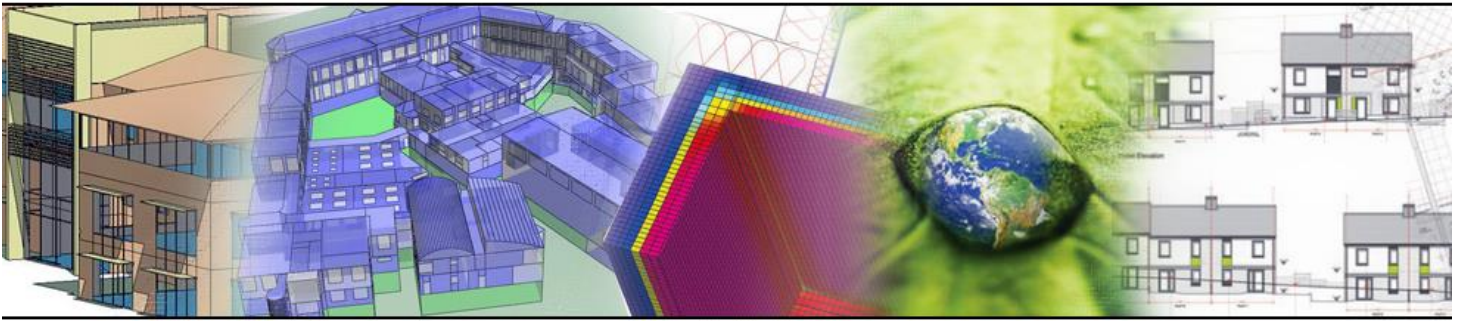




Daylight and Sunlight Assessment Report

OPP-091175: 42 Field Heath Road

Stroma Reference: OPP-091175 DSL2
Date: 24/11/2022
Prepared for: Trafalgar Properties Ltd

1. Executive Summary

- 1.1. A detailed assessment has been undertaken on the proposed development to determine the expected levels of daylight and sunlight. The shading impacts upon immediately surrounding buildings have also been assessed where considered to be potentially affected.
- 1.2. Works described within this report have been undertaken in accordance with BRE good practice guidance document BR209 Site Layout Planning for Daylight and Sunlight. This document includes recommendations for daylight and sunlight access and respective calculation methods.
- 1.3. Sunlight Availability Indicator: **London (51.5°N)**
- 1.4. All the windows on the surrounding buildings will continue to meet the daylight requirement outlined within the BR209 guidance of achieving a Vertical Sky Component (VSC) of 27% or greater or will not have a variance factor of worse than 0.8 after the proposed development has been constructed.
- 1.5. All the windows of the surrounding buildings will continue to meet the Annual Probable Sunlight Hours (APSH) outlined within the guidance of BR209 after the proposed development has been constructed. The north facing windows which do not meet the APSH do not have a variance factor of worse than 0.92 and so the reduction in sunlight would not be noticeable.
- 1.6. Most of the windows on the southern elevation achieve a vertical sky component in excess of 27%, and each habitable room on this façade is served by multiple windows. There are a few windows on the southern façade may be at risk of not meeting the VSC% target, however the windows that are below the VSC target of 27% serve rooms that are also served by windows that exceed the VSC target of 27%. In addition BR209 advises that windows with a VSC of between 15-27% are likely to provide adequate daylight levels with special measures such as large windows, the windows on this development are well sized. It is therefore highly likely that the habitable rooms on the southern elevation will receive good levels of daylight.
- 1.7. The windows on the South, East and West facades will receive a suitable amount of sunlight exceeding the BR209 guidance of 1.5 hours of direct sunlight.
- 1.8. The windows on the North facing façade are not predicted to achieve sunlight levels of 1.5 hours on the 21st March. Living rooms in flats 1, 3, 4 and 6 have North facing windows which do not meet sunlight hours, however they also have east and west faced windows which do meet the sunlight target of 1.5 hours, therefore these rooms are likely to receive adequate levels of sunlight.
- 1.9. Flat 7 on the top floor has one bedroom (a second bedroom) with only a north facing window that will not meet the sunlight requirements, there are two additional habitable rooms, the living room and master bedroom that have east and west facing windows which will meet the sunlight target if 1.5 hours or more. BR209 advises that "a habitable room, preferably a main living room can receive a total of at least 1.5hours

of sunlight on the 21st March”, with two habitable rooms meeting this requirement flat 7 would be deemed as meeting the guidance.

1.10. Flats 2 and 5 and north facing single aspect flats, none of the windows serving the habitable rooms will receive 1.5 hours of sunlight on the 21st March. The flat design has been optimised as much as possible with non-habitable spaces such as the bathroom and access corridors located to the inside of the building to enable the habitable spaces to maximise window usage. Flat 2 will be provided with some private amenity space so occupants would be able to go outside and maximise exposure to sunlight. A communal rear garden is being provided and so all residents from all flats will be able to go outside and maximise sunlight exposure.

1.11. Living spaces in flats 2 and 5 are only served by one window and are quite deep with the kitchens at the opposite end of the room, this could mean that despite good VSC levels, the kitchens may have a restricted daylight level.

This assessment does not consider Right-to-Light. Should there be concerns that a Right-to-Light exists, it is recommended that a suitably qualified specialist be consulted.

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2. Quality Management

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Date: 24/11/2022		Date: 24/11/2022	
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Version	Status	Date	Change Summary
DLSL1	First issue	16/11/2022	-
DLSL2	Second issue	24/11/2022	Model amendments



Registered office as above. Company reg. no. 4507219

3. Development Overview

3.1. The development comprises of a 3-story residential building. The site currently consists of a two-story building which is being used as bed and breakfast. Pre-liminary design drawings have been used to create massing models for use within this daylight and sunlight façade assessment.



Figure 1. Proposed development region – Image taken from Google Earth



Figure 2. Proposed development, massing model



Figure 3. Proposed site plan from plus5 pre-app submission

4. Approach and Recommendations

4.1. Daylight

4.1.1. New Developments

- 4.1. Where windows are obstructed by large objects, the level of daylight received will be adversely affected. Large obstructions are defined by both their relative height and distance away from the window concerned.
- 4.2. In the case of wide obstructions, i.e. those not allowing daylight access from either side, the amount of daylight entering a room is proportional to the visible sky angle (ϕ) – measured from the centre of the window pane. The Average Daylight Factor (ADF) commonly used to quantify daylight levels, is proportional to the visible sky angle.

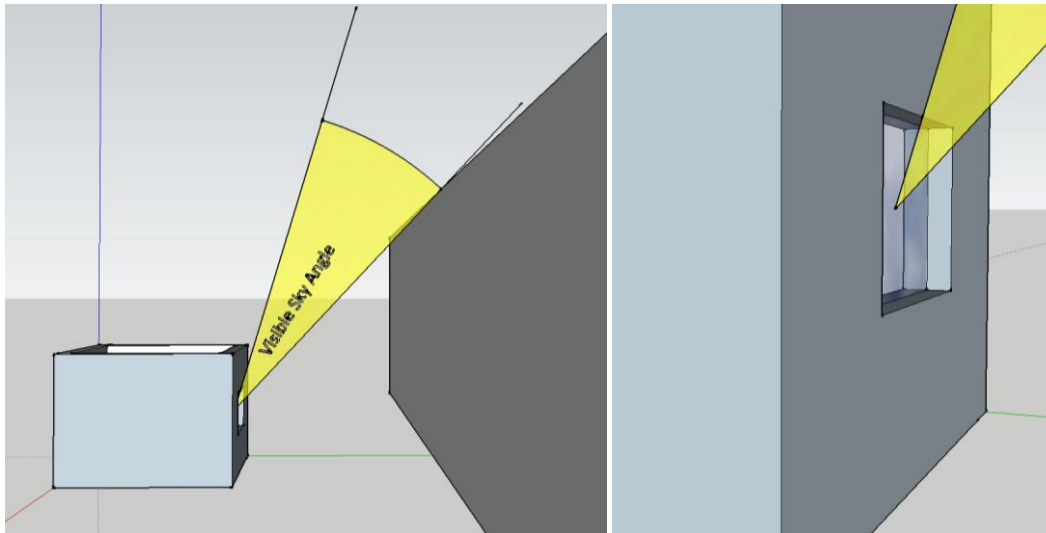


Figure 4. Visible sky angle

4.4. As obstructions are not always continuous, the angle of visible sky can be difficult to estimate. In such situations, the amount of skylight falling on a vertical wall or window can be quantified as the Vertical Sky Component (VSC). The VSC is the ratio of skylight received at a reference point against that of an unobstructed horizontal plane. Measurement of the VSC is usually determined at the centre point of a window and has a maximum value of approximately 40%. BRE guidance states the following daylight performance to correspond with VSC;

Summary

2.1.21 Obstructions can limit access to light from the sky. This can be checked by measuring or calculating the angle of visible sky θ , angle of obstruction or vertical sky component (VSC) at the centre of the lowest window where daylight is required. If VSC is:

- At least 27% (θ is greater than 65° , obstruction angle less than 25°) conventional window design will usually give reasonable results.
- Between 15% and 27% (θ is between 45° than 65° , obstruction angle is between 25° and 45°) special measures (larger windows, changes to room layout) are usually needed to provide adequate daylight.
- between 5% and 15% (θ is between 25° than 45° , obstruction angle is between 45° and 65°) it is very difficult to provide adequate daylight unless very large windows are used.
- Less than 5% (θ is less than 25° , obstruction more than 65°) it is often impossible to achieve reasonable daylight. even if the whole window wall is

Figure 5. BR209 Summary - impact of VSC on anticipated daylight performance¹

¹ Site Layout Planning for Daylight and Sunlight, P.J.Littlefair (2022) p.14

4.1.2. Existing Buildings

4.5. BRE guidance emphasises the importance of safeguarding daylight to nearby surroundings. Performance guidelines relate to dwelling rooms where daylight access is considered to be important. These areas include; living rooms, kitchens and bedrooms. The following procedure should be followed to assess whether proposed development is likely to have a detrimental effect upon existing surroundings.

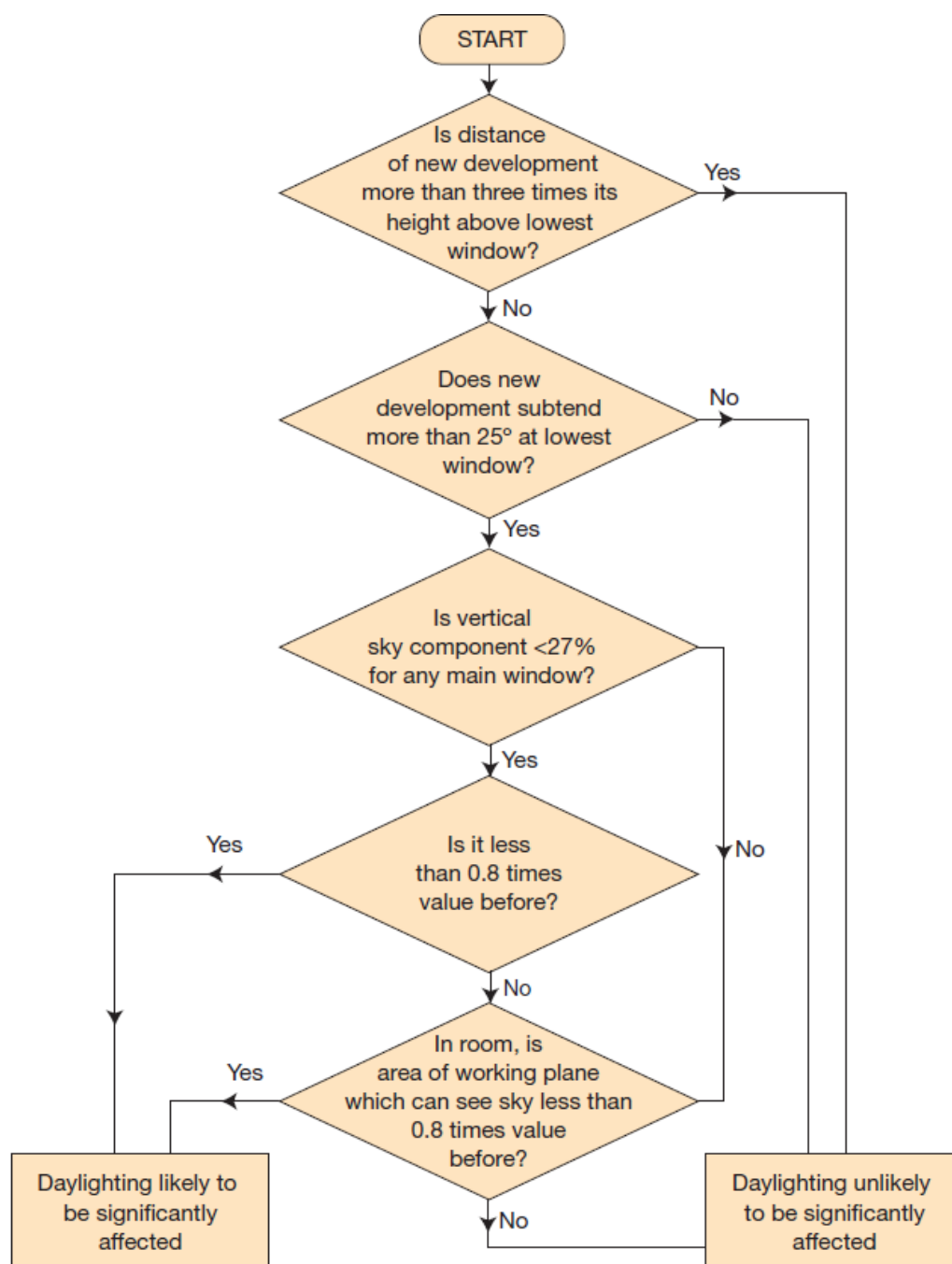


Figure 6. BR209 'Decision chart: diffuse daylight in existing buildings'²

² Site Layout Planning for Daylight and Sunlight, P.J.Littlefair (2022) p.18

4.2. Sunlight

4.2.1. New Developments

4.6. Ensuring access to sunlight is an important part of residential building design. The presence of direct sunlight is shown to have a positive impact upon occupant wellbeing. BRE guidance states that sunlight provision to living rooms and conservatories is of greatest importance compared with that to bedrooms and kitchens.

