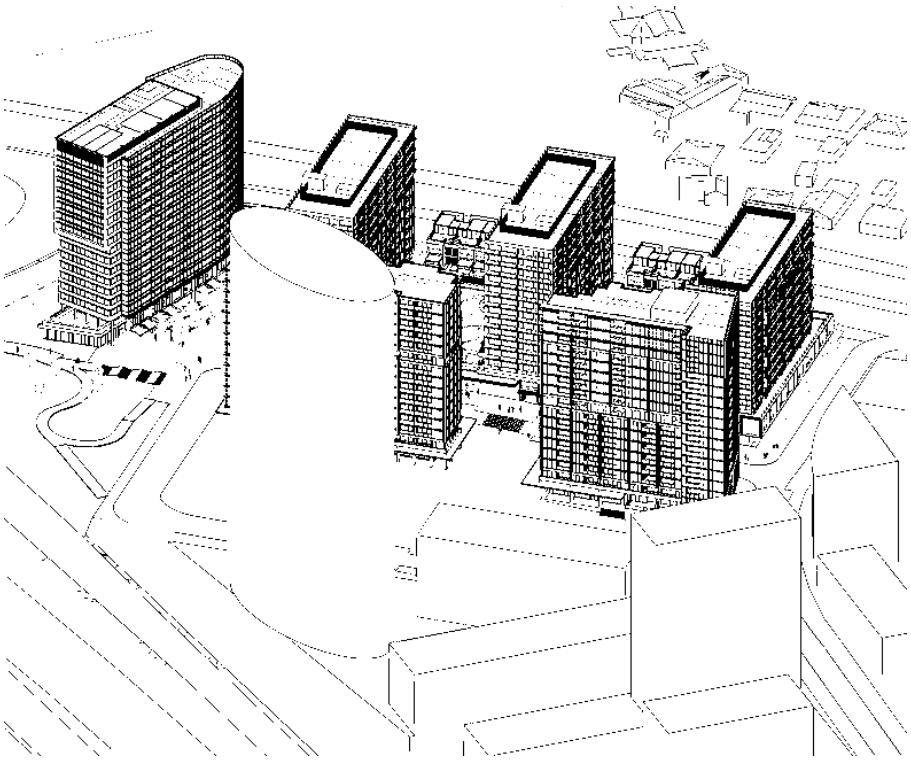
Attachment D -
Solar Access Options Study

Expert Opinion

SOLAR ACCESS OPTIONS STUDY



Greenland Lachlan's Line Apartments

17 October 2017

Signed,

S T E V E K I N G

C O N S U L T A N T

Appropriate design and alternative technologies for environmental control in buildings

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CONTENTS

1.0 PRELIMINARIES

This report is a consolidation and summary of three studies:

1.1 Summary peer review of solar access compliance of the submitted DA

This study of the submitted DA scheme for Lot 104 and Lot 105, which form part of the development known as Lachlan's Line, North Ryde was carried out in response to the recommendations of the Sydney North Planning Panel (SNPP) record of deferral, dated Wednesday 9 August 2017.
My original report is dated 13 August 2017.

The analysis for this report was based on a comprehensive detailed examination of all apartments I identified on the consolidated DA plans, using my preferred methodology based on a full 3D digital model, and views from the sun. The original report contained the full table of June 21 solar access between 9am and 3pm June 21, plus additional entries for 'extended hours (8am to 4pm) and those apartments designated as having wintergardens.

The current report contains at Appendix C the building and block summary of that table, with minor corrections.

1.2 Solar access sensitivity study

After considering the summary peer review of solar access / overshadowing compliance of the submitted DA, the SNPP further required a study for the purpose of examining the sensitivity of likely overall solar access compliance of the proposed development.

The study compared baseline ADG June 21 solar access compliance of the **current DA** initially with four iterative **Options A – D**, and after external overshadowing and other constraints were applied, to a **preferred Option F**.

The analysis concentrated on a range of options for redistributing building massing, consistent with constraints imposed by the existing lot subdivision. The choice of options to be analyzed was further narrowed by preliminary inferences from the current full 3D digital model, as to the likely benefit of varying different building heights.

For this study, the calculation of changes in numbers of apartments deemed to comply with the ADG was based on *simple deletion or addition of full floors, with layouts of the respective floor plates at different levels for the relevant buildings.* This process was then extended, by identifying from the amended 3D model those additional apartments in each Option, which were likely to have reduced overshadowing leading to change of their compliance status.

It is important to recognize the limited sensitivity of calculated percentages – on a development of approximately 880 apartments, it is necessary for nine (9) apartments to be identified as changing compliance status to achieve a 1.0% change in the overall compliance. The calculation is therefore warranted to be accurate only for the purpose of this study. It is sufficiently accurate to identify the sensitivity of the different Options relative to each other, and is subject to confirmation based on the resolved architectural plans.

1.3 Equinox study

This further analysis is a further extension of the sensitivity study, to include a **comparison of June 21 solar access compliance** of both current DA scheme and Option F, with **performance at the Equinox**.

The equinox analysis is based on a *new detailed examination of all individual apartments*, identified on the consolidated current DA plans, and the Option F plans concurrently in preparation. Following the direction of the Panel, the quantification is simplified to the baseline 9am to 3pm solar access for glazing and POS.

While the accuracy of the analysis is comparable to the original solar access compliance verification for June 21, both are subject to the limitations of the architectural documents available to me at the time.

The Building and Block summaries of the full tables of June 21 and Equinox solar access are included in this report, as APPENDIX C.

The other key Appendices included in this consolidated report are:

- APPENDIX A Views from the sun – Comparison Current DA to Option F June 21 + Equinox
- APPENDIX B Views from the sun – Comparison Current DA to Options A-D June 21

2.0 SUMMARY

2.1 Peer review of solar access / overshadowing compliance for the submitted DA

The peer review for the submitted DA reported compliance levels with the ADG Design criteria. Table 1 is a summary of the original, corrected for minor anomalies arising from the provisional unit numbering of the DA documents.

Table 1: Summary of detailed solar access compliance June 21, current DA

	All open POS	With wintergardens
Units which achieve 2 hours or more sunlight to both glazing and POS 9am - 3pm June 21	**46.7%**	52.1%
'Extended hours': Additional units which achieve 2 hours or more sunlight to both glazing and POS 8am - 4pm June 21		
Proportion that could be deemed to comply on the basis of 2 hours sun to Living and POS	55.9%	61.8%
Including Bedrooms: Additional apartments if sun to Bedrooms included*		
Proportion that could be deemed to comply on the basis of 2 hours sun to Living, Bedrooms and POS	*62.2%*	*68.5%*
Total units with no sun to any part of the apartment on June 21 between 8am and 4pm	*26.0%*	*25.5%*

This level of compliance was clearly lower than that reported for the preliminary study by BatesSmart, and DA submissions. My report offered some possible explanations of the factors which may lead to such an outcome.

The Panel was satisfied that at the densities of the proposed scheme, full compliance with solar access criteria of the ADG was unlikely. However, the Panel clarified that to fully meet its previous request for peer review, a sensitivity analysis was required to test how much overall compliance levels might change in response to variation in heights of some of the buildings in the proposed development.

2.2 Sensitivity study for June 21 compliance

The sensitivity study reports 'baseline' overall compliance of the current DA and four iterative options A to D, for the normal 9am to 3pm June 21 period and the 'extended hours' 8am to 3pm.

Table 2: Summary of solar access compliance for Options A to D

	>2hr 9-3	>2hr 8-4	No sun
Current	**46.7%**	55.9%	26%
A	**48.0%**	56.9%	25.4%
B	**48.2%**	57.3%	25.2%
C	**48.2%**	56.9%	25%
D	**49.2%**	58.1%	25%

With respect to the impact on winter sun in the communal open spaces, the sensitivity study concludes:

- *Reduction in height of Building J* makes little difference to sun in 'western' courtyard, and has no influence on other COS.
- *Reduction in height of Building K* makes significant difference to sun in the 'eastern' courtyard, and introduces sun between 1130 and 1330 into southern portion of plaza between Buildings L.3 and M.

Based on the outcomes for options A – D, a further optimization – primarily for limiting off-site overshadowing impacts – resulted in what is referred to as 'preferred' Option F.

2.3 Option F compliance, including analysis related to the Equinox

I note that both Council and SNPP make reference that the solar report / assessment to include "solar access both mid-winter and equinox to both units and the major communal open space". This additional analysis has now been carried out as part of the more detailed review of the preferred Option F compliance.

Table 3: Summary of Winter and Equinox solar access compliance for current and Option F schemes

	>2hr 9-3 Winter	>2hr 9-3 Equinox
Current	46.7.0%	15.4%
Option F	**47.4%**	(11.9%

As flagged in my original peer review opinion, the analysis confirmed that due overwhelmingly to self-shading of the facades because of the higher sun angles, at the Equinox solar access of glazing is dramatically reduced compared to that at midwinter.

On the other hand, the same higher sun angles assure that at the Equinox all categories of communal open space are exposed to sun over most of their area, for extended periods.

The following sections of this report incorporate the sensitivity study and the more detailed analysis of the preferred Option F.

3.0 SENSITIVITY STUDY: PRELIMINARY INFERENCES

3.1 Buildings L.1, L.2 and L.3

- Greater spacing of buildings is not feasible.
- Communal open space winter solar access for the 'courtyards' is almost insensitive to reduction in height of Buildings L.1 and L.2 by anything less than 4 storeys.
- Any such reduction in height would have a net neutral or more probably negative effect for the number of complying apartments in L.1 and L.2, and a negative effect for L.3.
- Reduction of height of L.3 would gain approximately the same number complying in Building M, as would be lost in L.3.

As the overall outcome of reducing height of these buildings can be reliably inferred to result in negative outcomes, no options for deleting levels from Buildings L.1, L.2 and L.3 were further investigated.

4.0 SENSITIVITY STUDY: OPTIONS EXAMINED IN AMENDED 3D MODELS

4.1 The Options

The following table sets out the four Options for which amended models and were *initially* prepared.

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	Block M	**Block J**	**Block K**
Option A	*ADDED 2* 1 X TYP LOWER LEVEL 1 UPPER LEVEL	*DELETE 1* LEVEL 15	*DELETE 2* LEVELS 12 & 13
Option B	*ADDED 3* 1 X TYP LOWER LEVEL & 2 UPPER LEVEL	*DELETE 2* LEVELS 11 & 15	*DELETE 2* LEVELS 12 & 13
Option C	*ADDED 4* 2 X TYP LOWER LEVEL & 2 UPPER LEVEL	*DELETE 2* LEVELS 11 & 15	*DELETE 3* LEVELS 8, 9 & 12
Option D	*ADDED 6* 3 X TYP LOWER LEVEL & 3 UPPER LEVEL	*DELETE 2* LEVELS 11 & 15	*DELETE 5* LEVELS 6, 7, 8, 9 & 12

After examining the outcomes from this comparison of four iterative options, a further optimization – primarily for limiting off-site overshadowing impacts – resulted in what is referred to as 'preferred' Option F.

	Block M	Block L.3	Block J	Block K
Option F	*ADDED 2* 2 X TYP UPPER LEVEL	*ADDED 2* 2 X TYP UPPER LEVEL	*DELETE 2* LEVEL 13 &15	*DELETE 2* LEVELS 12 & 13

4.2 The calculations: Options A – D

The original detailed compliance table of individual apartment solar access was modified for the initial four options, and used to calculate the overall compliance. Because of the overall pattern of overshadowing, the resulting tables can be relied on to have:

- preserved the compliance status of the overwhelming majority of units in Buildings L.1, L.2 and L.3, and
- captured the compliance characteristics of the remaining units in Buildings J & K, and the additional units in Building M.

