BURO HAPPOLD

All Saints Library

Daylight, Sunlight and Overshadowing Report for Planning

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Contents

1 Introduction **5**

2 Site Description **6**

3 Legislative and Planning Context **7**

3.1 National Planning Policy 7

3.2 Regional Planning Policy 7

3.3 Local Planning Policy 7

3.4 Other Relevant Policy, Standards And Guidance 7

4 Methodology **9**

4.1 Outline Approach For Daylight, Sunlight, Overshadowing 9

4.2 Daylight and Sunlight 9

4.2.1 Vertical Sky Component (VSC) 9

4.2.2 Annual Probable Sunlight Hours (APSH) 9

4.3 Transient Overshadowing 10

5 Impacts and Effects Significance **11**

5.1.1 Daylight And Sunlight 11

5.1.2 Transient Overshadowing 11

6 Sensitive Receptors **12**

6.1 Daylight and Sunlight 12

6.2 Transient Overshadowing 12

7 Baseline Scenario **14**

7.1 Daylight and Sunlight 14

7.2 Transient Overshadowing 14

8 Proposed Scenario **15**

8.1 Daylight and Sunlight 15

8.2 Transient Overshadowing 15

9 Summary and Conclusions **16**

9.1 Daylight, Sunlight and Overshadowing 16

Appendix A – VSC Results **18**

Appendix B – PSH Results **20**

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Table of Figures

Figure 2—1 Proposed Development Site Boundary 6

Figure 6—1 Nearby Building Typologies 12

Figure 6—2 Buildings Sensitive to the New Development 12

Figure 6—3 Public Amenity Spaces 12

Figure 6—4 Shadow analysis of adjacent external spaces. 13

Figure 7—1 VSC Baseline Condition 14

Figure 7—2 APSH Baseline Condition 14

Figure 7—3 Transient Overshadowing Baseline Condition 14

Figure 8—1 VSC Proposed Condition 15

Figure 8—2 APSH Proposed Condition 15

Figure 8—3 Transient Overshadowing Proposed Condition 15

Table of Tables

Table 4—1 Analysis metrics. 9

Table 5—1 Magnitude of Impact Depending on VSC 11

Table 6—1 Sensitivity of Receptors 12

Table 7—1 Summary of Baseline Daylight and Sunlight Values 14

Table 8—1 Summary of Proposed Daylight and Sunlight Values 15

Glossary

Term	Definition
Annual Probable Sunlight Hours (ASPH)	The long-term average of the total number of hours during a year in which direct sunlight reaches the unobstructed ground (when clouds are taken into account)
Winter Probable Sunlight Hours (WSPH)	The probable sunlight hours between 21 September and 21 March
Obstruction	Anything outside a building which prevents a direct view of the sky from a given reference point
Skylight	That part of the light from the sun that reaches the earth's surface as a result of scattering in the atmosphere
Sunlight	That part of the light from the sun that reaches the earth's surface as parallel rays after selective attenuation by the atmosphere
Daylight	The visible part of global solar radiation (includes sun and sky light)
Vertical Sky Component (VSC)	Ratio, expressed as a percentage, of that part of illuminance, at a point on a given vertical plane, that is received directly from a standard overcast sky, to illuminance on a horizontal plane due to an unobstructed hemisphere of this sky

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1 Introduction

The Proposed Development constitutes the development of a nine-storey library building (Use Class F1), public realm, access and servicing arrangements and other associated works.' The Site is located in Manchester City Centre, within the Manchester Metropolitan University's All Saints Campus. This report assesses the likely environmental effects of the proposed development with respect to daylight and sunlight.

The methodology adopted for the assessment of daylight, sunlight and overshadowing is in accordance with the BRE report BR209, *Site layout planning for daylight and sunlight: A guide to good practice, third edition, 2022*. BR209 sets out design guidance with the aim to provide sufficient access to light from the sky and sunlight in appropriate rooms of new and existing buildings and amenity spaces. The design criteria described in BR209 are meant to provide guidance for designers rather than a regulatory requirement. Designers are encouraged to apply the guidance so that it is sensitive to the development being assessed and its surroundings. In the following assessment, daylight and sunlight access to existing windows and open spaces surrounding the proposed development site has been assessed against the criteria described in BR209. The report assesses the impact of the proposed development in the context of the existing surroundings.

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2 Site Description

The proposed development comprises the development of a nine-storey library building (Use Class F1), public realm, access and servicing arrangements and other associated works. This Site is within Manchester City Centre and is bound by Oxford Road to the east, by the Mancunian Way to the north, Manchester Metropolitan University's Faculty of Business and Law to the west, and All Saints Park to the south, as shown in Figure 2—1.

The Site currently comprises the vacant All Saints Library Building- a seven-storey brick building. The building on site is considered no longer fit for purpose and has been vacant since summer 2024. The Site is subject to a planning application (submitted August 2025) for demolition, due to be determined early December 2025.

