

HOUSE 2 & 3 PROVISION OF NATURAL LIGHT

CLASS Q.2 (1)

Stokes Farm Barn Shed #4
Binfield Road,
Binfield,
RG40 5PR

Q.2. (1)

This statement has been prepared to accompany a planning application in relation to development proposals on Stokes Farm Barn Shed #4, Binfield Road, Binfield, Wokingham. (herein after referred to as 'the site'). The site falls within the administrative boundary of Wokingham Borough Council.

The site is located to the Southeast of Binfield Road, the North West of Wokingham Town centre and to the of East of Popeswood which are predominantly residential areas. To the North, the application site fronts onto open pasture, woodland and another redundant Poultry Shed not used for storage. To the South, the site is adjacent to Keephatch Meadows, a SANG/Thames SPA mitigated Greenspace over 100 m away, sitting between the site and A 329. To the East, the barn opens out onto open countryside and woodland, and to the West opens out towards the access road and more pasture

The site has previously been subject to multiple prior approval planning applications within the parameters of Class Q, Part 3, Schedule 2 of the Town and Country Planning (General Permitted Development) Order 2015. Class Q allows for development consisting of a change of use of a building and any land within its curtilage from a use as an agricultural building to a use falling within Class C3 (dwelling houses) of the Schedule to the Use Classes Order.

The site comprises of Barn # 4 which is currently vacant but operated under agricultural use in the past. The development proposals seek prior approval permission to redevelop the site to provide 5no. 2 and 3-bedroom houses. Access to the site will be achieved via the existing access road from Binfield Road. Car and cycle parking will be provided in accordance with applicable policy standards.

This statement will demonstrate that:

- All habitable rooms in House 2 & 3 are provided with natural light.

Baseline Conditions

This Section sets the context for the application proposals, providing information on the application site and surrounding area.

Site Location

The site is located on land north west of Binfield Road, approximately 430 metres to the South West of the recently completed housing development Keephatch Gardens. The site is bound by agricultural land with Keephatch Meadows, A SANG/SAMM, Thames Basin Heaths 'Greenspace', implemented as part of the Keephatch Gardens Residential Development adjacent to the site. Figure 1.



Figure 1 – The site

The site has not been associated with any such uses such as chicken egg production for more than two years due to the downsizing of the poultry business. To the North of the site sits agricultural buildings Shed's #5&6. Previously used for housing chickens, however egg production has been scaled down significantly due for economic reasons, the agricultural buildings are now being used for storage. Land surrounding sheds #5&6 is fenced and used for pasture.

The surrounding area outside the residential curtilage will be maintained as meadow. The land has not been classified by way of the Post 1988 Agricultural Land Classification (Magic.defra.gov.uk) and is considered to be very poor by Natural England and DEFRA Magic Maps. Fig 2

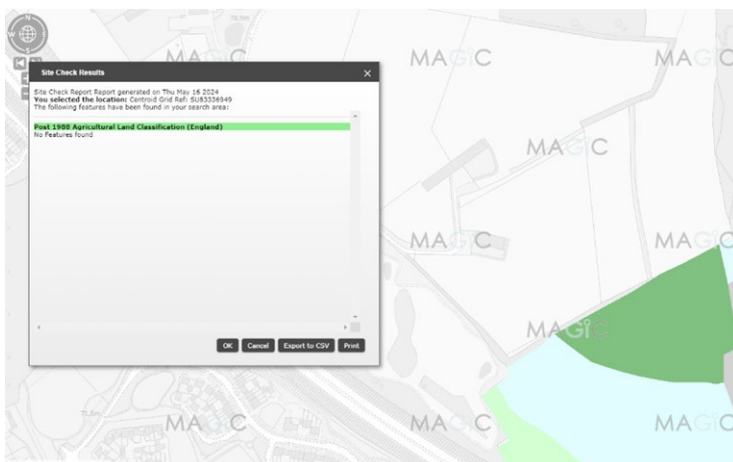


Figure 2 - ©Magic.defra.gov.uk show that the land has little value as unclassified agricultural land.

The provision of adequate natural light in all habitable rooms of the dwellinghouses

Unit 2 & 3 are single aspect.

Wokingham Borough Council, Borough design Guide SPD (June 2012) states;

R.18: Dwellings must be designed to provide appropriate levels of daylight and sunlight to new and existing properties. Research, for instance by the World Health Organisation and MIT, has shown that natural lighting contributes to the health and well being of residents.

New housing should be designed to:

- provide a reasonable outlook for each dwelling;
- be dual aspect where possible;
- avoid north facing, single aspect flats; and
- to have no material impact on levels of daylight in the habitable rooms of adjoining properties.

This can be assessed using the methodology set out in BRE report BRE 209 'Site layout planning for daylight and sunlight'.

The BRE Report, '[Site layout planning for daylight and sunlight: a guide to good practice](#)' (BR209), gives advice on planning developments to make good use of daylight and sunlight, and is widely used by local authorities to help determine the impact of new development.

BRE Guidance

The Building Research Establishment (BRE) has set out in their handbook, '*Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice (2022)*', guidelines and methodology for the measurement and assessment of daylight and sunlight within proposed buildings. This document states that it is also intended to be used in conjunction with the interior daylight recommendations found within British Standard BS EN 17037. This document is intended as a guideline and is not mandatory.

Failure to meet the target does not necessarily mean that the development should be refused planning permission. Other factors and local consideration will be taken into account and may prevail over the application of this guidance.

Daylight – Neighbouring Buildings

A decision chart outlining the sequential tests to be used is provided by the BRE Guidelines. This is to determine if a new development affects daylighting levels in neighbouring existing (or consented but not constructed) buildings. The chart is shown in Figure 1 The relevant steps followed in this report have been summarised below.

