

**1-11 Euston Road, London
Daylight and Sunlight Report**



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13th July 2011

Client:
Gaylord Property Investment

Re: Proposed Development: 1-11 Euston Road, London

You have instructed us to consider how the proposed scheme for the above site affects the daylight and sunlight amenity to the surrounding residential properties. Using the methods of Vertical Sky Component (VSC), Average Daylight Factor (ADF), and Annual Probable Sunlight Hours (APSH) we have assessed the relevant surrounding properties in relation to the Building Research Establishment (BRE) publication 'Site Layout Planning for Daylight and Sunlight 1991'. Our drawings 232/PL2/04 to 232/PL2/06 show our 3D model of the proposed scheme in the context of the surrounding properties.

1. Properties Considered

The following properties have been considered in this report:

2-5 Birkenhead Street, St. Mungo's Hostel
The King Cross Methodist Mission

Both these properties only provide temporary residential accommodation

2. Sources of Information

Ordnance Survey
Digital Siteplan

Bill Greensmith Architects
Partial site survey and proposal drawings -
EUSTON+RD7+august+2005.dwg
EUSTON RD May 2006.dwg
Feb 23 2009.dwg
6 may 2011 v 2000.dwg

WATERSLADE LTD
Site Photographs

3. Drawings attached

Drawing Number	Title
232/PL2/01-03	- Plan and 3D views, Existing buildings
232/PL2/04-06	- Plan and 3D views, Proposed development
232/PL2/07-08	- Window maps for surrounding properties

4. Assumptions made in the 3D model

The proposed building has been modelled from the of the architect's drawings. The massing of, and windows in, the surrounding properties were modelled from partial site survey, Ordnance survey data and site photographs, along with info obtained from site visits. We have made reasonable assumptions, based on careful site inspection, as to the internal room layouts in all properties. The 3D model was created so as to reproduce the massing of the buildings both on and surrounding the site, at a level of detail appropriate to the calculations performed. All heights in the model are at Above Ordnance Datum (AOD).

5. Daylight and Sunlight Analysis

Initially, a detailed 3D computer model of the existing site and all the surrounding buildings was created. This model was then analysed to calculate the existing light levels at each window. These existing light levels were then compared with the corresponding levels with the proposed development in place. The resulting levels and their reductions were then compared to the relevant BRE guideline.

Daylight -

We have calculated values of Vertical Sky Component (VSC) and these are shown in the attached tables of results. Both of these methods are discussed in the BRE document. The major difference between them is that VSC is a measurement of daylight received at a window and is therefore not dependent on the size, the number of windows or the size of the room served. (The BRE Report states that where a proposed VSC value is less than 27%, then the resultant value should not be less than 0.8 times its former value.) ADF, on the other hand, is a measure of the adequacy of daylight within the room and does account for factors such as the size of window in relation to the size of the room, the nature of the glazing and number of windows. Clearly a small room with a large window will be better illuminated by daylight than a large room with a small window, and the ADF measure accounts for this. The ADF method is described in the BRE document and British Standard BS8206 part 2, "Lighting for Buildings". The acceptable minima depend on the room use and are 1% for a bedroom, 1.5% for a living room and 2% for a kitchen.

We refer further to the discussion regarding ADF and VSC in Appendix A.

Sunlight -

We have calculated the Sunlight Availability before and after development as a measure of the impact of the proposal on sunlight. The BRE Report recommends that the APSH in the proposed case should be at least 25% of the total including at least 5% in winter. Where the proposed values fall short of these, then the diminution should be such that the proposed value is no less than 0.8 times its former value in either case. Only windows that face within 90 degrees of south are considered by the BRE to have a sunlight requirement. A further discussion of Sunlight Availability can be found in Appendix A.

6. Results

We have calculated the sunlight and daylight figures as set out in the BRE Report. In its introduction this document states that, *“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 designer. Although it gives numerical guidelines, these should be interpreted flexibly.”* Furthermore, *“In special circumstances the developer or planning authority may wish to use different target values. For example, in an historic city centre a higher degree of obstruction may be unavoidable if new developments are to match the height and proportion of existing buildings.”*

Each room and window in the surrounding properties has been assigned a unique label. These are shown in drawings 262/PL2/07-08. A discussion of each property follows –

2-5 Birkenhead Street, St. Mungo’s Hostel

This property does not face the proposed development directly, but has an oblique view of the southern part of it. The proposed development is 4-5 stories higher than the existing buildings in this area, but is some distance away. As a result, this property suffers some small reductions in daylight and sunlight but, as may be seen in the results tables, these are comfortably within the BRE criteria.

King’s Cross Methodist Mission

The windows in the north elevation of this property will be impacted by the proposal. While it appears that windows W1-3/50, W1/51 & W1/52 serve stairs and bathrooms, it is likely that the remaining windows serve a mixture of offices and bedrooms. It is only the bedroom windows that would need to be considered, and these only provide temporary accommodation. While all the windows fall short of achieving the BRE VSC criteria, 5 of the 20 rooms they serve will achieve an ADF in excess of 1% (the recommended level of daylight for a bedroom) after the proposal is implemented. A further 8 will achieve an ADF in excess of 0.8%, not far short of the recommended 1.0%. The 7 remaining rooms all achieve low levels of daylight in the existing situation. Given the temporary nature of the accommodation and the urban location, we consider that the impact on this property is acceptable with regard to the BRE criteria.

As far as sunlight is concerned, the windows do not face within 90 degrees of south, and so there is no requirement for the BRE test.

7. Conclusions

The only two properties surrounding the site that are in residential use are both hostels and therefore only provide temporary accommodation. The daylighting to King’s Cross Methodist Mission will be impacted, but given the nature of the accommodation and the urban location we consider it acceptable. 2-5 Birkenhead Road will not be materially impact by the proposal, and fully complies with the criteria set out in the BRE Handbook.