I then identified *additional units* that appear to have had the benefit of more sun, to the point of *achieving compliance*. Given the surprisingly small number of such additional complying units, and no coherent unit numbering for the options, I did not update the individual cells of the detailed compliance tables. I note that I could only identify with relative certainty an additional six (6) apartments which actually change from non-complying to complying, even when iterating the height reductions for Buildings J & K as far as Option D. This counter-intuitive outcome is largely explained by the following factors:

4.2.1 Building M

- No influence from any of the options until 1030, then 'oval building' external to the subject site takes over all shadowing till 1130.
- Expected sun access improvement at lowest levels in NW corner of Building M is not reflected in the overall compliance, because those apartments already comply.

4.2.2 Building L.1

- Makes no difference in complying number of apartments.

4.2.3 Building L.2

- Only appears to change status of one apartment in stack X.01

4.2.4 Building L.3

- Only appears to change status of upper level upper apartments in stack X.02:
  2 for Option A, 3 for Option C, 5 for Option D.
- Doesn't appear to change status of any NW facing apartments to complying.

These likely additional changes were added to the outcomes from the modified detailed tables, to produce the summary comparison of the Options.

4.3 The calculations: Option F

New detailed compliance tables of solar access of individual apartments for Option F were prepared for both June 21 and September 21.

4.4 Analysis for the Equinox

For completeness, views from the sun on September 21 were generated for Option F, and an additional detailed table was prepared for the original 'current DA' scheme, for solar access at the Equinox.

5.0 SENSITIVITY STUDY: OUTCOMES

5.1 Apartment solar access for June 21

The following summary presents the 'baseline' overall compliance for the normal 9am to 3pm June 21 period, and the 'extended hours' 8am to 3pm. The latter are justified because of the extents of the model allow a reasonable prediction where such additional sun will not be obstructed.

I would expect that when fully developed in plans, and taken off the relevant amended 3D model, detailed compliance of any one of the Options A-D would closely approximate this preliminary analysis.

With respect to Option F, I rely on a more detailed quantification, appropriate for inclusion with the amended DA documents.

Table 4: Summary of winter solar access compliance for Options A to D and F (the sensitivity study)

	>2hr 9-3	>2hr 8-4	No sun
Current	**46.7%**	55.9%	26%
A	**48.0%**	56.9%	25.4%
B	**48.2%**	57.3%	25.2%
C	**48.2%**	56.9%	25%
D	**49.2%**	58.1%	25%
F	**47.4%**	57.0%	26.7%

I note that Option F also has an apparent overall increase of 0.7% in the proportion of apartments with no sun between 9 AM and 3 PM on June 21. This is consistent with:

- additional overshadowing of apartments in Building M by the added two floors of L3;
- additional south facing apartments in both building M and building L3 being greater in number than those deleted from Buildings J and K.

5.2 Communal open space

5.2.1 The following observations can be made with respect to the impact on winter sun in the communal open spaces:

- *Reduction in height of Building J* makes little difference to sun in 'western' courtyard, and has no influence on other COS.
- *Reduction in height of Building K* makes significant difference to sun in the 'eastern' courtyard, and introduces a small patch of sun between 1130 and 1330 into southern portion of plaza between Buildings L.3 and M – with Option D, this effect is greater.

5.2.2 I record my estimated proportions of the spaces in two categories annotated on Figure 1:

A Conventional communal open space, potentially securable.

B Publicly accessible communal open space.

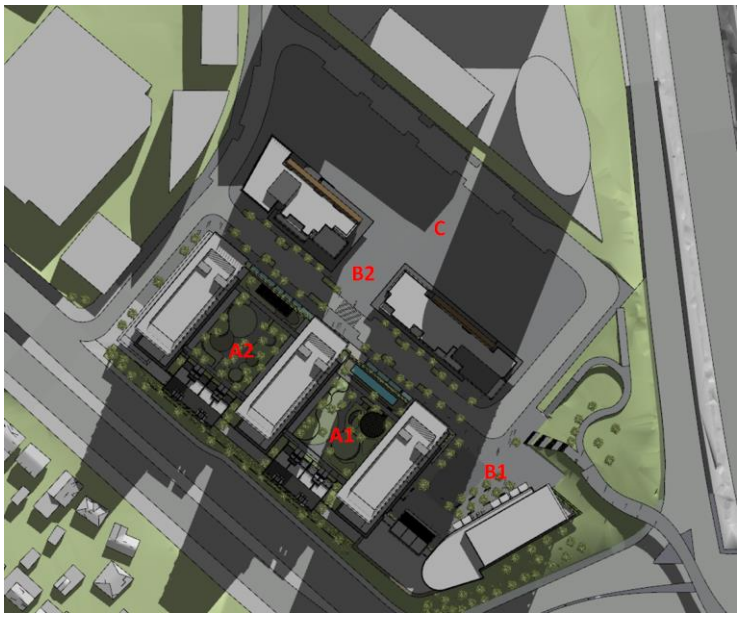


Figure 1: Key plan. Shadows are at 10:30am June 21

Table 5 summarizes the winter solar access for communal open spaces for the 'Current' and Option F schemes.

	WINTER			
	CURRENT		OPTION F	
	A	B	A	B
900	10%	65%*	10%	65%*
930	<10%	75%	<10%	75%
1000	<10%	75%	<10%	75%
1030	15%	60%	20%	60%
1100	25%	30%	30%	30%
1130	>35%	25%	>35%	25%**
1200	20%	15%	20%	15%**
1230	15%	<15%	15%	<15%**
1300	15%	<10%	15%	<10%**
1330	<10%	<5%	<10%	<5%**
1400		<5%		<10%**
1430		<5%**		10%**
1500		<5%**		<5%**

* Plaza area >90%

** Moving patch of additional sun to two shopfronts on South edge of plaza

Table 5: Summary of winter solar access for Current and preferred Option F schemes

6.0 EQUINOX COMPARISONS

Inspection of the views from the sun for the Equinox, for either the current DA scheme, or for Option F strongly suggests the implications of much higher sun angles.

6.1 Apartments

6.1.1 Table 6 summarises the solar access to living room glazing, for the current scheme and Option F.

Table 6: Summary of Equinox solar access to Living room glazing

	>2hr 9-3 Winter	>2hr 9-3 Equinox
Current	46.7%	15.4%
Option F	47.4%	11.9%

As flagged in my original peer review opinion, at the Equinox solar access performance of glazing is dramatically reduced from that at midwinter.

6.1.2 The explanation for this is immediately evident in the views from the sun.

Due to the higher sun angles, there is considerably less mutual overshadowing between the building blocks, and therefore more apartment facades are exposed to sun. However, any recessed glazing is substantially more self shaded by an overhang. Thus, apartment plans which have private open space verandas in front of the living room are unlikely to experience any useful sun penetration between 9am and 3pm, due to the shading by the private open space of the apartment above.

6.2 Communal open space

In contrast to the impact on sun access to living room glazing, the higher sun angles at the Equinox assure that communal open space is subject to much less shadowing by the bounding building blocks, for extended periods especially in the morning and the middle of the day.

Figure 2 compares the views from the sun at noon for Option F. Reference to the full comparison table of views from the sun in Appendix B confirms that this effect is very similar for the both current an Option F schemes.

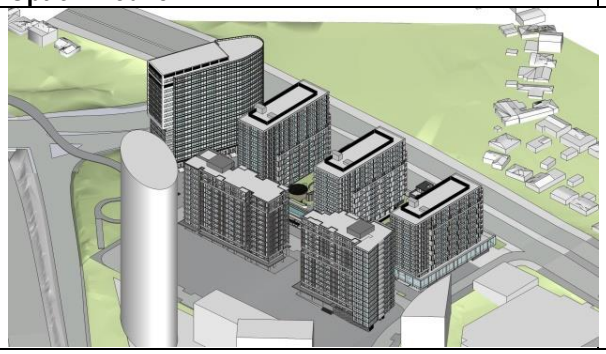
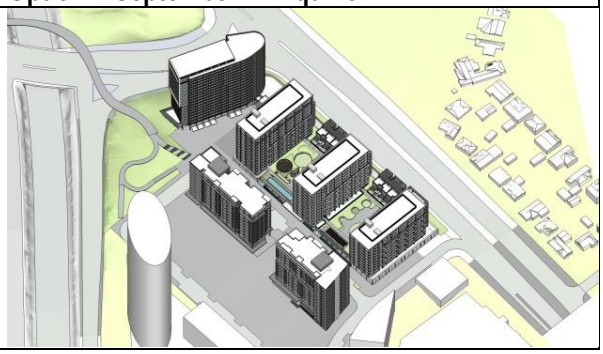
	Option F June 21	Option F September 21 Equinox
1200		

Figure 2: Comparison of winter and Equinox. 12pm views from the sun.

Table 7 records the proportion of the sunlit ground plane of the communal open spaces at the Equinox.

	EQUINOX			
	CURRENT		OPTION F	
	A	B	A	B
900	60%	65%*	70%	65%*
930	70%	65%*	75%	65%*
1000	75%	80%*	80%	80%*
1030	85%	90%*	90%	90%*
1100	85%	85%	90%	85%
1130	75%	75%	75%	70%
1200	60%	55%	60%	50%
1230	35%	30%	35%	25%
1300	<10%	<10%	<10%	<10%
1330	<5%	<5%	<5%	<5%
1400				
1430				
1500				

* Plaza area >90%

Table 7: Equinox sun exposure at ground plane of Communal open spaces

In brief, at the Equinox all the communal open spaces are exposed to direct sun for periods well in excess of 2 hours, and for well in excess of 50% of their area. Differences between the Current and preferred Option F schemes are minor.

7.0 CONCLUSIONS

7.1 Sensitivity study: Apartments

As predicted by inference from the 3D model, *as the heights of Buildings J and K are reduced and the height of Building M is increased, there is an improvement in the overall percentage of apartments with complying solar access.*

However, *the size of improvements is relatively small*. This is consistent with the expected limited sensitivity to any change. As I state in the introduction to this study, on a development of approximately 880 apartments it is necessary for nine (9) apartments to be identified as changing compliance status, in order to achieve a 1% change in the overall compliance.

The study shows that even with the significant changes in the heights of buildings M, J and K as the options progress from A to D, there is only approximately 2% change in the overall baseline compliance level for solar access to the apartments.

7.2 Sensitivity study: Communal open space

Notably, the improvement in winter solar access to communal open space is the *increased area of sun at ground level for the 'eastern courtyard'* between buildings L.2 and L.3. This change is almost entirely caused by the reduction in height of Building K.

Interestingly, *all the options introduce a small area of sun between 1130 and 1330 into southern portion of the plaza* between Buildings L.3 and M – of course, this effect is greater as the options progress from A to D. This sun patch is approximately the width of two shopfronts, and 'travels' during the day along the base of Building M. Though small, it is a non-trivial improvement in winter amenity for those premises.

Taken together, these improvements in winter solar access to communal open space are not large, but may be considered to be of significant benefit.

At the Equinox all the communal open spaces are exposed to direct sun for periods well in excess of 2 hours, and for well in excess of 50% of their area

7.3 'Preferred' Option F

Option F is the outcome of further constraining the previous four options, primarily with the objective to minimize off-site overshadowing impacts from the additional height of Building M. To preserve the redistributed FSR, and accommodate a variety of architectural considerations (e.g. lift access to appropriate areas of parking), the optimum outcome appears to be when two floors are added to Building L.3, rather than an additional two floors to Building M.

Based on the previously demonstrated marginal sensitivity, perhaps it's not surprising that Option F returns an overall solar access compliance for the apartments that falls within the range indicated by Options A to D.

