Flood Risk Management Report for 28-32 Evan Street, Penrith, NSW 2750

For Morson Group Pty Ltd

Reference: 180276.R1

02/05/2019

DOCUMENT HISTORY

REVISION	DATE	DESCRIPTION	PREPARED BY	AUTHORISED BY
1	02/05/19	Review	Tasnim Mostafiz	Kamyar Eivazzadeh

DISCLAIMER

- 1. Content of this report have been based on available information as noted in the report and its appendices, thus this report should be read in conjunction with the referenced reports.
- 2. The limitations present in any of the referenced reports will be inherent in this report.
- 3. This report and associated documents have been prepared for the proposed development at 28-32 Evan Street, Penrith, NSW. No responsibility will be accepted for the use of any part of this report in any other context or for any other purposes.
- 4. This report shall not be construed as relieving any other party of their responsibilities, liabilities or contractual obligations.
- 5. The results are subject to the scope, assumptions and limitations as set out in this report and the information that has been disclosed by the client.
- 6. The authors best professional opinion is represented in the conclusions drawn and is based on his experience and on previous results from other investigations on similar materials. The conclusions and any recommendations made are based on the condition of the item(s) in question as portrayed in the data provided by the client.

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1. INTRODUCTION

1.1 Scope of Works

LAM consulting has been engaged by the Morson Group in order to conduct a flood risk management plan for the proposed residential property at 28-32 Evan Street, Penrith, NSW 2750. The following shall be covered in this report:

- Define the flood risk for the proposed development
- Discuss risk management in accordance with Penrith DCP
- Provide flood risk management strategies and procedures

1.2 Locality Plan

The proposed development is a residential flat building situated on a 1632.5m² block (Lot 1, DP510281). The property faces 28 Evan Street on the North, a cemetery on the East, 34 Evan Street on the South and Evan Street on the West. The site area is situated within an R4 high density residential zone.



Figure 1: Map view of site

The proposed development consists of two levels of basement carparking, five levels of residential flats and a roof (see architectural plans by Morson Group appendix 7.1 for full set). The ground floor of the development is shown below in figure 2.



Figure 2: Ground floor plan

The 1% AEP overland flow flood level within the vicinity of the development has been estimated to be RL 35.9m AHD based on flood information provided by council (appendix 7.2). As a part of the property is less than 0.5m above the 1% AEP flood level (see survey plans by Higgins Surveyours (ref: 30307, dated: 02-03-17) appendix 7.4), it is subject to the Penrith Development Control Plan (DCP) 2014, section C3.5 Flood Planning.

2. INVESTIGATION RESULTS

2.1 Flood Hazard Levels and Risk Assessment

The NSW government Floodplain Development Manual defines flood hazard levels as the following:

- High hazard: possible danger to personal safety, evacuation by trucks difficult, able-bodied adults would have difficulty swimming to safety, potential for significant damage to buildings
- Low hazard: should it be necessary, a truck could evacuate people and their possessions, able bodied adults would have little difficulty wading to safety

Figure 8.3 (Appendix 7.3) of Penrith CBD Detailed Overland Flow Flood Study – Final report by Cardno (Reference: W4735 Dated: 07/07/15) shows the 1% AEP storm event flood extent. The plans show that the flood waters do no inundate the site. This site falls under the low hazard category as the hazard presented in the case evacuation is required is minimal.

2.3 Freeboard Level Requirements

Freeboard levels have been set out in order to ensure the safety of the property and occupants. The required freeboard for habitable areas is 0.5m above the flood plan level. Non-habitable areas (e.g. entry to basement), require 0.3m above flood planning level.

Table 1: Freeboards required and achieved

Building Element	Design Requirement	100 Year ARI level	Min. Elevation	Elevation Achieved
Units 1, 2, 3 & 4	0.5m above 1% AEP	35.90m	36.40m	37.10m
Foyer area	0.3m above 1% AEP	35.90m	36.40m	37.10m
Terraces	0.3m above 1% AEP	35.90m	36.40m	37.10m
Driveway Entry	0.3m above 1% AEP	35.90m	36.20m	36.6m

3. FLOOD RISK MANAGEMENT METHODS AND STRATEGIES

3.1 Building Materials and Methods

Any part of the development beneath the FPL (RL 35.90m) must be flood compatible:

Component	Flood compatible material	Notes	
Flooring/flooring finishes	Mass concrete, masonry, highly durable or durable timber, tiles, timber floor boarding	-	Low shrinkage timbers are recommended Timber requires good ventilation in order to dry Insulation under the floor may need to be removed in order to dry
Walls/linings	Highly durable, durable and treated timbers, steel frames, fibre cement boards, brick, concrete, stone (water proof grout), clay tiles (water proof mortar), glass, plastic sheeting (water proof adhesive), exterior grade plywood, sealed timber products	-	Steel frames should be made of open sections Steel frames should have holes drilled at the bottom to allow for water to escape Sheet wall linings should be installed horizontally 20-30mm gap between the bottom of lining and base of wall should be allowed for ventilation and cleaning
Insulation	Insulation should be closed cell type foam with fittings, nails, bolts and hinges made from brass, stainless steel or hot dipped galvanised steel. Hinges should be of the removable pin variety	-	NA
Doors/windows	Solid panel doors with water proof adhesives, flush doors with marine play, closed cell foam, aluminium/galvanised steel frame doors, aluminium windows with corrosion resistant rollers, fully epoxy sealed timber frame windows with stainless steel fittings	-	Refer to Flooring and Walls notes
Ancillary Structures	Masonry, sealed hardwood, corrosion resistant metals	-	Refer to Flooring and Walls notes

The connection to the main power should be located above the FPL (35.90m). In addition, all new wiring, switches, conduits and outlets should be located above the FPL and all electrical components should be water proof. New conduits must be self-draining.

Heating, ventilation and air conditioning (HVAC) systems and the associated components should be installed above RL 35.90m where ever possible. For any HVAC components that cannot be installed above the FPL, they must be installed in such a way to minimise water damage in the case that they should become inundated during a flood.

3.2 Structural Integrity

A structural engineer must assess the structural soundness of the building to ensure that the existing structure will be adequate when subject to the 100-year ARI and PMF floods. The structure must be assessed against hydrostatic and hydrodynamic forces, buoyancy and debris impact.

3.3 Flood Evacuation Strategy

In NSW the State Emergency Service (SES) is the responsible body for the provision of flood updates and issuing flood evacuation warnings and flood evacuation orders. The SES uses a wide variety of methods and platforms in order to relay flooding information including, local news, radio, tv broadcasting, SMS messaging, door knocking as well as social media platforms such as Facebook and Twitter. The evacuation schedule must be established from consultation with the SES.

In order to prepare the occupants and home owners for a flood event, they should compose Flood Emergency Plans. The SES can assist in the development of these plans through the use of their FloodSafe kits (Information regarding these kits is available from http://www.floodsafe.com.au/). Home owners and occupants should regularly review and update these plans and leave a copy in a high traffic area where it is easily accessible, such as the kitchen or entry way. If there should ever be a situation where the 100-year ARI flood could be exceeded, then the NSW Government operation guidelines and SES Emergency operational guidelines should be consulted.

The habitable floor level sits well above the 1% AEP flood level. As water is not expected to breach the property boundary, evacuation is not recommended.

