BRE DAYLIGHT ASSESSMENT FOR:

109 High Street, West Drayton

UB7 7GJ

UK

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1. EXECUTIVE SUMMARY

This daylight assessment has been prepared to support the planning application for the proposed development at 109 High Street, West Drayton. This assessment has been produced based on planning drawings provided by Quad architects. The study covers the addition of a new build top floor on Kirk House, West Drayton.

The following can be concluded based on the studies undertaken:

- Vertical Sky Component (VSC): Specific windows have been selected on 2& 4 St. Stephens Rd and Chiltern house. The study reveals that the new extension will not have any impact on these properties.

- Annual/Winter Probable Sunlight Hours (APSH): Specific windows have been selected on 2& 4 St. Stephens Rd and Chiltern house. The study reveals that the new extension will not have any impact on these properties.

- Overshadowing: This study reveals that all facades will receive more than 2 hours of daylight as specified on BRE Guidance and therefore will not have any impact.

- Average Daylight Factor: All rooms examined are compliant with the BRE Minimum standards

Please note that windows serving not highly occupied areas (stairs/WC etc) are not included within the analysis.

Therefore, the proposed scheme will not have any negative impact on the neighbouring properties and is considered compliant.

2. CURRENT POLICIES, REGULATIONS AND BENCHMARK

The Building Research Establishment (BRE) sets out good practice daylight and sunlight guidance in BR209 "*Site Layout Planning for Daylight and Sunlight: a Guide to Good Practice",* 2nd Ed, guidelines and methodology for the measurement and assessment of daylight and sunlight within proposed buildings. This document states that it is also intended to be used in conjunction with the interior daylight recommendations found within the British Standard BS8206-2:2008 and the *Applications Manual on Window Design* of the Chartered Institution of Buildings Services Engineers (CIBSE).

The provision of daylight is as important as ensuring low levels of noise or low levels of odour in maintaining the enjoyment of one's property. Adequate levels of daylight are important not only to light and heat the home, but also for an occupant's emotional well-being.

Daylight is widely accepted to have a positive psychological effect on human beings and there is a great deal of evidence to suggest that people who are deprived of daylight are more susceptible to depression and mood swings. This is common in northern countries, such as Norway, Iceland, and Canada where daylight is scarce during the winter months.

The Daylight and Sunlight Assessment, analysed in this report, has been carried out in compliance with the methodology outlined in the Building Research Establishment (BRE) Guide 'Site Layout Planning for Sunlight and Daylight: A Guide to Good Practice' by P J Littlefair (2011).

When assessing the effects of proposed building projects on the potential to cause issues relating to light, it is important to recognise the distinction between daylight and sunlight. Daylight is the combination of all direct and indirect sunlight during the daytime, whereas sunlight comprises only the direct elements of sunlight. On a cloudy or overcast day, diffused daylight still shines through windows, even when sunlight is absent.

Care should also be taken when the development is situated to the south of existing buildings, as in the northern hemisphere, the majority of the sunlight comes from the south. In the UK (and other northern hemisphere countries) south-facing facades will, in general, receive most sunlight, while north-facing facades will receive few sunlight hours during winter months, specifically early mornings and late evenings.

Please see below brief description of each criterion assessed.

Vertical Sky Component (VSC)

The Vertical Sky Component (VSC) quantifies the amount of available daylight received at a particular window and measured on the outer pane of the window. This is the ratio, expressed as a percentage, of the direct illuminance falling on a reference point (usually the centre of the window) to the simultaneous horizontal illuminance under an unobstructed sky (overcast sky conditions).

In order to maintain good levels of daylight the BRE guidance recommends that the VSC of a window should be 27% or greater.

The comparison test considers the VSC results of the baseline/existing condition and the VSC results assuming that the new development is in place. The 2011 BRE Handbook states that where the proposed VSC is less than 27%, the comparison with the existing situation should be analysed and if the VSC is less than 0.8 times its former value, occupants of the existing building may notice a reduction in the amount of daylight.

Annual Probable Sunlight Hours (APSH)

The assessment of the APSH demonstrates that all examined windows will achieve the minimum % requirement for compliance which corresponds to not less than 392 hours. The total annual sunlit hours according to BRE are 1486.

BRE guidance recommends that the APSH received at a given window in the proposed case should be at least 25% of the total available.

The comparison test considers the APSH results of the existing and proposed development in place. The BRE guidance say that if the reduction in sunlight between the existing and the proposed one results in an APSH and of at least 0.8 times its former value, then it is considered that the sunlight received is adequate.

