

GVA Schatunowski Brooks



Daylight and Sunlight
Report

GVA
65 Gresham Street
London
EC2V 7NQ

Ramsey Hall, 20 Maple Street, London W1

University College London

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1. Introduction and Scope of Report

- 1.1 GVA Schatunowski Brooks has been retained by University College London (UCL) to assess the performance and impact of the proposed extension of the Ramsey Hall of Residence at Maple Street, Whitfield Street and Fitzroy Street, London W1 in respect of Daylight and Sunlight.
- 1.2 The nature of the works is fairly modest in terms of increase in height and massing as it is limited to remodelling the existing fifth floor and a relatively small extension above the "Rome" block.
- 1.3 The purpose of this report is to assess the impact of the proposed development on the Daylight and Sunlight enjoyed by existing neighbouring dwellings in accordance with the Building Research Establishment (BRE) Guidelines "*Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice*" 2011, and to ensure that the proposed development satisfies the objectives in the Council's policy to ensure that existing neighbouring residents will continue to enjoy a reasonable level of amenity in context with the general character of this part of the Borough.
- 1.4 GVA Schatunowski Brooks has been retained as part of the design team from the outset of the design process to provide advice and guidance on the massing studies to determine an appropriate form of "massing" to ensure that the Council's policy objectives are satisfied.

2. Sources of Information and Limitations

2.1 A detailed 3D computer model of the existing neighbouring buildings has been built up from a 3D survey reference 12960-OP Ramsey Hall ROL.

2.2 For the proposed scheme, we have relied upon the Hawkins Brown drawing numbers:-

- 1438-HB-X-01-M2-A-P-BLDG.DWG
- 1438-HB-X- 02-M2-A-P-BLDG.DWG
- 1438-HB-X- 03-M2-A-B-BLDG.DWG
- 1438-HB-X- 04-M2-A-P-BLDG.DWG
- 1438-HB-X- 05-M2-A-P-BLDG.DWG
- 1438-HB-X- B1-M2-A-P-BLDG.DWG
- 1438-HB-X- E-01-A-E-BLDG.DWG
- 1438-HB-X- E-05-A-E-BLDG.DWG
- 1438-HB-X- E-06-A-E-BLDG.DWG
- 1438-HB-X- E-08-A-E-BLDG.DWG
- 1438-HB-X- RF-M2-A-P-BLDG.DWG

2.3 The site has been inspected on a number of occasions and a desktop review of the planning histories of the neighbouring buildings has also been undertaken.

2.4 Where details of the neighbouring buildings have been procured, they have been used in the analysis, but where no internal information has been available, internal room uses layouts and dimensions have been assumed and estimated.

3. Daylight and Sunlight Standards

3.1 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.

3.2 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."

3.3 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

3.4 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.

- 3.5 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.
- 3.6 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.
- 3.7 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.
- 3.8 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. 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.
- 3.9 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."

- 3.10 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.
- 3.11 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.
- 3.12 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.
- 3.13 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.
- 3.14 One of the main reasons why ADF is more appropriate for New-Build buildings 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.
- 3.15 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

- 3.16 The requirements for protecting sunlight to existing residential buildings are set out in section 3.2 of the BRE Guidelines.
- 3.17 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 0830hrs to 1730hrs. 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.
- 3.18 The sunlight standards are normally applied to the principal Living Room within each dwelling rather than to kitchens and bedrooms.
- 3.19 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."

- 3.20 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.

