Government Property Agency

AtkinsRéalis



# MANCHESTER DIGITAL CAMPUS

## Environmental Statement

## Volume 2 - Chapter 11:

## Daylight, sunlight, overshadowing and solar glare

NOVEMBER 2024

# Notice

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# Executive Summary

Daylight, sunlight, overshadowing and solar glare (DSO & SG) are all environmental conditions that impact the liveability and comfort of spaces for occupiers of existing development. The introduction of additional massing and materials from new development can change these conditions, sometimes changing the quality of living for existing occupiers.

This chapter assesses the effect of the Manchester Digital Campus on various receptors including daylight and sunlight levels for the neighbouring school and residential buildings, sunlight to the school's playground and rooftop solar panels, overshadowing to nearby gardens and public spaces, and solar glare potential onto surrounding highways.

The assessment baseline, scope and methodology were established in accordance with best practice technical standards. Various methods of assessment were used to assess the effects of the Proposed Development including Daylight - Vertical sky component (VSC), No-skyline (NSL), Sunlight- Annual probable sunlight hours (APSH), and 'Two-hours sun-on-ground' (SOG). The Proposed Developments urban context and the fact that it is currently cleared of any buildings, results in unusually good levels of light for neighbouring receptors. Therefore, any development on this Site would result in a change to the existing conditions.

Effects during the construction phase were scoped out of this chapter, as they are not expected to exceed effects identified during the operational phase and would be for the short to medium term only.

For the operational phase, the assessment results found the significance of effects to be 'negligible' or 'minor adverse' for all receptors except for the following receptors, which would experience a 'moderate' or 'minor to moderate' effect:

- Moderate adverse daylight effects to the Co-op Academy New Islington school
- Minor to moderate adverse overshadowing effects on outdoor space directly to the north of the Site, including playgrounds and other amenity areas at the school, Cotton Field Park and New Islington Marina, although the SOG test recommendations would nonetheless be met.

Given the moderate adverse effect on daylight for the neighbouring school, mitigation is proposed in the form of funding for new glazed canopies for the two Reception classrooms to admit more light. With this enhancement, the residual effects on daylight for the school would be reduced to a significance level of minor to moderate adverse.

The cumulative effects assessment found the effect on daylight levels on 40 Laystall Street (apart-hotel) increase significance from 'minor adverse' resulting from the Proposed Development alone, to 'minor to moderate adverse' in combination with cumulative developments.

Overall, once operational the Proposed Development is not expected to have an unacceptable impact on the amenity of surrounding occupants. While some minor to moderate adverse effect is unavoidable, early consideration for these environmental conditions has enabled primary mitigation measures to be incorporated into the development design, to maintain good levels of amenity for neighbouring occupiers and public space, as far as is practicable for this Proposed Development.

# 11. Daylight, Sunlight, Overshadowing and Solar Glare

## 11.1. Introduction

11.1.1. This chapter of the Environmental Statement (ES) assesses the likely effects of the Proposed Development with respect to daylight, sunlight, overshadowing, and solar glare. It outlines the assessment methodology, describes the existing baseline conditions, identifies potential impacts and provides an assessment of effects. The chapter also details the mitigation measures necessary to prevent, reduce, or offset any significant adverse effects, and discusses the likely residual effects after these measures have been implemented.

11.1.2. This chapter reports on two different types of cumulative effects: intra-project cumulative effects, which are the combined effects of individual topic impacts on a particular sensitive receptor; and inter-project cumulative effects, which consider the way in which the Proposed Development may give rise to impacts in combination with other developments the study area, termed Reasonably Foreseeable Future Projects (RFFPs). The outlined cumulative effects are then used to inform the overall assessment of cross-topic cumulative effects, which is reported in ES (Volume 2) Chapter 22: Cumulative Effects.

11.1.3. This chapter is supported by a technical appendix contained within ES Volume 4, which includes the following:

- ES (Volume 4) Appendix 11.1: DSO & SG Appendix
  - ES (Volume 4) Appendix 11.1.1 – Location plan
  - ES (Volume 4) Appendix 11.1.2 – Plan and 3D view drawings of the Baseline, Proposed Development, and Cumulative scenarios
  - ES (Volume 4) Appendix 11.1.3 – 25-degree angle section drawings
  - ES (Volume 4) Appendix 11.1.4 – Window location drawings for neighbouring buildings
  - ES (Volume 4) Appendix 11.1.5 – Daylight, sunlight and solar radiation results tables
  - ES (Volume 4) Appendix 11.1.6 – Sun-on-ground results for Co-op Academy New Islington playgrounds
  - ES (Volume 4) Appendix 11.1.7 – Transient overshadowing plots
  - ES (Volume 4) Appendix 11.1.8 – Solar glare results
  - ES (Volume 4) Appendix 11.1.9 – Cumulative results: daylight and sunlight results tables
- ES (Volume 4) Appendix 11.2: Obtrusive Lighting Report

## 11.2. Competent expert evidence

11.2.1. This daylight, sunlight, overshadowing, and solar glare assessment has been undertaken by a Chartered Surveyor (BSc (Hons) MRICS) who holds full professional membership with the Royal Institution of Chartered Surveyors. They have over 25 years of knowledge and experience in daylight and sunlight assessment and have used their knowledge and professional judgement to undertake this assessment.

# 11.3. Relevant legislation and guidance

11.3.1. Table 11-1 below summarises the legislation and regulations applicable to daylight, sunlight, overshadowing, and solar glare.

**Table 11-1 - Legislation and guidance for daylight, sunlight, overshadowing, and solar glare**

| Legislation / regulation | Summary of requirements |
|---|---|
| **National** | |
| National Planning Policy Framework[1]<br>December 2023 | Chapter 11, Making effective use of land – Planning policies and decisions should promote effective use of land in meeting the need for homes and other uses, while safeguarding the environment and ensuring healthy living conditions. |
| Planning Practice Guidance, Effective use of land[2]<br>July 2019 | 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. |
| Rainbird, R (on the application of) v The Council of the London Borough of Tower Hamlets[3]<br>March 2018 | Assessing the effects of development on daylight and sunlight amenity is a two-part process: first, as a matter of calculation, whether there would be a material deterioration in conditions by reference to the BRE guidelines; and second, as a matter of judgment, whether that deterioration would be acceptable in the circumstances. |
| **Regional** | |
| Greater Manchester Places For Everyone Joint Development Plan 2022 to 2023[4]<br>March 2024 | Policy JP-P1 Sustainable Places – Sets our key attributes for development, including addressing microclimate issues such as sunlight and shade.<br>Policy JP- G8 A Net Enhancement of Biodiversity and Geodiversity - Assess and potentially mitigate shading impacts on the Rochdale Canal Special Area of Conservation. |
| **Local** | |
| Manchester's Core Strategy 2012 – 2027[5] | Policy CC 1 – Primary Economic Development Focus: City Centre and Fringe - The City Centre and fringe will be considered a suitable location for the consideration of high-density buildings and commercially led mixed-use schemes.<br>Policy C 8 – Local Centres – Impacts of new commercial development on residential amenity will be carefully considered. |

[1] National Planning Policy Framework - Guidance - GOV.UK (www.gov.uk)

[2] Planning practice guidance - GOV.UK (www.gov.uk)

[3] https://www.bailii.org/ew/cases/EWHC/Admin/2018/657.html

[4] https://www.greatermanchester-ca.gov.uk/media/9578/places-for-everyone-joint-development-plan-document.pdf

[5] Core Strategy 2012-2027 | Core Strategy 2012-2027 | Manchester City Council

| Legislation / regulation | Summary of requirements |
|---|---|
| | Policy DM 1 – Development Management – Have regard to effects on amenity, including light. |
| Guide to Development in Manchester<br>Supplementary Planning Document and Planning Guidance (SPD)<br>April 2007 | Wherever possible, workplaces should be located near to residential areas and other services, to support the Council's sustainable development strategy. Proposals will be carefully considered to ensure that residential and local amenity is protected, and any adverse impacts are mitigated. |
| Extant Unitary Development Policies | Part 2, Area 4 - East Manchester, policy EM8<br>Within the Ancoats area, development will be permitted which includes high-density mixed-use development. |
| Strategic Regeneration Framework – Former Central Retail Park<br>March 2023 | Respecting the listed mill buildings, the canal setting and the other neighbours. Any new buildings will need to be cognisant of potential negative impacts on Co-op Academy New Islington. |

11.3.2. Table 11-2 below summarises the Technical Standards and Guidance applicable to daylight, sunlight, overshadowing, and solar glare.

**Table 11-2 - Technical standards and guidance for daylight, sunlight, overshadowing, and solar glare**

| Technical standards / guidance | Summary of guidance |
|---|---|
| Site layout planning for daylight and sunlight - A guide to good practice' (BR 209)[6] – *'the BRE guide'*<br>Building Research Establishment, 2022 (3rd edition) | Guidance on site layout to provide good natural lighting within a new development, and safeguarding of daylight and sunlight within existing buildings nearby. |
| Solar Dazzle Reflected from Sloping Glazed Facades[7]<br>Building Research Establishment, April 1987 | Guidance on assessing solar dazzle reflected from a proposed building façade. |
| Daylighting and Sunlighting, RICS Professional Standard[8]<br>Royal Institution of Chartered Surveyors, October 2012, reissued October 2023 | Guidance for chartered surveyors on daylight, sunlight and shading and how it is dealt with in the design, planning, and environmental impact assessment of developments. |
| Solar Glare Planning Advice Note - Guidelines and best practice for assessing solar glare in the City of London[9]<br>City of London Corporation, July 2017 | Guidance on assessing reflected solar glare from a proposed building façade. |

[6] https://www.brebookshop.com/details.jsp?id=328056

[7] https://www.brebookshop.com/details.jsp?id=326869

[8] https://www.rics.org/content/dam/ricsglobal/documents/standards/Daylighting-and-sunlighting.pdf

[9] https://www.cityoflondon.gov.uk/assets/Services-Environment/solar-glare-planning-advice-note.pdf

# 11.4. Assessment methodology

## Study area

11.4.1. The study area has been set having regard for the Manchester Digital Campus EIA Scoping Report (September 2024) and the recommendations in *'Site layout planning for daylight and sunlight - A guide to good practice'* (BR 209, 2022), hereafter referred to as the BRE guide.

11.4.2. The principal recommendations in the BRE guide for assessing the potential effects of development on daylight and sunlight to existing surrounding buildings relate to residential buildings. Consequently, the daylight and sunlight assessments were principally scoped to include nearby residential buildings, or residential parts of mixed-use buildings, surrounding the Site. For completeness, and with due regard for the Strategic Regeneration Framework – Former Central Retail Park (March 2023), the Co-op Academy New Islington has been included in the study. Although not a residential building, for completeness the apart hotel building (Use Class C1) at 40 Laystall Street was included in the study.

11.4.3. According to the BRE guide, loss of light to existing windows will be small and need not be analysed if no part of a proposed development, measured from the centre of the lowest window in a vertical section perpendicular to a main window wall of an existing building, would subtend an angle of more than 25° to the horizontal. On that basis, the following existing surrounding residential buildings (working anticlockwise around the Site) were **scoped out** of the study:

- Development on the former car park between Lomax Street and Ducie Street on the southwest side of Great Ancoats Street (planning application reference 140141/NMC/2024) – *see Section 4 on 25-degree section drawing numbers 25-DEG-001 and 003 at Appendix 11.1.3*
- Oxygen, 50 Store Street on the southwest side of Great Ancoats Street
- Buildings on the southeast side of Old Mill Street, including Islington Wharf and 1 Lockgate Mews – *see Section 3 on 25-degree section drawing numbers 25-DEG-001 and 003 at Appendix 11.1.3*
- Buildings on the northeast side of New Islington Marina, including Cotton Field Wharf, New Union Street and Mansion House, 1-15 Keepers Quay and beyond – *see Sections 1 and 2 on 25-degree section drawing numbers 25-DEG-001 and 002 at Appendix 11.1.3*

11.4.4. The following eight existing surrounding buildings (working anticlockwise around the Site from north) were **scoped into** the study and are labelled on the location plan at Appendix 11.1.1:

1. Co-op Academy New Islington (labelled New Islington School on drawings in the technical appendix)
2. Old Mill and Decker Mill on the northwest side of Redhill Street
3. Royal Mills and Sedgwick Mills on the northwest side of Redhill Street
4. M M2 Building, Pickford Street (Flats 1-65) on the northwest side of Redhill Street
5. M M2 Building, Pickford Street (Flats 66-93) on the northwest side of Redhill Street
6. Port Street car park development on the southwest side of Great Ancoats Street (planning application reference 132489/FO/2021, labelled Port Street on drawings in the technical appendix)
7. Brownsfield Mill, Binns Place on the southwest side of Great Ancoats Street
8. 40 Laystall Street (apart hotel) on the southwest side of Great Ancoats Street

11.4.5. Window location drawings of the existing surrounding buildings are attached at Appendix 11.1.4.

11.4.6. The BRE guide recommends assessing sunlight to main back gardens of houses, allotments, parks and playing fields, children's playgrounds, outdoor swimming pools, sitting-out areas such as in public

squares, and focal points for views, such as a group of monuments or fountains. Consequently, overshadowing has been assessed to the surrounding areas, including Co-op Academy New Islington, Cotton Field Park, and the Rochdale Canal Corridor. In addition, sun-on-ground has been assessed to the various playgrounds and other outdoor areas of the Co-op Academy New Islington.

