADR00-UNC	0	0.0%
Passenger Cars	PC-L-petrol	ADR27	56,971	1.2%
Passenger Cars	PC-L-petrol	ADR37-00	264,980	5.5%
Passenger Cars	PC-L-petrol	ADR37-01	210,427	4.4%
Passenger Cars	PC-L-petrol	ADR79-00	65,009	1.4%
Passenger Cars	PC-L-petrol	ADR79-01	73,277	1.5%
Passenger Cars	PC-L-petrol	ADR79-02	14,985	0.3%
Passenger Cars	PC-L-petrol	ADR79-03	0	0.0%
Passenger Cars	PC-L-petrol	ADR79-04	0	0.0%
Passenger Cars	PC-L-petrol	ADR79-05	0	0.0%
Passenger Cars	PC-S-diesel	ADR00-UNC	0	0.0%
Passenger Cars	PC-S-diesel	ADR30	32	0.0%
Passenger Cars	PC-S-diesel	ADR70-00	178	0.0%
Passenger Cars	PC-S-diesel	ADR79-00	3,769	0.1%
Passenger Cars	PC-S-diesel	ADR79-01	12,612	0.3%
Passenger Cars	PC-S-diesel	ADR79-02	5,803	0.1%
Passenger Cars	PC-S-diesel	ADR79-03	0	0.0%
Passenger Cars	PC-S-diesel	ADR79-04	0	0.0%
Passenger Cars	PC-S-diesel	ADR79-05	0	0.0%
Passenger Cars	PC-ML-diesel	ADR00-UNC	0	0.0%
Passenger Cars	PC-ML-diesel	ADR30	215	0.0%
Passenger Cars	PC-ML-diesel	ADR70-00	396	0.0%
Passenger Cars	PC-ML-diesel	ADR79-00	2,395	0.1%
Passenger Cars	PC-ML-diesel	ADR79-01	11,557	0.2%
Passenger Cars	PC-ML-diesel	ADR79-02	4,423	0.1%
Passenger Cars	PC-ML-diesel	ADR79-03	0	0.0%
Passenger Cars	PC-ML-diesel	ADR79-04	0	0.0%
Passenger Cars	PC-ML-diesel	ADR79-05	0	0.0%
Passenger Cars	PC-S-E10	ADR00-UNC	0	0.0%
Passenger Cars	PC-S-E10	ADR27	0	0.0%

Sector	Subsector	Technology	Population (Annual)	Percentage
Passenger Cars	PC-S-E10	ADR37-00	78,212	1.6%
Passenger Cars	PC-S-E10	ADR37-01	106,426	2.2%
Passenger Cars	PC-S-E10	ADR79-00	66,758	1.4%
Passenger Cars	PC-S-E10	ADR79-01	166,391	3.5%
Passenger Cars	PC-S-E10	ADR79-02	41,084	0.9%
Passenger Cars	PC-S-E10	ADR79-03	0	0.0%
Passenger Cars	PC-S-E10	ADR79-04	0	0.0%
Passenger Cars	PC-S-E10	ADR79-05	0	0.0%
Passenger Cars	PC-M-E10	ADR00-UNC	0	0.0%
Passenger Cars	PC-M-E10	ADR27	0	0.0%
Passenger Cars	PC-M-E10	ADR37-00	43,101	0.9%
Passenger Cars	PC-M-E10	ADR37-01	43,046	0.9%
Passenger Cars	PC-M-E10	ADR79-00	27,438	0.6%
Passenger Cars	PC-M-E10	ADR79-01	52,864	1.1%
Passenger Cars	PC-M-E10	ADR79-02	11,313	0.2%
Passenger Cars	PC-M-E10	ADR79-03	0	0.0%
Passenger Cars	PC-M-E10	ADR79-04	0	0.0%
Passenger Cars	PC-M-E10	ADR79-05	0	0.0%
Passenger Cars	PC-L-E10	ADR00-UNC	0	0.0%
Passenger Cars	PC-L-E10	ADR27	0	0.0%
Passenger Cars	PC-L-E10	ADR37-00	84,509	1.8%
Passenger Cars	PC-L-E10	ADR37-01	92,093	1.9%
Passenger Cars	PC-L-E10	ADR79-00	40,693	0.9%
Passenger Cars	PC-L-E10	ADR79-01	49,928	1.0%
Passenger Cars	PC-L-E10	ADR79-02	10,211	0.2%
Passenger Cars	PC-L-E10	ADR79-03	0	0.0%
Passenger Cars	PC-L-E10	ADR79-04	0	0.0%
Passenger Cars	PC-L-E10	ADR79-05	0	0.0%
Passenger Cars	PC-LPG	ADR00-UNC	0	0.0%
Passenger Cars	PC-LPG	ADR27	7,152	0.1%
Passenger Cars	PC-LPG	ADR37-00	13,465	0.3%
Passenger Cars	PC-LPG	ADR37-01	25,951	0.5%
Passenger Cars	PC-LPG	ADR79-00	17,528	0.4%
Passenger Cars	PC-LPG	ADR79-01	86,947	1.8%
Passenger Cars	PC-LPG	ADR79-02	8,935	0.2%
Passenger Cars	PC-LPG	ADR79-03	0	0.0%
Passenger Cars	PC-LPG	ADR79-04	0	0.0%