4. FLOOD RISK MANAGEMENT PLAN

- 1. Storms leading to major flooding are typically up to 2 hours long, however shorter storms can produce overland flows. Flood waters may take up to 36 hours to recede.
- 2. During floods many major and minor Streets and Roads may be inundated by floodwaters. Traveling through floodwaters by foot or by vehicle can be dangerous due to rapid currents, pollution or hidden obstructions. Council recommends remaining in-doors as much as practical. In the event of a flood on Evan Street, residents will be safe within the residence and vehicles will be safe within the on-site car parking area. It is not recommended to leave the property by foot or vehicle in the event of a flood

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- 3. Develop your own family flood plan and be prepared if flooding should occur whilst any residents are commuting to and from work or school. Contact Council for information about safer travel routes that are less likely to be cut by floodwaters.
- 4. In the event flood waters breach the boundary, gather medical supplies, special needs of any residents, mobile phones, important documents, any valuables and evacuate to the higher level via the internal stairs.
- 5. For above ground garages/parking facilities, if it is safe to do so, retrieve any items that may be damaged by water.
- 6. As the flood level approaches the habitable floor level:
- Gather medical supplies, special needs of any residents, mobile phones, important documents and any valuables to one location.
- Try to wear the appropriate clothing for the conditions, move any items within the residence that can be damaged by water to higher positions and place electrical items at the very top. For larger items that cannot be moved, turn them off and disconnect them from the power points.
- Place wet towels across the bottom sides of external doors to slow down the ingress of water.
- 7. In the event that flood waters enter the residence, collect all items of value and move to a higher level if possible, or in a single level dwelling provide a chair in the kitchen to enable access to the kitchen bench preferably adjacent to the window. Ensure windows that may be used to exit the site in an emergency are not locked or have a key readily available. Do not evacuate the residence unless instructed to do so by the SES or the police. Keep in mind that floodwater may be deeper and flow faster than what is apparent.
- 8. In case of a medical emergency, call 000 and explain the situation with regards to the flooding.
- A laminated copy of this flood plan should be permanently attached to an area where all residents frequently access such as in the kitchen or laundry and to the inside of the electrical meter box.
- 10. This overland flow management plan should be reviewed every 5 years, particularly if there have been any major changes to climate conditions or weather patterns.
- 11. Flood education programs should be undertaken by residents to assist the community in commencing and maintaining flood preparations, as well as how to respond in the event that flooding occurs.

5. CONCLUSION

This flood risk management report has been composed for the proposed residential flat building development located at 28-32 Evan Street, Penrith. The development complies with Penrith council's DCP section C3.5 flood planning.

The 1% AEP flood levels are expected to reach RL35.9m in the vicinity of the site. The required freeboards (0.5m above FPL for habitable and 0.3m above FPL from non-habitable) have been achieved. As the flood waters are not expected to inundate the site, it is not recommended to evacuate the site during a flood event. The development is not expected to have any adverse impact on overland flow paths or inhibit flood waters in any way.

All residents should be aware of and have easy access to the flood risk management plan and contact details for the appropriate authorities in the case of an emergency.

6. REFERENCES

- 1. Penrith CBD Detailed Overland Flow Flood Study Final report by Cardno (Reference: W4735 Dated: 07/07/15)
- 2. Penrith Development Control Plan 2014 C3.5
- 3. NSW government Floodplain Development Manual the development of flood liable land (Dated: 04/05)

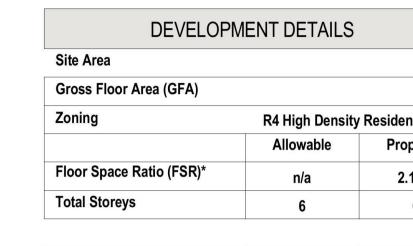
7. APPENDIX



PROPOSED RESIDENTIAL FLAT BUILDING

28-32 Evans Street, Penrith, NSW, 2750

UNITS TYPES					
Type Count					
	I				
1B	7				
1B + studio	1				
1B Livable	1				
2B	21				
2B Adap. & Liv.	4				
2B Livable	4				
3B	2				
	40				



		9	
Communal Open Space	25%	410.7m ²	25%
Deep Soil Zones	7%	626.9m ²	38%

LEP REQUIREMEI SEPP 65 REQUIREMEI REFER SHEET DA02 FOR DETAIL

	GROSS FLOOR AREA		
	Level	Area	
	GROUND LEVEL	398.8 m²	
1	LEVEL 1	706.5 m ²	
ļ.	LEVEL 2	706.5 m ²	
	LEVEL 3	706.5 m ²	
	LEVEL 4	596.0 m ²	
_	LEVEL 5	492.9 m ²	
[Grand total: 6	3607.4 m ²	

COMMON OPEN SPACE				
Area	% of Site			
246.3 m ²	15.08			

	LANDSCAPE AREA		
Area % of Site			
472.4 m ²	28.93		
95.5 m ²	5.85		
568.0 m ²	34.78		

DEEP SOIL AREA					
Name	Area	% the Site			
DEEP SOIL	487.0 m ²	29.82			
DEEP SOIL (1,4-4m deep)	109.7 m ²	6.72			
	596.7 m ²	36.54			

CAR SPACES REQUIRED				
3 Bed units: 2	4			
2 Bed units: 25	25			
2 Bed units Adaptable: 4	4			
1 Bed units: 9	9			
Visitors (1/5)	8			
Service vehicles (1/40)	1			
Washing bay (1/50)				
Grand total	51			

CAR SPACES - TYPES				
Туре	Number			
Class 3 - 2500w x 5400d	38			
Class 3 - 2500w x 5400d (Visitor)	6			
Class 3 - 2500w x 5400d (Washing+Service)	1			
Class 4 - 2500w x 5400d (Disabled)	4			
Grand total: 49	49			

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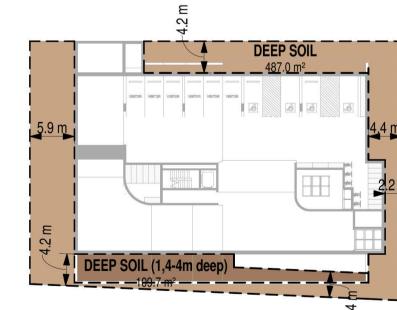




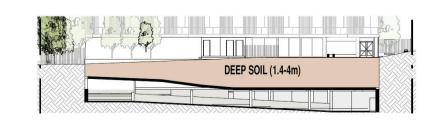
GROUND LEVEL COS



GROUND LEVEL LANDSCAPE



DEEP SOIL



SECTION DEEP SOIL

ISSUE	DATE	AMENDMENT
P1	07-11-2018	Pre-Da + Urban meeting
P2	05-02-2019	FOR CONSULTANTS
P3	12-03-2019	Urban meeting 2
P4	02-04-2019	FOR CONSULTANTS



PROJECT
PROPOSED RESIDENTIAL FLAT BUILDING

ADDRESS
28-32 Evans Street, Penrith, NSW, 2750

MORSON REGISTR GROUP (02) 938 PO Box 1

MORSON

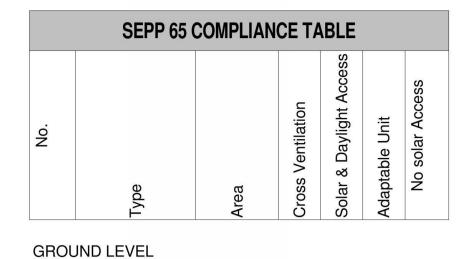
SHEET SIZE: A1

SCALE DATE

As indicated

SHEET NAME VIEWS AND SCHEDULES

DRAWING NUMBER DAOO



STATE OF THE STATE OF						
01	2B Adap. & Liv.	84.1 m ²	Yes	Yes	Yes	No
02	2B Adap. & Liv.	84.1 m ²	No	Yes	Yes	No
03	1B Livable	50.0 m ²	Yes	Yes	No	No
04	2B Livable	79.8 m ²	Yes	No	No	No
LEVE	L 1				20	
11	2B	80.4 m ²	Yes	No	No	No
12	2B Adap. & Liv.	80.4 m ²	No	No	Yes	No
13	2B Adap. & Liv.	80.5 m ²	No	No	Yes	No
14	1B	50.0 m ²	Yes	Yes	No	No
15	2B	83.9 m ²	Yes	Yes	No	No
16	2B	83.4 m ²	No	Yes	No	No
17	2B	79.8 m ²	No	Yes	No	No
18	2B Livable	75.0 m ²	Yes	Yes	No	No