- **Vertical Sky Component (VSC) Rule** – The VSC is a measure of the amount of light striking the face of a window and is calculated from the centre point of each window. A minimum of 27% is required to demonstrate that daylighting levels are acceptable, and if not, the 80% test is to be applied.

- **80% Rule** – If the VSC is less than 27%, but greater than 0.8 times its former value, then daylight may not be seriously affected.

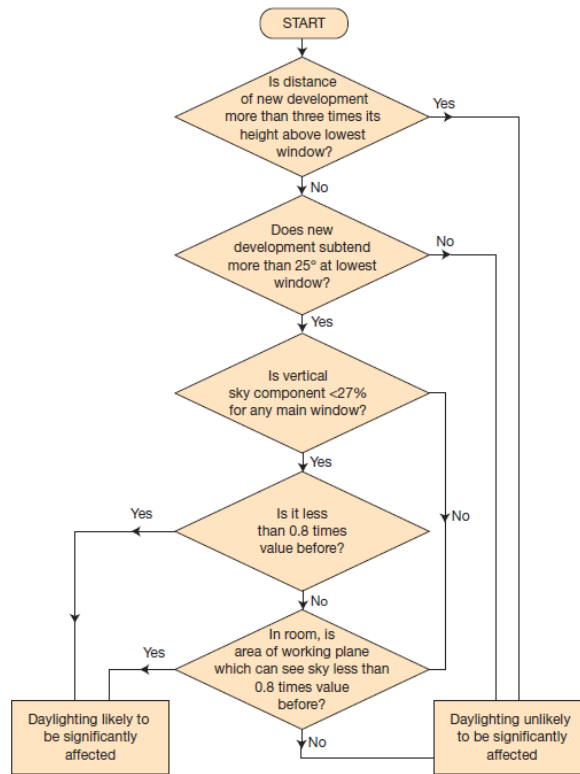


Figure 1: Decision Chart - Diffuse Daylight in Existing Buildings (BRE Report)

APPENDIX A, details modelling results for House 2 and 3 when applying VSC calculations.

The results of the VSC analysis for Houses 2 & 3 are detailed in Table 1.

Proposed		
House 2		(%VSC)
Bedroom 1	2B1W01	91
	2B1W02	38.3
Bedroom 2	2B2W01	91
	2B2W02	38.3
Living Kitchen Dining	2W01	91
	2W02	91
	2W03	91
	2W04	38.3
House 3		
Bedroom 1	3B1W01	91.1
	3B1W02	38.3
Living Kitchen Dining	3W01	91.1
	3W02	91.1
	3W03	38.3

Table 1 – VSC Results for House 2 & 3

Units 2 & 3 comply to the VSC rule, daylight levels are acceptable.

The provision of adequate natural light in all habitable rooms of the dwellinghouses.

BREEAM states that “. . . at least 80% of floor area in occupied spaces has an average daylight factor of 2% or more”. In domestic buildings, it states “... Kitchens achieve a minimum daylight factor of at least 2%; living rooms, dining rooms and studies achieve a minimum average daylight factor of at least 1.5%, and 80% of the working plane should receive direct light from the sky”.

APPENDIX B details result for House 2 & 3 when applying Annual Probable Sunlight Hours Calculations. (APSH)

A summary of Results are set out in Table 2

Room	Daylight Factor
House 2 - Bedroom 1	2.05%
House 2 - Bedroom 2	2.13%
House 2 - Kit/ Liv/ Din	2.60%
House 3 - Kit/ Liv/ Din	3.25%
House 3 - Bedroom 1	2.11%

Table 2 – ASPH Results for House 2 & 3

All habitable rooms are provided with adequate natural lighting.

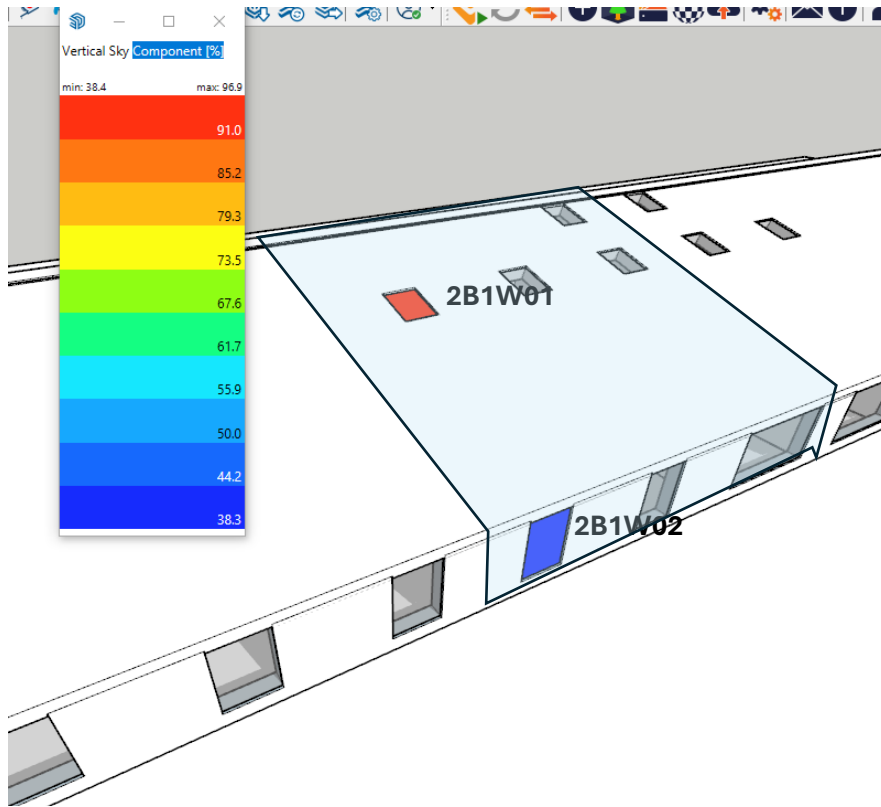
Summary and Conclusions

- House 2 & 3 habitable rooms are provided with natural light and are in line with ‘BRE (2022) ‘A Guide to Good Practice’.