Sector	Subsector	Technology	Population (Annual)	Percentage
Passenger Cars	PC-LPG	ADR79-05	0	0.0%
SUV	SUV-C-petrol	ADR00-UNC	1,529	0.0%
SUV	SUV-C-petrol	ADR37-00	22,064	0.5%
SUV	SUV-C-petrol	ADR37-01	48,013	1.0%
SUV	SUV-C-petrol	ADR79-00	26,171	0.5%
SUV	SUV-C-petrol	ADR79-01	47,376	1.0%
SUV	SUV-C-petrol	ADR79-02	17,394	0.4%
SUV	SUV-C-petrol	ADR79-03	0	0.0%
SUV	SUV-C-petrol	ADR79-04	0	0.0%
SUV	SUV-C-petrol	ADR79-05	0	0.0%
SUV	SUV-L-petrol	ADR00-UNC	1,561	0.0%
SUV	SUV-L-petrol	ADR36	41,700	0.9%
SUV	SUV-L-petrol	ADR37-00	14,309	0.3%
SUV	SUV-L-petrol	ADR37-01	27,391	0.6%
SUV	SUV-L-petrol	ADR79-00	26,603	0.6%
SUV	SUV-L-petrol	ADR79-01	38,774	0.8%
SUV	SUV-L-petrol	ADR79-02	9,264	0.2%
SUV	SUV-L-petrol	ADR79-03	0	0.0%
SUV	SUV-L-petrol	ADR79-04	0	0.0%
SUV	SUV-L-petrol	ADR79-05	0	0.0%
SUV	SUV-diesel	ADR00-UNC	2,205	0.0%
SUV	SUV-diesel	ADR30	9,727	0.2%
SUV	SUV-diesel	ADR70-00	26,202	0.5%
SUV	SUV-diesel	ADR79-00	31,054	0.6%
SUV	SUV-diesel	ADR79-01	36,982	0.8%
SUV	SUV-diesel	ADR79-02	17,519	0.4%
SUV	SUV-diesel	ADR79-03	0	0.0%
SUV	SUV-diesel	ADR79-04	0	0.0%
SUV	SUV-diesel	ADR79-05	0	0.0%
SUV	SUV-C-E10	ADR00-UNC	0	0.0%
SUV	SUV-C-E10	ADR37-00	7,458	0.2%
SUV	SUV-C-E10	ADR37-01	21,355	0.4%
SUV	SUV-C-E10	ADR79-00	16,383	0.3%
SUV	SUV-C-E10	ADR79-01	32,280	0.7%
SUV	SUV-C-E10	ADR79-02	11,851	0.2%
SUV	SUV-C-E10	ADR79-03	0	0.0%
SUV	SUV-C-E10	ADR79-04	0	0.0%