Overall, given the flexibility the guidelines urge, we consider the proposal acceptable with regard to the daylight and sunlight amenity to the surrounding properties.

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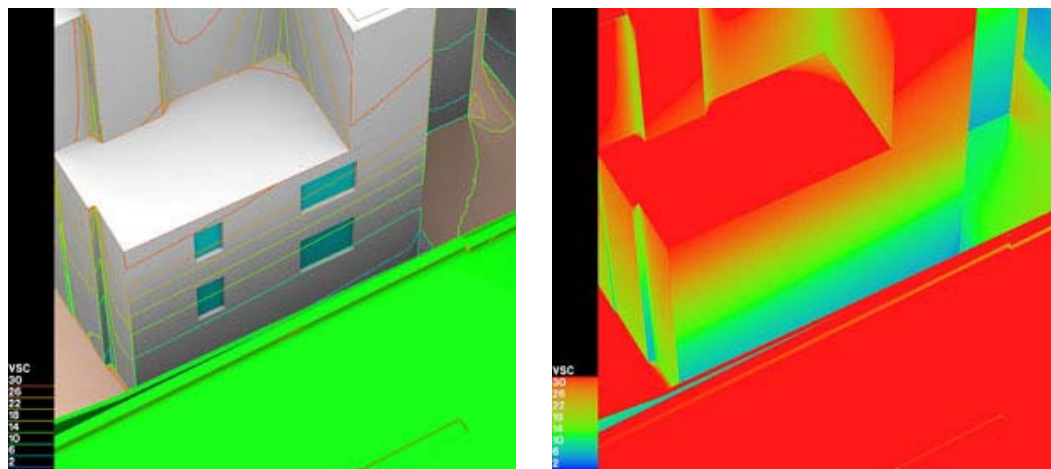
Appendix A

Vertical Sky Component (VSC)

The Vertical Sky Component is a measure of the amount of skylight incident on a vertical plane (i.e. the sky factor on a Vertical Plane). It is most commonly applied to the light incident at the centre of a window and in this sense is a measure of the potential for good daylighting. The VSC is calculated by taking the ratio of the skylight incident at a point to the unobstructed skylight available on a horizontal plane. For a uniform sky, the maximum value is 50% (since the point is on a vertical plane, clearly only the half of the hemisphere which is in front of the plane can contribute). For a CIE sky, the maximum value is 39.6%.

Simple VSC Example

The frames below show 2 different ways of showing how the VSC varies across the face of a building:



Clearly in this case, the further down the windows are, the less light they receive, and therefore the lower the value of the VSC.

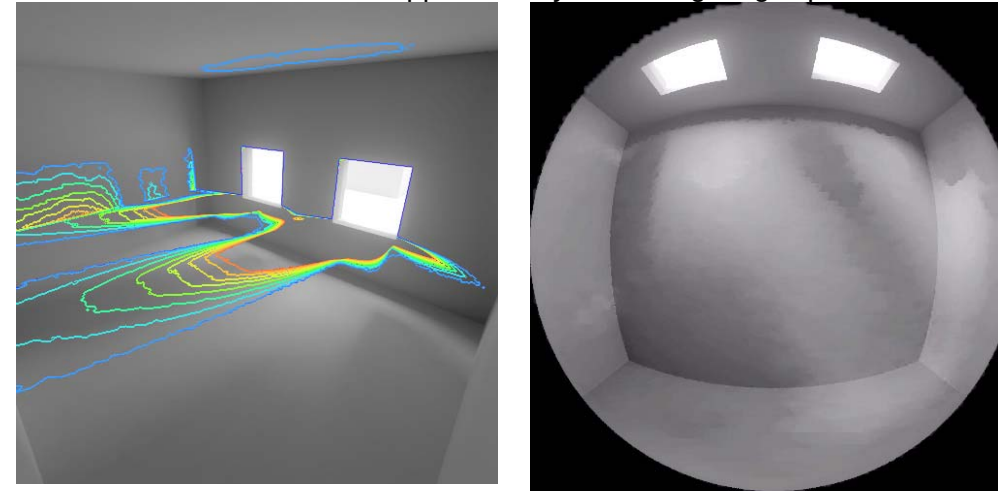
BRE Criterion

The guidelines state that if the VSC at the centre of a window is less than 27% and less than 0.8 times its former value, the diffuse daylighting of the existing building will be adversely affected. A value of 27% corresponds to an obstruction angle of 25 degrees over an infinite extent in plan.

This guideline (as with all the BRE guidelines) can be interpreted flexibly. The above criterion was developed in the case of suburban development where existing development was 2 storeys across an average street width. In city centre locations, the target VSC can be reduced to allow proposed buildings to match the height of other buildings in the neighbourhood.

Average Daylight Factor (ADF)

The Average Daylight Factor (ADF) is a measure of interior daylight. It can be used to establish whether a room will have a predominantly daylit appearance and if not, and it can provide levels below which a room should not fall even if supplementary electric lighting is provided.



ADF values can be calculated for rooms within a proposed development, and checked against the recommended value. Existing and Proposed ADF values can also be calculated for properties which overlook a site.

Factors on which the ADF depend are: VSC at the face of each window, the Total Window Area, Total Wall Area, Wall Reflectivity and Window Transmission.