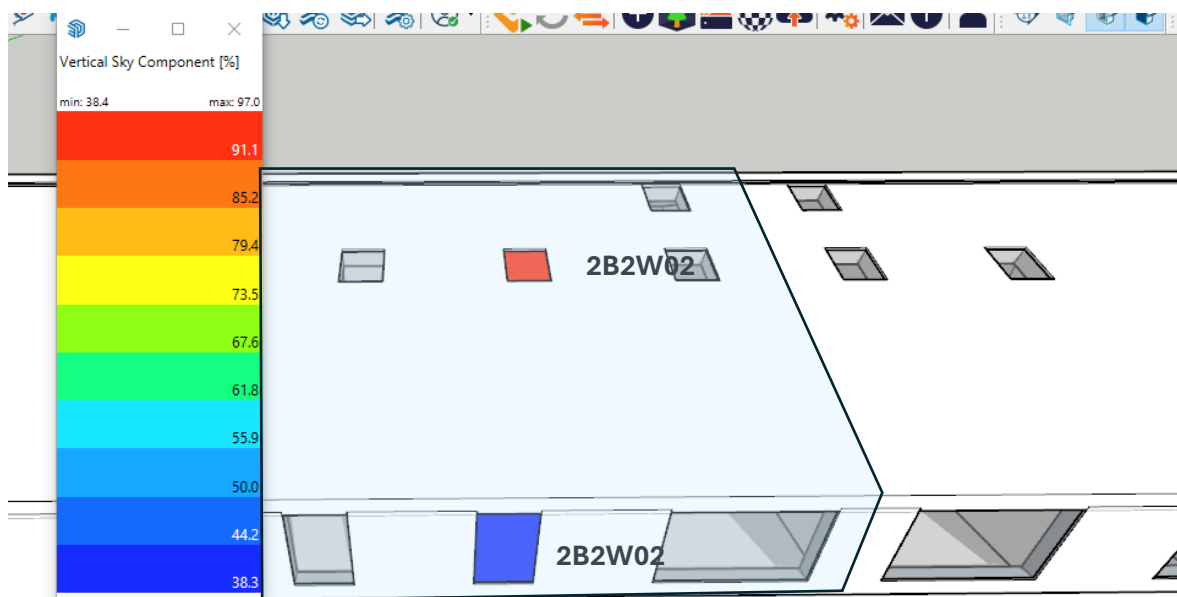
APPENDIX A

HOUSE 2

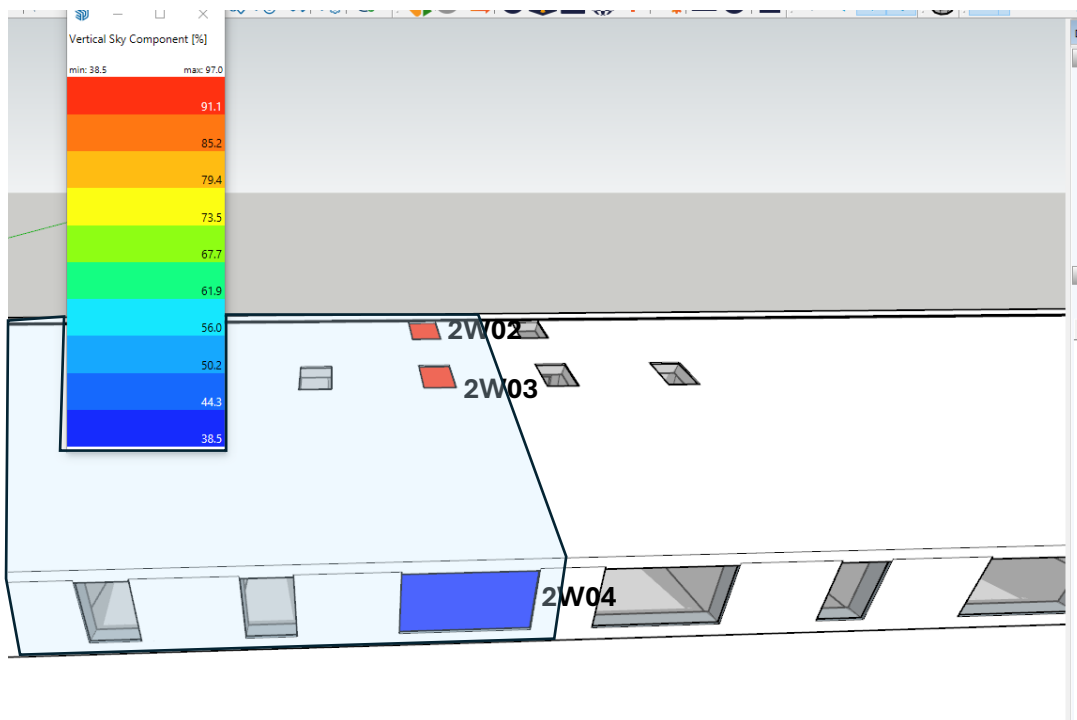
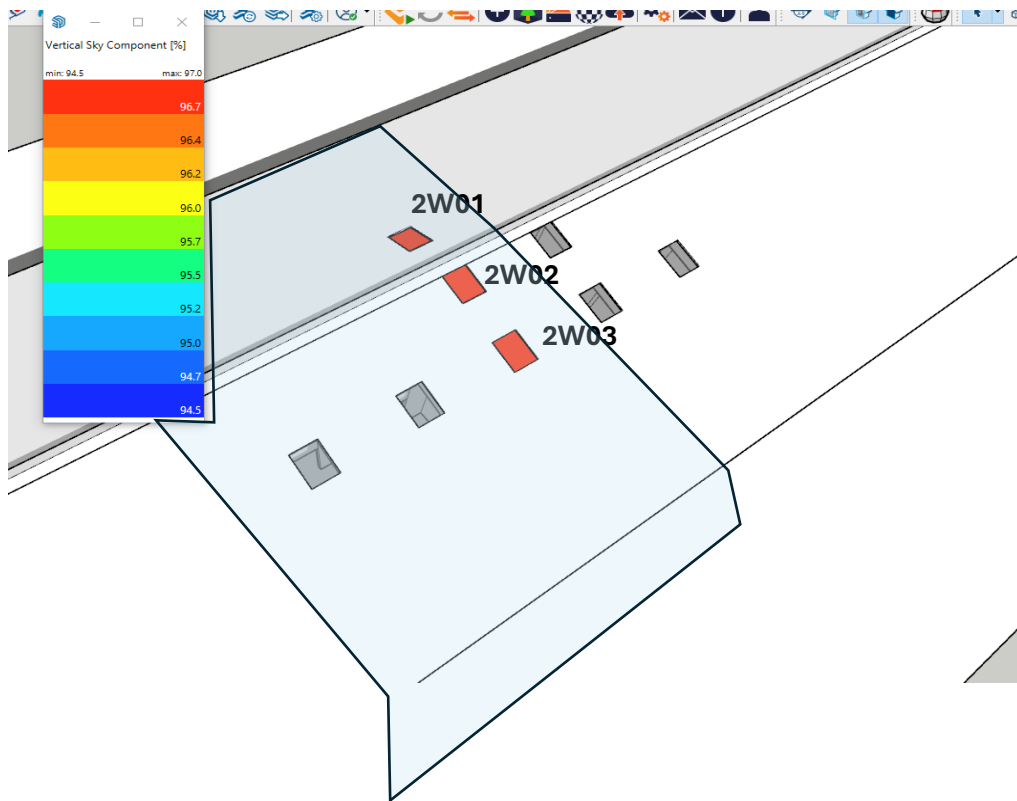
Bedroom 1