In brief,

Option F is an improvement on the current DA scheme:

- ***Between 0.7% - 1.4% representing a gain of 6 to 12 complying apartments, and a further number already previously complying that now have longer durations of projected sun access;***
- ***An increase in solar access to the courtyard between Buildings L.2 and L.3, and to the plaza between Buildings M and L.3.***

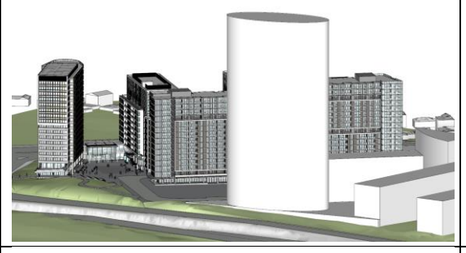
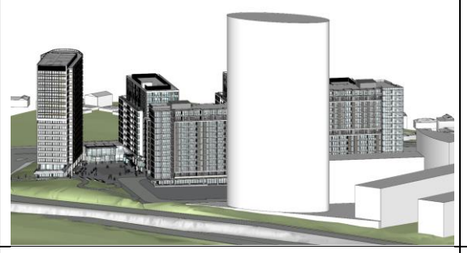
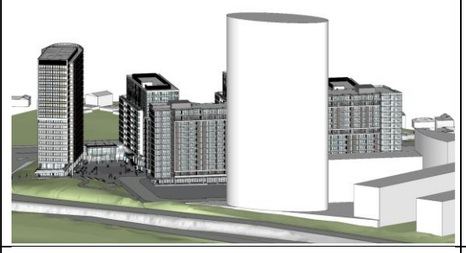
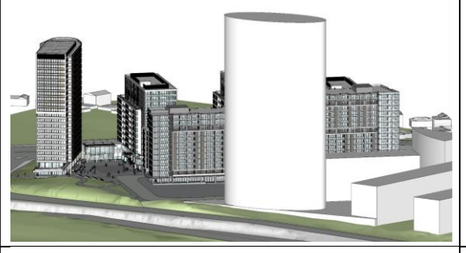
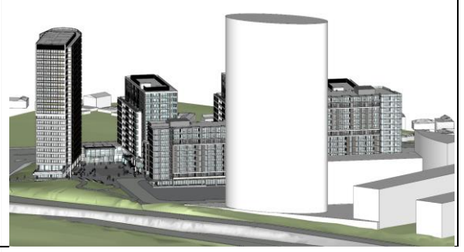
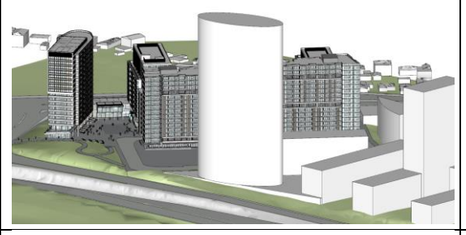
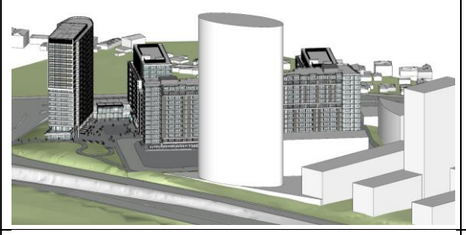
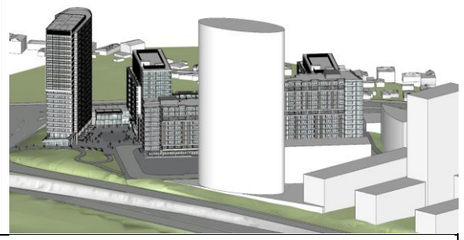
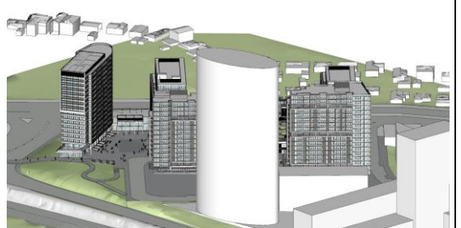
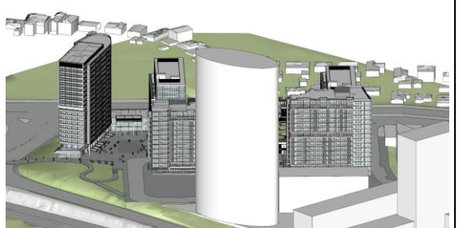
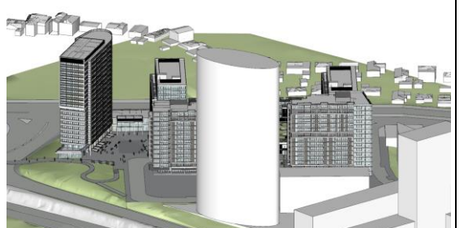
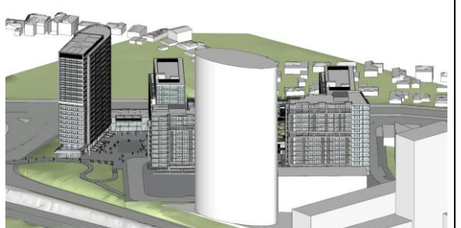
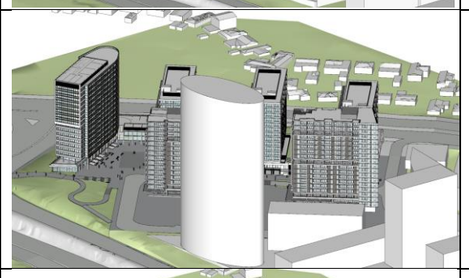
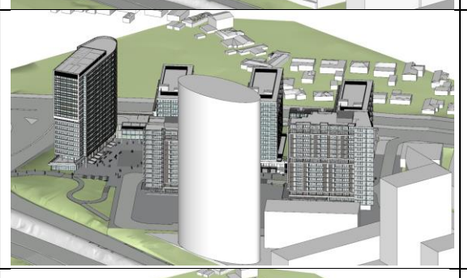
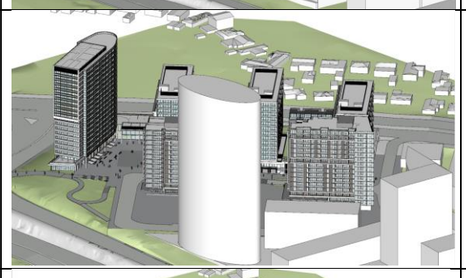
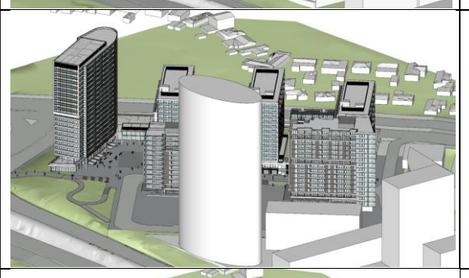
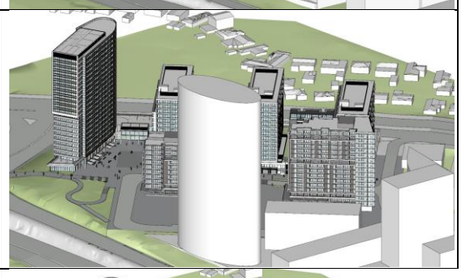
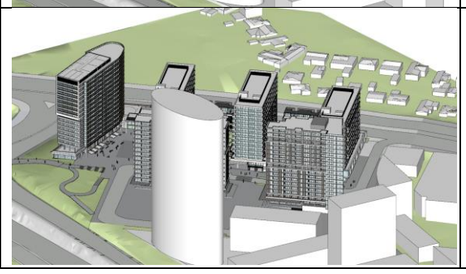
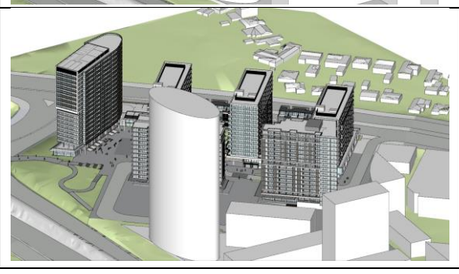
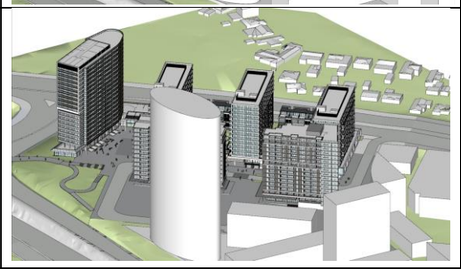
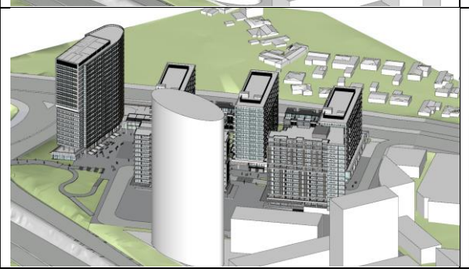
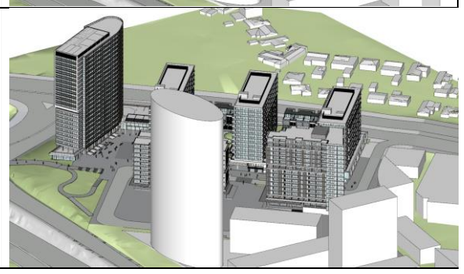
For completeness, at the Equinox all the communal open spaces are exposed to direct sun for periods well in excess of 2 hours, and for well in excess of 50% of their area.

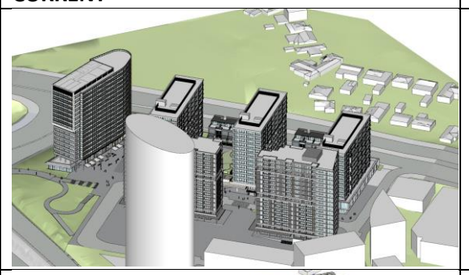
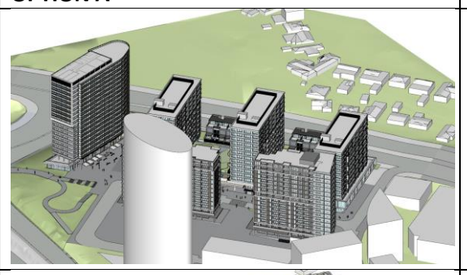
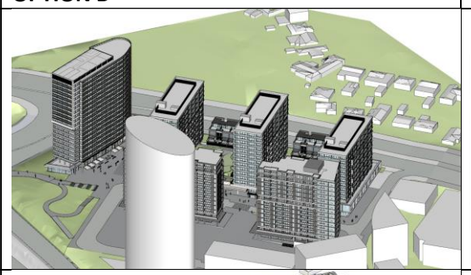
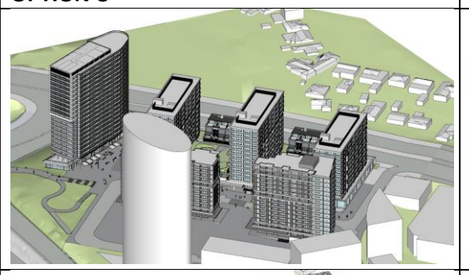
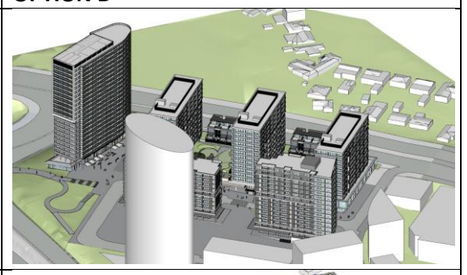
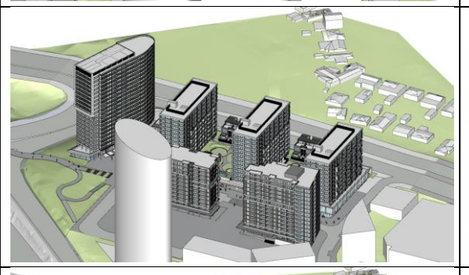
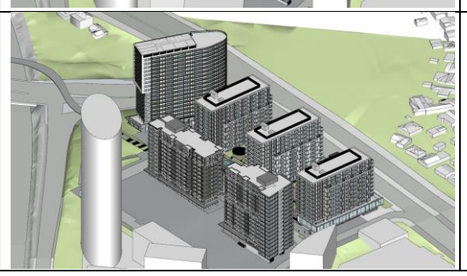
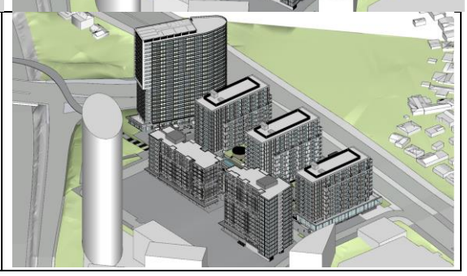
This outcome strongly confirms that at the proposed densities, 70% overall compliance for a large, multi-building development is usually an unrealistic expectation.