4. Scheme Assessment

- 4.1 Although the BRE Guidelines contain recommendations for commercial and non-domestic buildings as well as buildings in residential use, for the purpose of Planning, the tests within the BRE Guidelines are usually limited to existing neighbouring residential buildings. Non-domestic and commercial buildings are usually excluded as it is generally accepted that these uses normally rely primarily on supplementary artificial lighting throughout the day and are therefore not fully dependent on natural lighting as their sole source of amenity.
- 4.2 The purpose of the Guidelines, a "*habitable*" room is defined as a Kitchen, Living Room or Bedroom. Bathrooms, hallways and circulation space are excluded and therefore do not require testing.
- 4.3 We have not had access to the interior of all of the existing neighbouring buildings and it has therefore been necessary to estimate the internal room uses and dimensions based on external observation for some of the rooms. It should therefore be noted that in the present circumstances the results for the Daylight Distribution and Average Daylight Factor analysis are less reliable than the Vertical Sky Component results where they have been based on assumed and estimated room layouts and dimensions
- 4.4 Annexed at Appendix 1 are drawing numbers RA41/-06 CAD075, CAD076, CAD077 and CAD078 which are images of the 3D model showing the existing building and extent of the proposed roof extension in context with the various neighbouring buildings. Those drawings are followed in Appendix 2 by drawing numbers RA41-07-BRE097 to BRE111 which are the Daylight Distribution plans which illustrate the contour analysis for the rooms tested. The window and room references on those plans should be cross referenced with the Daylight Analysis Table annexed at Appendix 3 and Sunlight Analysis Table at Appendix 4.
- 4.5 Those results clearly demonstrate that every room/window comfortably satisfies the BRE Guidelines for Daylight and Sunlight. There will in fact be a considerable number of rooms/windows that will experience a minor improvement in daylight and sunlight as a result of the removal of some of the roof plant.

5. Summary and Conclusion

- 5.1 The results of the Daylight and Sunlight analysis clearly demonstrate that the impact of the proposed development will be comfortably within the BRE Guidelines in respect of Daylight and Sunlight. This therefore demonstrates that no existing neighbouring habitable room will experience a noticeable or material loss of Daylight and Sunlight and there will be no material loss of amenity. It therefore follows that the Council's policy objectives have been met.

