

EXPERT OPINION: SOLAR ACCESS

Walsh² Analysis

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24-28 Viccliffe Avenue, Campsie – Development Application

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1.0 PRELIMINARIES AND SUMMARY

1.1 PRELIMINARIES

- 1.1.1 This expert opinion report is an analysis and verification of projected **solar access** compliance for the DA proposal at 24–28 Viccliffe Street, Campsie.
- 1.1.2 The DA is for 28 units under the State Environmental Planning Policy (Affordable Rental Housing) 2009.
- 1.1.3 Our qualifications and experience are summarized in *A.0 APPENDIX A: CREDENTIALS*.
- 1.1.4 The documents referred to in this report are detailed in *2.1 DOCUMENTS*.

1.2 SUMMARY

1.2.1 SOLAR ACCESS FOR APARTMENTS

To undertake the analysis we received a 3D model of the proposal located in the surrounding context. We then took half hourly views from the sun (Appendix B), and a detailed compliance table of the DA scheme was prepared (Appendix C).

20/28 (71.4%) of the dwellings achieve 3 hours or more sunlight to the Living area glazing and Private Open Space (POS) between 9am–3pm on June 21st. **This represents full compliance with Clause 14(1)(e) and therefore cannot be used to refuse consent.**

21/28 (75.0%) of the dwellings achieve 2 hours or more sunlight to the Living area glazing and Private Open Space (POS) between 9am–3pm on June 21st. **This represents full compliance with design criterion 1 of the ADG Objective 4A-1.**

0/28 (0%) of the dwellings are projected to achieve no sun 9am – 3pm June 21. **This represents full compliance with design criterion 3 of the ADG Objective 4A-1.**

2.0 DOCUMENTS AND INFORMATION

2.1 DOCUMENTS

2.1.1 We base our analysis and opinion on drawings by Stanton Dahl Architects:

DRAWING NO.	DRAWING NAME	REVISION	DEVISION DATE
DA01	COVER PAGE	11	11/12/2019
DA02	PERSPECTIVE IMAGES	10	11/12/2019
DA03	SITE ANALYSIS	10	11/12/2019
DA04	SITE & EXTERNAL WORKS PLAN	12	11/12/2019
DA04B	PROPOSED ROOF PLAN OVER SURVEY	01	11/12/2019
DA05	BASEMENT CAR PARK PLAN	12	11/12/2019
DA06	FLOOR PLAN – LEVEL 1	12	11/12/2019
DA07	FLOOR PLAN – LEVEL 2-3 (TYPICAL)	12	11/12/2019
DA08	FLOOR PLAN – LEVEL 4	12	11/12/2019
DA09	ROOF PLAN	10	11/12/2019
DA10	ELEVATIONS (SHT 1 OF 2)	10	11/12/2019
DA11	ELEVATIONS (SHT 2 OF 2)	10	11/12/2019

- 3D digital model supplied by the architects in Sketchup format:
 - o 2370.18_24-28 Viccliffe St, Campsie_A.skp

2.2 SITE

2.2.1 We note that we have inspected the site and its context via various online mapping software.



Figure 1: Arial View from SIX Maps

The site itself is spread over three lots and a four storey unit building it to be constructed on the site. The DA scheme has significant setbacks to the southern boundary.

3.0 SOLAR ACCESS

3.1 RELEVANT SOLAR ACCESS CONTROLS

3.1.1 SEPP (AFFORDABLE RENTAL HOUSING)

SEPP (Affordable Rental Housing) 2009 – Division 1 In-fill affordable housing clause 14 (1) (e), provides the non-discretionary development standard:

14 Standards that cannot be used to refuse consent

(1) A consent authority must not refuse consent to development to which this Division applies on any of the following grounds:

inter alia

(e) solar access

if living rooms and private open spaces for a minimum of 70 per cent of the dwellings of the development receive a minimum of 3 hours direct sunlight between 9am and 3pm in mid-winter.

(3) A consent authority may consent to development to which this Division applies whether or not the development complies with the standards set out in subclause (1) or (2).

16 Continued application of SEPP 65

Nothing in this Policy affects the application of *State Environmental Planning Policy No 65—Design Quality of Residential Flat Development* to any development to which this Division applies.