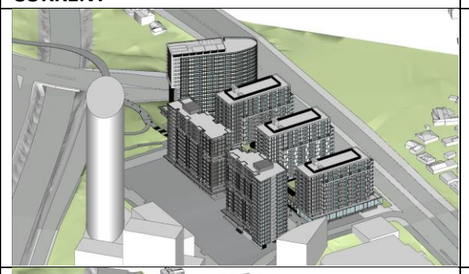
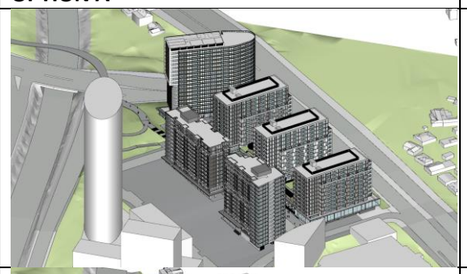
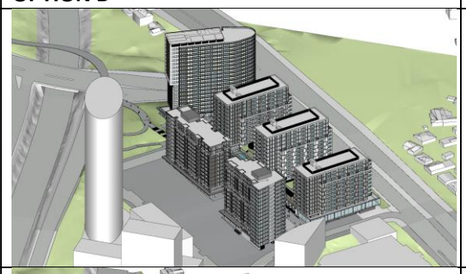
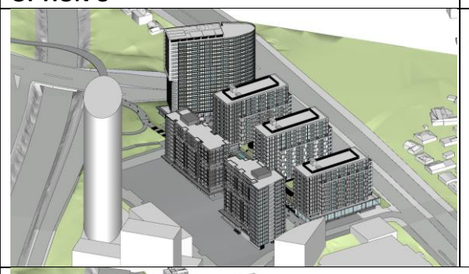
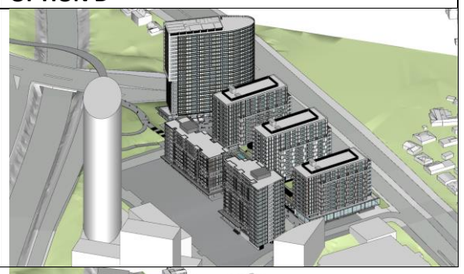
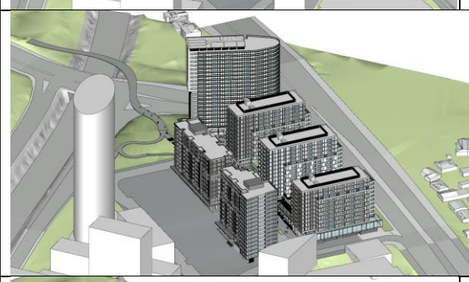
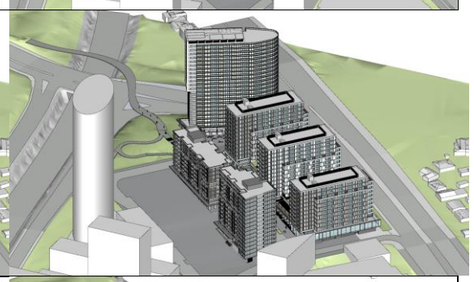
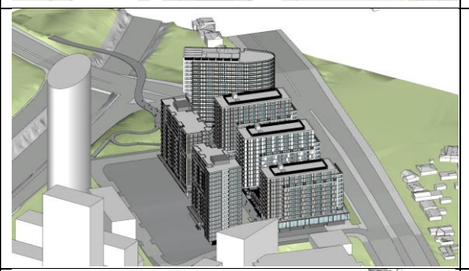
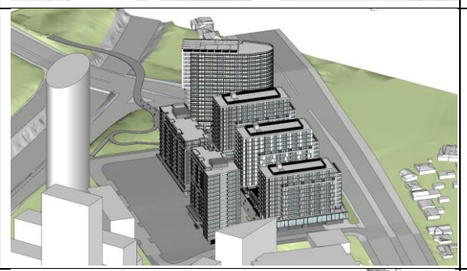
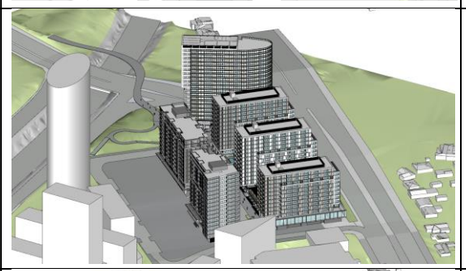
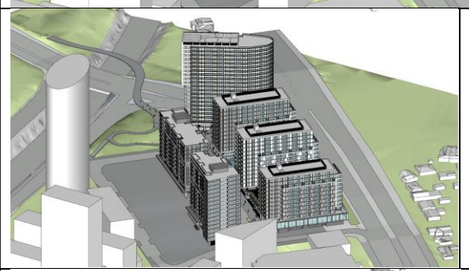
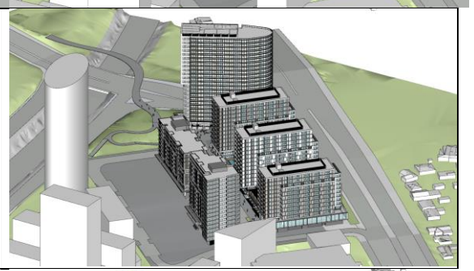
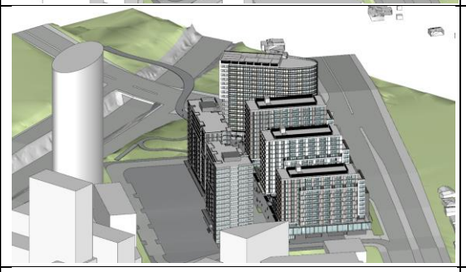
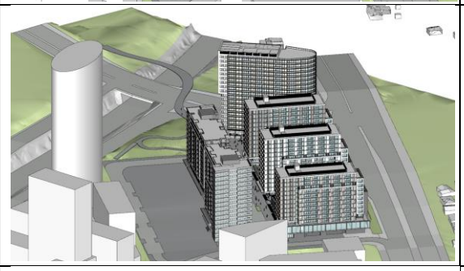
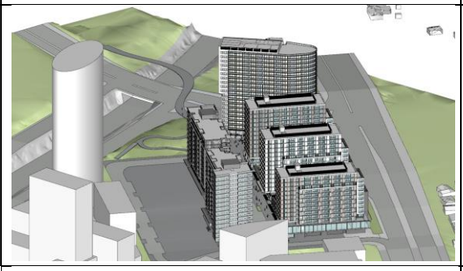
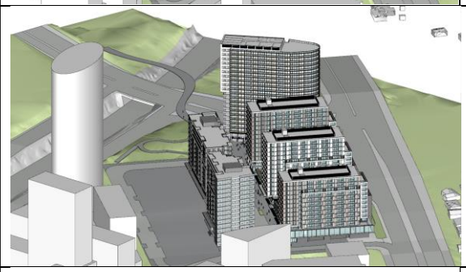
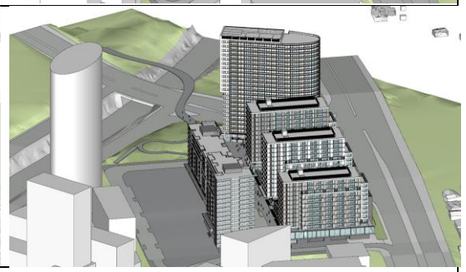
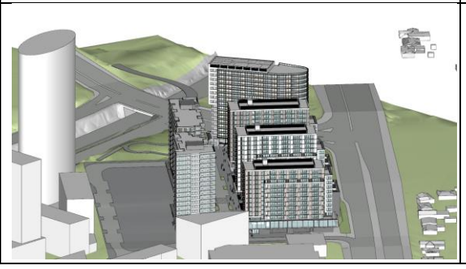
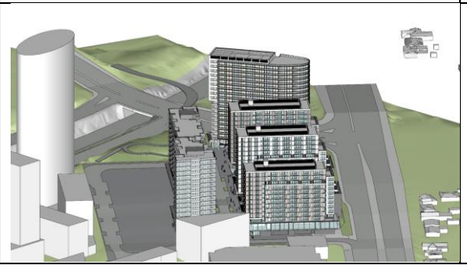
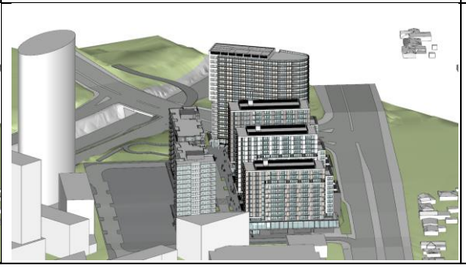
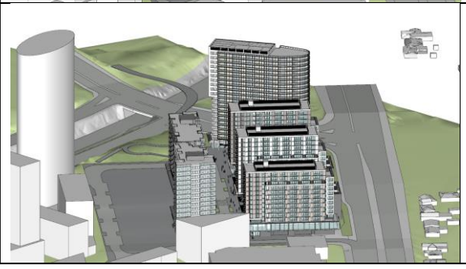
The study also confirms my experience that once the buildings exceed 6 to 8 storeys the actual likely achieved compliance is generally closely predetermined by the subdivision pattern, more strongly than by the building heights.