4.7. With developments in passive building design and a more frequent installation of solar collection technology, e.g., photovoltaics, the magnitude of sunlight and orientation of access is increasingly becoming a concern.

Summary (new buildings)

3.1.15 In general a dwelling, or non-domestic building that has a particular requirement for sunlight, will appear reasonably sunlit provided:

- at least one main window wall faces within 90° of due south and
- a habitable room, preferably a main living room, can receive a total of at least 1.5 hours of sunlight on 21 March. This is assessed at the inside centre of the window(s); sunlight received by different windows can be added provided they occur at different times and sunlight hours are not double counted.

3.1.16 Where groups of dwellings are planned, site layout design should aim to maximise the number of dwellings with a main living room that meets the above recommendations.

Figure 7. BR209 Summary – Sunlight recommendations for new build³

4.8. Unobstructed south-facing windows will receive significantly more sunlight than those facing north. East – facing aspects will receive direct sunlight during the morning and west-facing aspects in the afternoon/evening. The sunpath should be considered in setting out a development.

4.9. Where a dwelling has no window-wall within 90° of South, it is likely to be considered insufficiently sunlit. This is usually only a concern within apartment blocks where the number of aspects is limited. However, careful layout can help to ensure that the majority of apartments include window walls within 90° of south.

4.10. The overall sun lighting potential of a large residential development may be initially assessed by counting how many dwellings have a window to a main living room facing south, east, or west. The aim should be to minimise the number of dwellings whose living rooms face solely north, northeast, or northwest, unless there is some compensating factor such as an appealing view to the north.

³ Site Layout Planning for Daylight and Sunlight, P.J.Littlefair (2022) p.24

4.11. For interiors, access to sunlight can be quantified. BS EN 17037 recommends that a space should receive a minimum of 1.5 hours of direct sunlight on a selected date between 1 February and 21 March with cloudless conditions. It is suggested that 21 March (equinox) be used. The medium level of recommendation is three hours and the high level of recommendation four hours. For dwellings, at least one habitable room, preferably a main living room, should meet at least the minimum criterion.

4.2.2. Existing Buildings

4.12. Similarly to daylight, access to sunlight should be safeguarded to critical areas of existing buildings.

4.13. BRE guidance provides the following guidance;

Summary

3.2.13 If a living room of an existing dwelling has a main window facing within 90° of due south, and any part of a new development subtends an angle of more than 25° to the horizontal measured from the centre of the window in a vertical section perpendicular to the window, then the sunlighting of the existing dwelling may be adversely affected. This will be the case if the centre of the window:

- receives less than 25% of annual probable sunlight hours and less than 0.80 times its former annual value; or less than 5% of annual probable sunlight hours between 21 September and 21 March and less than 0.80 times its former value during that period;
- and also has a reduction in sunlight received over the whole year greater than 4% of annual probable sunlight hours.

Figure 8. BR209 Summary –securing sunlight levels of existing developments⁴

4.2.3. Gardens and Open Spaces

4.14. It is good practice to ensure that sunlight levels to relevant outdoor spaces are not adversely affected by new development proposals. Relevant outdoor spaces may include; domestic gardens, playing fields, outdoor pools and public squares etc. In these areas, guidance suggests that at least half the area receives at least 2 hours of sunlight on 21st March.

Summary

3.3.17 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 that can receive two hours of sun on 21 March is less than 0.80 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.

Figure 9. BR209 Summary – Sunlight levels in gardens and open spaces new and existing⁵

⁴ Site Layout Planning for Daylight and Sunlight, P.J.Littlefair (2022) p.24

⁵ Site Layout Planning for Daylight and Sunlight, P.J.Littlefair (2022) p.29

5. Assessment

5.1. Objectives

- 5.1. Determine the effect of the proposed development on the availability of VSC & APSH on the surrounding buildings.
- 5.2. Determine the availability of VSC and APSH on the proposed building.

5.2. Approach

5.2.1. Proposed

- 5.3. The proposed building VSC and APSH has been assessed as a façade analysis at this stage. This assessment details areas of potential risk for both daylight and sunlight and will allow the design team to refine the floor plans in order to maximise daylight and sunlight for future occupants.
- 5.4. Daylight assessment – VSC façade analysis has been carried out on the proposed building to highlight areas of potential concern and also to areas which are likely to receive good daylight.
- 5.5. Sunlight assessment - Sunlight façade analysis has also been carried out on the proposed building. The most recent BRE guidance (2022) on sunlight recommendation has changed and now requires confirmation that area will receive 1.5 hours of direct sunlight on March 21st. This assessment really requires that all window positions are set to ensure that windows received the correct sunlight.

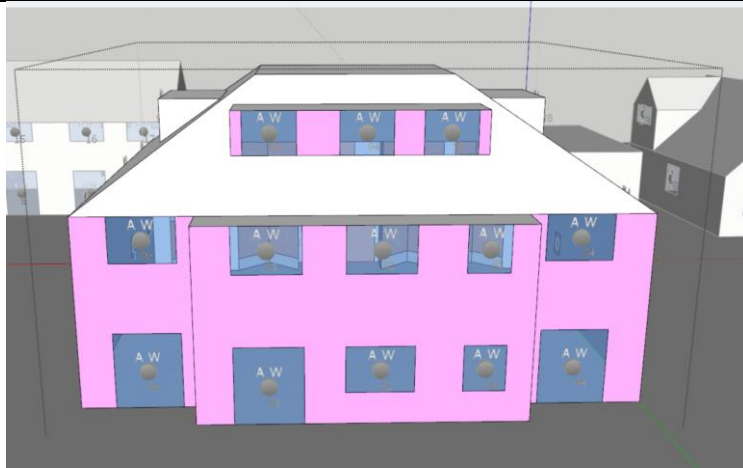


Image 1: North Elevation of proposed development

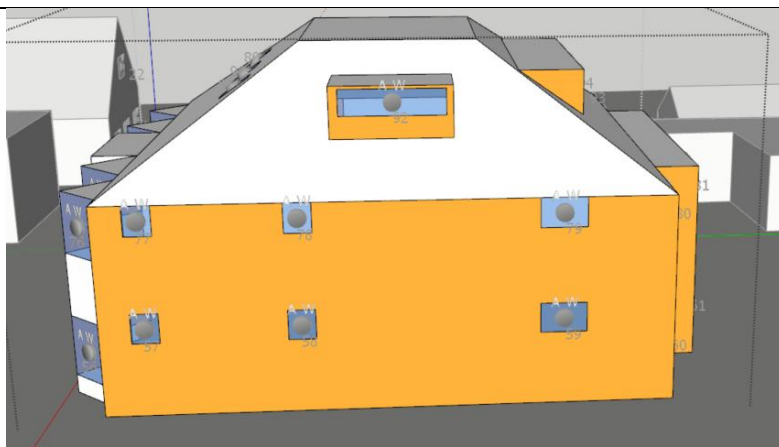


Image 2: East elevation of proposed development

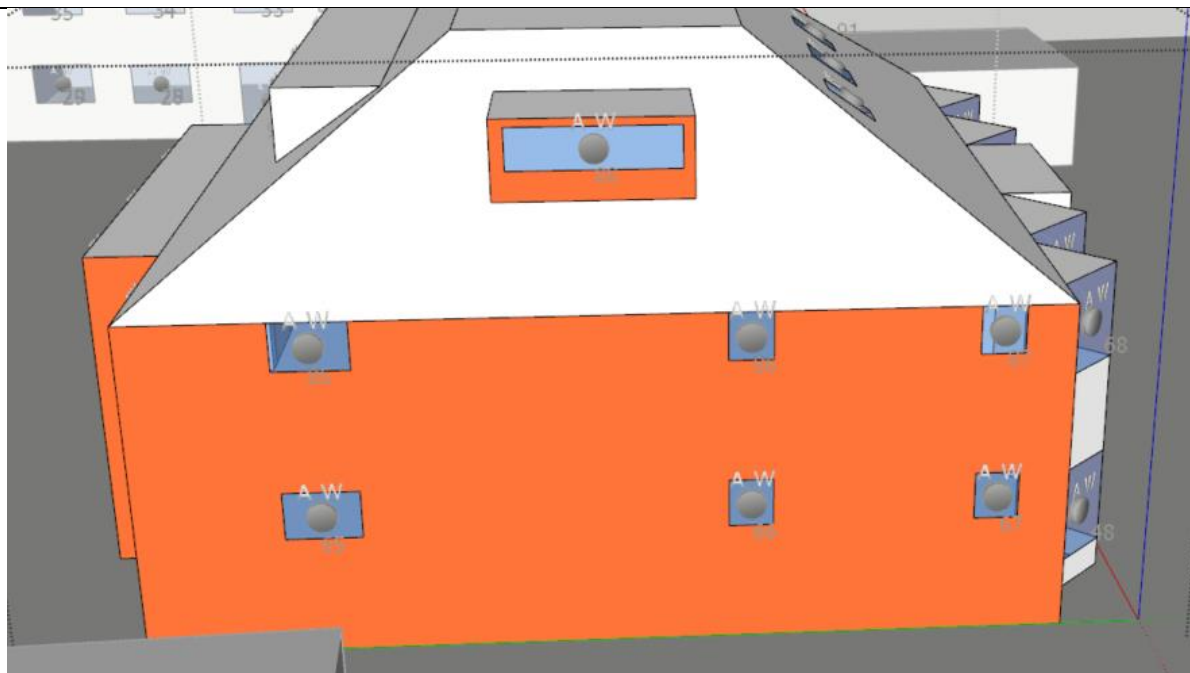
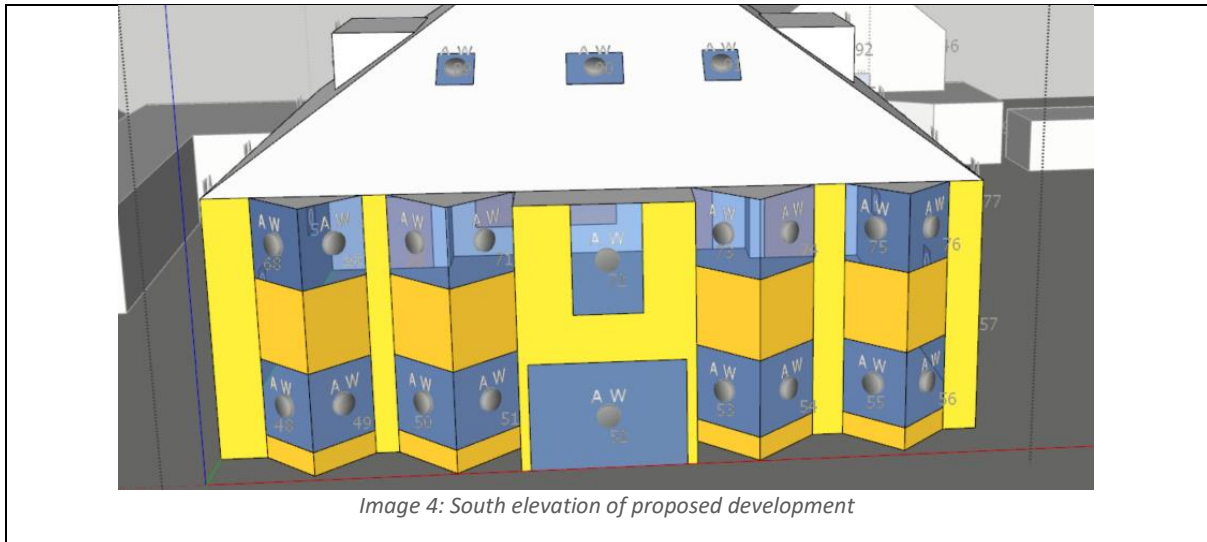


