

Potential Daylight and Sunlight Impact of a Proposed Shared Living Development on the Hendrons Site, Broadstone, Dublin 7

Applicant: Western Way Developments Ltd.
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1. Introduction

The proposed development comprises demolition of the existing warehouse buildings and no. 36 Dominick Street Upper and retention of the Hendrons Building as part of an overall redevelopment of the site to accommodate a shared living scheme including neighbourhood uses (including café/shop, gym and yoga studios). The scheme will include 280 no. shared living rooms (281. no bed spaces), internal and external amenity space over 5 no. blocks ranging in height from 4 no. storeys to 9 no. storeys, secure bicycle parking, site-wide landscaping, ESB substation and switch-room and site development works all on the 0.3285 hectare site.

This report has been updated from the previous report submitted at pre-application consultation stage to address the opinion received from An Bord Pleanala below and all living spaces on the ground and lower ground floor have been assessed.

"A detailed daylight and sunlight assessment of the proposed development, in accordance with the BRE 209 document "Site layout Planning for daylight a guide to good practice Second Edition -2011" by Paul Littlefair, which shall include all ground and lower ground floor units and all amenity spaces."

This analysis is carried out based on the drawings of John Fleming Architects. The report carries out an assessment for the impact to daylight and sunlight from the proposed development on the surrounding properties and facilities.

1.1 Executive Summary

The report assesses the impact of the proposed development for Daylight and Sunlight on the neighbouring buildings and the quality of daylight and sunlight to within the proposed development.

Impact on adjacent properties

There will be minimal impact to the daylight and sunlight to the adjacent dwellings with no perceivable reduction in either daylight or sunlight. There will be minimal reduction in the sunlight to any of the adjacent amenity spaces with most achieving and increase in availability. All areas assessed meet or exceed the recommendations of the BRE guidelines.

Assessment of the quality of the proposed development.

All the proposed units within the development will exceed the recommendations of the BRE guidelines for quality of Daylight. The bedroom and living space layouts have been optimised for daylight and sunlight. The proposed amenity spaces exceed the recommendations of the BRE guidelines.

The results find that any impact on the adjacent residential structures would be minimal and imperceptible. There would be a good quality of daylight in the apartments analysed and the amenity areas would have sufficient sunlight to be bright and a pleasant spaces. The proposed development meets the recommendations of the BRE guidelines.

2. Methodology

2.1 Notes on the use of BS 8206-2: 2008 – 'Lighting for Buildings – Part 2: Code of Practice for Daylighting and BRE guidance document (2011) "Site layout planning for daylight and sunlight".

Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities 2018 directs Planning authorities to have regard to quantitative performance approaches to daylight provision outlined in guides like the BRE guide 'Site Layout Planning for Daylight and Sunlight' (2nd edition) or British Standard BS 8206-2: 2008 – 'Lighting for Buildings – Part 2: Code of Practice for Daylighting'. The standards for daylight and sunlight access in buildings (and the methodologies for assessment of same) suggested in both of these documents have been referenced in this Sunlight and Daylight Access Analysis.

Neither the British Standard nor the BRE Guide set out rigid standards or limits. The BRE Guide is preceded by the following very clear warning as to how the design advice contained therein should be used:

"The advice given here is not mandatory and the guide should not be seen as an instrument of planning policy; its aims is to help rather than constrain the designer. Although it gives numerical guidelines, these should be interpreted flexibly since natural lighting is only one of many factors in site layout design."

That the recommendations of the BRE Guide are not suitable for rigid application to all developments in all contexts is of particular importance in the context of national and local policies for the consolidation and densification of urban areas.

2.2 Daylight to the existing dwellings

The site is analysed in plan & section, and building use. Windows and amenity area are selected to test for impact from the proposed development.

BRE guideline recommends that: "Loss of light to existing windows need not be assessed if the distance of each part of the new development from the existing window is three or more times its height above the centre of the existing window."

To check for this if part of a new building measured in a vertical section perpendicular to the main window wall of an existing building, from the centre of the lowest window, subtends an angle of more than 25° to the horizontal, then the diffuse light of the existing building may be adversely affected. If a window falls within a 45° angle both in plan and elevation with a new development in place then the window may be affected and should be assessed.

For loss of daylight and sunlight to existing buildings BRE guidance document (2011) "Site layout planning for daylight and sunlight" is used and BS 8206-2: 2008 – 'Lighting for Buildings – Part 2: *Code of Practice for Daylighting*.

For loss of light the report recommends calculation of the Vertical Sky Component. This is the ratio of direct sky illuminance falling on the outside window, to the simultaneous horizontal illuminance under an unobstructed sky. The standard CIE Overcast Sky is used and the ratio is usually expressed as a percentage. The maximum value is just under 40% for a completely unobstructed vertical wall. The vertical sky component on a window is a good measure of the amount of daylight entering it.

The BRE guidelines set out a two stage assessment for the vertical sky component:

a) Where the Vertical Sky component at the centre of the existing window exceeds 27% with the new development in place then enough sky light should still be reached by the existing window.

b) Where the vertical sky component with the new development in place is both less than 27% and less than 0.8 times its former value, then the area lit by the window is likely to appear more gloomy, and electric light will be needed more of the time.

2.3 Sunlight

The BRE Guidelines recommending assessing the loss of sunlight to the main living rooms and conservatories if they have a window wall facing within 90° of due south. Kitchens and bedrooms are less important but care should be taken not to block too much sun. If the proposed development is fully north then sunlight need not be assessed.

The Annual Probable Sunlight Hours (APBH) is used to assess the quantity of sunlight for a given location. This is the total amount sunshine for a given location on an unobstructed horizontal surface taking cloud cover into account. To Assess the APSH and the Probable Sunlight Hours for winter statistical data from the Irish Meteorological Service is used. Table 1 shows the average sunlight hours for each month and the maximum possible without any cloud cover. This gives the factor of possible sunlight hours for each month.

Met Eireann Sunlight hours Data Set 1981-2010													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	OCT	Nov	Dec	Total
Average sunlight hours/day	1.54	2.45	3.36	5.32	6.44	6.40	5.17	5.13	4.16	3.17	2.10	1.44	
Average sunlight hours/Month	58.54	77.00	111.36	166.00	208.44	200.00	163.47	161.43	128.00	101.47	65.00	53.44	1496.25
Total available sunlight hours	252.00	265.00	358.00	412.00	488.00	485.00	496.00	451.00	375.00	320.00	250.00	248.00	4383
Probable sunlight hours ratio	23.37%	29.06%	31.17%	40.29%	42.77%	41.24%	33.02%	35.86%	34.13%	31.81%	26.00%	21.67%	34.14%

Table 1: Average monthly sunlight hours recorded at Dublin Airport - Data set 1981-2010

The BRE guidelines recommend that the centre of a window or 1.6m above ground for a door be assessed and receive at least 25% of the APSH and at least 5% during the period of 21st September to 21st March. If the available APSH is less than this then it should not be reduced below 0.8 times its former value or noticeable loss of sunlight may occur.

2.4 Sunlight to gardens and open spaces

For calculations of sunlight analysis it is general practice to use March 21 and the recommendations of the BRE guidance document (2011) "Site layout planning for daylight and sunlight". P.J Littlefair, in relation to Gardens and open spaces section 3.3.17 state:

"It is recommended that for it to appear adequately sunlit throughout the year, at least half of a garden or amenity area should receive at least two hours of sunlight on 21 March. If as a result of new development an existing garden or amenity area does not meet the above, and the area which can receive two hours of sun on 21 March is less than 0.8 times its former value, then the loss of sunlight is likely to be noticeable. If a detailed calculation cannot be carried out, it is recommended that the centre of the area should receive at least two hours of sunlight on 21 March."

2.5 Daylight in the proposed development.

The proposed project is analysed in plan & section, and building use. The rooms are assessed for Average Daylight Factor (ADF).

3.0 Daylight to adjacent buildings.

3.1 Site overview

The site called Hendrons known for the existing industrial structure on the site is situated in an inner city built up location. It is bounded by Dominick Street Upper to the South, Western Way to the North & West. There is a residential street along the Eastern boundary, Palmerston Place. There is currently a substantial structure to the southern end of the site and the north east of the site is level yard.

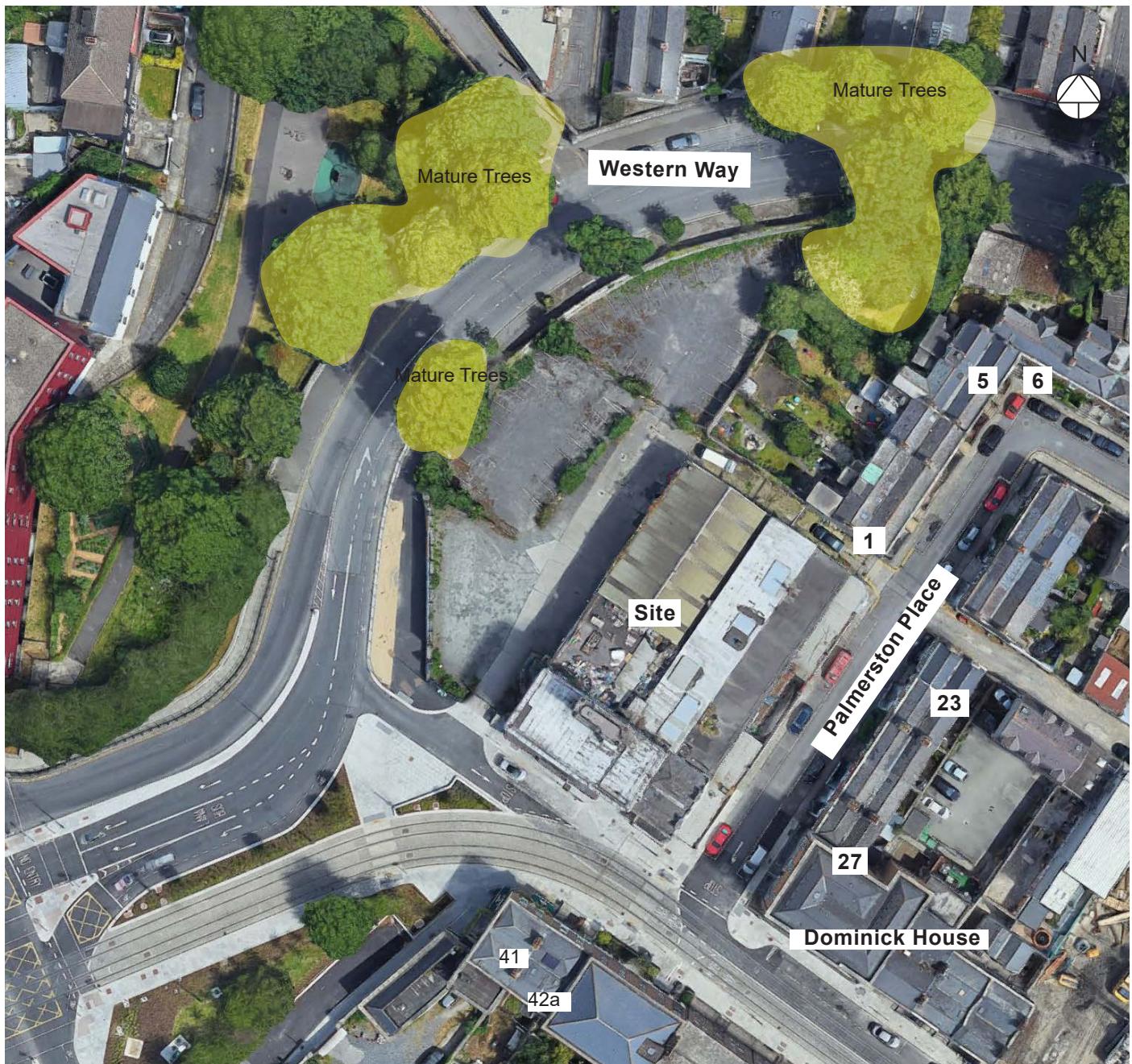


Figure 1: Aerial View of site

3.2 Preliminary assessment of adjoining dwellings

The BRE document states that if part of a new building measured in a vertical section perpendicular to the main window wall of an existing building, from the centre of the lowest window, subtends an angle of more than 25° to the horizontal, then the diffuse light of the existing building may be adversely affected. If a window falls within a 45° angle both in plan and elevation with a new development in place then the window may be affected and should be assessed. A good quality of daylight is only required in habitable rooms.

Figure 3 identifies locations with window walls facing the proposed development where possible impact may occur. Figures 3 and 4 show the sections through these locations. If the proposed development subtends a 25° angle from the lowest window there may be some impact and a detailed assessment should be carried out.

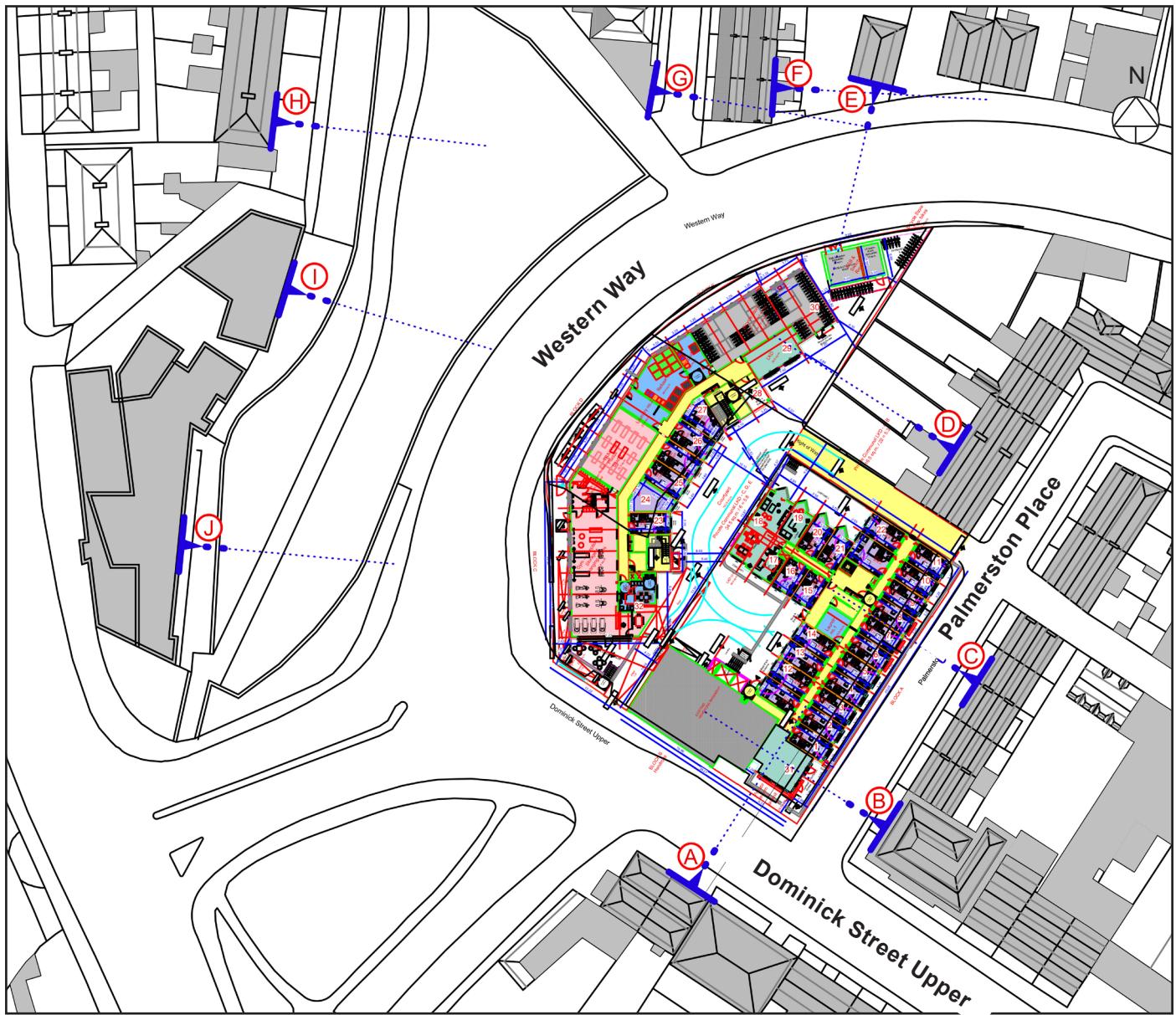


Figure 2: Site Plan with receptor points indicated at locations within 3 times the height of the proposed development. Preliminary assessment for effect on daylight to neighbouring windows.

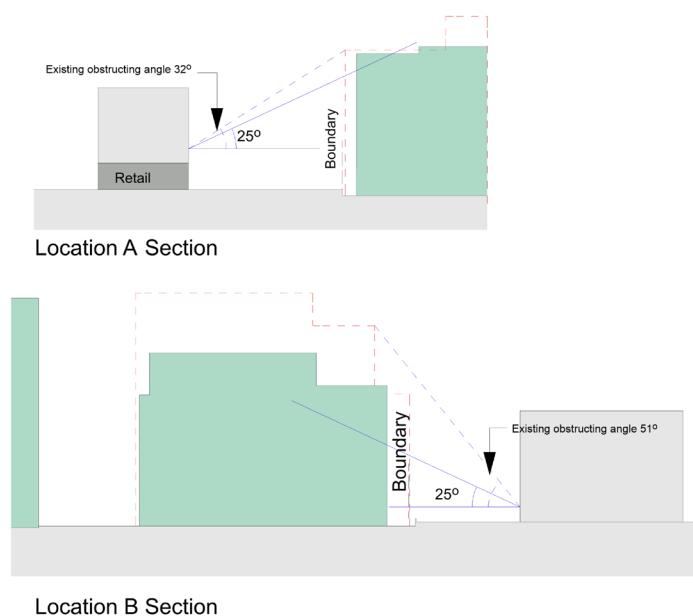


Figure 3: Sections perpendicular to window wall at locations indicated in Figure 2.



Figure 4: Sections perpendicular to window wall at locations indicated in Figure 2.

Location A. The proposed development subtends the 25° and will be assessed further. It should be noted that the existing obstructing angle is 32°.

