



Daylight & Sunlight Report

King's House School, Richmond

December 2020

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Prepared By: Sophie Probert-Hughes, Associate
Draft Date: December 2020

For and on behalf of Avison Young (UK) Limited

1. Introduction and Scope of Report

- 1.1 Avison Young ('AY') have been instructed by King's House School to undertake a Daylight and Sunlight technical assessment in relation to the proposed development at King's House School, Richmond (the 'Proposed Development').
- 1.2 This report considers the potential impact of the Proposed Development upon the daylight and sunlight amenity within sensitive neighbouring residential properties, in accordance with the Building Research Establishment (BRE) Guidelines – 'Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice' (2011) (the '*BRE Guidelines*').

2. Information Relied Upon & Assumptions

- 2.1 In order to undertake the daylight and sunlight assessments, a three dimensional computer model of the existing Site, Proposed Development and surrounding context was created by AY. The resultant 3D analysis model and subsequent technical analysis has been based upon the following sources of information:
- 3D model of the existing site and site plan drawings provided by David Miller Architects, received 2nd and 3rd August 2018;
 - OS Map;
 - Google Map aerial and streetview imagery;
 - Photographic survey, August 2018;
 - Floor plans for No. 64a Kings Road obtained from online planning records;
 - Survey elevation drawing for No. 64a Kings Road provided by Spatial Dimensions, received 28th February 2020; and
 - 2D drawings of the Proposed Development and 3D model of the Proposed Development and No. 64A Kings Road provided by David Miller Architects, received 28th February 2020 and 3rd and 7th December 2020.
- 2.2 The scope of buildings considered has been determined as a reasonable zone which considers both the scale of the proposed development and the proximity of those buildings which surround and face the site.
- 2.3 Best estimates have been made as to the uses which are carried out legally within the adjoining properties in terms of commercial and residential usage. These have been estimated from Valuation Office Agency (VOA) council tax band searches and external observation from aerial/street view imagery.
- 2.4 As is standard practice when assessing daylight and sunlight to adjoining properties, AY have not sought access to any of the adjoining properties.

3. Existing Site and Proposed Development

Existing Site

- 3.1 The site is located at King's House School, 68 Kings Road (the 'Site'), in the London Borough of Richmond upon Thames.
- 3.2 The existing Site comprises a series of school buildings that range in height from one to three stories, as illustrated in Figure 1 below (see also drawing BRE/32, located in Appendix II).

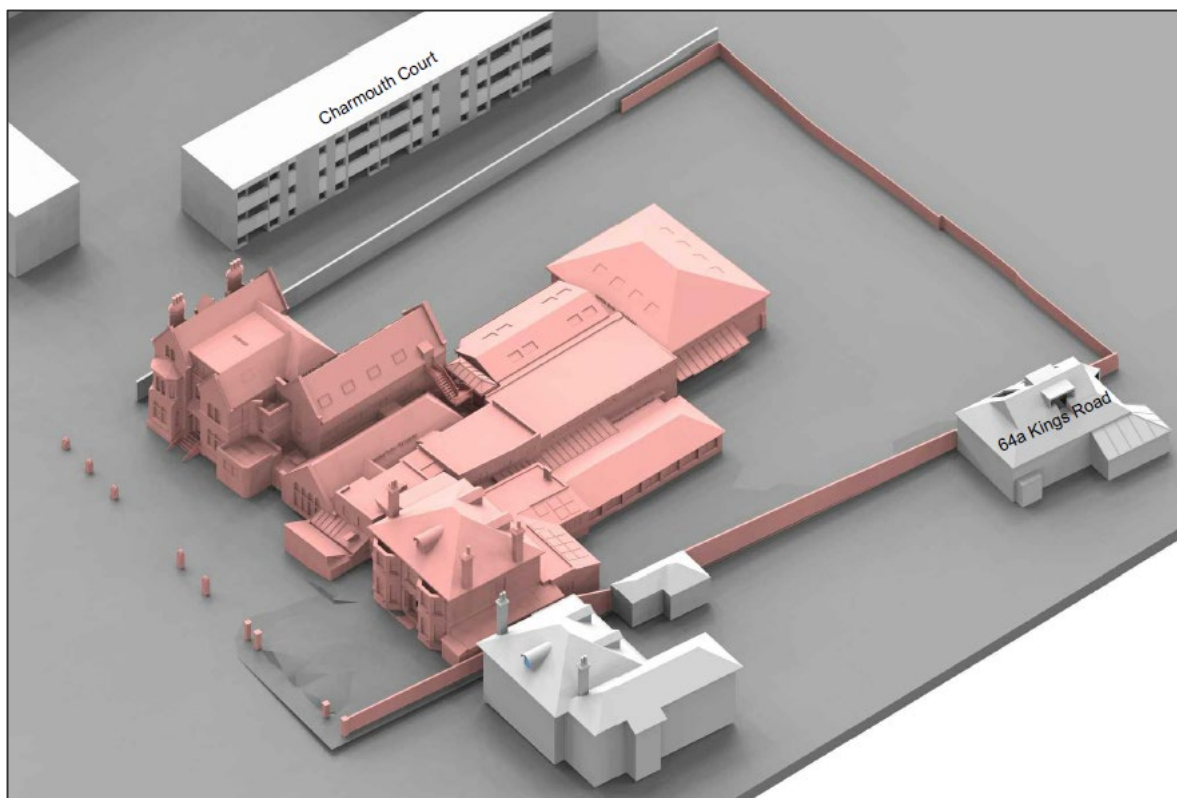


Figure 1 – Existing Site illustrated in red

Proposed Development

- 3.3 The planning application proposal comprises three main aspects:
- Demolition of a number of existing school buildings, which have been added since the original Victorian and Edwardian houses.
 - The erection of a two and three storey new build teaching block, linking to the existing sports hall, which will be extended to the north. This new teaching facility consists of music and drama classrooms, music practice rooms and general teaching classrooms. There are associated areas for staff, storage and services, which support the running of the building.
 - Internal refurbishment work to the existing main school buildings to improve circulation and logistical issues, such as enlarging the existing dining hall and library. This involves some external modifications to the rear of the buildings (east elevation).

3.4 The Proposed Development is illustrated in Figure 2 below (see also drawing BRE/33, located in Appendix II).

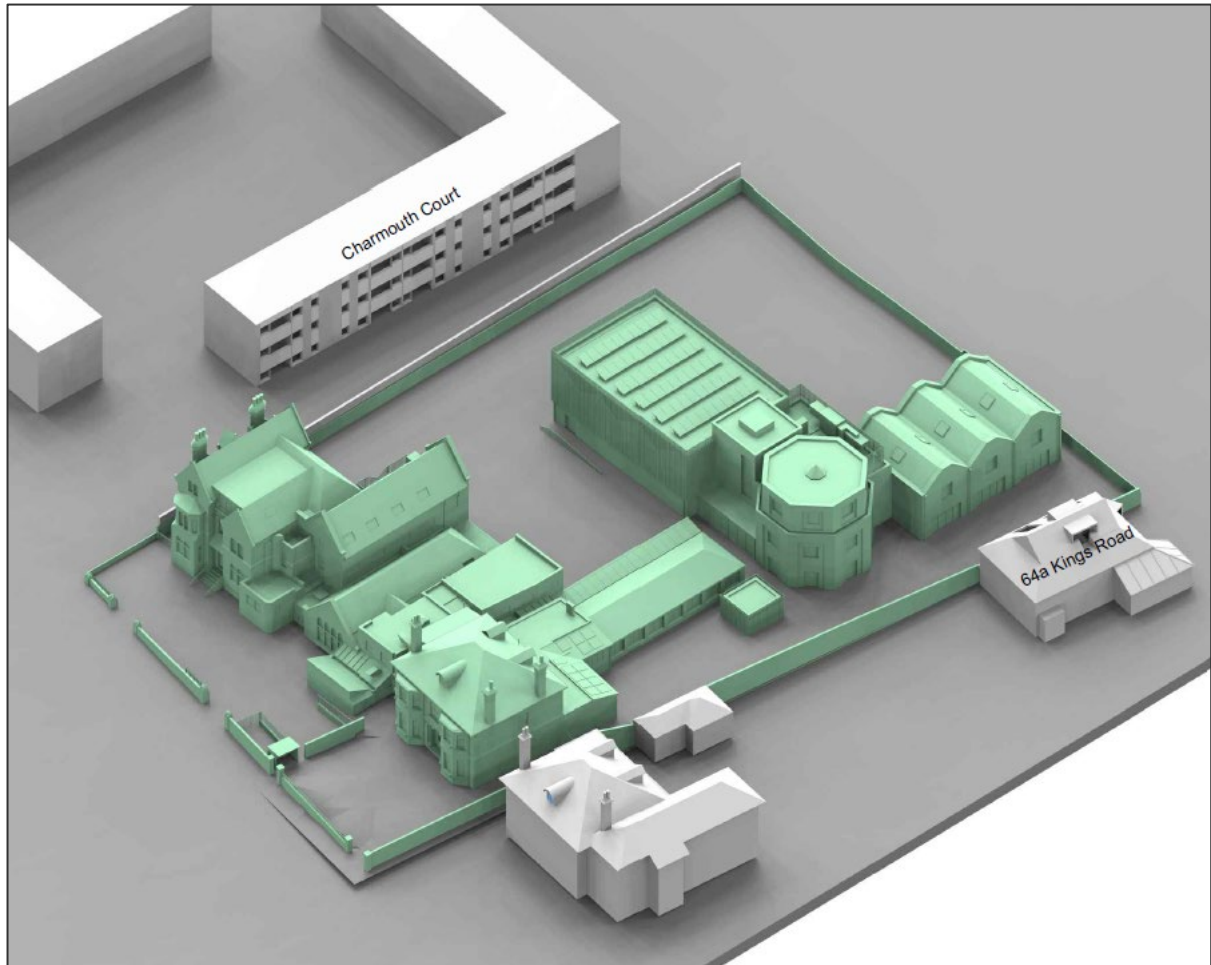


Figure 2 – Proposed Development illustrated in green

4. Scheme Assessment

- 4.1 Daylight and Sunlight is a planning matter, which is concerned with the changes in light within neighbouring residential properties by reference to the BRE Guidelines.
- 4.2 The BRE Guidelines state that properties of residential occupation have a greater requirement for natural light than commercial properties, due to the latter's reliance on artificial lighting (Page 7, Section 2.2.2).
- 4.3 Non-habitable rooms such as bathrooms, WC's, store rooms and circulation spaces (such as hallways) within residential properties have been discounted from our analysis where identified, in accordance with the recommendations set out in the BRE Guidelines (Page 7, Section 2.2.2), which state:

'The guidelines given here are intended for use for rooms in adjoining dwellings where daylight is required, including living rooms, kitchens and bedrooms. Windows to bathrooms, toilets, storerooms, circulation areas and garages need not be analysed.'