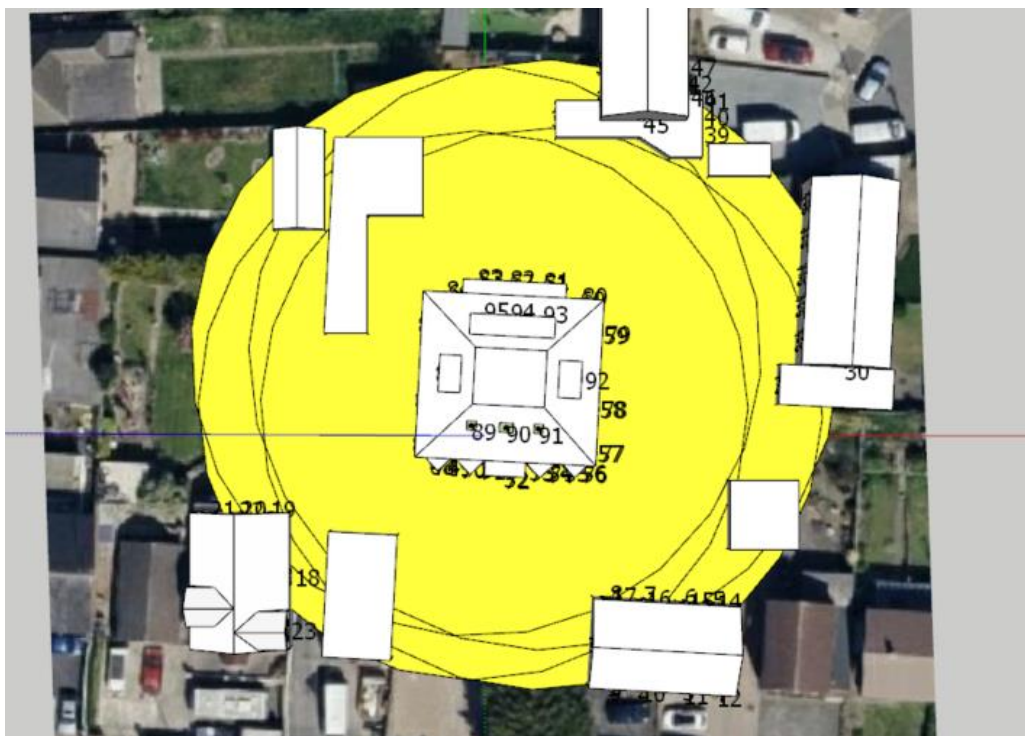
Image 3: West elevation of proposed development



5.2.2. Surrounding

5.6. To assess the impact the development will potentially have on the surrounding properties, the first step is to identify which properties are likely to have their daylight and sunlight impacted.

5.7. Following the first rule set out in the BR209 flow chart, an area three times the height of any proposed buildings must be determined. This can be seen in figure 9 below which identifies the surrounding buildings with windows which have the potential to lose natural daylight and sunlight. All buildings within this area have been assessed.



5.8. Once the area of the assessment has been established the next step is to identify the affected elevations. Elevations facing away from the proposed development will not require assessment as the impact of the daylight and sunlight levels will be insignificant. The images below indicate which elevations have been identified as needing assessment, they have been coloured green for ease of identification.

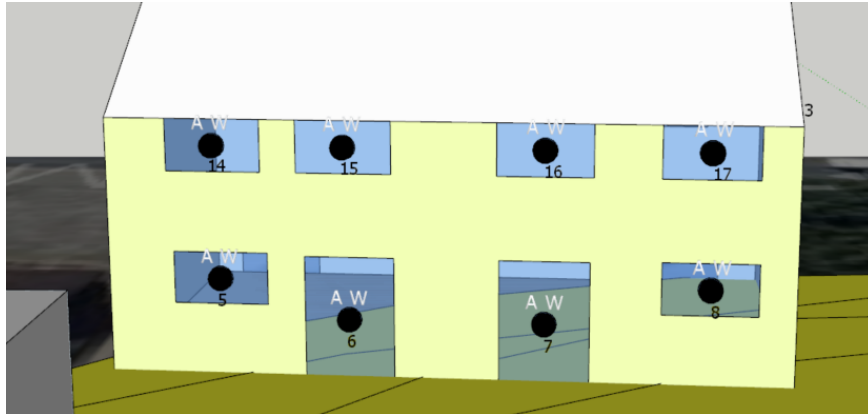


Image 5: Block B1 - Elevations and windows to be assessed

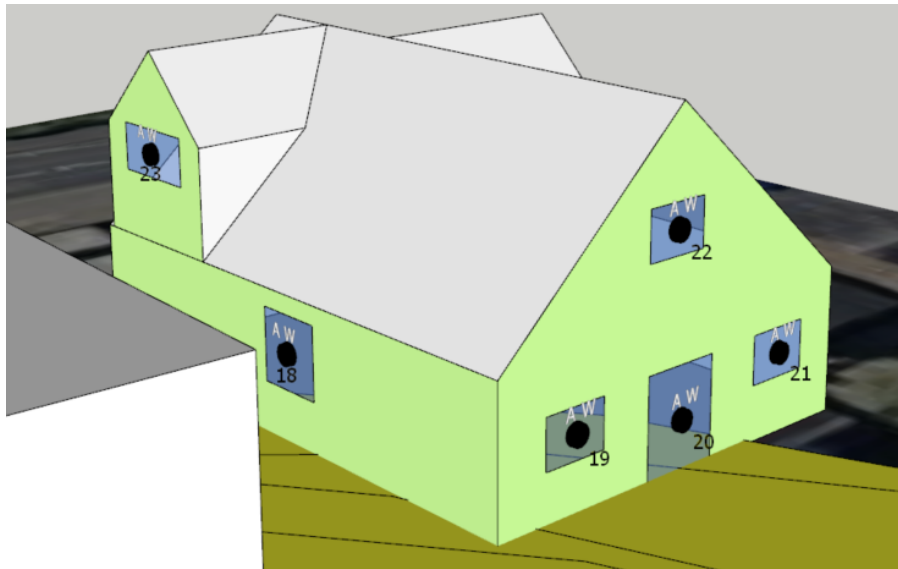


Image 6: Block B2 Window and elevation to be assessed

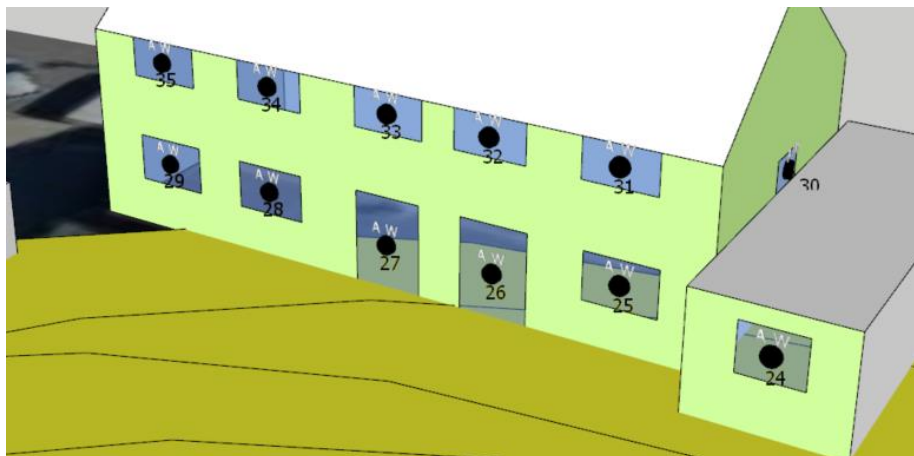


Image 7: Block B3 - Elevation and Window to be assessed

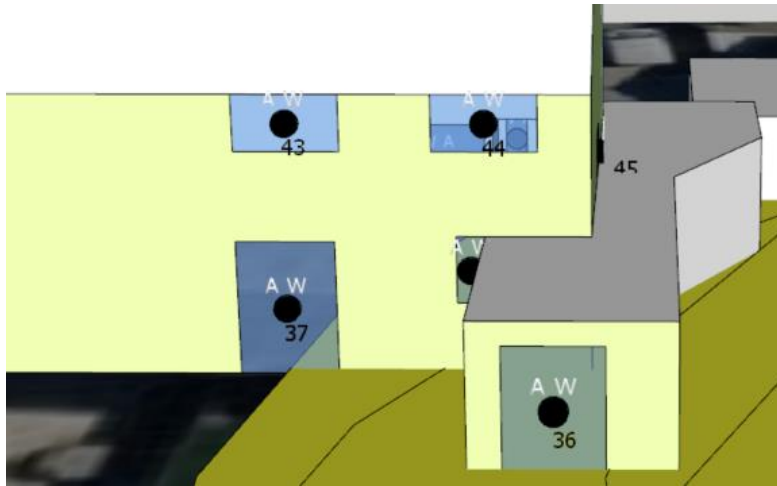


Image 8: Block B4 – Elevation and windows to be assessed

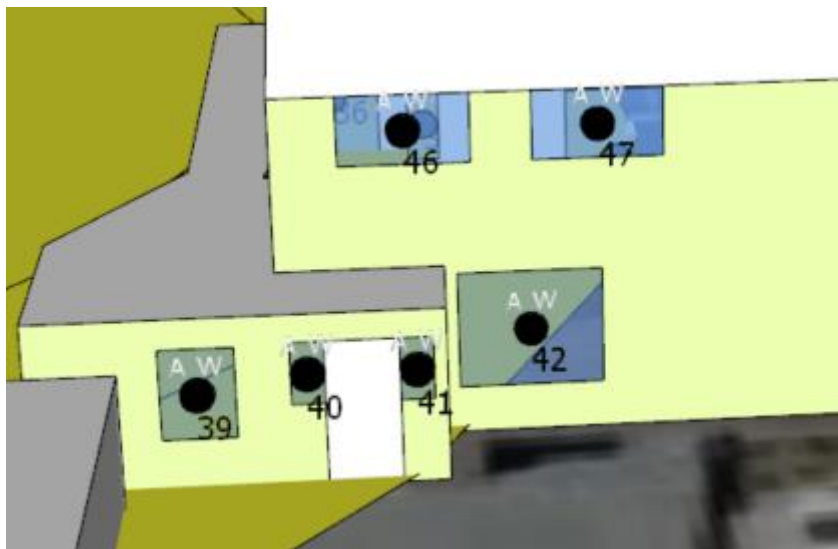


Image 9: Block B4 - Elevation and windows to be assessed

6. Results

6.1. Proposed

6.1.1. Daylight

6.1. Most of the windows serving rooms on the proposed building which have a requirement for daylight meet the BRE209 recommendations by achieving a VSC of 27% or greater. Refer to appendix A for visual of the results.

6.2. A total of 51 windows on the proposed dwelling have been assessed, 46 out of the 51 windows exceed the VSC target of 27%. The windows that do not meet the BR209 recommendations include a limited number on the southern façade and serve bedrooms. The failing windows are outlined below.

	Vertical Sky Component (VSC)	Room Served
Window Ref	Proposed %	
Pass Criterion	27	
71	22.96	Bedroom
73	23.36	Bedroom
49	26.99	Bedroom
51	17.93	Bedroom
53	18.48	Bedroom

Table 1: VSC% Results of the proposed block of windows not achieving 27%.