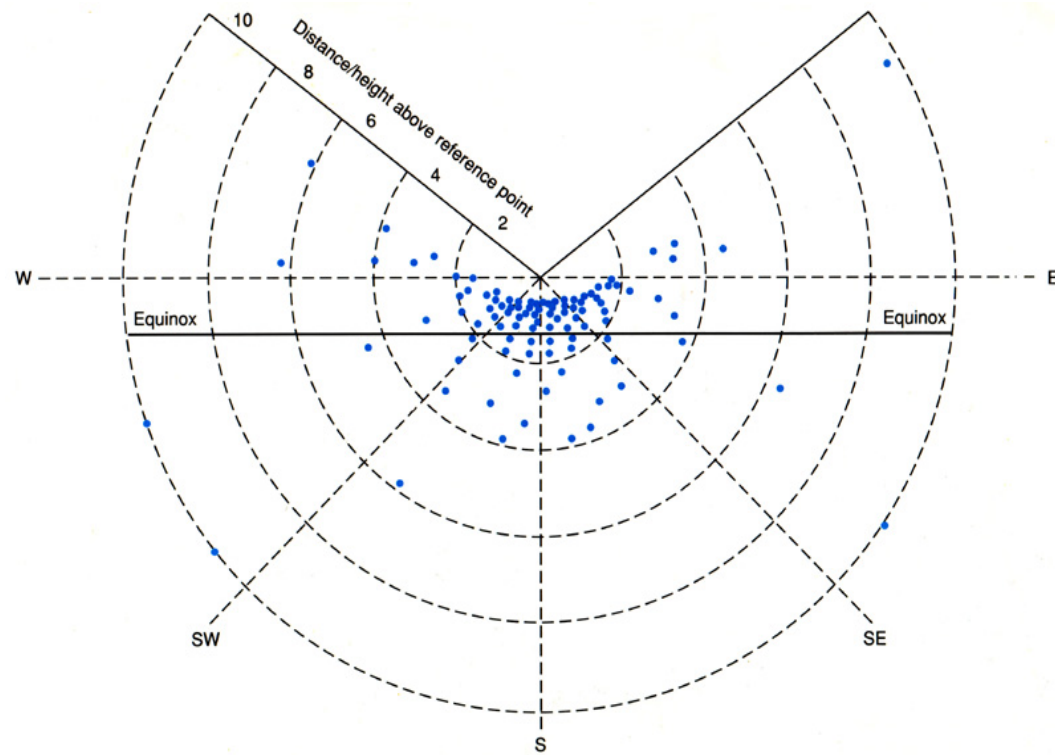
There are no specific BRE criteria for reduction in ADF if a proposed development were to be implemented, but in Appendix C it states that 'if the VSC is reduced from 30% to 24% (0.8 times its former value)...the ADF is reduced to 0.86 times its former value'. This implies that if up to a 20% reduction in VSC is acceptable, then up to a 14% reduction in ADF is also acceptable. In practice, the relationship between VSC and ADF is more complicated but the above holds to be approximately true over a range of values.

BRE Criterion

The BRE states that for a predominantly daylit appearance the ADF should be 5% or more if there is no supplementary electric lighting, or 2% or more if there is supplementary electric lighting. There are additional recommendations for dwellings. These are: 2.0% - Kitchens, 1.5% - Living Rooms, 1.0% - Bedrooms

Annual Probable Sunlight Hours (APSH)

Annual probable sunlight hours (APSH) is a measure of the average number of hours of sunlight one would expect to receive at a given position, as a fraction of the unobstructed total number of hours at the same location. The BRE have compiled data sets consisting of a statistical sample of solar positions convolved with local meteorological data. Using these to calculate APSH, one would simply calculate the number of solar positions visible from a point, compared to the total number, expressed as a percentage. The diagram below, taken from the BRE report, shows the solar positions, relative to a reference point, used to calculate Sunlight Availability for London (51.5°N).



BRE Criterion

The BRE report states that for windows within a new development, if a point at the centre of a window on the plane of the inside surface of the wall "...can receive more than one quarter of annual probable sunlight hours, including at least 5% of annual probable hours during the winter months between 21st September and 21st March, then the room should still receive enough sunlight."

For windows in surrounding properties, which experience a change in APSH, it goes on to say that, "Any reduction in sunlight access below this level should be kept to a minimum. If the available sunlight hours are both less than the amount given and less than 0.8 times their former value, either over the whole year or just during the winter months, then the occupants will notice the loss of sunlight."

Room Window		EXISTING VSC	PROPOSED VSC	LOSS VSC	VSC Ratio Proposed / Existing	EXISTING ADF	TOTAL	PROPOSED ADF	TOTAL
KING'S CROSS METHODIST MISSION									
R1/60	W1/60	2.76	1.44	1.32	0.52	0.23	0.23	0.07	0.07
R2/60	W2/60	5.12	3.51	1.61	0.69	0.41	0.41	0.30	0.30
R4/60	W3/60	0.30	0.01	0.29	0.03	0.00	0.00	0.00	0.00
R5/60	W4/60	9.42	5.84	3.58	0.62	0.64	0.64	0.44	0.44
R1/61	W1/61	4.78	2.35	2.43	0.49	0.54	0.54	0.27	0.27
R2/61	W2/61	9.71	5.92	3.79	0.61	0.96	0.96	0.68	0.68
R3/61	W3/61	13.38	7.77	5.61	0.58	1.19	1.19	0.82	0.82
R4/61	W4/61	15.39	8.51	6.88	0.55	1.34	1.34	0.89	0.89
R5/61	W5/61	14.48	8.22	6.26	0.57	1.24	1.24	0.83	0.83
R1/62	W1/62	9.03	5.96	3.07	0.66	0.72	0.72	0.54	0.54
R2/62	W2/62	17.54	11.00	6.54	0.63	1.20	1.20	0.87	0.87
R3/62	W3/62	23.00	12.90	10.10	0.56	1.45	1.45	0.95	0.95
R4/62	W4/62	25.14	12.73	12.41	0.51	1.57	1.57	0.95	0.95
R5/62	W5/62	24.06	11.72	12.34	0.49	1.45	1.45	0.85	0.85
R1/63	W1/63	21.71	16.49	5.22	0.76	1.30	1.30	1.06	1.06
R2/63	W2/63	28.90	17.68	11.22	0.61	1.69	1.69	1.18	1.18
R3/63	W3/63	31.78	16.96	14.82	0.53	1.82	1.82	1.14	1.14
R4/63	W4/63	32.20	15.75	16.45	0.49	1.86	1.86	1.08	1.08
R5/63	W5/63	31.07	14.14	16.93	0.46	1.73	1.73	0.94	0.94
R1/64	W1/64	16.85	13.37	3.48	0.79	1.40	1.40	1.26	1.26
2-5 BIRKENHEAD STREET (ST. MUNGO'S HOSTEL)									
R1/79	W1/79	20.02	18.72	1.30	0.94	1.60	1.60	1.52	1.52
R4/79	W2/79	19.84	19.16	0.68	0.97	1.20	1.20	1.18	1.18
R5/79	W3/79	19.07	18.60	0.47	0.98	1.26	1.26	1.24	1.24
R1/80	W2/80	24.70	22.68	2.02	0.92	2.61	2.61	2.47	2.47
R2/80	W3/80	24.45	22.69	1.76	0.93	1.63		1.56	
R2/80	W4/80	24.32	22.85	1.47	0.94	1.63	3.26	1.57	3.12