Location B. The proposed development subtends the 25° and will be assessed further. It should be noted that the existing obstructing angle is 51°.

Location C. The proposed development subtends the 25° and will be assessed further. It should be noted that the existing obstructing angle is 47°.

Location D. The proposed development subtends the 25° and will be assessed further.

Location E. The proposed development does not subtend the 25° and does not require further assessment.

Location F, G and H. The plane perpendicular to the centre of the window wall dose not intersect the proposed development and does not require further assessment.

Location I and J. The proposed development does not subtend the 25° and does not require further assessment.

3.3 Detailed assessment to adjoining dwellings

Locations at A-D either subtend the 25 degree line or due to the angle and adjacency will be assessed in detail. Locations E to J will not be impacted by the proposed development. When a detailed assessment of adjoining dwellings is called for, the BRE guidelines recommend assessing the Vertical Sky Component (VSC) where room layouts are not known. Following the preliminary analysis the relevant windows in Dominic Street Upper and Palmerston Place will be assessed for an impact on their VSC. Test points locations are indicated on the generated model in Figures 5-9 and the results are displayed in Table 1 below.



Figure 5: View to rear of Nos 1-4 Palmerston Place, showing test points.



Figure 7: View showing test points to front of No.6 Palmerston Place



Figure 6: View to front of 23-27 Palmerston Place, showing test points.



Figure 9: View showing test points to Dominick House, corner of Palmerston Place

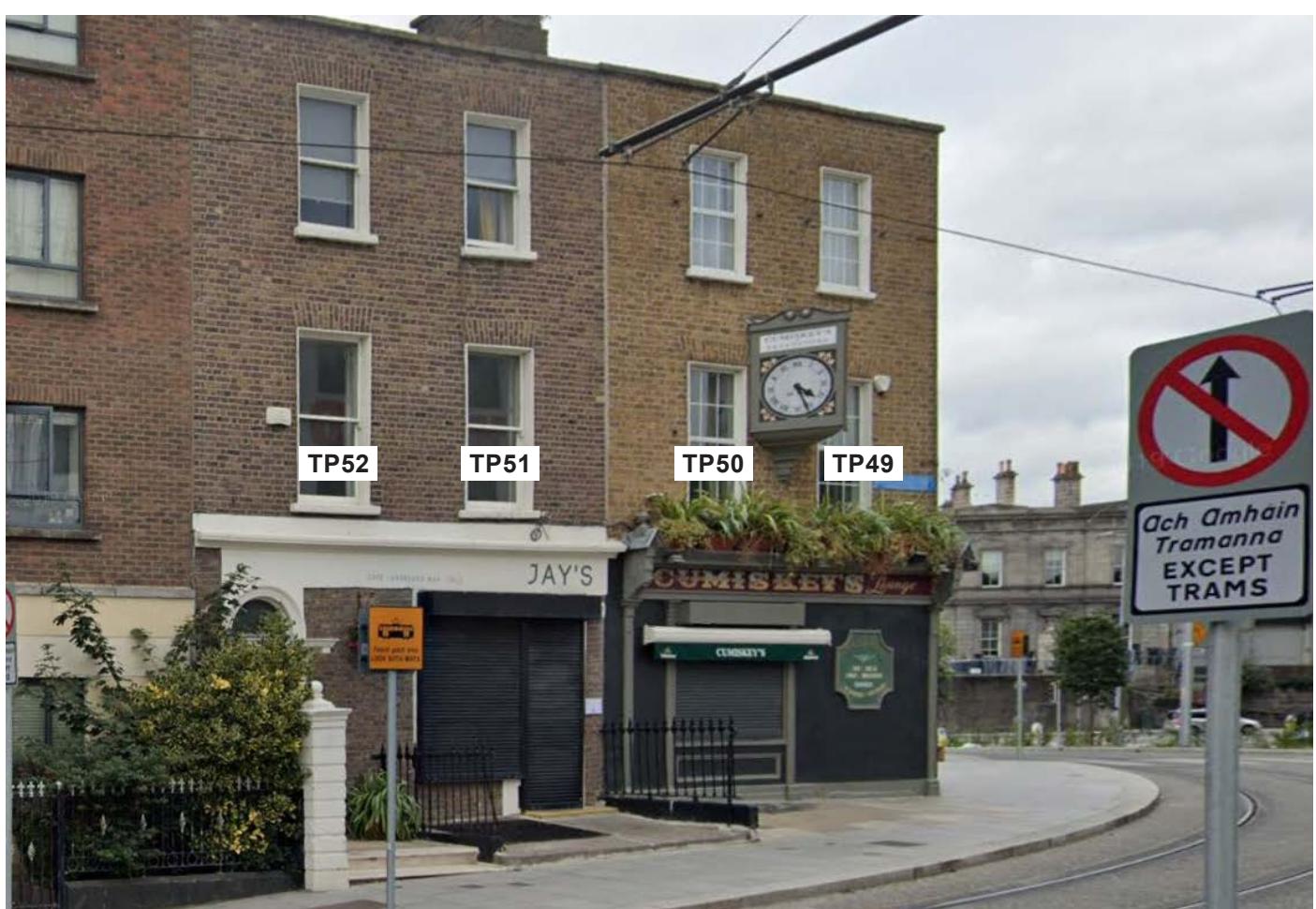


Figure 8: View of Dominick Street Upper, showing test points.

Following on from the preliminary analysis, windows in the adjacent buildings have been tested for Vertical Sky Component (VSC). Test points representing window at locations identified in Figure 2 are indicated in Figures 5-9 and the results are displayed in Table 1 below.

Windows to bedrooms have a lesser requirement for good daylight than the main living space or kitchen.

Available daylight to selected windows in adjacent residential properties						
Test Points	Location	Assumed Use	Vertical Sky Component Recommended 27%		Available daylight Ratio as a % of existing value Recommended 0.8	Notes
			Existing	Proposed		
Palmerston Place						
TP1a	No.1	Living	27.5	20.5	0.75	Minor Impact
TP1b		Living	11	6.5	0.59	Minor Impact
TP2		Undercroft				Not applicable use
TP3		Bathroom				Not applicable use
TP4a		Bedroom	31.5	29	0.92	Meets criteria
TP4b		Bedroom	26.5	22	0.83	Meets criteria
TP5	No.2	Living	24.5	18.5	0.76	Minor Impact
TP6		Living	32	24	0.75	Minor Impact
TP7		Living	33	28.5	0.86	Meets criteria
TP8		Bedroom	34	29	0.85	Meets criteria
TP9	No.3	Living	28	22	0.79	Minor Impact
TP10		Living	10.5	12.5	1.19	Positive impact*
TP11		Living	10	12	1.20	Positive impact*
TP12		Bedroom	36	29	0.81	Meets criteria
TP13		Bedroom	35	27	0.77	Meets criteria
TP14	No.4	Living	37	28	0.76	Meets criteria
TP15		Bedroom	37	31	0.84	Meets criteria
TP16	No.6	Living	13.5	13.5	1.00	No change
TP17		Living	29.5	30	1.02	Positive impact*
TP18		Bedroom	34.5	36	1.04	Positive impact*
TP19		Bedroom	29.5	30	1.02	Positive impact*
TP20	No.23	Living	11.5	12	1.04	Positive impact*
TP21		Living	20.5	22.5	1.10	Positive impact*
TP22		Bedroom	24.5	27	1.10	Positive impact*
TP23		Bedroom	22	25	1.14	Positive impact*
TP24	No.24	Living	10.5	11	1.05	Positive impact*
TP25		Living	16.5	18	1.09	Positive impact*
TP26		Bedroom	20.5	23.5	1.15	Positive impact*
TP27		Bedroom	20	21	1.05	Positive impact*
TP28	No.25	Living	10.5	10.5	1.00	Meets criteria
TP29		Living	13	16.5	1.27	Positive impact*
TP30		Bedroom	19	19.5	1.03	Positive impact*
TP31		Bedroom	18.5	18.5	1.00	No change
TP32	No.26	Living	10.5	11	1.05	Positive impact*
TP33		Living	14.5	15	1.03	Positive impact*
TP34		Bedroom	17.5	19	1.09	Positive impact*
TP35		Bedroom	17.5	19	1.09	Positive impact*
TP36	No.27	Living	11	10.5	0.95	Meets criteria
TP37		Living	14	14.5	1.04	Positive impact*
TP38		Bedroom	18	18.5	1.03	Positive impact*

Available daylight to selected windows in adjacent residential properties

Test Points	Location	Assumed Use	Vertical Sky Component Recommended 27%		Available daylight Ratio as a % of existing value Recommended 0.8	Notes
			Existing	Proposed		
TP39		Bedroom	17.5	19	1.09	Meets criteria
Dominick House						
TP40	Basement 1	Living	11.5	11	0.96	Meets criteria
TP41		Bedroom	9.5	9	0.95	Meets criteria
TP42	Basement 2	Living	12.5	12.5	1.00	No change
TP43	Grd Flr Apt 1	Living	16.5	17	1.03	Positive impact*
TP44		Bedroom	18	19	1.06	Positive impact*
TP45	Grd Flr Apt 2	Bedroom	20.5	22.5	1.10	Positive impact*
TP46	First Flr Apt 1	Living	19	20.5	1.08	Positive impact*
TP47		Bedroom	19.5	21.5	1.10	Positive impact*
TP48		Bedroom	23.5	25	1.06	Positive impact*
Dominick Street Upper 41 & 42A						
TP49	1st Flr	Unknown	20	20	1.00	No change
TP50		Unknown	21	21	1.00	No change
TP51	1st Flr	Unknown	22	22.5	1.02	Positive impact*
TP52		Unknown	24	23.5	0.98	Meets criteria

Table 2: Vertical Sky Component (VSC) for windows as per test points indicated in Figures 3-7 above.

*These windows will have an increased availability of daylight due to greater access to the sky.

3.4 Discussion

28 of the windows have an improvement in the VSC and 5 have no change. There are 5 windows marginally below 0.8 times the former value with the overall majority retaining close to the current levels of daylight availability.

The front windows of No. 6 and 23 to 27 Palmerston Place were assessed and as there was no significant reduction.

The buildings on Dominick Street Upper have commercial use on the ground floor, with residential accommodation on the upper levels. The change in VSC levels will be imperceptible.

There is a minor reduction to the VSC of a small number of windows to No.s 1, 2 & 3 Palmerston Place below the 80% recommended level in the BRE guidelines. The remaining test locations are not reduced below the a VSC of 27% or 80% of their former value and in a large number of the test locations there will be an improvement in available daylight.

The rear of No 1-5 Palmerston Place currently face on to an empty site which in an inner city location would have and expectation for some level of development and as a result they currently experience a high VSC. If the current proposal for block E was compared to a site with a building of similar scale to the houses on the Palmerston Place the ratio would be in line with the recommendations of the BRE guidelines and would not be reduced below 80% of the current value. The rear windows will benefit from the removal of the existing warehouse close to the boundary and the set back of the new Block A. They will also experience an enhanced view out. The VSC calculation does not take into account materials and the proposed finish of white brick will reflect light into the existing houses which will further enhance the light levels. A large number of the windows will also experience and increase in daylight availability due to the removal of the existing warehouse.

It should be noted that there are a number of mature trees along Western Way and to the northern gardens on Palmerston Place indicated in Figure 1. and the analysis software does not take into account the effects of trees.

3.5 Conclusion

A small number of windows a marginally lower than the recommendations with the majority meeting or exceeding the current levels of daylight availability. The BRE guidelines states that "Where the loss of light is well within the guidelines or only a small number of windows or limited area of open space lose light (within the guidelines), a classification of negligible impact is more appropriate." The proposed development meets the recommendations of the BRE guidelines and any impact will be negligible.

4.0 Daylight to Proposed Development.

The BRE guidelines recommend that the Average Daylight Factor (ADF) be assessed in habitable rooms of new developments. BS 8206-2: 2008 – ‘Lighting for Buildings – Part 2: *Code of Practice for Daylighting*’ sets minimum values of ADF of 2% for kitchens and living rooms which include a kitchen, 1.5% for living rooms and 1% for bedrooms. An average daylight factor of 5% is a well daylit space.

The factors that affect ADF are room depth, aspect, window size relative to floor area and closeness to an adjacent obstruction. All ground floor habitable rooms were assessed, as it can be assumed that the rooms above would have a better ADF. Room identifying plans for each block along with generated analysis are shown in Figures 10-13, the results are set out in Table 2 below.

All the living spaces to the Ground and Lower ground floor are assessed for the Average Daylight Factor as requested by An Board Pleanala.



Figure 10: Lower Ground floor plan identifying rooms assessed for Average Daylight Factor

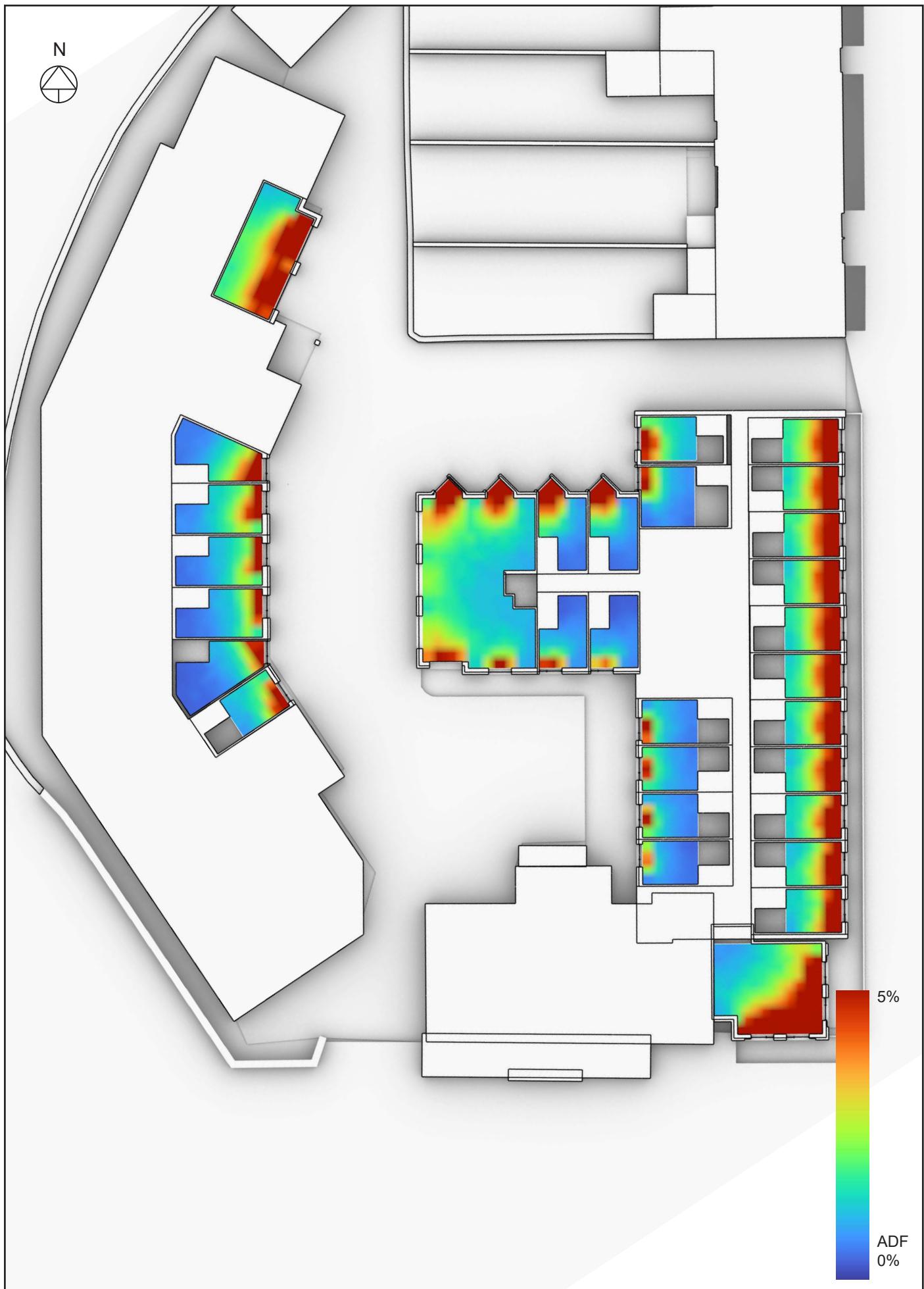


Figure 11: Lower ground floor plan of proposed development, showing unit assessed for Average Daylight Factor with false colour map.