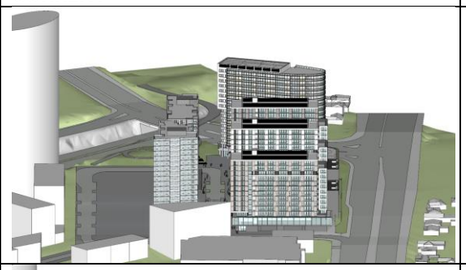
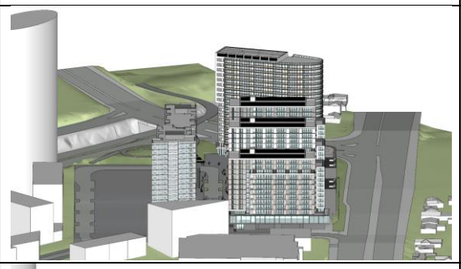
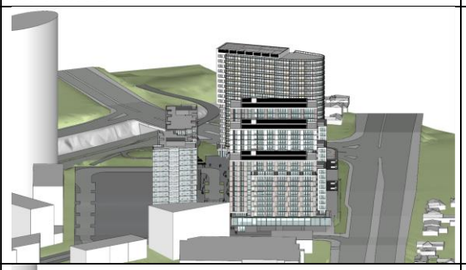
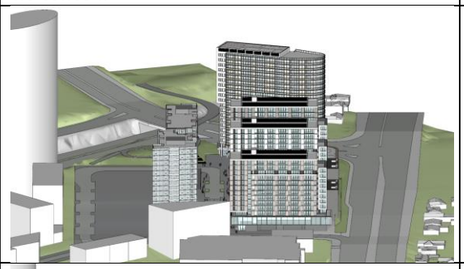
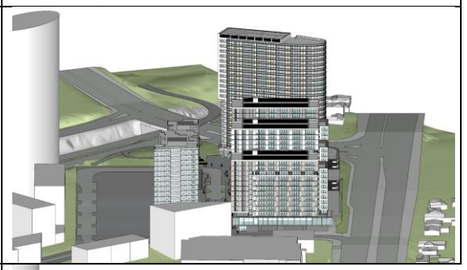
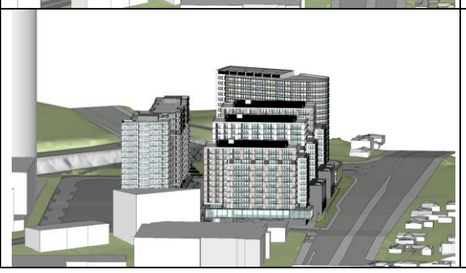
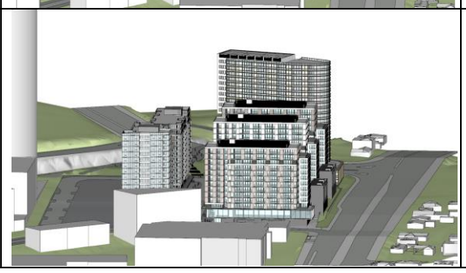
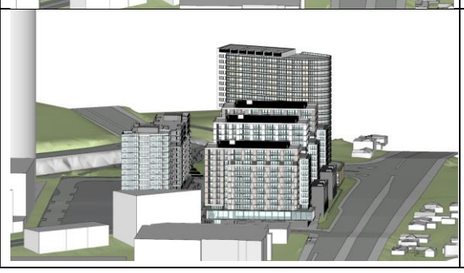
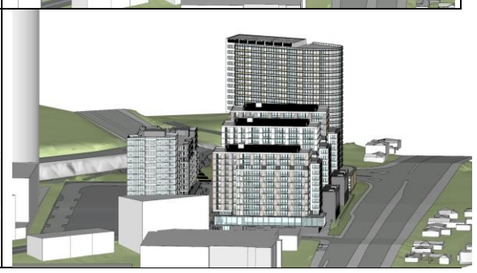
A.0 APPENDIX A: SENSITIVITY STUDY COMPARISON

Comparison of views from the sun on a half hourly basis for June 21, for the current scheme and Options A – D. The table of views is attached as A3 format, but may be printed at larger scale.

	CURRENT	OPTION A	OPTION B	OPTION C	OPTION D
0800					
0830					
0900					
0930					
1000					

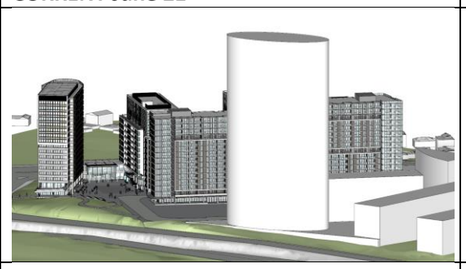
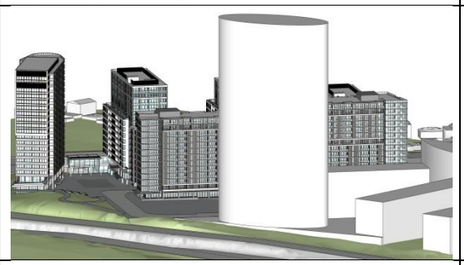
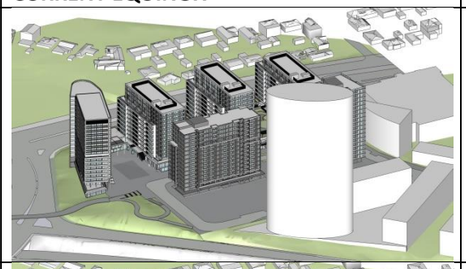
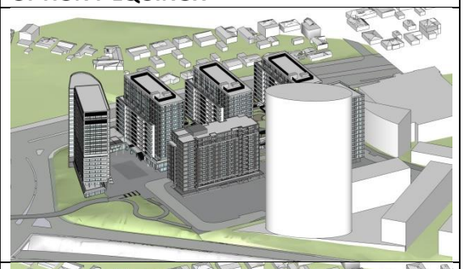
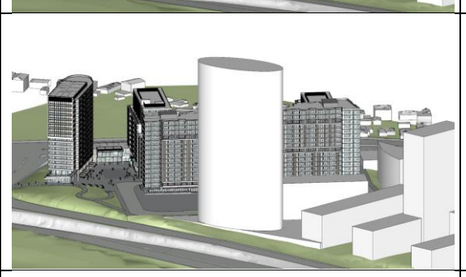
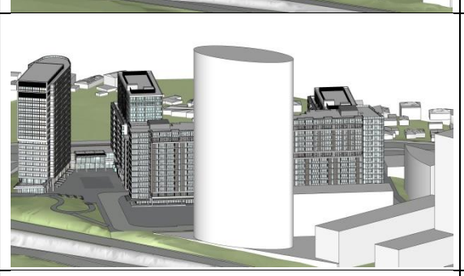
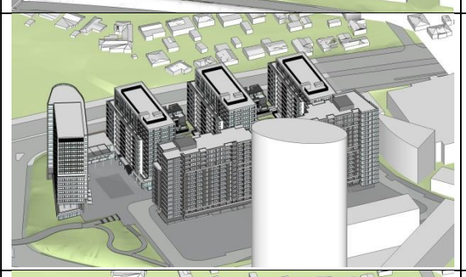
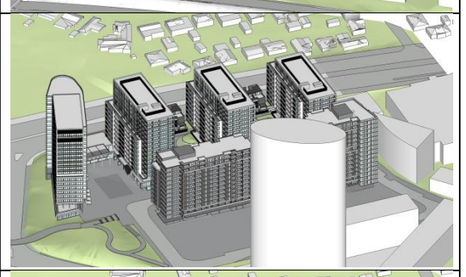
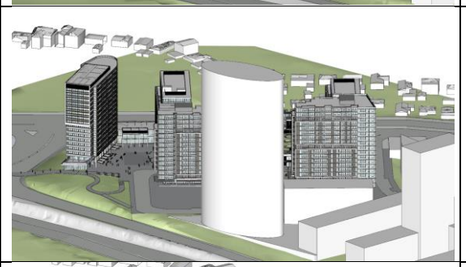
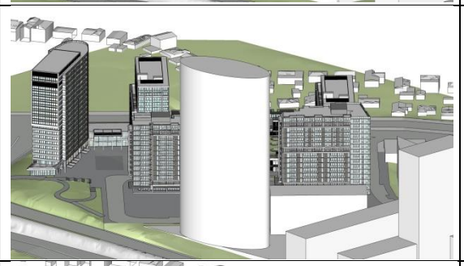
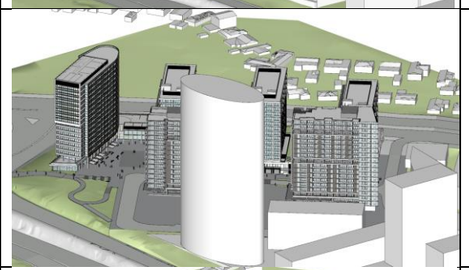
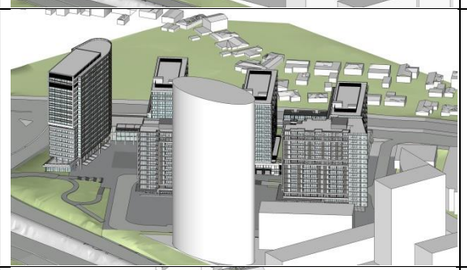
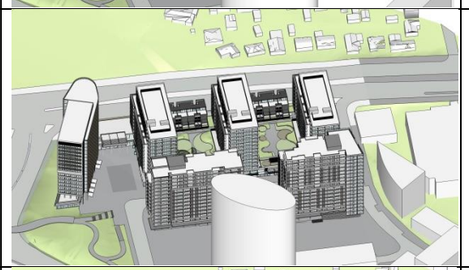
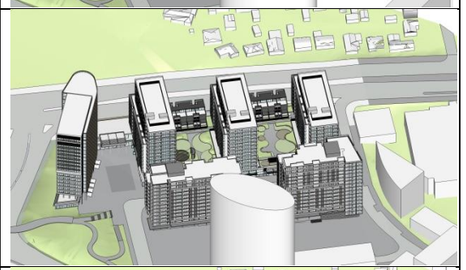
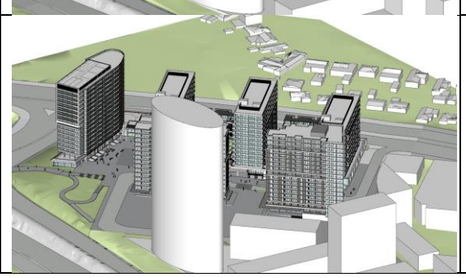
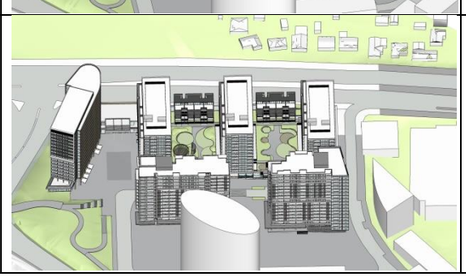
	CURRENT	OPTION A	OPTION B	OPTION C	OPTION D
1030					
1100					
1130					
1200					
1230					