6.3. It is very probable that the rooms on this side of the building will receive adequate levels of daylight. The windows on this elevation do not fall short of the VSC requirements by much and BR209 guidance states that between 15% and 27% adequate daylighting can be achieved with special measures such as larger windows. The design of the building has sought to maximise the benefits of being southern facings by designing large windows, this can be seen from the elevation. In addition to the previous point, by analysing the floor plan in relation to the visual of results it is clear that even where windows do not meet the VSC of 27% the room they are serving is being served by additional windows that do exceed the guidance of 27%.

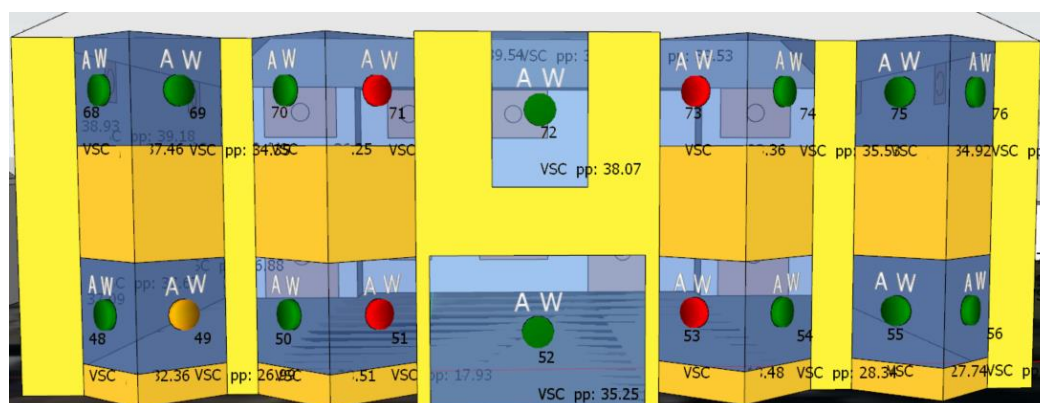


Figure 1: Visual of results from simulation model

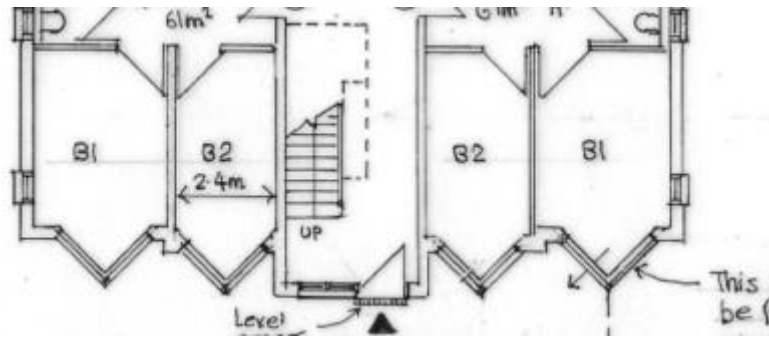
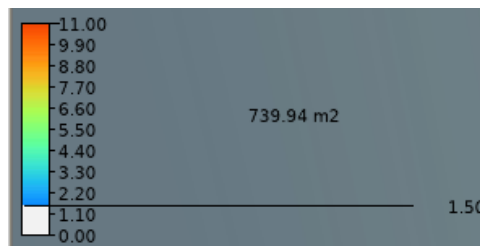


Figure 2: Room layout on southern side of building

6.4. No windows on the proposed development achieve rating below 15% on the VSC.

6.2. Sunlight

6.5. Sunlight calculations completed on the proposed massing of the building show that most windows on the proposed massing of the building will achieve the BR209 recommended 1.5 hours of direct sunlight on the 21st March. A key for the results in the following figures can be seen below. Anything white has not achieved the minimum 1.5 hours of direct sunlight on 21st March.



6.6. All windows on the southern elevation of the proposed massing achieve the BR209 guidance of 1.5 hours of direct sunlight, therefore no windows on this façade would fail to meet the guidance.

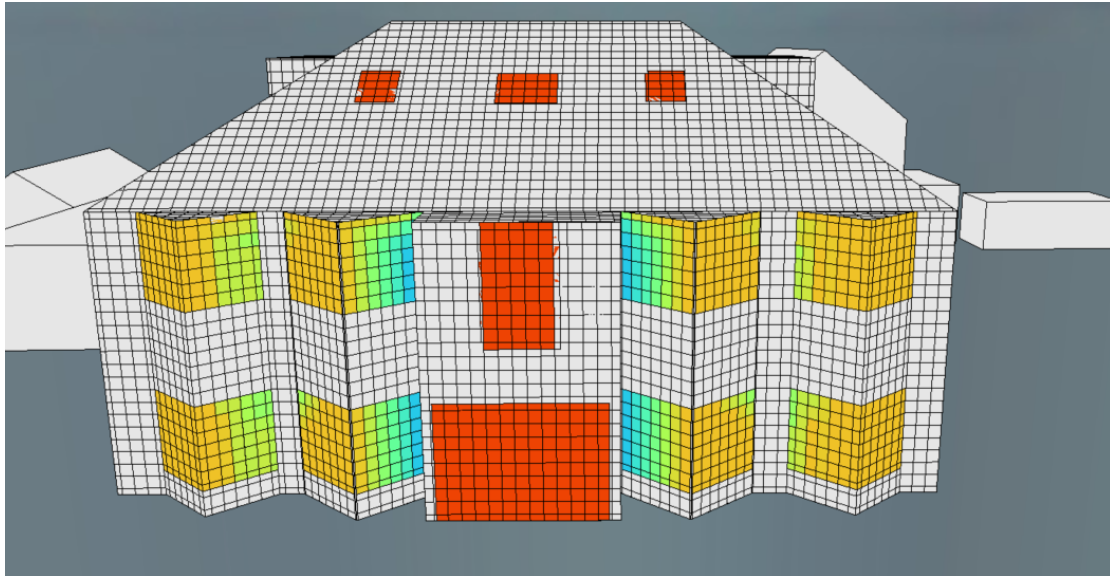


Figure 3: Areas achieving 1.5 hours of direct sunlight - Southern elevation

6.7. The western façade, while receiving less overall sunlight still receives a good level. All of the windows on the west façade receive more than 1.5 hours of direct sunlight on the 21st March. The indicative floor plans for the development show that the spaces being served by the glazed areas on this façade include both habitable and non-habitable rooms. The larger windows to the left on the ground and first floors will serve living rooms, the windows to the right bedrooms and the central windows bathrooms. The dormer window on the top floor will serve a bedroom.

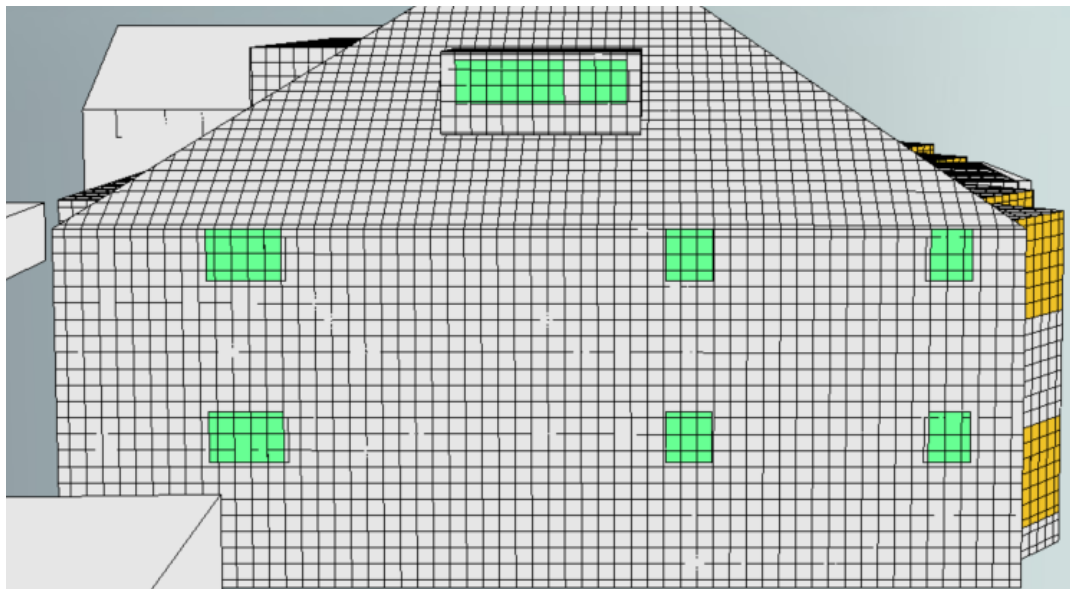


Figure 4: Areas achieving 1.5 hours of direct sunlight - Western elevation

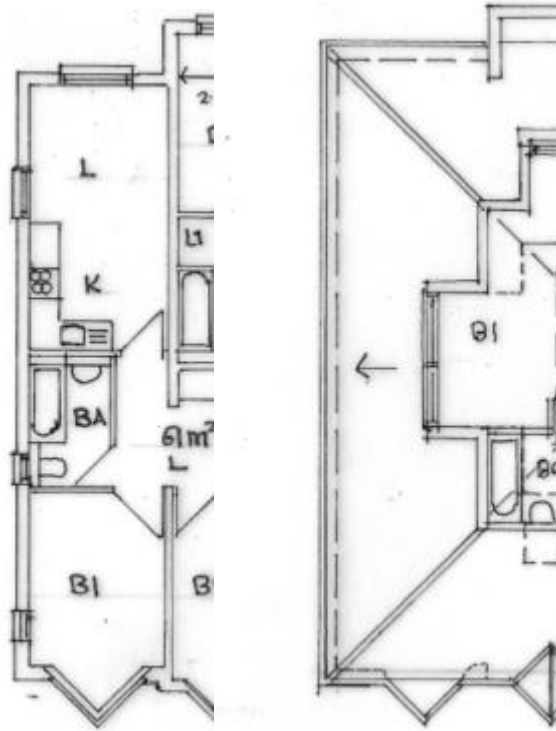


Figure 5: Floor plan extract showing room designations along the west of the building

6.8. All of the windows on the eastern façade achieves the BR209 recommendation of 1.5 hours of direct sunlight. The indicative floor plans show that the ground and first floors are mirrors of the east façade with the windows at the front serving bedrooms and the windows at the rear serving living rooms. The second floor dormer window will be serving a living room.

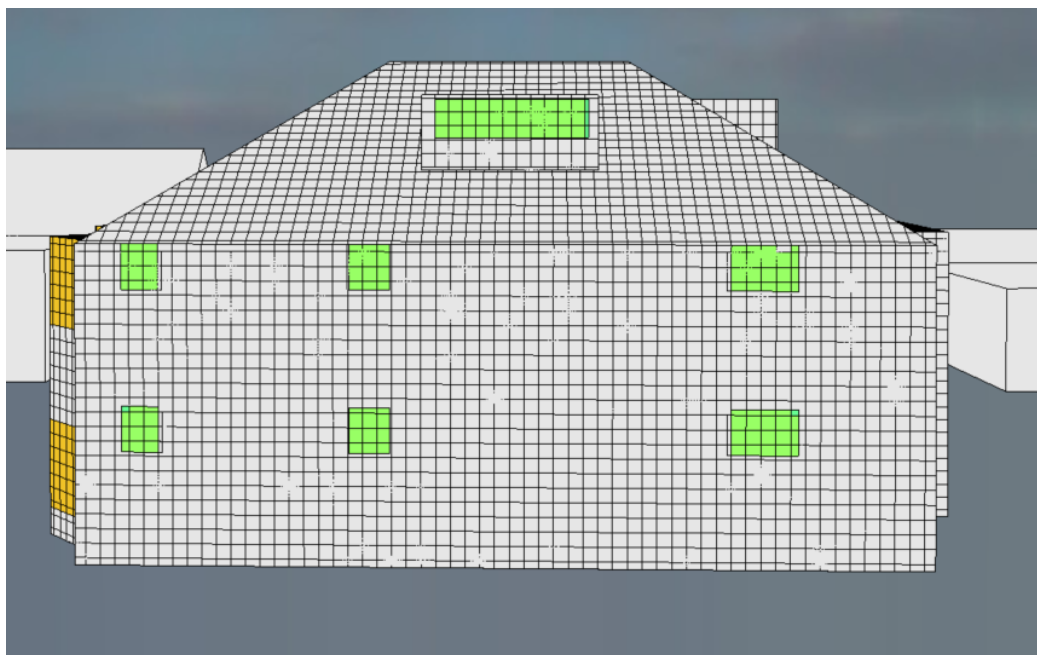


Figure 6: Areas achieving 1.5 hours or more of direct sunlight - Eastern façade

6.9. The North façade does not receive at any point on the 21st of March more than 1.5 hours of sunlight as can be witnessed in the figure below being all white. All the windows to the rear of the building serve habitable spaces. The windows on the far left and right of the image below serve living rooms, however these rooms are also served by additional windows on the east and west facades as well as roof lights which meet the BR209 guidance of achieving 1.5 hours of sunlight on the 21st of March, therefore these rooms could be deemed as meeting the guidance within BR209. The three central windows on the ground and first floor serve individual apartments which are single aspect and so none of the rooms will meet the BR209 guidance of achieving 1.5 hours of sunlight on 21st March, however BR209 recognises that this is not always possible as the development has to be designed with other constraints in mind. Flat 7 on the second floor has a second bedroom that will not meet the sunlight requirement, BR209 advises that “a habitable room, preferably a living room can achieve a total of at least 1.5 hours sunlight on 21st March, flat 7 does have a living room and a bedroom that will meet the sunlight requirements, therefore flat 7 would be deemed to meet the BR209 guidance.