- 4.4 Further information can be found in Appendix I.
- 4.5 We have identified two sensitive neighbouring residential properties located to the north and south of the Proposed Development which are discussed in further detail below.

37-48 Charmouth Court



Figure 3 – Southern elevation of Charmouth Court Road looking onto the Site

- 4.6 This three storey residential block is located to the north of the Site. South facing windows as pictured in Figure 3 above look towards the Site.
- 4.7 When attempting to determine whether a neighbouring property will be affected by a new development/extension and thus receive an adequate quantum of Daylight or Sunlight, the BRE advises drawing a section in a plane perpendicular to each affected main window wall of the existing building. It then recommends measuring the angle to the horizontal subtended by the new development at the level of the centre of the lowest window. The 2011 BRE Guidelines state that:

'If this angle is less than 25° for the whole of the development then it is unlikely to have a substantial effect on the diffuse skylight enjoyed by the existing building.' (BRE Guidelines, Page 7, Paragraph 2.2.5)

- 4.8 Due to the distance of Charmouth Court from the Proposed Development, a 25 degree line exercise was undertaken.
- 4.9 Figure 4 below illustrates the 25 degree line that was taken from the centre point of a ground floor window located within Charmouth Court, see also drawing BRE/30 located in Appendix III.
- 4.10 This exercise illustrates that the Proposed Development falls comfortably below the 25° line and therefore we can conclude that there is unlikely to be any noticeable alteration in daylight or sunlight to Charmouth Court as a result of the Proposed Development.

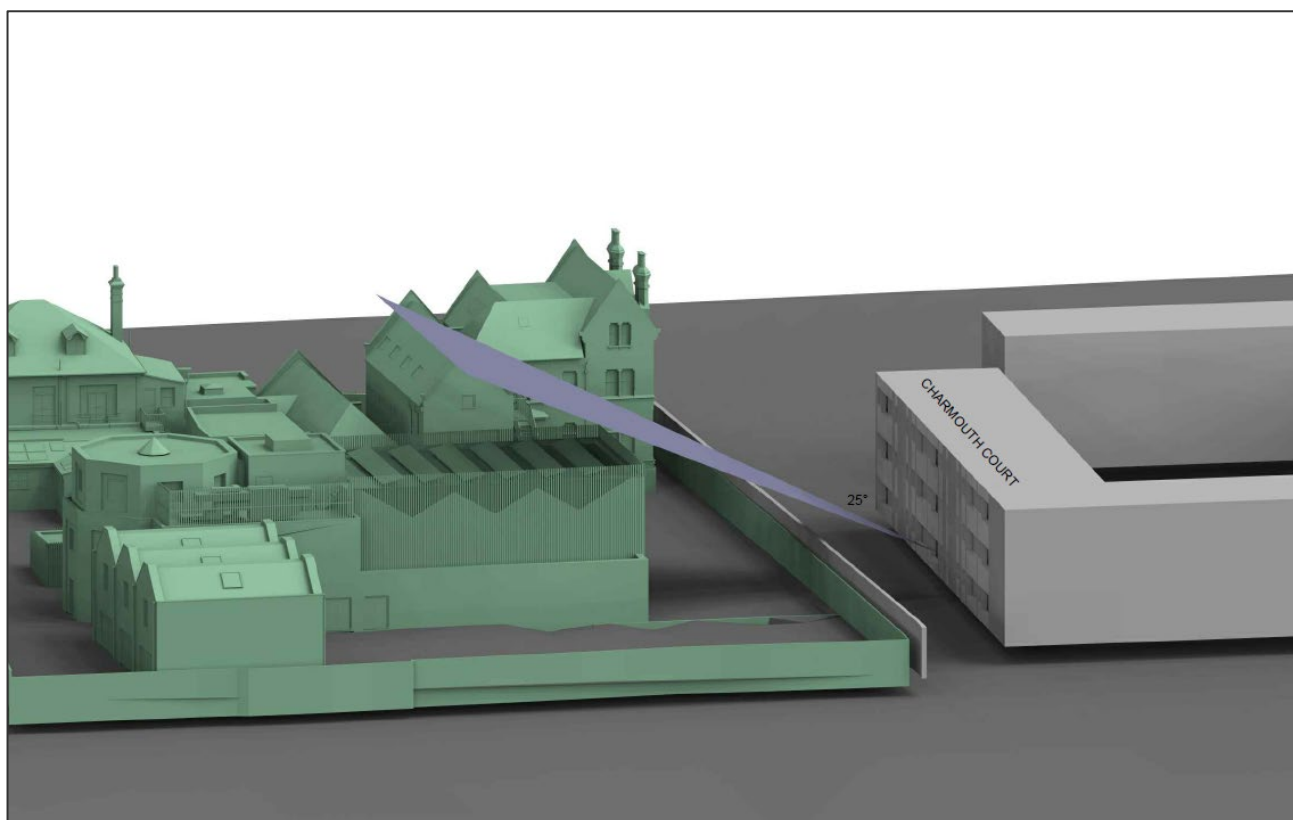


Figure 4 – 25 degree line exercise for Charmouth Court

No. 64a Kings Road

Figure 5 – Southern elevation of No. 64a Kings Road looking onto the Site

- 4.11 This three storey residential property is located to the south of the Site on Kings Road. The southern elevation forming the back of the property faces onto the Site as illustrated in Figure 5 above.
- 4.12 As is standard practice when assessing daylight/sunlight, AY have not sought access to No. 64a Kings Road, however floor plans (see Appendix V) were sourced from online planning records and incorporated into our 3D computer model prior to the technical assessment. This has enabled Avison Young to make best estimates as to the habitable room uses and to discount non-habitable spaces. These drawings have also helped to determine room depths ensuring a more accurate NSL (daylight distribution) assessment.

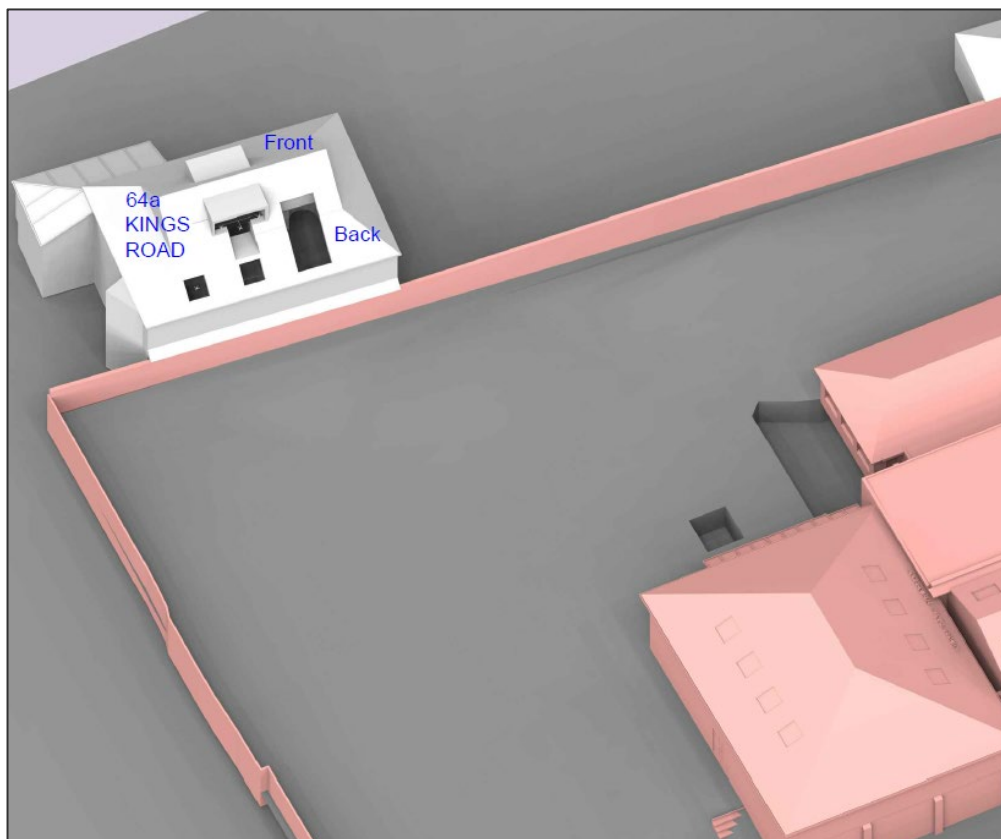


Figure 6 – Existing Site illustrated in red in relation to the neighbouring no.64a King's Road illustrated in grey