11.4.7. The BRE guide and BRE solar glare paper highlight the potential for road users to be affected by sunlight reflected from glazed façades or areas of reflective metal cladding on buildings that adjoin the highway. Six points on the highways at junctions or traffic signals adjacent to the Site were selected at which reflected solar glare assessments were undertaken.

# Methodology

11.4.8. The assessment of daylight, sunlight, overshadowing, and solar glare was undertaken using a methodology in line with the technical guidance listed in Table 11-2.

## Establishing baseline conditions

11.4.9. Site visits were undertaken on 4 January 2023 and 11 January 2024 to scan the external elevations of the existing buildings on the Site and the surrounding properties using a tripod-mounted high-definition laser scanner and to make an external visual inspection of the Site and the surrounding buildings. The site visits afforded an understanding of the baseline environment, the likely uses of the surrounding properties, and the location of surrounding amenity spaces.

11.4.10. From the scan data a digital point cloud was created. The point cloud was overlaid onto a contextual 3D computer model of the Site and surrounding areas commissioned from and produced AccuCities Ltd in AutoCAD® DWG format using photogrammetry. Using the more accurate point cloud, the contextual model was adjusted as necessary, and window openings were added to the surrounding buildings being assessed to create an analysis model.

11.4.11. To identify which of the buildings surrounding the Site are in residential use, their post codes were checked against the Council Tax Valuation List produced by the Valuation Office Agency.[10]

11.4.12. The 3D computer model of the baseline scenario is illustrated in the plan and 3D view drawings Appendix 11.1.2.

11.4.13. Baseline levels of daylight, sunlight, sun on ground, and overshadowing to the existing surrounding receptors were established using the BRE assessment methodology. Solar glare was not assessed in the baseline scenario as it is not a comparative assessment. The assessments were run using trusted computer software (Waldram Tools for AutoCAD®).

11.4.14. Desktop research was undertaken of online planning application records for the surrounding buildings with a view to obtaining floor plans, wherever possible, showing their internal layouts and room uses. Floor plans were found for all buildings except the M M2 Buildings. Where plans were obtained, the room layouts and uses were modelled from the plans. For the M M2 Buildings, internal layouts were assumed using professional judgment based on an external visual inspection of the building.

[10] https://www.gov.uk/council-tax-bands

**Daylight to neighbouring buildings**

11.4.15. In housing, living rooms, dining rooms and kitchens have a greater requirement for daylight. Bedrooms should also be analysed but are less important. Bathrooms, stairwells and other areas without a requirement for daylight need not be assessed.

11.4.16. Baseline daylight levels were therefore assessed to all habitable rooms and school classrooms by calculating:

- Vertical sky component (VSC) at the centre of each main window in the external plane of the window wall, which measures the total amount of skylight available; and
- No-sky line (NSL) on the working plane inside the room, where its layout is known, which measures the area that can receive direct skylight and assesses the distribution of daylight around the room.

11.4.17. If a window receives at least 27% VSC it should be enough to provide good daylight inside the room with conventional window design. For good distribution of daylight around the room, at least 80% of the area of the working plane should lie in front of the NSL.

11.4.18. For a bay window, the centre window facing directly outwards can be taken as the main window for the VSC calculation. If a room has two or more windows of equal size, the mean of their VSCs may be taken. If a room has two or more windows of unequal size, the area-weighted mean of their VSCs may be taken.

**Sunlight to neighbouring buildings**

11.4.19. The BRE numerical guidelines on sunlight apply to main living rooms and conservatories in dwellings. Kitchens and bedrooms are less important. The author of the BRE guide, Dr Paul Littlefair, does not normally assess sunlight to bedrooms on the basis they are not a material issue, except when combined with a living space, such as in a bed-sitting room.[11] Nevertheless, kitchens and bedrooms have been included for completeness. Typically, school classrooms do not have a particular requirement for sunlight but, again, have been included for completeness. Only windows facing within 90˚of due south have been assessed, in accordance with the guidelines.

11.4.20. In each case the level of sunlight has been measured by calculating the percentage of annual probable sunlight hours (**APSH**) at the centre the window in the external plane of the window wall. If a room has two or more windows, the total APSH has been calculated, avoiding any double counting of probable sunlight hours.

11.4.21. In general, a dwelling will appear reasonably sunlit if at least one main window wall faces within 90˚ of due south and a habitable room, preferably a main living room, can receive 25% APSH, including at least 5% of APSH in the winter months between 21st September and 21st March.

**Sunlight to solar panels**

11.4.22. Where a proposed development may result in loss of radiation to existing solar panels, the BRE guide recommends, as an initial check, calculating APSH at the centre of each panel followed, where necessary, by a more detailed assessment of solar radiation.

[11] BRE Client Report for Reardon and Lowder Houses, Wapping on behalf of London Borough of Tower Hamlets, (planning application reference PA/18/03541/A1)

**Sunlight and overshadowing to back gardens, playgrounds and amenity spaces**

11.4.23. Sunlight to back gardens and amenity spaces should be assessed on the equinox (21st March). The BRE guide recommends that at least 50% of each amenity space should be able to receive at least two hours of direct sunlight on the equinox. This is known as the 'two-hours sun-on-ground' (**SOG**) test.

11.4.24. Sunlight at an altitude of 10° or less is ignored, because it is likely to be blocked by planting, and fences or walls less than 1.5 metres high can also be ignored. Normally, trees and shrubs need not be included, partly because their shapes are almost impossible to predict, and partly because the dappled shade of a tree is more pleasant than a deep shadow of a building.

11.4.25. Where a large building is proposed which may affect a number of gardens or open spaces, the BRE guide advises it can be illustrative to plot shadow plans showing the location of shadows at different times of day and year. The BRE recommends the equinox (21st March) as the best assessment date as it shows the average level of shadowing. Shadow plans have therefore been produced at hourly intervals from 08:00 hrs to 17:00 hrs GMT on 21st March.

## Identifying likely significant effects

11.4.26. The BRE methodology was used to assess the likely daylight (VSC and NSL), sunlight (APSH and SOG), overshadowing and solar glare effects of the completed Development. The results have then been compared with those of the baseline scenario and the loss of light at each receptor has been quantified on an absolute and a relative scale, except for overshadowing, which has been plotted graphically.

**BRE numerical guidelines**

11.4.27. The BRE guide gives default numerical guidelines for loss of daylight and sunlight, as explained below. These are advisory and should be interpreted flexibly since natural lighting is only one of many factors in site layout design.

***Daylight to neighbouring buildings***

11.4.28. Daylight to an existing building will be adversely affected if after development either:

- the VSC will be reduced to both less than 27% and less than 0.80 times its former value, or
- the area enclosed by the NSL will be reduced to less than 0.80 times its former value.

***Sunlight to neighbouring buildings***

11.4.29. Sunlight to an existing dwelling will be adversely affected if after development a living room with a window facing within 90° of due south will receive:

- less than 25% APSH or less than 5% APSH during the winter months (21st September to 21st March); and
- less than 0.80 times its former value during either period; and
- the reduction in sunlight over the whole year will be greater than 4% APSH.

***Sunlight to solar panels***

11.4.30. Where APSH to a solar panel would reduce to less than 0.90 times former value, the BRE guide recommends a more detailed specialist assessment of total solar radiation, including both direct solar

and diffuse sky radiation. The detailed assessment involves a realistic simulation of cloud cover at different times of year and variations in incoming solar radiation from different parts of the sky.

11.4.31. If over the whole year the level of solar radiation received by solar panels would reduce to less than the following ratios with a proposed development in place, the loss is significant:

- less than 0.90 times former value for panels with a slope angle of up to 30°
- less than 0.85 times former value for panels with a slope angle of more than 30° but less than 60°
- less than 0.80 times former value for panels with a slope angle of at least 60°

***Sunlight and overshadowing to back gardens, playgrounds and amenity spaces***

11.4.32. Sunlight to a garden or other amenity space will be noticeably reduced and tend to look more heavily overshadowed if, following development, the area that can receive two hours of direct sunlight on 21st March will be reduced to both less than 50% of its total area and less than 0.80 times its former value.

11.4.33. The BRE guide does not give any numerical guidelines for assessing the effects of overshadowing beyond those described above in the preceding paragraph. The overshadowing assessment involves making a visual comparison between the shadow plans for the baseline scenario and the relevant future scenario and professional judgment in determining the likely effects.

11.4.34. In interpreting the impact of such differences, it must be borne in mind that nearly all structures will create areas of new shadow, and some degree of transient overshadowing of a space is to be expected.

***Solar glare***

11.4.35. Solar glare reflected from facades of buildings is usually only a problem for vertical facades when the sun is low in the sky and the reflection can appear close to a traffic light or railway signal, and when the sun's rays are not blocked by clouds or other buildings. It is more of a problem for sloping facades, as these can reflect more intense sunlight from high solar altitudes into the eyes of drivers.[12]

11.4.36. Glare sources off to one side, or above the observer, are less likely to cause disability glare. Usually, glare sources at more than 25 degrees to the line of sight can be discounted. The worst problems can occur when drivers are travelling directly towards the building, and sunlight can reflect off surfaces in the driver's direct line of sight. Usually this will be off the lower parts of the building. For vertically mounted clear double glazing facing the driver, solar dazzle could be a significant issue if the glare angle is less than 10 degrees to the line of sight. With a sloping façade (reflecting bright sun from high in the sky), or high reflectance glazing or cladding, solar dazzle might be a problem at higher angles of view as well.[13] The cut-off angle of a typical car sun visor and windscreen are around 5° and 25° respectively.

11.4.37. To assess the potential for reflected solar glare at a receptor location, the BRE solar glare paper provides a manual method involving plotting the geometry of the reflective facades relative to the receptor location onto a sunlight availability protractor and reading off the times of day and year at which reflected sunlight could occur. This allows the total possible solar glare duration to be calculated for each date. The sunlight availability protractor also gives the probability of bright sunshine occurring at any time and date in the year. This allows the probable duration of solar glare on any given day to be calculated and aggregated for the whole year.

11.4.38. Three-dimensional computer modelling and analysis was used to run the calculations recommended in the BRE solar glare paper. The assessment therefore predicts the likely total probable solar glare

[12] Solar Dazzle Reflected from Sloping Glazed Facades (BRE IP 3/87, 1987)

[13] Solar Glare Planning Advice Note (City of London Corporation, 2017)

duration for each receptor location, assuming the glazing used in the facades is fully reflective. It also calculates the glare angle (i.e. the angle subtended by the reflected sunlight from the line of sight) and sun altitude for each incidence of glare, which is relevant to significance, as explained later in this chapter.

11.4.39. The receptor locations are positioned at 1.05m above road level for a typical car to replicate eye level of the driver of the vehicle.

11.4.40. The solar glare assessment is not a comparative assessment; it assesses the potential for reflected solar glare to occur in the Proposed Development scenario. For the purposes of the assessment, the only façade material that is assumed to reflect sunlight is the glazing to the windows.

11.4.41. This type of assessment does not calculate the intensity of glare. Such an assessment would involve more complex modelling and software, taking in to account the reflective properties of all the proposed façade materials, e.g. specularity (surface roughness) and atmospheric conditions. That is beyond the scope of this assessment, the aim of which is to predict when glare could occur. Glasses produce mostly specular reflection unless treated with an anti-reflection coating or film, metals produce a mixture of specular and diffuse reflections, and brick or matt cladding give mainly diffuse reflection, which is unlikely to cause disability glare. Standard low emissivity double glazing has a specular reflectance of around 13% at normal incidence, rising to 15% at 45 degrees and 49% at 75 degrees.[14]

11.4.42. The findings can be used, where appropriate, to inform potential mitigation measures and more detailed assessment, which could be secured through a suitable planning condition.

**Effect of existing trees**

11.4.43. In accordance with the BRE assessment methodology, existing trees were ignored in the calculations.

**Flexible application and alternative target values**

11.4.44. The BRE guidelines should be interpreted flexibly. The guide states:

*1.6 The guide is intended for building designers and their clients, consultants, and planning officials. The advice 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. Although it gives numerical guidelines, these should be interpreted flexibly because natural lighting is only one of the many factors in site layout design… In special circumstances the developer or planning authority may wish to use different target values. For example, in a historic city centre, or in an area with modern high rise buildings, a higher degree of obstruction may be unavoidable if new developments are to match the height and proportions of existing buildings… The calculation methods … are entirely flexible in this respect.*

*2.2.3 Note that numerical values given here [for daylight] are purely advisory. Different criteria may be used based on the requirements for daylighting in an area viewed against other site layout constraints.*

*3.2.10 In certain situations care needs to be taken in applying these [sunlight] guidelines… The guidelines are purely advisory. Planning authorities may wish to use different criteria based on the requirements for sunlight in particular types of developments in particular areas. Sometimes a larger*

[14] Solar Glare Planning Advice Note (City of London Corporation, 2017)

*reduction in sunlight may be necessary if new development is to match the height and proportion of existing buildings nearby.*

*4.5.10 Note that numerical values given here [for sunlight to photovoltaic panels] are purely advisory. Different criteria may be used based on the requirements for solar energy in an area viewed against other site layout constraints.*

11.4.45. The Site comprises vacant brownfield land and sits within the city centre in a suitable location for the consideration of high-density buildings and commercially led mixed-use schemes, as noted in Manchester's Core Strategy. As such, it sits within an area earmarked for growth and change, where a higher degree of obstruction is to be expected. An appropriate level of deviation from the BRE numerical guidelines is therefore to be expected.