Figure 12: Upper Ground floor plan identifying rooms assessed for Average Daylight Factor

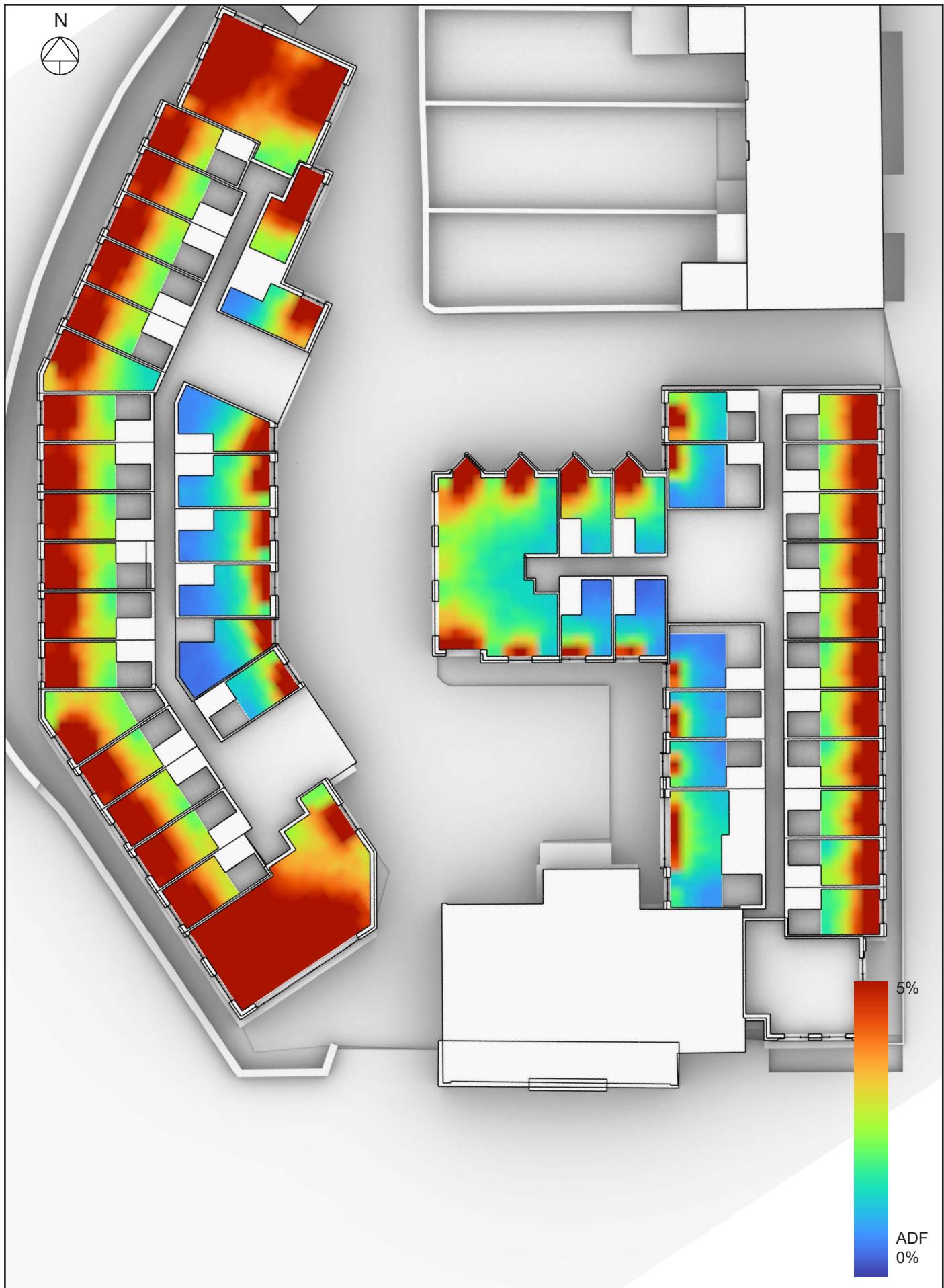


Figure 13: Upper ground floor plan of proposed development, showing unit assessed for Average Daylight Factor with false colour map.

Average Daylight Factor						
Space ID	Use	Area m2	Sensor Count	Average ADF %	Min Recommended ADF %	Meets Criteria
Lower Ground Floor						
L 1	Bedroom	11.51	30	2.39%	1	Y
L 2	Bedroom	18.70	45	1.18%	1	Y
L 3	Bedroom	17.06	42	1.62%	1	Y
L 4	Bedroom	17.06	42	1.87%	1	Y
L 5	Bedroom	17.06	42	2.28%	1	Y
L 6	Bedroom	16.48	34	1.91%	1	Y
L 7	Bedroom	11.51	30	1.06%	1	Y
L 8	Bedroom	11.51	30	1.36%	1	Y
L 9	Bedroom	11.51	30	1.53%	1	Y
L 10	Bedroom	11.51	30	1.43%	1	Y
L 11	Bedroom	13.46	32	1.07%	1	Y
L 12	Bedroom	13.46	32	1.30%	1	Y
L 14	Bedroom	15.09	34	2.27%	1	Y
L 15	Bedroom	15.09	34	2.15%	1	Y
L 16	Bedroom	15.34	42	1.36%	1	Y
L 17	Bedroom	11.51	30	2.48%	1	Y
L 18	Bedroom	11.51	30	4.51%	1	Y
L 19	Bedroom	11.51	30	4.37%	1	Y
L 20	Bedroom	11.51	30	4.30%	1	Y
L 21	Bedroom	11.51	30	4.25%	1	Y
L 22	Bedroom	11.51	30	4.17%	1	Y
L 23	Bedroom	11.51	30	4.09%	1	Y
L 24	Bedroom	11.51	30	4.01%	1	Y
L 25	Bedroom	11.51	30	3.95%	1	Y
L 26	Bedroom	11.51	30	3.82%	1	Y
L 27	Bedroom	11.51	30	3.65%	1	Y
L 28	Bedroom	11.51	30	3.54%	1	Y
LKD 01	Living Kitchen Dining	44.75	114	3.92%	2	Y
LKD 02	Living Kitchen Dining	68.58	174	2.17%	2	Y
LKD 03	Living Kitchen Dining	34.59	92	4.20%	2	Y
Upper Ground Floor						
U 01	Bed	11.51	30	4.43%	1	Y
U 02	Bed	11.51	30	4.56%	1	Y
U 03	Bed	11.51	30	4.72%	1	Y
U 04	Bed	11.51	30	4.92%	1	Y
U 05	Bed	11.51	30	5.02%	1	Y
U 06	Bed	11.51	30	5.09%	1	Y
U 07	Bed	11.51	30	5.16%	1	Y
U 08	Bed	11.51	30	5.20%	1	Y
U 09	Bed	11.51	30	5.25%	1	Y
U 10	Bed	11.51	30	5.32%	1	Y
U 11	Bed	11.51	30	5.41%	1	Y
U 12	Bed	12.28	30	2.97%	1	Y
U 13	Bed	15.34	42	1.66%	1	Y
U 14	Bed	15.09	34	3.30%	1	Y
U 15	Bed	15.09	34	3.48%	1	Y

Average Daylight Factor						
Space ID	Use	Area m2	Sensor Count	Average ADF %	Min Recommended ADF %	Meets Criteria
Upper Ground Floor						
U 17	Bed	13.46	32	1.59%	1	Y
U 18	Bed	13.46	32	1.35%	1	Y
U 19	Bed	13.13	36	1.24%	1	Y
U 20	Bed	11.09	30	1.84%	1	Y
U 21	Bed	11.09	30	1.89%	1	Y
U 22	Bed	14.10	40	5.59%	1	Y
U 23	Bed	14.10	40	5.57%	1	Y
U 24	Bed	19.31	48	4.80%	1	Y
U 25	Bed	14.10	40	5.34%	1	Y
U 26	Bed	14.10	40	5.35%	1	Y
U 27	Bed	14.10	40	5.28%	1	Y
U 28	Bed	14.10	40	5.34%	1	Y
U 29	Bed	14.10	40	5.33%	1	Y
U 30	Bed	14.10	40	5.41%	1	Y
U 31	Bed	19.87	53	4.82%	1	Y
U 32	Bed	14.10	40	5.43%	1	Y
U 33	Bed	14.10	40	5.42%	1	Y
U 34	Bed	14.10	40	5.40%	1	Y
U 35	Bed	14.10	40	5.42%	1	Y
U 36	Bed	12.45	35	5.92%	1	Y
U 37	Bed	14.03	30	7.42%	1	Y
U 38	Bed	15.26	38	3.51%	1	Y
U 39	Bed	16.48	34	2.28%	1	Y
U 40	Bed	17.06	42	2.71%	1	Y
U 41	Bed	17.06	42	2.28%	1	Y
U 42	Bed	17.06	42	2.03%	1	Y
U 43	Bed	18.70	45	1.51%	1	Y
U 44	Bed	11.51	30	3.02%	1	Y
U 45	Bed	12.45	35	6.18%	1	Y
U 46	Bed	14.10	40	5.61%	1	Y
U LKD 01	Living Dining	45.16	120	2.07%	1.5	Y
U LKD 02	Living Kitchen Dining	68.58	174	2.62%	1.5-2	Y
U LKD 03	Living Kitchen Dining	85.88	225	7.87%	1.5-2	Y
U LKD 04	Living Kitchen Dining	63.97	173	6.35%	1.5-2	Y

Table 3: Average Daylight factor to test rooms.

4.1 Conclusion

All relevant rooms on the lower ground and upper ground floor exceed the minimum recommendation for Average Daylight Factor and will have adequate daylight. The proposed development meets the criteria set out in BRE Guidelines and BS 8206-2: 2008 – ‘Lighting for Buildings – Part 2: *Code of Practice for Daylighting*.

4.2 Sunlight to proposed living spaces

The BRE guidelines recommend assessing main living space for sunlight availability and where possible living spaces should be orientated to within 90° due south to achieve this. The method for assessment is the calculation of the Annual probable sunlight hours (APSH). This is a measure of the total number of hours in the year that the sun is expected to shine on unobstructed ground taking into account geographic location and cloudiness.

The BRE guidelines advocates a flexible approach and recognises that it is not realistic for all spaces to achieve the targets. It does not set specific targets for the number of units within a development that should achieve the recommended targets.

Sunlight in Ireland due to the climate is less persistent and more often experienced in spells due to the prevalence of cloudy conditions. It can not be relied on for lighting to a living space and the assessment of the Average Daylight Factor is the more appropriate metric for this and the main source of natural light in a room. Excessive sunlight can cause glare and unwanted heat gains and should be mitigated for.

The main Living / Dining / Kitchen spaces are assessed for the APSH and the results are set out in Table 4. Most of the spaces have multiple windows and where there are more than 2 facing within due south a sample selection of windows are assessed.



Figure 14: Window ID's to main LKD spaces for assessment.

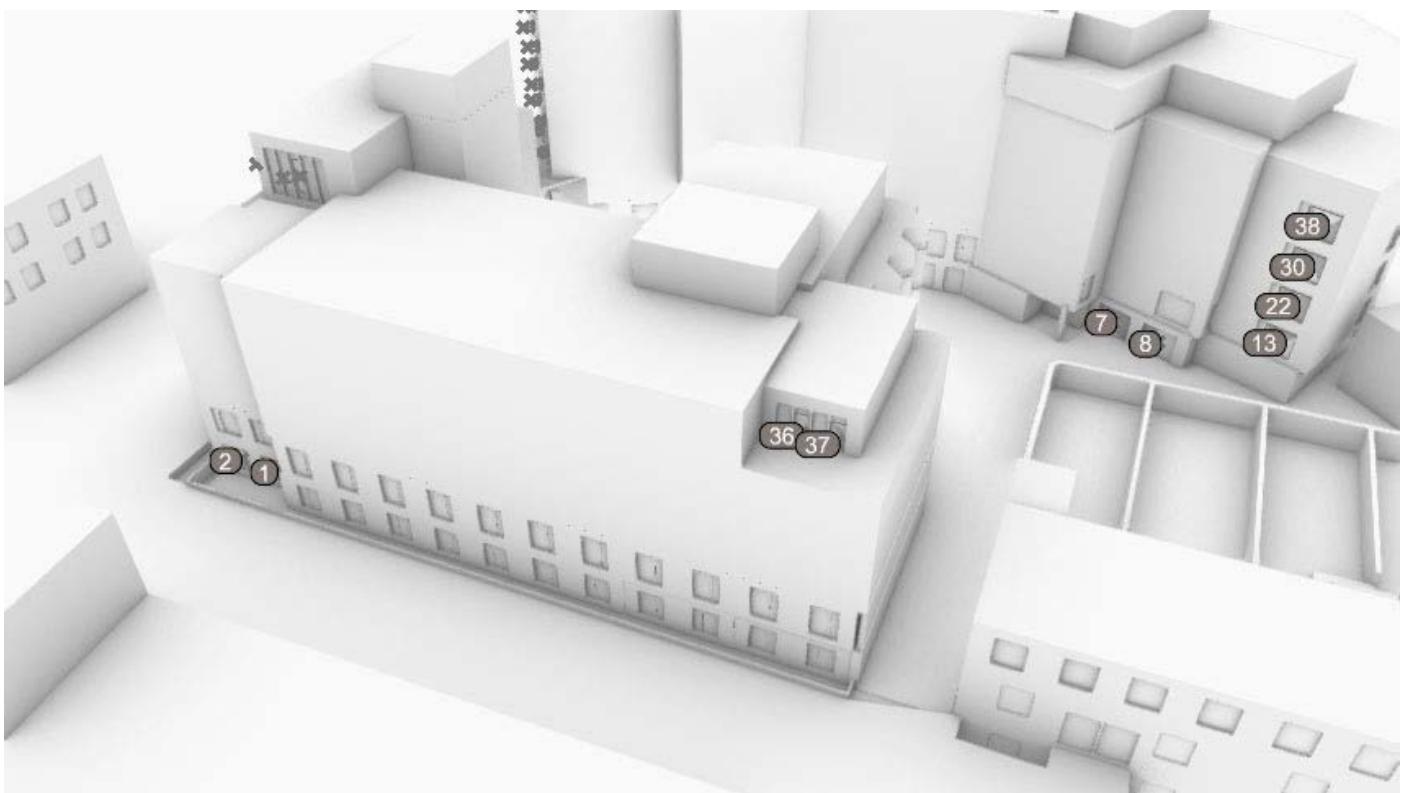


Figure 15: Window ID's to main LKD spaces for assessment.

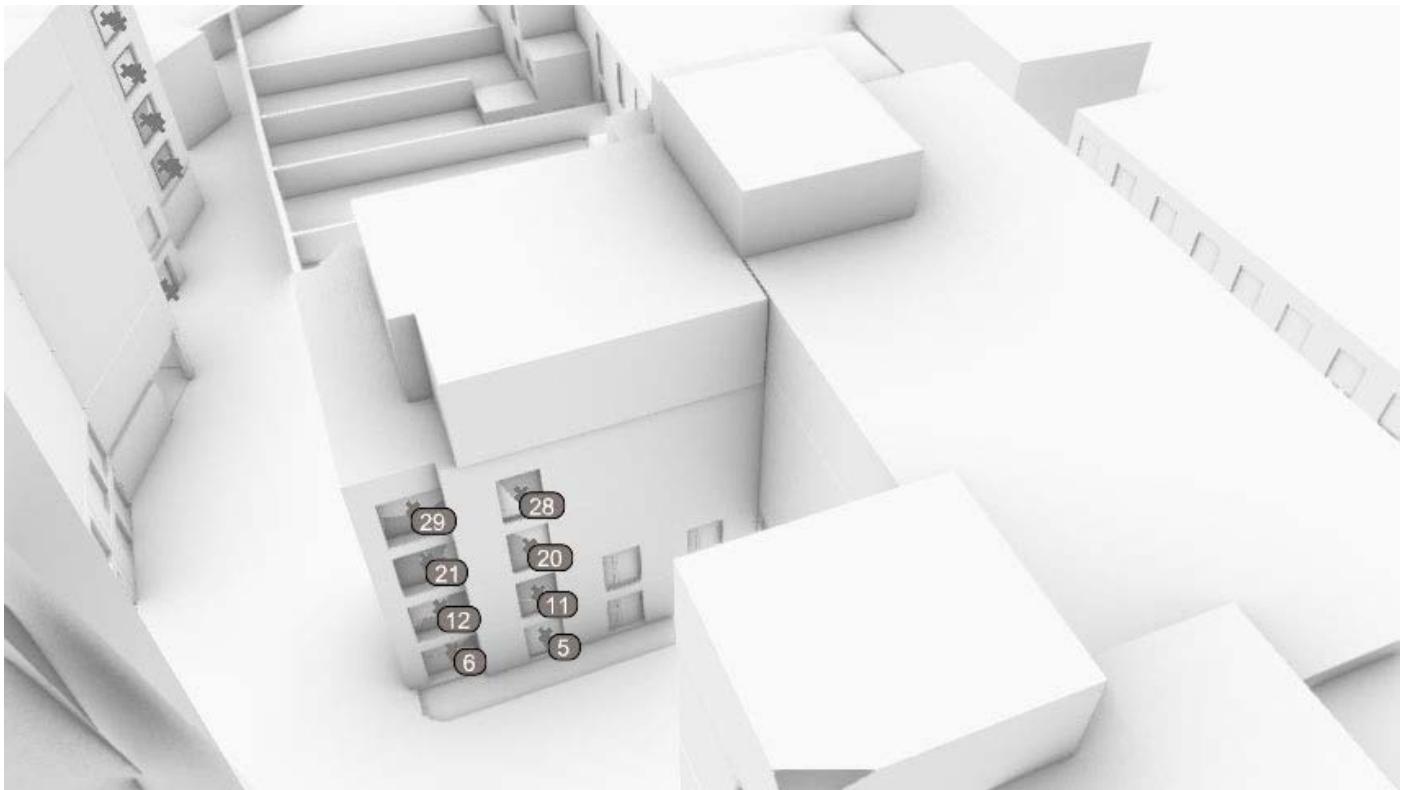


Figure 16: Window ID's to main LKD spaces for assessment.