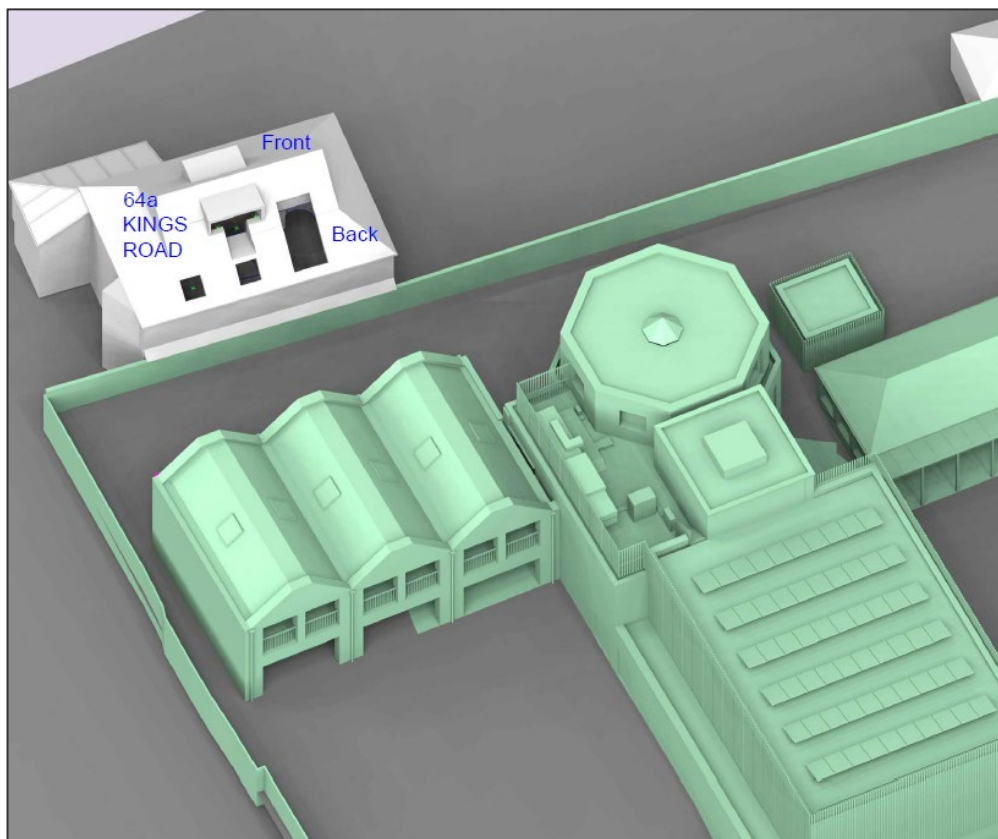


Figure 7 – Proposed Development illustrated in green in relation to the neighbouring no.64a King's Road illustrated in grey

- 4.13 Eight windows serving two bedrooms on the first and second floors of this property have been considered for assessment.
- 4.14 Please refer to Appendix IV for the existing and proposed drawings, daylight and sunlight results tables and associated NSL contour drawing (BRE/31).

Daylight

- 4.15 Technical analysis demonstrates that all eight windows will fully comply with the BRE Guidelines for VSC, with all windows retaining well in excess of the 27% VSC recommended by the BRE Guidelines.
- 4.16 In addition, both bedrooms assessed will fully comply with the BRE Guidelines for NSL, experiencing no alteration in daylight distribution (NSL) from their existing condition.
- 4.17 As such there will be a negligible impact to the daylight amenity of this property as a result of the Proposed Development.

Sunlight

- 4.18 Technical analysis demonstrates that all eight windows assessed will fully comply with the BRE Guidelines for both winter and total sunlight (APSH), experiencing no alteration in sunlight from their existing condition.
- 4.19 As such there will be a negligible impact to the sunlight amenity of this property as a result of the Proposed Development.

5. Summary and Conclusion

- 5.1 Avison Young have undertaken a Daylight and Sunlight technical assessment in relation to the Proposed Development at King's House School, Richmond and the sensitive neighbouring properties located at 37-48 Charmouth Court and No. 64a Kings Road, in accordance with the 2011 BRE Guidelines.
- 5.2 The 25 degree line exercise carried out for Charmouth Court illustrates that the Proposed Development falls comfortably below the 25⁰ line and therefore we can conclude that there is unlikely to be any noticeable alteration in daylight or sunlight to Charmouth Court as a result of the Proposed Development.
- 5.3 Technical analysis demonstrates that all windows and rooms that have been assessed within No. 64a Kings Road will fully comply with the recommended BRE Guidelines for daylight and sunlight and thus will experience a negligible impact as a result of the Proposed Development.
- 5.4 In consideration of the above, the impact of the Proposed Development is considered to be acceptable in terms of neighbouring daylight and sunlight.

Appendix I

Daylight & Sunlight Principles

Daylight & Sunlight Principles

The BRE Guidelines – Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice are well established and are adopted by most Local Authorities as the appropriate scientific and empirical methods of measuring daylight and sunlight in order to provide objective data upon which to apply their planning policies. The Guidelines are not fixed standards but should be applied flexibly to take account of the specific circumstances of each case.

The Introduction of the Guidelines states:

"The guide is intended for building designers and their clients, consultants and planning officials. The advice given here is not mandatory and this document should not be seen as an instrument of planning policy. Its aim is to help rather than constrain the developer. Although it gives numerical guidelines, these should be interpreted flexibly because natural lighting is only one of the many factors in site layout design."

The 'flexibility' recommended in the Guidelines should reflect the specific characteristics of each case being considered. For example, as the numerical targets within the Guidelines have been derived on the basis of a low density suburban housing model, it is entirely appropriate to apply a more flexible approach when dealing with higher rise developments in a denser urban environment where the general scale of development is greater. In addition, where existing and proposed buildings have specific design features such as projecting balconies, deep recesses, bay windows etc., it is also equally valid to apply a degree of flexibility to take account of the effect of these particular design features. This does not mean that the recommendations and targets within the Guidelines can be disregarded but, instead, the 'flexibility' that should be applied should be founded on sound scientific principles that can be supported and justified. This requires a certain level of professional value judgement and experience.

Daylighting

In respect of daylighting, the BRE Guidelines adopt different methods of measurement depending on whether the assessment is for the impact on existing neighbouring premises or for measuring the adequacy of proposed new dwellings. For safeguarding the daylight received by existing neighbouring residential buildings around a proposed development, the relevant recommendations are set out in Section 2.2 of the Guidelines.

The adequacy of daylight received by existing neighbouring dwellings is measured using two methods of measurement. First, it is necessary to measure the Vertical Sky Component (VSC) followed by the measurement of internal Daylight Distribution by plotting the position of the 'existing' and 'proposed' no sky line contour.

VSC is measured at the mid-point on the external face of the window serving a habitable room. For the purpose of the Guidelines, a "habitable" room is defined as a Kitchen, Living Room or Bedroom. Bathrooms, hallways and circulation space are excluded from this definition. In addition, many Local Authorities make a further distinction in respect of small kitchens. Where the internal area of a small kitchen limits the use to food preparation and is not of sufficient size to accommodate some other form of "habitable" use such as dining, the kitchen need not be classed as a "habitable" room in its own right.

VSC is a 'spot' measurement taken on the face of the window and is a measure of the availability of light from the sky from over the "existing" and "proposed" obstruction caused by buildings or structures in front of the window. As it is measured on the outside face of the window, one of the inevitable shortcomings is that it does not take account of the size of the window or the size or use of the room served by the window. For this reason, the BRE Guidelines require internal Daylight Distribution to be measured in addition to VSC.

The 'No Sky Line' contour plotted for the purpose of measuring internal Daylight Distribution identifies those areas within the room usually measured on a horizontal working plane set at table top level, where there is direct sky visibility. This therefore represents those parts within the room where the sky can be seen through the window. This second measure therefore takes account of the size of the window and the size of the room but is only more reliable than VSC when the actual room uses, layouts and dimensions are known. When interpreted in conjunction with the VSC value, the likely internal lighting conditions, and hence the quality of lighting within the room, can be assessed.

For VSC, the Guidelines states that:

"If this Vertical Sky Component is greater than 27% then enough skylight should still be reaching the window of the existing building. Any reduction below this level should be kept to a minimum. If the Vertical Sky Component with the new development in place is both less than 27% and less than 0.8 times its former value, then the occupants of the existing building will notice the reduction in the amount of skylight."

To put this in context, the maximum VSC value that can be received for a totally unobstructed vertical window is 40%. There are however circumstances where the VSC value is already below 27%. In such circumstances, it is permissible to reduce the existing VSC value by a factor of 0.2 (i.e. 20%) so that the value on the 'proposed' conditions remains more than 0.8 times its former value. The scientific reasoning for this permissible margin of reduction is that existing daylight (and sunlight) levels can be reduced by a factor of 20% before the loss becomes materially noticeable. This factor of reduction applies to VSC, daylight distribution, sunlight and overshadowing.

By contrast, the adequacy of daylight for proposed 'New-Build' dwellings is measured using the standards in the British Standard Code of Practice for Daylighting, BS8206 Part 2.

The British Standard relies upon the use of Average Daylight Factors (ADF) rather than VSC and Daylight Distribution. The use of ADF is referred to in the BRE Guidelines (Appendix C) but its use is usually limited as a supplementary 'check' of internal lighting conditions once the VSC and Daylight Distribution tests have been completed.

ADF is sometimes seen as a more accurate and representative measure of internal lighting conditions as it comprises a greater number of design factors and input variables/coefficients. That is, the value of ADF is derived from:

- The actual amount of daylight received by the window(s) serving the room expressed as the "angle of visible sky" which is derived from the VSC value and therefore represents the amount of light striking the face of the window.
- The loss of transmittance through the glazing.
- The size of the window (net area of glazing).
- The size of the room served by the window(s) (net internal surface area of the room).
- The internal reflectance values of the internal finishes within the room.
- The specific use of the room.

One of the main reasons why ADF is more appropriate for New-Build dwellings is that any of the above input variables can be changed during the course of the design process in order to achieve the required internal lighting values. The ability to make such changes is not usually available when dealing with existing neighbouring buildings.

Unlike the application of VSC and daylight distribution, the British Standard differentiates between different room uses. It places the highest ADF standard on Family Kitchens where the minimum target value is 2% df. Living Rooms should achieve 1.5% df, and Bedrooms 1.0% df.

Sunlighting

The requirements for protecting sunlight to existing residential buildings are set out in section 3.2 of the BRE Guidelines.