SEPP 65 COMPLIANCE TABLE									
No.	Туре	Area	Cross Ventilation	Solar & Daylight Access	Adaptable Unit	No solar Access			

			_	0,		
LEVE	L 2					
21	2B	80.5 m ²	Yes	No	No	No
22	2B	80.5 m ²	No	No	No	No
23	2B	80.5 m ²	No	No	No	No
24	1B	50.0 m ²	Yes	Yes	No	No
25	2B	83.9 m ²	Yes	Yes	No	No
26	2B	83.4 m ²	No	Yes	No	No
27	2B	79.8 m ²	No	Yes	No	No
28	2B Livable	75.0 m ²	Yes	Yes	No	No
LEVE	L 3					
31	2B	80.5 m ²	Yes	No	No	No
32	2B	80.5 m ²	No	No	No	No
33	2B	80.5 m ²	No	No	No	No
34	1B	50.0 m ²	Yes	Yes	No	No
35	2B	83.9 m ²	Yes	Yes	No	No
36	2B	83.4 m ²	No	Yes	No	No
37	2B	79.8 m ²	No	Yes	No	No
38	2B Livable	75.0 m ²	Yes	Yes	No	No

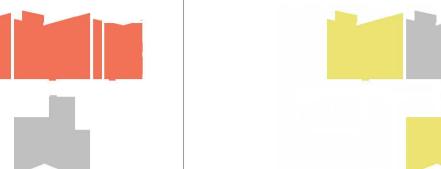
	SEPP 65	COMPLIAN	CE TA	BLE		
O	Туре	Area	Cross Ventilation	Solar & Daylight Access	Adaptable Unit	No solar Access
LEVEI	L 4					
41	1B	56.9 m ²	Yes	No	No	No

	H		O	S	\triangleleft	
LEVE	EL 4					
41	1B	56.9 m ²	Yes	No	No	No
42	2B	80.5 m ²	No	Yes	No	No
43	3B	106.8 m ²	Yes	Yes	No	No
44	1B	58.4 m ²	Yes	No	No	No
45	2B	83.4 m ²	No	Yes	No	No
46	3B	123.4 m ²	Yes	Yes	No	No
LEVE	L 5					
51	1B	50.6 m ²	Yes	Yes	No	No
52	2B	75.3 m ²	Yes	Yes	No	No
53	1B + studio	61.4 m ²	Yes	Yes	No	No
54	2B	81.7 m ²	Yes	Yes	No	No
55	2B	90.0 m ²	No	Yes	No	No
56	1B	56.9 m ²	Yes	Yes	No	No
UNIT	S: 40	3063.0 m²	24/40 60%	28/40 70%	4/40 10%	0/40 0%



DAYLIGHT ACCESS GF

DAYLIGHT ACCESS LVL1



CROSS VENTILATION

CROSS VENTILATION GF

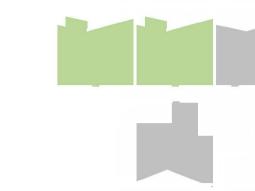
CROSS VENTILATION LVL1

CROSS VENTILATION LVL2

CROSS VENTILATION LVL3

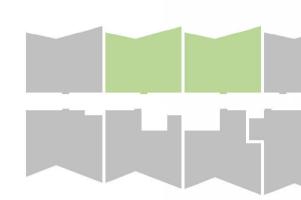
CROSS VENTILATION LVL4

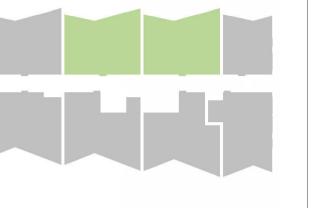


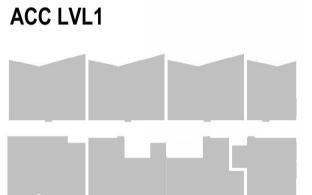


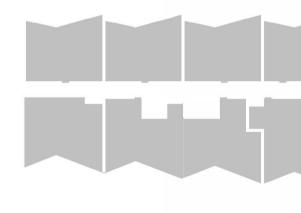
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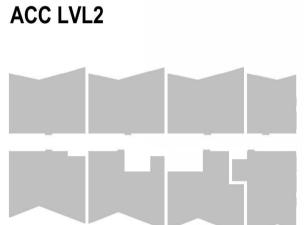
ACC GF