Sector	Subsector	Technology	Population (Annual)	Percentage
SUV	SUV-C-E10	ADR79-05	0	0.0%
SUV	SUV-L-E10	ADR00-UNC	0	0.0%
SUV	SUV-L-E10	ADR36	16,919	0.4%
SUV	SUV-L-E10	ADR37-00	4,926	0.1%
SUV	SUV-L-E10	ADR37-01	11,993	0.3%
SUV	SUV-L-E10	ADR79-00	16,652	0.3%
SUV	SUV-L-E10	ADR79-01	26,419	0.6%
SUV	SUV-L-E10	ADR79-02	6,312	0.1%
SUV	SUV-L-E10	ADR79-03	0	0.0%
SUV	SUV-L-E10	ADR79-04	0	0.0%
SUV	SUV-L-E10	ADR79-05	0	0.0%
Light Commercial Vehicles	LCV-petrol	ADR00-UNC	29,241	0.6%
Light Commercial Vehicles	LCV-petrol	ADR36	123,715	2.6%
Light Commercial Vehicles	LCV-petrol	ADR37-00	43,792	0.9%
Light Commercial Vehicles	LCV-petrol	ADR37-01	38,684	0.8%
Light Commercial Vehicles	LCV-petrol	ADR79-00	47,219	1.0%
Light Commercial Vehicles	LCV-petrol	ADR79-01	44,034	0.9%
Light Commercial Vehicles	LCV-petrol	ADR79-02	9,447	0.2%
Light Commercial Vehicles	LCV-petrol	ADR79-03	0	0.0%
Light Commercial Vehicles	LCV-petrol	ADR79-04	0	0.0%
Light Commercial Vehicles	LCV-petrol	ADR79-05	0	0.0%
Light Commercial Vehicles	LCV-diesel	ADR00-UNC	28,825	0.6%
Light Commercial Vehicles	LCV-diesel	ADR30	36,092	0.8%
Light Commercial Vehicles	LCV-diesel	ADR70-00	60,452	1.3%
Light Commercial Vehicles	LCV-diesel	ADR79-00	68,553	1.4%
Light Commercial Vehicles	LCV-diesel	ADR79-01	88,557	1.9%
Light Commercial Vehicles	LCV-diesel	ADR79-02	32,648	0.7%
Light Commercial Vehicles	LCV-diesel	ADR79-03	0	0.0%
Light Commercial Vehicles	LCV-diesel	ADR79-04	0	0.0%
Light Commercial Vehicles	LCV-diesel	ADR79-05	0	0.0%
Heavy Duty Trucks	MCV-petrol	ADR00-UNC	10,603	0.2%
Heavy Duty Trucks	MCV-diesel	ADR00-UNC	20,660	0.4%
Heavy Duty Trucks	MCV-diesel	ADR30	11,700	0.2%
Heavy Duty Trucks	MCV-diesel	ADR70-00	20,969	0.4%
Heavy Duty Trucks	MCV-diesel	ADR80-00	23,569	0.5%
Heavy Duty Trucks	MCV-diesel	ADR80-02	12,869	0.3%
Heavy Duty Trucks	MCV-diesel	ADR80-03	0	0.0%