The availability of sunlight varies throughout the year with the maximum amount of sunlight being available on the summer solstice and the minimum on the winter solstice. In view of this, the internationally accepted test date for measuring sunlight is the spring equinox (21 March), on which day the United Kingdom has equal periods of daylight and darkness and sunlight is available from approximately 08:30hrs to 17:30hrs. In addition, on that date, sunlight received perpendicular to the face of a window would only be received where that window faces within 90° of due south. The BRE Guidelines therefore limit the extent of testing for sunlight where a window faces within 90° of due south.

The sunlight standards are normally applied to the principal Living Room within each dwelling rather than to kitchens and bedrooms.

The recommendation for sunlight is:

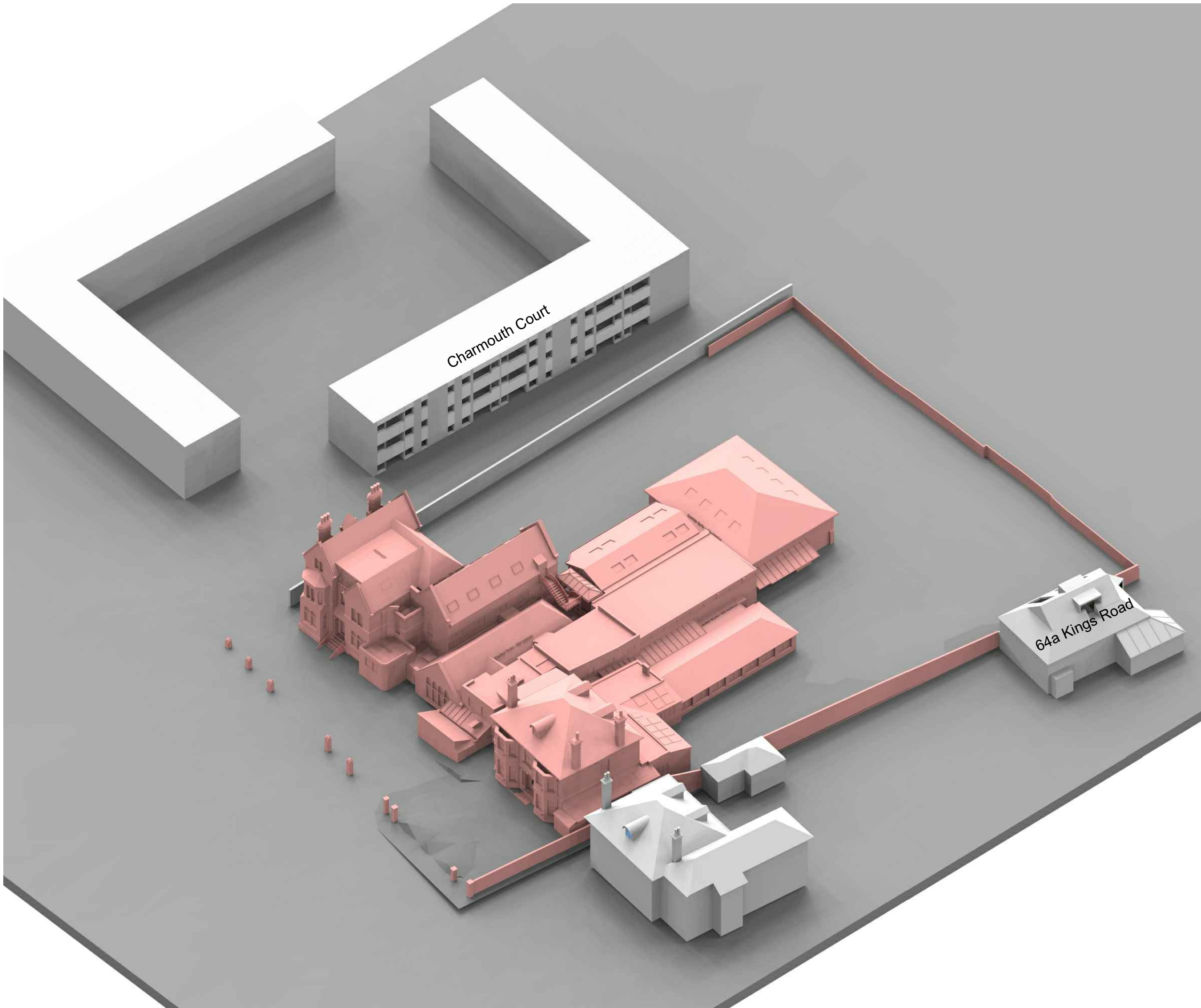
"If this window reference point can receive more than one quarter of annual probable sunlight hours, including at least 5% of annual probable sunlight hours during the winter months of 21 September and 21 March, then the room should still receive enough sunlight .

Any reduction in sunlight access below this level should be kept to a minimum. If the availability of sunlight hours are both less than the amounts given and less than 0.8 times their former value, either over the whole year or just during the winter months, then the occupants of the existing building will notice the loss of sunlight."

A good level of sunlight will therefore be achieved where a window achieves more than 25% APSH, of which 5% should be in the winter months. Where sunlight levels fall below this suggested recommendation, a comparison with the existing condition should be undertaken and if the reduction ratio is less than 0.2, i.e. the window continues to receive more than 0.8 times its existing sunlight levels, the impact on sunlight will be acceptable.

Appendix II

Existing & Proposed Drawings



Sources of Information

EXISTING BUILDING

INFO 03 AUGUST 2018 - Existing model
BA26590618_02 - Kings House School_3DCAD2018

INFO 02 AUGUST 2018 - Existing

Existing Site Information
2001662 existing site plan.dwg (TOPO)

SURROUNDING BUILDINGS

PHOTOS
OS MAP
GOOGLE STREET VIEW
INFO 02 AUGUST 2018 - Existing
Existing Site Information
2001662 existing site plan.dwg (TOPO)

PROPOSED BUILDING

INFO 07 DECEMBER 2020
KHS-DMA-XX-XX-M3-A-99012 - Site_Model_For_Daylight_Sunlight



08449 02 03 04
65 Gresham Street, London, EC2V 7NQ
www.gva.co.uk

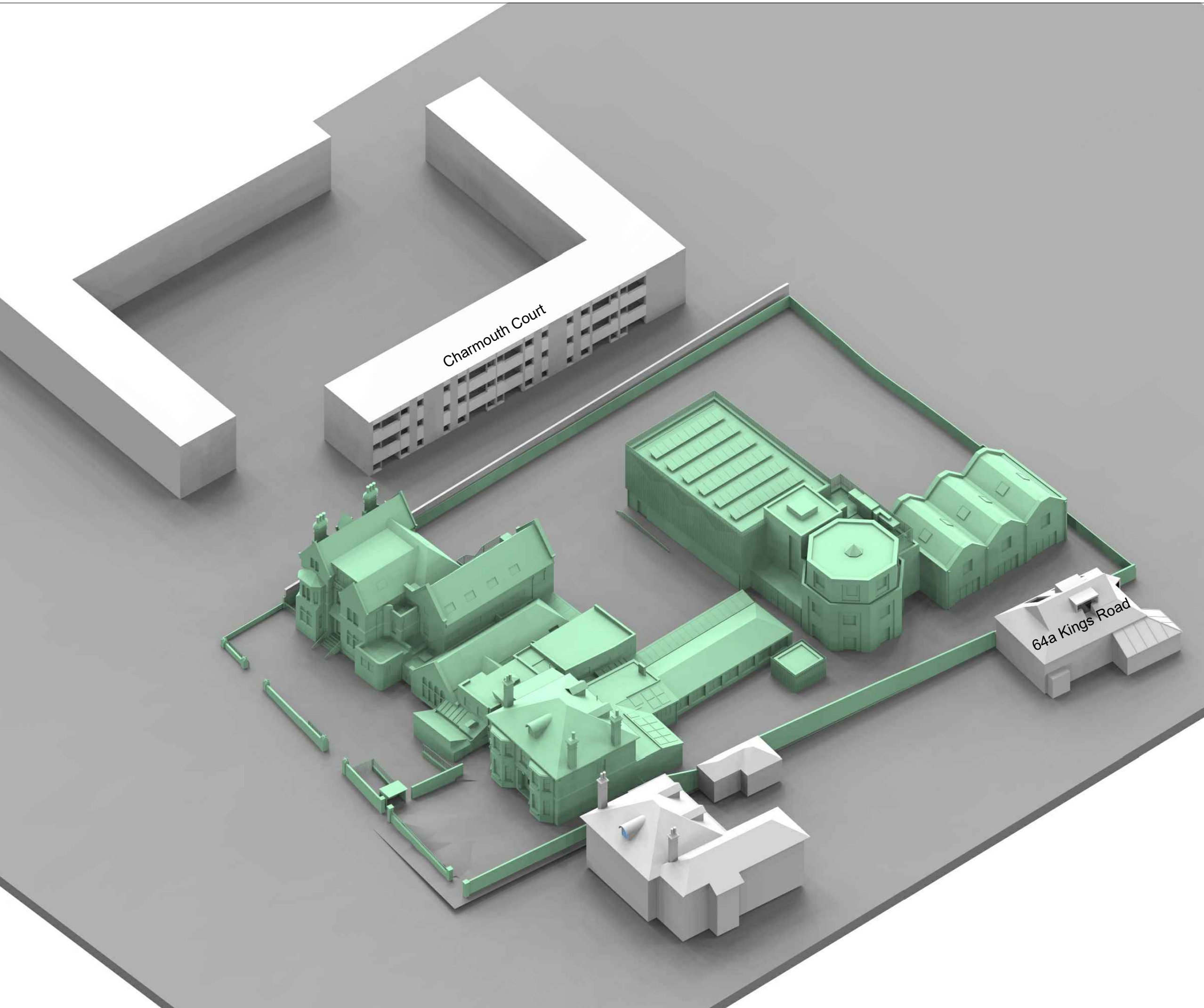
Project Name
KINGS HOUSE SCHOOL
RICHMOND