Bedroom 2

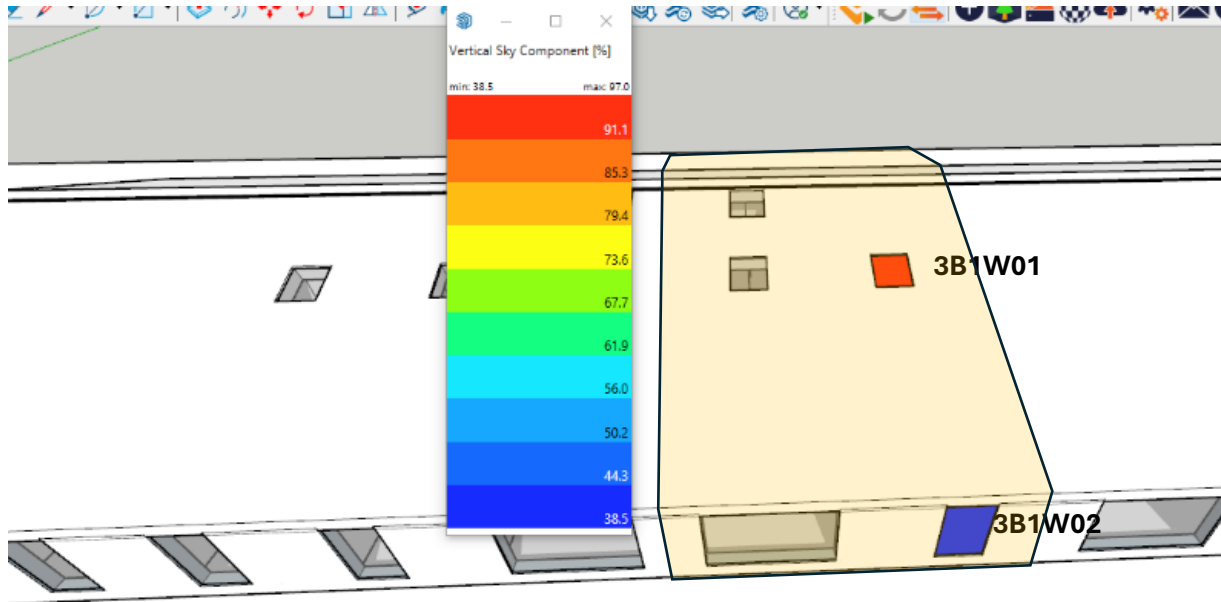


Kitchen Living Dining

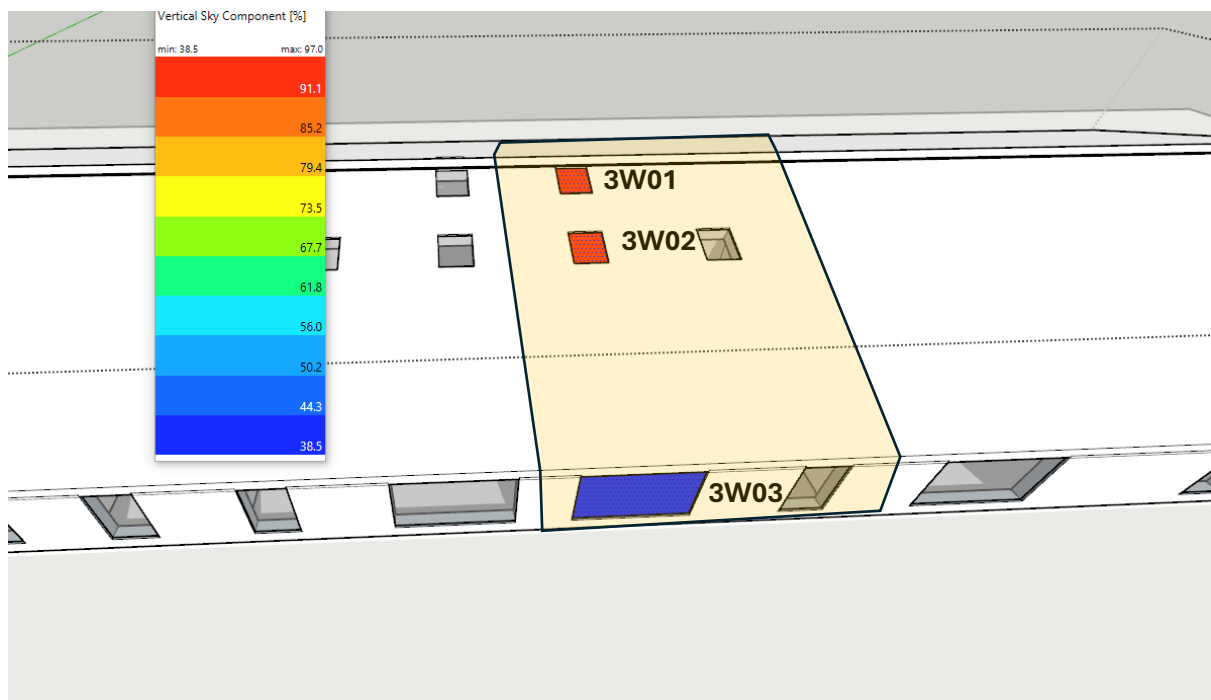


HOUSE 3

Bedroom 1

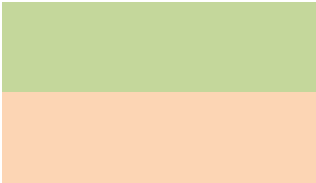


Living Kitchen Dining



APPENDIX B

Room	Daylight Factor
House 2 - Bedroom 1	2.05%
House 2 - Bedroom 2	2.13%
House 2 - Kit/ Liv/ Din	2.60%
House 3 - Kit/ Liv/ Din	3.25%
House 3 - Bedroom 1	2.11%



PASS

FAIL

DAYLIGHT FACTOR CALCULATION

angle of visible sky

Height of the window (meters)
Thickness of the wall (meters)
Distance from window to the obstruction (meters)
Height of the obstruction above the mid-height of the window (meters)
Variable a
Variable b

u	90
Hw	0
Tw	0
D	0
H	0

0.00
0.00

Formulas

$u=90-a-b$
 $\tan a = H/D$
 $\tan b = Tw/Hw$

AREA (square meters)

Average daylight factor

Total glazed area of windows or room lights
Total area of all the room surfaces (ceiling, floor, walls and windows)
Area-weighted average reflectance of the room surface*
Correction factor or dirt
Glass transmittion factor
angle of visible sky

DF	2.60
W	6
A	166
R	0.5
M	1
T	0.6
u	90

Formulas

$DF=M.W.u.T/A(1-R^2)$

* fixed values

R = 0.5

M = 1.0 (vertical glazing that can be cleaned easily)

M = 0.8 (sloping glazing)

M = 0.7 (horizontal glazing)

T = 0.7 (double glazing)

T = 0.6 (double glazing with low emissivity coating)

T = 0.6 (triple glazing)

u = 65 (vertical glazing) in last case

Areas (m ²)	ceiling	floor	wall	window	window W x H	total
House 2 - Kit/ Liv/ Din	34.5	36.9	94.59	6	0 x 0	166.0

Summary of Daylight factor - DF

House 2 - Kit/ Liv/ Din 2.6%

Source:

Guidance (based on the Code for Sustainable Homes)