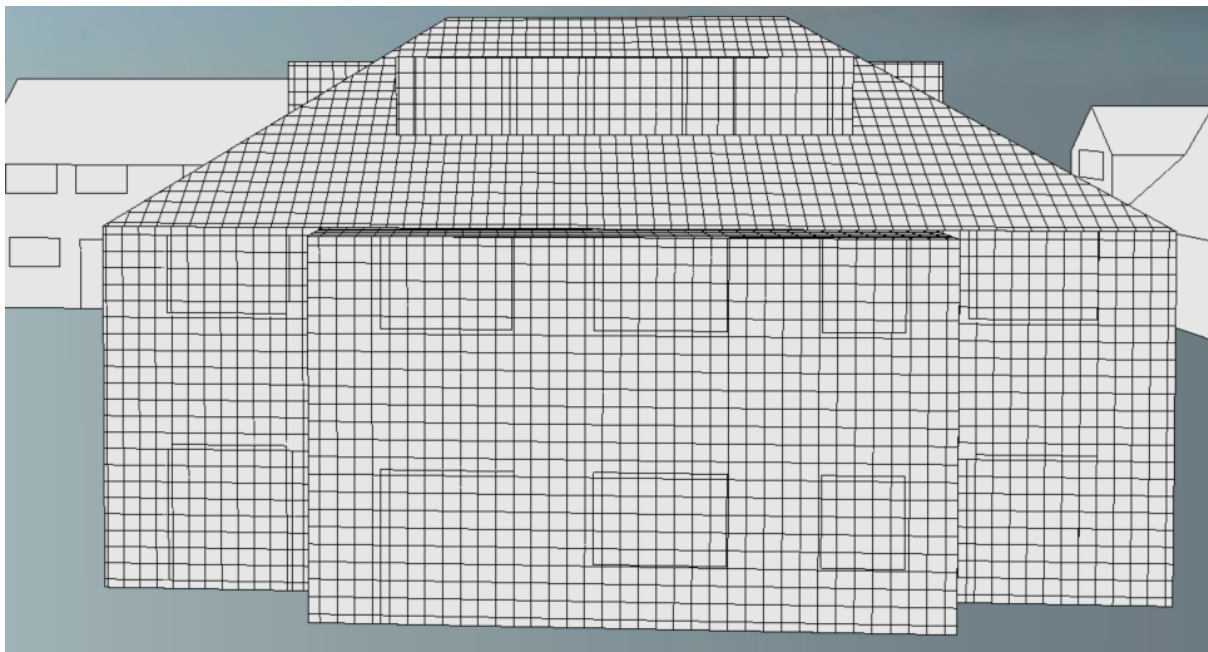
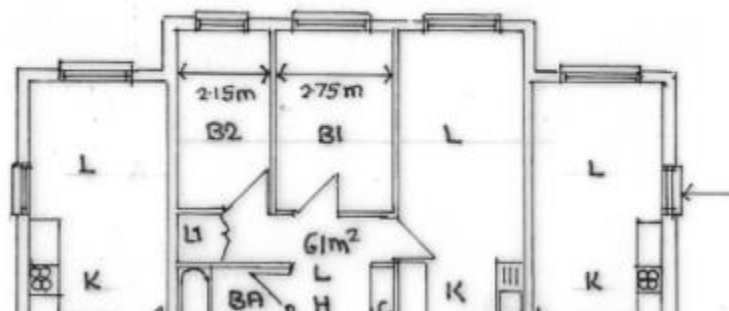


Figure 7: Areas achieving 1.5 hours of direct sunlight - Northern elevation



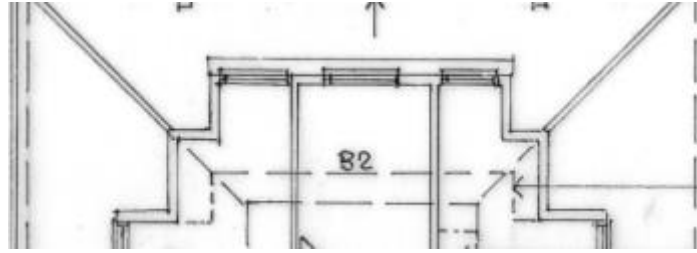


Figure 8: Floor plans of southern side of building

6.10. There are also three roof lights on the flat room at the top of the building, all three windows receive good levels of sunlight exceeding the BR209 guidance of 1.5 hours of sunlight on 21st March. The central window is serving a hallway which as it is not a habitable space and so is excluded from the assessment. The two flanking windows the living room and bedroom on the top floor apartment further maximising the amount of sunlight hours that occupants will receive within these habitable spaces. Apartment 7 will be meeting the guidance of BR209 of windows serving habitable rooms receiving 1.5 hours of sunlight on 21st March.

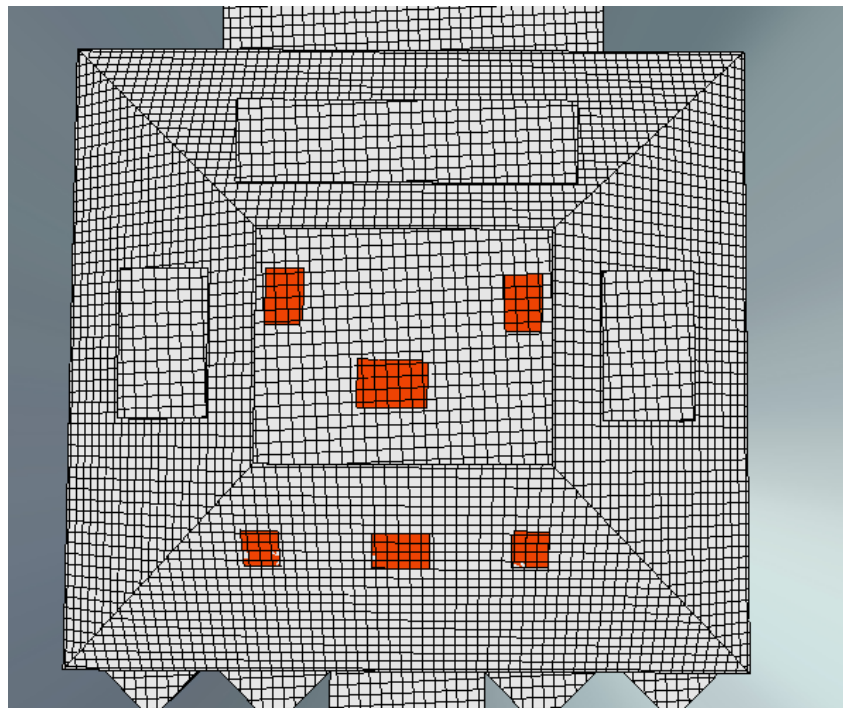


Figure 9: Roof plan showing rooflight exposure

6.3. Surrounding

6.3.1. Daylight

6.11. Vertical Sky Component (VSC) calculations for the windows on the surrounding buildings have been completed with the current existing building and the proposed new development. The analysis of the proposed building shows that it has a minimal impact on the surrounding buildings. All buildings within a radius of 3xheight of the building have been modelled and assessed (see figure below).

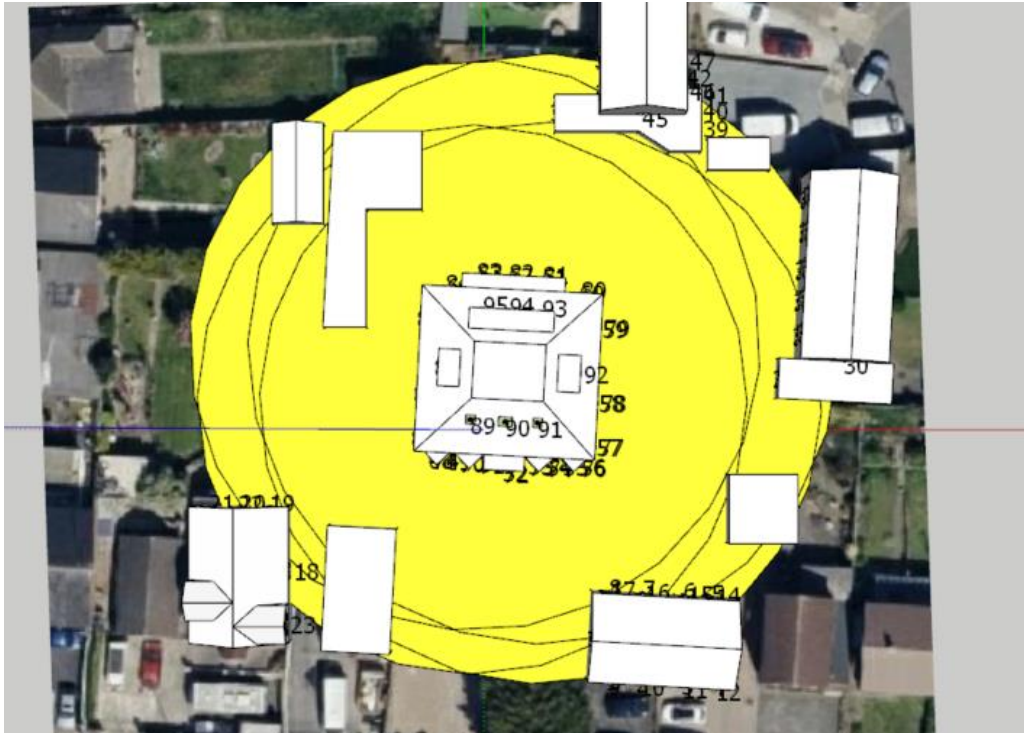


Figure 10: 3x height radius (yellow) to determine windows to be assessed

6.12. Whilst it has not been possible to determine the rooms being served behind the windows on the surrounding buildings, it does not seem to be an issue. All but two of the windows assessed on the surrounding buildings will achieve a VSC of 27% or better. The two windows that do not receive a VSC of greater than 27% did not achieve this before the proposed development was assessed with window 18 only reporting a variation factor of 0.99 (i.e. a 1% reduction in daylight compared to before). The lowest reportable variation factor between the existing and proposed is 0.93 (a 7% reduction in daylight), guidance in BR209 advises that variation factors of 0.8 (20% reduction in daylight) or greater would result in a “fail” as it is thought that at this level that the reduction in daylight is noticeable. The full set of results for the VSC can be seen below.