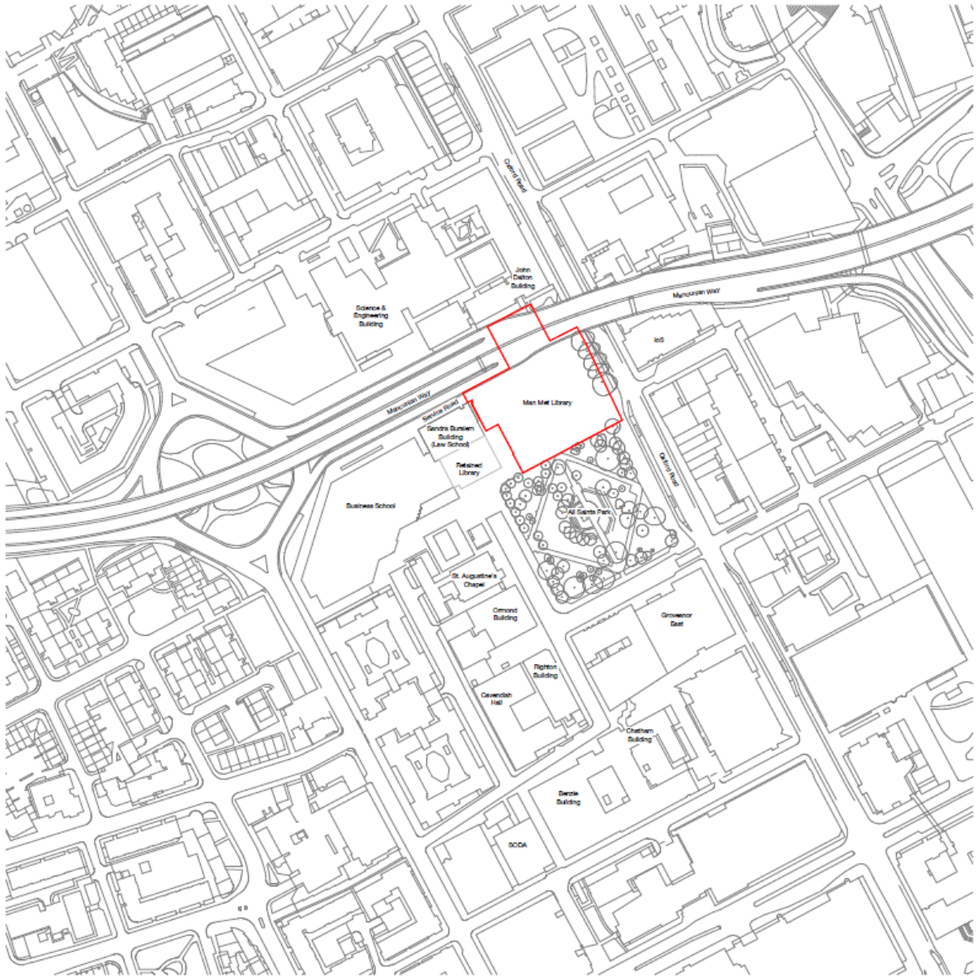


Figure 2—1 Proposed Development Site Boundary

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3 Legislative and Planning Context

3.1 National Planning Policy

National Planning Policy Framework (NPPF) (2024)

The National Planning Policy Framework (NPPF) (2024) updated on December 2024 stipulates that:

> *"The purpose of the planning system is to contribute to the achievement of sustainable development"*

Paragraph 8 further defines sustainable development:

> *"to support strong, vibrant and healthy communities, by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations; and by fostering a well-designed and safe built environment, with accessible services and open spaces that reflect current and future needs and support communities' health, social and cultural well-being; and" … "to contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land"*

Paragraph 130 states that:

> *"local planning authorities should refuse applications which they consider fail to make efficient use of land, taking into account the policies in this Framework. In this context, when considering applications for housing, authorities should take a flexible approach in applying policies or guidance relating to daylight and sunlight, where they would otherwise inhibit making efficient use of a site (as long as the resulting scheme would provide acceptable living standards).*"

Planning Practice Guidance, Effective use of land (2019)

The national Planning Practice Guidance Effective use of Land states that:

> *"Where a planning application is submitted, local planning authorities will need to consider whether the proposed development would have an unreasonable impact on the daylight and sunlight levels enjoyed by neighbouring occupiers"*

3.2 Regional Planning Policy

Greater Manchester Spatial Framework (2020)

As stated on the Greater Manchester Combined Authority website,

> *"Following the decision of Stockport Council on December 3 2020, Greater Manchester's Plan for Homes Jobs and Environment (the Spatial Framework) is no longer being progressed. The documents on this page are for information and historical reference only. They are not currently live supporting documents"*

Therefore, there is currently no relevant regional policy or guidance.

3.3 Local Planning Policy

Guide to Development in Manchester Supplementary Planning Document and Planning Guidance (2007)

In paragraph 12.26, the visual impact of new, tall building developments is discussed:

> *"the location and design of tall buildings need careful consideration as they can be viewed from longer distances and have an impact on a much wider area, both within and outside of the City Centre. (…) Tall buildings provide very positive messages about Manchester, and can significantly improve its image and peoples' perceptions of it. Conversely, badly located tall buildings could have an adverse effect and as such any proposals will always have to be fully justified and carefully considered."*

In paragraph 12.8, the influence of tall buildings on surrounding spaces is detailed:

> *"Schemes will be considered on an individual basis, by reference to their appearance, their impact on the immediate area and the effect on the City's skyline. Key questions will be (…) the microclimate, including overshadowing and air turbulence effects, created by the relationship of the building to those adjacent; and the quality and usability of the spaces surrounding the building."*

3.4 Other Relevant Policy, Standards And Guidance

Historic England Guidance on Tall Buildings – Historic England Advice Note 4 (2019)

Paragraph 4.11 of the Historic England Advice Note 4 recommends that the following should be addressed in relation to tall buildings:

> *"Consideration of the impact on the local environment is also important, wind and other microclimatic effects, overshadowing, night-time appearance, light pollution, vehicle movements, the environment and amenity of those in the vicinity of the building, and the impact on the pedestrian experience."*

Building Research Establishment (BRE) Guidelines: Site Layout Planning for Daylight and Sunlight 2011, A Guide to Good Practice, Second Edition (2011)

The Building Research Establishment (BRE) Guidelines ' Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice 2011, 2nd edition' (released October 2011) provides advice on site layout planning to achieve good sunlighting and daylighting within buildings, and in the open spaces between them. It is intended for use by building designers, developers, consultants and Local Planning Authorities (LPAs). The advice it gives is not mandatory and should not be used as an instrument of planning policy, it states:

> *"This guide is a comprehensive revision of the 1991 edition of Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice. It is purely advisory and the numerical target values within it may be varied to meet the needs of the development and its location."*

It also states:

> *"The advice is given here is not mandatory and the guide should not be seen as an instrument of planning policy; its aim is to help rather than constrain the designer. In special circumstances the developer or planning authority may wish to use different target values… in an area with modern high rise buildings, a higher degree of obstruction maybe unavoidable if new developments are to match the height and proportions of existing building" (para.1.6).*

In addition, the BRE Guidelines state (para. 1.3) that

> *"it is intended to be read in conjunction with the interior daylighting recommendations in the British Standard 8206-2 Code of practice for daylighting, and in the CIBSE publication Lighting guide: daylighting and window design".*

British Standard (BS) 8206 Part 2 (2008)

The British Standard 8206 part 2 provides recommendations regarding the design for daylight in buildings and sets out various methods for assessing daylight. The document states:

> *"Daylighting gives to a building a unique variety and interest. An interior which looks gloomy, or which does not have a view to the outside when this could reasonably be expected, will be considered unsatisfactory by its users."*

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Daylighting and window design: Lighting Guide LG10 (CIBSE) (1999)

This guide replaces the CIBSE Applications Manual Window Design (1987) and provides a daylight design guide. It states:

> *"when daylighting decisions are made, however, they will have implications for other, interrelated aspects of window performance such as solar heat gain, winter heat loss, provision of view, acoustic performance, privacy, security and protection from fire."*

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4 Methodology

The assessment has been carried out in the context of BR209 which sets out sensible design guidance with the aim to provide sufficient daylight and sunlight access in the adjacent buildings and open spaces.