Annual Probable Sunlight Hours					
		APSH >25% Target	Sept 21 - Mar 21 APSH >5% Target		
Window ID	Location	% of APSH	% PSH Winter	Room	Meet Criteria
1	LG L2	30.81%	7.4%		
2	LG L2	30.51%	8.2%		
3	LG L2	47.35%	10.2%		
4	LG L2	48.38%	11.0%	LG L2	Y
5	LG L3	10.04%	1.8%		
6	LG L3	11.41%	2.4%	LG L3	N
7	LG L1	29.67%	2.7%		
8	LG L1	36.24%	4.8%	LG L1	Y
9	UG L1	50.73%	20.1%		
10	UG L1	44.52%	14.0%	UG L1	Y
11	UG L4	15.08%	1.4%		
12	UG L4	12.92%	2.5%	UG L4	N
13	UG L2	50.96%	12.5%	UG L2	Y
14	01 L3	55.39%	21.1%		
15	01 L3	44.02%	12.3%		
16	01 L3	69.24%	24.7%		
17	01 L3	45.23%	13.2%	01 L3	Y
18	02 L1	43.72%	15.6%		
19	02 L2	55.75%	21.3%	02 L2	Y
20	01 L4	19.81%	1.7%		
21	01 L4	14.47%	2.4%	01 L4	N
22	01 L2	57.85%	17.9%	01 L2	Y
23	03 L1	48.81%	16.6%		
24	03 L1	60.06%	21.9%	03 L1	Y

Annual Probable Sunlight Hours					
		APSH >25% Target	Sept 21 - Mar 21 APSH >5% Target		
25	02 L3	75.35%	28.7%		
26	02 L3	75.35%	28.7%		
27	02 L3	75.17%	28.8%	02 L3	Y
28	02 L4	25.74%	3.2%		
29	02 L4	17.05%	3.8%	02 L4	N - Yes for summertime
30	02 L2	63.78%	22.5%	02 L2	Y
31	03 L3	75.35%	28.7%		
32	03 L3	75.35%	28.7%		
33	03 L3	74.72%	28.8%		
34	03 L3	58.01%	17.6%		
35	03 L3	66.91%	22.9%	03 L3	Y
36	03 L4	42.06%	10.5%		
37	03 L4	51.76%	14.8%	02 L4	Y
38	03 L2	65.70%	23.3%	03 L2	Y
39	04 L3	59.13%	19.8%		
40	04 L3	66.27%	25.6%		
41	04 L3	66.27%	25.6%		
42	04 L3	66.27%	25.6%	04 L3	Y
43	04 L1	66.87%	22.4%		
44	04 L1	72.02%	25.7%	04 L1	Y
45	05 L1	78.14%	29.8%		
46	05 L1	79.35%	30.8%	05 L1	Y
47	06 L1	80.81%	32.0%		
48	06 L1	80.81%	32.0%	06 L1	Y
49	07 L1	67.39%	30.3%		
50	07 L1	67.39%	30.3%	07 L1	Y
51	UG L3			UG L3	* Windows >90 due south

Table 4: Annual Probable sunlight hours to proposed development

4.3 Discussion

The BRE Guidelines recommend only assessing main living spaces and bedrooms need not be assessed. There are 24 no. Living / Dining spaces within the proposed development and 23 no. of these have windows facing within 90° of due south. 18 no. of the living spaces meet the criteria for both winter and summer sunlight hours for at least one window. One further space 02 L4 meets the target for summer sunshine hours. Three of the living spaces do not fully meet the target criteria but will still receive good levels of sunshine. These spaces meet the requirements for good daylight and will be bright well lit rooms which is highly desirable. All rooms have multiple windows with multiple aspects catering all requirements of daylight and sunlight.

The residents in this development are not limited to using one LKD only, they can move between any of the 24 LKDs. For those who want direct sunshine, weather permitting, there will be multiple choices at all times of the day. For those wanting good well lit LKD spaces with less direct sunshine, there are LKDs that fit that criteria also.

4.4 Conclusion

The majority of the living spaces to the proposed development achieve a high level of sunshine and have a window facing due south. Considering the constraints of the site and inner city nature the proposed development it achieves a high ratio of 79% meeting the targets set out in the BRE guidelines coupled with 100% meeting the target set out in the BRE guidelines for the ADF.

5.0 Sunlight to neighbouring properties

5.1 Annual Probable Sunlight Hours

The BRE guidelines recommend assessing walls for the APSH that face within 90° of due south. For a proposed development to have a noticeable impact on the annual Probable Sunlight Hours the value need to be reduced below the recommended 25% annual or 5% in the winter period from September to March. If the value is either below this to begin with or is reduced below this then it should not be reduced below 0.8 times its former value.

There are no windows facing the proposed development in the neighbouring properties that are within 90° of due south requiring assessment.

5.2 Conclusion

There will be no loss of sunlight to the adjoining dwellings and the proposed development meets the requirements of the BRE guidelines.

6.0 Sunlight to Gardens and Open Spaces

6.1 Sun on the Ground Calculation.

The BRE guidelines recommend that for it to appear adequately sunlit throughout the year, at least half of a garden or amenity area should receive at least 2 hours of sunlight on March 21st. It also states that front gardens need not be assessed for sunlight. The amenity areas of the adjacent houses were analysed, the results are shown in Table 5 and false colour radiation maps with average sunlight hours can be viewed in Figures 17 & 18 below.

6.2 Sunlight to existing gardens and amenities

Sunlight on Ground - Adjacent Residential Properties					
Space ID	Location	Existing	Proposed	Ratio	Meets Criteria
G1	No. 1 Palmerston Place	8	10	125.00%	Y
G2	No. 2 Palmerston Place	27	46	170.37%	Y
G3	No. 3 Palmerston Place	49	57	116.33%	Y
G4	No. 4 Palmerston Place	54	69	127.78%	Y
G5	No. 5 Palmerston Place	80	79	98.75%	Y

Table 5: Percentage area of amenity space that receives 2 or more hours of sunlight on 21st March.

6.3 Conclusion

There is no loss of sunlight to any of the rear amenity spaces assessed. The majority will have an increase in sunlight hours over the amenity space. The proposed development meets the BRE guidelines for gardens and open spaces.

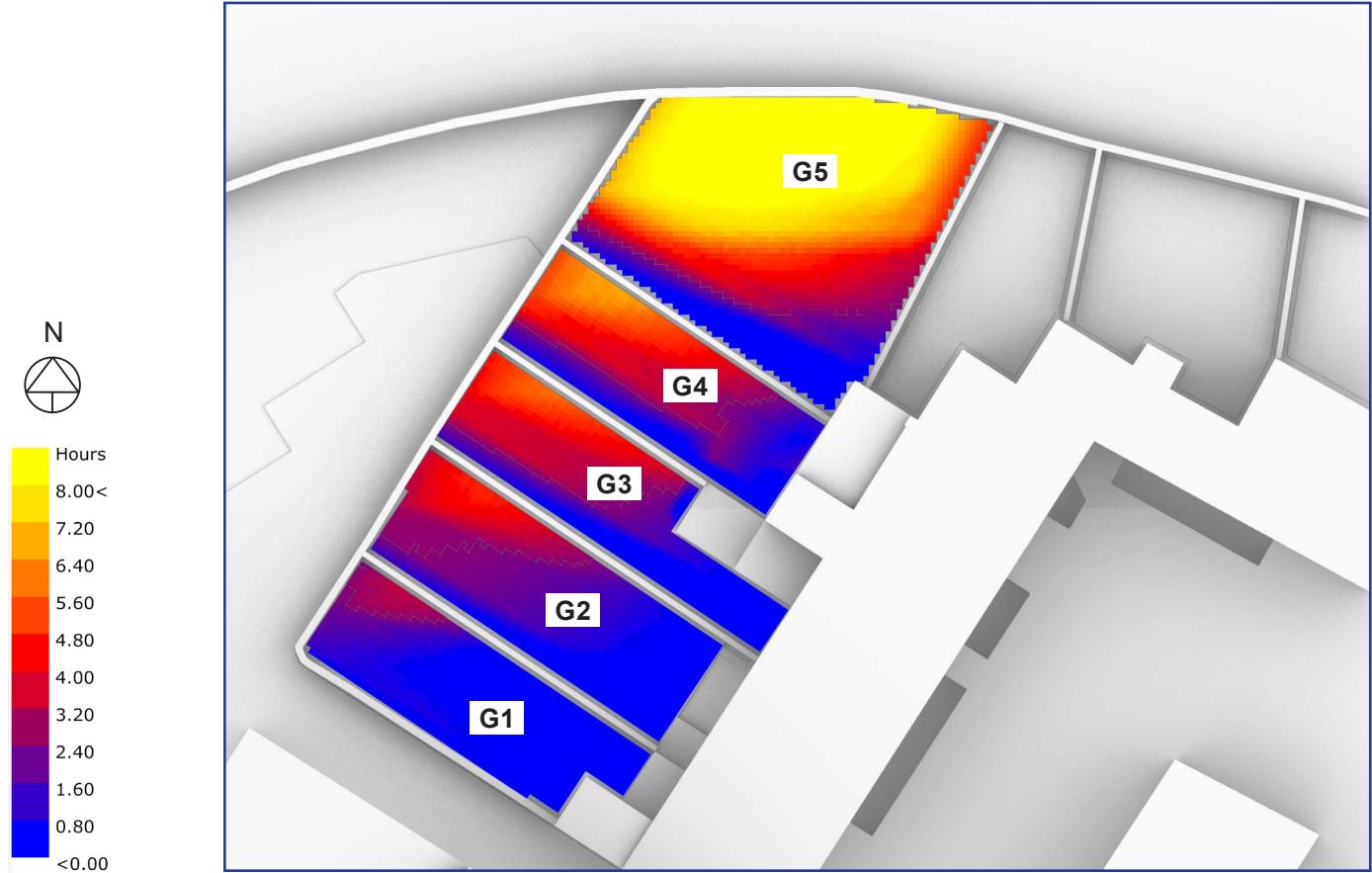


Figure 17: Radiation map of existing amenity areas, showing available sunlight on 21st March. The scale represents the percentage of daylight received from 0 - 8 hours.

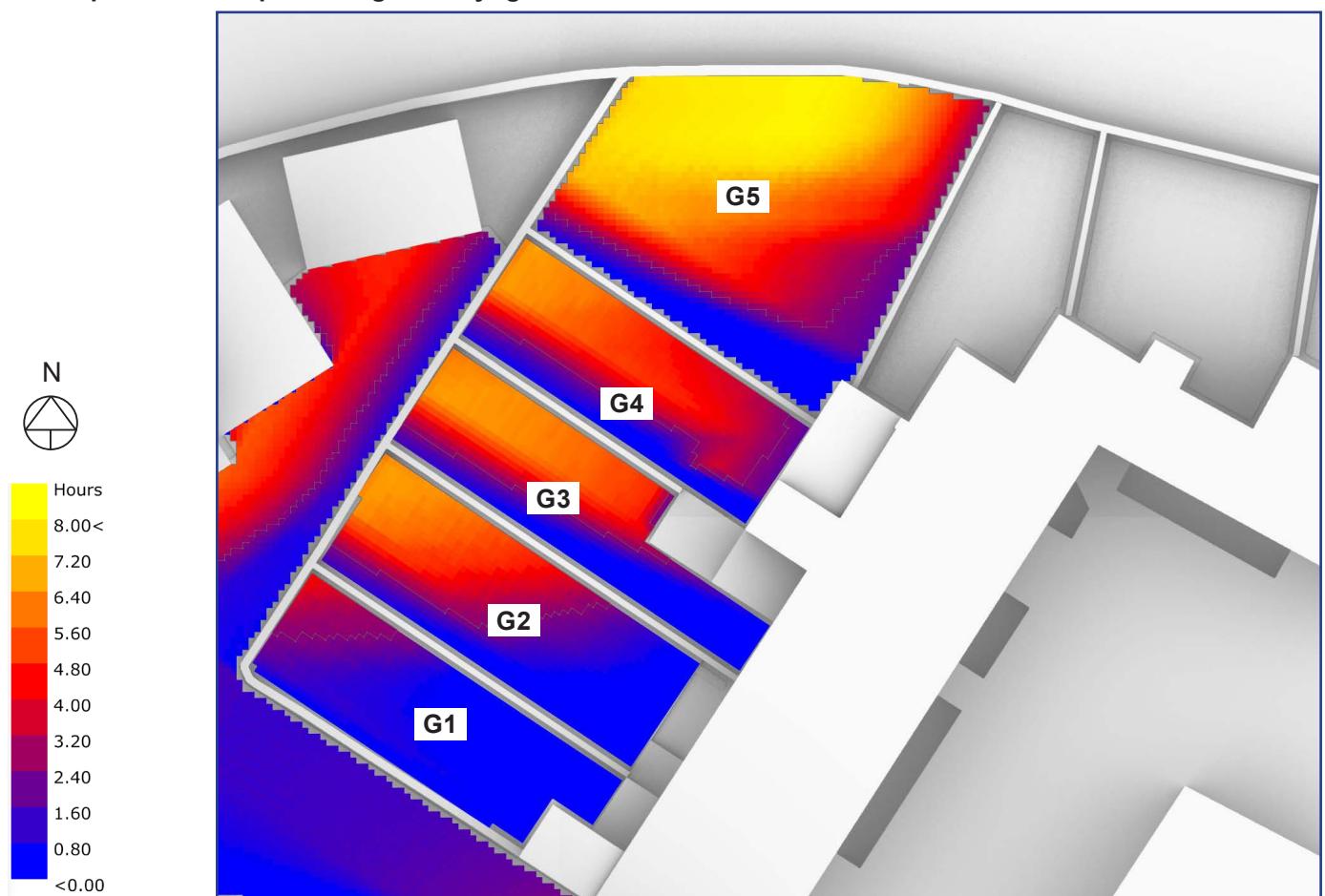


Figure 18: Proposed Radiation map of amenity areas, showing available sunlight on 21st March. The scale represents the percentage of daylight received from 0 - 8 hours.

6.4 Sunlight to amenity spaces within the proposed development



Figure 19: Landscape plan of the proposed development.

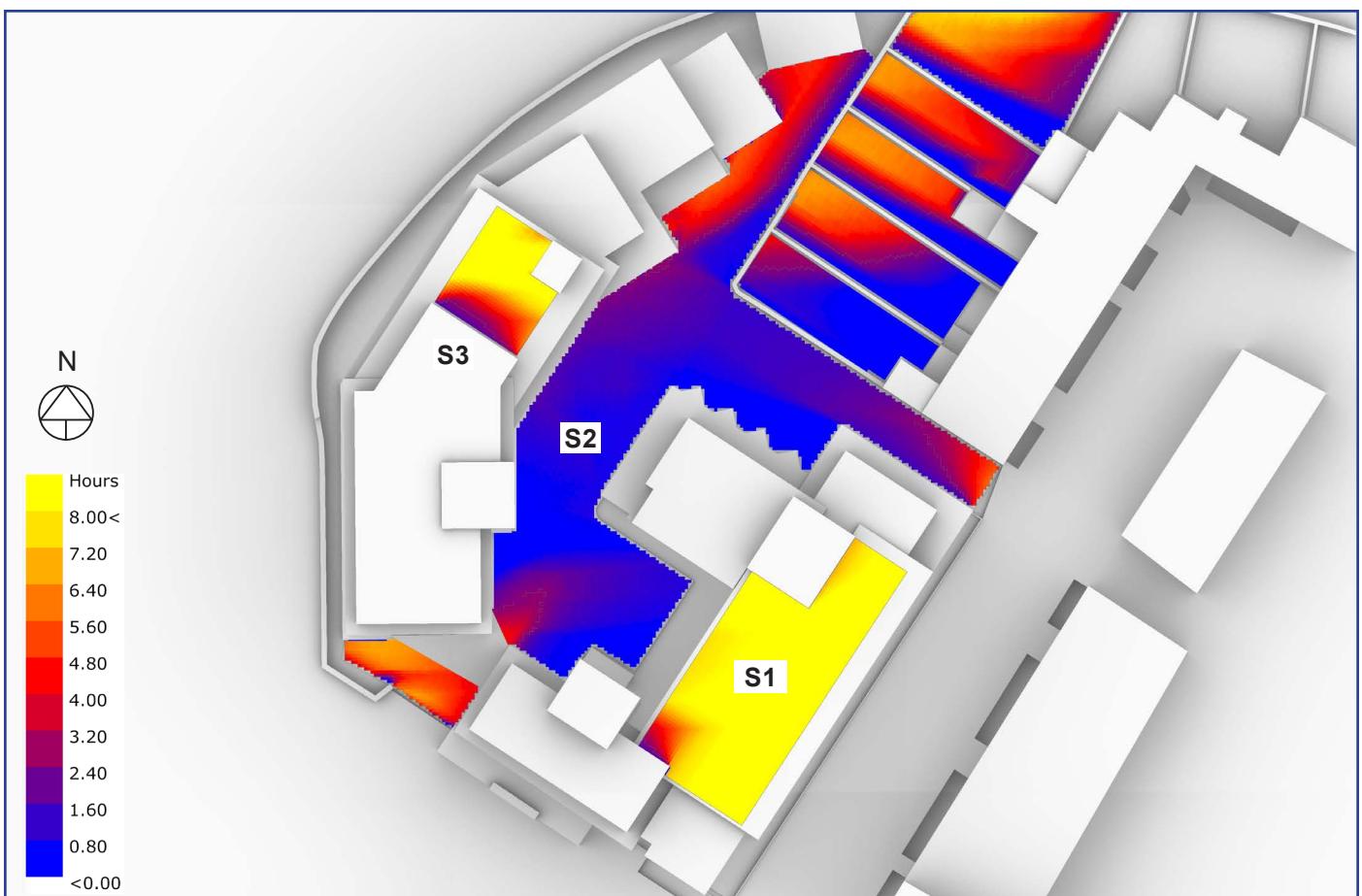


Figure 20: Proposed Radiation map of amenity areas, showing available sunlight on 21st March. The scale represents the percentage of daylight received from 0 - 8 hours.

The areas of amenity within this proposal have been assessed with a calculation of Sun on the Ground. The results are shown in Table 4, the location plan and a radiation map with average sunlight hours can be viewed in Figures 12 & 13 above.

Sunlight on the ground - within development			
No.	Use	Proposed	Meets criteria
S1	Communal Amenity Space	99%	Y
S2	Communal Amenity Space	23%	N
S3	Communal Amenity Space	98%	Y

Table 4: Calculation of Sun on the Ground to amenity area within the proposed development.

6.5 Conclusion

There are a variety of external amenity spaces provided through-out the scheme with three different zones available at ground and roof level. They are well designed with some covered areas and associated internal communal spaces affording use regardless of weather. The space at ground level includes extensive landscaping and is designed to have areas of seating in the zones where the sunlight is most prevalent. The two other spaces would have sun on the ground for in excess of 2 hours of sunlight on March 21st. The proposed development would meet the BRE guidelines.