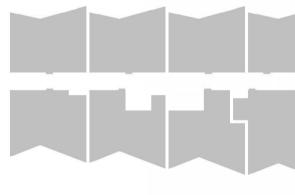


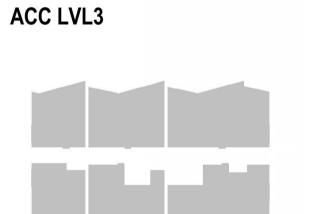


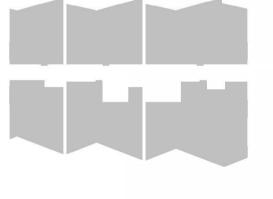




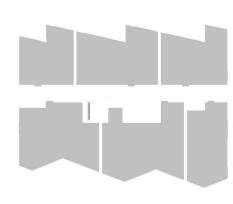












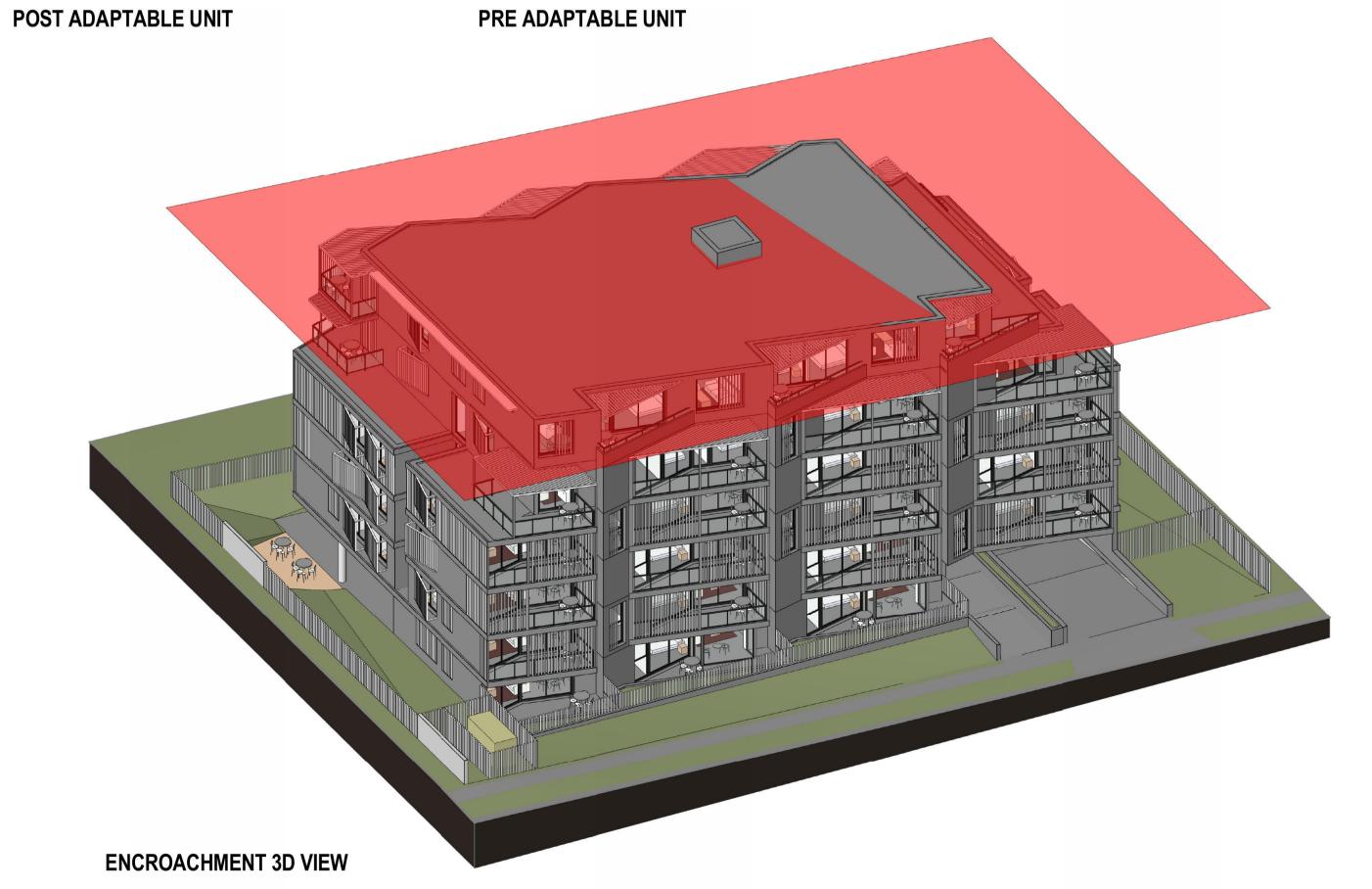
ACC LVL5

6 1000
1025
145018
POST ADAPTABLE UNIT
1600 12 605 865

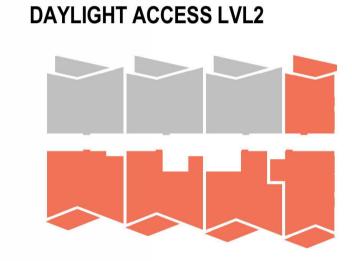


ADAPTABLE UNITS							
UNIT	LEVEL	TYPE					
01	GROUND FLOOR	2 BED					
02	GROUND FLOOR	2 BED					
12	FIRST LEVEL	2 BED					
13	FIRST LEVEL	2 BED					

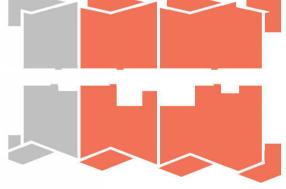




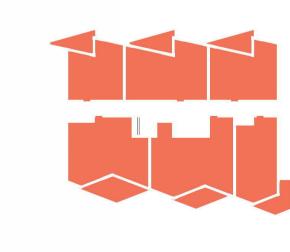
AD	ADAPTABLE UNITS							
UN	IIT	LEVEL	TYPE					
0	1	GROUND FLOOR	2 BED					
0.	2	GROUND FLOOR	2 BED					
1.	2	FIRST LEVEL	2 BED					
1	3	FIRST LEVEL	2 BED					







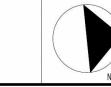
DAYLIGHT ACCESS LVL4



DAYLIGHT ACCESS LVL5 **CROSS VENTILATION LVL5**

Basement Unit Unit 22 Basement Unit Unit	Height 3450 2650 2650	Width 570	Depth	Volume	Unit / Location	Height	Width	Depth	Volume
Unit Unit D2 Basement Unit Unit	2650		1000						
Unit 02 Basement Unit Unit			1990	3.91 m ³	31				8.52 m ³
02 Basement Unit Unit	2650	900	600	1.43 m ³	Basement	3350	600	2540	5.11 m ³
Basement Unit Unit	10.100000000000000000000000000000000000	500	3200	4.24 m ³	Unit	2650	2200	500	2.92 m ³
Basement Unit Unit				9.58 m ³	32				8.02 m ³
Unit	3450	570	1990	3.91 m ³	Basement	3350	600	2550	5.13 m ³
	2650	900	600	1.43 m ³	Unit	2650	2200	500	2.92 m ³
00	2650	500	3200	4.24 m ³	00				8.04 m ³
03				9.58 m ³	33 Basement	3350	600	2550	5.13 m ³
	3450	1750	583	3.52 m ³	Unit	2650	2200	500	2.92 m ³
Unit	2650	500	1000	1.33 m ³		**			8.04 m ³
Unit	2650	500	1800	2.39 m ³	34	0.450	1750	500	0.50
04				7.23 m ³	Basement Unit	3450 2650	1750 500	583 1000	3.52 m ³ 1.33 m ³
Basement	3450	1750	583	3.52 m ³	Unit	2650	500	1800	2.39 m ³
Unit	2650	800	1040	2.20 m ³	O.I.K	2000	000	1000	7.23 m ³
Unit	2650	2730	500	3.62 m ³	35				
				9.34 m ³	Basement	3313	600	2400	4.77 m ³
11	0010	000	0000	0.003	Unit	2650	2550	550	3.72 m ³
Basement Unit	3313 2650	600 2200	3060 500	6.08 m ³ 2.92 m ³	Unit	2650	500	700	0.93 m ³ 9.41 m ³
Offic	2000	2200	300	9.00 m ³	36				9.41 111
12					Basement	3313	600	2550	5.07 m ³
00.00	3450	570	1990	3.91 m ³	Unit	2650	550	3000	4.37 m ³
Unit	2650	900	600	1.43 m ³			_		9.44 m ³
Unit	2650	500	3200	4.24 m ³	37	00:-	000	055-	F 67
10				9.58 m ³	Basement	3313	600	2550	5.07 m ³
13 Basement	3450	5300	600	10.97 m ³	Unit Unit	2650 2650	800 2730	1040 500	2.20 m ³
Basement Unit	2650	900	600	10.97 m ³	OTIIL	2000	2/30	J00	3.62 m ³ 10.89 m ³
Unit	2650	500	3200	4.24 m ³	38				.0.03 111
				16.64 m ³	Basement	3200	600	2400	4.61 m ³
14					Unit	2650	3100	430	3.53 m ³
Basement	3450	1750	583	3.52 m ³	900				8.14 m ³
Unit	2650	500	1000	1.33 m ³	41 December	0400	000	0000	4.04 2
Unit	2650	500	1800	2.39 m ³ 7.23 m ³	Basement Unit	3100 2650	600 500	2266 1000	4.21 m ³ 1.33 m ³
15				7.23 1119	Unit	2650	500	1778	2.36 m ³
	3450	1750	583	3.52 m ³	OTIL	2000	000	1770	7.89 m ³
Unit	2650	2550	550	3.72 m ³	42				
Unit	2650	500	700	0.93 m ³	Basement	3000	600	2834	5.10 m ³
				8.16 m ³	Unit	2650	2200	500	2.92 m ³
16 Pagamant	3450	1750	583	2 E2 m3	40				8.02 m ³
Basement Unit	2650	650	3000	3.52 m ³ 5.17 m ³	43 Basement	2800	600	2400	4.03 m ³
J. 110	_550	550	5500	8.69 m ³	Unit	2650	2200	500	2.92 m ³
17					Unit	2650	2200	600	3.50 m ³
Basement	3657	1750	583	3.73 m ³					10.45 m ³
Unit	2650	800	1040	2.20 m ³	44		000		1.51
Unit	2650	2730	500	3.62 m ³	Basement	2750	600 500	2550	4.21 m ³
18				9.55 m ³	Unit Unit	2650 2650	500	1000 2300	1.33 m ³ 3.05 m ³
Basement	3450	2400	683	5.66 m ³	J		1550		8.58 m ³
Unit	2650	3100	430	3.53 m ³	45				
				9.19 m ³	Basement	2650	600	2550	4.05 m ³
21	0.450	0.400	200	T 00 0	Unit	2650	550	3000	4.37 m ³
Basement	3450	2400	683	5.66 m ³	46				8.43 m ³
Unit	2650	2200	500	2.92 m ³ 8.57 m ³	46 Basement	2650	600	3500	5.57 m ³
22				0.57 111	Unit	2650	600	2978	4.73 m ³
Basement	3450	2400	678	5.62 m ³					10.30 m ³
	2650	2200	500	2.92 m ³	51				
	_	_	_	8.53 m ³	Ground	2650	2100	860	4.79 m ³
23 Pagamant	2450	0400	600	E CC2	Unit	2650	1000	500	1.33 m ³
Basement Unit	3450 2650	2400 2200	683 500	5.66 m ³ 2.92 m ³	52				6.11 m ³
Ji iit	2000		_550	8.57 m ³	Ground	2650	2200	700	4.08 m ³
24					Unit	2650	1400	700	2.60 m ³
Basement	3450	1750	583	3.52 m ³	Unit	650	4217	500	1.37 m ³
Unit	2650	500	1000	1.33 m ³					8.05 m ³
Unit	2650	500	1800	2.39 m ³	53	00==	0000	700	100
25				7.23 m ³	Ground	2650	2200	700	4.08 m ³
25 Basement	3450	1750	583	3.52 m ³	Unit	2650	1800	500	2.39 m ³ 6.47 m ³
Unit	2650	2550	550	3.72 m ³	54				U.71 III"
Unit	2650	500	700	0.93 m ³	Basement	2650	5300	700	9.83 m ³
				8.16 m ³	Unit	2650	1200	600	1.91 m ³
26		T.							11.74 m ³
Basement	3450	2400	683	5.66 m ³	55				
Unit	2650	550	3000	4.37 m ³	Ground	2650	1700	780	3.51 m ³
27				10.03 m ³	Unit Unit	2650 2650	1900 500	500 1500	2.52 m ³ 1.99 m ³
27 Basement	3450	2400	683	5.66 m ³	OTIIL	2000	500	1300	8.02 m ³
Unit	2650	800	1040	2.20 m ³	56				3.3E III
Unit	2650	2730	500	3.62 m ³	Ground	2650	1700	854	3.85 m ³
			-	11.48 m³	Unit	2650	3050	600	4.85 m ³
28									8.70 m ³
Basement	3450	700	2065	4.99 m ³					
Unit	2650	3100	430	3.53 m ³					