The metrics used to assess the effect on the sensitive receptors of surrounding properties and external areas when the proposed building is complete and operational are detailed in Table 4—1.

Table 4—1 Analysis metrics.

Category	Metric(s)
Daylight	Vertical Sky Component (VSC)
Sunlight	Annual Probable Sunlight Hours (APSH) Winter Probable Sunlight Hours (WPSH)
Impact on external amenity areas	Transient Overshadowing

4.1 Outline Approach For Daylight, Sunlight, Overshadowing

The technical analysis carried out to inform the daylight, sunlight and overshadowing assessments have been undertaken by creating a digital three-dimensional (3D) model of the existing Site based on measured survey data and satellite images. The proposed building model used for this assessment was produced from Revit model *1350B-HBA-XX-XX-M3-A-000001.rvt* from Hawkins Brown.

The 3D model used the VSC methodology and 3D geometric calculations for daylight distribution. This enables the path of the sun to be tracked throughout the year to establish the shadow cast by the existing and proposed buildings and thus calculate the sun hours on ground in each scenario.

Only those surrounding properties which have windows facing towards the Site were included in the assessment. If a nearby property has no windows facing the Site, these properties would not be affected by the Proposed Building in terms of light.

4.2 Daylight and Sunlight

4.2.1 Vertical Sky Component (VSC)

The VSC method of assessment is defined in BRE Guidelines as the

> *"ratio of the part of illuminance at a point on a given vertical plane that is received directly from a CIE standard overcast sky, to illuminate on a horizontal plane due to an unobstructed hemisphere of this sky".*

This ratio is the percentage of the total unobstructed view that is available, once obstructions are placed in front of the view.

The assessment is calculated from the centre of a window on the outward face and measures the amount of light available on a vertical wall or window following the introduction of visible barriers, such as buildings.

The maximum VSC value is 40% for a completely unobstructed vertical wall or window. In terms of assessment criteria, the BRE Guidelines state that:

> *"if the VSC, with the development in place, is both less than 27% and less than 0.8 times its former value, occupants of the existing building will notice the reduction in the amount of skylight. The area lit by the window is likely to appear more gloomy and electric lighting will be needed more of the time".*

Therefore, to maintain good levels of daylight, the VSC of a window is recommended in BR209 to be at 27% or greater, Where possible, the post-development VSC should not be less than 80% of the pre-development VSC.

4.2.2 Annual Probable Sunlight Hours (APSH)

Sunlight is measured using a sun indicator which contains 100 spots, each representing 1% of APSH. The number of spots is calculated for the baseline and proposed scenarios during the year and also during the winter period, and a comparison is made between the two. This provides a percentage of APSH for each of the time periods for each window assessed.

The BRE Guidelines note that:

> *"In housing, the main requirement for sunlight is in living rooms, where it is valued at any time of day, but especially in the afternoon"*
>
> *"all main living rooms of dwellings…should be checked if they have a window facing within 90°of due South. Kitchens and bedrooms are less important, although care should be taken not to block too much sun"*
>
> *"If the main living room to a dwelling has a main window facing within 90° of due north, but a secondary window facing within 90° of due South, sunlight to the secondary window should be checked."*
>
> *"…a South facing window will, in general, receive most sunlight, while a north facing one will receive it only on a handful of occasions. East and west facing windows will receive sunlight only at certain times of day".*

In regard to existing surrounding receptors, the BRE Guidelines provide that a window may be adversely affected if a point at the centre of the window receives for the whole year, less than 25% of the APSH, including at least 5% of the APSH during the winter months (21st September to 21st March) and less than 0.8 times its former sunlight hours during either period, and if there is a reduction in total APSH which is greater than 4%.

BS 8206 Part 2 states that:

> *"Provided that the entry of sunlight is properly controlled, it is generally welcome in most buildings in the UK. Dissatisfaction can arise as much from the permanent exclusion of sunlight as from its excess. The provision of sunlight is important in dwellings, particularly during winter months. Sunlight is especially valued in habitable rooms used for long periods during the day."*
>
> *"Interiors in which the occupants have a reasonable expectation of direct sunlight should receive at least 25% of probable sunlight hours. At least 5% of probable sunlight hours should be received during the winter months, between 21 September and 21 March. Sunlight is taken to enter an interior when it reaches one or more window reference points."*

Therefore, the APSH assessment states that living room windows should ideally receive at least:

- 25% of annual probable sunlight hours throughout the year;
- 5% of annual probable sunlight hours during the winter months (September – March); and
- The difference between the APSH is not less than 0.8 times its former value.

As is often the case, it is not possible to determine the room uses within each of the neighbouring properties, nor is it clear which window should be considered as the 'main windows'. Therefore, regardless of use, all the rooms with windows facing the Site and within 90 degrees of due South have been considered in the assessment.

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4.3 Transient Overshadowing

The 2011 BRE Guidelines suggests that where large buildings are proposed which may affect a number of gardens or open spaces, it is useful to plot a shadow plan to illustrate the location of shadows at different times of the day and year.

For the purpose of this assessment the overshadowing was mapped for the following key dates in the year:

- 21st March (Spring Equinox);
- 21st June (Summer Solstice);

September 21st (Autumn Equinox) provides the same overshadowing images as March 21st (Spring Equinox) as the sun follows the same path at these corresponding times of year and is therefore not necessary to include in this study.

For each of these dates, the overshadowing is calculated at hourly intervals throughout the day from 08:00 to 18:00.

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5 Impacts and Effects Significance

5.1.1 Daylight And Sunlight

The terminology used to describe the sensitivity of resources/ receptors and magnitude of the effect will be as follow:

- High;
- Medium; and
- Low.

The key terminology to be used to describe the classification of effects is as follows and is further described in the below sections of this document:

- Major;
- Moderate;
- Minor; and
- Negligible.

BR209 Appendix I describes the impact of a development on its surroundings as "Beneficial", "Negligible" or "Adverse" in terms of the change in the amount of skylight and sunlight reaching an existing building where it is required, or the amount of sunlight reaching an existing building where it is required, or the amount of sunlight reaching an open space.

It also states that, *"The assessment of impact will depend on a combination of factors, and there is no simple rule of thumb that can be applied";* however guidance is provided on quantifying the significance of relative adverse changes as minor, moderate or major, as follows:

Factors tending towards a minor adverse impact include:

- Only a small number of windows or limited area of open space are affected;
- The loss of light is only marginally outside the guidelines;
- An affected room has other sources of skylight or sunlight; and
- The affected building or open space only has a low level of requirement for skylight or sunlight.