11.4.46. The Site was cleared of any massing a number of years ago when the former retail park buildings were demolished. If the densities expected for a commercially led regeneration of the Site are to be achieved, impacts greater than the BRE numerical guidelines are therefore unavoidable.

11.4.47. It is therefore appropriate to consider applying alternative target values for daylight and sunlight commensurate with the Site's context.

***Alternative VSC targets used in key planning decisions***

11.4.48. In a number of key planning decisions, use of a mid-teen VSC benchmark has been held to be appropriate in denser, more built-up urban areas.

11.4.49. When the Mayor of London granted planning permission on 1 April 2016 for a development of Monmouth House and Speedfix House, London, the GLA representation hearing report stated:[15]

*When considering the findings of the assessment, GLA officers have had regard to the site's central urban context and BRE's advice that the numerical guidelines it provides are not mandatory, and should be interpreted with a reasonable degree of flexibility – taking into account site context and the nature of the situation in which they are being applied.*

*For general guidance, whilst the BRE guidelines recommend a target value of 27% VSC when measured on an absolute scale, that value is derived from a low density suburban housing model. In an inner city urban environment, VSC values in excess of 20% should be considered as reasonably good, and VSC in the mid-teens should be acceptable.*

*GLA officers acknowledge that it can be difficult to meet the recommended daylight and sunlight standards for all residential units in the centre of London where there is a strong demand for accommodation of all types and where high density development is encouraged by local and national planning policies. When considering the information available, including the site context, policy-led development aspirations, and having reference to BRE guidelines that are intended to be applied flexibly to help rather than constrain design, on balance the predicted impacts are acceptable.*

11.4.50. Another example of this approach is the Whitechapel Estate Appeal.[16] There the Inspector noted that development that resulted in a proportion of residual VSC values in the mid-teens, with a smaller

[15] GLA representation hearing report reference. D&P/3698/03

[16] Appeal reference APP/E5900/W/17/31714378

proportion in the bands below 15% VSC, have been found acceptable in major developments across London. He stated:

*The BRE document offers guidance on generally acceptable standards of daylight and sunlight, but advises that numerical values are not to be rigidly applied and recognises the importance of the specific circumstances of each case. Inner city development is one of the examples where a different approach might be justified. This is specifically endorsed by the [Mayor of London's] Housing SPG, which calls for guidelines to be applied sensitively to higher density developments, especially in (among others) opportunity areas and accessible locations, taking into account local circumstances, the need to optimise housing capacity, and the scope for the character and form of an area to change over time. … I agree with the appellants that blanket application of the BRE guide optimum standards, which are best achieved in relatively low-rise well spaced layouts, is not appropriate in this instance.*

*The SPG advises that the daylight impact on adjacent properties should be assessed drawing on "broadly comparable residential typologies within the area and of a similar nature across London"...*

*The figures [from comparable typologies from a range of example sites across Central London analysed by the appellants, comprising both traditional urban streets and recently permitted areas of significant development] show that a proportion of residual Vertical Sky Component ('VSC') values in the mid-teens have been found acceptable in major developments across London. This echoes the Mayor's endorsement in the preSPG decision at Monmouth House, Islington that VSC values in the mid-teens are acceptable in an inner urban environment. They also show a smaller proportion in the bands below 15%...*

*I acknowledge that a focus on overall residual levels could risk losing sight of individual problem areas. It is accepted that light is only one factor in assessing overall levels of amenity, but I consider that the trade-off with other factors, such as access to public transport or green space, is likely to be of more relevance to an occupier of new development than to an existing neighbour whose long-enjoyed living conditions would be adversely affected by new buildings. However, I also consider that Inner London is an area where there should generally be a high expectation of development taking place. This is particularly so in the case of the appeal site, where the Whitechapel Vision Masterplan and the City Fringe Opportunity Area Planning Framework have flagged the desirability of high density development. Existing residents would in my view be prepared for change and would not necessarily expect existing standards of daylight and sunlight to persist after development.*

11.4.51. At a more recent Appeal for a development at Goldsworth Road, Woking, the Inspector noted:[17]

*Retaining a VSC level of 27% in neighbouring properties is unrealistic; as has been recognised in many appeal decisions and other documents. Even retaining 20% VSC is considered, generally, to be reasonably good, and in urban areas retaining around mid-teen % VSC is considered to be acceptable.*

11.4.52. Therefore, it could be argued that a reasonable alternative VSC target for a development of the Site would generally be 15% VSC, with a smaller proportion of windows in the bands below 15%.

11.4.53. There are examples of developments in Manchester where this type of approach was taken within daylight and sunlight reports submitted to Manchester City Council and where planning permission was

[17] Appeal reference: APP/A3655/W/21/3276474

granted. Application of an alternative target value based on lower levels of VSC appropriate to city-centre sites will therefore be familiar to the local planning authority. Examples include:

- One Medlock Street, Manchester, M15 5FJ
  Application reference: 135419/FO/2022
  Proposal: Demolition of the existing hotel building and structures and redevelopment of the site to comprise two separate buildings: one 13 storey office building with commercial unit (Use Class E) at ground floor; a part 11, part 38 storey building comprising 1,014 purpose built student accommodation units (sui generis) with ground floor office/community uses (Use Class E, F1 or F2); and associated ancillary internal and external amenity space, hard and soft landscaping and associated highway works.
  Approved: 7 November 2023
- Port Street, Manchester, M1 2EQ
  Application reference: 132489/FO/2021
  Proposal: Erection of a part-33, part-11, part 9 part 7 storey residential building above semi-basement level, with associated residents' amenity space including gym (Use Class C3) (comprising 481 dwellings), commercial space (Use Class E), basement car parking (47 spaces), cycle parking (481 spaces) landscaping, and other associated works
  Approved: 7 October 2022
- Victoria House, Great Ancoats Street, Manchester, M4 7AB
  Application reference: 122000/FO/2018
  Proposal: Erection of a part 25 part 3 storey residential tower (Use Class C3) for 177 apartments comprising 59 x 1 bed ( 34 x 1 bed 1 person and 25 1 bed 2 person), 113 x 2 bed (44 x 2 bed 3 person and 69 x 2 bed 4 person) and 5 x 3 bed (3 bed 5 person) with ground floor commercial space (Use Class A1, A2, A3, A4 and D1) above partial basement level associated shared amenity spaces at 3rd floor level, realm enhancements following demolition of existing buildings.
  Approved: 26 Aug 2020
- 60 Charles Street, Manchester, M1 7DF
  Application reference: 122644/FO/2019
  Proposal: Erection of 16 storey building plus plant level comprising a 278 room hotel (Use Class C1) with ancillary ground floor bar and restaurant uses (Use Classes A3, A4) with associated works to facilitate access, servicing and other associated works following demolition of existing building on-site.
  Approved: 31 May 2019

11.4.54. For the purpose of this Environmental Statement, the default BRE numerical guidelines have been applied. However, when considering the acceptability of the daylight effects, the local planning authority is invited to consider the level of adherence to an alternative target of 15% VSC.

***Layout and use of affected property***

11.4.55. Another example of flexible application of the BRE guidelines involves consideration of the layout and use of the affected property when judging the reasonableness and acceptability of effects on daylight and sunlight to neighbouring buildings. This point was considered carefully by the Inspector in her report leading to the Secretary of State's call-in decision to grant planning permission for the redevelopment of the former London Television Centre, 60-72 Upper Ground, London SE1 in the London Borough of Lambeth in February 2024.[18] The Secretary of State agreed with the Inspector's conclusions that, despite numerous high-magnitude daylight impacts (greater than 40% reduction), the residents of an affected social housing block would not experience unacceptable levels of loss of daylight and the impact of the proposal would not be unreasonable.

[18] Appeal reference: APP/N5660/V/22/3306162

11.4.56. In reaching that conclusion, the Inspector noted that the design of the social housing block addressed its dense urban environment, with many of the dwellings being dual aspect and having balconies and rooms overlooking a central private landscaped green space. Living/kitchen/dining rooms (LKDs) facing the development were well proportioned, had relatively large windows, and took borrowed light from the south-facing entrance halls via internal glazed doors. In other flats, the LKDs faced onto the central garden and their light would be unaffected.

11.4.57. The Inspector regarded the use of some bedrooms for studies or homeworking as a matter of personal choice for the occupiers, but mainly they were used for sleeping. Where desks were evident during her site visit, they were positioned close to a window to maximise the use of natural light and outlook.

11.4.58. The Inspector also noted there is no distinction made between social or private housing in planning terms to the application of the BRE Guide or planning policy.

11.4.59. The dual-aspect nature of an affected social housing block, and the small size of the affected kitchens (which disqualified them from habitable room status), were factors in the Inspector's decision to grant permission in an appeal at Graphite Square, London SE11 in the London Borough of Lambeth in September 2019.[19]

***Self-obstructing balconies and other projections***

11.4.60. The BRE guide gives another example when care should be taken in applying its numerical guidelines involving windows that sit beneath balconies or are blinkered by projecting parts of their own building. It states:

*2.2.11 Existing windows with balconies above them typically receive less daylight. Because the balcony cuts out light from the top part of the sky, even a modest obstruction opposite may result in a large relative impact on the VSC, and on the area receiving direct skylight.*

*2.2.12 A larger relative reduction in VSC may also be unavoidable if the existing window has projecting wings on one or both sides of it or is recessed into the building so that it is obstructed on both sides as well as above.*

*3.2.9 Balconies and overhangs above an existing window tend to block sunlight, especially in summer. Even a modest obstruction opposite may result in a large relative impact on the sunlight received.*

11.4.61. Clearly, projections from existing neighbouring buildings can be a factor in their relative light loss. In such instances it can be helpful to run a supplementary assessment with the projections removed, to understand the degree to which they contribute to the relative light loss. For that reason, a supplementary assessment has been undertaken for the Co-op Academy New Islington without its projecting canopies above ground-floor classroom windows and recessed balcony to the first-floor IT suite.

**Cumulative effects**

11.4.62. Of the cumulative schemes that have been identified, the only one that could give rise to cumulative daylight, sunlight, and overshadowing effects on the identified sensitive receptors in combination with the effects of the Proposed Development is planning application reference 135662/FO/2022 for erection of a 20-storey building to create a 154-bedroom hotel (Class C1) above 2 basement levels with ancillary

[19] Appeal reference. APP/N5660/W/18/3211223 and APP/N5660/W/19/ 3225761

café / bar / restaurant and gym and other associated works including highway improvements, cycle parking and creation of accessible parking bay following removal of on-site structures.

11.4.63. The other cumulative schemes have been scoped out of the cumulative assessment for this chapter due to their distance from the Site.

**Determining effect significance**

11.4.64. In determining the significance of effects, the methodology below was used.

***Sensitivity of receptor***

11.4.65. The receptors have different sensitivities according to their requirements, as defined in Table 11-3.

**Table 11-3 - Receptor sensitivity for daylight, sunlight, overshadowing, and solar glare**

| Sensitivity | Daylight receptor | Sunlight receptor | Overshadowing receptor | Solar glare receptor |
|---|---|---|---|---|
| High | Main living rooms and kitchens; school classrooms | Main living rooms, back gardens, and shared or public amenity spaces | Back gardens, and shared or public amenity spaces | Locations on railways *(not applicable here)* |
| Medium | Bedrooms | Solar panels | - | Locations on trunk roads (Great Ancoats Street) |
| Low | - | Kitchens and bedrooms | - | Locations on side streets |
| Negligible | Circulation spaces, bathrooms and other non-habitable rooms | Circulation spaces, bathrooms and other non-habitable rooms; school classrooms | | |

***Magnitude of impact***

11.4.66. The magnitudes of impact on daylight, sunlight, overshadowing, and solar glare have been classified as set out in Table 11-4.