Window ID	VSC (Vertical Sky Component)			Pass / Fail
	Existing %	Proposed %	Variation Factor	
Pass Criterion	27.00	27.00	0.8	
9	39.62	39.62	1.00	Pass
10	39.62	39.62	1.00	Pass
11	39.62	39.62	1.00	Pass
12	39.62	39.62	1.00	Pass
13	38.94	38.73	0.99	Pass
14	38.51	37.95	0.99	Pass
15	38.37	37.74	0.98	Pass
16	38.06	37.36	0.98	Pass
17	37.74	37.05	0.98	Pass
1	39.62	39.62	1.00	Pass
2	39.62	39.62	1.00	Pass

3	39.62	39.62	1.00	Pass
4	39.62	39.62	1.00	Pass
5	36.02	35.34	0.98	Pass
6	34.84	34.16	0.98	Pass
7	34.54	33.91	0.98	Pass
8	34.99	34.35	0.98	Pass
22	39.30	38.90	0.99	Pass
23	38.90	38.59	0.99	Pass
18	23.75	23.53	0.99	Pass
19	37.75	37.18	0.98	Pass
20	37.81	37.30	0.99	Pass
21	38.45	38.03	0.99	Pass
30	38.51	38.41	1.00	Pass
31	38.63	37.42	0.97	Pass
32	38.60	37.54	0.97	Pass
33	38.50	37.56	0.98	Pass
34	38.28	37.48	0.98	Pass
35	37.96	37.30	0.98	Pass
24	36.69	34.28	0.93	Pass
25	35.50	33.61	0.95	Pass
26	36.00	34.36	0.95	Pass
27	35.92	34.53	0.96	Pass
28	36.21	35.04	0.97	Pass
29	35.76	34.79	0.97	Pass
43	39.44	39.24	0.99	Pass
44	39.40	39.09	0.99	Pass
45	36.71	35.55	0.97	Pass
46	38.24	38.24	1.00	Pass
47	38.59	38.59	1.00	Pass
36	37.62	37.11	0.99	Pass
37	37.17	37.17	1.00	Pass
38	26.11	26.11	1.00	Pass
39	34.28	34.28	1.00	Pass
40	36.09	36.09	1.00	Pass
41	36.66	36.66	1.00	Pass
42	34.44	34.44	1.00	Pass

6.13. A full visual reference of the windows on surrounding blocks can be viewed in appendix B.

6.3.1. Sunlight

6.14. Annual probable sunlight hours (APSH) calculations have been carried out for the windows on all surrounding buildings within the 3×height radius. Similar to the daylight analysis all the windows on the surrounding buildings pass.

6.15. There are numerous windows on the surrounding blocks that do not meet the BR209 target for APSH with the sight as it is with the existing building, however this is because they are predominantly north facing and as such receive limited sunlight anyway. With the proposed building modelled on site the APSH on the lowest variation factor identified on the surrounding buildings is 0.80 i.e., a 20% reduction in sunlight. BR209 advises that a reduction factor in excess of 0.8 should be targeted as beyond this the reduction would be deemed to be noticeable. It can therefore be assumed that all windows on the surrounding buildings will receive an adequate amount of sunlight.

6.16. Window 36 on block B4 exceeds the variation factor for its Winter probable sunlight hours (WPSH) only achieving a result of 0.71, however it still achieves 10 hours of winter sunlight exceeding the WPSH target of 5 so is still a pass.

6.17. The predicted APSH results can be viewed here.

Building ref	Floor	Window Ref	Window ID	APSH (Annual Probable Sunlight Hours)							
				Annual				Winter			
				Existing %	Proposed %	Variation Factor	Pass / Fail	Existing %	Proposed %	Variation Factor	Pass / Fail
			Pass Criterion	25	25	0.8		5	5	0.8	
B1	First	W1	9	88	88	1.00	Pass	30	30	1.00	Pass
B1	First	W2	10	88	88	1.00	Pass	30	30	1.00	Pass
B1	First	W3	11	88	88	1.00	Pass	30	30	1.00	Pass
B1	First	W4	12	88	88	1.00	Pass	30	30	1.00	Pass
B1	First	W5	13	49	49	1.00	Pass	15	15	1.00	Pass
B1	First	W6	14	12	12	1.00	Pass	0	0	-	Pass
B1	First	W7	15	12	12	1.00	Pass	0	0	-	Pass
B1	First	W8	16	12	12	1.00	Pass	0	0	-	Pass
B1	First	W9	17	12	12	1.00	Pass	0	0	-	Pass
B1	Ground	W1	1	88	88	1.00	Pass	30	30	1.00	Pass
B1	Ground	W2	2	88	88	1.00	Pass	30	30	1.00	Pass
B1	Ground	W3	3	88	88	1.00	Pass	30	30	1.00	Pass
B1	Ground	W4	4	88	88	1.00	Pass	30	30	1.00	Pass
B1	Ground	W5	5	12	12	1.00	Pass	0	0	-	Pass
B1	Ground	W6	6	11	11	1.00	Pass	0	0	-	Pass
B1	Ground	W7	7	11	11	1.00	Pass	0	0	-	Pass
B1	Ground	W8	8	12	12	1.00	Pass	0	0	-	Pass
B2	First	W1	22	12	11	0.92	Pass	0	0	-	Pass
B2	First	W2	23	50	50	1.00	Pass	15	15	1.00	Pass
B2	Ground	W1	18	31	31	1.00	Pass	9	9	1.00	Pass
B2	Ground	W2	19	11	11	1.00	pass	0	0	-	Pass
B2	Ground	W3	20	11	11	1.00	Pass	0	0	-	Pass
B2	Ground	W4	21	11	11	1.00	Pass	0	0	-	Pass

B3	First	W1	30	88	87	0.80	Pass	30	29	0.97	Pass
B3	First	W2	31	50	48	0.80	pass	15	14	0.93	Pass
B3	First	W3	32	50	49	0.98	Pass	15	14	0.93	Pass
B3	First	W4	33	50	49	0.98	Pass	15	14	0.93	Pass
B3	First	W5	34	50	48	0.96	Pass	15	13	0.87	Pass
B3	First	W6	35	49	47	0.96	Pass	15	13	0.87	Pass
B3	Ground	W1	24	48	44	0.80	pass	13	13	1.00	Pass
B3	Ground	W2	25	41	39	0.80	pass	6	6	1.00	Pass
B3	Ground	W3	26	47	45	0.96	Pass	12	11	0.92	Pass
B3	Ground	W4	27	48	47	0.98	Pass	13	12	0.92	Pass
B3	Ground	W5	28	49	47	0.96	Pass	14	12	0.86	Pass
B3	Ground	W6	29	48	47	0.98	Pass	14	13	0.93	Pass
B4	First	W1	43	50	50	1.00	Pass	15	15	1.00	Pass
B4	First	W2	44	50	50	1.00	Pass	15	15	1.00	Pass
B4	First	W3	45	86	84	0.98	Pass	28	26	0.93	Pass
B4	First	W4	46	49	49	1.00	Pass	14	14	1.00	Pass
B4	First	W5	47	49	49	1.00	Pass	14	14	1.00	Pass
B4	Ground	W1	36	49	45	0.92	Pass	14	10	0.71	Pass
B4	Ground	W2	37	46	46	1.00	Pass	11	11	1.00	Pass
B4	Ground	W3	38	10	10	1.00	Pass	0	0	-	Pass
B4	Ground	W4	39	43	43	1.00	Pass	8	8	1.00	Pass
B4	Ground	W5	40	47	47	1.00	Pass	12	12	1.00	Pass
B4	Ground	W6	41	48	48	1.00	Pass	13	13	1.00	Pass
B4	Ground	W7	42	37	37	1.00	Pass	2	2	1.00	Pass

7. Conclusion

- 7.1. All the windows on the surrounding buildings will continue to meet the daylight requirement outlined within the BR209 guidance of achieving a Vertical Sky Component (VSC) of 27% or greater or will not have a variance factor of worse than 0.8 after the proposed development has been constructed.
- 7.2. All the windows of the surrounding buildings will continue to meet the Annual Probable Sunlight Hours (APSH) outlined within the guidance of BR209 after the proposed development has been constructed. The north facing windows which do not meet the APSH do not have a variance factor of worse than 0.92 and so the reduction in sunlight would not be noticeable.
- 7.3. Most of the windows on the southern elevation achieve a vertical sky component in excess of 27%, and each habitable room on this façade is served by multiple windows. There are a few windows on the southern façade may be at risk of not meeting the VSC% target, however the windows that are below the VSC target of 27% serve rooms that are also served by windows that exceed the VSC target of 27%. In addition BR209 advises that windows with a VSC of between 15-27% are likely to provide adequate daylight levels with special measures such as large windows, the windows on this development are well sized. It is therefore highly likely that the habitable rooms on the southern elevation will receive good levels of daylight.
- 7.4. The windows on the South, East and West facades will receive a suitable amount of sunlight exceeding the BR209 guidance of 1.5 hours of direct sunlight.
- 7.5. The windows on the North facing façade are not predicted to achieve sunlight levels of 1.5 hours on the 21st March. Living rooms in flats 1, 3, 4 and 6 have North facing windows which do not meet sunlight hours, however they also have east and west faced windows which do meet the sunlight target of 1.5 hours, therefore these rooms are likely to receive adequate levels of sunlight.
- 7.6. Flat 7 on the top floor has one bedroom (a second bedroom) with only a north facing window that will not meet the sunlight requirements, there are two additional habitable rooms, the living room and master bedroom that have east and west facing windows which will meet the sunlight target if 1.5 hours or more. BR209 advises that “a habitable room, preferably a main living room can receive a total of at least 1.5 hours of sunlight on the 21st March”, with two habitable rooms meeting this requirement flat 7 would be deemed as meeting the guidance.
- 7.7. Flats 2 and 5 and north facing single aspect flats, none of the windows serving the habitable rooms will receive 1.5 hours of sunlight on the 21st March. The flat design has been optimised as much as possible with non-habitable spaces such as the bathroom and access corridors located to the inside of the building to enable the habitable spaces to maximise window usage. Flat 2 will be provided with some private amenity space so occupants would be able to go outside and maximise exposure to sunlight. A communal rear garden is being provided and so all residents from all flats will be able to go outside and maximise sunlight exposure.

7.8. Living spaces in flats 2 and 5 are only served by one window and are quite deep with the kitchens at the opposite end of the room, this could mean that despite good VSC levels, the kitchens may have a restricted daylight level.