Factors tending towards a major adverse impact include:

- A large number of windows or large area of open space are affected;
- The loss of light is substantially outside the guidelines;
- All the windows in a particular property are affected; and
- The affected indoor or outdoor spaces have a particular strong requirement for skylight or sunlight, e.g. a living room in a dwelling or a children's playground".

The impact is considered to be negligible if the guidance of BR209 is met. The further categories include major, moderate and minor impact significance, mapped to the impact criteria defined in

Table 5—1.

An element of professional judgement is required to establish threshold values for the level of impact. Based on relevant numerical values provided in BR209 and industry-accepted typical values, the significance criteria adopted for this assessment are detailed in Table 5—1. Where an impact is identified as "Beneficial", the same significance criteria are adopted as recommended in BR209 Appendix I.

Table 5—1 Magnitude of Impact Depending on VSC

Magnitude of Impact (BR209 equivalent)	Change in VSC or PSH
Negligible	≤20%
Minor	>20% and ≤30%
Moderate	>30% and ≤40%
Major	>40%

5.1.2 Transient Overshadowing

The BRE Guidelines outline a check to be undertaken to ensure sufficient daylighting of external spaces in *Site layout planning for daylight and sunlight*:

> *"Where a large building is proposed that may affect a number of gardens or open spaces it is often illustrative to plot a shadow plan showing the location of shadows at different times of day and year… It is recommended that [amenity areas] should receive at least two hours of sunlight on 21 March"*

A shadow analysis and subsequent measurement of daylight hours on the 21st of March for adjacent external amenity areas will be carried out, to determine whether these spaces receive the required minimum two hours of sunlight.

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6 Sensitive Receptors

6.1 Daylight and Sunlight

To understand the potential daylight and sunlight impact of the proposed development on the windows of the surrounding properties, a study was undertaken to investigate the variety of uses in close proximity to the site and their sensitivity to natural light. Properties in close proximity to the site had been considered as they are most likely to be affected by the proposed development.

The magnitude of the effect caused by the proposed building is relative to the level of building's requirement to daylight and sunlight. BRE Guidelines are mainly intended to be used for residential buildings. However, the guidelines may also be applied to any existing non-domestic building where occupants have a reasonable expectation of daylight. This would normally include schools, hospitals, hotel and hostels, small workshops and some offices. The criteria used to assess receptor sensitivity is described in Table 6—1, and the results of the analysis of nearby building typologies are shown in Figure 6—1.

Table 6—1 Sensitivity of Receptors

Sensitivity	Criteria
High	Viewers likely to feel the immediate impact to their surroundings and notice a significant reduction in the amount of natural light to their environment.
Moderate	Viewers with everyday access to this environment but perhaps with less expectations as they are spending shorter periods of time in the space or are within an office environment. They may have previously used the space and therefore will be aware of the change, but it would affect them less.
Low	Small number or low sensitivity of viewers assumed. Viewers with a passing interest in their surroundings and momentary viewing periods. Infrequent users of open spaces around the proposed development.



Figure 6—1 Nearby Building Typologies

The majority of adjacent properties have educational use, whilst only a small number of buildings have been identified as residential and student accommodation. Those that would be most sensitive to the new proposed development due to their typologies would be the residential buildings to the East on Oxford Road and the student accommodations to the South West on Higher Chatham St and Higher Cambridge St, detailed in Figure 6—2.



Figure 6—2 Buildings Sensitive to the New Development

It should be considered that only the residential properties to the South-East of the site is in close enough proximity to be considered a high sensitivity receptor, and hence the focus of the daylight and sunlight analysis will be on these buildings.

6.2 Transient Overshadowing

To estimate the sunlight impact of the proposed development on adjacent sensitive external spaces, an assessment of the local parks, green spaces and other amenities was undertaken to ascertain whether there were any spaces that might be impacted by the proposed development, as detailed in Figure 6—3.



Figure 6—3 Public Amenity Spaces

The All Saints Park to the South of the All Saints library was the only open amenity aera identified in the close proximity to the proposed development. By observing the shadow analysis for the March equinox shown in Figure 6—4, it can be seen that the risk of overshadowing from the proposed development to the park is low, with only minor shading to the Northern corner of the space.

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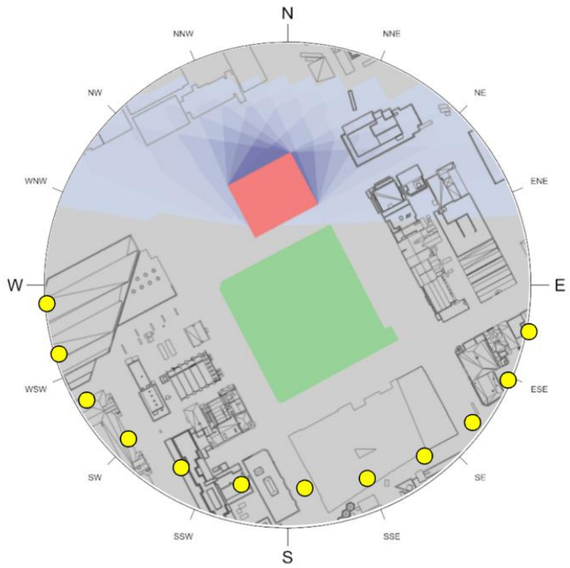


Figure 6—4 Shadow analysis of adjacent external spaces.

Despite the relatively low risk of overshadowing, it was decided to undertake a detailed study to ensure the daylight access in this space is not significantly impacted by the proposed development.

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7 Baseline Scenario

This section of the report provides a description of the current baseline conditions present at the site in relation to daylight, sunlight and overshadowing.

7.1 Daylight and Sunlight

There are a total of 64 windows serving 8 residential properties which have been assessed for daylight and sunlight as they are orientated towards the proposed development and are located within 90 degrees of due South.

The baseline scenario results for daylight and sunlight conditions in the adjacent residential properties has been assessed and summarised in Table 7—1 and visualised in Figure 7—1 and Figure 7—2. Detailed results can be found in Appendix A and Appendix B.