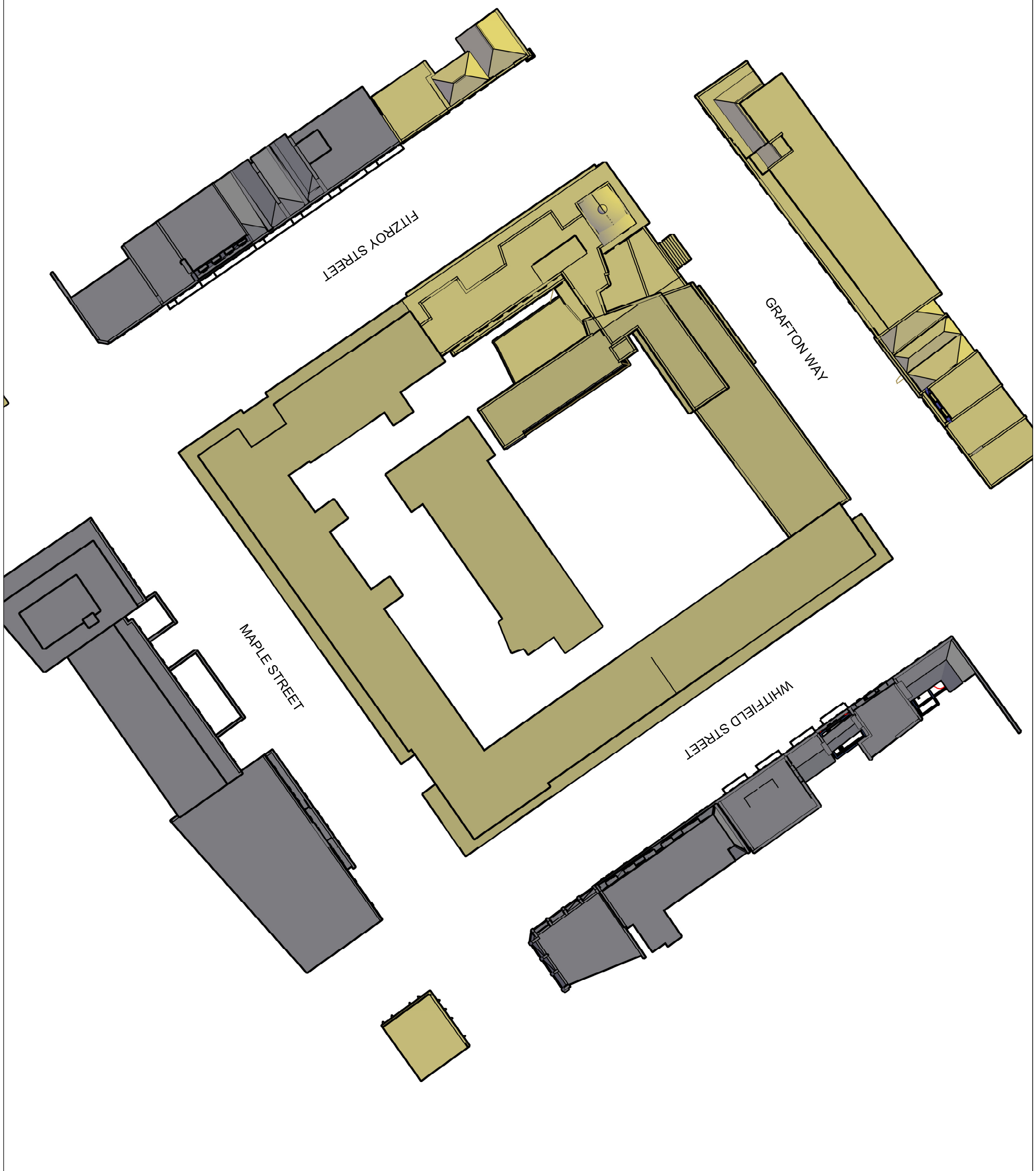


Appendix I

- Legend
- Existing Site
 - Proposed Scheme
 - Analysed Building
 - Surrounding Building

Source of Information
 Existing And Surrounding Buildings
 Hawkins Brown 3d Survey Information sent on 23 April 2014
 12960-0P Ramsey Hall ROL

Proposed Scheme
 Hawkins Brown Drawings sent on 15 June 2015
 1438-HB-X-01-MZ-A-P-Bldg.dwg
 1438-HB-X-02-MZ-A-P-Bldg.dwg
 1438-HB-X-03-MZ-A-P-Bldg.dwg
 1438-HB-X-04-MZ-A-P-Bldg.dwg
 1438-HB-X-05-MZ-A-P-Bldg.dwg
 1438-HB-X-B1-MZ-A-P-Bldg.dwg
 1438-HB-X-E-01-A-E-Bldg.dwg
 1438-HB-X-E-05-A-E-Bldg.dwg
 1438-HB-X-E-06-A-E-Bldg.dwg
 1438-HB-X-E-08-A-E-Bldg.dwg
 1438-HB-X-RF-MZ-A-P-Bldg.dwg



GVA
 08449 02 03 04
 GVA Schatunowski Brooks
 10 Stratton Street, London, W1J 8UR
 www.gva.co.uk