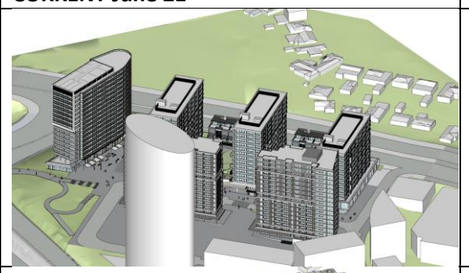
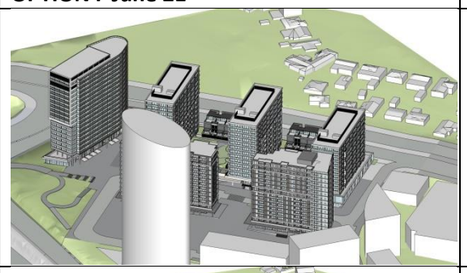
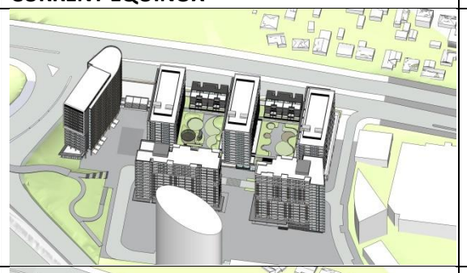
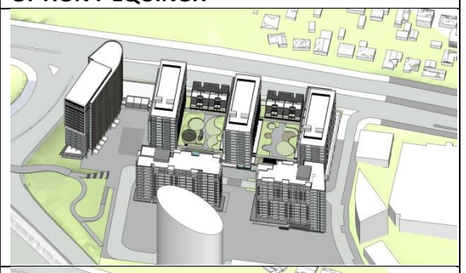
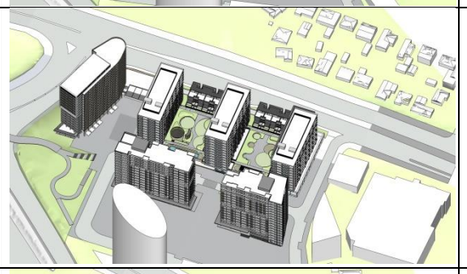
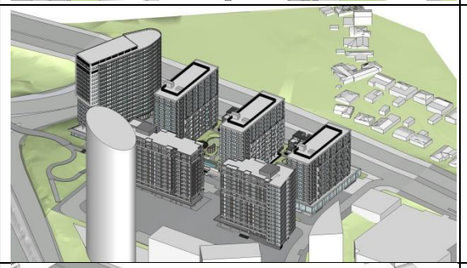
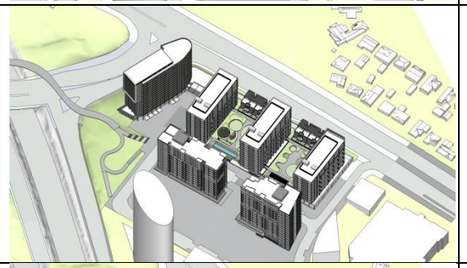
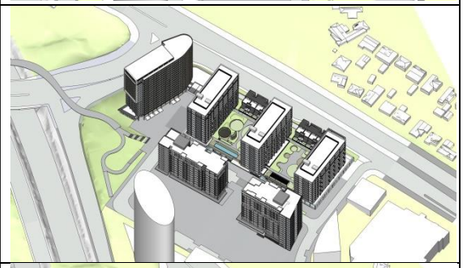
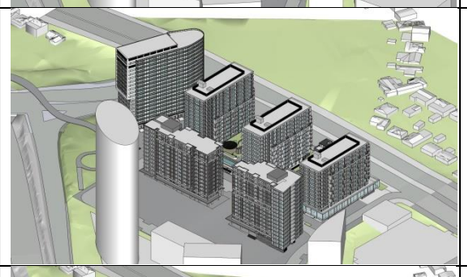
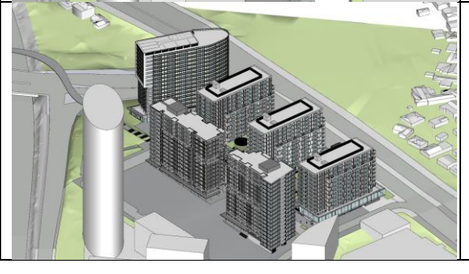
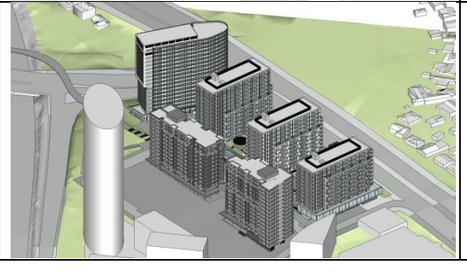
	CURRENT	OPTION A	OPTION B	OPTION C	OPTION D
1300					
1330					
1400					
1430					
1500					

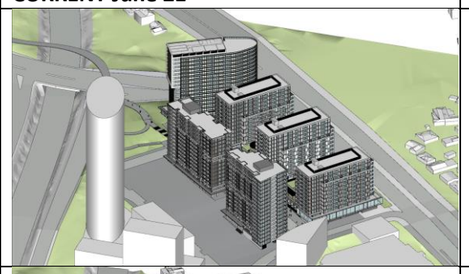
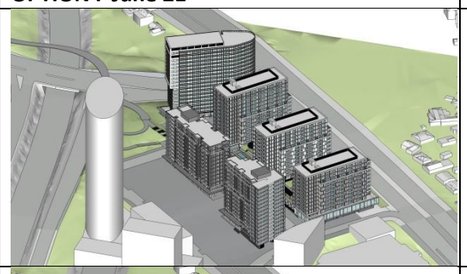
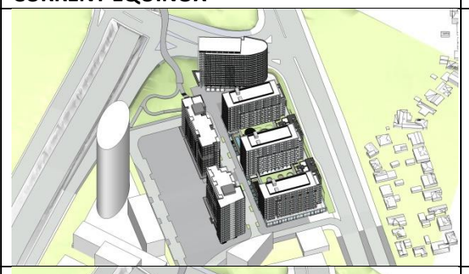
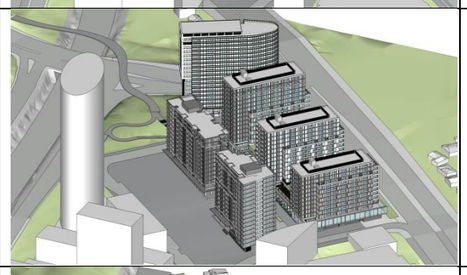
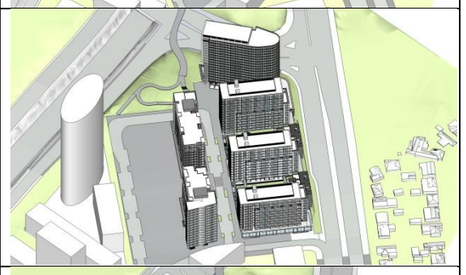
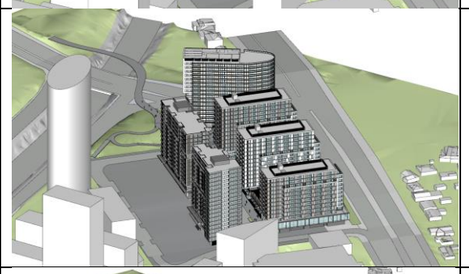
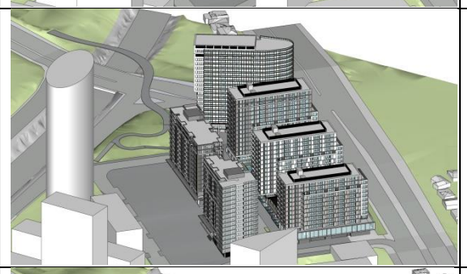
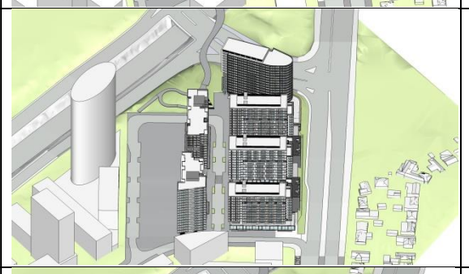
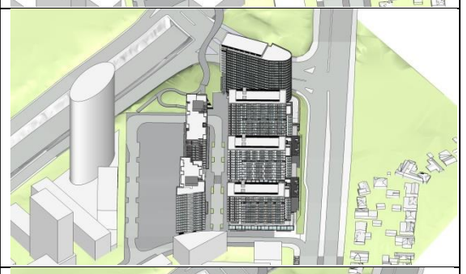
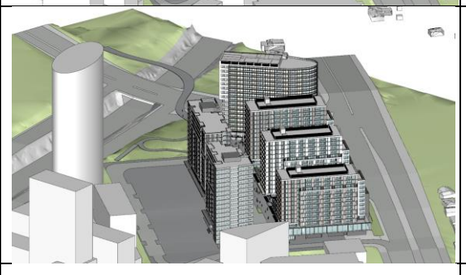
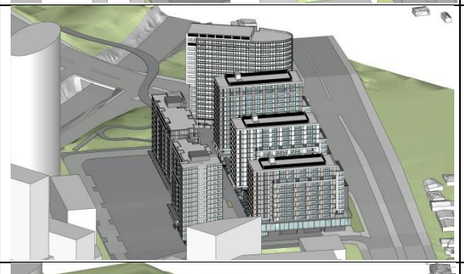
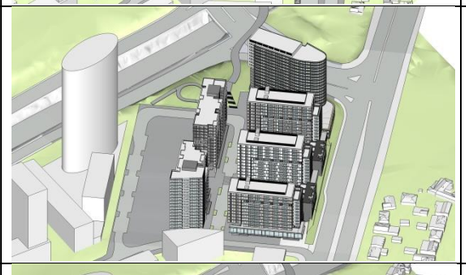
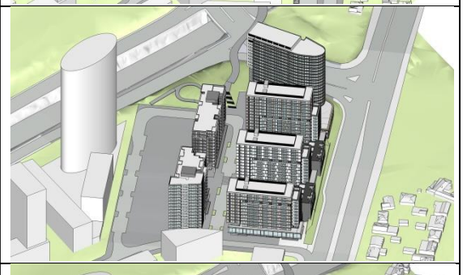
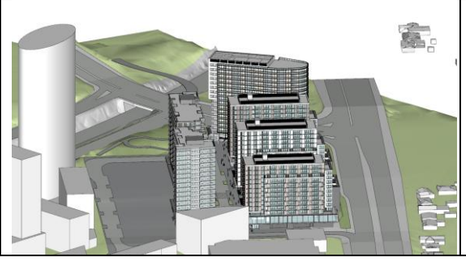
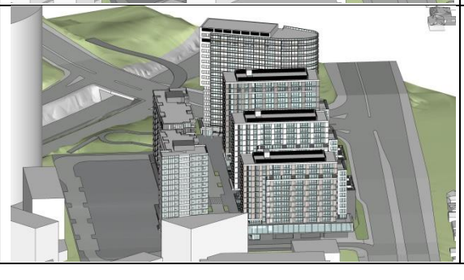
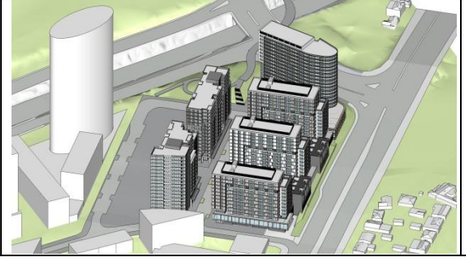
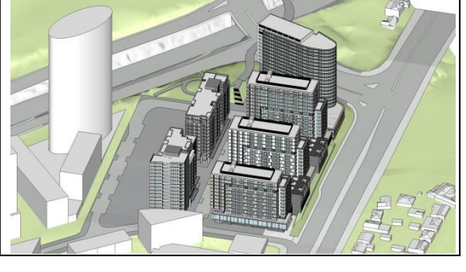
	CURRENT	OPTION A	OPTION B	OPTION C	OPTION D
1530					
1600					

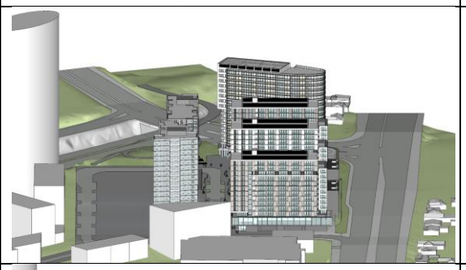
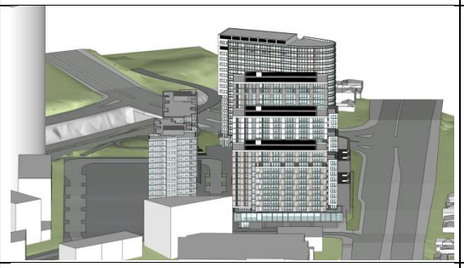
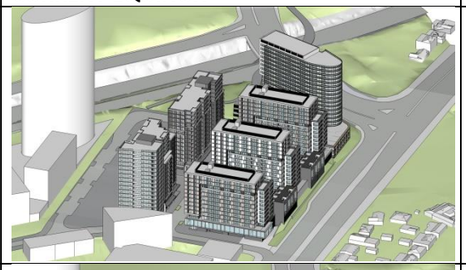
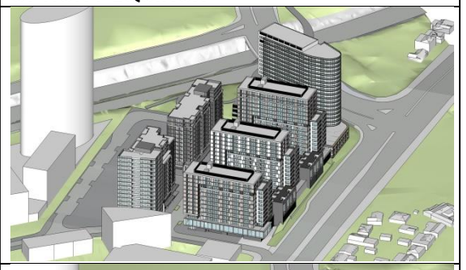
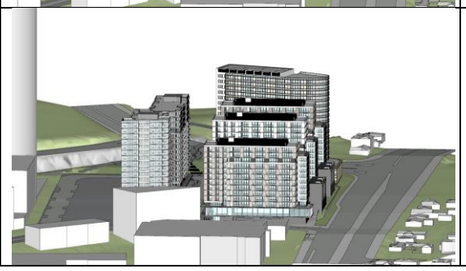
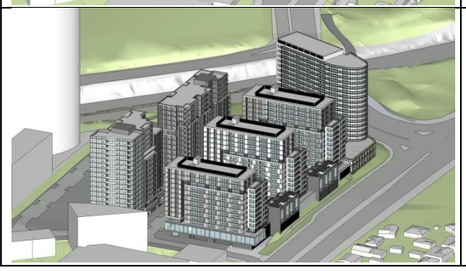
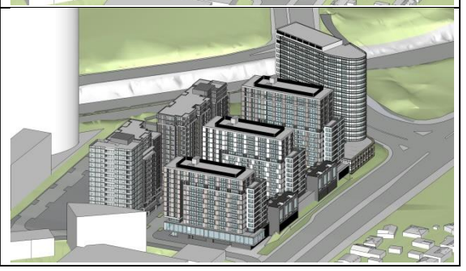
B.0 APPENDIX B: CURRENT SCHEME AND OPTION F

Comparison of views from the sun on a half hourly basis for June 21, for the current scheme and Option F. This table of views is attached as A3 landscape format to match the previous table, but also may be printed at larger scale.