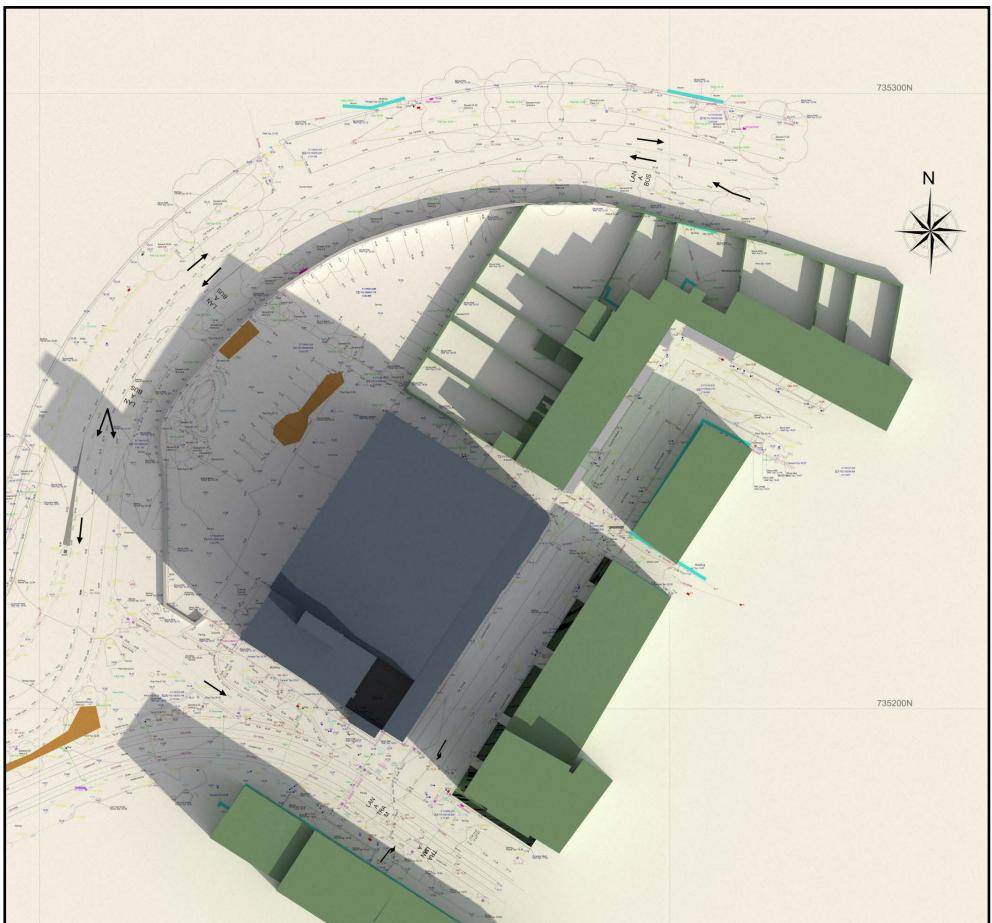
6.6 Shadow Diagrams

The BRE guidelines recommend using the 21st March for plotting shadow diagrams. June 21st and December 21st are shown for information, but it should be noted that the summer solstice is the best case scenario with shadows at their shortest, and even low buildings will cast long shadows in the winter; it is common for large areas of the ground to be in shadow.

Existing and proposed shadow diagrams for the Equinox 21 March at two hourly intervals during the day are shown in Figures 21-32. They indicate that the buildings across Western Way would not be impacted by the proposed development.

Appendix A: Shadow Casting Diagrams

N
Existing



Proposed

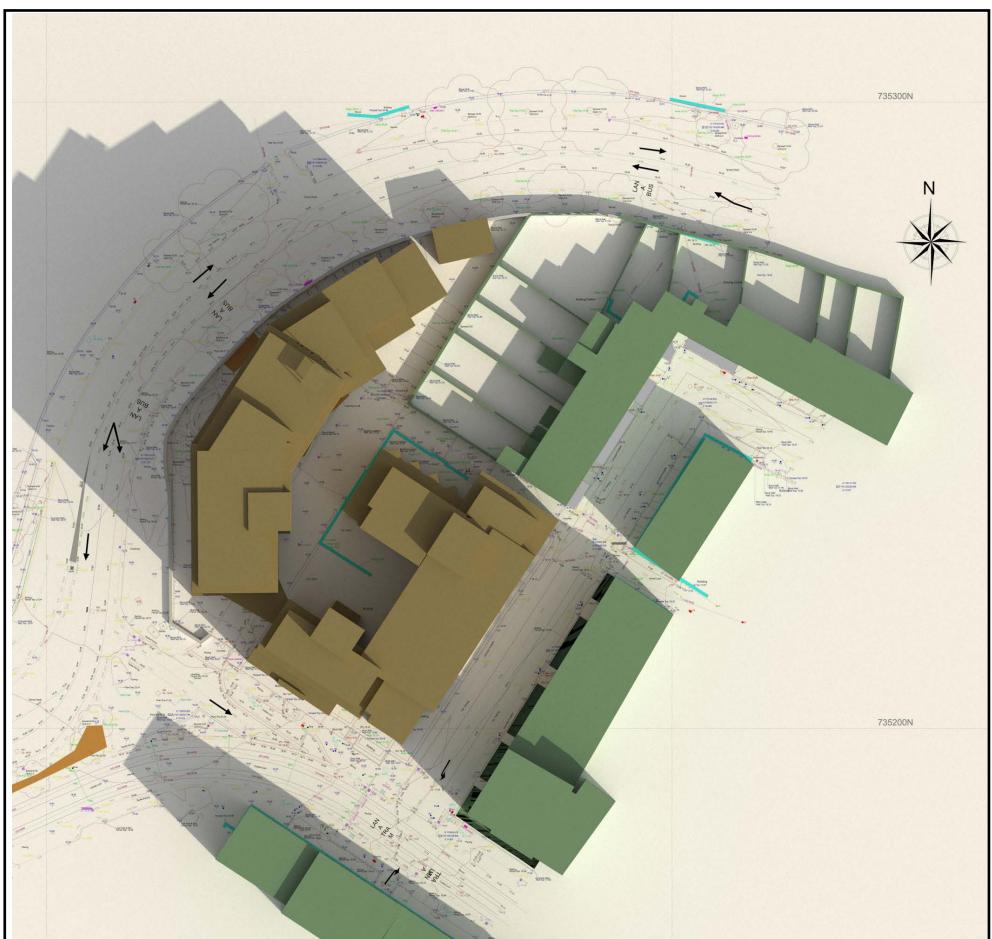
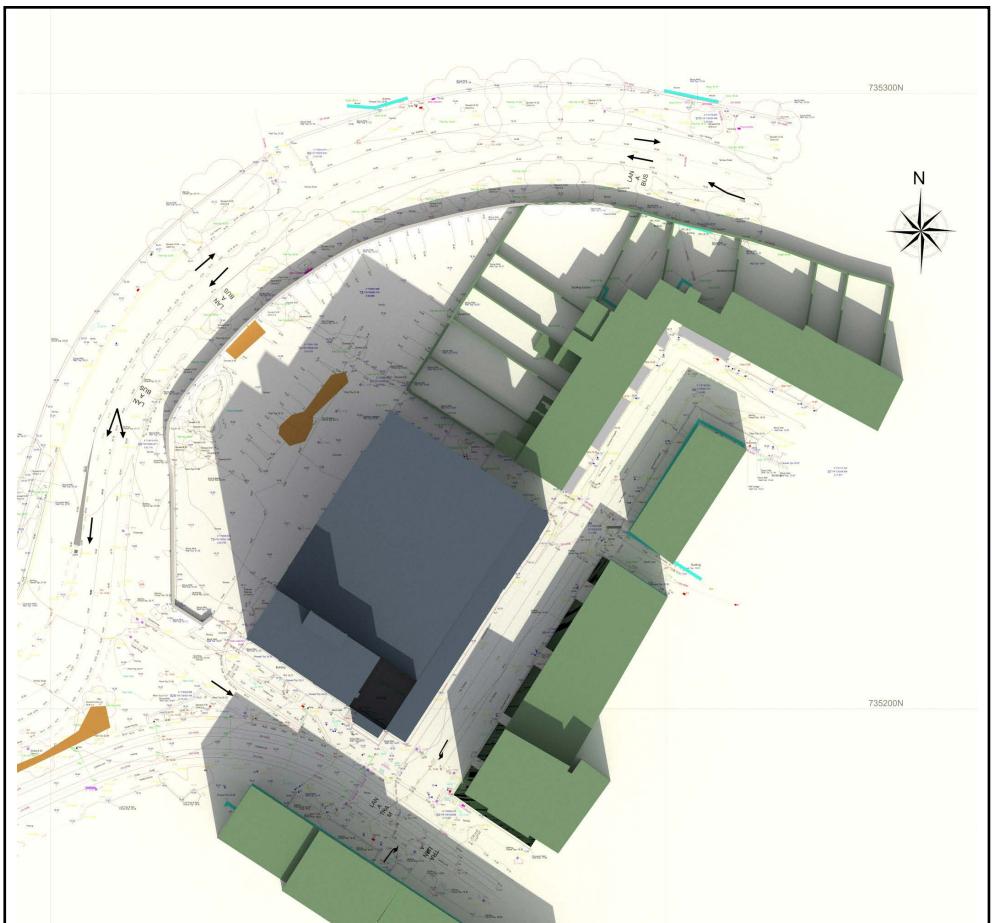


Figure 21: March 21st 10.00 am

Appendix A: Shadow Casting Diagrams

N
Existing



Proposed

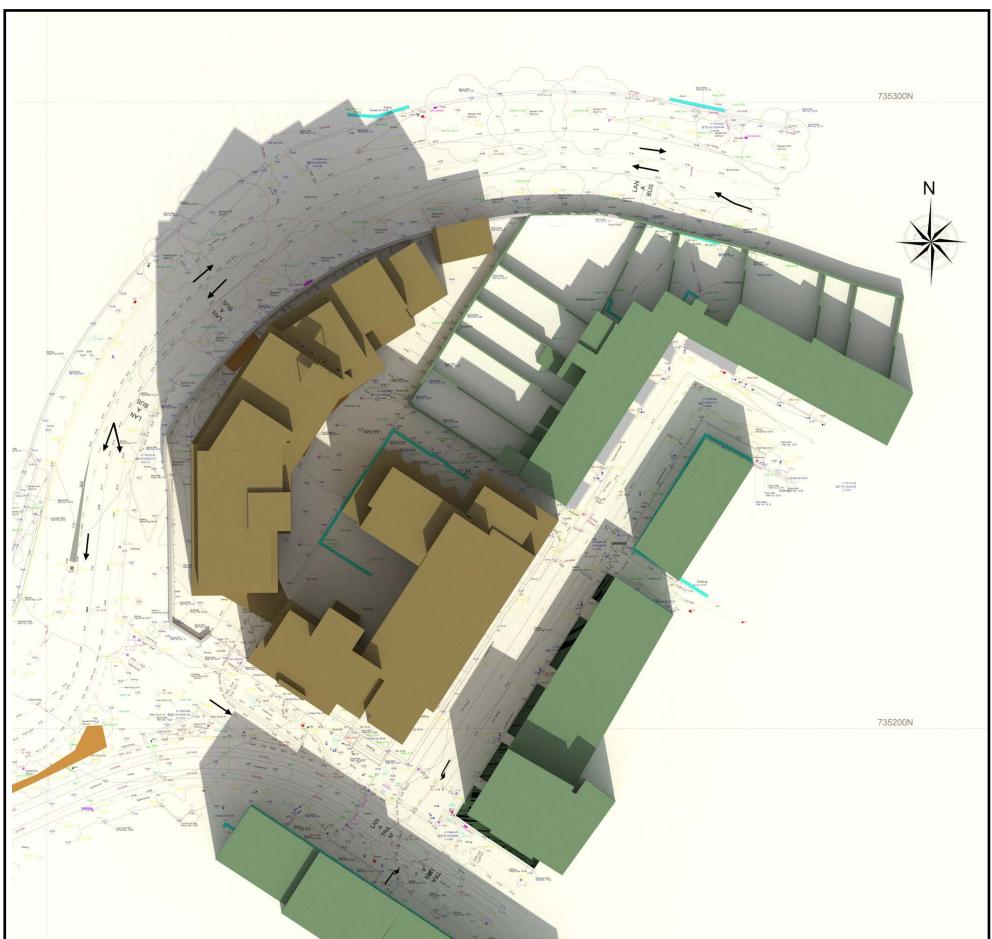
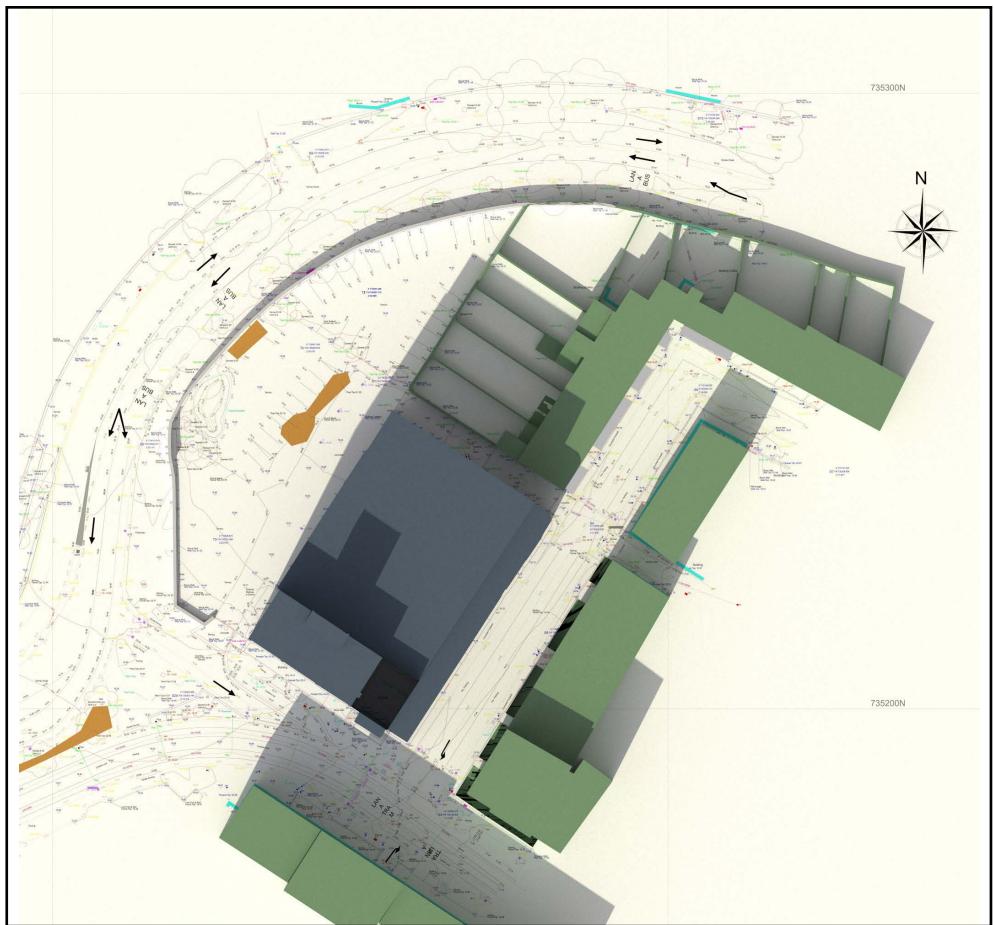


Figure 22: March 21st 12.00 noon

Appendix A: Shadow Casting Diagrams

N
Existing



Proposed

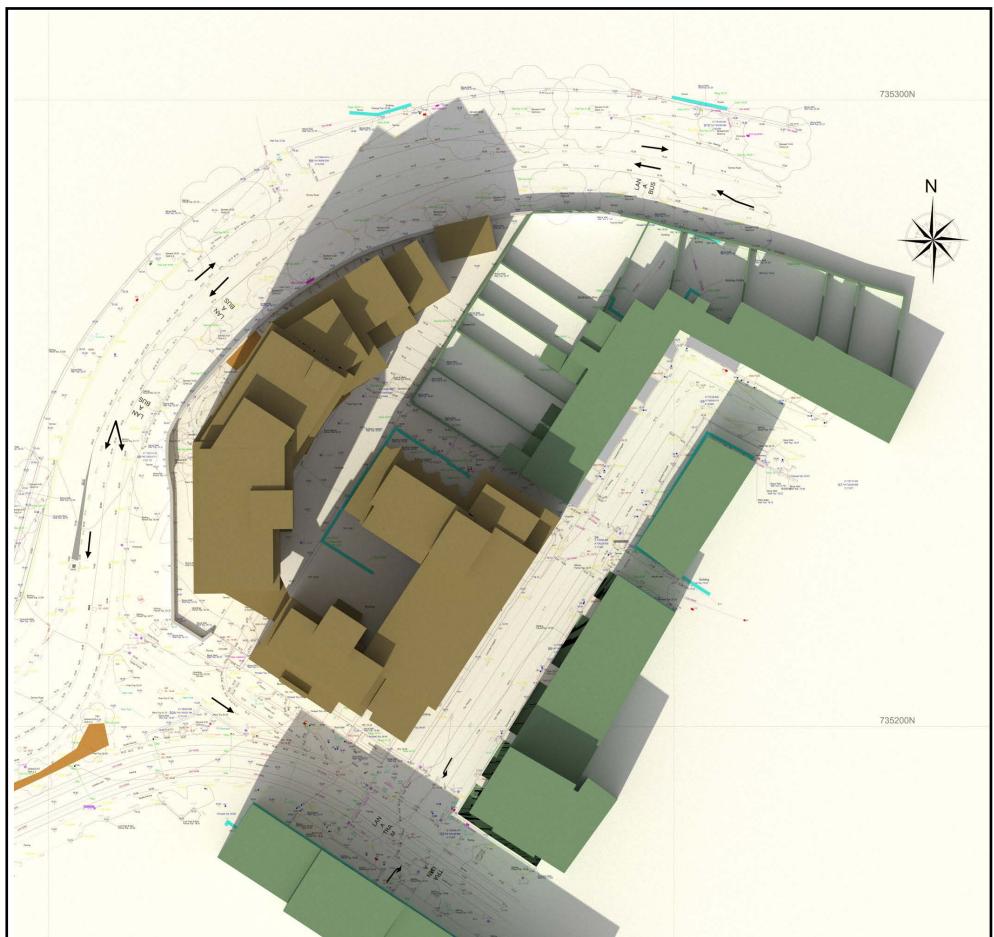
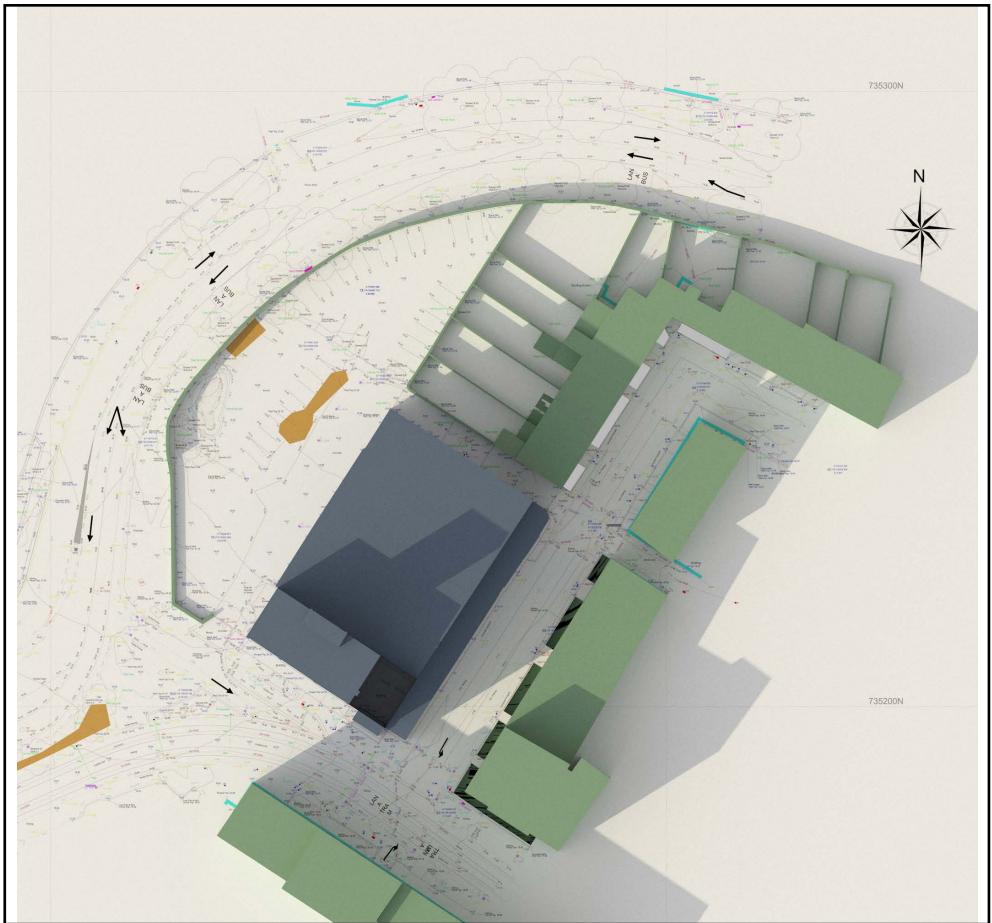