Appendix A. Proposed building window references



Image 10: North elevation window references

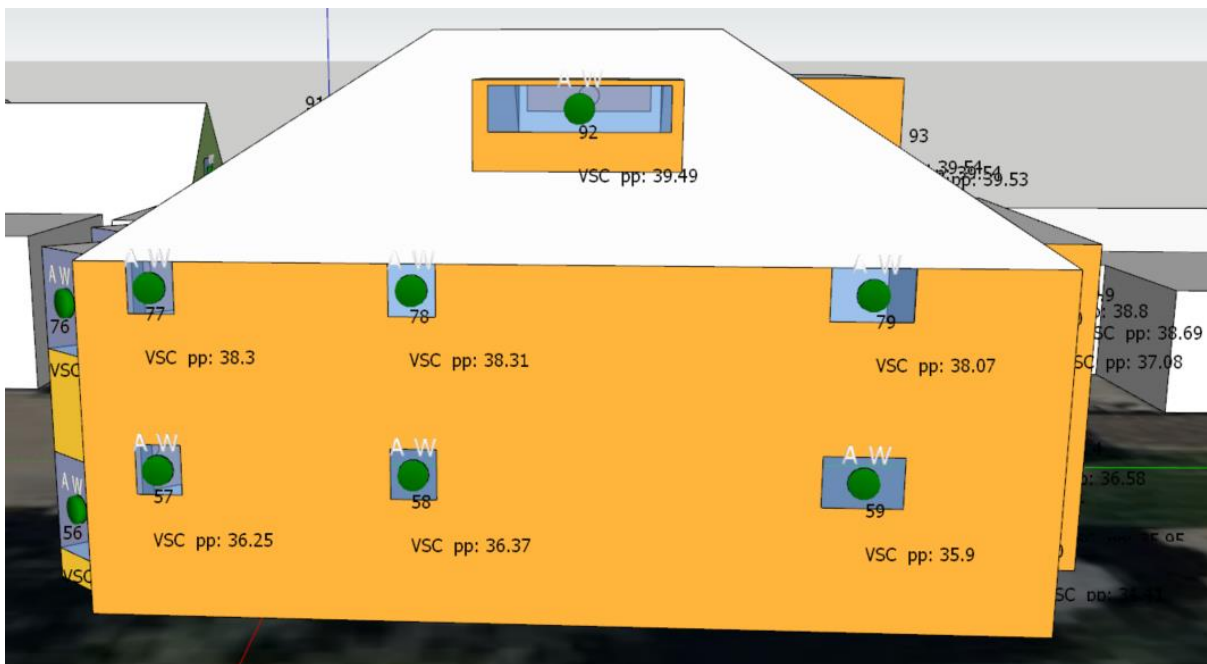


Image 11: East elevation window references

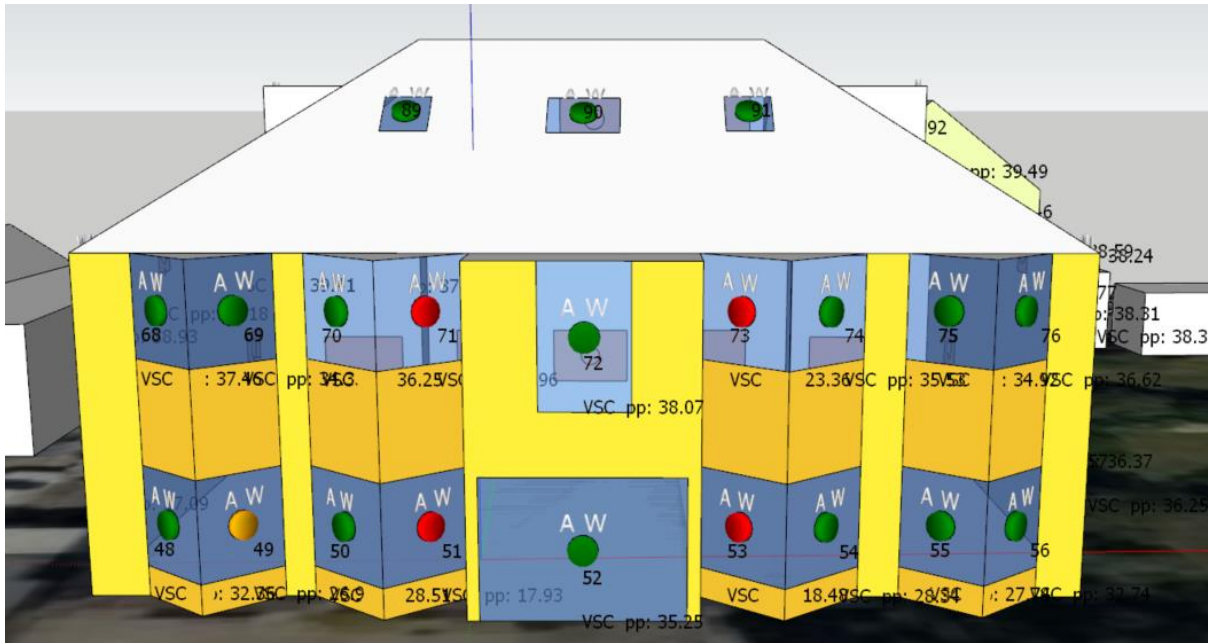


Image 12: South elevation window references

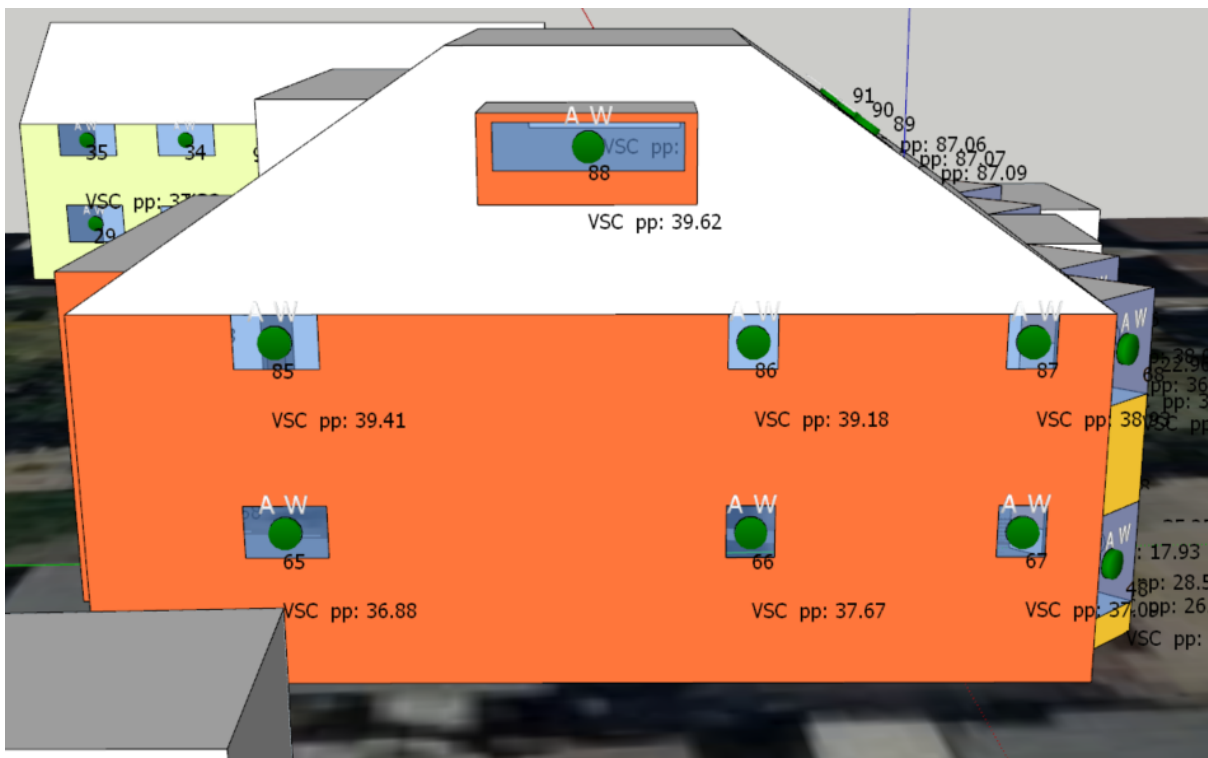


Image 13: West elevation window references

Appendix B. Surrounding building window references

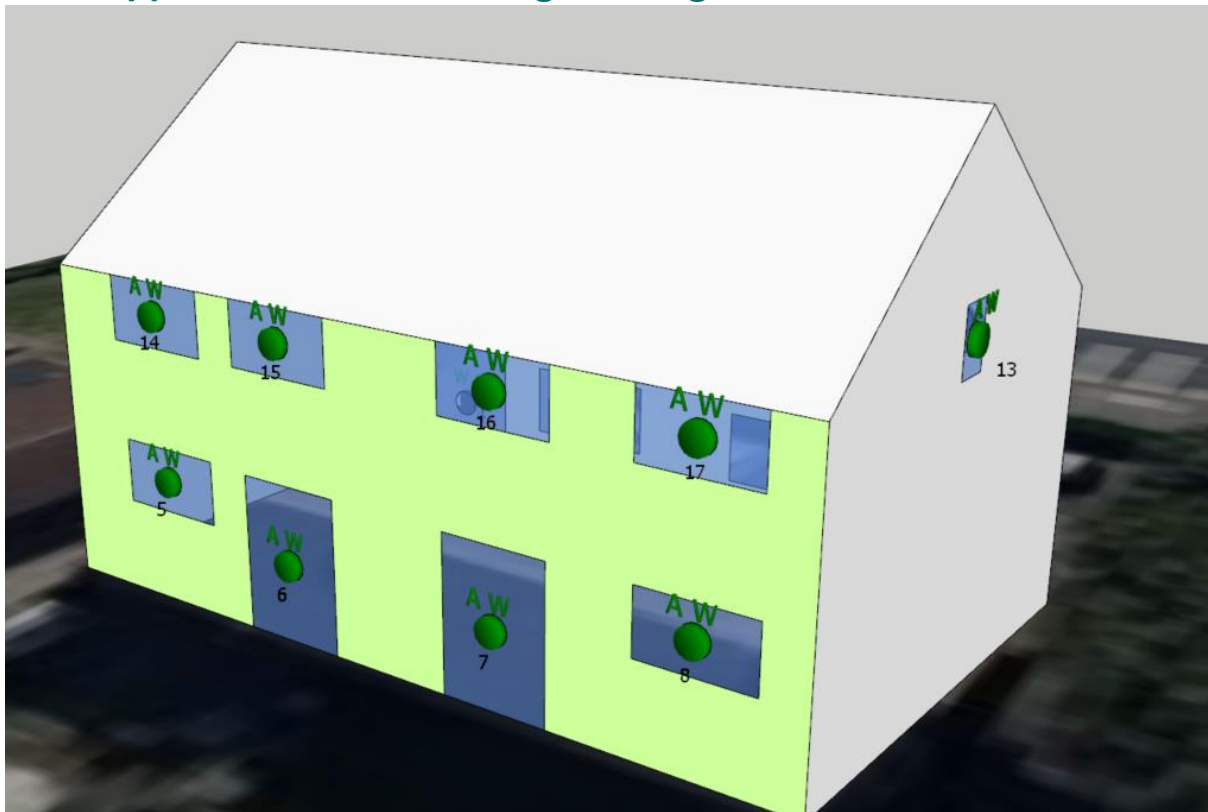


Image 14: Blocks 1 window references

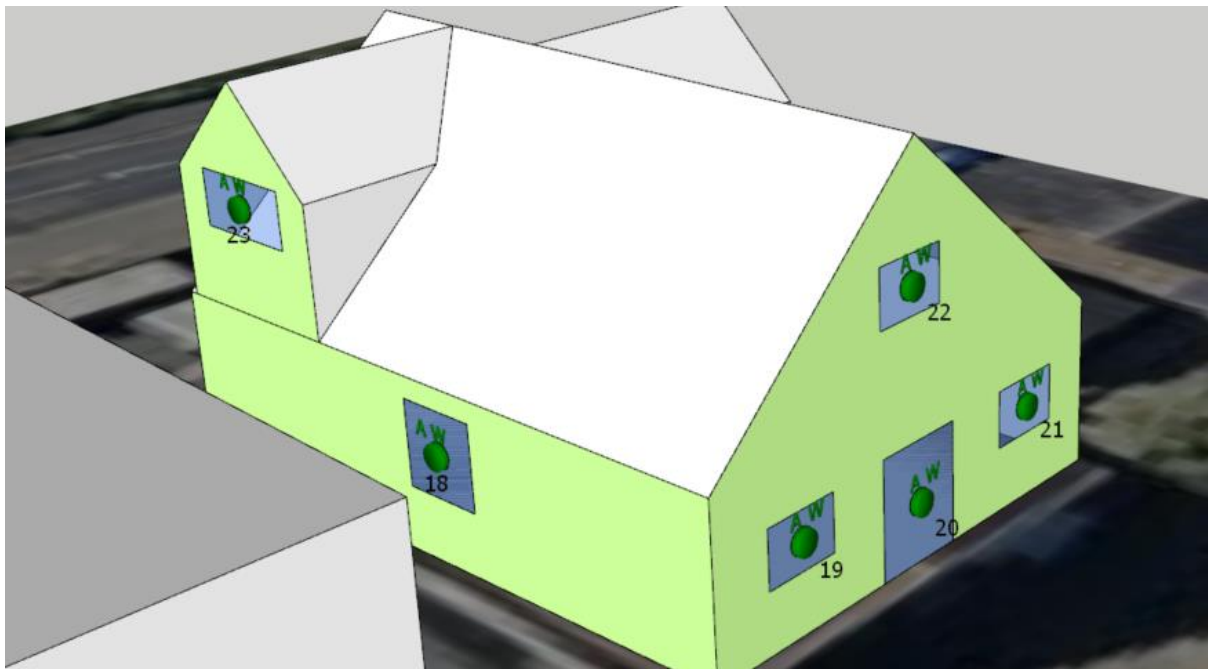


Image 15: Block 2 window references

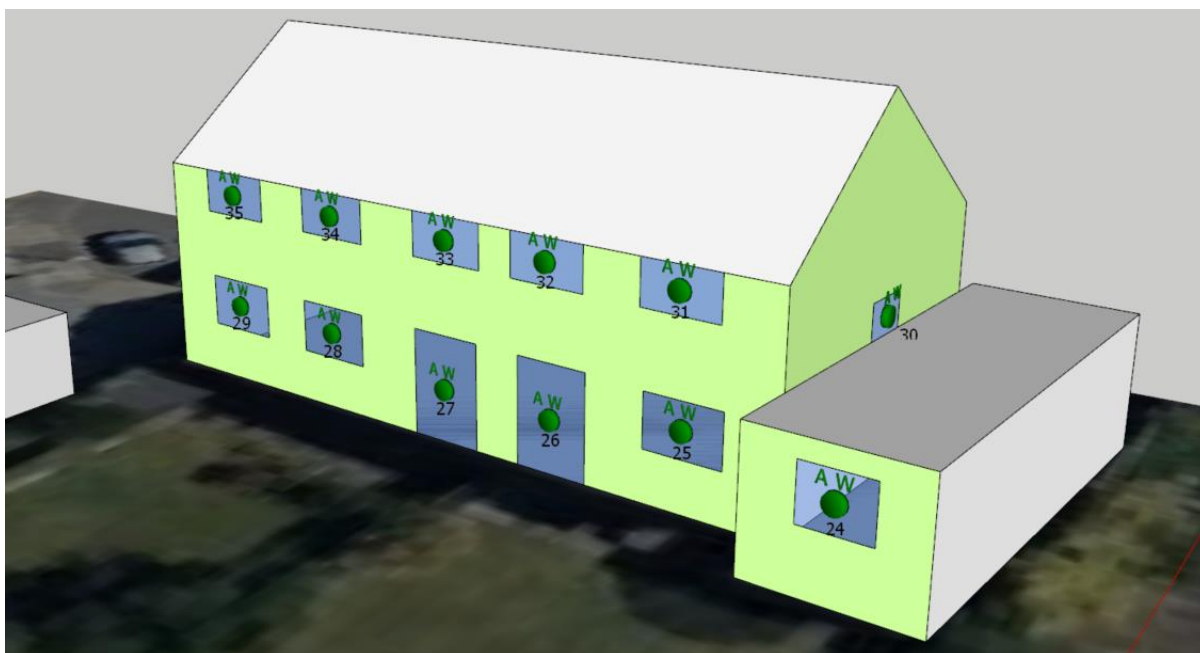


Image 16: Block B3 window references

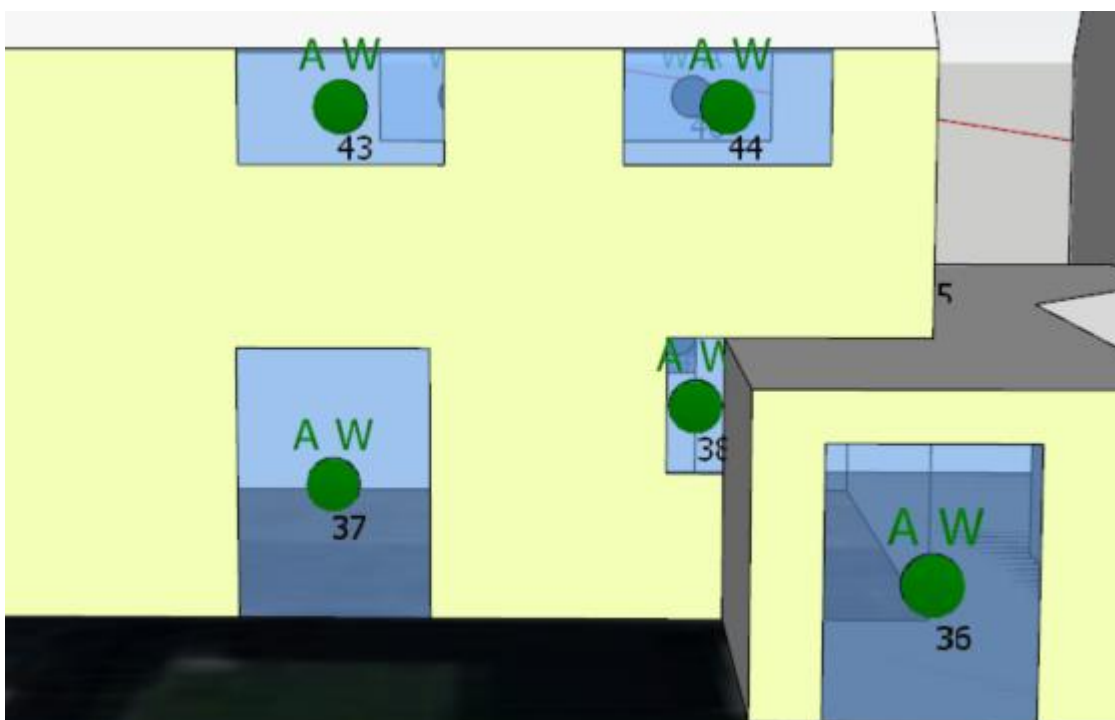


Image 17: Block B4 window references

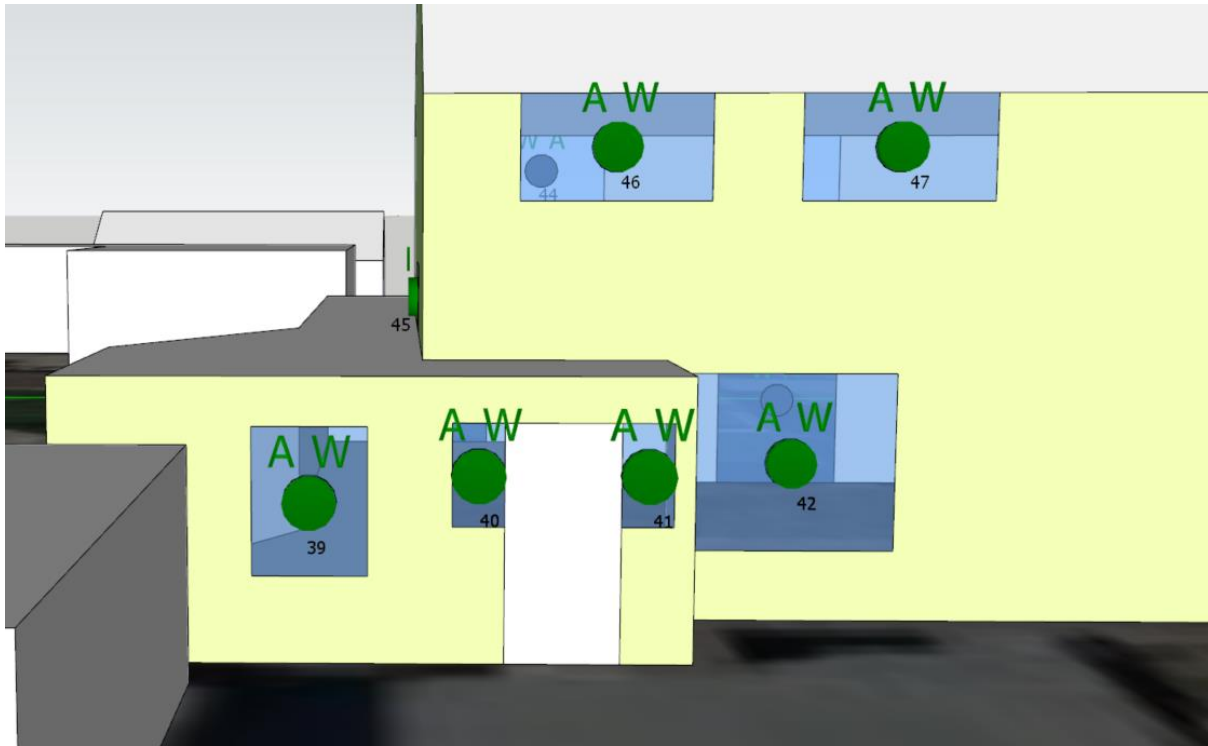


Image 18: Block B4 window references

Appendix C. Full VSC (Vertical Sky Component) results

	Floor	Window Ref	Window ID	VSC (Vertical Sky Component)			Pass / Fail
				Existing %	Proposed %	Variation Factor	
Building Ref			Pass Criterion	27.00	27.00	0.8	
B1	First	W1	9	39.62	39.62	1.00	Pass
B1	First	W2	10	39.62	39.62	1.00	Pass
B1	First	W3	11	39.62	39.62	1.00	Pass
B1	First	W4	12	39.62	39.62	1.00	Pass
B1	First	W5	13	38.94	38.73	0.99	Pass
B1	First	W6	14	38.51	37.95	0.99	Pass
B1	First	W7	15	38.37	37.74	0.98	Pass
B1	First	W8	16	38.06	37.36	0.98	Pass
B1	First	W9	17	37.74	37.05	0.98	Pass
B1	Ground	W1	1	39.62	39.62	1.00	Pass
B1	Ground	W2	2	39.62	39.62	1.00	Pass
B1	Ground	W3	3	39.62	39.62	1.00	Pass
B1	Ground	W4	4	39.62	39.62	1.00	Pass
B1	Ground	W5	5	36.02	35.34	0.98	Pass
B1	Ground	W6	6	34.84	34.16	0.98	Pass
B1	Ground	W7	7	34.54	33.91	0.98	Pass
B1	Ground	W8	8	34.99	34.35	0.98	Pass
B2	First	W1	22	39.30	38.90	0.99	Pass
B2	First	W2	23	38.90	38.59	0.99	Pass
B2	Ground	W1	18	23.75	23.53	0.99	Pass
B2	Ground	W2	19	37.75	37.18	0.98	Pass
B2	Ground	W3	20	37.81	37.30	0.99	Pass
B2	Ground	W4	21	38.45	38.03	0.99	Pass
B3	First	W1	30	38.51	38.41	1.00	Pass
B3	First	W2	31	38.63	37.42	0.97	Pass
B3	First	W3	32	38.60	37.54	0.97	Pass
B3	First	W4	33	38.50	37.56	0.98	Pass
B3	First	W5	34	38.28	37.48	0.98	Pass
B3	First	W6	35	37.96	37.30	0.98	Pass