ISSUE	DATE	AMENDMENT
P1	07-11-2018	Pre-Da + Urban meeting
P2	05-02-2019	FOR CONSULTANTS
P3	12-03-2019	Urban meeting 2
P4	02-04-2019	FOR CONSULTANTS



PROJECT
PROPOSED RESIDENTIAL FLAT BUILDING ADDRESS 28-32 Evans Street, Penrith, NSW, 2750

MORSON GROUP:

SHEET SIZE: A1 SCALE DATE
As indicated SEPP65 COMPLIANCE SCHEDULE

DA01 ISSUE NO.

	Design Criteria	Compliance	Design Proposal		Design Criteria	Compliance	Design Proposal
1	1. Communal open space has a minimum area equal to 25% of the site 2. Developments achieve a minimum of 50% direct sunlight to the principal usable part of the communal open space for a minimum of 2 hours between 9 am and 3 pm on 21 June (mid winter)	NO	There is a total combined Communal Open Space Area of 243.3m². As a percentage of the site, this equates to 15.08%; falling short of the minimum requirement. The total Communal Open Space achieves a minimum of 50% direct sunlight to the principle, usable parts for a minimum of 2 hours between 9am and 3pm on 21 June. See 'Principle 9: Housing Diversity & Social Interaction' below for further details. There is a total combined Landscape Area of 568m². As a percentage of the site, this equates to 34.78%.	4D-1	Apartments are required to have the following minimum internal areas: Apartment type	YES	All minimum apartment sizes are achieved
Č	Deep soil zones are to meet the following minimum requirements: Site Area	YES	There is a total combined Deep Soil Area of 596.7m². As a percentage of the site, this equates to 36.54%; exceeding the minimum requirement. Along the Eastern boundary, there is a large strip of deep soil which presents an opportunity for extensive planting.		a total minimum glass area of not less than 10% of the floor area of the room. Daylight and air may not be borrowed from other rooms.		
	>1,500m² 6m			4D-2	Habitable room depths are limited to a maximum of 2.5 x the ceiling height In open plan layouts (where the living, dining and kitchen are combined) the maximum habitable room depth is 8m from a window	YES	All habitable room depths comply with the calculation (2.5 x ceiling height) All habitable room depths, with open plan layouts, are less than 8m from a window
	Separation between windows and balconies is provided to ensure visual privacy is achieved. Min required separation distances from buildings to the side and rear boundaries are as follows: Building Height	NO	Refer to Statement of Environmental Effects (SEE) for a detailed building separation summary	4D-3	1. Master bedrooms have a minimum area of 10m² and other bedrooms to have 9m² (excluding wardrobe space) 2. Bedrooms have a minimum dimension of 3m (excl. wardrobe space) 3. Living rooms or combined living/dining rooms have a minimum width of: • 3.6m for studio and 1 bed apartments • 4m for 2 and 3 bedroom apartments	YES	All Master Bedrooms have a minimum area of 10m². In a majority of the apartment the second bedroom is also 10m².
	privacy separation distances between neighbouring properties. 1. Living rooms and private open spaces of at least 70% of	YES	A total of 28/40 apartments receive a minimum of 2 hours direct sunlight between	4E-1	All apartments are required to have primary balconies as follows: Dwelling type	YES	All minimum primary balcony sizes are met.
	apartments in a building receive a minimum of 2 hours direct sunlight between 9 am and 3 pm at mid winter in the Sydney Metropolitan Area and in the Newcastle and Wollongong local government areas.	ILO	9am and 3pm at mid winter. This equates to 70%		1 bedroom apartments 8m² 2m 2 bedroom apartments 10m² 2m 3+ bedroom apartments 12m² 2.4m The minimum balcony depth to be counted as contributing		
	3. A maximum of 15% of apartments in a building receive no direct sunlight between 9 am and 3 pm at mid winter	YES	100% of apartments receive direct sunlight between 9am and 3pm at mid winter		to the balcony area is 1m. 2. For apartments at ground level or on a podium or similar structure, a private open space is provided instead of a balcony. It must have a minimum area of 15m² and a minimum depth of 3m		
B-3	1. At least 60% of apartments are naturally cross ventilated in the first nine storeys of the building. Apartments at ten storeys or greater are deemed to be cross ventilated only if any enclosure of the balconies at these levels allows adequate natural ventilation and cannot be fully enclosed	YES A total of 24/40 apartments are naturally cross ventilated. This equates to 60% and well exceeds to minimum of 60%. Due to the nature of the design and creation of corner apartments, this will provide great amenity.		4F-1	The maximum number of apartments off a circulation core on a single level is eight For buildings of 10 storeys and over, the maximum number of apartments sharing a single lift is 40	YES	There are maximum 8 apartments per level.
	Overall depth of a cross-over or cross-through apartment does not exceed 18m, measured glass line to glass line	N/A	There are no cross-over apartments in the proposed design.		aparanento onanny a omyle int io 40		
	Measured from finished floor level to finished ceiling level, minimum ceiling heights are: Minimum ceiling height for apartment and mixed use buildings Habitable rooms 2.7m Non-habitable 2.4m For 2 storey 2.7m for main living area apartments 2.4m for second floor, where its area does not exceed 50% of the apt area.	YES	As we have allowed 2950mm between each level, all minimum ceiling heights can realistically be achieved with 200mm concrete slabs and plaster on ceilings. (Refer to DA28)	4G-1	In addition to storage in kitchens, bathrooms and bedrooms, the following storage is provided: Apartment type	YES	All minimum storages are met.