Figure 23: March 21st 14.00 pm

Appendix A: Shadow Casting Diagrams

N
Existing



Proposed

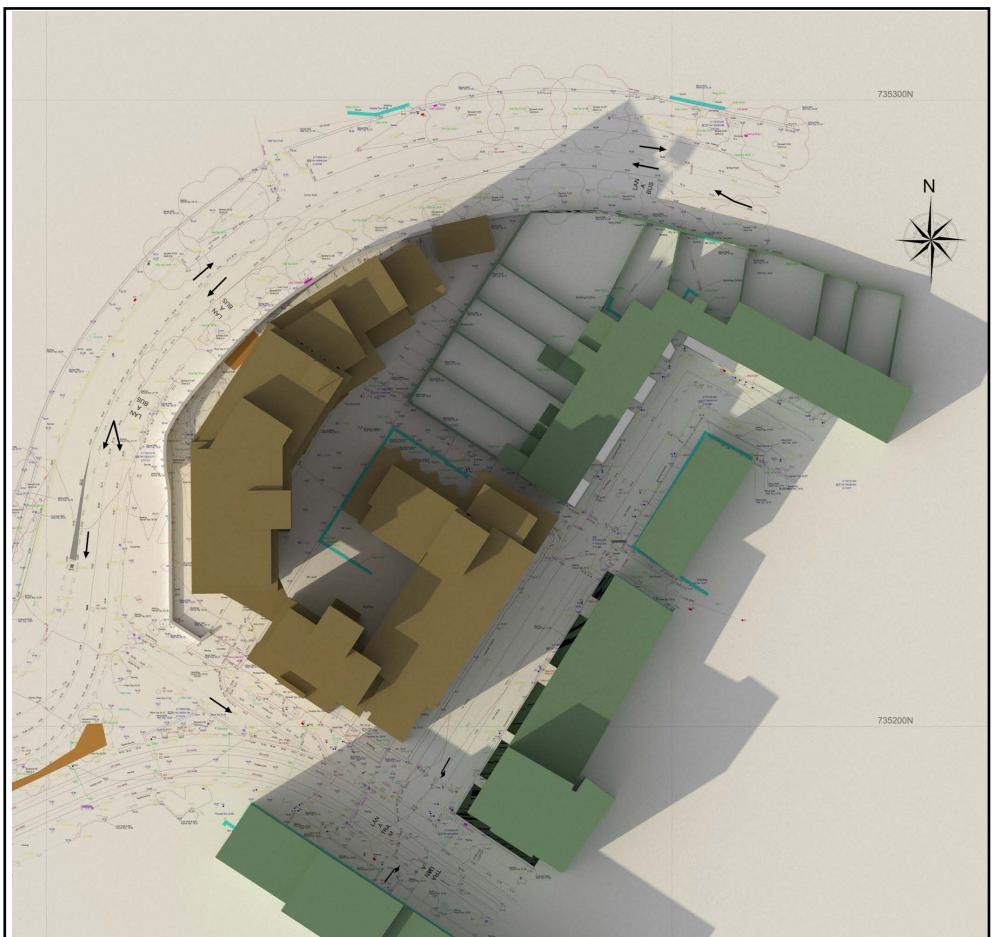
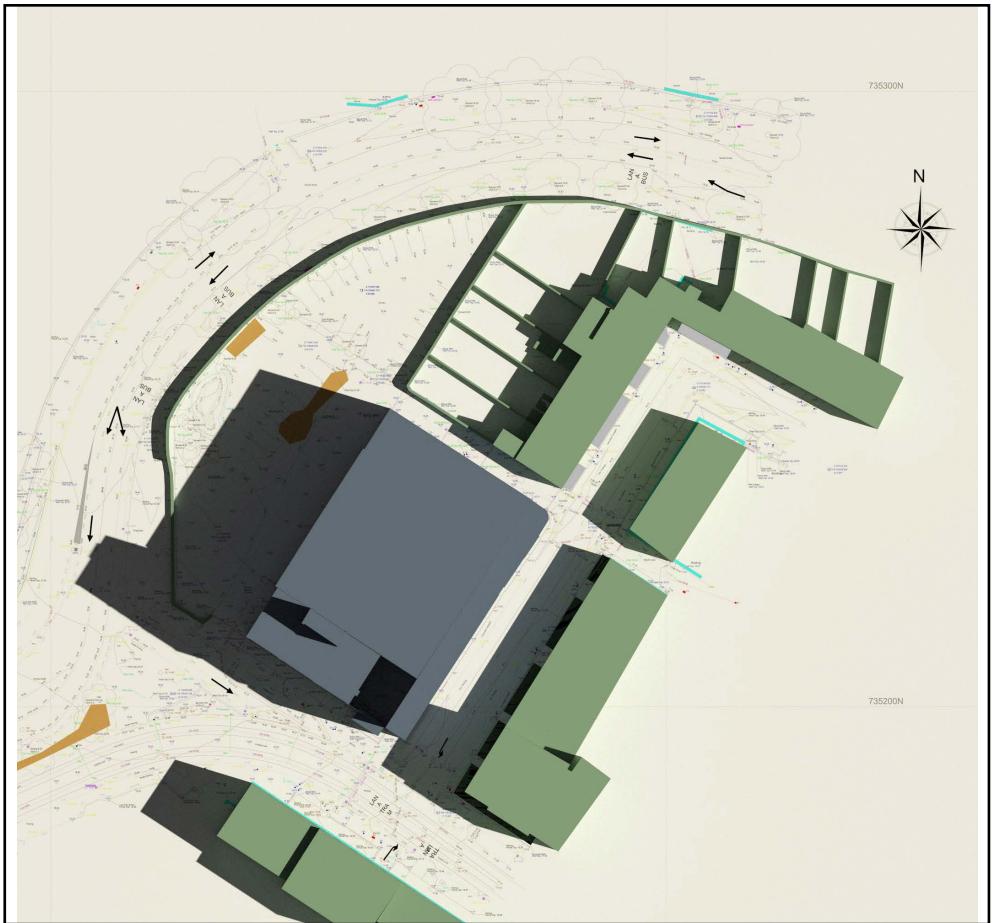


Figure 24: March 21st 16.00 pm

Appendix A: Shadow Casting Diagrams

N
Existing



Proposed

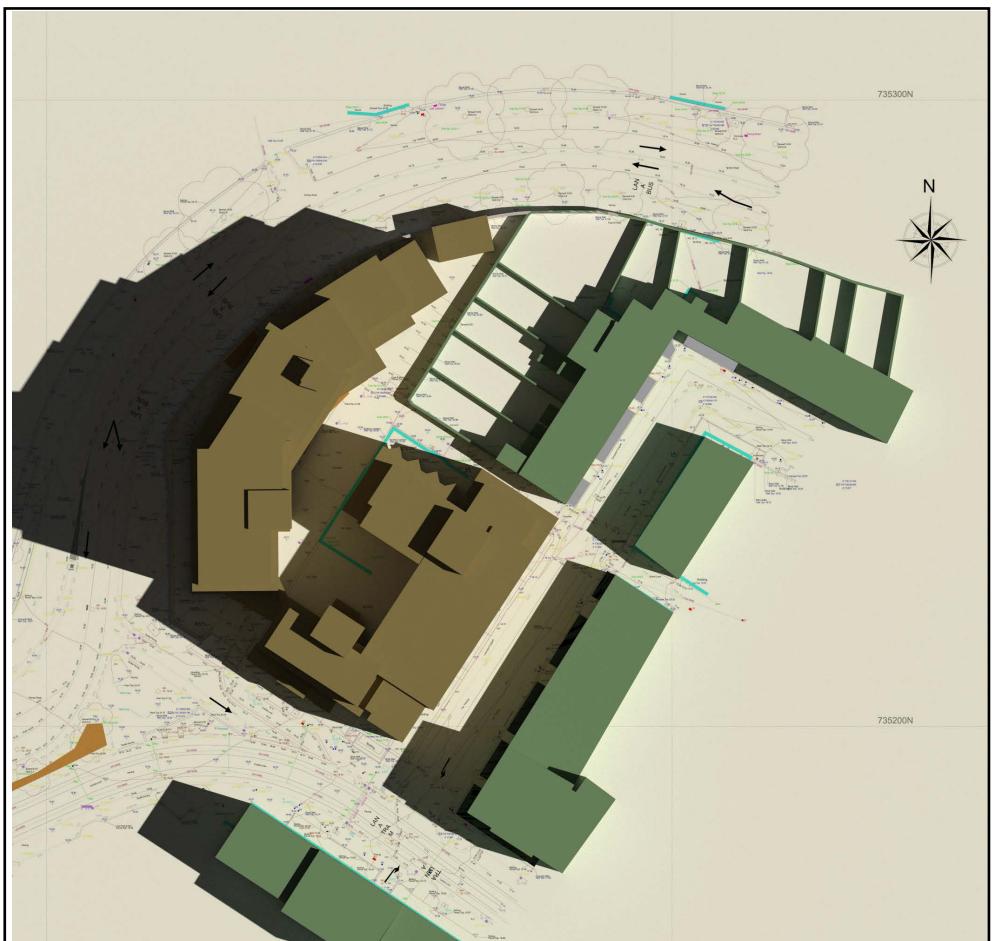
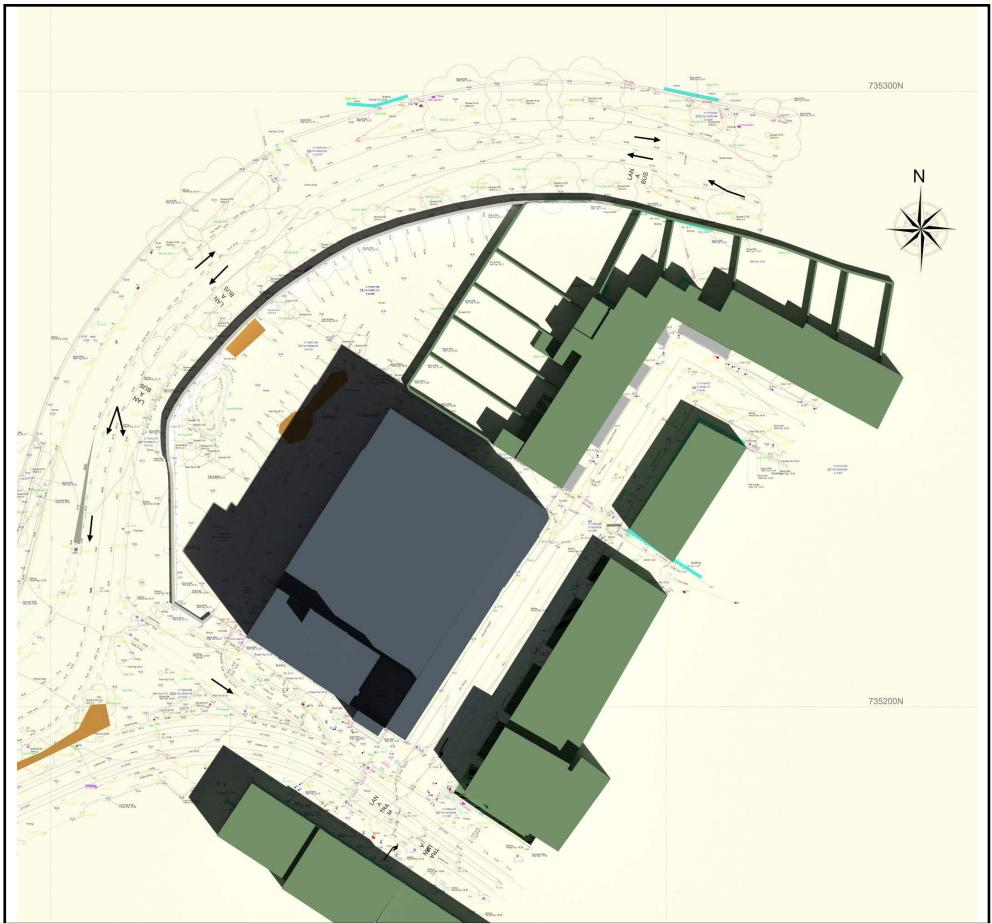


Figure 25: June 21st 10.00 am

Appendix A: Shadow Casting Diagrams

N
Existing



Proposed

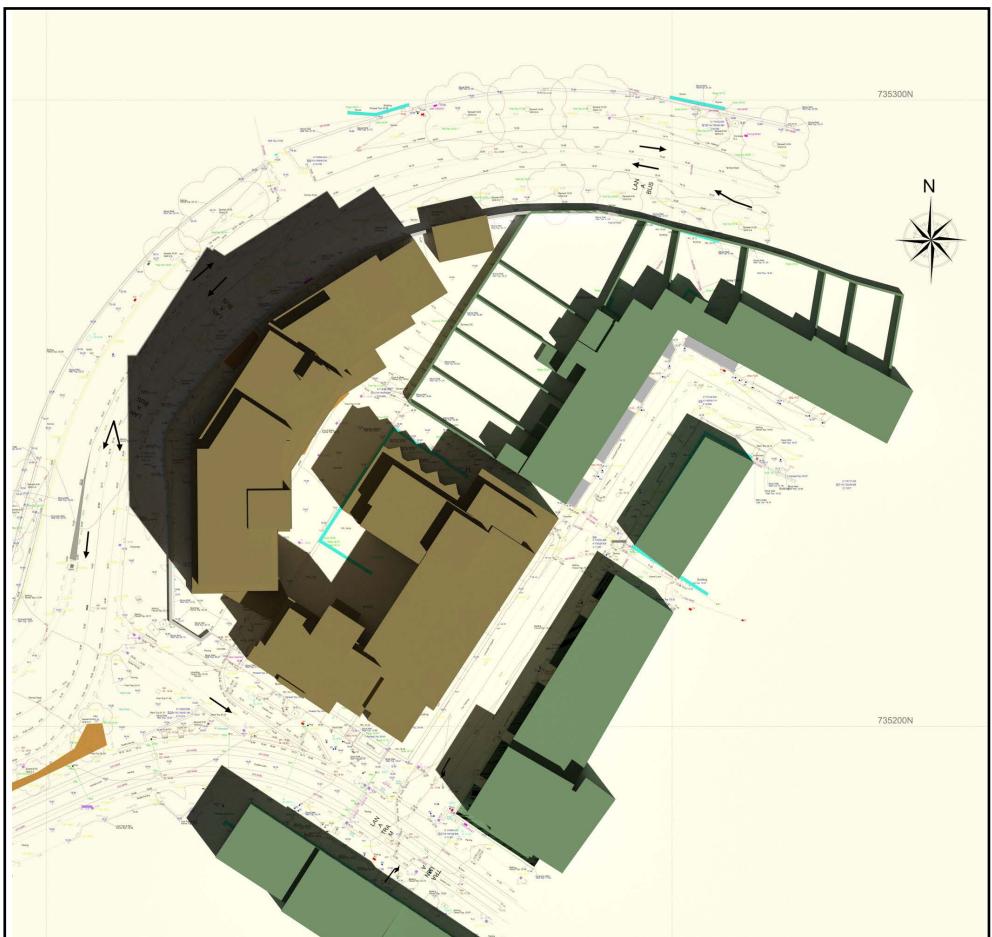
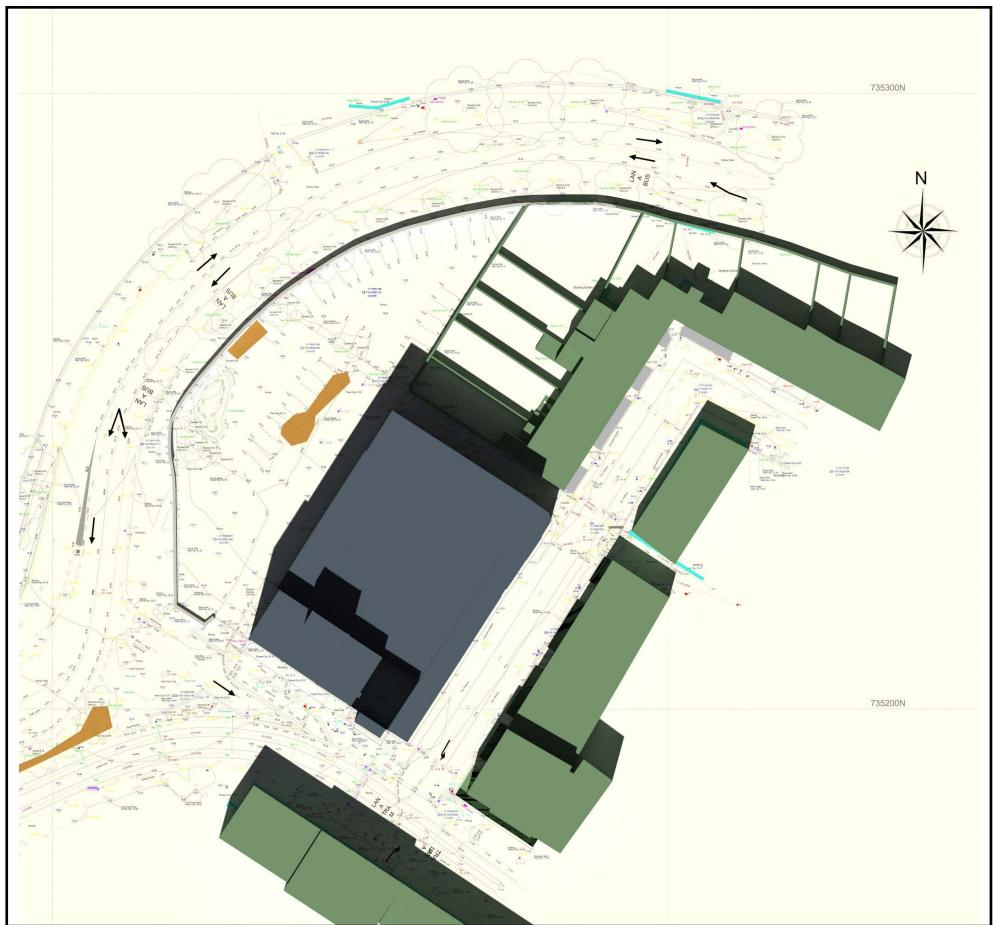