3.1.2 APARTMENT DESIGN GUIDE

The *Apartment Design Guide (ADG)* gives effect to SEPP65 for assessing solar access and other amenity provisions and gives the following quantified recommendations:

<i>Objective 4A-1</i>	
To optimise the number of apartments receiving sunlight to habitable rooms, primary windows and private open space	
<i>Design criteria</i>	
1.	Living rooms and private open spaces of at least 70% of 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
2.	In all other areas, living rooms and private open spaces of at least 70% of apartments in a building receive a minimum of 3 hours direct sunlight between 9 am and 3 pm at mid winter
3.	A maximum of 15% of apartments in a building receive no direct sunlight between 9 am and 3 pm at mid winter

3.1.3 LOCAL CONTROLS

We note that **Solar access (6.1) Design criteria** in the ADG are *discretionary controls* which, by virtue of Cl. 6A of SEPP65, take precedence over controls contained in Councils' DCPs.

In quantifying the compliance for solar access for this application, we rely on satisfying the SEPP (Affordable Rental Housing) 2009 & ADG as also satisfying the DCP requirements.

3.2 PREDICTED SOLAR ACCESS: METHODOLOGY

We employ the following analysis methodology.

3.2.1 3D DIGITAL MODEL

For a detailed analysis of solar access, we refer to a 3D model that has been provided by Stanton Dahl Architects. A Sketchup file was sent to us on the 03/04/2020 named "2370.18_24-28 Viccliffe St, Campsie_A.skp".

3.2.2 MODEL LOCATION

We have independently geo-located the model and verified the direction of North based off the survey file named "74878_Surveyors CAD 24-28 Viccliffe.dwg".

3.2.3 ACCURACY OF THE MODEL

From the model, we have summarily checked topographical and building dimensions that might otherwise give rise to any errors, by reference to figured RL dimensions. We are satisfied that the model is sufficiently accurate for the purpose of solar access assessment.

3.2.4 VIEWS FROM THE SUN

The SketchUp software prepares the shadow projections by reference to accurate solar geometry. Because of the complexity of demonstrating the quantification of solar access to glazing and private open space of various orientations, our detailed analysis was performed primarily by using projections known as '**View from the Sun**' taken at half hourly intervals.

A view from the sun shows all sunlit surfaces at a given time and date. It therefore allows a very precise count of sunlight hours on any glazing or horizontal surface, with little or no requirement for secondary calculations or interpolation. The technique is illustrated in Figure 1.

Note that a 'view from the sun' by definition does not show any shadows.



Figure 2: View from the sun, 12pm June 21

3.3 CHARACTERISATION OF SOLAR ACCESS COMPLIANCE

3.3.1 SUN PATCHES ON GLAZING

For the purpose of calculating the compliance with the control, we examine sun patches on the relevant glazing line of each apartment. Because of its key importance in the determination of what is 'effective sunlight' for characterisation of compliance, for both glazing and private open space, we refer specifically to the relevant *L+EC Planning Principle (The Benevolent Society v Waverley Council [2010] NSWLEC 1082)* in that:

- We quantify as complying all sun patches of 'reasonable size', which we generally take to be a minimum of approximately 1m².
- We ignore very large angles of incidence to the glazing surface, and unusably small areas of sunlit glazing.

There is no accepted standard for the absolute limit of acceptable area of the sun patch on partly shaded glazing. In accordance with the Court's Planning Principle, we consider this to be approximately 1m² (on the basis that it exceeds 50% of the area of a standard window 1500 x 1200 high which would normally be accepted as complying).

4.0 SOLAR ACCESS COMPLIANCE

4.1 SOLAR ACCESS COMPLIANCE

Table 1 below summarises the projected solar access for the living area glazing and private open space of the residential dwelling units for the amended design. Appendix C records the detailed solar access for individual apartments.

Total number of units	28	
Units which achieve 3 hours or more sunlight to glazing and POS 9am – 3pm June 21	20	71.4%
Units which achieve 2 hours or more sunlight to glazing and POS 9am – 3pm June 21	21	75.0%
Units with no sun between 9am and 3pm June 21	0	0.0%

Table 1: Summary of solar access for DA scheme

SEPP (Affordable Rental Housing) 2009 – Division 1 In-fill affordable housing clause 14 (1) (e) requires a minimum of 70 per cent of the dwellings of the development to receive a minimum of three hours direct sunlight between 9am and 3pm in mid-winter. The DA scheme has 71.4% total of such apartments.