**Table 11-4 – Magnitudes of impact for daylight, sunlight, overshadowing, and solar glare**

| Magnitude of impact | Daylight, sunlight, and sun on ground numerical criteria | | Solar glare numerical criteria |
|---|---|---|---|
| High | Impact is outside BRE guidelines and… | <0.60 times former value *(>40% loss)* | Glare angles < 3° |
| Medium | | 0.60-0.69 times former value *(31% to 40% loss)* | Glare angles between 3° and 10° for long period of time |
| Low | | 0.70-0.79 times former value *(21% to 30% loss)* | Glare angles between 10° and 30° for long period of time or between 3° and 10° for short period of time |
| Negligible | Impact is inside BRE guidelines and… | ≥0.80 times former value *(<20% loss)* | Glare angles > 30° or between 10° and 30° for short period of time |

***Significance criteria for daylight, sunlight and overshadowing effects***

11.4.67. The guidance in Appendix I of the BRE guide in respect of EIA was followed when ascribing significance to the daylight, sunlight, and overshadowing effects identified in this assessment. The guide states:

*The assessment of impact will depend on a combination of factors, and there is no simple rule of thumb that can be applied.*

*Where the loss of skylight or sunlight fully meets the guidelines, the impact is assessed as negligible or minor adverse. Where the loss of light is well within the guidelines, or only a small number of windows or limited area of open space lose light (within the guidelines), a classification of negligible impact is more appropriate. Where the loss of light is only just within the guidelines, and a larger number of windows or open space area are affected, a minor adverse impact would be more appropriate, especially if there is a particularly strong requirement for daylight and sunlight in the affected building or open space.*

*Where the loss of skylight or sunlight does not meet the guidelines, the impact is assessed as minor, moderate or major adverse. 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;*
- *the affected building or open space only has a low level requirement for skylight or sunlight;*
- *and there are particular reasons why an alternative, less stringent, guideline should be applied (see Appendix F).*

*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 particularly strong requirement for skylight or sunlight, e.g. a living room in a dwelling or a children's playground.*

11.4.68. Where baseline levels of daylight or sunlight are already low, for example where the view of sky from a window is restricted by projecting canopies, balconies or other parts of the host building, the magnitude of absolute reduction has been considered when determining the likely significance of effect.

***Significance criteria for solar glare effects***

11.4.69. For solar glare, glare angles beyond 25° of the central line of sight are of least significance, unless is it is a sloping façade reflecting more intense summer sunlight from high solar altitudes. Spring and autumn sunlight has lower intensity as it passes through more atmosphere. Winter sunlight has least intensity and is often blocked by surrounding buildings.

11.4.70. The cone of sensitive vision for the human eye is within 10° of the central line of sight, with the highest acuity vision within around 3° of the central line of sight. Glare within these angles is therefore likely to be of more significance. The solar glare diagrams in Appendix 11.1.8 include circles showing angles of 3°, 10°, 20°, and 30° from the central line of sight.

11.4.71. The size and extent of unbroken windows or other reflective parts of a façade can be a factor in effect significance. The more an area of glazed or highly reflective façade is broken up by non-reflective

elements, the more the reflected solar disc is likely to be broken up, thereby reducing the intensity of glare.

11.4.72. The risk of disability glare occurring at a given location increases the longer the period in which solar glare can occur, particularly in summer months or when solar glare angles are less than 10°, and when the reflected sun disk is not broken up by non-reflecting parts of the façade, fritting, trees, etc.

11.4.73. The cut-off angle of a typical car sun visor and windscreen are around 5° and 25° respectively. Drivers may therefore mitigate some of the potential effects from reflected solar glare themselves by use of their sun visors. The potential effects may also be mitigated if additional sets of traffic lights/signals are present at a junction (for example, when traffic lights are positioned on both sides of the carriageway) and one of the sets of lights/signals is not affected by solar glare.

## Assumptions and limitations

11.4.74. The following assumptions and limitations are relevant to the assessment:

- The contextual model supplied by AccuCities was produced from photogrammetry and updated with more accurate data from the 3D point cloud captured on site by high-definition laser scanner.
- Whilst floor plans from planning records were used wherever possible for modelling the layouts and room uses in neighbouring buildings, where no plans were available (M M2 Buildings) reasonable assumptions were made based on external visual inspection and professional judgment. Assumptions have typically had to be made as to the internal floor levels and wall thicknesses.
- Trusted computer software was used to run calculations: Waldram Tools for AutoCAD®.
- A 3D computer model of the massing of the Proposed Development was supplied by the Architect, AtkinsRéalis UK Limited.
- The following existing buildings were under construction at the time of the site survey and have been modelled in part or in whole from planning consented drawings: developments of former car park between Lomax Street and Ducie Street (planning application reference 140141/NMC/2024) and former car park at Port Street (planning application reference 132489/FO/2021)
- The following cumulative scheme has been modelled from planning consented drawings: erection of a 20-storey building to create a 154-bedroom hotel (Class C1) above 2 basement levels with ancillary café / bar / restaurant and gym and other associated works including highway improvements, cycle parking and creation of accessible parking bay following removal of on-site structures (planning application reference 135662/FO/2022)
- The solar glare assessment does not measure the intensity of reflected solar glare. It calculates the times when solar glare could possibly be reflected to the receptor locations, the probable duration allowing for the likelihood of bright sunshine on those dates, and the angles of incidence to the line of sight. For the purposes of the calculation, the relevant areas of the facades of the Development were assumed to act like a mirror with pure specular reflection (mirror-like direct reflection). No account was taken of their surface reflective properties that could result in diffuse reflection (where the reflected light is scattered in all directions), e.g. surface roughness, presence of dirt, etc. In reality, only a percentage of the light is reflected.
- Existing trees were ignored in the assessment, in accordance with the BRE assessment methodology.

## Consultation

11.4.75. During pre-application discussions with Manchester City Council in September 2023, daylight and sunlight results from the assessment of early-stage scale and massing were presented to the Council. Officers' comments were positive and have been take into account during further design development.

11.4.76. An EIA Scoping Report dated September 2024 was submitted to the Council, which included details of the proposed daylight, sunlight, overshadowing and solar glare assessment. The Council consulted a number of interested parties. No comments of relevance to the daylight, sunlight, overshadowing and solar glare have been received.

# 11.5. Baseline conditions

11.5.1. Baseline levels of daylight, sunlight, sun on ground, and overshadowing to the existing surrounding receptors were calculated using the BRE assessment methodology described above.

11.5.2. As the baseline condition is vacant brownfield land, with no buildings or other obstructions to the passage of light, the surrounding buildings and open spaces presently enjoy unusually high levels of daylight and sunlight across the Site for a city-centre location.

### Daylight and sunlight to existing surrounding buildings

11.5.3. The baseline daylight and sunlight conditions for the eight existing surrounding receptor buildings are set out in the detailed results tables in Appendix 11.1.5 (columns headed “Exis.”). The level of adherence of these baseline daylight and sunlight levels to the BRE absolute numerical targets for achieving good daylight and sunlight in buildings, namely 27% VSC, 80% NSL, and 25% APSH of which 5% APSH in winter, are summarised in Table 11-5. This summarises how well lit the properties are in the baseline condition.

**Table 11-5 – Number of assessed windows/rooms meeting BRE recommendations in baseline condition**

| Property address | VSC | | NSL | | APSH | |
|---|---|---|---|---|---|---|
| | No. of windows tested | No. meeting target | No. of rooms tested | No. meeting target | No. of rooms tested | No. meeting targets |
| Co-op Academy New Isling. | 13 | 8 | 9 | 9 | 9 | 9 |
| Old Mill and Decker Mill | 86 | 63 | 47 | 40 | 47 | 47 |
| Royal Mills and Sedgwick Mills | 197 | 186 | 128 | 121 | 128 | 128 |
| MM2 Building Flats 1-65 | 40 | 27 | 16 | 16 | 16 | 16 |
| MM2 Building Flats 66-93 | 24 | 18 | 12 | 12 | 12 | 12 |
| Brownsfield Mill | 114 | 93 | 58 | 51 | 48 | 48 |
| 40 Laystall St. (apart hotel) | 41 | 30 | 18 | 18 | 2 | 2 |
| Port Street development | 90 | 71 | 30 | 30 | 18 | 18 |
| Totals: | 605 | 496 | 318 | 297 | 280 | 280 |
| | | *82%* | | *93%* | | *100%* |

11.5.4. In total, 605 windows serving 318 rooms in eight properties were assessed for daylight, and 280 rooms in eight properties were assessed for sunlight.

11.5.5. In the baseline condition, the BRE daylight recommendations (27% VSC and 80% NSL) are met for 496 windows (82%) and 297 rooms (93%) respectively, and the sunlight recommendations (25% APSH including 5% APSH in winter) are met for 280 rooms (100%).

11.5.6. The baseline levels of daylight and sunlight to the surrounding properties show a very high level of adherence to the BRE recommendations, with the vast majority of windows and rooms being well lit.

11.5.7. Such a high level of adherence to BRE recommendations in a city-centre location is due, in part, to the existing cleared site condition which poses no obstruction to daylight and sunlight across the Site. In the historic baseline condition, the former retail park buildings would have obstructed some of the daylight and sunlight to the surrounding buildings.

## Sunlight to solar panels

11.5.8. The baseline levels of sunlight to the eight arrays of solar panels located on the roof of the Co-op Academy New Islington school building has been assessed using the APSH test, as explained at paragraph 11.4.22. The results are shown in Table 11-6 below.

**Table 11-6 – Sunlight to Co-op Academy New Islington's rooftop solar panels in baseline condition**

| Solar panel ref. | APSH (%) |
|---|---|
| Array 1 | 96% |
| Array 2 | 97% |
| Array 3 | 97% |
| Array 4 | 95% |
| Array 5 | 95% |
| Array 6 | 96% |
| Array 7 | 96% |
| Array 8 | 96% |

11.5.9. Very high levels of sunlight (95% to 97% APSH) are received by the rooftop solar panels on the Co-op Academy New Islington school in the baseline condition.

## Sunlight and overshadowing to existing surrounding amenity spaces

11.5.10. The baseline sunlight conditions for the six playground and other outdoor spaces at the Co-op Academy New Islington assessed using the BRE two-hours sun-on-ground test on 21 March, are shown graphically and set out in the results table on the drawing at Appendix 11.1.6.

11.5.11. The numerical results are shown in Table 11-7. They show the proportion of each space that can receive at least two hours of sunlight on 21st March and whether this satisfies the BRE guideline of at least 50%.

**Table 11-7 – Adherence of amenity spaces to BRE sun-on-ground recommendations in baseline condition**

| Amenity space at Co-op Academy | Proportion sunlit >2hrs | Satisfies BRE guideline? |
|---|---|---|
| A1 – small soft play area | 100% | Yes |
| A2 – multi-use games area | 100% | Yes |
| A3 – large soft play area | 100% | Yes |
| A4 – reception play area | 100% | Yes |
| A5 – habitat area | 97% | Yes |

| Amenity space at Co-op Academy | Proportion sunlit >2hrs | Satisfies BRE guideline? |
|---|---|---|
| A6 – hard play area | 92% | Yes |

11.5.12. For each playground or other outdoor amenity area at the school, a very high proportion (92% to 100%) of each area can receive at least two hours of sunlight on 21 March in the baseline condition, which is far higher than the BRE 50% guideline.

11.5.13. Such a high levels of sunlight in a city-centre location is due, in part, to the existing cleared site condition which poses no obstruction to sunlight across the Site. In the historic baseline condition, the former retail park buildings may have obstructed some of the sunlight to the school amenity spaces.

11.5.14. The baseline levels of overshadowing of the surrounding areas have been assessed on the spring equinox (21st March) and are shown on the hourly snapshot drawings at Appendix 11.1.8 in the images in the left side of each drawing.

11.5.15. As the Site has been cleared of any massing, it casts no shadows in the baseline scenario. All shadows shown coloured grey are cast by existing surrounding massing.

### Expected changes to baseline

11.5.16. If the Proposed Development was not to proceed (i.e. 'do-nothing' scenario), baseline levels of daylight and sunlight could change as other surrounding developments come forward. The daylight, sunlight and overshadowing effects of any such surrounding developments would typically be assessed and a report submitted with their respective planning applications.

## 11.6. Potential impacts

11.6.1. The Proposed Development would result in the following potential impacts:

- Loss of daylight and sunlight to existing surrounding dwellings and Co-op Academy New Islington
- Loss of sunlight to outdoor play spaces and loss of solar radiation to rooftop solar panels at the Co-op Academy New Islington
- Increased overshadowing to Cotton Field Park, and the Rochdale Canal Corridor and Co-op Academy New Islington
- Reflected solar glare to motorists

11.6.2. The potential effects have been quantified and assessed below.

## 11.7. Assessment of effects

### Construction phase

#### Embedded mitigation

11.7.1. No embedded mitigation is practicable during the construction phase.

### Construction effects

11.7.2. During construction, daylight, sunlight, and overshadowing effects are unlikely to exceed those of the completed Proposed Development. Any effects during the construction phase will be temporary and will fluctuate as the Proposed Development is implemented. Any impacts due to on-site machinery such as cranes would be short to medium term and changeable during operational hours. It is therefore considered that the completed Proposed Development represents the worst-case assessment. The assessment of daylight, sunlight and overshadowing construction phase effects is scoped out of this chapter, as stated in the Scoping Report. Although the Scoping Report identified potential for solar reflection from protective plastic sheeting with a high reflectance/gloss factor, further investigation has established that scaffold sheeting is made from low density polyethylene (LDPE), which has lower reflectance than other plastics and, being flexible sheeting, results in diffuse, rather than specular, reflection with negligible potential for solar glare. The assessment of construction phase solar glare effects is therefore scoped out of this chapter.

## Operation phase

### Embedded mitigation

11.7.3. The daylight consultant worked with the Architect during design development to assess and understand likely daylight and sunlight effects and, where appropriate, to consider potential primary mitigation measures to ameliorate the potential effects. Primary mitigation against potential solar glare effects is also embedded in the design by avoiding reflective materials (with the exception of glazed windows) in areas that could cause potential solar glare.

### Operation effects

#### Daylight to existing surrounding buildings

11.7.4. The daylight conditions for the eight existing surrounding receptor buildings have been assessed with the Proposed Development in place and quantified in the detailed results tables in Appendix 11.1.5 (columns headed “Prop.”).