Figure 26: June 21st 12.00 noon

Appendix A: Shadow Casting Diagrams

N
Existing



Proposed

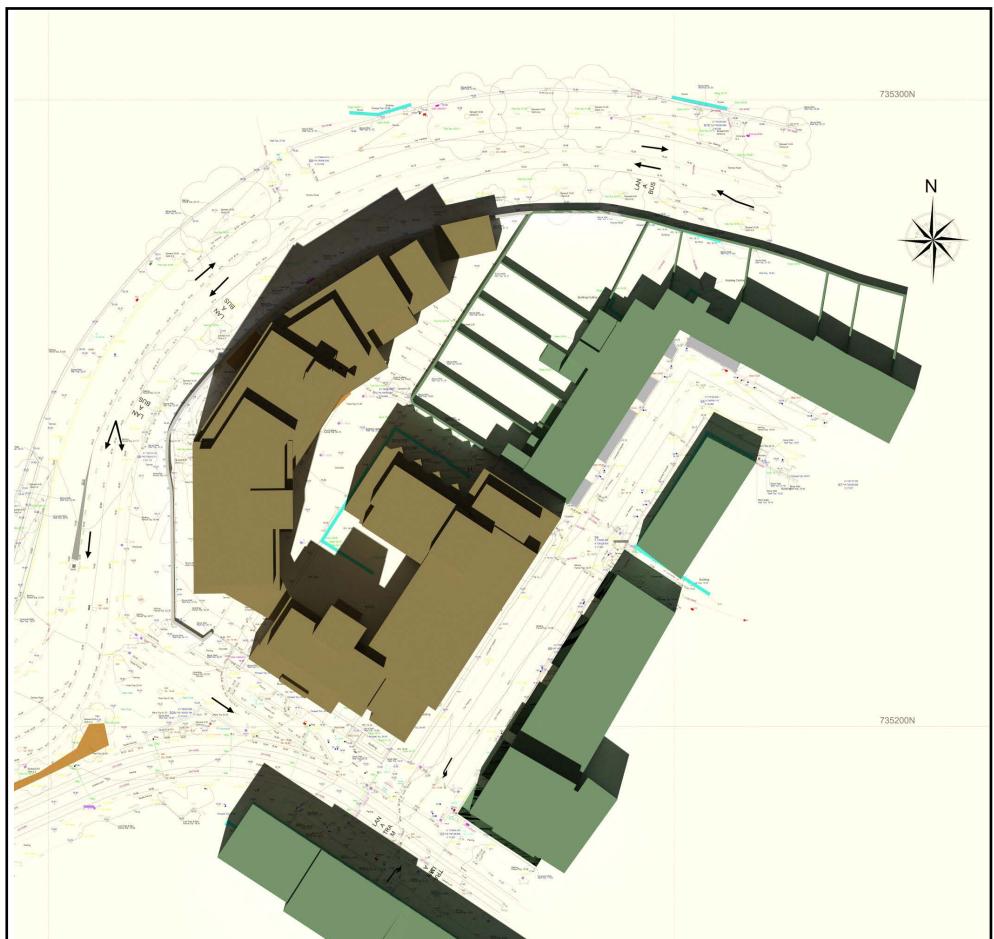
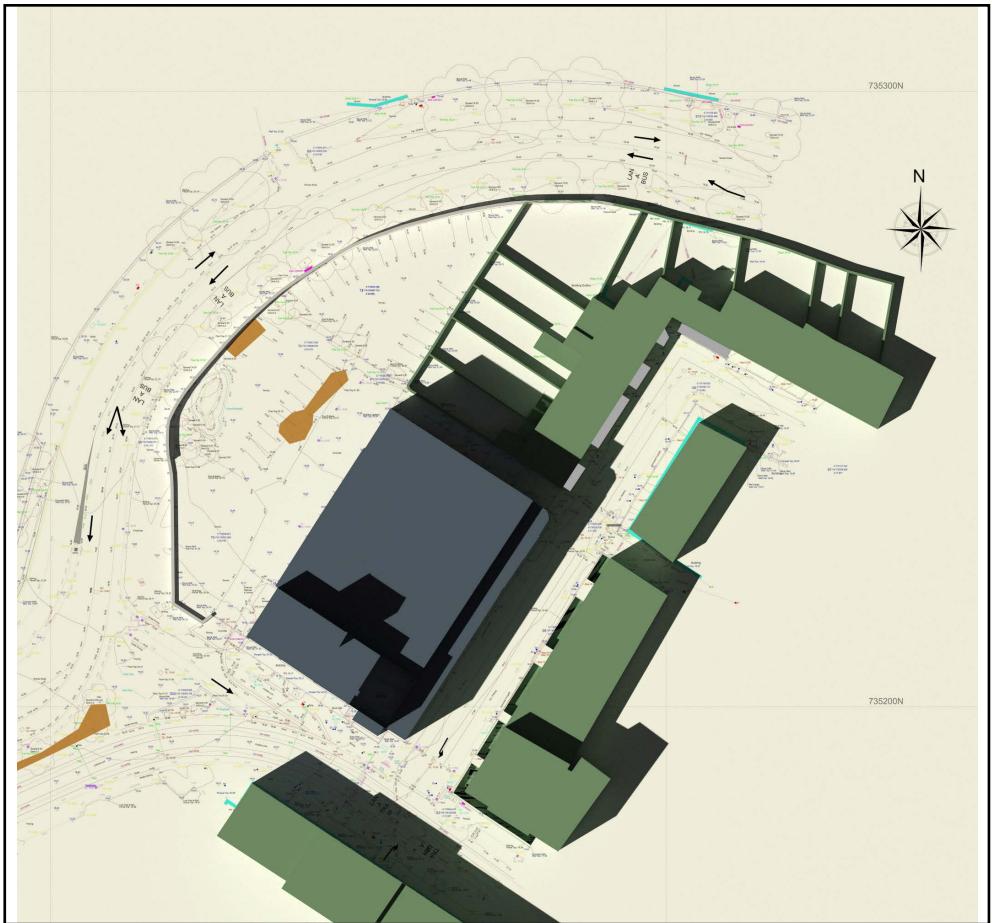


Figure 27: June 21st 14.00 pm

Appendix A: Shadow Casting Diagrams

N
Existing



Proposed

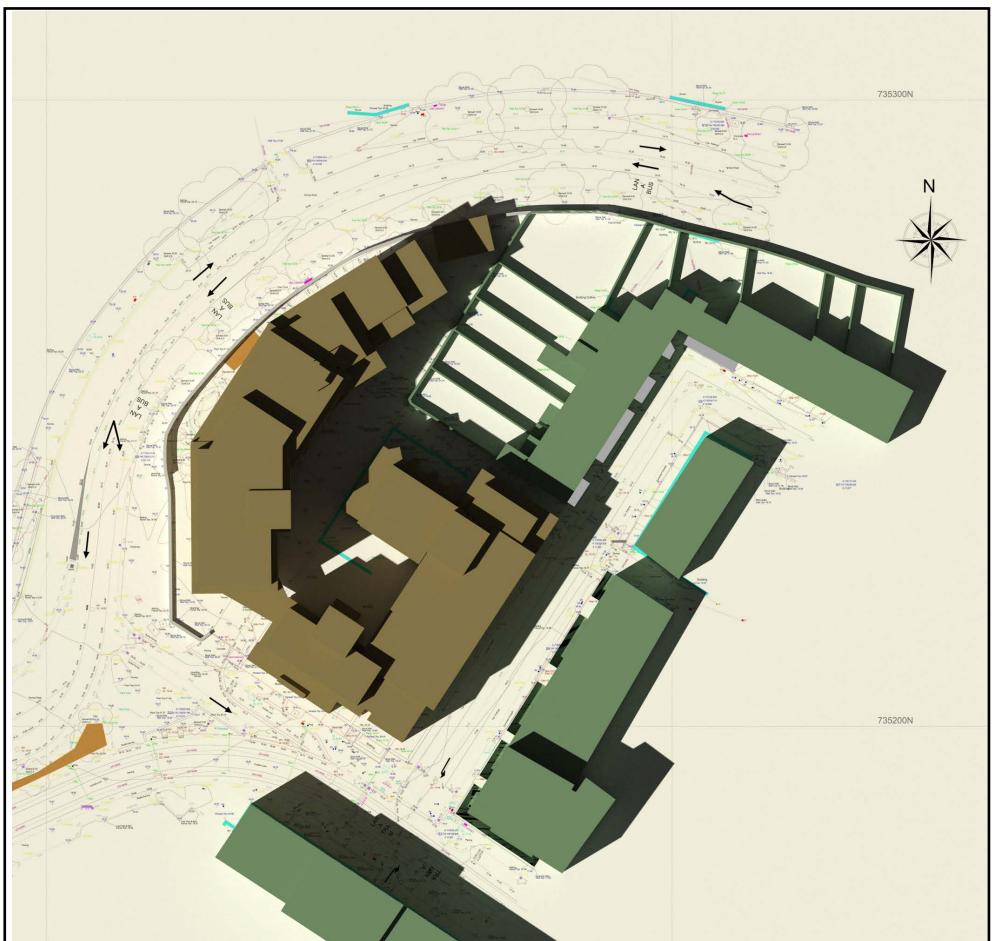
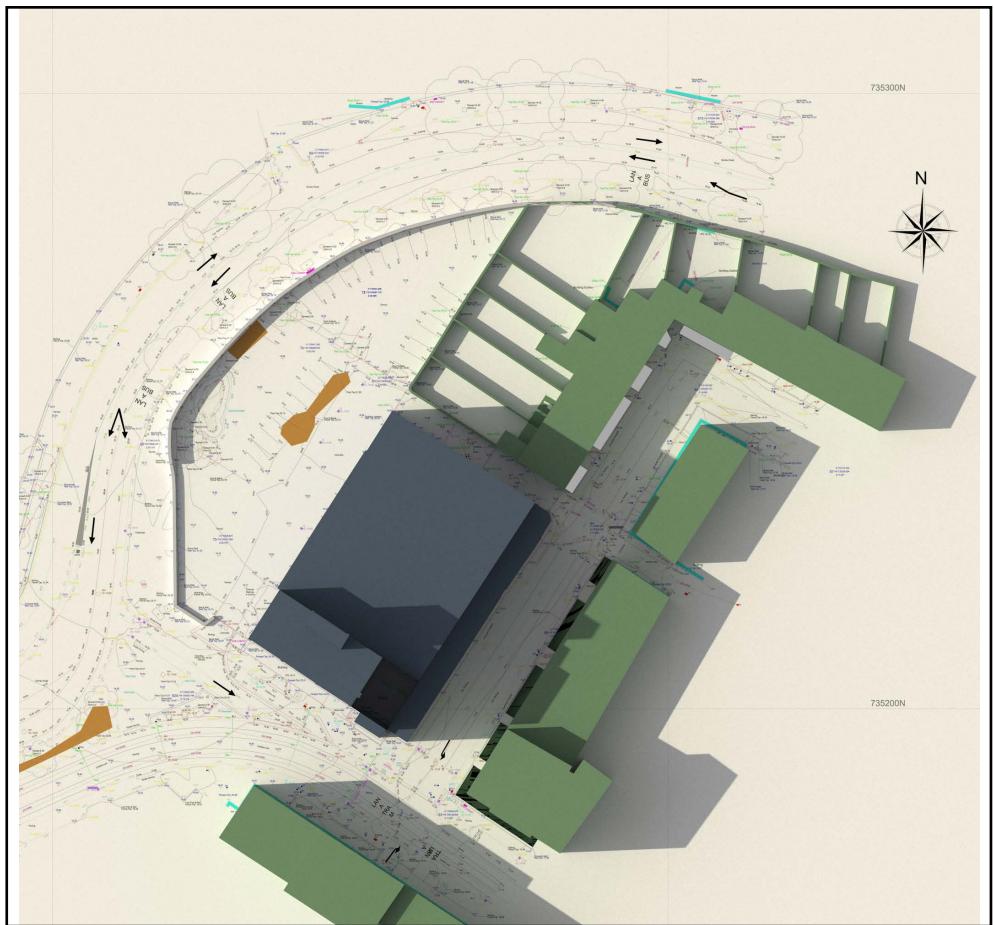


Figure 28: June 21st 16.00 pm

Appendix A: Shadow Casting Diagrams

N
Existing



Proposed

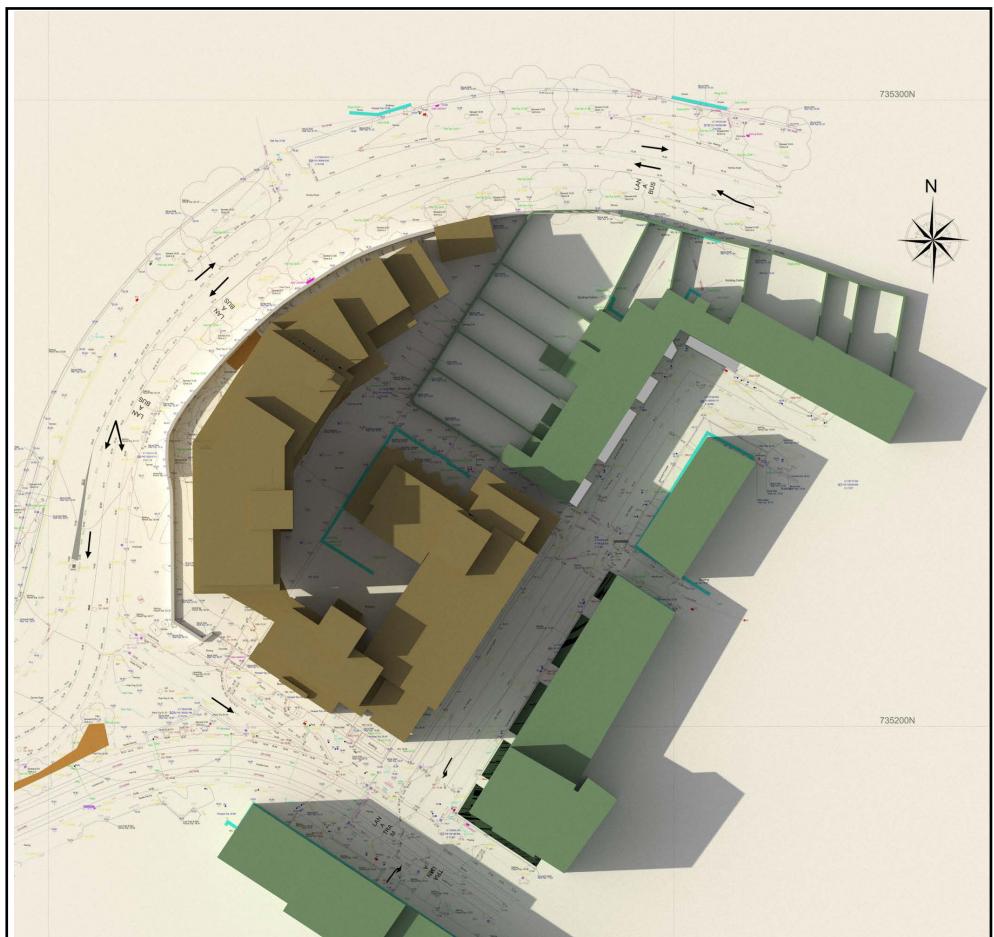
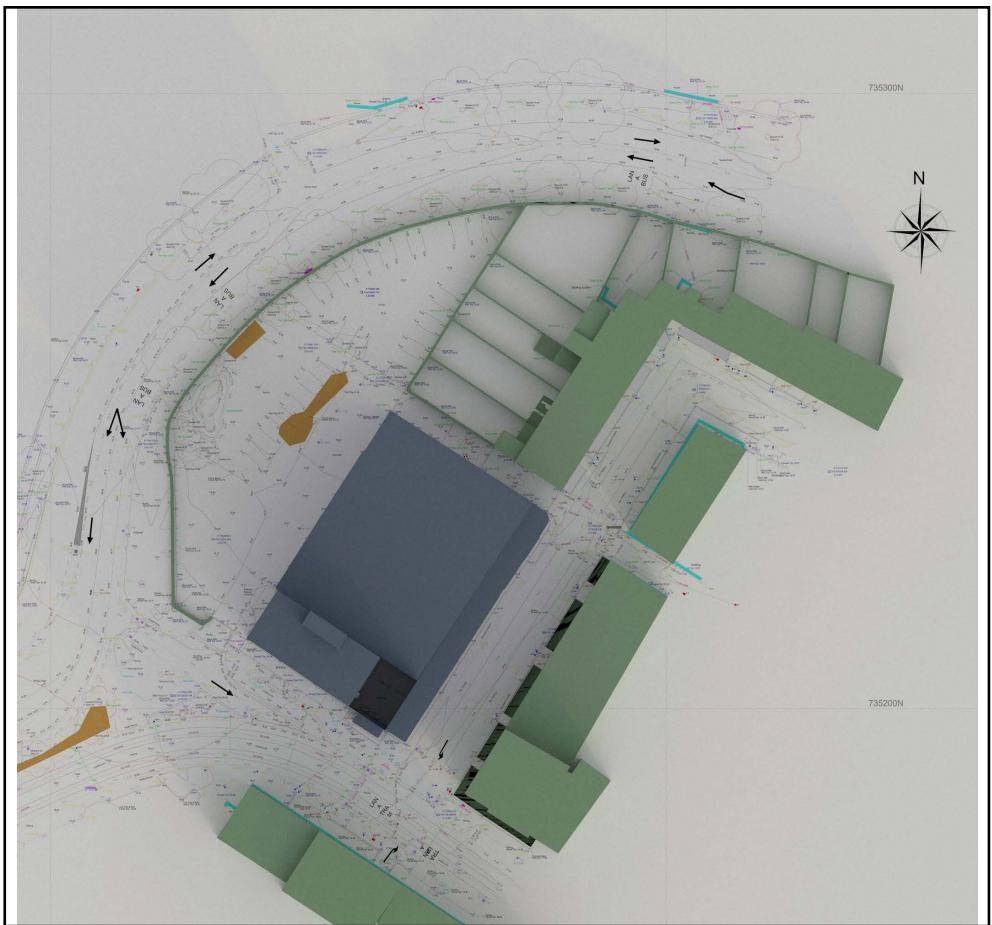