Angle of visible sky

The angle of visible sky u is the angle subtended, in the vertical plane normal to the window, by the visible sky from the centre of the window.

Where:

Hw is the height of the window - Tw is the thickness of the wall - D is the distance from the window to the obstruction - H is the height of the obstruction above the mid-height of the window
 $u = 90 - a - b$

Average daylight factor

The average daylight factor is the average indoor illuminance (from daylight) on the working plane within a room, expressed as a percentage of the simultaneous outdoor illuminance on a horizontal plane under an unobstructed CIE 'standard overcast sky'. The average daylight factor can be calculated using the following equation: $DF = MW_uT$

$A(1-R_2)$

Where:

W = total glazed area of windows or roof lights

A = total area of all the room surfaces (ceiling, floor, walls and windows) R = area-weighted average reflectance of the room surfaces

M = a correction factor for dirt

T = glass transmission factor

u = angle of visible sky

Guide values for a typical dwelling with light-coloured walls are as follows (for more accurate values, refer to CIBSE Lighting Guide 10):

R = 0.5

M = 1.0 (vertical glazing that can be cleaned easily)

0.8 (sloping glazing)

0.7 (horizontal glazing)

T = 0.7 (double glazing)

0.6 (double glazing with low emissivity coating)

0.6 (triple glazing)

u = 65° (vertical glazing)

Note: It is advised that this default figure for the angle of visible sky is used with caution; the methodology detailed in the angle of visible sky definition must be preferred for more accuracy.