Room	Window	EXISTING VSC	PROPOSED VSC	LOSS VSC	VSC Ratio Proposed / Existing	EXISTING ADF	TOTAL	PROPOSED ADF	TOTAL
R3/80	W6/80	24.10	23.08	1.02	0.96	2.24	2.24	2.18	2.18
R4/80	W8/80	23.88	23.19	0.69	0.97	2.44	2.44	2.41	2.41
R1/81	W1/81	29.02	26.18	2.84	0.90	3.82	3.82	3.56	3.56
R2/81	W2/81	28.93	26.31	2.62	0.91	4.45	4.45	4.19	4.19
R3/81	W3/81	28.77	26.54	2.23	0.92	4.24	4.24	4.03	4.03
R4/81	W4/81	28.65	26.76	1.89	0.93	4.19	4.19	4.01	4.01
R5/81	W5/81	28.70	27.07	1.63	0.94	4.10	4.10	3.96	3.96
R6/81	W6/81	28.60	27.20	1.40	0.95	4.53	4.53	4.40	4.40
R7/81	W7/81	28.46	27.28	1.18	0.96	4.26	4.26	4.16	4.16
R8/81	W8/81	28.36	27.32	1.04	0.96	3.15	3.15	3.09	3.09
R1/82	W1/82	34.05	30.43	3.62	0.89	1.75	1.75	1.60	1.60
R2/82	W2/82	33.99	30.64	3.35	0.90	2.45	2.45	2.26	2.26
R3/82	W3/82	33.87	30.97	2.90	0.91	1.82	1.82	1.71	1.71
R4/82	W4/82	33.77	31.18	2.59	0.92	2.42	2.42	2.28	2.28
R5/82	W5/82	33.64	31.39	2.25	0.93	2.90	2.90	2.76	2.76
R6/82	W6/82	33.53	31.56	1.97	0.94	3.16	3.16	3.03	3.03
R7/82	W7/82	33.52	31.79	1.73	0.95	2.91	2.91	2.81	2.81
R8/82	W8/82	33.30	31.77	1.53	0.95	2.80	2.80	2.72	2.72
R1/83	W1/83	36.54	32.69	3.85	0.89	2.38	2.38	2.16	2.16
R2/83	W2/83	37.14	33.62	3.52	0.91	2.55	2.55	2.33	2.33
R3/83	W3/83	37.14	33.96	3.18	0.91	2.40	2.40	2.21	2.21
R4/83	W4/83	37.08	34.17	2.91	0.92	2.28	2.28	2.11	2.11
R5/83	W5/83	36.97	34.42	2.55	0.93	2.20	2.20	2.06	2.06
R6/83	W6/83	36.91	34.58	2.33	0.94	2.41	2.41	2.27	2.27
R7/83	W7/83	37.06	35.03	2.03	0.95	1.59	1.59	1.51	1.51
R8/83	W8/83	36.96	35.11	1.85	0.95	1.81	1.81	1.73	1.73

Room	Window	EXISTING			PROPOSED			REDUCTION FACTOR	
		Summer	Winter	Total	Summer	Winter	Total	Winter	Total
2-5 BIRKENHEAD STREET (ST. MUNGO'S HOSTEL)									
R1/79	W1/79	22	6	28	22	6	28	1.00	1.00
R4/79	W2/79	22	4	26	22	4	26	1.00	1.00
R5/79	W3/79	21	3	24	21	3	24	1.00	1.00
R1/80	W2/80	28	6	34	27	6	33	1.00	0.97
R2/80	W3/80	26	6	32	25	6	31	1.00	0.97
R2/80	W4/80	27	5	32	26	5	31	1.00	0.97
R3/80	W6/80	27	6	33	27	6	33	1.00	1.00
R4/80	W8/80	26	6	32	25	6	31	1.00	0.97
R1/81	W1/81	30	9	39	28	9	37	1.00	0.95
R2/81	W2/81	31	8	39	28	8	36	1.00	0.92
R3/81	W3/81	29	8	37	28	8	36	1.00	0.97
R4/81	W4/81	29	8	37	28	8	36	1.00	0.97
R5/81	W5/81	31	10	41	29	10	39	1.00	0.95
R6/81	W6/81	30	8	38	29	8	37	1.00	0.97
R7/81	W7/81	30	7	37	29	7	36	1.00	0.97
R8/81	W8/81	30	7	37	29	7	36	1.00	0.97
R1/82	W1/82	33	12	45	28	11	39	0.92	0.87
R2/82	W2/82	33	12	45	28	11	39	0.92	0.87
R3/82	W3/82	33	13	46	30	12	42	0.92	0.91
R4/82	W4/82	33	13	46	31	12	43	0.92	0.93
R5/82	W5/82	34	13	47	31	13	44	1.00	0.94
R6/82	W6/82	35	12	47	31	12	43	1.00	0.91
R7/82	W7/82	35	13	48	31	13	44	1.00	0.92
R8/82	W8/82	35	13	48	31	13	44	1.00	0.92
R1/83	W1/83	40	21	61	34	19	53	0.90	0.87
R2/83	W2/83	40	21	61	34	19	53	0.90	0.87
R3/83	W3/83	40	21	61	36	19	55	0.90	0.90
R4/83	W4/83	40	21	61	36	20	56	0.95	0.92
R5/83	W5/83	40	21	61	36	21	57	1.00	0.93
R6/83	W6/83	40	21	61	36	21	57	1.00	0.93
R7/83	W7/83	38	20	58	35	20	55	1.00	0.95
R8/83	W8/83	38	20	58	35	20	55	1.00	0.95