Figure 29: June 21st 18.00 pm

Appendix A: Shadow Casting Diagrams

N
Existing



Proposed

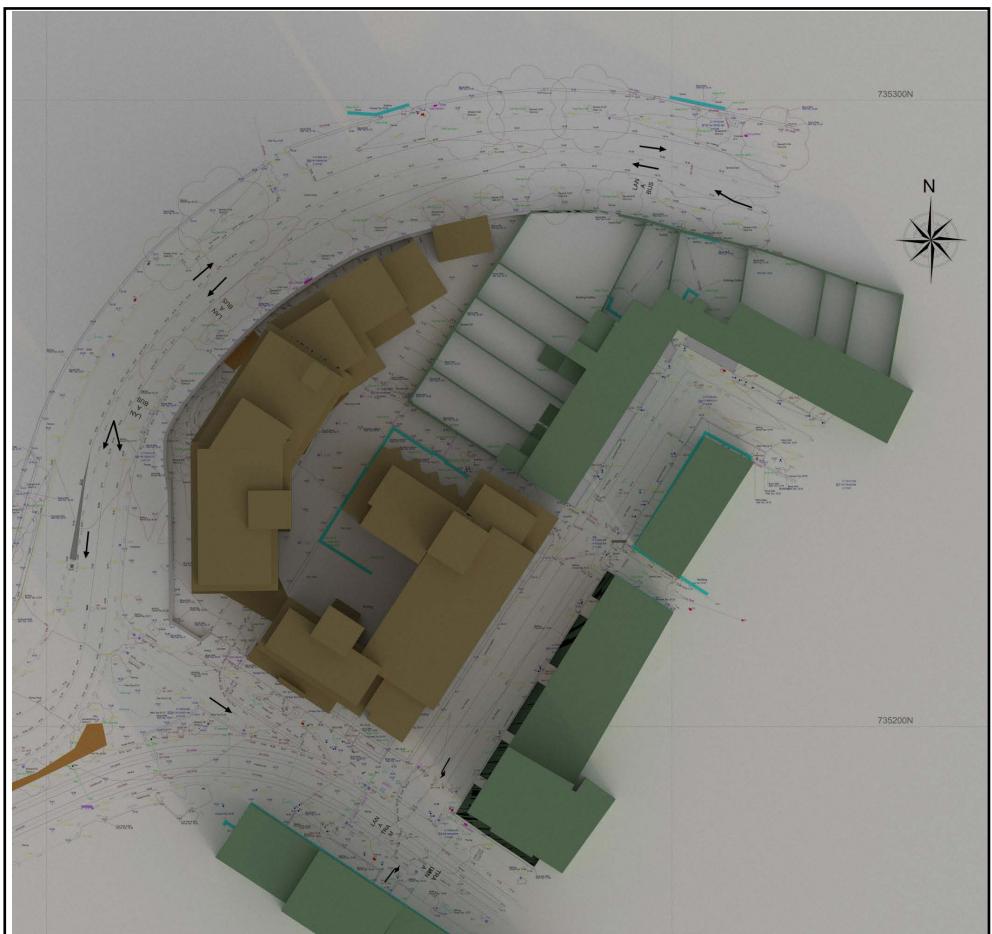
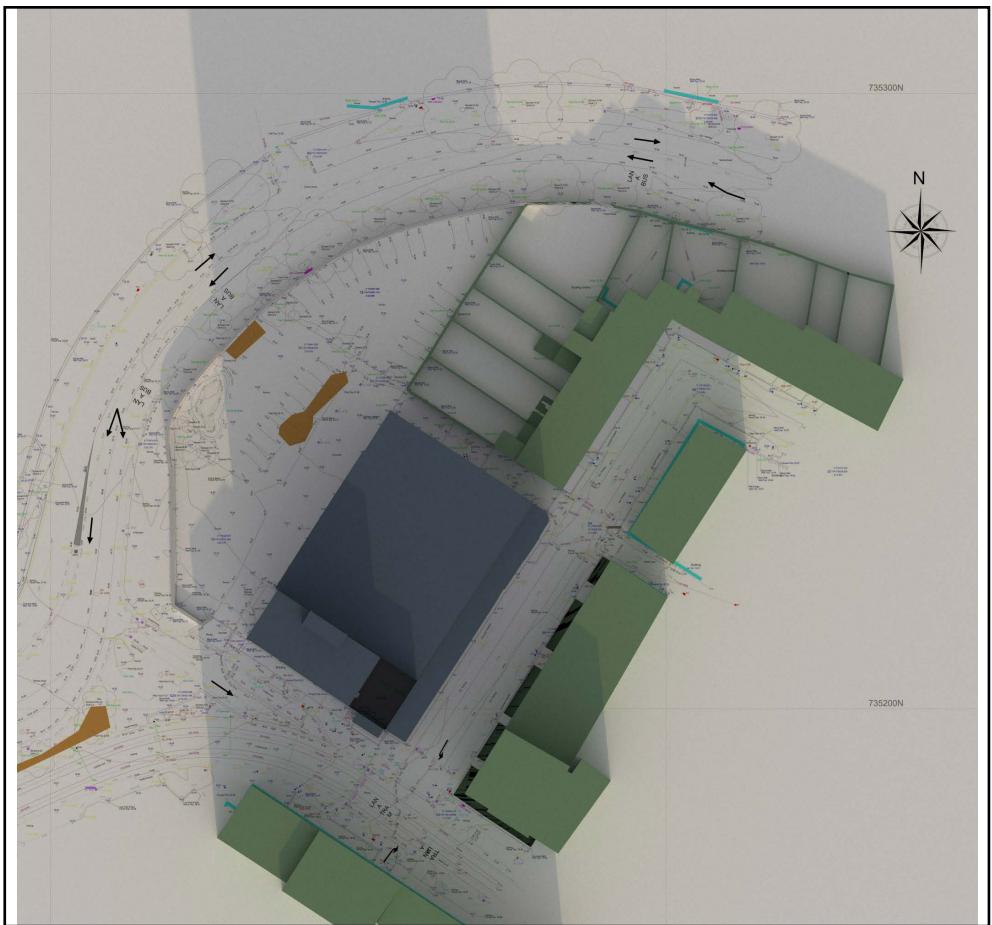


Figure 30: December 21st 10.00 am

Appendix A: Shadow Casting Diagrams

N
Existing



Proposed

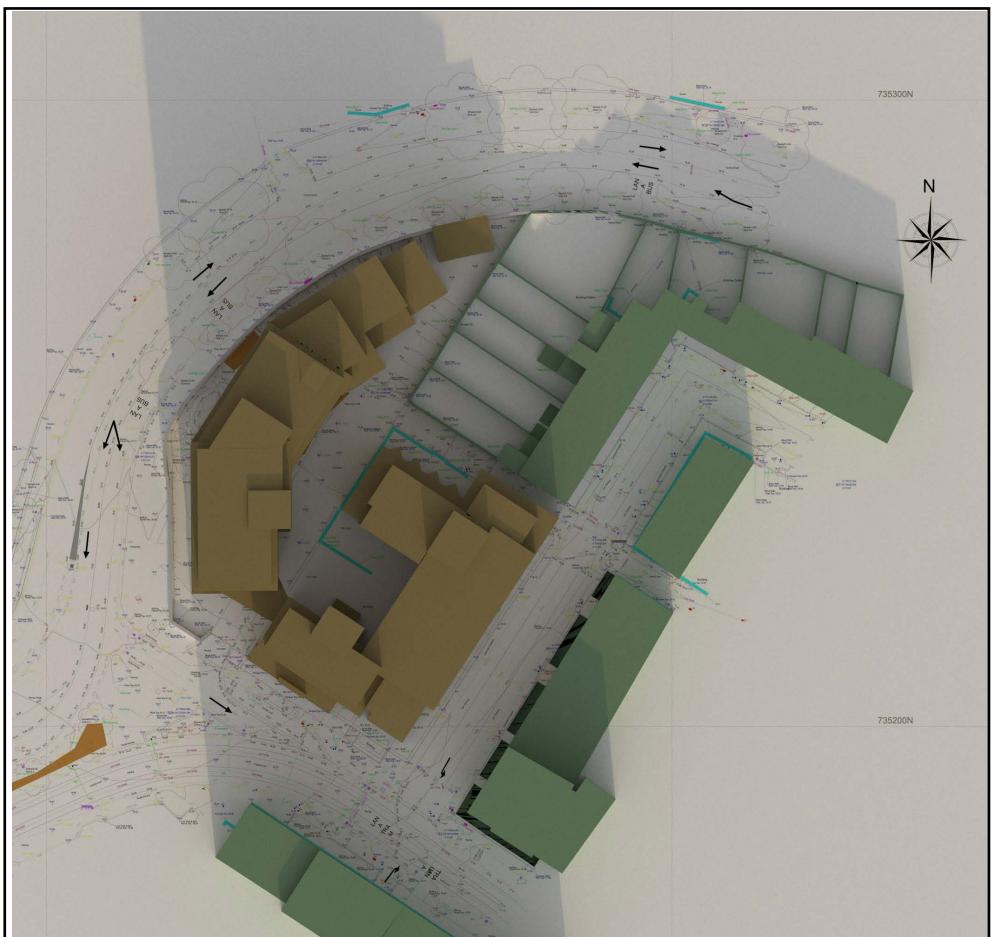
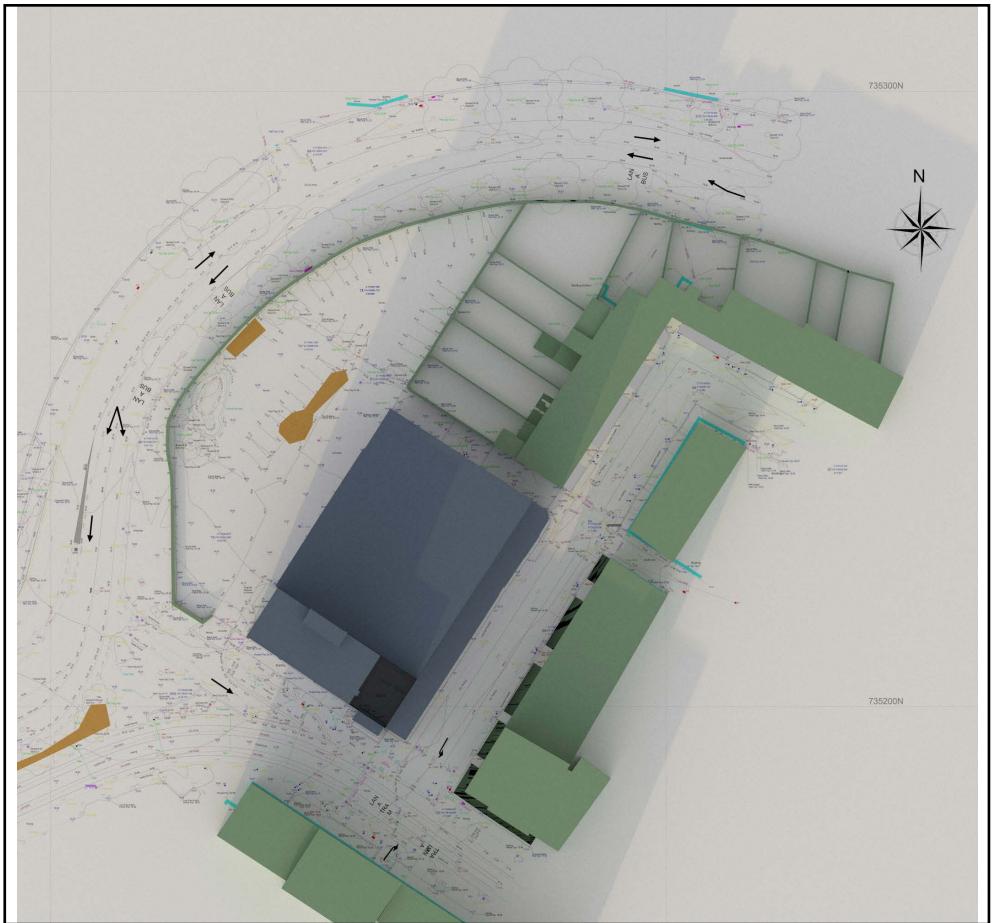


Figure 31: December 21st 12.00 noon

Appendix A: Shadow Casting Diagrams

N
Existing



Proposed

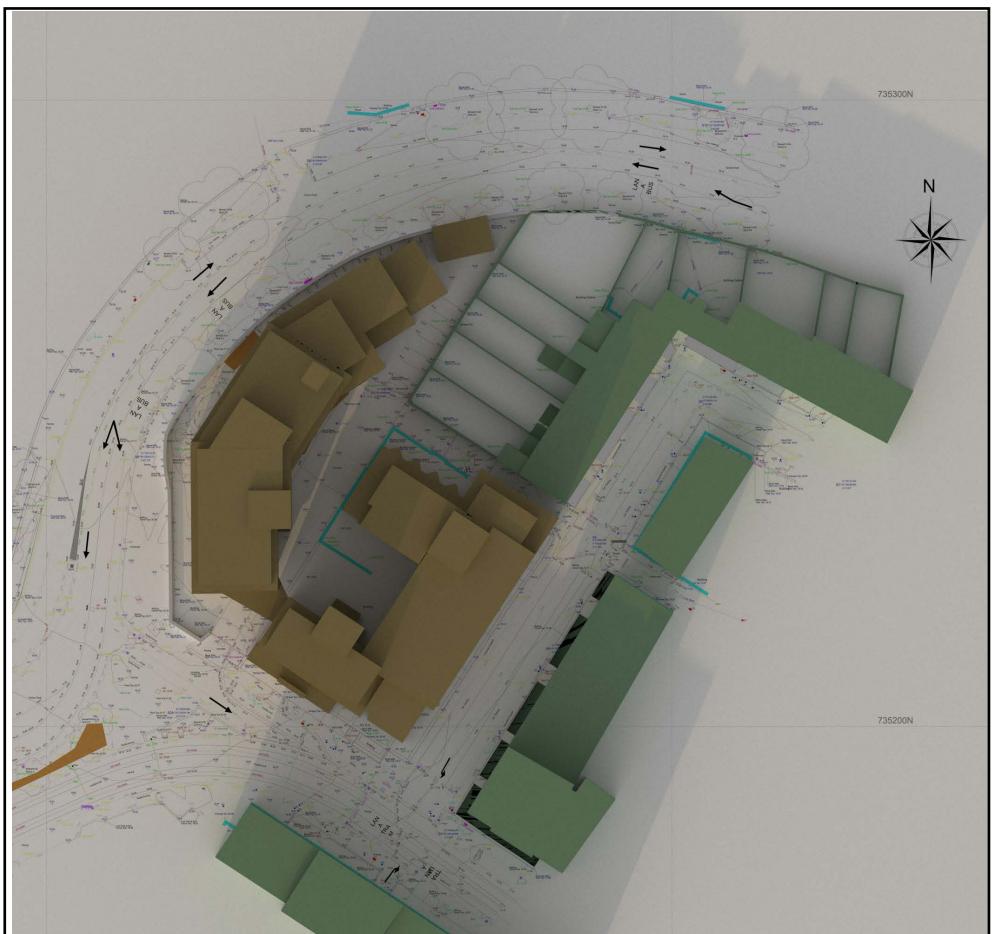


Figure 32: December 21st 14.00 pm