Sector	Subsector	Technology	Population (Annual)	Percentage
Heavy Duty Trucks	MCV-diesel	ADR80-04	0	0.0%
Heavy Duty Trucks	MCV-diesel	ADR80-05	0	0.0%
Heavy Duty Trucks	HCV-diesel	ADR00-UNC	8,264	0.2%
Heavy Duty Trucks	HCV-diesel	ADR30	3,948	0.1%
Heavy Duty Trucks	HCV-diesel	ADR70-00	6,540	0.1%
Heavy Duty Trucks	HCV-diesel	ADR80-00	7,411	0.2%
Heavy Duty Trucks	HCV-diesel	ADR80-02	3,420	0.1%
Heavy Duty Trucks	HCV-diesel	ADR80-03	0	0.0%
Heavy Duty Trucks	HCV-diesel	ADR80-04	0	0.0%
Heavy Duty Trucks	HCV-diesel	ADR80-05	0	0.0%
Heavy Duty Trucks	AT-diesel	ADR00-UNC	3,142	0.1%
Heavy Duty Trucks	AT-diesel	ADR30	1,918	0.0%
Heavy Duty Trucks	AT-diesel	ADR70-00	4,115	0.1%
Heavy Duty Trucks	AT-diesel	ADR80-00	6,450	0.1%
Heavy Duty Trucks	AT-diesel	ADR80-02	2,803	0.1%
Heavy Duty Trucks	AT-diesel	ADR80-03	0	0.0%
Heavy Duty Trucks	AT-diesel	ADR80-04	0	0.0%
Heavy Duty Trucks	AT-diesel	ADR80-05	0	0.0%
Heavy Duty Trucks	Autogas Trucks	ADR30	643	0.0%
Heavy Duty Trucks	Autogas Trucks	ADR70-00	455	0.0%
Heavy Duty Trucks	Autogas Trucks	ADR80-00	461	0.0%
Heavy Duty Trucks	Autogas Trucks	ADR80-02	282	0.0%
Heavy Duty Trucks	Autogas Trucks	ADR80-03	0	0.0%
Heavy Duty Trucks	Autogas Trucks	ADR80-04	0	0.0%
Heavy Duty Trucks	Autogas Trucks	ADR80-05	0	0.0%
Buses	BUS-L-diesel	ADR00-UNC	1,961	0.0%
Buses	BUS-L-diesel	ADR30	2,065	0.0%
Buses	BUS-L-diesel	ADR70-00	3,352	0.1%
Buses	BUS-L-diesel	ADR80-00	2,582	0.1%
Buses	BUS-L-diesel	ADR80-02	2,126	0.0%
Buses	BUS-L-diesel	ADR80-03	0	0.0%
Buses	BUS-L-diesel	ADR80-04	0	0.0%
Buses	BUS-L-diesel	ADR80-05	0	0.0%
Buses	BUS-H-diesel	ADR00-UNC	527	0.0%
Buses	BUS-H-diesel	ADR30	708	0.0%
Buses	BUS-H-diesel	ADR70-00	1,095	0.0%
Buses	BUS-H-diesel	ADR80-00	852	0.0%

Page 7 of 9

Sector	Subsector	Technology	Population (Annual)	Percentage
Buses	BUS-H-diesel	ADR80-02	746	0.0%
Buses	BUS-H-diesel	ADR80-03	0	0.0%
Buses	BUS-H-diesel	ADR80-04	0	0.0%
Buses	BUS-H-diesel	ADR80-05	0	0.0%
Mopeds	2-stroke <50 cm <sup>3</sup>	Conventional	0	0.0%
Mopeds	2-stroke <50 cm <sup>3</sup>	Mop - Euro I	0	0.0%
Mopeds	2-stroke <50 cm <sup>3</sup>	Mop - Euro II	0	0.0%
Mopeds	2-stroke <50 cm <sup>3</sup>	Mop - Euro III	0	0.0%
Mopeds	4-stroke <50 cm <sup>3</sup>	Conventional	0	0.0%
Mopeds	4-stroke <50 cm <sup>3</sup>	Mop - Euro I	0	0.0%
Mopeds	4-stroke <50 cm <sup>3</sup>	Mop - Euro II	0	0.0%
Mopeds	4-stroke <50 cm <sup>3</sup>	Mop - Euro III	0	0.0%
Motorcycles	2-stroke >50 cm <sup>3</sup>	Conventional	0	0.0%
Motorcycles	2-stroke >50 cm <sup>3</sup>	Mot - Euro I	0	0.0%
Motorcycles	2-stroke >50 cm <sup>3</sup>	Mot - Euro II	0	0.0%
Motorcycles	2-stroke >50 cm <sup>3</sup>	Mot - Euro III	0	0.0%
Motorcycles	4-stroke <250 cm <sup>3</sup>	Conventional	0	0.0%
Motorcycles	4-stroke <250 cm <sup>3</sup>	Mot - Euro I	0	0.0%
Motorcycles	4-stroke <250 cm <sup>3</sup>	Mot - Euro II	0	0.0%
Motorcycles	4-stroke <250 cm <sup>3</sup>	Mot - Euro III	0	0.0%
Motorcycles	4-stroke 250 - 750 cm <sup>3</sup>	Conventional	180,979	3.8%
Motorcycles	4-stroke 250 - 750 cm <sup>3</sup>	Mot - Euro I	0	0.0%
Motorcycles	4-stroke 250 - 750 cm <sup>3</sup>	Mot - Euro II	0	0.0%
Motorcycles	4-stroke 250 - 750 cm <sup>3</sup>	Mot - Euro III	0	0.0%
Motorcycles	4-stroke >750 cm <sup>3</sup>	Conventional	0	0.0%
Motorcycles	4-stroke >750 cm <sup>3</sup>	Mot - Euro I	0	0.0%
Motorcycles	4-stroke >750 cm <sup>3</sup>	Mot - Euro II	0	0.0%
Motorcycles	4-stroke >750 cm <sup>3</sup>	Mot - Euro III	0	0.0%