King's Cross Station (Terminus)

GRAY'S INN ROAD

EUSTON ROAD

BIRKENHEAD STREET

CRESTFIELD STREET

Access Self Storage
Belgrove House

CENTA HOUSE
13

CHINESE METHODIST
CONGREGATION
13

KING'S CROSS
METHODIST MISSION

HOTEL
345

HOTEL
1

23

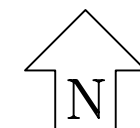
Sources: Ordnance Survey
Digital Siteplan

Bill Greensmith Architects
Partial site survey and proposal drawings -
EUSTON+RD7+august+2005.dwg
EUSTON RD May 2006.dwg
feb 23 2009.dwg
6 may 2011 v 2000.dwg

Red Numbers
indicate properties in
residential use (incl.
hostel)

Blue Numbers
indicate commercial
properties

Magenta Numbers
indicate proposed
commercial properties



Project Title: 1-11 Euston Road
London N1

Drawing Title: PLAN VIEW
EXISTING BUILDINGS

Date: JULY 11

Drawing No. W232/PL2/01

Scale: 1:500



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EUSTON ROAD

CRESTFIELD STREET

BIRKENHEAD STREET

30695

26300

28470

30040

31495

28185

31190

25565

Project Title: **1-11 Euston Road
London N1**

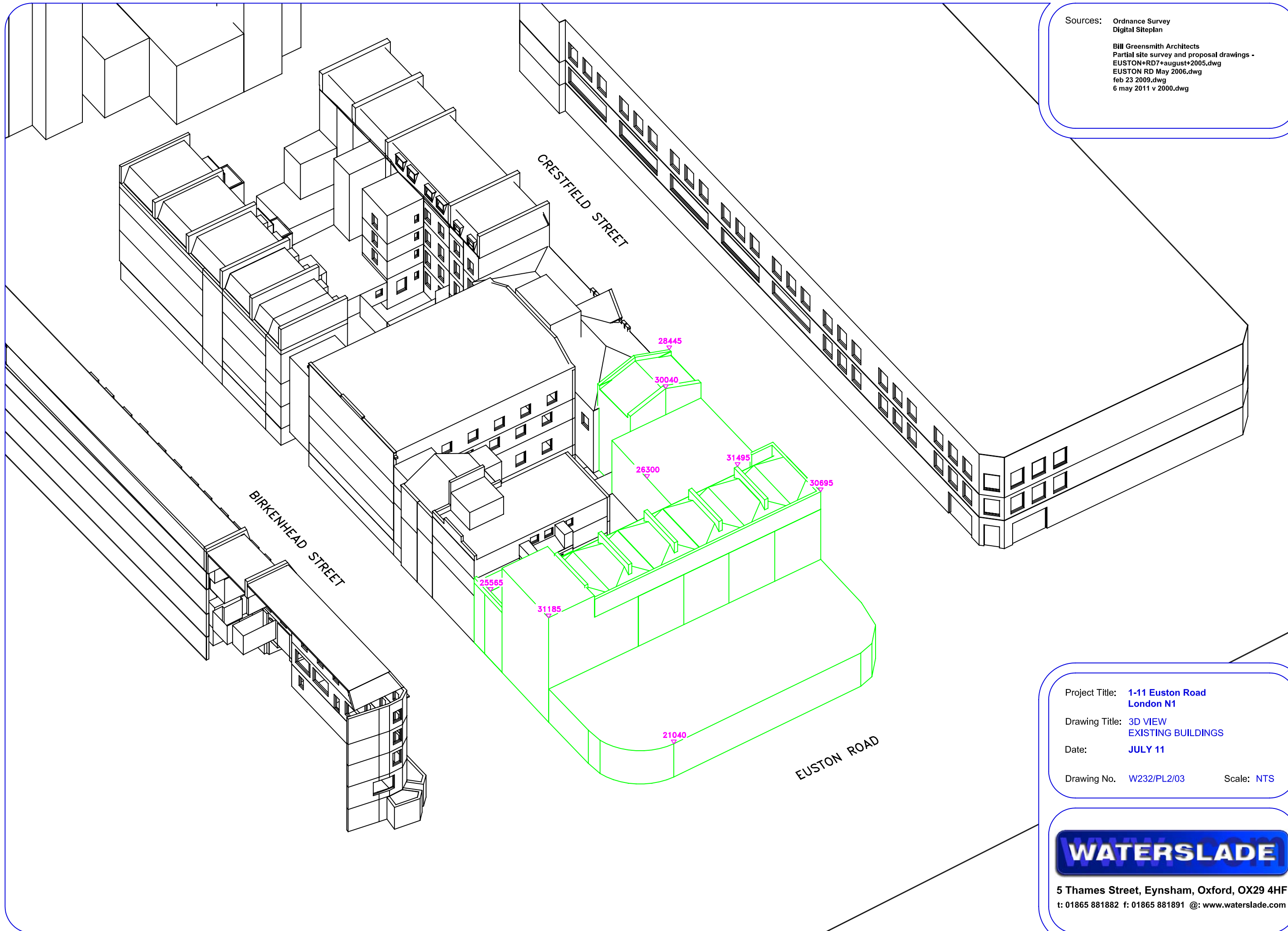
Drawing Title: **3D VIEW
EXISTING BUILDINGS**