Client
KINGS HOUSE SCHOOL

Drawing Title
3D VIEW
EXISTING CONDITION

Drawn By AH	Chk'd By -	Scale @ A3 NTS	Date 14 DEC 2020
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Project No. K1118/07	Drawing No. BRE/32	Revision -
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Sources of Information

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KINGS HOUSE SCHOOL

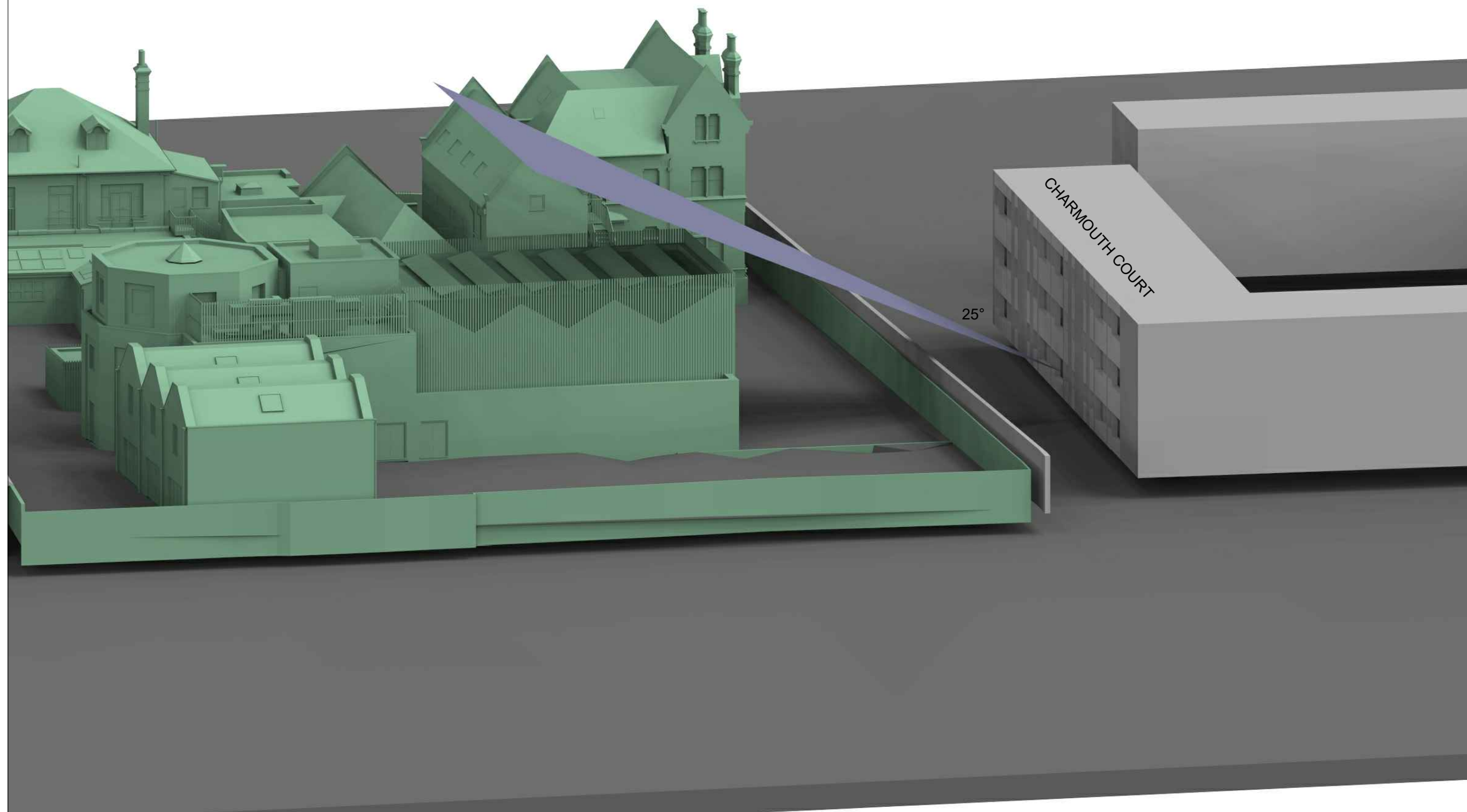
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3D VIEW
PROPOSED CONDITION

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AH	-	NTS	14 DEC 2020

Project No.	Drawing No.	Revision
KI118/07	BRE/33	-

Appendix III
Charmouth Court - 25 Degree
Line Exercise



Sources of Information

EXISTING BUILDING

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Project Name

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RICHMOND

Client

KINGS HOUSE SCHOOL

Drawing Title

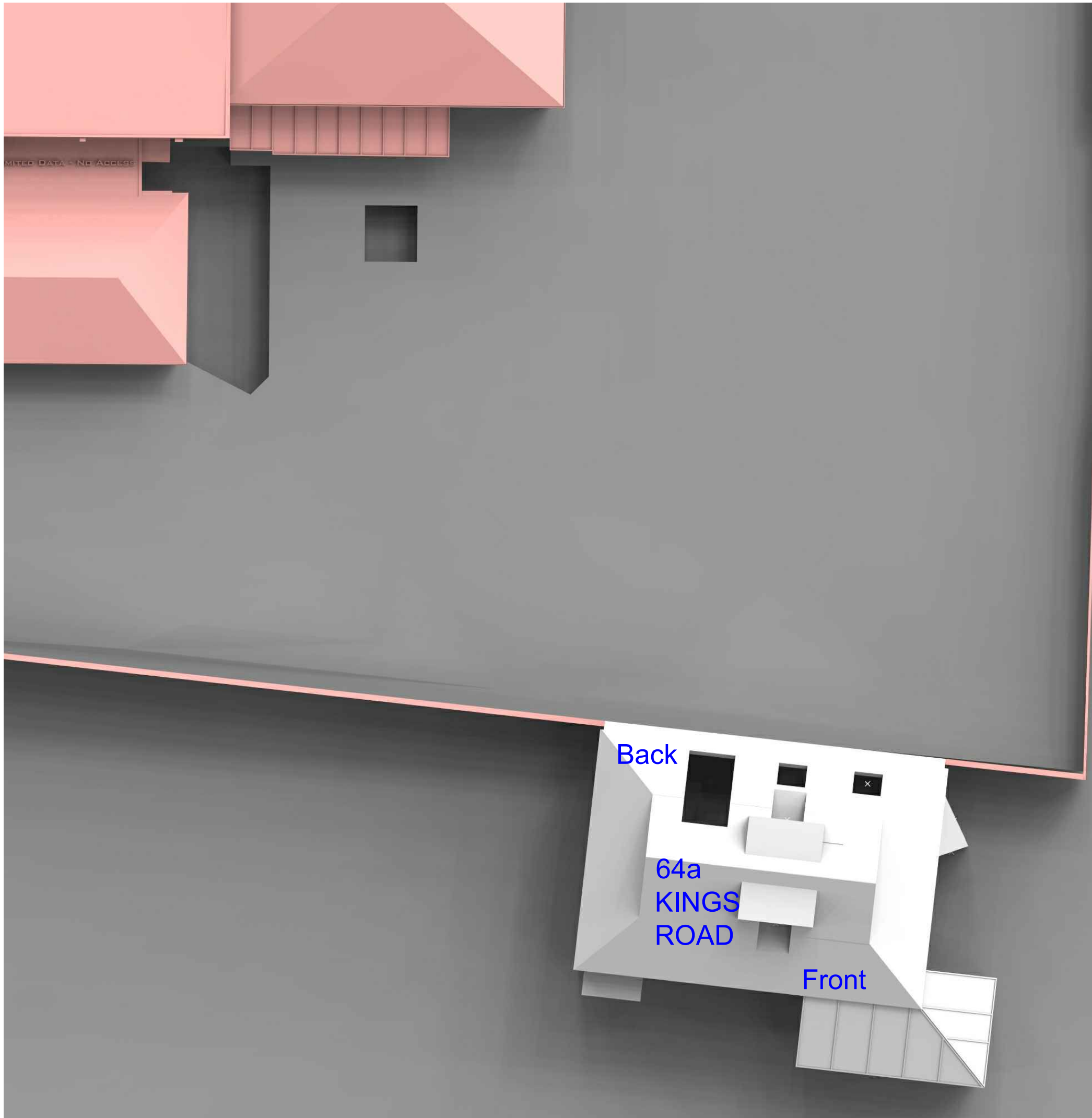
3D VIEW
PROPOSED 25 DEGREE ANGLE

Drawn By	Chk'd By	Scale @ A3	Date
AH	-	NTS	14 DEC 2020

Project No.	Drawing No.	Revision
KI118/07	BRE/30	-

Appendix IV

No. 64a Kings Road - Existing &
Proposed Drawings, Daylight &
Sunlight Results Tables & NSL
Contours



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Do not scale this drawing.
All dimensions to be checked on site. Drawing to be read in conjunction with any specifications, schedules and Consultants drawings and details.