Daylight factor

The daylight factor is the ratio between the illuminance (from daylight) at a specific point on the working plane within a room, expressed as a percentage of the illuminance received on an outdoor unobstructed horizontal plane. This is based on an assumed overcast sky, approximated by the CIE 'standard overcast sky'.

No-sky line

The no-sky line divides those areas of the working plane which can receive direct light from the sky, from those which cannot. It is important as it indicates how good the distribution of daylight is in a room. Areas beyond the no-sky line will generally look gloomy.

As an approximation, obstructions that are parallel to the window can be considered infinite. The no sky-line will then be parallel to the window at a distance 'd' from the window wall, which can be calculated as follows:

$d = xh/y$

Where:

h = height of the window head above the working plane

y = height of the obstruction above the window head x = distance from the window to the obstruction

If d is greater than the room depth, then no part of the room lies beyond this no-sky line. Where results using this methodology do not comply with the requirements, more accurate calculations can be carried out, as detailed in the Calculation Procedures of the issue.

DAYLIGHT FACTOR CALCULATION

angle of visible sky

Height of the window (meters)
Thickness of the wall (meters)
Distance from window to the obstruction (meters)
Height of the obstruction above the mid-height of the window (meters)
Variable a
Variable b

u	90
Hw	
Tw	
D	
H	
	0.00
	0.00

Formulas

$u=90-a-b$
 $\tan a = H/D$
 $\tan b = Tw/Hw$

AREA (square meters)

76.3

Average daylight factor

Total glazed area of windows or room lights
Total area of all the room surfaces (ceiling, floor, walls and windows)
Area-weighted average reflectance of the room surface*
Correction factor or dirt
Glass transmittion factor
angle of visible sky

DF	2.05
W	2.1725
A	76
R	0.5
M	1
T	0.6
u	90

Formulas

$DF=M.W.u.T/A(1-R^2)$

* fixed values

R = 0.5

M = 1.0 (vertical glazing that can be cleaned easily)

M = 0.8 (sloping glazing)

M = 0.7 (horizontal glazing)

T = 0.7 (double glazing)

T = 0.6 (double glazing with low emissivity coating)

T = 0.6 (triple glazing)

u = 65 (vertical glazing) in last case

Areas (m ²)	ceiling	floor	wall	window	window W x H	total
House 2 - Bedroom 1	16.8	16.3	43.218	2.1725		76.3

Summary of Daylight factor - DF

House 2 - Bedroom 1 2.05%

Source:

Guidance (based on the Code for Sustainable Homes)

Angle of visible sky

The angle of visible sky u is the angle subtended, in the vertical plane normal to the window, by the visible sky from the centre of the window.

Where:

Hw is the height of the window - Tw is the thickness of the wall - D is the distance from the window to the obstruction - H is the height of the obstruction above the mid-height of the window
 $u = 90 - a - b$

Average daylight factor

The average daylight factor is the average indoor illuminance (from daylight) on the working plane within a room, expressed as a percentage of the simultaneous outdoor illuminance on a horizontal plane under an unobstructed CIE 'standard overcast sky'. The average daylight factor can be calculated using the following equation: $DF = MW_uT$

$A(1-R^2)$

Where:

W = total glazed area of windows or roof lights

A = total area of all the room surfaces (ceiling, floor, walls and windows) R = area-weighted average reflectance of the room surfaces

M = a correction factor for dirt

T = glass transmission factor

u = angle of visible sky

Guide values for a typical dwelling with light-coloured walls are as follows (for more accurate values, refer to CIBSE Lighting Guide 10):

R = 0.5

M = 1.0 (vertical glazing that can be cleaned easily)

0.8 (sloping glazing)

0.7 (horizontal glazing)

T = 0.7 (double glazing)

0.6 (double glazing with low emissivity coating)

0.6 (triple glazing)

u = 65° (vertical glazing)

Note: It is advised that this default figure for the angle of visible sky is used with caution; the methodology detailed in the angle of visible sky definition must be preferred for more accuracy.

Daylight factor

The daylight factor is the ratio between the illuminance (from daylight) at a specific point on the working plane within a room, expressed as a percentage of the illuminance received on an outdoor unobstructed horizontal plane. This is based on an assumed overcast sky, approximated by the CIE 'standard overcast sky'.

No-sky line

The no-sky line divides those areas of the working plane which can receive direct light from the sky, from those which cannot. It is important as it indicates how good the distribution of daylight is in a room. Areas beyond the no-sky line will generally look gloomy.

As an approximation, obstructions that are parallel to the window can be considered infinite. The no sky-line will then be parallel to the window at a distance 'd' from the window wall, which can be calculated as follows:

$d = xh/y$

Where:

h = height of the window head above the working plane

y = height of the obstruction above the window head x = distance from the window to the obstruction

If d is greater than the room depth, then no part of the room lies beyond this no-sky line. Where results using this methodology do not comply with the requirements, more accurate calculations can be carried out, as detailed in the Calculation Procedures of the issue.