Table 7—1 Summary of Baseline Daylight and Sunlight Values

Windows that meet VSC Criteria (>27%)		Windows that meet APSH criteria	
Pass	**Total**	**Pass**	**Total**
64	64	64	64

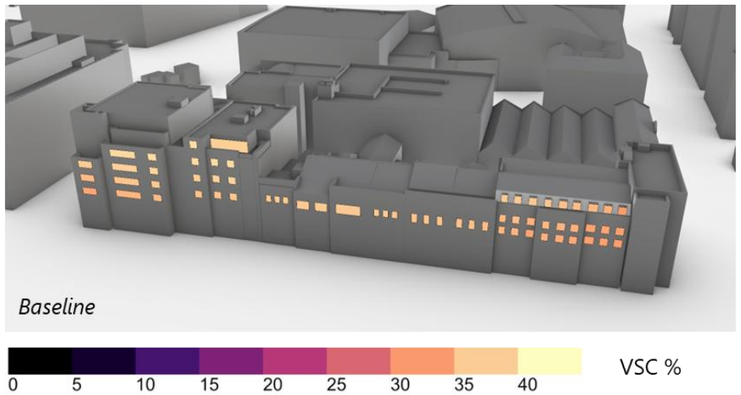


Figure 7—1 VSC Baseline Condition

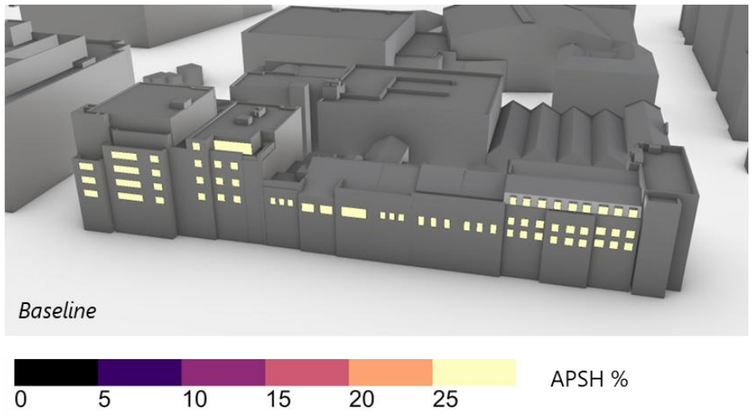


Figure 7—2 APSH Baseline Condition

The results of the baseline assessment indicate that 64 (100%) out of the total of 64 windows assessed currently have an existing VSC level of 27% or more and meet the BRE criteria for Probable Sunlight Hours with an annual value of 25% of available hours, of which 5% is in the winter. These high levels of BRE compliance are a reflection of the current baseline condition in the site with relatively good access to natural light on the assessed dates.

7.2 Transient Overshadowing

Overshadowing of the sensitive All Saints Park adjacent to the development site was measured on the 21st of March, to determine whether this space receives the recommended two hours of daylight. The results of this study for the baseline scenario, shown in Figure 7—3, highlighting compliance with the BRE across 100% of the park area.

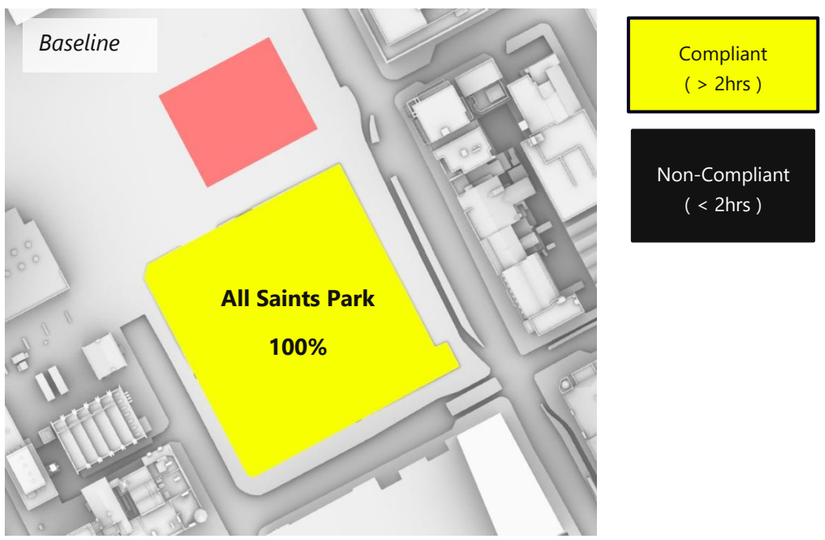


Figure 7—3 Transient Overshadowing Baseline Condition

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8 Proposed Scenario

This section of the report provides a description of the proposed conditions present at the site in relation to daylight, sunlight and overshadowing.

8.1 Daylight and Sunlight

There are a total of 64 windows serving 8 residential properties which have been assessed for daylight and sunlight as they face the site and are located within 90 degrees of due South.

The proposed scenario results for daylight and sunlight conditions in the adjacent residential properties has been assessed and summarised in Table 8—1 and visualised in Figure 8—1Figure 7—1 and Figure 8—2Figure 7—2. Detailed results can be found in Appendix A and Appendix B.

Table 8—1 Summary of Proposed Daylight and Sunlight Values

Windows that meet VSC Criteria (>27%)			Windows that meet APSH criteria		
Pass	**Total**	**Ratio of Impact (vs Baseline)**	**Pass**	**Total**	**Ratio of Impact (vs Baseline)**
64	64	1.0	64	64	1.0