Project Name
 UCL, Ramsey Hall
 London, W1

Client
 University College London

Drawing Title
 Existing Site Plan

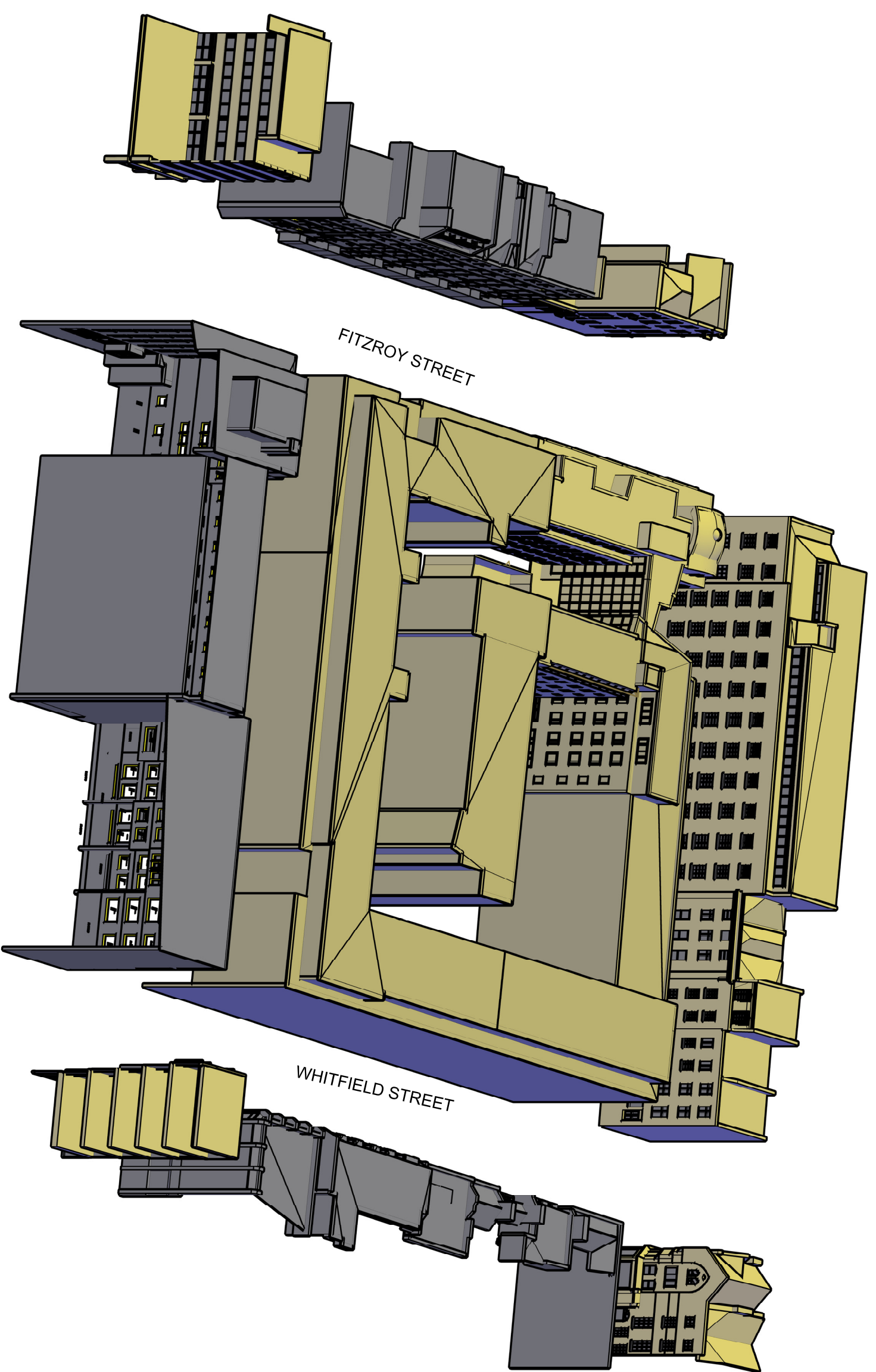
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Checked By					

Project No.	RA41-06	Drawing No.	CAD 075	Revision	-
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 1438-HB-X-05-M2-A-P-Bldg.dwg
 1438-HB-X-B1-M2-A-P-Bldg.dwg
 1438-HB-X-E-01-A-E-Bldg.dwg
 1438-HB-X-E-05-A-E-Bldg.dwg
 1438-HB-X-E-06-A-E-Bldg.dwg
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 GVA Schatunowski Brooks
 10 Stratton Street, London, W1J 8JR
 www.gva.co.uk

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 London, W1

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Drawing Title
 Existing 3d View

Drawn By	Checked By	Scale @ A3	Date
M/O	-	1/500	31/07/2015

Project No.	Drawing No.	Revision
RA41-06	CAD 076	-

Source of Information
Existing And Surrounding Buildings
Hawkins Brown 3d Survey Information sent on 23 April 2014
12960-0P Ramsey Hall ROL

Proposed Scheme
Hawkins Brown Drawings sent on 15 June 2015
1438-HB-X-01-MZ-A-P-Bldg.dwg
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10 Stratton Street, London, W1J 8JR
www.gva.co.uk

Project Name
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London, W1

Client
University College London

Drawing Title
Proposed Site Plan

Drawn By	Checked By	Scale @ A3	Date
M/O	-	1/500	31/07/2015

Project No.	Drawing No.	Revision
RA41-06	CAD 077	-