In accordance with BRE 'Site Layout Planning for Sunlight and Daylight: A Guide to Good Practice' section 3.2.3, only windows facing south are to be examined and therefore all north facing are excluded from the assessment.

Overshadowing

BRE Guide recommends that for a garden or amenity to appear adequately sunlit throughout the year, at least half of it should receive at least two hours of sunlight on 21 March.

Average Daylight factor – Proposed developments only

The quality and quantity of daylight provision to a space in a new dwelling are both important. The BRE guidance suggests the use of the widely understood average daylight factor (ADF) metric to assess both the quantity and distribution of daylight in new rooms, using a CIE standard overcast sky condition. Referencing BS8206-2 Code of Practice for Daylighting, the guidance recommends values of 5% for a well day lit space and 2% for a partly day lit space.

Average daylight factor (ADF)	Kitchen > or = 2% Living areas > or = 1.5% Bedrooms > or = 1%

Table 1 below summarizes all criteria examined.

Parameter	Acceptability Criteria
Vertical Sky Component (VSC)	If VSC is at least 27% then examined window design is compliant Or Reduction ratio of <1 and >or= of 0.8 Minor adverse - <0.8 and >or=0.7 Moderate adverse - <0.7 and >or=0.6 Major adverse - <0.6
Annual Probable Sunlight Hours (APSH)	APSH received at a given window in the proposed case should be at least 25% of the total available Or Reduction ratio of <1 and >or= of 0.8 Minor adverse - <0.8 and >or=0.7 Moderate adverse - <0.7 and >or=0.6 Major adverse - <0.6
Overshadowing	Should receive at least two hours of sunlight on 21 March
Average daylight factor (ADF)	Kitchen > or = 2% Living areas > or = 1.5% Bedrooms > or = 1%

Table 1 - Overall Guidance/methodology assessment

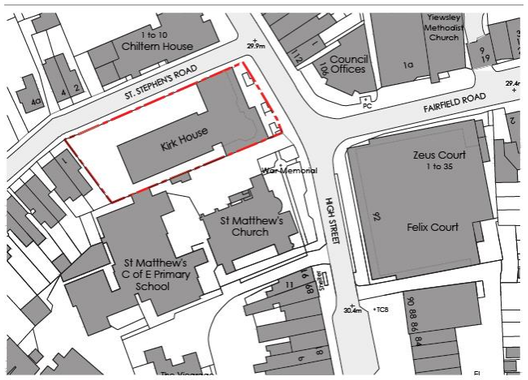
3. SITE LOCATION AND DESCRIPTION

The site is situated at the junction of High Street and St. Stephen's Road in Yiewsley, West Drayton.

The site lies within a primarily residential area although it is within the high street and is in close proximity to commercial shops and amenities. The site covers an area of 0.18 hectares. To the north, there is a three storey residential flat, to the east and north-east there are commercial shops to the ground floor and residential flats on the upper levels. To the south lies St. Mathew Church and to the south-west St.

Mathews primary school. To the West there are predominantly two storey semi-detached and terrace dwellings.

Kirk House is a detached mid-80's three storey office building which has a shallow pitch tiled roof, a dark red brick facade with painted concrete arches between the ground and first floor.



OS Map 1. Site Location

Figure 1: Key Plan Showing Proposed Layout and an aerial image of the site

4. DAYLIGHT ASSESSMENT

4.1 STEP 1- MODEL BUILDING

For the daylight and sunlight assessment, a full-size 3D model of the existing area, including existing buildings and neighbouring properties was constructed in IES <VE> 2021. Figure 2 below demonstrates the existing modelled site plan while figure 3 the proposed modelled one. Finally figure 4 demonstrates window reference for easier interpretation of the results while figure 5 façade reference.

Please see below modules used for each analysis within IES <VE> 2021 software.