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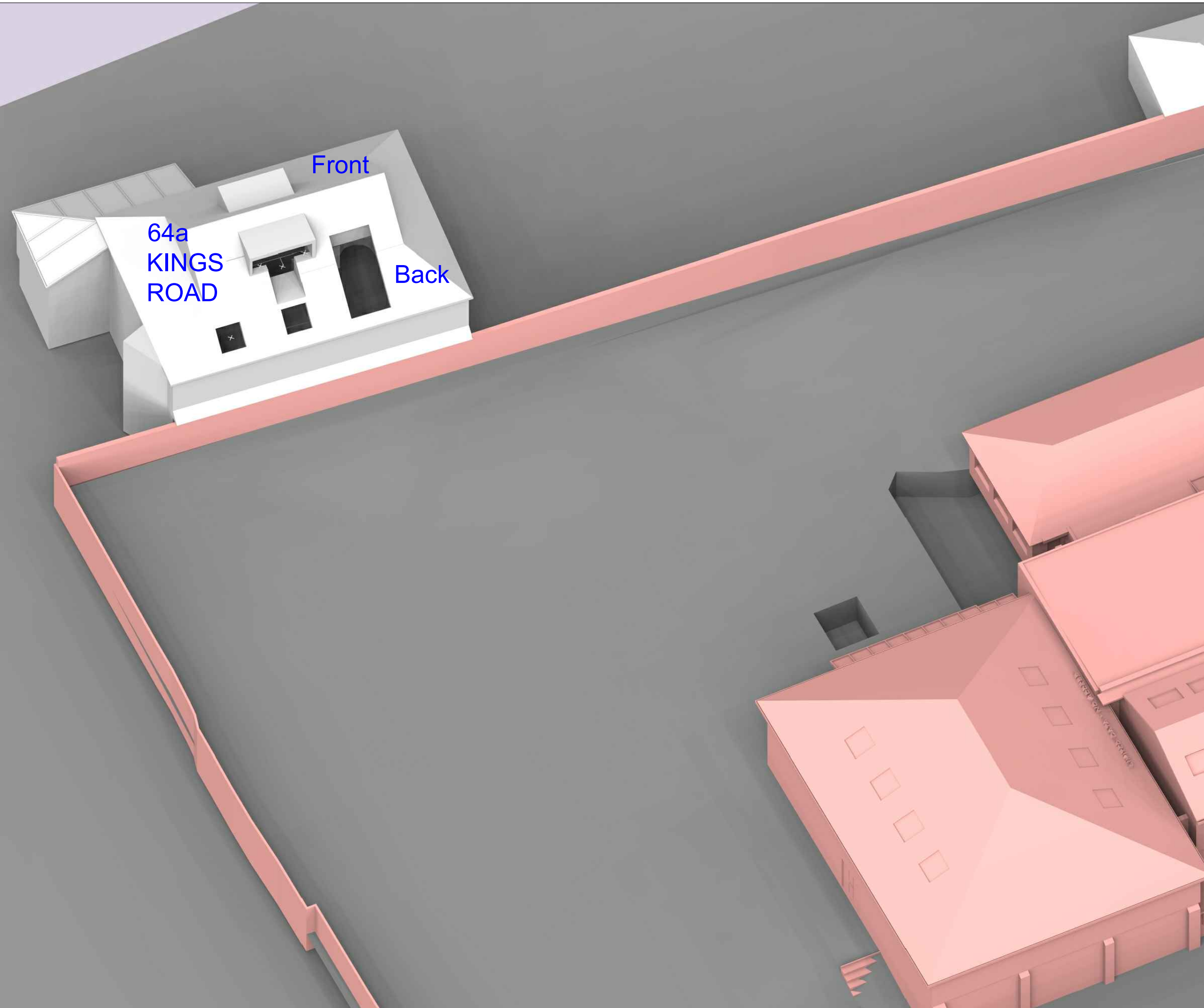
KINGS HOUSE SCHOOL

Drawing Title

PLAN VIEW
EXISTING CONDITION

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Project No.	Drawing No.	Revision
KI118/07	BRE/26	-



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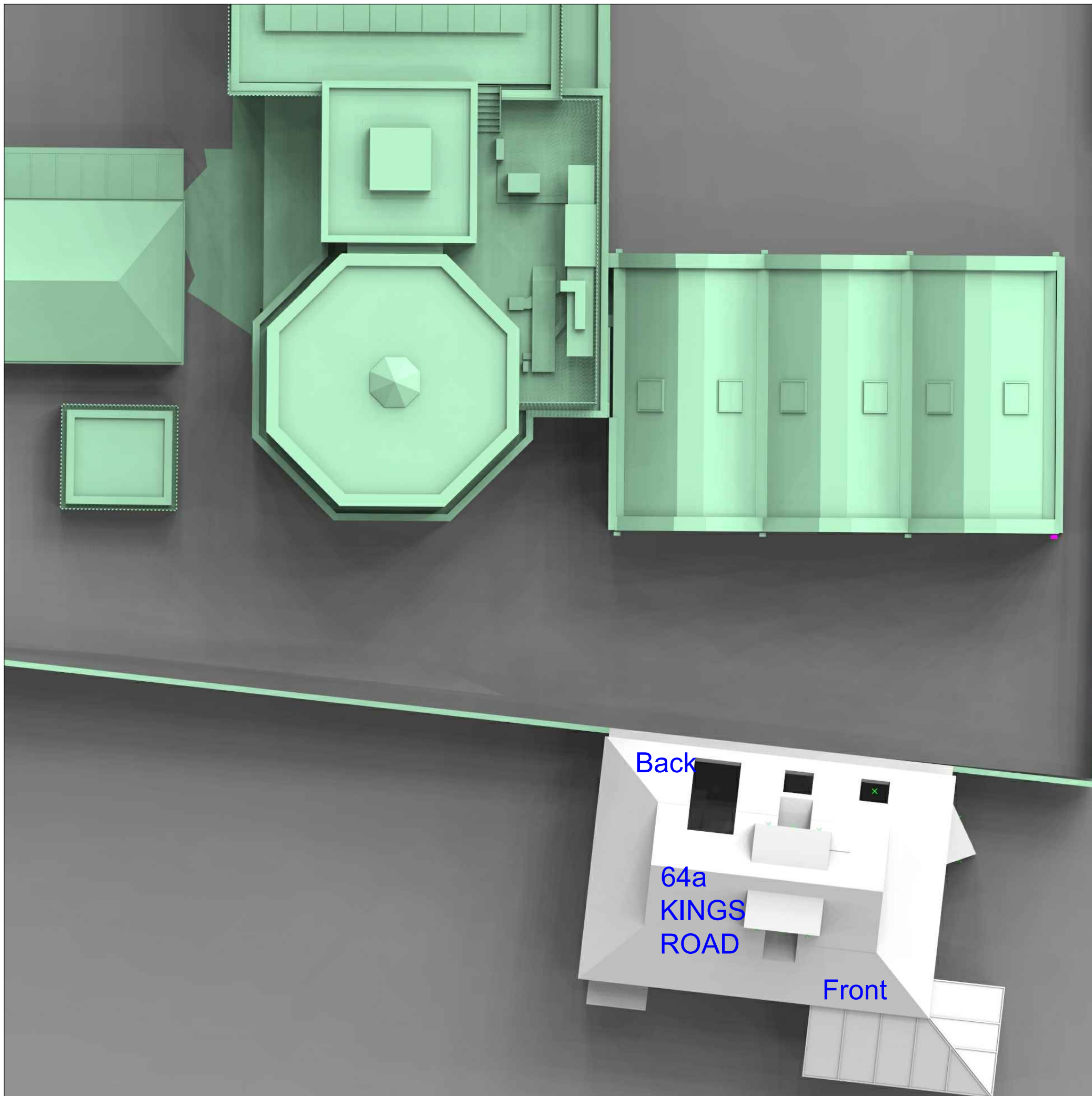
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 EXISTING CONDITION

Drawn By AH	Chk'd By -	Scale @ A3 NTS	Date 14 DEC 2020
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Project No. KI118/07	Drawing No. BRE/27	Revision -
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Daylight

A3



Sources of Information

EXISTING BUILDING

INFO 03 AUGUST 2018 - Existing model
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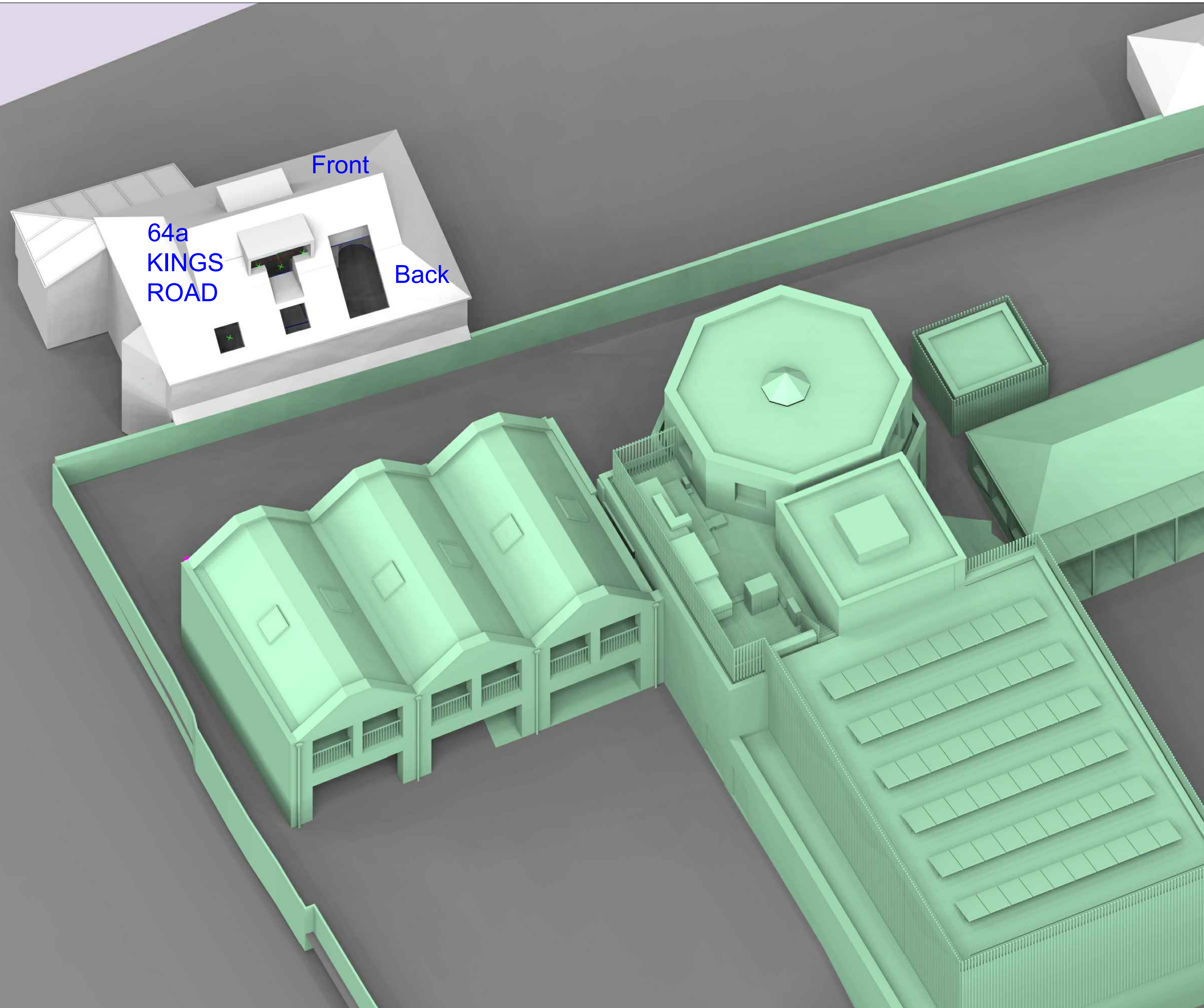
KINGS HOUSE SCHOOL