Date: **JULY 11**

Drawing No. **W232/PL2/02** Scale: **NTS**



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Project Title: **1-11 Euston Road
London N1**

Drawing Title: **3D VIEW
EXISTING BUILDINGS**

Date: **JULY 11**

Drawing No. **W232/PL2/03** Scale: **NTS**



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King's Cross Station (Terminus)

GRAY'S INN ROAD

EUSTON ROAD

BIRKENHEAD STREET

CRESTFIELD STREET

Access Self Storage
Belgrove House

CENTA HOUSE
13

CHINESE METHODIST
CONGREGATION
15

KING'S CROSS
METHODIST MISSION

HOTEL
345

HOTEL
1

25

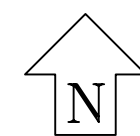
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Red Numbers
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indicate commercial
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Magenta Numbers
indicate proposed
commercial properties



Project Title: 1-11 Euston Road
London N1

Drawing Title: PLAN VIEW
PROPOSED DEVELOPMENT

Date: JULY 11

Drawing No. W232/PL2/04 Scale: 1:500



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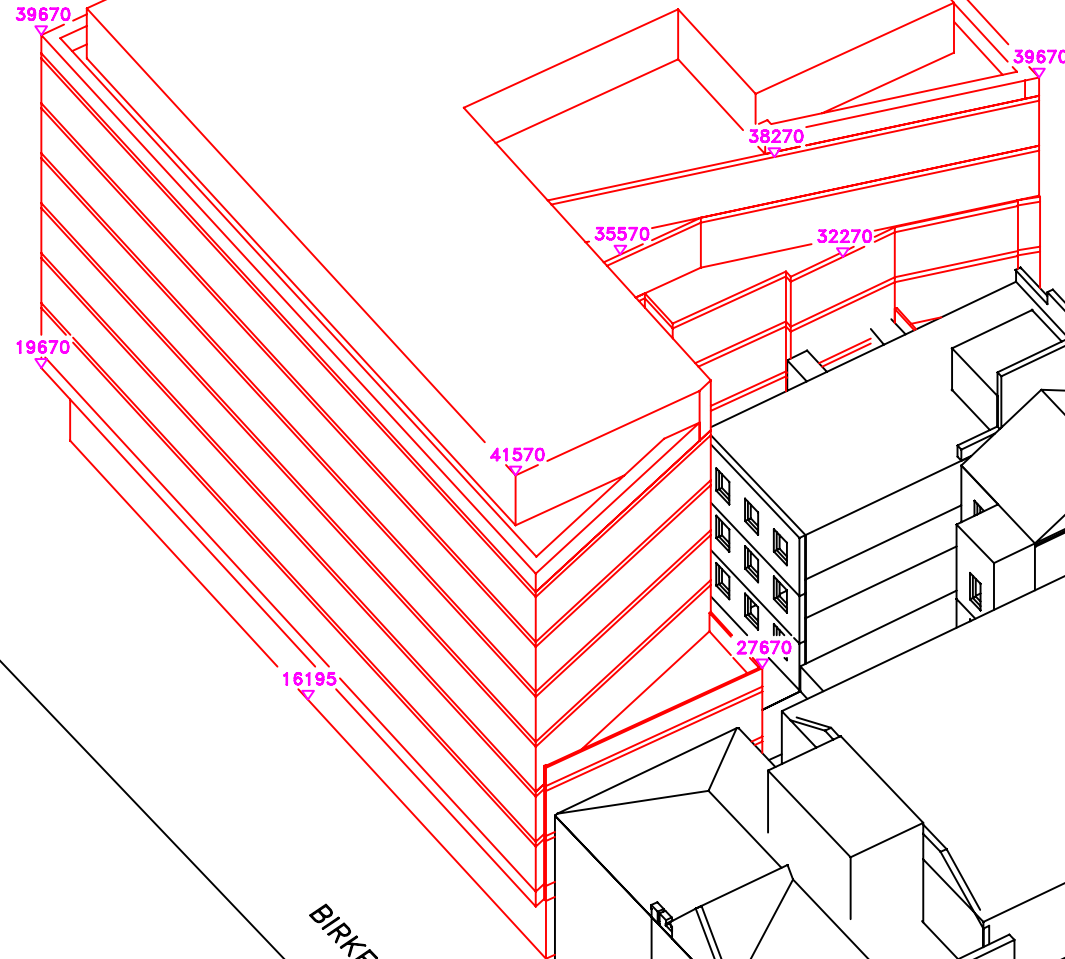
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EUSTON ROAD