VSC – Radiance module

A/WPSH – SunCast module

Overshadowing – SunCast module

ADF – Radiance module

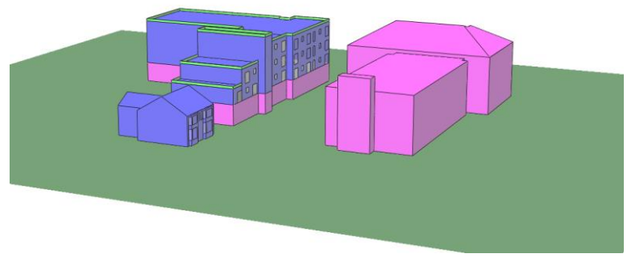


Figure 2: Existing IES VE 3D Model

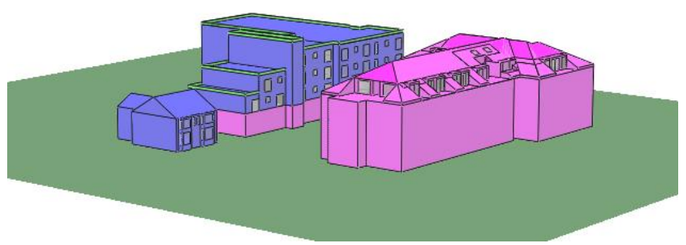


Figure 2: Proposed IES VE 3D Model

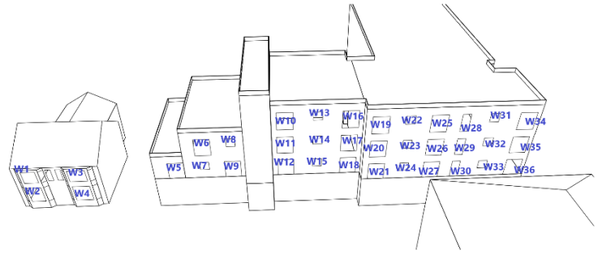


Figure 3: Neighbouring window reference

4.2 ASSESSEMENT RESULTS

Vertical Sky Component (VSC)

The assessment of VSC demonstrates that there is no impact between the VSC available to the windows analysed on the existing and the proposed development

Please see below table 2 illustrating the window ID reference for easier interpretation of the results.

Vertical Sky Component (VSC) - Kirk House, UB7 7HJ				
Window ID	Existing VSC	Proposed VSC	minimum 0.8 ratio difference	Compliance
W1	37.13	36.88	0.99	PASS
W2	36.03	36.02	1.00	PASS
W3	36.53	35.71	0.98	PASS
W4	34.78	34.32	0.99	PASS
W5	34.24	33.26	0.97	PASS
W6	36.27	34.24	0.94	PASS
W7	33.57	32.1	0.96	PASS
W8	32.47	30.12	0.93	PASS
W9	28.98	27.41	0.95	PASS
W10	32.88	30.7	0.93	PASS
W11	30.2	27.96	0.93	PASS
W12	27.17	25.41	0.94	PASS
W13	38.15	36.53	0.96	PASS
W14	35.67	33.52	0.94	PASS
W15	32.66	30.19	0.92	PASS
W16	33.46	31.58	0.94	PASS
W17	31.02	28.92	0.93	PASS
W18	27.14	25.88	0.95	PASS
W19	38.15	36.21	0.95	PASS
W20	34.63	32.86	0.95	PASS
W21	30.21	28.8	0.95	PASS
W22	38.25	36.71	0.96	PASS
W23	34.39	33.39	0.97	PASS
W24	29.68	28.81	0.97	PASS
W25	37.34	36.35	0.97	PASS
W26	32.78	32.3	0.99	PASS
W27	27.8	27.45	0.99	PASS
W28	37.09	36.43	0.98	PASS
W29	32.2	32.27	1.00	PASS
W30	27.67	27.68	1.00	PASS
W31	37.83	37.39	0.99	PASS
W32	33.55	33.68	1.00	PASS
W33	29.08	29.08	1.00	PASS
W34	37.68	37.8	1.00	PASS
W35	34.09	34.55	1.01	PASS
W36	30.7	31.13	1.01	PASS

Table2: VSC results

Annual Probable Sunlight Hours (APSH)

The assessment of the APSH demonstrates that all examined windows will achieve the minimum % requirement for compliance which corresponds to not less than 392 hours. The total annual sunlit hours according to BRE are 1486.

BRE guidance recommends that the APSH received at a given window in the proposed case should be at least 25% of the total available.