B3	Ground	W1	24	36.69	34.28	0.93	Pass
B3	Ground	W2	25	35.50	33.61	0.95	Pass
B3	Ground	W3	26	36.00	34.36	0.95	Pass
B3	Ground	W4	27	35.92	34.53	0.96	Pass
B3	Ground	W5	28	36.21	35.04	0.97	Pass
B3	Ground	W6	29	35.76	34.79	0.97	Pass
B4	First	W1	43	39.44	39.24	0.99	Pass
B4	First	W2	44	39.40	39.09	0.99	Pass
B4	First	W3	45	36.71	35.55	0.97	Pass

B4	First	W4	46	38.24	38.24	1.00	Pass
B4	First	W5	47	38.59	38.59	1.00	Pass
B4	Ground	W1	36	37.62	37.11	0.99	Pass
B4	Ground	W2	37	37.17	37.17	1.00	Pass
B4	Ground	W3	38	26.11	26.11	1.00	Pass
B4	Ground	W4	39	34.28	34.28	1.00	Pass
B4	Ground	W5	40	36.09	36.09	1.00	Pass
B4	Ground	W6	41	36.66	36.66	1.00	Pass
B4	Ground	W7	42	34.44	34.44	1.00	Pass
P1	First	W1	68		37.46	-	Pass
P1	First	W2	69		34.35	-	Pass
P1	First	W3	70		36.25	-	Pass
P1	First	W4	71		22.96	-	Pass
P1	First	W5	72		38.07	-	Pass
P1	First	W6	73		23.36	-	Pass
P1	First	W7	74		35.53	-	Pass
P1	First	W8	75		34.92	-	Pass
P1	First	W9	76		36.62	-	Pass
P1	First	W10	77		38.30	-	Pass
P1	First	W11	78		38.31	-	Pass
P1	First	W12	79		38.07	-	Pass
P1	First	W13	80		37.08	-	Pass
P1	First	W14	81		38.69	-	Pass
P1	First	W15	82		38.80	-	Pass
P1	First	W16	83		38.90	-	Pass
P1	First	W17	84		37.45	-	Pass
P1	First	W18	85		39.41	-	Pass
P1	First	W19	86		39.18	-	Pass
P1	First	W20	87		38.93	-	Pass
P1	Ground	W1	48		32.36	-	Pass
P1	Ground	W2	49		26.99	-	Pass
P1	Ground	W3	50		28.51	-	Pass
P1	Ground	W4	51		17.93	-	Pass
P1	Ground	W5	52		35.25	-	Pass
P1	Ground	W6	53		18.48	-	Pass
P1	Ground	W7	54		28.34	-	Pass
P1	Ground	W8	55		27.74	-	Pass
P1	Ground	W9	56		32.74	-	Pass
P1	Ground	W10	57		36.25	-	Pass
P1	Ground	W11	58		36.37	-	Pass
P1	Ground	W12	59		35.90	-	Pass
P1	Ground	W13	60		31.41	-	Pass
P1	Ground	W14	61		35.95	-	Pass
P1	Ground	W15	62		36.58	-	Pass
P1	Ground	W16	63		36.40	-	Pass

P1	Ground	W17	64		30.81	-	Pass
P1	Ground	W18	65		36.88	-	Pass
P1	Ground	W19	66		37.67	-	Pass
P1	Ground	W20	67		37.09	-	Pass
P1	Second	W1	88		39.62	-	Pass
P1	Second	W2	89		87.09	-	Pass
P1	Second	W3	90		87.07	-	Pass
P1	Second	W4	91		87.06	-	Pass
P1	Second	W5	92		39.49	-	Pass
P1	Second	W6	93		39.53	-	Pass
P1	Second	W7	94		39.54	-	Pass
P1	Second	W8	95		39.54	-	Pass