CRESTFIELD STREET

BIRKENHEAD STREET



Project Title: **1-11 Euston Road
London N1**

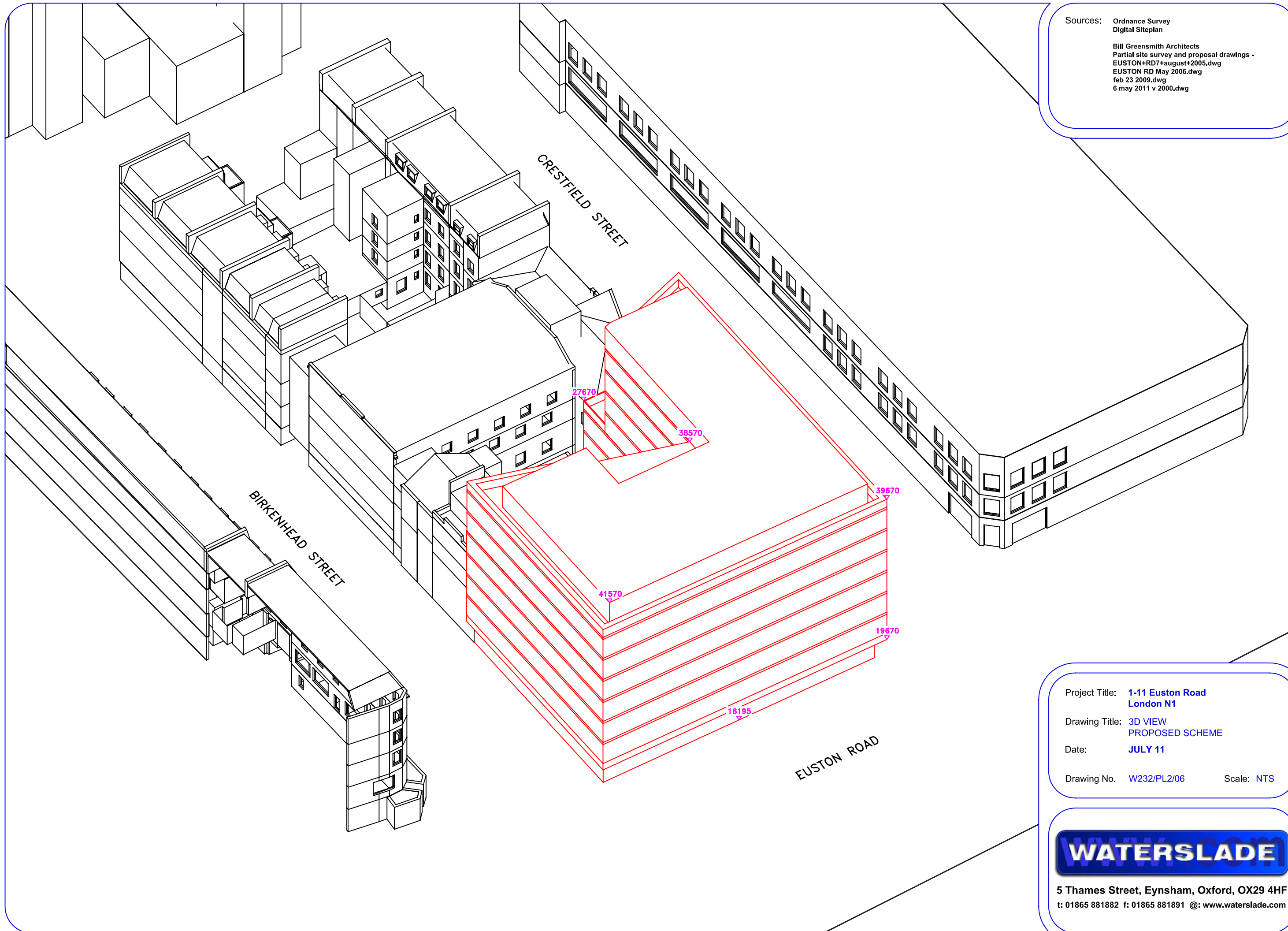
Drawing Title: **3D VIEW
PROPOSED SCHEME**

Date: **JULY 11**

Drawing No. **W232/PL2/05** Scale: **NTS**



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Sources: Ordnance Survey
Digital Siteplan

Bill Greensmith Architects
Partial site survey and proposal drawings -
EUSTON+RD7+august+2005.dwg
EUSTON RD May 2006.dwg
feb 23 2009.dwg
6 may 2011 v 2000.dwg

Project Title: **1-11 Euston Road
London N1**

Drawing Title: **3D VIEW
PROPOSED SCHEME**

Date: **JULY 11**

Drawing No. **W232/PL2/06** Scale: **NTS**



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Sources: Ordnance Survey
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EUSTON+RD7+august+2005.dwg
EUSTON RD May 2006.dwg
feb 23 2009.dwg
6 may 2011 v 2000.dwg



Project Title: **1-11 Euston Road**
London N1

Drawing Title: **WINDOW MAP**
2-5 BIRKENHEAD STREET (HOSTEL)