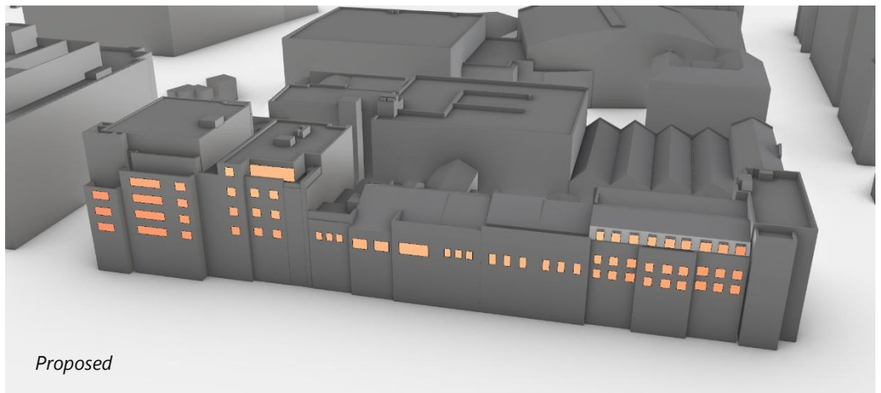


Figure 8—1 VSC Proposed Condition

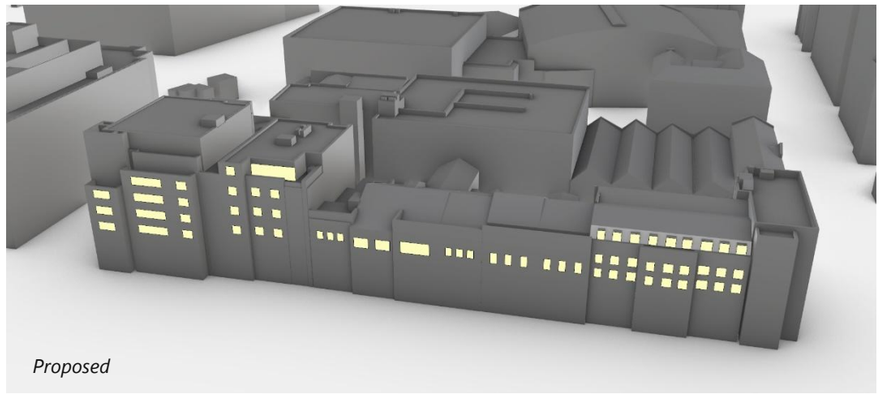


Figure 8—2 APSH Proposed Condition

The results of the proposed assessment indicate that 64 (100%) out of the total of 64 windows assessed currently have an existing VSC level of 27% or more and meet the BRE criteria for Probable Sunlight Hours with an annual value of 25% of available hours, of which 5% is in the winter.

These results represent a ratio of impact of 1.0 when compared to the baseline, identifying the risk of the proposed development to the sunlight availability of sensitive properties as **negligible.**

8.2 Transient Overshadowing

Overshadowing of the sensitive All Saints Park adjacent to the development site was measured on the 21st of March, to determine whether this space receives the recommended two hours of daylight. The results of this study for the proposed scenario, shown in Figure 8—3, highlight compliance with the BRE across 100% of the park area.

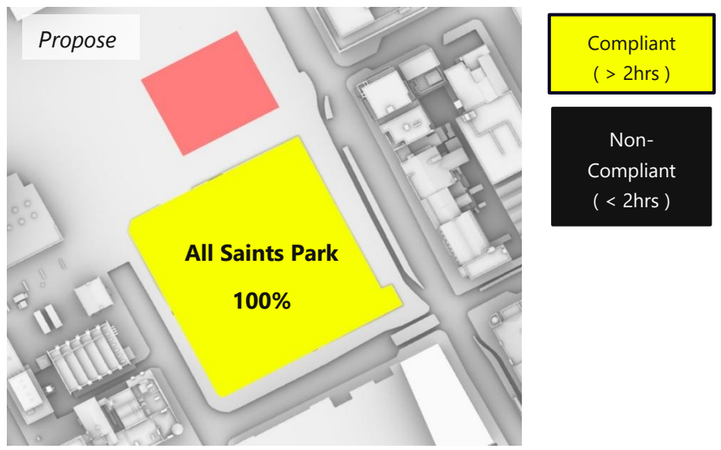


Figure 8—3 Transient Overshadowing Proposed Condition

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9 Summary and Conclusions

9.1 Daylight, Sunlight and Overshadowing

The impacts on daylight and sunlight access at existing surrounding dwellings from the proposed development was assessed according to the methods defined in BR209, “Site Layout Planning for Daylight and Sunlight”, 2022. The daylight and sunlight impact of the proposed development in the context of the existing surroundings has been assessed. The sunlight access of surrounding amenity spaces has also been included.

The proposed development has no significant impact on the surrounding residential buildings. The ratio of impact of the proposed development on VSC and APSH values of adjacent residential buildings is 1, meaning **the impact is negligible**. With regard to the open spaces, the results of the study identify that there is no significant impact from the proposed building on the transient overshadowing of All Saints Park to the South. **Hence, no mitigation strategies are needed for the surrounding existing buildings and open spaces.**

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Appendix A – VSC Results

A.1 VSC Study Summary

There are a total of 64 windows serving 8 residential properties which have been assessed for daylight and sunlight as they face the site and are located within 90 degrees of due South.

The results of the baseline assessment indicate that 64 (100%) out of the total of 64 windows assessed currently have an existing VSC level of 27% or more and meet the BRE criteria for sunlight with an annual value of 25% of which 5% is in the winter. The results of the proposed assessment also indicate that 100% of the windows reach the BRE criteria

For VSC, all 64 windows assessed will meet the BRE criteria, hence no effect of significance on daylight occurs.

Overall, the effect of the illustrative masterplan on VSC for this property is considered **negligible** in significance.

The measured VSC results for the affected windows are shown in Table A-1 and the visualisations are shown in Figure A-1 and Figure A-2.

Table A-1 VSC Detailed Results

Total Windows	Bre Criteria Met		Minor Effect Significance		Moderate Effect Significance		Major Effect Significance	
Num	Num	%	Num	%	Num	%	Num	%
64	64	100	0	0	0	0	0	0