	CURRENT June 21	OPTION F June 21	CURRENT EQUINOX	OPTION F EQUINOX
0800				
0830				
0900				
0930				
1000				

	CURRENT June 21	OPTION F June 21	CURRENT EQUINOX	OPTION F EQUINOX
1030				
1100				
1130				
1200				
1230				

	CURRENT June 21	OPTION F June 21	CURRENT EQUINOX	OPTION F EQUINOX
1300				
1330				
1400				
1430				
1500				

	CURRENT June 21	OPTION F June 21	CURRENT EQUINOX	OPTION F EQUINOX
1530				
1600				

C.0 APPENDIX C: SUMMARY DETAILED COMPLIANCE TABLES

Building and block level summaries of the detailed compliance tables for Current Scheme and preferred Option F, for both June 21 and the Equinox (September 21)

CURRENT WINTER

LOT 104 BUILDING L1

	>3 hrs 9-3	>2 hrs 9-3 (>3hrs 8-4)	>2 hrs 9-3	>2 hrs 9-3 WG	>2hrs 8-4	>2hrs 8-4 WG	No sun	No sun WG	Private Open Space 9-3	Private Open Space 8-4
126	65	10	0	0	0	0	41	41	75	0
	51.6%	7.9%	0.0%	0.0%	0.0%	0.0%	32.5%	32.5%	59.5%	0.0%
		59.5%								**59.5%**
			59.5%	0.0%	**59.5%**	0.0%				

LOT 104 BUILDING L2

	>3 hrs 9-3	>2 hrs 9-3 (>3hrs 8-4)	>2 hrs 9-3	>2 hrs 9-3 WG	>2hrs 8-4	>2hrs 8-4 WG	No sun	No sun WG	Private Open Space 9-3	Private Open Space 8-4
136	40	12	6	1	1	1	48	47	58	2
	29.4%	8.8%	4.4%	0.7%	0.7%	0.7%	35.3%	34.6%	42.6%	1.5%
		38.2%								**44.1%**
			42.6%	0.7%	**43.4%**	1.5%				

LOT 104 BUILDING L3

	>3 hrs 9-3	>2 hrs 9-3 (>3hrs 8-4)	>2 hrs 9-3	>2 hrs 9-3 WG	>2hrs 8-4	>2hrs 8-4 WG	No sun	No sun WG	Private Open Space 9-3	Private Open Space 8-4
128	21	7	20	1	2	0	45	44	48	2
	16.4%	5.5%	15.6%	0.8%	1.6%	0.0%	35.2%	34.4%	37.5%	1.6%
		21.9%								**39.1%**
			37.5%	0.8%	**39.1%**	0.8%				

LOT 104 BUILDING M

	>3 hrs 9-3	>2 hrs 9-3 (>3hrs 8-4)	>2 hrs 9-3	>2 hrs 9-3 WG	>2hrs 8-4	>2hrs 8-4 WG	No sun	No sun WG	Private Open Space 9-3	Private Open Space 8-4
170	83	4	9	45	29	3	21	18	96	32
	48.8%	2.4%	5.3%	26.5%	17.1%	1.8%	12.4%	10.6%	56.5%	18.8%
		51.2%								**75.3%**
			56.5%	26.5%	**73.5%**	28.2%				

LOT 104 BUILDING L4

	>3 hrs 9-3	>2 hrs 9-3 (>3hrs 8-4)	>2 hrs 9-3	>2 hrs 9-3 WG	>2hrs 8-4	>2hrs 8-4 WG	No sun	No sun WG	Private Open Space 9-3	Private Open Space 8-4
4	0	0	0	0	0	0	0	0	0	0
	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		0.0%								**0.0%**
			0.0%	0.0%	**0.0%**	0.0%				

LOT 104 BUILDING L5

	>3 hrs 9-3	>2 hrs 9-3 (>3hrs 8-4)	>2 hrs 9-3	>2 hrs 9-3 WG	>2hrs 8-4	>2hrs 8-4 WG	No sun	No sun WG	Private Open Space 9-3	Private Open Space 8-4
4	0	0	0	0	0	0	0	0	0	0
	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		0.0%								**0.0%**
			0.0%	0.0%	**0.0%**	0.0%				

LOT 104 - TOTAL

	>3 hrs 9-3	>2 hrs 9-3 (>3hrs 8-4)	>2 hrs 9-3	>2 hrs 9-3 WG	>2hrs 8-4	>2hrs 8-4 WG	No sun	No sun WG	Private Open Space 9-3	Private Open Space 8-4
568	209	33	35	47	32	4	155	150	277	36
	36.8%	5.8%	6.2%	8.3%	5.6%	0.7%	27.3%	26.4%	48.8%	6.3%
		42.6%								**55.1%**
			48.8%	8.3%	**54.4%**	9.0%				

LOT 105 BUILDING J

	>3 hrs 9-3	>2 hrs 9-3 (>3hrs 8-4)	>2 hrs 9-3	>2 hrs 9-3 WG	>2hrs 8-4	>2hrs 8-4 WG	No sun	No sun WG	Private Open Space 9-3	Private Open Space 8-4
163	76	25	2	0	13	0	37	37	119	0
	46.6%	15.3%	1.2%	0.0%	8.0%	0.0%	22.7%	22.7%	73.0%	0.0%
		62.0%								**73.0%**
			63.2%	0.0%	**71.2%**	0.0%				

LOT 105 BUILDING K

	>3 hrs 9-3	>2 hrs 9-3 (>3hrs 8-4)	>2 hrs 9-3	>2 hrs 9-3 WG	>2hrs 8-4	>2hrs 8-4 WG	No sun	No sun WG	Private Open Space 9-3	Private Open Space 8-4
145	7	10	12	0	36	0	36	36	29	36
	4.8%	6.9%	8.3%	0.0%	24.8%	0.0%	24.8%	24.8%	20.0%	24.8%
		11.7%								**44.8%**
			20.0%	0.0%	**44.8%**	0.0%				

LOT 105 - TOTAL

	>3 hrs 9-3	>2 hrs 9-3 (>3hrs 8-4)	>2 hrs 9-3	>2 hrs 9-3 WG	>2hrs 8-4	>2hrs 8-4 WG	No sun	No sun WG	Private Open Space 9-3	Private Open Space 8-4
308	83	35	14	0	49	0	73	73	148	36
	26.9%	11.4%	4.5%	0.0%	15.9%	0.0%	23.7%	23.7%	48.1%	11.7%
		38.3%								**59.7%**
			42.9%	0.0%	**58.8%**	0.0%				

PRECINCT - TOTAL

	>3 hrs 9-3	>2 hrs 9-3 (>3hrs 8-4)	>2 hrs 9-3	>2 hrs 9-3 WG	>2hrs 8-4	>2hrs 8-4 WG	No sun	No sun WG	Private Open Space 9-3	Private Open Space 8-4
876	292	68	49	47	81	4	228	223	425	72
	33.3%	7.8%	5.6%	5.4%	9.2%	0.5%	26.0%	25.5%	48.5%	8.2%
		41.1%								**56.7%**
			46.7%	5.4%	**55.9%**	5.8%				

CURRENT EQUINOX

LOT 104 BUILDING L1

	>3 hrs 9-3	>2 hrs 9-3 (>3hrs 8-4)	>2 hrs 9-3	>2 hrs 9-3 WG	>2hrs 8-4	>2hrs 8-4 WG	No sun	No sun WG	Private Open Space 9-3	Private Open Space 8-4
126	0	9	2	0	65	0	29	29	11	65
	0.0%	7.1%	1.6%	0.0%	51.6%	0.0%	23.0%	23.0%	8.7%	51.6%
		7.1%								**60.3%**
			8.7%	0.0%	**60.3%**	0.0%				

LOT 104 BUILDING L2

	>3 hrs 9-3	>2 hrs 9-3 (>3hrs 8-4)	>2 hrs 9-3	>2 hrs 9-3 WG	>2hrs 8-4	>2hrs 8-4 WG	No sun	No sun WG	Private Open Space 9-3	Private Open Space 8-4
136	14	16	7	0	48	0	23	23	37	48
	10.3%	11.8%	5.1%	0.0%	35.3%	0.0%	16.9%	16.9%	27.2%	35.3%
		22.1%								**62.5%**
			27.2%	0.0%	**62.5%**	0.0%				

LOT 104 BUILDING L3

	>3 hrs 9-3	>2 hrs 9-3 (>3hrs 8-4)	>2 hrs 9-3	>2 hrs 9-3 WG	>2hrs 8-4	>2hrs 8-4 WG	No sun	No sun WG	Private Open Space 9-3	Private Open Space 8-4
128	23	11	2	0	46	0	24	24	36	46
	18.0%	8.6%	1.6%	0.0%	35.9%	0.0%	18.8%	18.8%	28.1%	35.9%
		26.6%								**64.1%**
			28.1%	0.0%	**64.1%**	0.0%				

LOT 104 BUILDING M

	>3 hrs 9-3	>2 hrs 9-3 (>3hrs 8-4)	>2 hrs 9-3	>2 hrs 9-3 WG	>2hrs 8-4	>2hrs 8-4 WG	No sun	No sun WG	Private Open Space 9-3	Private Open Space 8-4
170	10	15	3	0	60	0	47	47	28	60
	5.9%	8.8%	1.8%	0.0%	35.3%	0.0%	27.6%	27.6%	16.5%	35.3%
		14.7%								**51.8%**
			16.5%	0.0%	**51.8%**	0.0%				

LOT 104 BUILDING L4

	>3 hrs 9-3	>2 hrs 9-3 (>3hrs 8-4)	>2 hrs 9-3	>2 hrs 9-3 WG	>2hrs 8-4	>2hrs 8-4 WG	No sun	No sun WG	Private Open Space 9-3	Private Open Space 8-4
4	3	0	1	0	0	0	0	0	4	0
	75.0%	0.0%	25.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%
		75.0%								**100.0%**
			100.0%	0.0%	**100.0%**	0.0%				

LOT 104 BUILDING L5

	>3 hrs 9-3	>2 hrs 9-3 (>3hrs 8-4)	>2 hrs 9-3	>2 hrs 9-3 WG	>2hrs 8-4	>2hrs 8-4 WG	No sun	No sun WG	Private Open Space 9-3	Private Open Space 8-4
4	3	0	1	0	0	0	0	0	4	0
	75.0%	0.0%	25.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%
		75.0%								**100.0%**
			100.0%	0.0%	**100.0%**	0.0%				