## **Table B-4 Other Parameters**

Parameter	Input
Road share percentage	100% urban
Canister size	
Fuel tank size	
Fuel injection percentage	(DSITIA, 2014)
RVP	
Sulphur and metal content in fuel	



# **APPENDIX C**

Selection of Representative Meteorological Data



#### C.1 SELECTION OF REPRESENTATIVE METEOROLOGICAL DATA

Once emitted to atmosphere, emissions will:

- Rise according to the momentum and buoyancy of the emission at the discharge point relative to the prevailing atmospheric conditions;
- Be adverted from the source according to the strength and direction of the wind at the height which the plume has risen in the atmosphere;
- Be diluted due to mixing with the ambient air, according to the intensity of turbulence; and
- (Potentially) be chemically transformed and/or depleted by deposition processes.

Dispersion is the combined effect of these processes.

Dispersion modelling is used as a tool to simulate the air quality effects of specific emission sources, given the meteorology typical for a local area together with the expected emissions. Selection of a year when the meteorological data is atypical means that the resultant predictions may not appropriately represent the most likely air quality impacts. Therefore, in dispersion modelling, one of the key considerations is the representative nature of the meteorological data used.

The year of meteorological data used for the dispersion modelling was selected by reviewing the most recent five years of historical surface observations at Randwick AQMS (2016 to 2020 inclusive) to determine the year that is most representative of average conditions. Wind direction, wind speed and ambient temperature were compared to averages for the region to determine the most representative year.

Data collected from 2016 to 2020 is summarised in **Figure C1** to **Figure C3**. Examination of the data indicates the following:

- **Figure C1** indicates relatively similar wind roses for all years analysed. The lowest percentage of southerly and westerly winds which would blow emissions from vehicles travelling on Anzac Parade away from the Project site were observed in 2017;
- Figure C2 indicates that 2017 and 2020 exhibit lower than average wind speeds; and
- Figure C3 shows relatively similar temperatures for all years analysed.

It is noted that background air quality data recorded in 2020 is not representative of typical conditions for the region due to significant bushfires and potential impacts of the COVID pandemic on ambient air pollutant concentrations (refer **Section 6**).

Given the above considerations, the year 2017 was selected as the representative year of meteorology.



N 1400 NNW NNE 1200 NW NE 1000 800 600 WNW ENE 400 W 0 Ε 2016 2017 wsw ESE 2018 2019 2020 ssw SSE s

Figure C1 Frequency of Winds at Randwick AQMS for 2016 – 2020



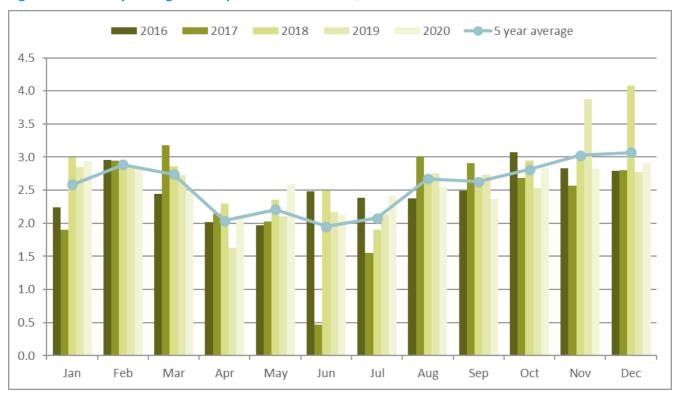


Figure C3 Monthly Average Temperature at Randwick AQMS for 2016 – 2020



## **APPENDIX D**

Predicted Pollutant Isopleth Plots – Incremental Concentrations



Figure C1 Maximum Predicted Incremental 24-hour Average PM<sub>10</sub> – Ground Level