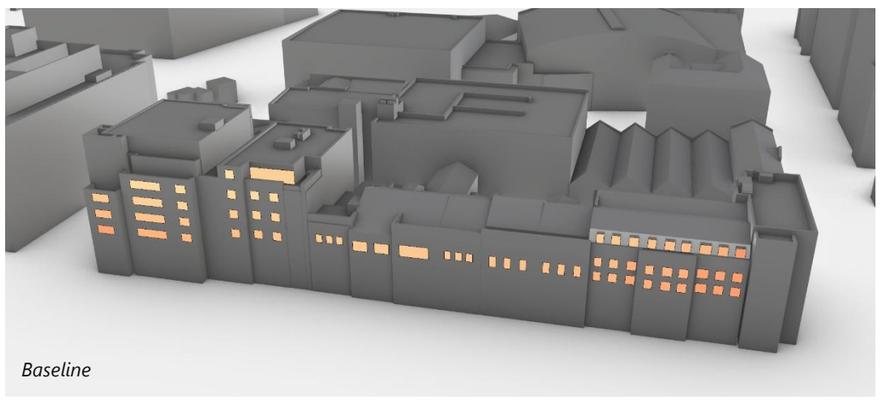


Figure A-1 VSC Baseline Condition

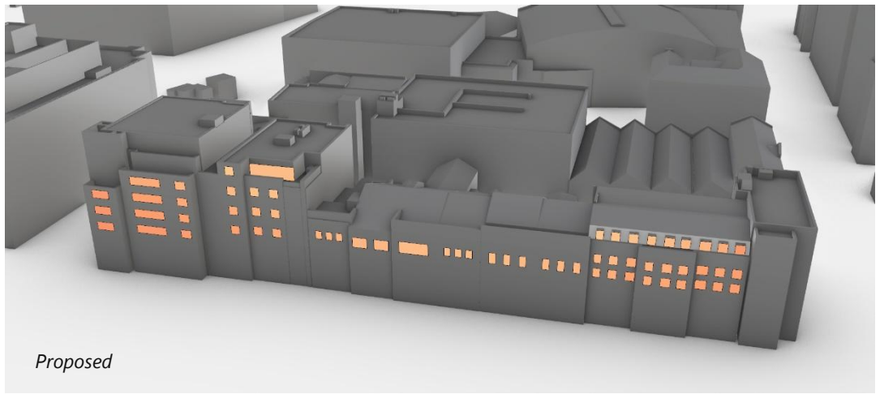


Figure A-2 VSC Proposed Condition

A.2 VSC Detailed Results

Window	Baseline	Proposed	Ratio of impact	BRE compliance	Effect significance
Num	%	%	-	-	-
1	34.9	30.6	0.88	Meets Target	Negligible
2	33.9	29.8	0.88	Meets Target	Negligible
3	32.4	29.0	0.90	Meets Target	Negligible
4	36.2	32.7	0.91	Meets Target	Negligible
5	35.4	31.9	0.90	Meets Target	Negligible
6	34.4	31.1	0.90	Meets Target	Negligible
7	33.3	30.3	0.91	Meets Target	Negligible
8	36.3	33.3	0.92	Meets Target	Negligible
9	35.6	32.6	0.92	Meets Target	Negligible
10	34.8	31.9	0.92	Meets Target	Negligible
11	33.8	31.1	0.92	Meets Target	Negligible
12	36.8	34.8	0.94	Meets Target	Negligible
13	36.0	33.8	0.94	Meets Target	Negligible
14	35.1	32.9	0.94	Meets Target	Negligible
15	34.2	32.0	0.93	Meets Target	Negligible
16	36.2	34.3	0.95	Meets Target	Negligible
17	35.4	33.3	0.94	Meets Target	Negligible
18	34.4	32.3	0.94	Meets Target	Negligible
19	35.3	33.9	0.96	Meets Target	Negligible
20	36.2	34.4	0.95	Meets Target	Negligible
21	35.5	33.7	0.95	Meets Target	Negligible
22	34.7	32.7	0.94	Meets Target	Negligible
23	34.9	33.3	0.96	Meets Target	Negligible

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Window	Baseline	Proposed	Ratio of impact	BRE compliance	Effect significance
Num	%	%	-	-	-
24	34.9	33.4	0.96	Meets Target	Negligible
25	34.9	33.5	0.96	Meets Target	Negligible
26	34.8	33.7	0.97	Meets Target	Negligible
27	34.9	33.6	0.96	Meets Target	Negligible
28	34.8	33.8	0.97	Meets Target	Negligible
29	34.8	34.0	0.98	Meets Target	Negligible
30	34.8	34.0	0.98	Meets Target	Negligible
31	34.7	34.0	0.98	Meets Target	Negligible
32	34.6	33.9	0.98	Meets Target	Negligible
33	34.5	33.9	0.98	Meets Target	Negligible
34	34.4	33.8	0.98	Meets Target	Negligible
35	34.3	33.7	0.98	Meets Target	Negligible
36	34.3	33.6	0.98	Meets Target	Negligible
37	34.0	33.6	0.99	Meets Target	Negligible
38	35.0	34.6	0.99	Meets Target	Negligible
39	33.8	33.5	0.99	Meets Target	Negligible
40	33.4	33.1	0.99	Meets Target	Negligible
41	34.9	34.4	0.99	Meets Target	Negligible
42	34.0	33.6	0.99	Meets Target	Negligible
43	33.5	33.0	0.99	Meets Target	Negligible
44	34.7	34.3	0.99	Meets Target	Negligible
45	33.1	32.6	0.99	Meets Target	Negligible
46	32.4	32.0	0.99	Meets Target	Negligible
47	34.4	34.1	0.99	Meets Target	Negligible
48	33.7	33.2	0.99	Meets Target	Negligible
49	33.1	32.7	0.99	Meets Target	Negligible
50	34.2	33.9	0.99	Meets Target	Negligible
51	33.4	32.9	0.99	Meets Target	Negligible
52	32.8	32.5	0.99	Meets Target	Negligible
53	33.9	33.6	0.99	Meets Target	Negligible
54	33.2	32.7	0.99	Meets Target	Negligible
55	32.5	32.3	0.99	Meets Target	Negligible
56	33.6	33.4	0.99	Meets Target	Negligible
57	32.2	31.9	0.99	Meets Target	Negligible
58	31.7	31.5	0.99	Meets Target	Negligible
59	33.2	32.8	0.99	Meets Target	Negligible
60	32.4	32.1	0.99	Meets Target	Negligible
61	31.8	31.5	0.99	Meets Target	Negligible
62	31.0	30.8	0.99	Meets Target	Negligible
63	31.9	31.6	0.99	Meets Target	Negligible
64	31.3	31.1	0.99	Meets Target	Negligible

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Appendix B – PSH Results

B.1 PSH Study Summary

The results of the baseline assessment indicate that 64 (100%) out of the total of 64 windows assessed currently receive at least 25% of annual probable sunlight hours (5% of these hours occurring in the winter months), and the proposed PSH value is not less than 80% of the baseline.

Overall, the effect of the illustrative masterplan on PSH for this property is considered **negligible** in significance.

The measured PSH results for the affected windows are shown in Table A-2 and the visualisations are shown in Figure A-3 and Figure A-4.

Table A-2 PSH Detailed Results

Total Windows	Bre Criteria Met		Minor Effect Significance		Moderate Effect Significance		Major Effect Significance	
Num	Num	%	Num	%	Num	%	Num	%
64	64	100	0	0	0	0	0	0