Annual Probable Sunlight Hours (APSH) - Kirk House, UB7 7HJ APSH >25%				
Window ID	Existing	Proposed	APSH Ratio	Compliance
W1	70.74	69.54	0.98	PASS
W2	68.37	68.4	1.00	PASS
W3	68.82	67.77	0.98	PASS
W4	65.66	65.71	1.00	PASS
W5	66.12	63.5	0.96	PASS
W6	70.09	65.99	0.94	PASS
W7	66.3	62.87	0.95	PASS
W8	62.26	58.53	0.94	PASS
W9	56.16	52.37	0.93	PASS
W10	51.83	50.51	0.97	PASS
W11	48.09	44.25	0.92	PASS
W12	42.95	38.79	0.90	PASS
W13	67.7	66.31	0.98	PASS
W14	62.32	59.83	0.96	PASS
W15	57.6	53.14	0.92	PASS
W16	58.81	58.16	0.99	PASS
W17	55.43	52.75	0.95	PASS
W18	48.73	44.45	0.91	PASS
W19	75.41	75.4	1.00	PASS
W20	71.53	69.31	0.97	PASS
W21	64.28	60.09	0.93	PASS
W22	76.38	76.76	1.00	PASS
W23	70.48	70.84	1.01	PASS
W24	65.77	61.18	0.93	PASS

W25	75.2	75.75	1.01	PASS
W26	67.97	68.45	1.01	PASS
W27	61.36	58.75	0.96	PASS
W28	75.78	76.49	1.01	PASS
W29	67.72	68.5	1.01	PASS
W30	61.04	59.18	0.97	PASS
W31	79.15	79.17	1.00	PASS
W32	70.47	71.36	1.01	PASS
W33	61.53	61.46	1.00	PASS
W34	79.13	79.17	1.00	PASS
W35	71.07	72.22	1.02	PASS
W36	64.17	64.53	1.01	PASS

Table3: APSH results

Overshadowing

The Assessment indicates the following:

- Existing scenario:
  - All examined facades achieve minimum 2 hours of daylight on the 21st of March.
- Proposed scenario:

The above statement confirms that the proposed development will not have an impact.

Figure 6 indicates the façade reference while figure 7 and 8 the existing and proposed overshadowing results.