LOT 104 - TOTAL

	>3 hrs 9-3	>2 hrs 9-3 (>3hrs 8-4)	>2 hrs 9-3	>2 hrs 9-3 WG	>2hrs 8-4	>2hrs 8-4 WG	No sun	No sun WG	Private Open Space 9-3	Private Open Space 8-4
568	53	51	16	0	219	0	123	123	120	219
	9.3%	9.0%	2.8%	0.0%	38.6%	0.0%	21.7%	21.7%	21.1%	38.6%
		18.3%								**59.7%**
			21.1%	0.0%	**59.7%**	0.0%				

LOT 105 BUILDING J

	>3 hrs 9-3	>2 hrs 9-3 (>3hrs 8-4)	>2 hrs 9-3	>2 hrs 9-3 WG	>2hrs 8-4	>2hrs 8-4 WG	No sun	No sun WG	Private Open Space 9-3	Private Open Space 8-4
163	1	0	0	0	14	0	65	65	1	14
	0.6%	0.0%	0.0%	0.0%	8.6%	0.0%	39.9%	39.9%	0.6%	8.6%
		0.6%								**9.2%**
			0.6%	0.0%	**9.2%**	0.0%				

LOT 105 BUILDING K

	>3 hrs 9-3	>2 hrs 9-3 (>3hrs 8-4)	>2 hrs 9-3	>2 hrs 9-3 WG	>2hrs 8-4	>2hrs 8-4 WG	No sun	No sun WG	Private Open Space 9-3	Private Open Space 8-4
145	11	3	0	0	0	0	29	29	14	0
	7.6%	2.1%	0.0%	0.0%	0.0%	0.0%	20.0%	20.0%	9.7%	0.0%
		9.7%								**9.7%**
			9.7%	0.0%	**9.7%**	0.0%				

LOT 105 - TOTAL

	>3 hrs 9-3	>2 hrs 9-3 (>3hrs 8-4)	>2 hrs 9-3	>2 hrs 9-3 WG	>2hrs 8-4	>2hrs 8-4 WG	No sun	No sun WG	Private Open Space 9-3	Private Open Space 8-4
308	12	3	0	0	14	0	94	94	15	14
	3.9%	1.0%	0.0%	0.0%	4.5%	0.0%	30.5%	30.5%	4.9%	4.5%
		4.9%								**9.4%**
			4.9%	0.0%	**9.4%**	0.0%				

PRECINCT - TOTAL

	>3 hrs 9-3	>2 hrs 9-3 (>3hrs 8-4)	>2 hrs 9-3	>2 hrs 9-3 WG	>2hrs 8-4	>2hrs 8-4 WG	No sun	No sun WG	Private Open Space 9-3	Private Open Space 8-4
876	65	54	16	0	233	0	217	217	135	233
	7.4%	6.2%	1.8%	0.0%	26.6%	0.0%	24.8%	24.8%	15.4%	26.6%
		13.6%								**42.0%**
			15.4%	0.0%	**42.0%**	0.0%				

OPTION F WINTER

LOT 104 BUILDING L1

	>3 hrs 9-3	>2 hrs 9-3 (>3hrs 8-4)	>2 hrs 9-3	>2 hrs 9-3 WG	>2hrs 8-4	>2hrs 8-4 WG	No sun	No sun WG	Private Open Space 9-3	Private Open Space 8-4
126	66	10	1	0	0	0	41	41	77	0
	52.4%	7.9%	0.8%	0.0%	0.0%	0.0%	32.5%	32.5%	61.1%	0.0%
		60.3%								**61.1%**
			61.1%	0.0%	**61.1%**	0.0%				

LOT 104 BUILDING L2

	>3 hrs 9-3	>2 hrs 9-3 (>3hrs 8-4)	>2 hrs 9-3	>2 hrs 9-3 WG	>2hrs 8-4	>2hrs 8-4 WG	No sun	No sun WG	Private Open Space 9-3	Private Open Space 8-4
136	42	12	7	1	1	1	48	47	61	2
	30.9%	8.8%	5.1%	0.7%	0.7%	0.7%	35.3%	34.6%	44.9%	1.5%
		39.7%								**46.3%**
			44.9%	0.7%	**45.6%**	1.5%				

LOT 104 BUILDING L3

	>3 hrs 9-3	>2 hrs 9-3 (>3hrs 8-4)	>2 hrs 9-3	>2 hrs 9-3 WG	>2hrs 8-4	>2hrs 8-4 WG	No sun	No sun WG	Private Open Space 9-3	Private Open Space 8-4
148	36	11	19	1	2	0	51	50	66	2
	24.3%	7.4%	12.8%	0.7%	1.4%	0.0%	34.5%	33.8%	44.6%	1.4%
		31.8%								**45.9%**
			44.6%	0.7%	**45.9%**	0.7%				

LOT 104 BUILDING M

	>3 hrs 9-3	>2 hrs 9-3 (>3hrs 8-4)	>2 hrs 9-3	>2 hrs 9-3 WG	>2hrs 8-4	>2hrs 8-4 WG	No sun	No sun WG	Private Open Space 9-3	Private Open Space 8-4
182	86	0	9	54	36	5	25	21	95	41
	47.3%	0.0%	4.9%	29.7%	19.8%	2.7%	13.7%	11.5%	52.2%	22.5%
		47.3%								**74.7%**
			52.2%	29.7%	**72.0%**	32.4%				

LOT 104 BUILDING L4

	>3 hrs 9-3	>2 hrs 9-3 (>3hrs 8-4)	>2 hrs 9-3	>2 hrs 9-3 WG	>2hrs 8-4	>2hrs 8-4 WG	No sun	No sun WG	Private Open Space 9-3	Private Open Space 8-4
4	0	0	0	0	0	0	0	0	0	0
	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		0.0%								**0.0%**
			0.0%	0.0%	**0.0%**	0.0%				

LOT 104 BUILDING L5

	>3 hrs 9-3	>2 hrs 9-3 (>3hrs 8-4)	>2 hrs 9-3	>2 hrs 9-3 WG	>2hrs 8-4	>2hrs 8-4 WG	No sun	No sun WG	Private Open Space 9-3	Private Open Space 8-4
4	0	0	0	0	0	0	0	0	0	0
	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		0.0%								**0.0%**
			0.0%	0.0%	**0.0%**	0.0%				

LOT 104 - TOTAL

	>3 hrs 9-3	>2 hrs 9-3 (>3hrs 8-4)	>2 hrs 9-3	>2 hrs 9-3 WG	>2hrs 8-4	>2hrs 8-4 WG	No sun	No sun WG	Private Open Space 9-3	Private Open Space 8-4
600	230	33	36	56	39	6	165	159	299	45
	38.3%	5.5%	6.0%	9.3%	6.5%	1.0%	27.5%	26.5%	49.8%	7.5%
		43.8%								**57.3%**
			49.8%	9.3%	**56.3%**	10.3%				
				59.2%		66.7%				

LOT 105 BUILDING J

	>3 hrs 9-3	>2 hrs 9-3 (>3hrs 8-4)	>2 hrs 9-3	>2 hrs 9-3 WG	>2hrs 8-4	>2hrs 8-4 WG	No sun	No sun WG	Private Open Space 9-3	Private Open Space 8-4
146	70	19	2	0	11	0	35	35	105	0
	47.9%	13.0%	1.4%	0.0%	7.5%	0.0%	24.0%	24.0%	71.9%	0.0%
		61.0%								**71.9%**
			62.3%	0.0%	**69.9%**	0.0%				

LOT 105 BUILDING K

	>3 hrs 9-3	>2 hrs 9-3 (>3hrs 8-4)	>2 hrs 9-3	>2 hrs 9-3 WG	>2hrs 8-4	>2hrs 8-4 WG	No sun	No sun WG	Private Open Space 9-3	Private Open Space 8-4
127	3	11	10	0	34	0	33	33	24	34
	2.4%	8.7%	7.9%	0.0%	26.8%	0.0%	26.0%	26.0%	18.9%	26.8%
		11.0%								**45.7%**
			18.9%	0.0%	**45.7%**	0.0%				

LOT 105 - TOTAL

	>3 hrs 9-3	>2 hrs 9-3 (>3hrs 8-4)	>2 hrs 9-3	>2 hrs 9-3 WG	>2hrs 8-4	>2hrs 8-4 WG	No sun	No sun WG	Private Open Space 9-3	Private Open Space 8-4
273	73	30	12	0	45	0	68	68	129	34
	26.7%	11.0%	4.4%	0.0%	16.5%	0.0%	24.9%	24.9%	47.3%	12.5%
		37.7%								**59.7%**
			42.1%	0.0%	**58.6%**	0.0%				
				42.1%		58.6%				

PRECINCT - TOTAL

	>3 hrs 9-3	>2 hrs 9-3 (>3hrs 8-4)	>2 hrs 9-3	>2 hrs 9-3 WG	>2hrs 8-4	>2hrs 8-4 WG	No sun	No sun WG	Private Open Space 9-3	Private Open Space 8-4
873	303	63	48	56	84	6	233	227	428	79
	34.7%	7.2%	5.5%	6.4%	9.6%	0.7%	26.7%	26.0%	49.0%	9.0%
		41.9%								**58.1%**
			47.4%	6.4%	**57.0%**	7.1%				
				53.8%		64.1%				

OPTION F EQUINOX

LOT 104 BUILDING L1

	>3 hrs 9-3	>2 hrs 9-3	No sun	Private Open Space 9-3
126	0	4	29	4
	0.0%	3.2%	23.0%	3.2%
		3.2%		

LOT 104 BUILDING L2

	>3 hrs 9-3	>2 hrs 9-3	No sun	Private Open Space 9-3
136	14	12	23	26
	10.3%	8.8%	16.9%	19.1%
		19.1%		

LOT 104 BUILDING L3

	>3 hrs 9-3	>2 hrs 9-3	No sun	Private Open Space 9-3
148	25	2	21	27
	16.9%	1.4%	14.2%	18.2%
		18.2%		

LOT 104 BUILDING M

	>3 hrs 9-3	>2 hrs 9-3	No sun	Private Open Space 9-3
182	10	16	45	26
	5.5%	8.8%	24.7%	14.3%
		14.3%		

LOT 104 BUILDING L4

	>3 hrs 9-3	>2 hrs 9-3	No sun	Private Open Space 9-3
4	3	1	0	4
	75.0%	25.0%	0.0%	100.0%
		100.0%		

LOT 104 BUILDING L5

	>3 hrs 9-3	>2 hrs 9-3	No sun	Private Open Space 9-3
4	3	1	0	4
	75.0%	25.0%	0.0%	100.0%
		100.0%		

LOT 104 - TOTAL

	>3 hrs 9-3	>2 hrs 9-3	No sun	Private Open Space 9-3
600	55	36	118	91
	9.2%	6.0%	19.7%	15.2%
		15.2%		

LOT 105 BUILDING J

	>3 hrs 9-3	>2 hrs 9-3	No sun	Private Open Space 9-3
146	1	0	56	1
	0.7%	0.0%	38.4%	0.7%
		0.7%		

LOT 105 BUILDING K

	>3 hrs 9-3	>2 hrs 9-3	No sun	Private Open Space 9-3
127	9	3	23	12
	7.1%	2.4%	18.1%	9.4%
		9.4%		

LOT 105 - TOTAL

	>3 hrs 9-3	>2 hrs 9-3	No sun	Private Open Space 9-3
273	10	3	79	13
	3.7%	1.1%	28.9%	4.8%
		4.8%		

PRECINCT - TOTAL

	>3 hrs 9-3	>2 hrs 9-3	No sun	Private Open Space 9-3
873	65	39	197	104
	7.4%	4.5%	22.6%	11.9%
		11.9%		