11.7.5. The values with the Proposed Development in place were then compared with those in the baseline and the differences, i.e. impacts, were quantified both on an absolute scale (column headed “Loss”) and a relative scale (column headed “Pro/Ex”).

11.7.6. The impacts were categorised and counted according to the scale of magnitude of impact in Table 11-4 above and summarised in Table 11-8 and Table 11-9 below. In total, 605 windows serving 318 rooms were assessed for daylight across the eight buildings.

**Table 11-8 – Summary of VSC impacts from the Proposed Development**

| Property address | No. of windows tested | No. inside VSC guidelines | No. outside VSC guidelines | | |
|---|---|---|---|---|---|
| | | | Low magnitude | Medium magnitude | High magnitude |
| Co-op Academy New Islington | 13 | 0 | - | 8 | 5 |
| Old Mill and Decker Mill | 86 | 78 | 7 | 1 | - |
| Royal Mills and Sedgwick Mills | 197 | 181 | 7 | 9 | - |
| MM2 Building Flats 1-65 | 40 | 33 | 7 | - | - |
| MM2 Building Flats 66-93 | 24 | 24 | - | - | - |
| Brownsfield Mill | 114 | 114 | - | - | - |

| Property address | No. of windows tested | No. inside VSC guidelines | No. outside VSC guidelines | | |
|---|---|---|---|---|---|
| | | | Low magnitude | Medium magnitude | High magnitude |
| 40 Laystall Street (apart hotel) | 41 | 35 | 4 | 2 | - |
| Port Street | 90 | 90 | - | - | - |
| **Totals:** | **605** | **555** | **25** | **20** | **5** |
| | | *92%* | *4%* | *3%* | *1%* |

**Table 11-9 – Summary of NSL impacts from the Proposed Development**

| Property address | No. of rooms tested | No. inside NSL guidelines | No. outside NSL guidelines | | |
|---|---|---|---|---|---|
| | | | Low magnitude | Medium magnitude | High magnitude |
| Co-op Academy New Islington | 9 | 1 | - | - | 8 |
| Old Mill and Decker Mill | 47 | 42 | 1 | 2 | 2 |
| Royal Mills and Sedgwick Mills | 128 | 67 | 21 | 16 | 24 |
| MM2 Building Flats 1-65 | 16 | 16 | - | - | - |
| MM2 Building Flats 66-93 | 12 | 12 | - | - | - |
| Brownsfield Mill | 58 | 58 | - | - | - |
| 40 Laystall Street (apart hotel) | 18 | 16 | - | - | 2 |
| Port Street development | 30 | 30 | - | - | - |
| **Totals:** | **318** | **242** | **22** | **18** | **36** |
| | | *76%* | *7%* | *6%* | *11%* |

11.7.7. In the Proposed Development condition, the daylight impacts would be inside the BRE default numerical guidelines to 555 windows (92%) for VSC and, 242 rooms (76%) for NSL.

11.7.8. For the following three properties, which appear in the rows shaded grey in summary Table 11-8 and Table 11-9 above, all daylight impacts would be inside the BRE default numerical guidelines for both VSC and NSL and the effects would be negligible:

- M M2 Building (Flats 66-93)
- Brownsfield Mill
- Port Street development

11.7.9. The remaining five properties would experience some VSC and/or NSL impacts outside the BRE guidelines. These are examined in more detail below.

***Co-op Academy New Islington***

11.7.10. Daylight has been assessed to 13 windows serving nine classrooms in this school building: two classrooms each for Reception and Year 4 on the ground floor, two classrooms each for Years 5 and 6 on the first floor, and an IT suite on the first floor. The classrooms for Years 1, 2 and 3 (six classrooms in all) are on the far side of the school and have not been assessed as they would be unaffected.

11.7.11. The classrooms and IT suite are around 8.8m and 8.1m-deep respectively and lit from one side only. As they are considerably greater than 5m deep, a greater movement of the no-sky line may be unavoidable (see BRE paragraph 2.2.12).

11.7.12. The ground floor rooms have projecting rain canopies above their main windows with a small clerestory window above. The rain canopy to the Reception classrooms has been extended with a timber and translucent polycarbonate structure. The window serving the IT suite sits behind a recessed balcony. These features restrict the view of sky from the relevant windows. The BRE guide recognises that because the canopies/balcony cuts out light from the top part of the sky, a larger relative impact may result (see BRE paragraph 2.2.13 to 2.2.14).

11.7.13. None of the VSC impacts and one of the NSL impacts (IT suite) would be inside the BRE default numerical guidelines.

11.7.14. The magnitudes of impact on VSC would be medium for eight windows and high for five windows (outlined orange and red respectively on window location drawing LOC-VSC-001 at Appendix 11.1.4). When the area-weighted mean VSC for the nine rooms is considered, the magnitudes of impact would be medium for four rooms and high for five rooms. The eight classrooms that would be outside the default NSL guidelines would experience high-magnitude impacts.

11.7.15. For the IT suite, the VSC value would reduce from 17.2% (existing) to 9.5% (proposed), i.e. 0.55 times former value (high magnitude). In the supplementary assessment with the recessed balcony removed, the VSC would reduce from 33.8% (existing) to 26.1% (proposed), i.e. 0.77 times former value (low magnitude), which is only fractionally below BRE guidelines. This illustrates how the recessed balcony increases sensitivity and amplifies relative light loss to the window. In both assessments, NSL would remain 100% in the proposed condition.

11.7.16. For the first-floor classrooms (which are unaffected by canopies), the VSC values would reduce from 36.3%-36.6% (existing) to 24.7%-25.1% (proposed), i.e. 0.68-0.69 times former value (medium magnitude). This is good for an urban area. The NSL values would reduce from 99%-100% (existing) to 43%-49% (proposed), i.e. 0.44-0.50 times former value (high magnitude), but the deep rooms (8.8m versus 5m guideline) must be borne in mind.

11.7.17. For the ground-floor classrooms with canopies, the VSC values to the clerestory windows immediately above the canopies would reduce from 35.7%-36.4% (existing) to 23.4%-24.1% (proposed), i.e. 0.65-0.66 times former value (medium magnitude), whereas to the corresponding windows immediately below the canopies the VSC values would reduce from 9.1%-17.7% (existing) to 1.4%-4.6% (proposed), i.e. 0.15-0.26 times former value (high magnitude). The area-weighted mean VSCs for the rooms would reduce from 14.3%-21.2% (existing) to 5.7%-8.3% (proposed), i.e. 0.39-0.43 times former value (high magnitude). The clerestory windows retain good daylight for an urban area, as would the main windows, but for the canopies. The NSL values would reduce from 96%-99% (existing) to 42%-48% (proposed), i.e. 0.43-0.50 times former value (high magnitude), but the guideline on rooms more than 5m deep must be borne in mind.

11.7.18. In the supplementary assessment of the ground-floor classrooms with the canopies removed, the VSC values to the windows immediately below the canopies would reduce from 35.4%-36.1% (existing) to 22.6%-23.4% (proposed), i.e. 0.64-0.65 times former value (medium magnitude). The area-weighted mean VSCs for the rooms would reduce from 35.5%-36.1% (existing) to 22.8%-23.5% (proposed), i.e. 0.64-0.65 times former value (medium magnitude). This highlights that the canopies are a material factor in the relative light loss. The NSL results without canopies are broadly similar to those with the canopies, but the 5m-deep guideline is relevant.

11.7.19. The conclusions to be drawn from these results are:

- In the existing baseline, the school building enjoys unusually high levels of daylight over the existing cleared site, except to windows whose view of sky is restricted by ground-floor rain canopies and first-floor recessed balcony.
- The Proposed Development would result in high magnitude daylight impacts to windows restricted by canopies/balconies and medium magnitude impacts to unfettered windows.
- The retained VSC values in the proposed condition would be good for an urban area, except under canopies and behind the recessed balcony, where daylight is fettered by the design of the school building.
- But for these self-restrictions, all VSC impacts would be medium magnitude and the retained VSCs would be 22.6%-26.1%, which is good for an urban area. The canopies/balcony are a material factor in the larger relative light loss to the corresponding windows.
- At 8.8m and 8.2m deep respectively, the classrooms and IT suite are significantly deeper than the 5m depth beyond which the BRE guide recognises that a greater movement of the no-sky line may be unavoidable.

11.7.20. Having regard to Appendix H of the BRE guide (see paragraph 11.4.67 above), and the effect of the overhanging canopies, the significance of the daylight effects would be permanent moderate adverse.

***Old Mill and Decker Mill***

11.7.21. This converted former mill building contains dwellings at all floor levels.

11.7.22. Daylight has been assessed to 86 windows serving 47 habitable rooms (seven LKDs, two LDs, and 38 bedrooms) across 19 dwellings. The VSC and NSL impacts would be inside the default numerical BRE guidelines to 78 windows (91%) and 42 rooms (89%) respectively.

11.7.23. The only impacts that would be outside the guidelines are to a three-bedroom, triple-aspect corner flat on each floor level from lower ground to third floor levels (five flats). Each flat has a master bedroom and a snug facing away from the Site, which would not be affected, a living/kitchen/dining room (LKD) lit by a pair of windows facing Murray Street (labelled W1 and W2 on the window location drawing LOC-VSC-002 at Appendix 11.1.4), a dual-aspect corner bedroom (windows W3, W4 and W5), and a third bedroom facing Redhill Street (windows W6 and W7).

11.7.24. Although VSC impacts would be outside the guidelines to eight windows individually (outlined yellow and orange on window location drawing LOC-VSC-002 at Appendix 11.1.4), after considering area-weighted mean VSC, only two rooms would be outside the default VSC guidelines: lower ground floor LKD (B01_R1_W1 & W2) and ground floor LKD (F00_R1_W1 & W2). In both cases, the magnitudes of impact would be small (0.71 and 0.76 times former value respectively), as would the absolute loss (not exceeding 2% VSC).

11.7.25. Five rooms would be outside the default NSL guidelines: the LKDs from lower ground to third floor levels. The magnitudes of impact would be high for two rooms, medium for two rooms, and low for one room (working up the building). The rooms face an existing eight-storey building (Sedgwick Mills) across a narrow street (Murray Street). Coupled with their windows being on the back edge of the pavement, they rely on a narrow shaft of oblique light from over the Site. Arguably, they are overly reliant on oblique light from over the Site (BRE paragraph 2.2.3).

11.7.26. Having regard to Appendix H of the BRE guide, the small absolute VSC losses, and the over-reliance on a narrow shaft of oblique light from over the Site, the significance of the daylight effects would be permanent minor adverse.

***Royal Mills and Sedgwick Mills***

11.7.27. This converted former mill building contains commercial uses at ground and first floor level and dwellings at second floor level and above. The residential conversion has resulted in very deep habitable rooms – some up to 11m deep – lit from one side only. As they are considerably greater than 5m deep, a greater movement of the no-sky line may be unavoidable (BRE paragraph 2.2.12).

11.7.28. Daylight has been assessed to 197 windows serving 128 rooms in (58 LKDs, five living rooms, 61 bedrooms, and four rooms of unknown use) across 57 dwellings. The VSC and NSL impacts would be inside the default numerical BRE guidelines to 181 windows (92%) and 67 rooms (52%) respectively.

11.7.29. Although VSC impacts would be outside the guidelines to 16 windows individually (outlined yellow and orange on window location drawing LOC-VSC-003-01 and 003-02 at Appendix 11.1.4), after considering area-weighted mean VSC, only 11 rooms would be outside the default VSC guidelines with low and medium magnitude impacts: four LKDs (windows W3 to W6, and W11 to W15) and six bedrooms (W7 to W10, and W16 to W17) at second floor level, and one LKD (windows W11 to W13) at third floor level. The retained VSC values would range from 25.6% to 26.9%, which is only marginally below the 27% target and good for an urban area.

11.7.30. Of the 61 rooms that would be outside the default NSL guidelines, the magnitudes of impact would be low for 21 rooms, medium for 16 rooms and high for 24 rooms. The residual NSL values for the adversely affected rooms would range from 28% to 79%, with an average of 53%. The affected rooms are 29 LKDs and 32 bedrooms. However, the guideline on rooms more than 5m deep must be borne in mind. Such deep rooms (up to 11m deep) only enjoy deep light penetration currently due to the Site being clear of massing. Most of the rooms would retain light penetration to a depth of around 5m, so if the rooms were no more than 5m deep the magnitude of impacts would be much lower and the retained NSL values would be considerably higher.

11.7.31. Having regard to Appendix H of the BRE guide, the retained VSC levels, and the effect of very deep rooms on the NSL results with development of a cleared site, the significance of the daylight effects would be permanent minor adverse.

***MM2 Building Flats 1-65***

11.7.32. Daylight has been assessed to 40 windows serving 16 rooms in this residential building. The VSC and NSL impacts would be inside the BRE default numerical guidelines to 33 windows (82%) and 16 rooms (100%) respectively.

11.7.33. The seven windows that would be outside the default VSC guidelines would experience low-magnitude impacts (0.74 to 0.79 times former value, outlined yellow on window location drawings LOC-VSC-004-01 and 004-02 at Appendix 11.1.4). When the area-weighted mean VSC for the five rooms is considered, the magnitudes of impact would be low for three rooms and negligible for the other two. The affected windows would retain between from 24.4% to 26.7%, which is only slightly below the 27% guideline and good for an urban area.