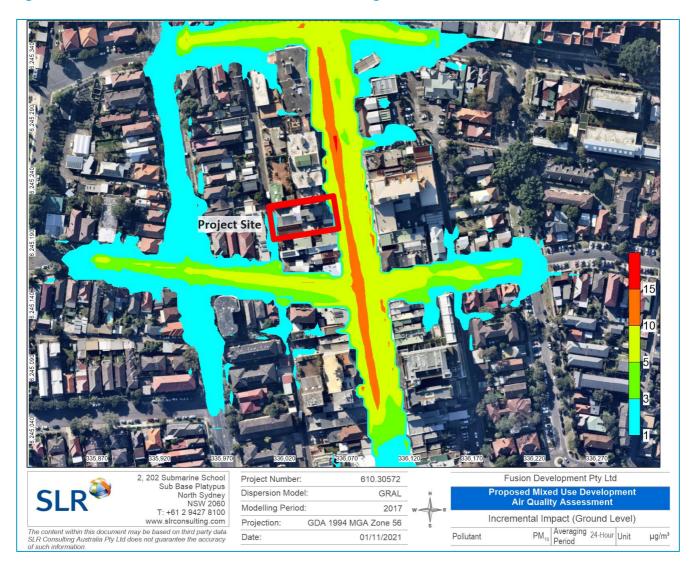


Figure C2 Maximum Predicted Incremental Annual Average PM<sub>10</sub> – Ground Level

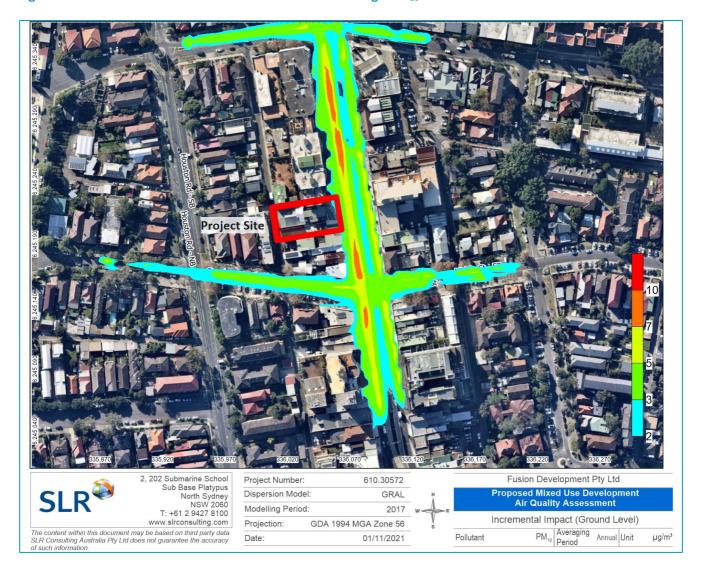


Figure C3 Maximum Predicted Incremental 24-hour Average PM<sub>2.5</sub> – Ground Level

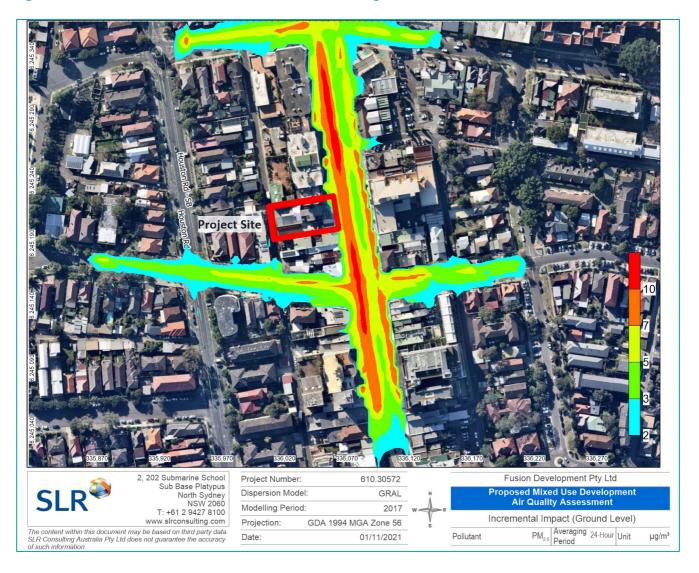


Figure C4 Maximum Predicted Incremental Annual Average PM<sub>2.5</sub> – Ground Level