Drawing Title

PLAN VIEW
PROPOSED CONDITION

Drawn By	Chk'd By	Scale @ A3	Date
AH	-	NTS	14 DEC 2020

Project No.	Drawing No.	Revision
KI118/07	BRE/28	-



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Client
 KINGS HOUSE SCHOOL

Drawing Title
 3D VIEW
 PROPOSED CONDITION

Drawn By AH	Chk'd By -	Scale @ A3 NTS	Date 14 DEC 2020
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Project No. K118/07	Drawing No. BRE/29	Revision -
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Kings House School, Richmond

Daylight analysis results

Job 07

14-Dec-20

Room/Floor	Room Use	Window	%VSC			% Daylight Factor			Proposed No Sky	
			Exist	Prop	% Loss	Exist	Prop	% Loss	% of Room Area	% Loss of Existing
64a KINGS ROAD										
1st Floor										
R1/21	BEDROOM	W1/21	35.84	35.84	>27	1.57	1.51	3.83%	100.00%	0.00%
		W2/21	82.72	80.32	>27					
2nd Floor										
R1/22	BEDROOM	W1/22	39.60	39.60	>27	4.17	4.12	1.15%	89.60%	0.00%
		W2/22	39.39	38.60	>27					
		W3/22	39.30	37.99	>27					
		W4/22	39.60	39.60	>27					
		W5/22	39.38	38.46	>27					
		W6/22	39.60	39.60	>27					

Kings House School, Richmond

Sunlight analysis results

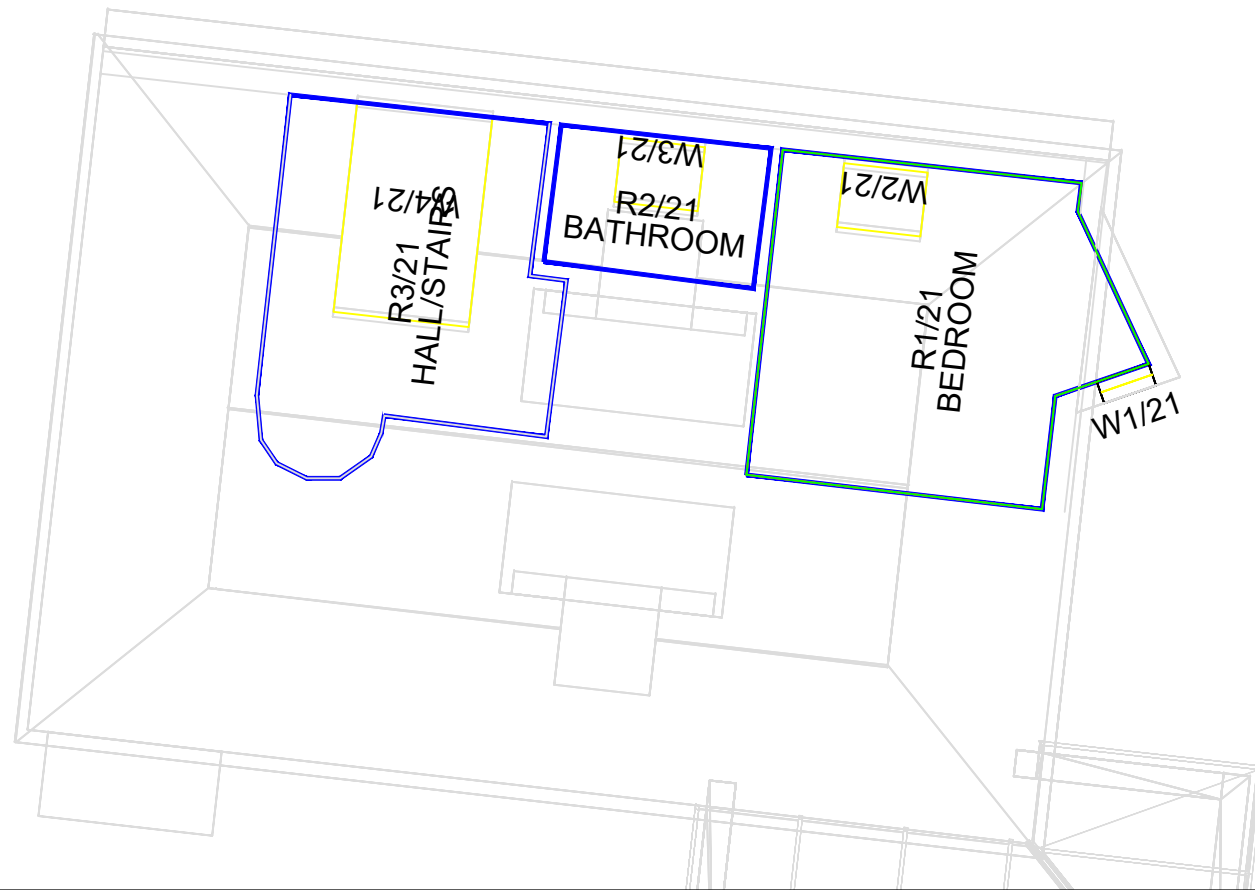
Job 07

14-Dec-20

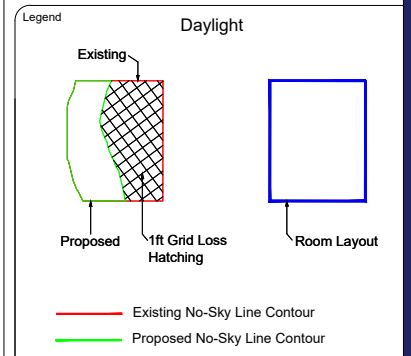
Available sunlight as a percentage of annual unobstructed total (1486.0 Hrs)

Room use	Window Ref	Existing %			Proposed %			% Loss of Summer	% Loss of Winter	% Loss of Total
		Summer	Winter	Total	Summer	Winter	Total			
64a KINGS ROAD										
1st Floor										
BEDROOM	W1/21	50.00	23.00	73.00	50.00	23.00	73.00	0.00%	0.00%	0.00%
BEDROOM	W2/21	61.00	1.00	62.00	61.00	1.00	62.00	0.00%	0.00%	0.00%
2nd Floor										
BEDROOM	W1/22	59.00	30.00	89.00	59.00	30.00	89.00	0.00%	0.00%	0.00%
BEDROOM	W2/22	11.00	0.00	11.00	11.00	0.00	11.00	0.00%	0.00%	0.00%
BEDROOM	W3/22	11.00	0.00	11.00	11.00	0.00	11.00	0.00%	0.00%	0.00%
BEDROOM	W4/22	59.00	30.00	89.00	59.00	30.00	89.00	0.00%	0.00%	0.00%
BEDROOM	W5/22	11.00	0.00	11.00	11.00	0.00	11.00	0.00%	0.00%	0.00%
BEDROOM	W6/22	59.00	30.00	89.00	59.00	30.00	89.00	0.00%	0.00%	0.00%

This drawing is Copyright © of Avison Young (UK) Limited.
 Do not scale this drawing.
 All dimensions to be checked on site. Drawing to be read in conjunction with any specifications, schedules and Consultants drawings and details.



1ST FLOOR



Sources of Information

EXISTING BUILDING
INFO 03 AUGUST 2018 - Existing model
 BA26590618_02 - Kings House School_3DCAD2018

INFO 02 AUGUST 2018 - Existing
 Existing Site Information
 2001662 existing site plan.dwg (TOPO)

SURROUNDING BUILDINGS

PHOTOS
 OS MAP
 GOOGLE STREET VIEW

INFO 02 AUGUST 2018 - Existing
 Existing Site Information
 2001662 existing site plan.dwg (TOPO)

PROPOSED BUILDING
INFO 07 DECEMBER 2020
 KHS-DMA-XX-XX-M3-A-99012 - Site_Model_For_Daylight_Sunlight