11.7.34. All NSL impacts would be inside the BRE default numerical guidelines.

11.7.35. The significance of the daylight effects would be permanent minor adverse.

***40 Laystall Street***

11.7.36. Although not residential use (Use Class C3), this apart hotel (Use Class C1) was assessed for completeness. The apart hotel suites are located at first floor and above, with commercial use on the ground floor. The lowest two floors (first and second) of the apart hotel were assessed.

11.7.37. Daylight has been assessed to 41 windows serving 18 rooms in this apart hotel building. The VSC and NSL impacts would be inside the default numerical BRE guidelines to 35 windows (85%) and 16 rooms (89%) respectively.

11.7.38. Of the six windows that would be outside the default VSC guidelines, the magnitudes of impact would be low for four windows (serving two LKDs) and medium for two windows (serving two bedrooms). The windows are outlined yellow and orange respectively on window location drawing LOC-VSC-006 at Appendix 11.1.4.

11.7.39. The residual VSC values for the affected LKDs would range from 21.4% to 28%, which is good for an urban area. The residual VSC values for the affected bedrooms, which have a lower requirement for daylight and whose view of sky is blinkered by their own building, would range from 9.6% to 10.2%.

11.7.40. The two rooms that would be outside the default NSL guidelines are bedrooms and would experience high-magnitude impacts. The residual NSL values for these rooms would be 40% to 46%.

11.7.41. The significance of the daylight effects would be permanent minor adverse.

**Sunlight to existing surrounding buildings**

11.7.42. The sunlight conditions for the eight existing surrounding receptor buildings have been assessed with the Proposed Development in place and quantified in the detailed results tables in Appendix 11.1.5 (columns headed “Prop.”).

11.7.43. The values with the Proposed Development in place were then compared with those in the baseline and the differences, i.e. impacts, were quantified both on an absolute scale (column headed “Loss”) and a relative scale (column headed “Pro/Ex”).

11.7.44. The impacts were categorised and counted according to the scale of magnitude of impact in Table 11-4 above and summarised in the Table 11-10 and Table 11-11 below. In total, 280 rooms were assessed for sunlight across the eight buildings.

**Table 11-10 – Summary of annual sunlight impacts from the Proposed Development**

| Property address | No. of rooms tested | No. inside APSH annual guidelines | No. outside APSH annual guidelines | | |
|---|---|---|---|---|---|
| | | | Low magnitude | Medium magnitude | High magnitude |
| Co-op Academy New Islington | 9 | 8 | - | 1 | - |
| Old Mill and Decker Mill | 47 | 44 | 3 | - | - |
| Royal Mills and Sedgwick Mills | 128 | 128 | - | - | - |
| MM2 Building Flats 1-65 | 16 | 16 | - | - | - |
| MM2 Building Flats 66-93 | 12 | 12 | - | - | - |
| Brownsfield Mill | 48 | 48 | - | - | - |
| 40 Laystall Street (apart hotel) | 2 | 2 | - | - | - |
| Port Street | 18 | 18 | - | - | - |
| **Totals:** | **280** | **276** | **3** | **1** | **0** |
| | | ***99%*** | ***1%*** | ***0%*** | ***0%*** |

**Table 11-11 – Summary of winter sunlight impacts from the Proposed Development**

| Property address | No. of rooms tested | No. inside APSH winter guidelines | No. outside APSH winter guidelines | | |
|---|---|---|---|---|---|
| | | | Low magnitude | Medium magnitude | High magnitude |
| Co-op Academy New Islington | 9 | 9 | - | - | - |
| Old Mill and Decker Mill | 47 | 47 | - | - | - |
| Royal Mills and Sedgwick Mills | 128 | 128 | - | - | - |
| MM2 Building Flats 1-65 | 16 | 16 | - | - | - |
| MM2 Building Flats 66-93 | 12 | 12 | - | - | - |
| Brownsfield Mill | 48 | 48 | - | - | - |
| 40 Laystall Street (apart hotel) | 2 | 2 | - | - | - |
| Port Street development | 18 | 18 | - | - | - |
| **Totals:** | 280 | 280 | **0** | **0** | **0** |
| | | *100%* | *0%* | *0%* | *0%* |

11.7.45. In the Proposed Development condition, the sunlight impacts would be inside the BRE default numerical guidelines to 276 out of 280 rooms (99%) for both annual and winter sunlight.

11.7.46. For the following six buildings, which appear in the rows shaded grey in summary Table 11-10 and Table 11-11 above, all sunlight impacts would be inside the BRE default numerical guidelines for both annual and winter sunlight and the effects would be negligible:

- Royal Mills and Sedgwick Mills
- M M2 Building (Flats 1-65)
- M M2 Building (Flats 66-93)
- Brownsfield Mill
- 40 Laystall Street (apart hotel)
- Port Street development

11.7.47. The remaining two properties would experience some VSC and/or NSL impacts outside the BRE guidelines. These are examined in more detail below.

***Co-op Academy New Islington***

11.7.48. Schools are generally not considered as having a special requirement for sunlight and arguably do not require assessment. However, Co-op Academy New Islington has been scoped into the study for completeness and to include an assessment of its rooftop solar panels.

11.7.49. The same nine rooms have been assessed for sunlight as daylight: two classrooms each for Reception and Year 4 on the ground floor, two classrooms each for Years 5 and 6 on the first floor, and an IT suite on the first floor.

11.7.50. The sunlight impacts would be inside the BRE default numerical guidelines to eight rooms (89%) and outside the guidelines to one room. The one room (IT suite) that would be outside the annual sunlight guidelines would experience a medium-magnitude impact on annual sunlight only (0.62 times former value). The residual annual sunlight value would be 19.6% APSH.

11.7.51. Given that IT suites do not have a requirement for sunlight, the significance of the sunlight effects on the building would be negligible.

***Old Mill and Decker Mill***

11.7.52. Sunlight has been assessed to 47 rooms in this converted former mill building. The sunlight impacts would be inside the BRE default numerical guidelines to 44 rooms (94%) and outside the guidelines to three rooms.

11.7.53. The three rooms that would be outside the default sunlight guidelines would experience low-magnitude impacts (0.74 times former value) to annual sunlight only. The affected rooms are the LKDs (W1 and W2) at lower ground to first floor levels facing Murray Street with an oblique view of sky over the Site.

11.7.54. The affected rooms would retain 20% APSH annually, which is good for an urban area, and 6% APSH in winter, which exceeds the winter sunlight guideline.

11.7.55. The significance of the sunlight effects would be permanent minor adverse.

**Sunlight to solar panels**

11.7.56. As an initial check on potential impact on solar radiation to the eight arrays of solar panels located on the roof of the Co-op Academy New Islington school building, sunlight was assessed using the APSH test, as explained at paragraphs 11.4.22 and 11.4.30. The results are shown in Table 11-12 below.

**Table 11-12 – Sunlight impacts to rooftop solar panels at Co-op Academy New Islington**

| Solar panel ref. | APSH (%) - baseline | APSH (%) - proposed | Proposed / baseline ratio |
|---|---|---|---|
| Array 1 | 96% | 81% | 0.84 |
| Array 2 | 97% | 83% | 0.86 |
| Array 3 | 97% | 85% | 0.88 |
| Array 4 | 95% | 83% | 0.87 |
| Array 5 | 95% | 83% | 0.87 |
| Array 6 | 96% | 83% | 0.86 |
| Array 7 | 96% | 82% | 0.85 |
| Array 8 | 96% | 81% | 0.84 |

11.7.57. The levels of APSH received by the school's rooftop solar panels would be reduced by the Proposed Development to between 0.84 and 0.88 times their baseline levels, which is slightly below the BRE 0.90 numerical guideline. Consequently, the more detailed assessment of solar radiation was carried out.

11.7.58. The results of the detailed solar radiation assessment are tabulated at Appendix 11.1.5 and summarised in Table 11-13 below. The eight arrays of solar panels are shown labelled in the aerial image in Figure 1.

**Table 11-13 – Solar radiation impacts to rooftop solar panels at Co-op Academy New Islington**

| Solar panel ref. | Solar radiation (kWh/m$^2$) – baseline | Solar radiation (kWh/m$^2$) – proposed | Proposed / baseline ratio |
|---|---|---|---|
| Array 1 | 1,051 | 941 | 0.90 |
| Array 2 | 1,040 | 945 | 0.91 |

| Solar panel ref. | Solar radiation (kWh/m$^2$) – baseline | Solar radiation (kWh/m$^2$) – proposed | Proposed / baseline ratio |
|---|---|---|---|
| Array 3 | 1,040 | 949 | 0.91 |
| Array 4 | 1,040 | 952 | 0.92 |
| Array 5 | 1,041 | 956 | 0.92 |
| Array 6 | 1,042 | 953 | 0.91 |
| Array 7 | 1,042 | 948 | 0.91 |
| Array 8 | 1,052 | 944 | 0.90 |




**Figure 1 - Aerial image of rooftop solar panels to Co-op Academy New Islington (© Google)**

11.7.59. The slope angle of each of array of solar panels is around 10°. As the solar radiation to each array of panels would not reduce to less than 0.90 times former value, the loss is within the BRE guidelines and is not significant.

11.7.60. The significance of the potential sunlight effects to solar panels would be negligible.

**Sunlight and overshadowing to playgrounds and amenity spaces**

11.7.61. The results of the two-hour sun-on-ground on 21 March assessment of the six playground and other outdoor spaces at the Co-op Academy New Islington are shown graphically and set out in the results table on the drawing at Appendix 11.1.6.

11.7.62. The final three columns of the table confirm the proportion of each amenity space that would retain at least two hours of sunlight on 21 March in the Proposed Development condition, the factor of former value, and whether the results meet the BRE numerical guidelines.

11.7.63. The six playground and other outdoor spaces at the school would be able to receive at least two hours of sunlight on 21 March to between 86% and 100% of their area, which is well in excess of the BRE 50% numerical guideline. They would also experience negligible impact, with two retaining between 0.87 and 0.89 times their former values and the other four experiencing no reduction.

11.7.64. The significance of the sun-on-ground effects to the school playgrounds and amenity spaces would be negligible.

11.7.65. The shadow plans at Appendix 11.1.7 illustrate the extent of potential overshadowing effects of the Proposed Development. They have been produced at hourly intervals (two per page) from 08:00 hrs to 17:00 hrs GMT on the spring equinox (21st March), which the BRE recommends as the best assessment date as it shows the average level of overshadowing. Existing shadows are coloured grey. Shadow that would be cast by the Proposed Development is coloured yellow.

11.7.66. The Rochdale Canal and towpath to the northwest of the Site would experience new transient overshadowing moving across it from before 08:00 hrs to around 13:00 hrs GMT to varying degrees, albeit bisected by an area of sunlight received from between the two proposed buildings and whose shape and size would change as the sun tracks around.

11.7.67. The playgrounds and other amenity areas at the Co-op Academy New Islington school would experience new transient overshadowing from between around 11:00 hrs and 17:00 hrs GMT to varying degrees.

11.7.68. Cotton Field Park and New Islington Marina would experience new transient overshadowing moving across them in the afternoon from 13:00 hrs to at least 17:00 hrs GMT to varying degrees.

11.7.69. Notwithstanding the new transient overshadowing, all these surrounding amenity spaces would continue to enjoy least two hours of sunlight on 21 March, as per BRE guidelines.

11.7.70. The significance of the overshadowing effects would be permanent minor to moderate adverse.

**Solar glare**

11.7.71. The levels of potential reflected solar glare were assessed at six receptor locations on the public highway (GLR_001 to GLR_006). The results are at Appendix 11.1.8.

11.7.72. For the purposes of the assessment, all areas of glazing on the facades of the Proposed Development were treated as 100% reflective mirrors in order to calculate all times and durations of possible reflected solar glare throughout the year. The glare angles relative to the direction of travel and line of sight of the observer (i.e. car driver) were also calculated.

11.7.73. Solar glare can only occur when the sunshine is sufficiently bright to reflect off surfaces. The probability of bright sunshine occurring at each time of day and date in the year, as advised in the BRE solar glare paper based on long-term weather data, was applied to the numerical data to calculate the durations at each interval when solar reflections would probably reach the receptor locations.

11.7.74. The total annual duration (in hours) of probable glare occurrences throughout the year, after allowing for average levels of cloudiness, for each receptor location are reproduced in Table 11-14 below.