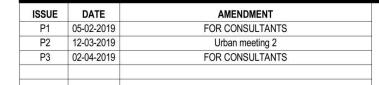
Principle 1: Context and Neighbourhood Character The proposed development significantly contributes to the local context & character of the area. By providing a diverse range of apartment options which are affordable for a wider demographic of people, it not only assists with the densification issue currently within Sydney, but also provides social & economic benefits for the community. These include new businesses, improvement to environmental conditions ie. parks, roads (through contributions) and social interaction & participation in community events just to name a few. The Landscaping strategy has been critically analysed to ensure that is not only enhances the existing character of the neighbourhood, but also the future character. If each development can do the same, it will create a continous green network of planting. By doing so, it will not only achknowledge the key built & natural features of the area, but also improve them. Good design responds and contributes to its context. Context is the key natural and built features of an area, their relationship and the character they create when combined. It also includes social, economic, health and environmental conditions. Responding to context involves identifying the desirable elements of an area's existing or future character. Well designed buildings respond to and enhance the qualities and identity of the area including the adjacent sites, streetscape and neighbourhood. Consideration of local context is important for all sites, including sites in established areas, those undergoing change or identified for change.				Housing affordability is a key issue within Sydney that affects both Individuals & Families. Increased supply of various housing options at an affordable price is key in dealing with the increased levels of densification. The proposal aims to cater for a diverse number of individuals & families looking to get into the housing market. Located within walking distance to the Nepean hospital, it provides good potential renting posibilities for owners. Similarly, the number of jobs & community facilities within Penrith (and the greater region) continues to increase, not to mention the work being done on the local environment; specifically at the Nepean River. Both Penrith & Kingwood train stations are in close proximity to the development, as well as local buses which frequently operate along the Northern Rd (150m walk)		Principle 4: Sustainability As Penrith has a large temperature variation between Winter & Summer Solstice, the need to provide amenity through passive design was one of the key drivers for the proposal. By creating numerous corner apartments, it allows natural ventilation rather than mechanical heating or cooling. We have well exceeded the minimum requirement (62%) for cross ventilation in SEPP65. Additional to this, we have ensured that over 70% of the apartments will have great access to daylight all year round. This will reduce the reliance on artificial lighting and in turn, energy. On each level, we have provided a Bin Chute system with both Residual & Recycling options. This is amass within the waste room (Basement) and be collected multiple times throughout the week to ensure it is being dealt with responsively. Good design combines positive environmental, social and economic outcomes. Good sustainable design includes use of natural cross ventilation and sunlight for the amenity and liveability of residents and passive thermal design for ventilation, heating and cooling reducing reliance on technology and operation costs. Other elements include recycling and reuse of materials and waste, use of sustainable materials and deep soil zones for groundwater recharge and vegetation.									
								Principle 5: Landscape	Principle 6: Amenity		Principle 7: Safety		Principle 8: Housing Diversity & Social Interaction		Principle 9: Aesthetics
								We have worked closely with our Landscape Architect to ensure that the Landscape design achieves our intent. To improve the local context, neighbourhood character screen the building & connecting an existing green network, we propose a continous tree row of canopy trees. They will have a mature growth height of approximately 9m, which will asisst in bringing down the scale of the built form. We have consciously created a large area of Deep Soil to the proposal. This will allow us to have significant planting in that area. We want the Landscaping & Building to work together & compliment one another.	dscape design achieves our intent. To improve the local in neighbourhood character screen the building & connecting an interaction of the apartments are efficient, spacious & a large majority allow for natural ventilation. Over 70% of the apartments will receive great access to sunlight all year round; reducing the requirements for artificial lighting. To mitigate visual privacy concerns associated to building separation, we propose a variety of extruded elements which, when placed in the correct position, completely eliminate any privacy issues. As we have carefully considerd the landscaping strategy, residents are generally screened by large canopy trees, which also contribute towards shielding the hot summer sun whilst providing another level of privacy/acoustic treatment to the surrounding context.		Residents enter through a walkway through a secure, clearly defined access point & into the entry foyer. Not only will the main entry be adequately lit at night, the window provided next to the car park entry overlooks this area; encouraging passive surveillance at all times. The Common Open Space is located on level Fifth and roof. It was designed as a safe, quiet & relaxing space with extensive landscaping. Many developments have a number of walkways & common spaces which are located at the rear of the building. From our experience, this is where residents feel most unsafe & uncomforatble. With this in mind, we eliminated this from our design & simply improved the size & amenity of the private terraces. All of the public & private spaces are clearly defined and well integrated to the local neighbourhood.		residents. We aim to encourage various methods of social interaction by creating two contrasting atmospheres. The Common Area on level 5 provides an accesible Common Area for disabled people, as well as a		Typically, the streetscape character of the area is predominantly individual, free standing houses. Now re-zoned & unrealistic for increased densification, we believe it is important to bring that character through in our facade treatment & overall building envelope. Along Even St, the proposal reads as four individual towers. This has been achieved by altering the scale, composition, colours & textures of each tower. The design similarly considers the internal layout & structure of the building as a priority to ensure amenity & functionaly is not sacrificed.
Good design recognises that together landscape and buildings operate as an integrated and sustainable system, resulting in attractive developments with good amenity. A positive image and contextual fit of well designed developments is achieved by contributing to the landscape character of the streetscape and neighbourhood.	The East & West elevations have bee carefully considered. Using a variety of colours, horizontal & vertical elements, we have broken down the scale of the building and provided a suitable transition between the North & South facade differences.														
Good landscape design enhances the development's environmental performance by retaining positive natural features which contribute to the local context, co-ordinating water and soil management, solar access, micro-climate, tree canopy, habitat values and preserving green networks.		nfluences internal and external amenity for residents and neighbours. Achieving s to positive living environments and resident well being.	Good design optimises safety and security within for quality public and private spaces that are clean Opportunities to maximise passive surveillance of		Good design achieves a mix of apartment sizes, providing housing choice for different de living needs and household budgets. Well designed apartment developments respond to social context by providing housing as		Good design achieves a built form that has good proportions and a balanced composition of elements								
Good landscape design optimises useability, privacy and opportunities for social interaction, equitable access, respect for neighbours' amenity and provides for practical establishment and long term management.	ies for social interaction, equitable Good amenity combines appropriate room dimensions and shapes, access to sunlight, natural		A positive relationship between public and private spaces is achieved through clearly defined secure access points and well lit and visible areas that are easily maintained and appropriate to the location and purpose.		to suit the existing and future social mix. Good design involves practical and flexible features, including different types of communal spaces for a broad range of people and providing opportunities for social interaction among residents.		reflecting the internal layout and structure. Good design uses a variety of materials, colours and textur The visual appearance of a well designed apartment development responds to the existing or future to context, particularly desirable elements and repetitions of the streetscape.								