Date: **JULY 11**

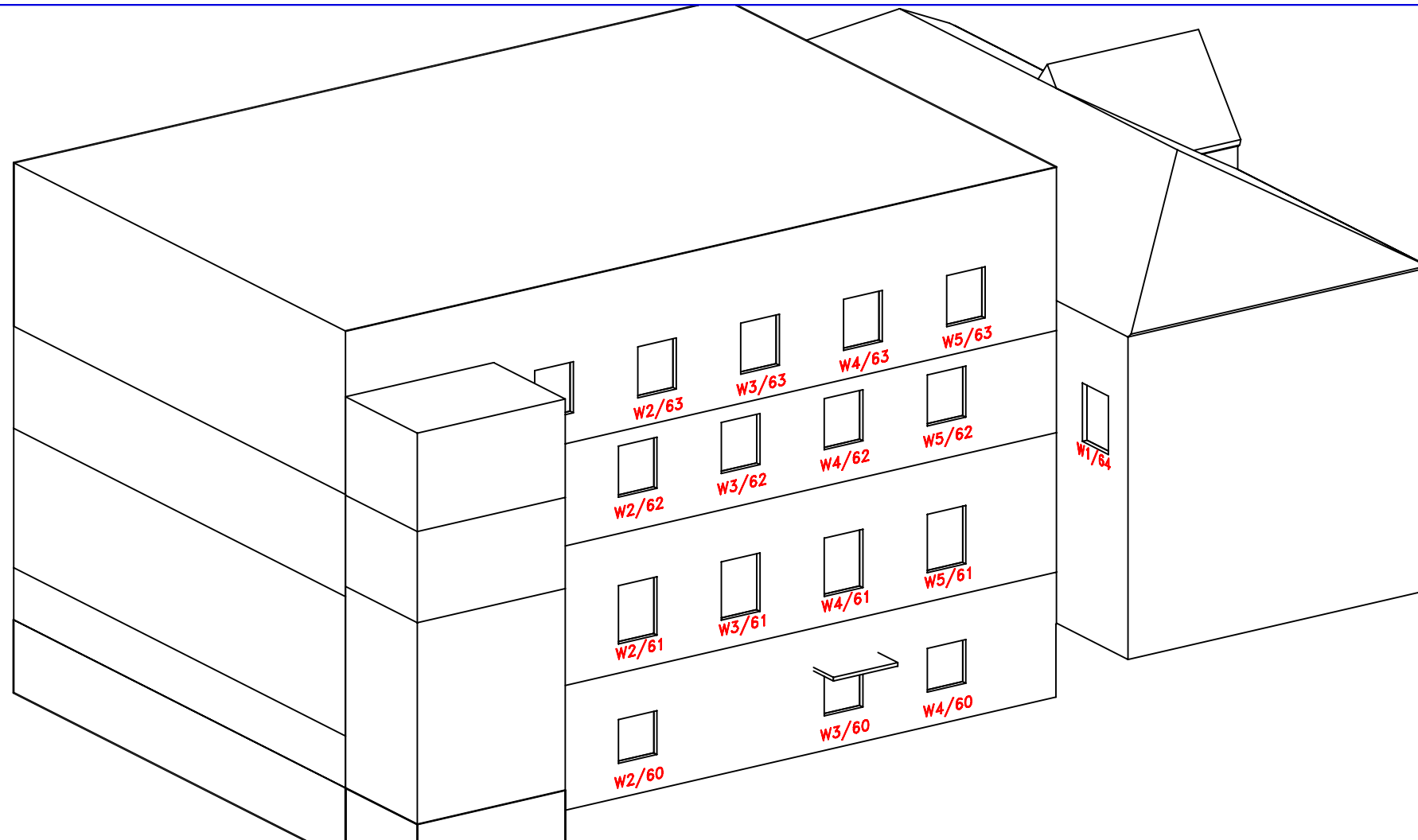
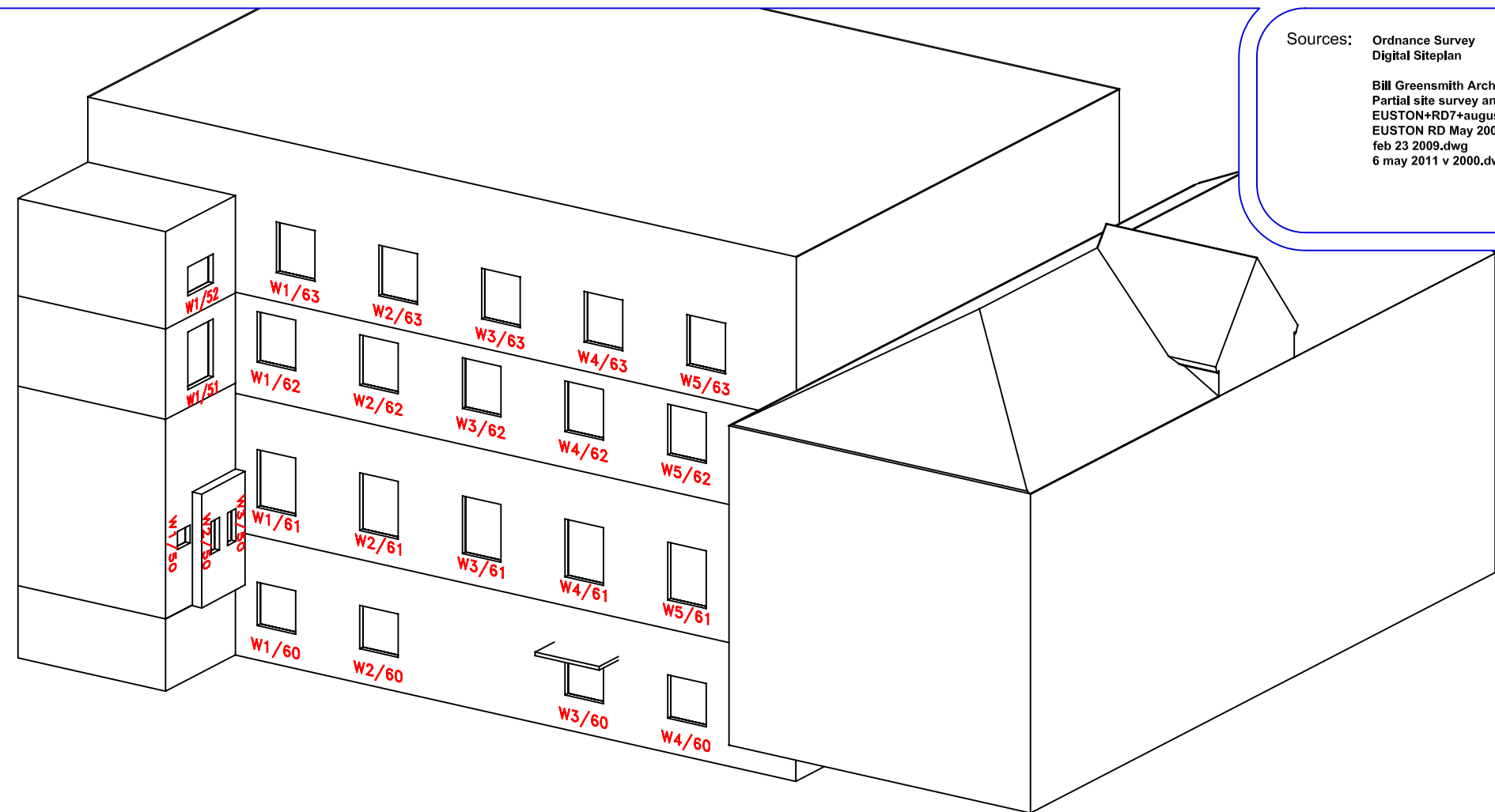
Drawing No. **W232/PL2/07** Scale: **NTS**



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Project Title: **1-11 Euston Road
London N1**

Drawing Title: **WINDOW MAP
KING'S CROSS METHODIST MISSION**

Date: **JULY 11**

Drawing No. **W232/PL2/08** Scale: **NTS**



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