**Table 11-14 – Summary of probable annual solar glare durations in the Proposed Development scenario**

| Location ref. | Probable annual solar glare duration (hours) within stated glare angles | | | | |
|---|---|---|---|---|---|
| | <5° | 5°-9.9° | 10°-29.9° | ≥30° | All angles |
| GLR_001 | - | 0.6 | 11.0 | 2.7 | 14.2 |
| GLR_002 | - | 2.9 | 16.8 | - | 19.8 |
| GLR_003 | - | 0.2 | 1.8 | 0.1 | 2.1 |
| GLR_004 | 0.0 | 0.3 | 50.7 | 7.8 | 58.8 |
| GLR_005 | - | - | 8.9 | 5.6 | 14.5 |
| GLR_006 | 2.1 | 15.9 | 12.9 | - | 30.8 |

11.7.75. For more information, refer to the drawing for the relevant receptor location, which contains the following information:

- Plan showing location of receptor
- Rendered diagrams using a false-colour image of the sun paths potentially reflected from the glazing of the Proposed Development. The coloured diagram aids an understanding of the source area of the façade of the Proposed Development that may allow solar reflections to reach the receptor location. The left-hand image shows the typical field of view from the receptor location. The right-hand image shows a close-up view within 30 degrees of the central line of sight.
- Tabulated results showing the total annual duration (in minutes) of all possible and probable glare occurrences throughout the year in each band of glare angles.

11.7.76. The solar glare sensitivity criteria stated in Table 11-4, which is based on a combination of glare angle and duration, was then applied to the data to enable the significance of effect to be established. The findings are presented below.

***GLR_001 – Henry Street***

11.7.77. Location GLR_001 is on Henry Street approaching the T-junction with Redhill Street. Being a side street with low-speed traffic, the receptor is of low sensitivity.

11.7.78. The total probable annual solar glare duration is around 14 hours, mostly for short individual periods of time, typically with glare angles between 10° and 30° (low magnitude), and none less than 5°.

11.7.79. The significance of the potential solar glare effects of the Development on this receptor location would be **negligible**.

***GLR_002 – Pickford Street***

11.7.80. Location GLR_002 is on Pickford Street approaching the T-junction with Redhill Street. Being a side street with low-speed traffic, the receptor is of low sensitivity.

11.7.81. The total probable annual solar glare duration is around 20 hours, mostly for short individual periods of time, typically with glare angles between 10° and 30° (low magnitude), some between 5° and 10° (medium magnitude) and none less than 5°.

11.7.82. The significance of the potential solar glare effects of the Development on this receptor location would be negligible to minor adverse.

***GLR_003 – Great Ancoats Street***

11.7.83. Location GLR_003 is on Great Ancoats Street heading southeast approaching the pelican crossing T-junction with Redhill Street before the canal crossing. Being a main road, the receptor is of medium sensitivity.

11.7.84. The total probable annual solar glare duration is around two hours for very short individual periods of time, typically with glare angles between 10° and 30° (low magnitude), none less than 5°, and none that would veil the pelican crossing traffic lights.

11.7.85. The significance of the potential solar glare effects of the Development on this receptor location would be negligible.

***GLR_004 – Laystall Street***

11.7.86. Location GLR_004 is on Laystall Street approaching the T-junction with Great Ancoats Street. Being a side street with low-speed traffic, the receptor is of low sensitivity.

11.7.87. The total probable annual solar glare duration is around 59 hours, some for longer individual periods of time, typically with glare angles between 10° and 30° (low magnitude), virtually none (0.03 hours annually) less than 5°, and none that would veil the traffic lights.

11.7.88. The significance of the potential solar glare effects of the Development on this receptor location would be permanent **minor adverse**.

***GLR_005 – Great Ancoats Street***

11.7.89. Location GLR_005 is on Great Ancoats Street heading northwest approaching the traffic lights at the junction with Laystall Street. Being a main road, the receptor is of medium sensitivity.

11.7.90. The total probable annual solar glare duration is around 14 hours, largely for short individual periods of time, typically with glare angles between 10° and 30° (low magnitude) or greater, none less than 10°, and none that would veil the traffic lights.

11.7.91. The significance of the potential solar glare effects of the Development on this receptor location would be negligible to minor adverse.

***GLR_006 – Great Ancoats Street***

11.7.92. Location GLR_006 is on Great Ancoats Street heading northwest approaching the traffic lights at the junction with Store Street. Being a main road, the receptor is of medium sensitivity.

11.7.93. The total probable annual solar glare duration is around 31 hours, some for longer individual periods of time, typically with glare angles between 5° and 30° (low and medium magnitude), some (around two hours annually) less than 5°, and some that could potentially veil one or more of the traffic lights.

11.7.94. The potential solar reflections from the north building are heavily broken up by non-reflecting parts of the facades (see drawing GLR_006 at Appendix 11.1.8), so the risk of disability glare from this building is not significant.

11.7.95. The areas of potential solar reflection from the southeast façade of the south building are somewhat broken up by non-reflecting parts of the façade. The periods when the latter solar reflections may possibly occur at solar glare angles of 10° or less are for between three and 16 minutes per day between 7 am and 8 am for seven days in late-February and again in mid-October when the probability of bright sunshine occurring is around 10%, and for between one and two minutes per day between 4 pm and 5 pm for four days in early March and again in early October when the probability of bright

sunshine occurring is around 20%. All but one instance would have a solar glare angle between 6° and 10°, so drivers should be able to mitigate the potential effects by using their sun visors. At these times (early morning and later afternoon in spring and autumn respectively) the intensity of the sun, and therefore the glare, is relatively low.

11.7.96. At location GLR_006, drivers approaching the junction are presented with a pair of traffic lights positioned either side of the main carriageway. Only the lights on the right-hand side of the main carriageway are in the same line of sight as the potential solar reflections. The lights on the left-hand side of the junction are not in the same line of sight as the potential solar reflections, being more than 20° to the left (compare Figure 2 below and compare with drawing GLR_006 at Appendix 11.1.8).




**Figure 2 – Google street view from receptor location GLR_006 (© Google)**

11.7.97. Taking all factors into account, the significance of the potential solar glare effects of the Development on this receptor location would be minor adverse.

# 11.8. Additional mitigation and enhancement measures

11.8.1. Although no additional mitigation is required for the daylight, sunlight, overshadowing and solar glare effects, the Applicant wishes to offer mitigation to the Co-op Academy New Islington in the form of funding for the replacement of their two existing rain canopies above/outside the Reception classroom windows (which comprise two original solid projecting canopies and a timber and clear polycarbonate roof structure) with glazed rain canopies to admit more light. With this mitigation, the significance of the daylight effects would reduce to minor to moderate adverse.

# 11.9. Residual effects

## Construction

11.9.1. The residual effects during construction would remain as stated in the Assessment of effects section.

## Operation

11.9.2. The residual effects during operation would remain as stated in the Assessment of effects section, except the daylight effects to the Co-op Academy New Islington would reduce to minor to moderate adverse with the proposed mitigation (replacement of school's existing rain canopies with new glass canopies, funded by the Applicant).

# 11.10. Cumulative effects

11.10.1. This section considers the cumulative effects of the Proposed Development (intra-project cumulative effects) and the Proposed Development interacting with other RFFPs (inter-project cumulative effects) from the perspective of impacts within the scope of the DSO&SG topic.

## Cumulative effects assessment

11.10.2. The further consideration of cross-topic intra-project and inter-project cumulative effects is reported in Chapter 22: Cumulative Effects.

### Intra-in-combination cumulative effects assessment (single project impacts) within topic

11.10.3. The focus of intra-project CEA is understanding how receptors may experience a number of different types of impacts from the Proposed Development at the same time. Within this topic assessment, singular impacts are considered for the following issues:

- Daylight to existing surrounding buildings
- Sunlight to existing surrounding buildings
- Sunlight to solar panels
- Sunlight and overshadowing to playgrounds and amenity spaces
- Solar glare

11.10.4. Of these singular effects, the two that could potentially combine to cause intra-project cumulative effects would be daylight and sunlight to existing surrounding buildings, because they affect different but interrelated aspects of amenity and comfort within the rooms of a building.

11.10.5. The significance of sunlight effects on Co-op Academy New Islington, Royal Mills and Sedgwick Mills, MM2 Buildings (Flats 1-65 and Flats 66-93), Brownsfield Mill, 40 Laystall Street (apart hotel), and Port Street development would be negligible and would not have a material cumulative effect on amenity beyond the daylight effects. The intra-project cumulative daylight and sunlight effects on these receptors would therefore be no greater than the daylight effects stated in the 'Assessment of effects' section.

11.10.6. The significance of sunlight effects on Old Mill and Decker Milll would be minor adverse on account of low-magnitude loss of sunlight in the summer months to three out of 47 rooms. The three rooms would retain good levels of sunlight for an urban area and all other sunlight impacts would be negligible. There

would be minimal cumulative effect on amenity beyond the daylight effects. The intra-project cumulative daylight and sunlight effects on this receptor would therefore be no greater than the daylight effects stated in the 'Assessment of effects' section, i.e. minor adverse.

## Inter-project cumulative effects assessment (different project impacts) within topic

11.10.7. The inter-project cumulative effects assessment 'within topic' element for the DSO&SG assessment has been completed with reference to the shortlist list of RFFPs that has been developed for the Proposed Development. As explained at paragraphs 11.4.62 to 11.4.63, the only cumulative scheme that has been identified that could potentially give rise to cumulative daylight, sunlight, and overshadowing effects in combination with the effects of the Proposed Development and which has been scoped into the cumulative assessment is the proposed development of a 20-storey building to create a 154-bedroom hotel (Class C1) above 2 basement levels with ancillary café / bar / restaurant and gym and other associated works including highway improvements, cycle parking and creation of accessible parking bay following removal of on-site structures (planning application reference 135662/FO/2022). All other cumulative schemes are too far away from the Site and have been scoped out.

11.10.8. The cumulative scenario is illustrated on drawing numbers CUMU-001, CUMU-002, and CUMU-003 at Appendix 11.1.2. The massing of the proposed cumulative scheme is shown coloured lilac.

## Potential inter-project impacts

### Daylight to existing surrounding buildings

11.10.9. The detailed results for the cumulative daylight assessment are at Appendix 11.1.9. The impacts were categorised and counted according to the scale of magnitude of impact in Table 11-4 above and summarised in the Table 11-15 and Table 11-16 below.

11.10.10. The only difference from the summary tables for the Proposed Development scenario is identified in the row shaded grey in the Table 11-15, with the numerical difference identified in brackets in italics.

**Table 11-15 – Summary of cumulative VSC impacts**

| Property address | No. of windows tested | No. inside VSC guidelines | No. outside VSC guidelines | | |
|---|---|---|---|---|---|
| | | | Low magnitude | Medium magnitude | High magnitude |
| Co-op Academy New Islington | 13 | 0 | - | 8 | 5 |
| Old Mill and Decker Mill | 86 | 78 | 7 | 1 | - |
| Royal Mills and Sedgwick Mills | 197 | 181 | 7 | 9 | - |
| MM2 Building Flats 1-65 | 40 | 33 | 7 | - | - |
| MM2 Building Flats 66-93 | 24 | 24 | - | - | - |
| Brownsfield Mill | 114 | 114 | - | - | - |
| 40 Laystall Street (apart hotel) | 41 | 35 | 3*(-1)* | 1*(-1)* | 2*(+2)* |
| Port Street | 90 | 90 | - | - | - |
| **Totals:** | **605** | **555** | **25** | **20** | **5** |
| | | ***92%*** | ***4%*** | ***3%*** | ***1%*** |

**Table 11-16 – Summary of cumulative NSL impacts**

| | No. outside NSL guidelines |
|---|---|

| Property address | No. of rooms tested | No. inside NSL guidelines | Low magnitude | Medium magnitude | High magnitude |
|---|---|---|---|---|---|
| Co-op Academy New Islington | 9 | 1 | - | - | 8 |
| Old Mill and Decker Mill | 47 | 42 | 1 | 2 | 2 |
| Royal Mills and Sedgwick Mills | 128 | 67 | 21 | 16 | 24 |
| MM2 Building Flats 1-65 | 16 | 16 | - | - | - |
| MM2 Building Flats 66-93 | 12 | 12 | - | - | - |
| Brownsfield Mill | 58 | 58 | - | - | - |
| 40 Laystall Street (apart hotel) | 18 | 16 | - | - | 2 |
| Port Street development | 30 | 30 | - | - | - |
| **Totals:** | **318** | **242** | **22** | **18** | **36** |
| | | *76%* | *7%* | *6%* | *11%* |

11.10.11. As there is no material difference in the cumulative daylight impacts on properties other than 40 Laystall Street (apart hotel), the significance of the cumulative daylight effects on those properties would remain as stated in the Assessment of Effects section.

11.10.12. Turning to 40 Laystall Street (apart hotel), the detailed results show that medium-magnitude VSC impacts to two bedrooms (low sensitivity receptors) would become high-magnitude impacts in the cumulative scenario, because the cumulative scheme will build directly adjacent to them. Also, one low-magnitude VSC impact on one window of one LKD would become a medium-magnitude impact in the cumulative scenario, but the other two windows serving that room would remain low-magnitude impacts and 26% VSC in the cumulative condition, which is good for an urban area. None of the NSL impacts would change classification. The significance of the cumulative daylight effects on 40 Laystall Street would be permanent **minor to moderate adverse**, compared with minor adverse in the Proposed Development condition.

**Sunlight to existing surrounding buildings**

11.10.13. The detailed results for the cumulative sunlight assessment are at Appendix 11.1.9. The impacts were categorised and counted according to the scale of magnitude of impact in Table 11-4 above and summarised in the Table 11-17 and Table 11-18 below.