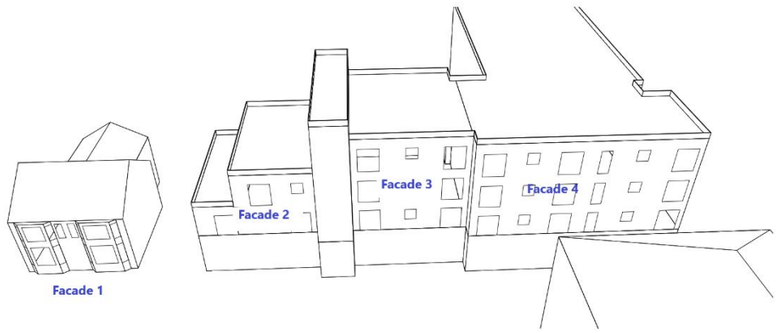


Figure 6: Facade reference

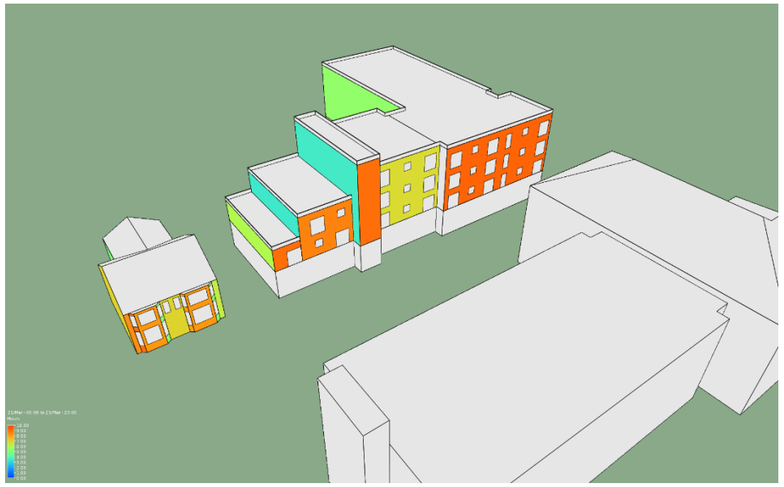


Figure 7: Existing Overshadowing

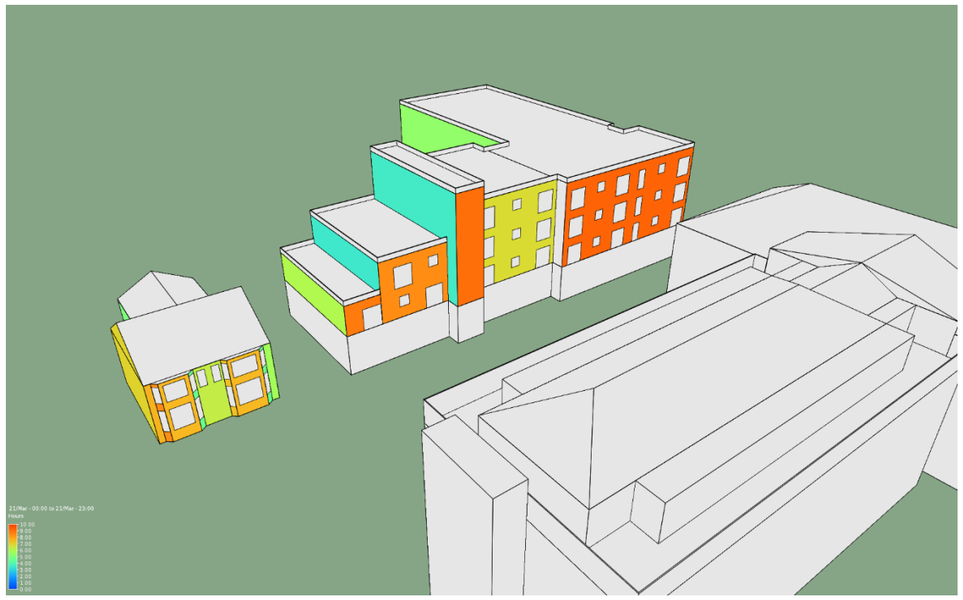


Figure 8: Proposed Overshadowing

Table 4 below indicate s the overshadowing results.

Overshadowing (21st March) - Kirk House, UB7 7HJ			
Room ID	Existing	Proposed	Compliance
Façade 1	>2%	>2%	PASS
Façade 2	>2%	>2%	PASS
Façade 3	>2%	>2%	PASS
Façade 4	>2%	>2%	PASS

Table 4: Overshadowing results

Average Daylight Factor

The results of the analysis for the levels of daylight available within the occupied spaces of the proposed development are presented on table 5 below. Image 9 displays room reference for easier interpretation of the results while image 10 shows a graphic display of the results. Full IES VE results can be visible as an Appendix