Compliance with Clause 14 (1) (e) is achieved and therefore cannot be used to refuse consent.

The ADG Design criteria recommends a minimum of 70% of apartments should have the amenity of two hours winter sun between 9 AM and 3 PM. The DA scheme has 75% total of such apartments

Overall compliance for solar access is therefore fully satisfied.

The ADG design criteria recommends that a maximum of 15% of apartments in a building receive no direct sunlight between 9 am and 3 pm at mid-winter. The DA scheme has 0% total of such apartments.

Overall compliance for solar access is therefore fully satisfied.

4.2 COMMUNAL OPEN SPACE COMPLIANCE

The *Apartment Design Guide (ADG)* gives effect to SEPP65 for assessing solar access and other amenity provisions and gives the following quantified recommendations for communal open space:

<i>Objective 3D-1</i>	
An adequate area of communal open space is provided to enhance residential amenity and to provide opportunities for landscaping	
<i>Design criteria</i>	
1.	Communal open space has a minimum area equal to 25% of the site (see figure 3D.3)
2.	Developments achieve a minimum of 50% direct sunlight to the principle usable part of the communal open space for a minimum of 2 hours between 9 am and 3 pm on 21 June (mid winter)

The first import part of design criteria 2 is determining what is “the principle usable part of the common open space”. We have determined the principle usable part of the common open space as the area that is free from dense vegetation and outside of circulation zones. We determined it as the BBQ Area including the terraced area, as well as the turfed area to the east which include four bench seats. To further explain this area, we have included an extract of the landscape plan with what we have determined is the principle usable part in a red fill.

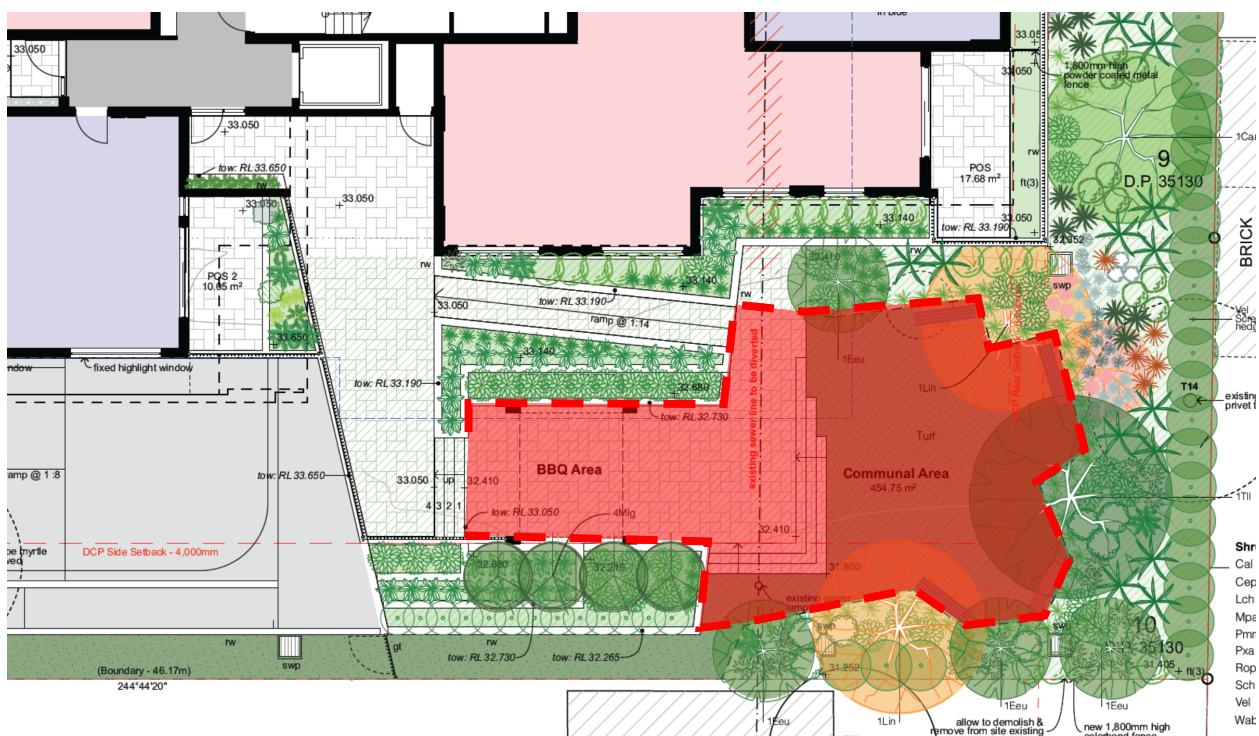


Figure 3: Extract from Landscape Plan with a red fill overlay

Once the principle usable part of the common open space is clearly defined, we then investigated its solar compliance. With reference to Appendix B's Views from the Sun, we can confirm that over 50% of direct sunlight is received to communal open space for the two hours of 9am-11am.