**Table 11-17 – Summary of cumulative annual sunlight impacts**

| Property address | No. of rooms tested | No. inside APSH annual guidelines | No. outside APSH annual guidelines | | |
|---|---|---|---|---|---|
| | | | Low magnitude | Medium magnitude | High magnitude |
| Co-op Academy New Islington | 9 | 8 | - | 1 | - |
| Old Mill and Decker Mill | 47 | 44 | 3 | - | - |
| Royal Mills and Sedgwick Mills | 128 | 128 | - | - | - |
| MM2 Building Flats 1-65 | 16 | 16 | - | - | - |
| MM2 Building Flats 66-93 | 12 | 12 | - | - | - |
| Brownsfield Mill | 48 | 48 | - | - | - |
| 40 Laystall Street (apart hotel) | 2 | 2 | - | - | - |
| Port Street | 18 | 18 | - | - | - |
| **Totals:** | **280** | **276** | **3** | **1** | **0** |
| | | *99%* | *1%* | *0%* | *0%* |

**Table 11-18 – Summary of cumulative winter sunlight impacts**

| Property address | No. of rooms tested | No. inside APSH winter guidelines | No. outside APSH winter guidelines | | |
|---|---|---|---|---|---|
| | | | Low magnitude | Medium magnitude | High magnitude |
| Co-op Academy New Islington | 9 | 9 | - | - | - |
| Old Mill and Decker Mill | 47 | 47 | - | - | - |
| Royal Mills and Sedgwick Mills | 128 | 128 | - | - | - |
| MM2 Building Flats 1-65 | 16 | 16 | - | - | - |
| MM2 Building Flats 66-93 | 12 | 12 | - | - | - |
| Brownsfield Mill | 48 | 48 | - | - | - |
| 40 Laystall Street (apart hotel) | 2 | 2 | - | - | - |
| Port Street development | 18 | 18 | - | - | - |
| **Totals:** | 280 | 280 | **0** | **0** | **0** |
| | | *100%* | *0%* | *0%* | *0%* |

11.10.14. There is no difference between the summary tables for the cumulative scenario and the Proposed Development scenario. The significance of the cumulative sunlight effects would remain as stated in the Assessment of Effects section.

**Sunlight to solar panels**

11.10.15. The cumulative scheme is too remote from the Co-op Academy New Islington to the north of the Site to result in any cumulative effects on sunlight to its solar panels.

**Sunlight and overshadowing to playgrounds and amenity spaces**

11.10.16. The cumulative scheme is too remote from the playgrounds and amenity spaces to the north of the Site to result in any cumulative effects on sunlight or overshadowing to playgrounds and amenity spaces.

**Solar glare**

11.10.17. At each of the receptor locations where solar glare has been assessed, the cumulative scheme does not sit within 30° of the Proposed Development and is therefore unlikely to result in any significant cumulative solar glare effects.

# Mitigation measures

11.10.18. No additional mitigation measures are proposed beyond those stated at paragraph 11.8.1 above, namely replacement of the school's existing rain canopies with new glass canopies, funded by the Applicant.

# Summary of Cumulative Effects

11.10.19. The intra-project cumulative effects assessment has identified no impacts of significance.

11.10.20. Within the inter-project assessment, one significant effect has been assessed. The significance of the cumulative daylight effects on 40 Laystall Street would be permanent minor to moderate adverse, compared with minor adverse in the Proposed Development condition.

# 11.11. Summary and conclusions

11.11.1. Since demolition of the former retail park buildings some years ago, the baseline is a cleared site condition. Consequently, the surrounding buildings and amenity spaces enjoy unusually high levels of daylight and sunlight across the Site.

11.11.2. The assessment methodology has followed that recommended in the BRE guide and BRE solar glare paper and has used 3D computer modelling and software analysis to calculate the impacts on daylight (VSC and NSL) and sunlight (APSH) to surrounding buildings, sunlight to rooftop solar panels on the adjacent school, sun on ground to the school playgrounds, transient overshadowing to nearby amenity spaces, and potential for solar glare to occur at key points on the surrounding highways.

11.11.3. During design development, the daylight consultant worked with the Architect to assess and understand likely daylight and sunlight effects and, where appropriate, to consider potential primary mitigation measures to ameliorate the potential effects. A pre-application consultation meeting was held with Manchester City Council planning officers to present the daylight and sunlight impacts of early-stage scale and massing.

11.11.4. During the construction phase, any daylight, sunlight, overshadowing, and solar glare effects will fluctuate as the Proposed Development is constructed. Any impacts due to on-site machinery such as cranes would be short to medium term and changeable during operational hours. The impacts during the construction phase are unlikely to exceed those of the completed Proposed Development and their assessment has been scoped out of this chapter.

11.11.5. The significance of effects of the operational phase of the Proposed Development on existing surrounding receptors would be as follows:

- Daylight to buildings: negligible for three buildings, minor adverse for four buildings, and moderate adverse for one building (school)
- Sunlight to buildings: negligible for seven buildings, and minor adverse for one building
- Sunlight to solar panels: negligible for the school's rooftop solar panels
- Sun-on-ground to amenity spaces: negligible for the school's playgrounds and amenity spaces
- Transient overshadowing to surrounding amenity spaces: minor to moderate adverse
- Solar glare: negligible for two locations, negligible to minor adverse for two locations, minor adverse for two locations

11.11.6. The Applicant wishes to offer mitigation measures to the Co-op Academy New Islington in the form of replacement of two existing rain canopies with new glazed rain canopies funded by the Applicant. With this mitigation, the residual effects on daylight to the school would reduce in significance to minor to moderate adverse.

11.11.7. There would be no intra-project cumulative effects of significance. Only one cumulative scheme (application reference 135662/FO/2022 for a proposed 20-storey building at the junction of Laystall Street and Great Ancoats Street) has been scoped into the inter-project cumulative effects assessment. The significance of inter-project cumulative effects would the same as the significance of effects of the Proposed Development, with the exception of daylight impacts on 40 Laystall Street (apart hotel). The latter would increase slightly in significance from minor adverse in the Proposed Development condition

to minor to moderate adverse in the cumulative condition, solely due to the cumulative scheme being positioned directly adjacent to some of the bedroom windows to 40 Laystall Street. No additional mitigation is proposed in response to the limited cumulative effects.

11.11.8. The significance of most effects would be negligible or minor adverse. The exceptions are:

- Moderate adverse daylight effects to the Co-op Academy New Islington school, although there are mitigating factors, as summarised at paragraph 11.7.19, reducing to minor to moderate adverse after mitigation.
- Minor to moderate adverse overshadowing effects on amenity spaces directly to the north of the Site, including playgrounds and other amenity areas at the Co-op Academy New Islington school, Cotton Field Park and New Islington Marina, although the BRE two-hour sun-on-ground recommendations would nonetheless be met.

11.11.9. As the Site has already been cleared of any massing from the former retail park in the existing baseline condition, daylight, sunlight and overshadowing impacts greater than the BRE numerical guidelines are unavoidable if the densities expected of a commercially led regeneration of the Site are to be achieved.

11.11.10. The effects are summarised in the table below.

**Table 11-19 – Summary of effects**

| Resource / Receptor / affected group | Sensitivity of receptor | Activity or impact | Embedded design mitigation | Effect<br>Magnitude<br>Type<br>Spatial extent<br>Duration<br>Likelihood | Significance of effect | Additional mitigation | Residual effect |
|---|---|---|---|---|---|---|---|
| **Construction** | | | | | | | |
| Various | Various | Daylight, sunlight, overshadowing, solar glare | None | Adverse | Not Significant | None | Not Significant |
| | | | | Fluctuating magnitude, not exceeding that of the completed development | | | |
| | | | | Direct | | | |
| | | | | Local | | | |
| | | | | Temporary | | | |
| | | | | Likely | | | |
| **Operation** | | | | | | | |
| Co-op Academy New Islington school | High | Daylight | Yes | Adverse | Moderate | Glazed rain canopies to admit more light | Minor to moderate |
| | | | | Medium/High | | | |
| | | | | Direct | | | |
| | | | | Local | | | |
| | | | | Permanent | | | |
| | | | | Certain | | | |
| Co-op Academy New Islington school | High (playground) to low (classrooms) | Sunlight to building, playgrounds and other amenity spaces | Yes | Adverse | Not Significant | None | Not Significant |
| | | | | Negligible | | | |
| | | | | Direct | | | |
| | | | | Local | | | |
| | | | | Permanent | | | |
| | | | | Certain | | | |
| | Medium | | Yes | Adverse | Not Significant | None | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Co-op Academy New Islington school | | Sunlight to solar panels | | Low | | | Not Significant |
| | | | | Direct | | | |
| | | | | Local | | | |
| | | | | Permanent | | | |
| | | | | Certain | | | |
| Old Mill & Decker Mill | Various | Daylight & sunlight | Yes | Adverse | Not Significant | None | Not Significant |
| | | | | Negligible/Low/Medium | | | |
| | | | | Direct | | | |
| | | | | Local | | | |
| | | | | Permanent | | | |
| | | | | Certain | | | |
| Royal Mills & Sedgwick Mills, 1-65 MM2 Building, 40 Laystall St | Various | Daylight | Yes | Adverse | Not Significant | None | Not Significant |
| | | | | Negligible/Low/Medium/High | | | |
| | | | | Direct | | | |
| | | | | Local | | | |
| | | | | Permanent | | | |
| | | | | Certain | | | |
| Royal Mills & Sedgwick Mills, 1-65 MM2 Building, 40 Laystall St | Various | Sunlight | Yes | Adverse | Not Significant | None | Not Significant |
| | | | | Negligible | | | |
| | | | | Direct | | | |
| | | | | Local | | | |
| | | | | Permanent | | | |
| | | | | Certain | | | |
| 66-93 MM2 Building, Brownsfield | Various | Daylight & sunlight | Yes | Adverse | Not Significant | None | Not Significant |
| | | | | Negligible | | | |
| | | | | Direct | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Mill, Port St development | | | | Local | | | |
| | | | | Permanent | | | |
| | | | | Certain | | | |
| Surrounding amenity spaces | Various | Overshadowing | Yes | Adverse | Minor to moderate | None | Minor to moderate |
| | | | | Negligible/Low/Medium | | | |
| | | | | Direct | | | |
| | | | | Local | | | |
| | | | | Permanent | | | |
| | | | | Certain | | | |
| GLR_001 Henry Street | Low | Solar glare | Yes | Adverse | Not Significant | None | Not Significant |
| | | | | Negligible/Low | | | |
| | | | | Indirect | | | |
| | | | | Local | | | |
| | | | | Permanent | | | |
| | | | | Likely | | | |
| GLR_002 Pickford Street | Low | Solar glare | Yes | Adverse | Not Significant | None | Not Significant |
| | | | | Negligible/Low/Medium | | | |
| | | | | Indirect | | | |
| | | | | Local | | | |
| | | | | Permanent | | | |
| | | | | Likely | | | |
| GLR_003 Great Ancoats Street | Medium | Solar glare | Yes | Adverse | Not Significant | None | Not Significant |
| | | | | Negligible/Low | | | |
| | | | | Indirect | | | |
| | | | | Local | | | |
| | | | | Permanent | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | Likely | | | |
| GLR_004 Laystall Street | Low | Solar glare | Yes | Adverse | Not Significant | None | Not Significant |
| | | | | Negligible/Low | | | |
| | | | | Indirect | | | |
| | | | | Local | | | |
| | | | | Permanent | | | |
| | | | | Likely | | | |
| GLR_005 Great Ancoats Street | Medium | Solar glare | Yes | Adverse | Not Significant | None | Not Significant |
| | | | | Negligible/Low | | | |
| | | | | Indirect | | | |
| | | | | Local | | | |
| | | | | Permanent | | | |
| | | | | Likely | | | |
| GLR_006 Great Ancoats Street | Medium | Solar glare | Yes | Adverse | Not Significant | None | Not Significant |
| | | | | Negligible/Low | | | |
| | | | | Indirect | | | |
| | | | | Local | | | |
| | | | | Permanent | | | |
| | | | | Likely | | | |

# 11.12. Glossary and Acronyms

**Table 11-20 – Glossary and acronyms**

| Term | Definition |
|---|---|
| APSH | Annual probable sunlight hours (APSH)<br>The long-term average of the total number of hours during a year in which direct sunlight is expected to shine on the unobstructed ground, allowing for average levels of cloudiness for the location in question. |
| LKD | Living-kitchen-dining room. |
| NSL | No-sky line (NSL)<br>The outline on the working plane of the area from which no sky can be seen. It divides points on the working plane which can and cannot see the sky. |
| SOG | Sun on ground (SOG)<br>The measure of sunlight potential to gardens and amenity spaces. It is measured in hours on the spring equinox (21 March) at a point on the ground accounting for the latitude of the site location. Sunlight below an altitude of 10° is usually discounted as it is likely to be prevented from reaching the ground by fences, plants or other low-level obstructions. |
| VSC | Vertical sky component (VSC)<br>The amount of daylight falling on a vertical wall or window. It is the ratio of that part of illuminance, at a point on a given vertical plane (e.g. window), that is received directly from a CIE standard overcast sky, to simultaneous illuminance on a horizontal plane due to an unobstructed hemisphere of this sky. The VSC does not include reflected light, either from the ground or from other buildings.<br>The ratio is usually expressed as a percentage. The maximum value is almost 40% for a completely unobstructed vertical wall. |

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