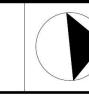
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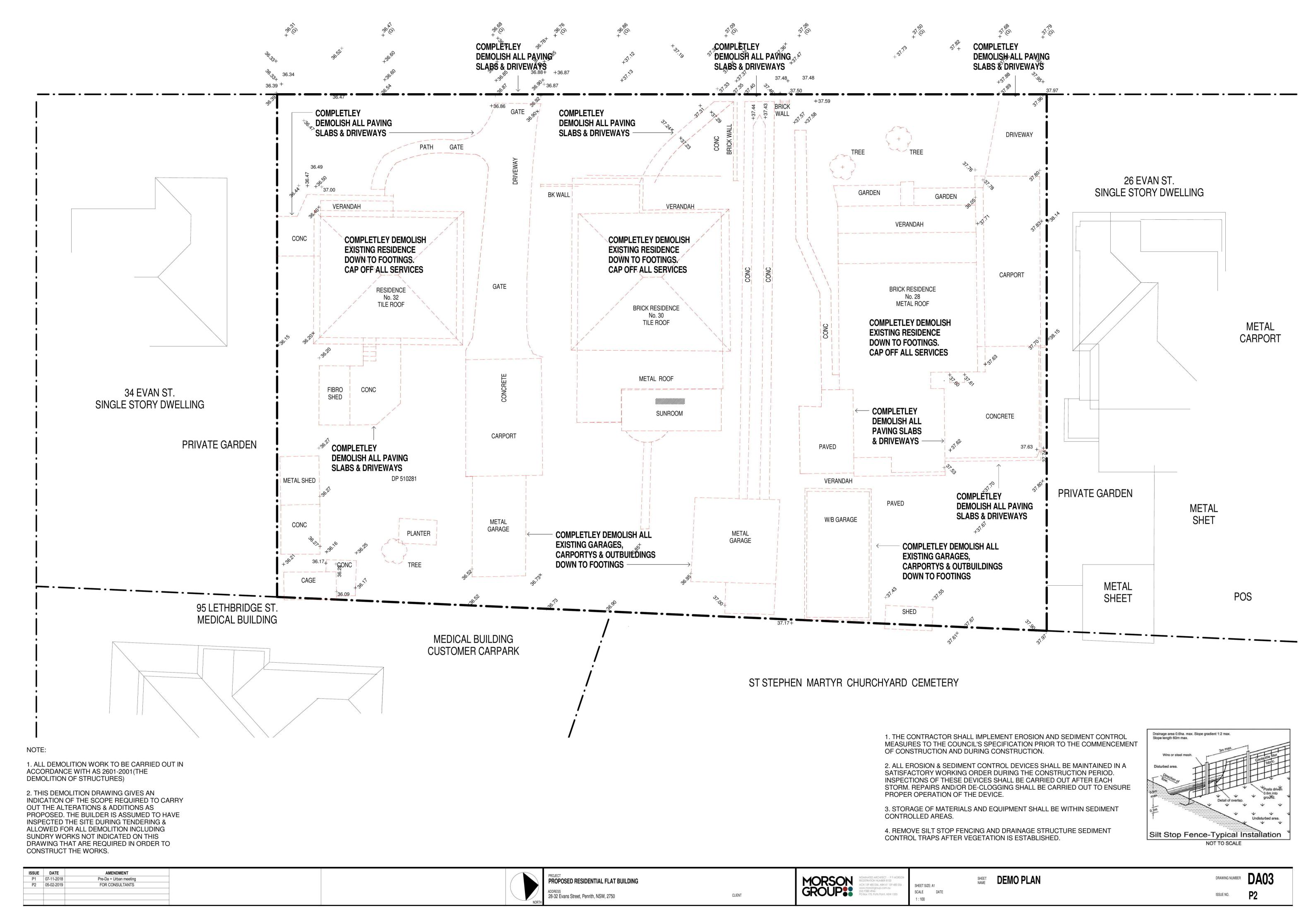


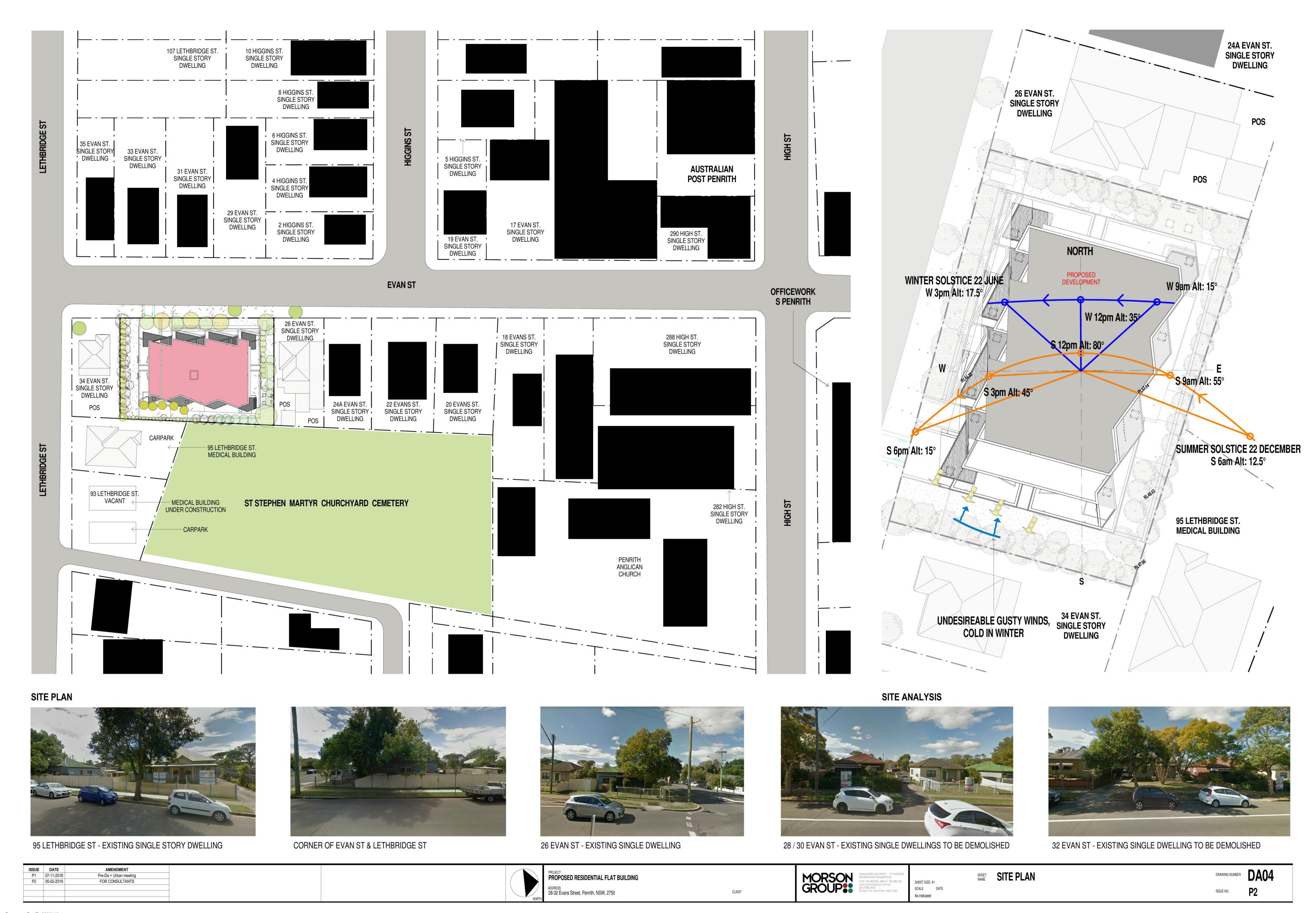
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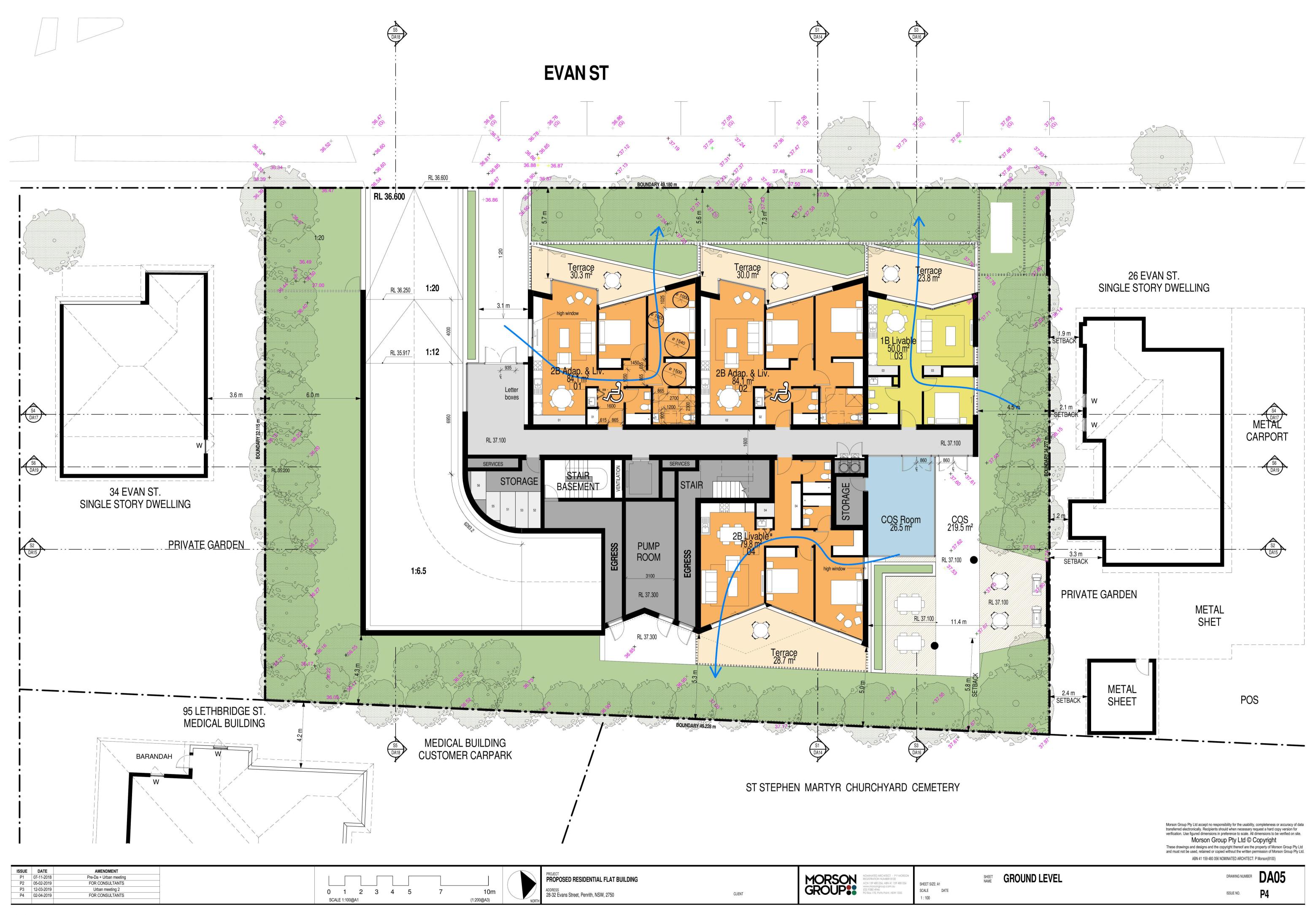
SCALE DATE