Compliance with Objective 3D-1 solar access to communal open space is therefore fully satisfied.

6.0 CONCLUSIONS

5.1 SOLAR ACCESS FOR APARTMENTS

5.1.1 SEPP (AFFORDABLE RENTAL HOUSING) 2009 COMPLIANCE

SEPP (Affordable Rental Housing) 2009 requires a minimum of 70 per cent of the dwellings of the development to receive a minimum of 3 hours direct sunlight between 9am and 3pm in mid-winter.

20/28 (71.4%) of the dwellings are projected to achieve 3 hours or more sunlight to glazing and POS 9am – 3pm June 21. This represents full compliance with Clause 14 (1) (e) and therefore cannot be used to refuse consent.

5.1.2 ADG COMPLIANCE

The ADG *Design criteria* recommend a minimum of 70% of apartments should have the amenity of two hours winter sun between 9 AM and 3 PM.

21/28 (75.0%) of the dwellings are projected to achieve 2 hours or more sunlight to glazing and POS 9am – 3pm June 21. This represents full compliance with the relevant ADG design criterion.

0/28 (0%) of the dwellings are projected to achieve no sun 9am – 3pm June 21. This represents a full compliance with the relevant ADG design criterion.

A.0 APPENDIX A: CREDENTIALS

Walsh² Analysis provides opinion based services primarily in relation to analysis and reporting of solar access and overshadowing compliance of multi residential projects.

Scott Walsh is a Director of Walsh² Analysis. He developed his specialised expertise under Steve King, a well-known expert in the field.

Scott started working for Steve King in 2011 as a tutor of Environmental Design at the University of New South Wales. From 2013 Scott has contracted to Steve King to undertake modelling and numerical analysis of solar access to large apartment projects. Over a number of years Scott contributed significantly to fine-tune the way the analysis was undertaken, and assisted in providing to the architects feedback in regards to areas that could be adjusted to improve solar access.

Scott holds a Masters of Architecture from the University of New South Wales as well as a Bachelor of Architecture. He is a registered architect in New South Wales (10366) and the Australian Capital Territory (2624) and a director of Walsh² Architects.




Stewart Cowan holds a Masters of Architecture at University of Technology Sydney. Stewart also assisted Steve King in undertaking modelling and numerical analysis work from early 2015.

Steve King:

I am pleased to provide my commendation and support for Walsh² Analysis. Scott and Stewart have undertaken solar access and overshadowing analysis of over 150 apartment buildings from as small as 10 units up to over 1000 units. I have relied on their technical expertise and accuracy to provide advice to architects, planners and to the Land and Environment Court, including independent third-party peer review of others' characterisation and reporting of compliance.

B.0 APPENDIX B: VIEWS FROM THE SUN

The table shows half-hourly views of solar access projections for June 21.