DAYLIGHT FACTOR CALCULATION

angle of visible sky

Height of the window (meters)
Thickness of the wall (meters)
Distance from window to the obstruction (meters)
Height of the obstruction above the mid-height of the window (meters)
Variable a
Variable b

u	90
Hw	0
Tw	0
D	0
H	0

0.00
0.00

Formulas

u=90-a-b
tan a = H/D
tan b = Tw/Hw

AREA (square meters)

73.3

Average daylight factor

Total glazed area of windows or room lights
Total area of all the room surfaces (ceiling, floor, walls and windows)
Area-weighted average reflectance of the room surface*
Correction factor or dirt
Glass transmittion factor
angle of visible sky

DF	2.13
W	2.1725
A	73
R	0.5
M	1
T	0.6
u	90

Formulas

DF=M.W.u.T/A(1-R²)

* fixed values

R = 0.5

M = 1.0 (vertical glazing that can be cleaned easily)

M = 0.8 (sloping glazing)

M = 0.7 (horizontal glazing)

T = 0.7 (double glazing)

T = 0.6 (double glazing with low emissivity coating)

T = 0.6 (triple glazing)

u = 65 (vertical glazing) in last case

Areas (m ²)	ceiling	floor	wall	window	window W x H	total
House 2 - Bedroom 2	16.8	14.7	41.828	2.1725	0 x 0	73.3

Summary of Daylight factor - DF

House 2 - Bedroom 2 2.1%

Source:

Guidance (based on the Code for Sustainable Homes)

Angle of visible sky

The angle of visible sky u is the angle subtended, in the vertical plane normal to the window, by the visible sky from the centre of the window.

Where:

Hw is the height of the window - Tw is the thickness of the wall - D is the distance from the window to the obstruction - H is the height of the obstruction above the mid-height of the window
u = 90-a-b

Average daylight factor

The average daylight factor is the average indoor illuminance (from daylight) on the working plane within a room, expressed as a percentage of the simultaneous outdoor illuminance on a horizontal plane under an unobstructed CIE 'standard overcast sky'. The average daylight factor can be calculated using the following equation: DF = MWuT

A(1-R_z)

Where:

W = total glazed area of windows or roof lights

A = total area of all the room surfaces (ceiling, floor, walls and windows) R = area-weighted average reflectance of the room surfaces

M = a correction factor for dirt

T = glass transmission factor

u = angle of visible sky

Guide values for a typical dwelling with light-coloured walls are as follows (for more accurate values, refer to CIBSE Lighting Guide 10):

R = 0.5

M = 1.0 (vertical glazing that can be cleaned easily)

0.8 (sloping glazing)

0.7 (horizontal glazing)

T = 0.7 (double glazing)

0.6 (double glazing with low emissivity coating)

0.6 (triple glazing)

u = 65° (vertical glazing)

Note: It is advised that this default figure for the angle of visible sky is used with caution; the methodology detailed in the angle of visible sky definition must be preferred for more accuracy.

Daylight factor

The daylight factor is the ratio between the illuminance (from daylight) at a specific point on the working plane within a room, expressed as a percentage of the illuminance received on an outdoor unobstructed horizontal plane. This is based on an assumed overcast sky, approximated by the CIE 'standard overcast sky'.

No-sky line

The no-sky line divides those areas of the working plane which can receive direct light from the sky, from those which cannot. It is important as it indicates how good the distribution of daylight is in a room. Areas beyond the no-sky line will generally look gloomy.

As an approximation, obstructions that are parallel to the window can be considered infinite. The no sky-line will then be parallel to the window at a distance 'd' from the window wall, which can be calculated as follows:

d = xh y

Where:

h = height of the window head above the working plane

y = height of the obstruction above the window head x = distance from the window to the obstruction

If d is greater than the room depth, then no part of the room lies beyond this no-sky line. Where results using this methodology do not comply with the requirements, more accurate calculations can be carried out, as detailed in the Calculation Procedures of the issue.

DAYLIGHT FACTOR CALCULATION

angle of visible sky

Height of the window (meters)
Thickness of the wall (meters)
Distance from window to the obstruction (meters)
Height of the obstruction above the mid-height of the window (meters)
Variable a
Variable b

u	90
Hw	0
Tw	0
D	0
H	0

0.00
0.00

Formulas

$u=90-a-b$
 $\tan a = H/D$
 $\tan b = Tw/Hw$

AREA (square meters)

115.3

Average daylight factor

Total glazed area of windows or room lights
Total area of all the room surfaces (ceiling, floor, walls and windows)
Area-weighted average reflectance of the room surface*
Correction factor or dirt
Glass transmission factor
angle of visible sky

DF	3.25
W	5.2
A	115
R	0.5
M	1
T	0.6
u	90

Formulas

$DF=M.W.u.T/A(1-R^2)$

* fixed values

R = 0.5

M = 1.0 (vertical glazing that can be cleaned easily)

M = 0.8 (sloping glazing)

M = 0.7 (horizontal glazing)

T = 0.7 (double glazing)

T = 0.6 (double glazing with low emissivity coating)

T = 0.6 (triple glazing)

u = 65 (vertical glazing) in last case

Areas (m ²)	ceiling	floor	wall	window	window W x H	total
House 3 - Kit/ Liv/ Din	26.32	25.3	63.7	5.2	0 x 0	115.3

Summary of Daylight factor - DF

House 3 - Kit/ Liv/ Din 3.2%

Source:

Guidance (based on the Code for Sustainable Homes)

Angle of visible sky

The angle of visible sky u is the angle subtended, in the vertical plane normal to the window, by the visible sky from the centre of the window.