DRAWING NUMBER DA02
ISSUE NO. P3

PROPOSED RESIDENTIAL FLAT BUILDING













Flood Information Lot 1 DP 510281 No. 32 Evan Street Penrith

Date of issue: 18 January 2017

The 1% AEP local overland flow flood level in the vicinity of the above property is estimated to be RL35.9m AHD

Property less than 0.5m above the 1% AEP flood level is subject to Penrith Development Control Plan 2014 Section C3.5 Flood Planning. The Penrith Development Control Plan 2014 is available from Council's website www.penrithcity.nsw.gov.au.



Definitions

AEP - Annual Exceedance Probability - the chance of a flood of this size occurring in any one year.

AHD – Australian Height Datum – A standard level datum used throughout Australia, approximately equivalent to mean sea level.

Legend

Extent of 1% AEP local catchment overland flow path. Generally depths less than 150mm is not shown.

Notes

- The contours shown above in yellow numbering are at 0.5m intervals and are based on Aerial Laser Scanning (ALS) Survey
 undertaken in 2002. The contour levels are approximate and for general information only. Accurate ground levels should be
 obtained by a Registered Surveyor.
- The flood level is based on current information available to Council at the date of issue. The flood level may change in the
 future if new information becomes available. The 1% AEP flood is the flood adopted by Council for planning controls. Rarer
 and more extreme flood events will have a greater effect on the property.
- Council's studies are reflected in flood mapping for the City which show properties potentially affected by overland flows in excess of 150mm.
- This property is shown on Council's flood mapping as potentially so affected.
- Council imposes flood related development controls where, in its opinion, such controls are justified. Such controls may or may
 not be imposed with respect to this property in the event of an application for development consent.
- 6. If a development proposal is submitted with respect to this property, Council will consider the possibility of flood or overland flow in the context of the application. Council may impose a requirement that the applicant for development consent carry out a detailed assessment of the possible overland water flows affecting the property (a flood study) and/or may impose other controls on any development designed to ameliorate flood risk.
- You are strongly advised if you propose to carry out development upon the property, that you retain the assistance of an
 experienced flooding engineer and have carried out a detailed investigation.
- Council accepts no liability for the accuracy of the flood levels (or any other data) contained in this certificate, having regard to the information disclosed in Notes "1" to "4". As such you should carry out and rely upon your own investigations.

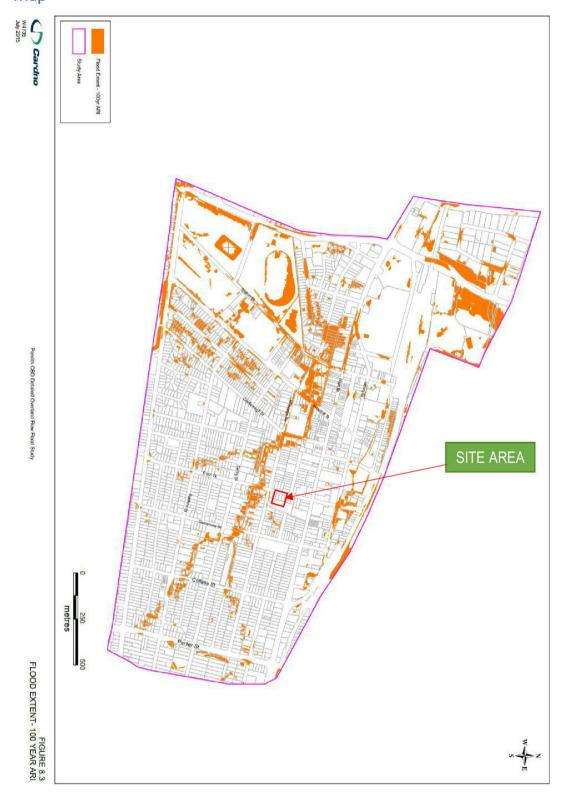
Penrith City Council PO 80x 60, Penrith NSW 2751 Australia T 4732 7777 F 4732 7958 penrithcity.nsw.gov.au

Ratnam Thilliyar

Engineering Stormwater Supervisor

PENRITH CITY COUNCIL

7.3 Figure 8.3 Penrith CBD Detailed Overland Flow Flood Study – 100 Year ARI Flood Map



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