8.00	
8.30	
9.00	

9.30



10.00



10.30



11.00



11.30



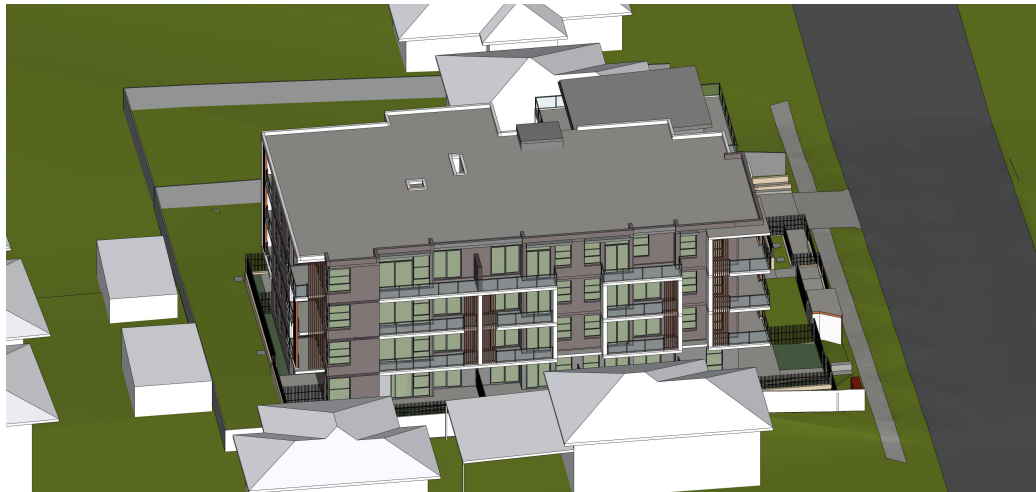
12.00



12.30



1.00



1.30



2.00



2.30



3.00



3.30



4.00



C.0 APPENDIX C: DETAILED COMPLIANCE TABLE

The following table sets out in detail the solar access status of each apartment.

UNIT NUMBER	ROOM	8	830	9	930	10	1030	11	1130	12	1230	13	1330	14	1430	15	1530	16	> 3 hrs 9-3	Comply for Living + POS > 3 Hours	> 2 hrs 9-3	Comply for Living + POS > 2 Hours	> 2hrs 8-4	No sun
101	Living	N	N	N	N	N	N	N	N	N	N	N	N	N	B	B	Y	Y						
	POS	N	N	N	N	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y					YES.	N/A
102	Living	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	YES	YES		YES		
	POS	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	YES.					N/A
103	Living	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	B	YES			YES		
	POS	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N			YES.			N/A
104	Living	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	B	N	N	N	N	YES	YES		YES		
	POS	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	YES.					N/A
105	Living	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	YES	YES		YES		
	POS	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	YES.					N/A
106	Living	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	YES	YES		YES		
	POS	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	YES.					N/A
107	Living	N	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N					YES	
	POS	N	N	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	YES.					N/A
201	Living	N	N	N	N	N	N	N	N	N	N	N	N	N	B	B	B	Y						
	POS	Y	N	N	N	N	N	N	N	N	N	N	N	Y	Y	Y	Y	Y					YES.	N/A
202	Living	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	YES	YES		YES		
	POS	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	YES.					N/A
203	Living	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	YES	YES		YES		
	POS	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	YES.					N/A
204	Living	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	YES	YES		YES		
	POS	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	YES.					N/A
205	Living	N	B	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	YES	YES		YES		
	POS	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	YES.					N/A
206	Living	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	YES	YES		YES		
	POS	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	YES.					N/A
207	Living	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N					YES	
	POS	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	YES.					N/A
301	Living	N	N	N	N	N	N	N	N	N	N	N	N	N	B	B	B	Y						
	POS	Y	N	N	N	N	N	N	N	N	N	N	N	Y	Y	Y	Y	Y					YES.	N/A

302	Living	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	YES	YES		YES		
	POS	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	YES.					N/A
303	Living	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	YES	YES		YES		
	POS	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	YES.					N/A
304	Living	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	YES	YES		YES		
	POS	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	YES.					N/A
305	Living	B	B	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	YES	YES		YES		
	POS	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	YES.					N/A
306	Living	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	YES	YES		YES		
	POS	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	YES.					N/A
307	Living	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N					YES	
	POS	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	YES.					N/A
401	Living	N	N	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	Y	Y	Y	YES	YES		YES		
	POS	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	YES.					N/A
402	Living	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	YES	YES		YES		
	POS	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	YES.					N/A
403	Living	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	YES	YES		YES		
	POS	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	YES.					N/A
404	Living	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	YES	YES		YES		
	POS	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	YES.					N/A
405	Living	B	B	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	YES	YES		YES		
	POS	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	YES.					N/A
406	Living	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	YES	YES		YES		
	POS	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	YES.					N/A
407	Living	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N					YES	
	POS	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	YES.					N/A

UNIT
COUNT 28

> 3 hrs 9-3	Comply for Living + POS > 3 Hours	> 2 hrs 9-3	Comply for Living + POS > 2 Hours	> 2hrs 8-4	No sun
21	20	0	21	4	0
75.0%	71.4%	0.0%	75.0%	14.3%	0.0%
	71.4%		75.0%		