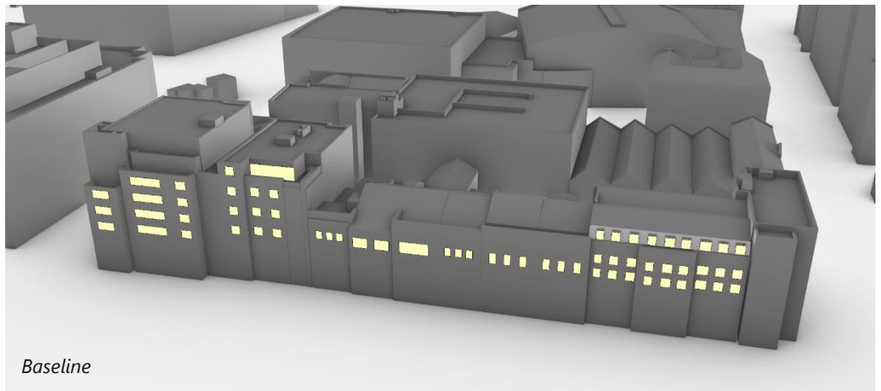


Figure A-3 APSH Baseline Condition

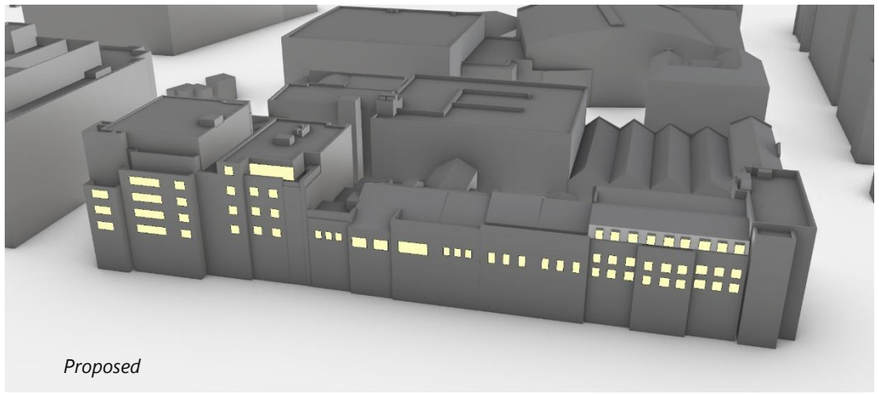


Figure A-4 APSH Proposed Condition

B.2 PSH Detailed Results

Window	APSH			WPSH			BRE Compliance	Effect Significance
	Baseline	Proposed	Ratio Of Impact	Baseline	Proposed	Ratio Of Impact		
Num	%	%	-	%	%	-	-	-
1	70	62	0.88	31	31	1.00	Meets Target	Negligible
2	67	61	0.91	30	30	1.00	Meets Target	Negligible
3	63	58	0.92	29	29	1.00	Meets Target	Negligible
4	74	64	0.86	33	32	0.99	Meets Target	Negligible
5	71	62	0.86	31	31	1.00	Meets Target	Negligible
6	68	60	0.90	30	30	1.00	Meets Target	Negligible
7	63	60	0.94	29	29	1.01	Meets Target	Negligible
8	73	67	0.92	32	32	1.00	Meets Target	Negligible
9	71	64	0.90	30	30	1.00	Meets Target	Negligible
10	67	61	0.91	29	29	1.00	Meets Target	Negligible
11	65	59	0.91	29	29	1.00	Meets Target	Negligible
12	76	69	0.90	33	33	1.00	Meets Target	Negligible
13	73	68	0.93	32	32	1.00	Meets Target	Negligible
14	70	66	0.95	30	30	1.00	Meets Target	Negligible
15	66	64	0.97	28	29	1.00	Meets Target	Negligible
16	73	68	0.92	32	32	1.00	Meets Target	Negligible
17	70	66	0.95	30	30	1.00	Meets Target	Negligible
18	66	64	0.97	28	28	1.00	Meets Target	Negligible
19	74	69	0.94	33	33	1.00	Meets Target	Negligible
20	73	68	0.92	32	32	1.00	Meets Target	Negligible
21	70	66	0.94	30	30	1.00	Meets Target	Negligible
22	66	63	0.96	27	27	1.00	Meets Target	Negligible
23	66	63	0.95	27	27	1.00	Meets Target	Negligible

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Window	APSH			WPSH				
	Baseline	Proposed	Ratio Of Impact	Baseline	Proposed	Ratio Of Impact	BRE Compliance	Effect Significance
Num	%	%	-	%	%	-	-	-
24	66	63	0.95	27	27	1.00	Meets Target	Negligible
25	61	57	0.94	24	24	1.00	Meets Target	Negligible
26	66	63	0.95	26	26	1.00	Meets Target	Negligible
27	62	60	0.97	25	25	1.00	Meets Target	Negligible
28	66	65	0.98	26	26	1.00	Meets Target	Negligible
29	66	66	1.00	26	26	1.00	Meets Target	Negligible
30	66	66	0.99	26	26	1.00	Meets Target	Negligible
31	66	65	0.99	26	26	1.00	Meets Target	Negligible
32	66	64	0.98	25	25	1.00	Meets Target	Negligible
33	65	64	0.98	24	24	1.00	Meets Target	Negligible
34	65	63	0.98	23	23	1.00	Meets Target	Negligible
35	63	62	0.98	22	22	1.00	Meets Target	Negligible
36	63	61	0.97	21	21	1.00	Meets Target	Negligible
37	63	61	0.97	21	21	1.00	Meets Target	Negligible
38	68	65	0.96	25	25	1.00	Meets Target	Negligible
39	63	61	0.97	21	21	1.00	Meets Target	Negligible
40	61	59	0.97	19	19	1.00	Meets Target	Negligible
41	66	64	0.96	24	24	1.00	Meets Target	Negligible
42	60	58	0.97	19	19	1.00	Meets Target	Negligible
43	55	54	0.97	17	17	1.00	Meets Target	Negligible
44	65	63	0.96	23	23	1.00	Meets Target	Negligible
45	46	44	0.95	13	13	1.00	Meets Target	Negligible
46	45	43	0.96	12	12	1.00	Meets Target	Negligible
47	65	63	0.97	22	22	1.00	Meets Target	Negligible
48	62	60	0.97	20	20	1.00	Meets Target	Negligible
49	60	59	0.97	18	18	1.00	Meets Target	Negligible
50	64	62	0.98	21	21	1.00	Meets Target	Negligible
51	62	60	0.97	19	19	1.00	Meets Target	Negligible
52	60	58	0.97	18	18	1.00	Meets Target	Negligible
53	63	62	0.98	20	20	1.00	Meets Target	Negligible
54	61	60	0.97	19	19	1.00	Meets Target	Negligible
55	60	58	0.97	17	17	1.00	Meets Target	Negligible
56	61	60	0.99	17	17	1.00	Meets Target	Negligible
57	59	58	0.97	17	17	1.00	Meets Target	Negligible
58	56	55	0.98	16	16	1.00	Meets Target	Negligible
59	56	55	0.99	13	13	1.00	Meets Target	Negligible
60	54	53	0.97	15	15	1.00	Meets Target	Negligible
61	53	52	0.98	14	14	1.00	Meets Target	Negligible
62	44	44	1.00	10	10	1.00	Meets Target	Negligible
63	49	48	0.99	10	10	1.00	Meets Target	Negligible
64	48	47	0.98	9	9	1.00	Meets Target	Negligible

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