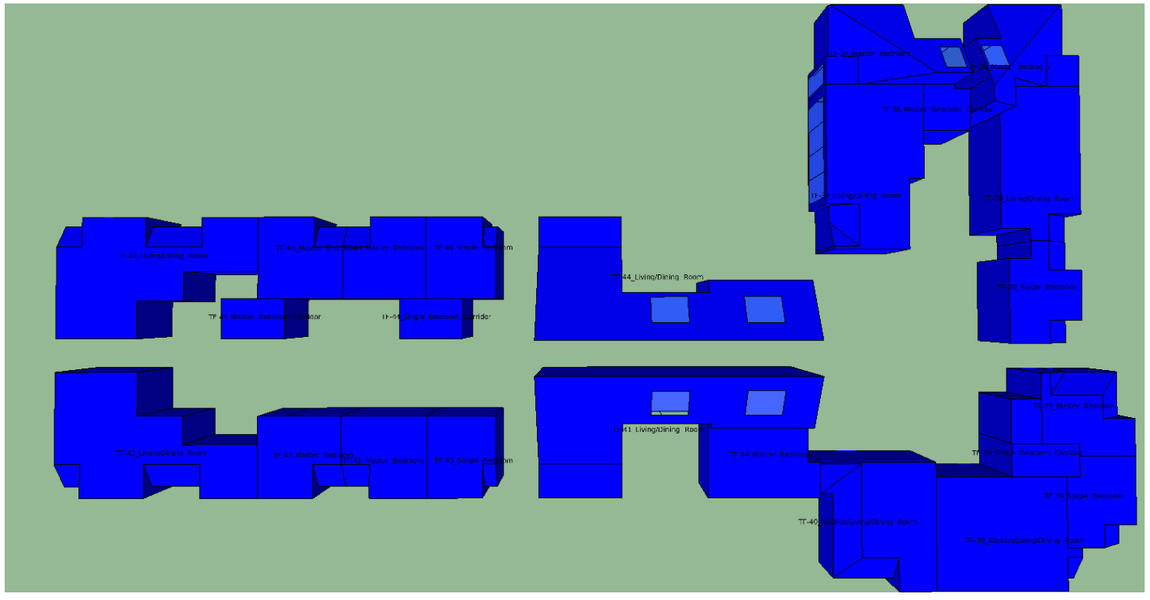


Figure 9: Room reference

Average Daylight Factor - Kirk House, UB7 7HJ			
Room ID	Target ADF	Achieved ADF	Compliance
TF-43_Living/Dining Room	1.5	8.8	PASS
TF-42_Living/Dining Room	1.5	8.98	PASS
TF-42_Master Bedroom	1	7.49	PASS
TF-43_Master Bedroom	1	6.52	PASS
TF-44_Master Bedroom	1	6.2	PASS
TF-41_Master Bedroom	1	7.13	PASS
TF-44_Single Bedroom	1	5.64	PASS
TF-41_Single Bedroom	1	6.38	PASS
TF-44_Living/Dining Room	1.5	18.82	PASS
TF-41_Living/Dining Room	1.5	12.11	PASS
TF-44_Master Bedroom	1	7.22	PASS
TF-40_Kitchen/Living/Dining Room	1.5	2.02	PASS
TF-37_Master Bedroom	1	3.23	PASS
TF-39_Kitchen/Living/Dining Room	1.5	6.26	PASS
TF-38_Master Bedroom	1	4.61	PASS
TF-38_Living/Dining Room	1.5	8.13	PASS
TF-38_Single Bedroom	1	5.96	PASS
TF-39_Master Bedroom	1	3.5	PASS
TF-39_Single Bedroom	1	9.46	PASS
TF-37_Living/Dining Room	1.5	7.05	PASS

Table 5: ADF Results

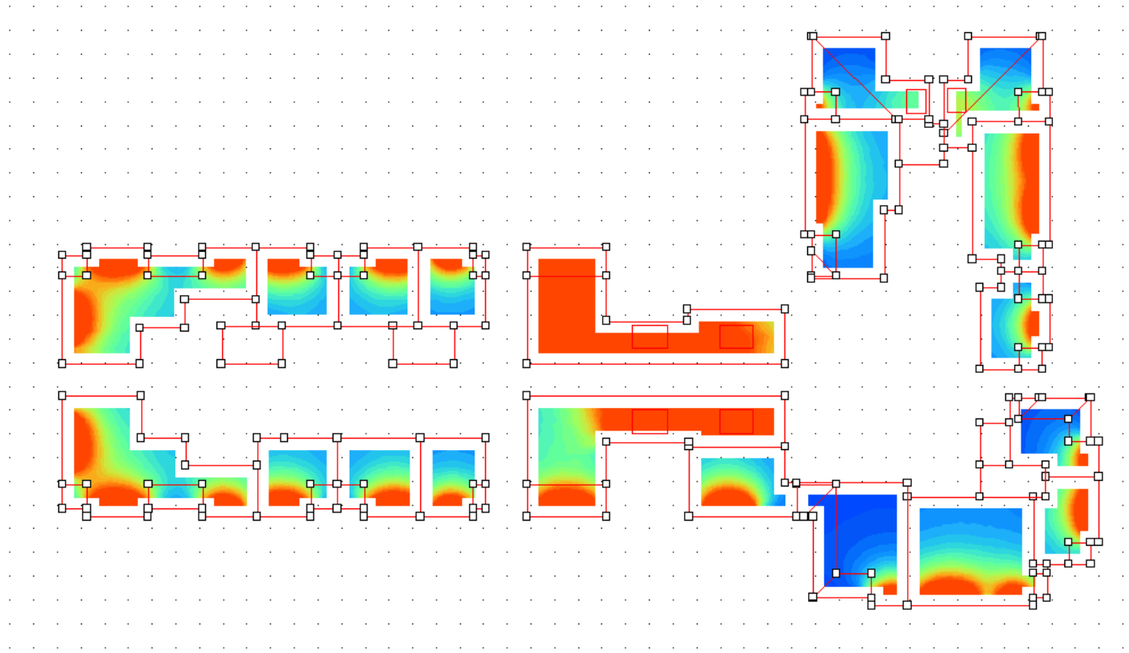


Figure 10: ADF Graphic representation

5. CONCLUSION

This daylight assessment has been prepared to support the planning application for the proposed development at 109 High Street, West Drayton.

The following can be concluded based on the studies undertaken:

- Vertical Sky Component (VSC): Specific windows have been selected on 2& 4 St. Stephens Rd and Chiltern house. The study reveals that the new extension will not have any impact on these properties.

- Annual/Winter Probable Sunlight Hours (APSH): Specific windows have been selected on 2& 4 St. Stephens Rd and Chiltern house. The study reveals that the new extension will not have any impact on these properties.

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- Average Daylight Factor: All rooms examined are compliant with the BRE Minimum standards

Therefore, the proposed scheme will not have any negative impact on the neighbouring properties and is considered compliant.