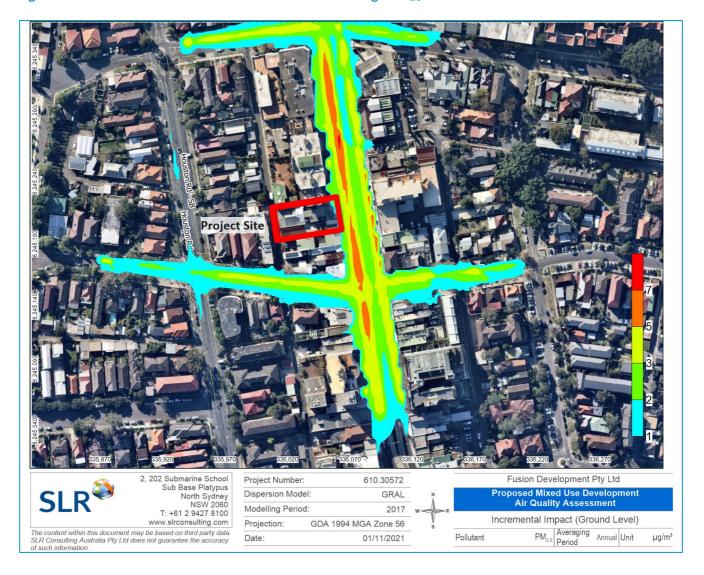


Figure C5 Maximum Predicted Incremental 1-hour Average NO<sub>X</sub> (as NO<sub>2</sub>) – Ground Level

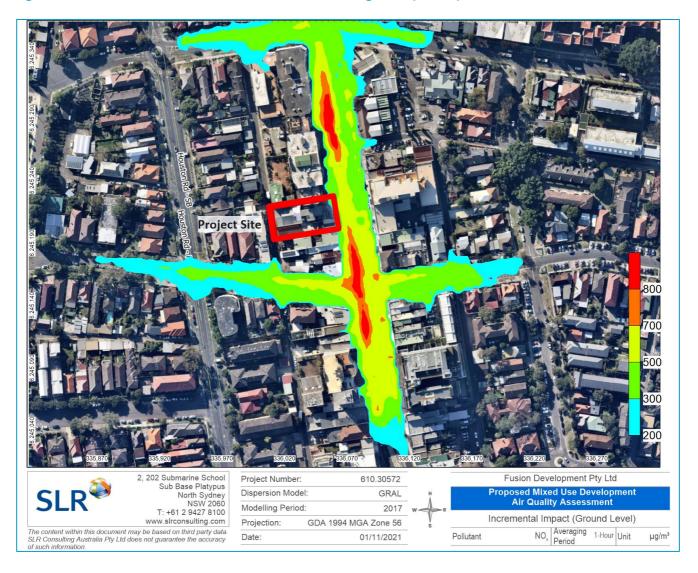
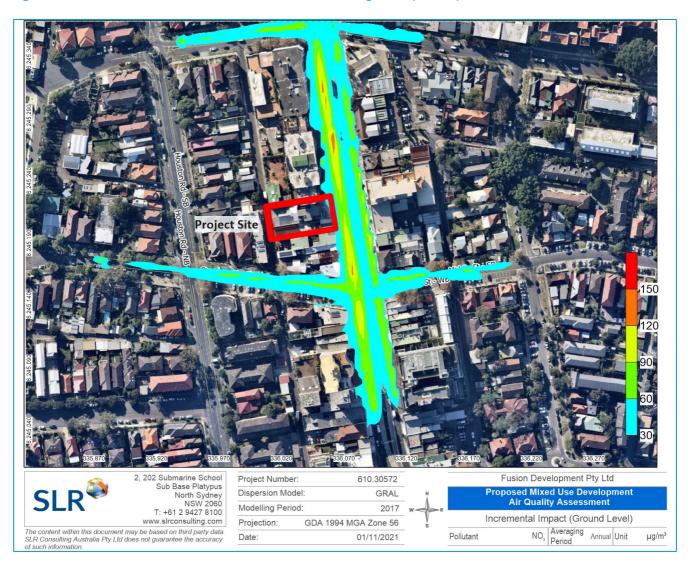


Figure C6 Maximum Predicted Incremental Annual Average NO<sub>X</sub> (as NO<sub>2</sub>) – Ground Level



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