SECOND FLOOR



08449 02 03 04
 65 Gresham Street, London, EC2V 7NQ
 www.gva.co.uk

Project Name
 KINGS HOUSE SCHOOL
 RICHMOND

Client
 KINGS HOUSE SCHOOL

Drawing Title
 NO-SKY LINE CONTOURS FOR
 64a KINGS ROAD

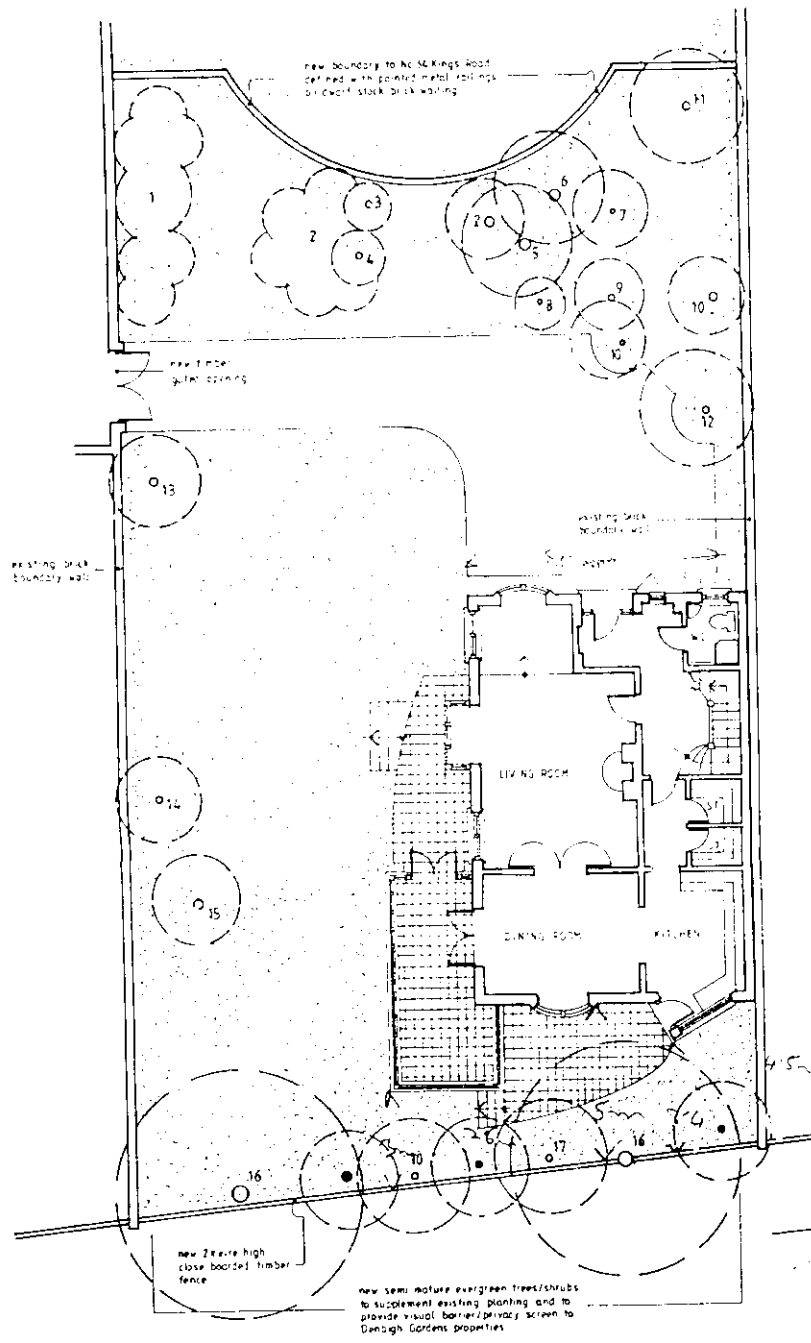
Drawn By AH	Chk'd By -	Scale @ A3 NTS	Date 14 DEC 2020
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Project No. K1118/07	Drawing No. BRE/31	Revision -
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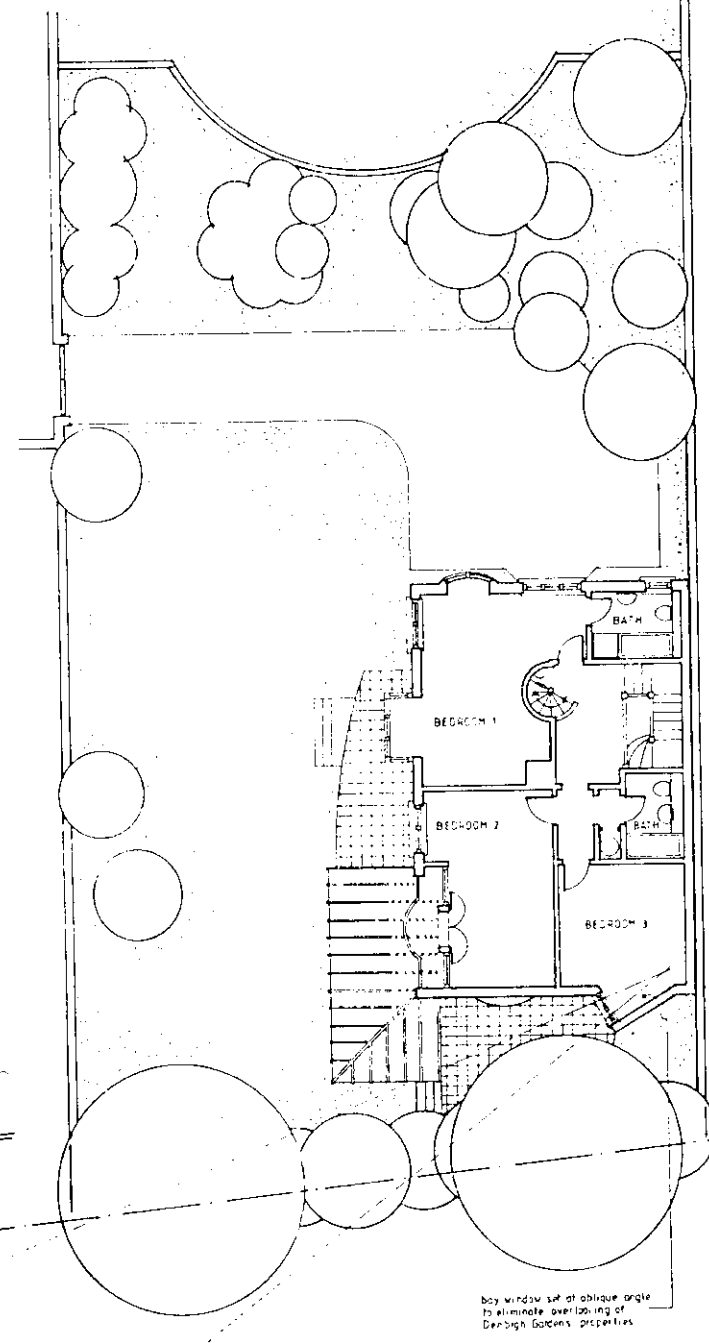
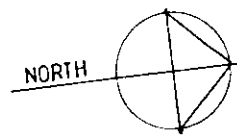
Appendix V

No. 64a King's Road Floor Plan

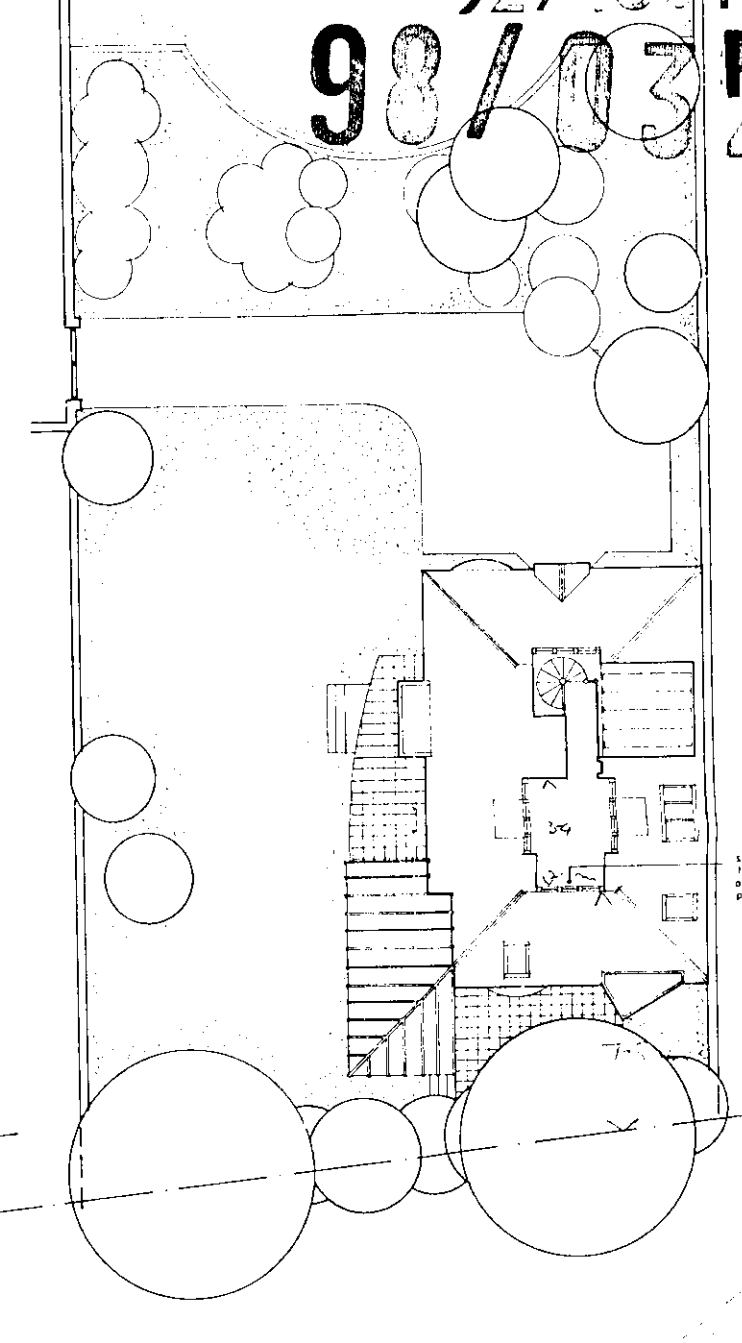
92/134
 98/0320



GROUND FLOOR PLAN



FIRST FLOOR PLAN



ROOF/ATTIC SPACE PLAN

REV	REVISION	DATE

INITIATIVES IN DESIGN
 CHARTERED ARCHITECTS
 52, RICHMOND ROAD, EAST TWICKENHAM, MIDDLESEX TW20 0EX
 TEL: 0181 870 6601 FAX: 0181 870 7271

PROJECT
 NEW HOUSE
 64 KINGS ROAD, RICHMOND

DRAWING TITLE
 FLOOR PLANS

SCALE 1:100 DATE 9.92

DRAWING NO. 270/PL-03 REV. B