Where:

Hw is the height of the window - Tw is the thickness of the wall - D is the distance from the window to the obstruction - H is the height of the obstruction above the mid-height of the window
 $u = 90 - a - b$

Average daylight factor

The average daylight factor is the average indoor illuminance (from daylight) on the working plane within a room, expressed as a percentage of the simultaneous outdoor illuminance on a horizontal plane under an unobstructed CIE 'standard overcast sky'. The average daylight factor can be calculated using the following equation: $DF = MWuT$

$A(1-R^2)$

Where:

W = total glazed area of windows or roof lights

A = total area of all the room surfaces (ceiling, floor, walls and windows) R = area-weighted average reflectance of the room surfaces

M = a correction factor for dirt

T = glass transmission factor

u = angle of visible sky

Guide values for a typical dwelling with light-coloured walls are as follows (for more accurate values, refer to CIBSE Lighting Guide 10):

R = 0.5

M = 1.0 (vertical glazing that can be cleaned easily)

0.8 (sloping glazing)

0.7 (horizontal glazing)

T = 0.7 (double glazing)

0.6 (double glazing with low emissivity coating)

0.6 (triple glazing)

u = 65° (vertical glazing)

Note: It is advised that this default figure for the angle of visible sky is used with caution; the methodology detailed in the angle of visible sky definition must be preferred for more accuracy.

Daylight factor

The daylight factor is the ratio between the illuminance (from daylight) at a specific point on the working plane within a room, expressed as a percentage of the illuminance received on an outdoor unobstructed horizontal plane. This is based on an assumed overcast sky, approximated by the CIE 'standard overcast sky'.

No-sky line

The no-sky line divides those areas of the working plane which can receive direct light from the sky, from those which cannot. It is important as it indicates how good the distribution of daylight is in a room. Areas beyond the no-sky line will generally look gloomy.

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$d = xh/y$

Where:

h = height of the window head above the working plane

y = height of the obstruction above the window head x = distance from the window to the obstruction

If d is greater than the room depth, then no part of the room lies beyond this no-sky line. Where results using this methodology do not comply with the requirements, more accurate calculations can be carried out, as detailed in the Calculation Procedures of the issue.

DAYLIGHT FACTOR CALCULATION

angle of visible sky

Height of the window (meters)
Thickness of the wall (meters)
Distance from window to the obstruction (meters)
Height of the obstruction above the mid-height of the window (meters)
Variable a
Variable b

u	90
Hw	0
Tw	0
D	0
H	0

0.00
0.00

Formulas

u=90-a-b
tan a = H/D
tan b = Tw/Hw

AREA (square meters)

74.0

Average daylight factor

Total glazed area of windows or room lights
Total area of all the room surfaces (ceiling, floor, walls and windows)
Area-weighted average reflectance of the room surface*
Correction factor or dirt
Glass transmittion factor
angle of visible sky

DF	2.11
W	2.17
A	74
R	0.5
M	1
T	0.6
u	90

Formulas

DF=M.W.u.T/A(1-R²)

* fixed values

R = 0.5

M = 1.0 (vertical glazing that can be cleaned easily)

M = 0.8 (sloping glazing)

M = 0.7 (horizontal glazing)

T = 0.7 (double glazing)

T = 0.6 (double glazing with low emissivity coating)

T = 0.6 (triple glazing)

u = 65 (vertical glazing) in last case

Areas (m ²)	ceiling	floor	wall	window	window W x H	total
House 3 - Bedroom 1	16.42	16	41.6	2.17	0 x 0	74.0

Summary of Daylight factor - DF	
House 3 - Bedroom 1	2.1%

Source:

Guidance (based on the Code for Sustainable Homes)

Angle of visible sky

The angle of visible sky u is the angle subtended, in the vertical plane normal to the window, by the visible sky from the centre of the window.

Where:

Hw is the height of the window - Tw is the thickness of the wall - D is the distance from the window to the obstruction - H is the height of the obstruction above the mid-height of the window
u = 90-a-b

Average daylight factor

The average daylight factor is the average indoor illuminance (from daylight) on the working plane within a room, expressed as a percentage of the simultaneous outdoor illuminance on a horizontal plane under an unobstructed CIE 'standard overcast sky'. The average daylight factor can be calculated using the following equation: DF = MWuT

A(1-R_z)

Where:

W = total glazed area of windows or roof lights

A = total area of all the room surfaces (ceiling, floor, walls and windows) R = area-weighted average reflectance of the room surfaces

M = a correction factor for dirt

T = glass transmission factor

u = angle of visible sky

Guide values for a typical dwelling with light-coloured walls are as follows (for more accurate values, refer to CIBSE Lighting Guide 10):

R = 0.5

M = 1.0 (vertical glazing that can be cleaned easily)

0.8 (sloping glazing)

0.7 (horizontal glazing)

T = 0.7 (double glazing)

0.6 (double glazing with low emissivity coating)

0.6 (triple glazing)

u = 65° (vertical glazing)

Note: It is advised that this default figure for the angle of visible sky is used with caution; the methodology detailed in the angle of visible sky definition must be preferred for more accuracy.

Daylight factor

The daylight factor is the ratio between the illuminance (from daylight) at a specific point on the working plane within a room, expressed as a percentage of the illuminance received on an outdoor unobstructed horizontal plane. This is based on an assumed overcast sky, approximated by the CIE 'standard overcast sky'.

No-sky line

The no-sky line divides those areas of the working plane which can receive direct light from the sky, from those which cannot. It is important as it indicates how good the distribution of daylight is in a room. Areas beyond the no-sky line will generally look gloomy.

As an approximation, obstructions that are parallel to the window can be considered infinite. The no sky-line will then be parallel to the window at a distance 'd' from the window wall, which can be calculated as follows:

d = xh y

Where:

h = height of the window head above the working plane

y = height of the obstruction above the window head x = distance from the window to the obstruction

If d is greater than the room depth, then no part of the room lies beyond this no-sky line. Where results using this methodology do not comply with the requirements, more accurate calculations can be carried out, as detailed in the Calculation Procedures of the issue.