GVA Schatunowski Brooks

Daylight and Sunlight Report

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1-9 Sandycombe Road

Goldcrest Land

December 2015

Contents

Appendices

1. Introduction and Scope of Report

1.1 GVA Schatunowski Brooks have been retained by Goldcrest Land to assess the performance and impact of the proposed development at the site known as 1-9 Sandycombe Road in respect of daylight and sunlight.

1.2 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 according with the Building Research Establishment (BRE) Guidelines *"Site Layout Planning for Daylight and Sunlight - A Guide to Good Practice"*, 2011, to ensure that the proposed development will not result in any material impact on the amenity enjoyed by existing neighbouring residents.

1.3 In addition, as the proposed development is to contain new residential accommodation, a representative sample of the habitable rooms within those flats have also been modelled and tested to ensure that the future occupants of those habitable rooms will enjoy a reasonable and adequate level of daylight amenity.

1.4 We have been retained from the outset of the Feasibility Study to provide advice and input into the design and location of the proposed habitable rooms in order to assist the architect in ensuring that the design meets the target standards for impact on amenity.

2. Sources of Information and Limitations

2.1 The existing and surrounding buildings have been modelled from an accurate survey comprising drawing numbers:

- Jkk_8676_01 Rev A
- Jkk_8676_01 Rev A

2.2 For the proposed scheme we have relied upon the 3D massing model reference 5409-p01-3dview-(3d).dwg and drawing numbers:

- P01 100
- P01 101
- P01 102
- P01 103
- P01 104
- P01 201
- P01 202
- P01 203
- P01 051

2.3 The above drawings represent the same massing and layouts as the Planning Application scheme.

2.4 The Site has been inspected and the survey information has been supplemented by photographs and measurements taken on site.

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 standards within the Guidelines have been derived on the basis of a low density suburban housing model, it would be entirely appropriate to apply a more flexible approach when dealing with higher rise developments in a denser inner city urban environment. 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 The maximum VSC value that can be achieved for a totally unobstructed vertical window is 40% VSC. The target VSC value for good daylighting conditions is 27% VSC. In simple terms, 27% VSC equates to being able to see 27% of the Sky Dome i.e. the hemisphere of sky above a given reference point. A VSC value of 27% will be achieved where the obstruction in front of a vertical window is continuous and parallel to the plane of that window and subtends a vertical angle of 25 degrees when measured from the mid-point of that window. It therefore follows that if a proposed new development is below a vertical angle of 25 degrees, the resultant VSC value will remain above 27%. This is the scientific basis for the initial 'screening' in the BRE Guidelines where it is unnecessary for any further detailed daylight (or sunlight) tests to be undertaken where a proposed development will remain below a vertical angle of 25 degrees. It is clear that in an inner city urban environment the relationship of the vast majority of existing buildings already exceed a vertical angle of 25% and that the VSC values that prevail will therefore be below 27% VSC. In such circumstances VSC values in the mid-teens are the norm, and value in excess of 20% VSC will be considered to be good.

3.5 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.

3.6 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.

3.7 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, there is often 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.

3.8 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 and around 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 recommend that internal Daylight Distribution is measured in addition to VSC.

3.9 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.

3.10 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."

3.11 To put this in context, the maximum VSC value that can be received for a totally unobstructed vertical window is 40%. It is therefore permissible for an obstruction to reduce the VSC value by 13 percentage points before the level of daylight received by the window could be below standard. 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 through the

research undertaken at the Building Research Establishment, they have found 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. Where existing windows enjoy very high levels of daylight under existing conditions, the percentage reduction of daylight can be higher provided that the residual VSC value remains adequate.

3.12 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.

3.13 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).

3.14 ADF is sometimes seen as a more accurate and representative measure of internal lighting conditions and is more suitable for New-Build dwellings as it comprises a greater number of design factors and input variables/coefficients that are within the Designer's control. 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.

3.15 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.

3.16 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

3.17 The requirements for protecting sunlight to existing residential buildings are set out in section 3.2 of the BRE Guidelines. As with daylight, it is unnecessary for detailed sunlight tests to be undertaken if a proposed development is below a vertical angle of 25 degrees as the BRE targets will automatically be met.

3.18 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 90º of due south. The BRE Guidelines therefore limit the extent of testing for sunlight where a window faces within 90º of due south.

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

3.20 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."

3.21 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

Impact on Neighbouring Dwellings

4.1 The site is a relatively long and narrow site set out on an axis that runs approximately North-South. The eastern boundary of the site borders the railway line, and beyond the railway to the east are a row of houses and car showroom on North Road. The distance between those houses and the site is considerable, and it is clear that those houses are sufficiently remote as to continue to receive more than sufficient daylight and sunlight from over the proposed development. It is therefore unnecessary for any of the houses along North Road to be tested. In addition, the southern part of North Road is a car showroom with a car parking deck, and therefore not in residential use. It therefore does not need to be tested in respect of the BRE Guidelines.

4.2 To the immediate south of the site is the Manor Circus Roundabout and a petrol service station. As these are not residential properties there is nothing to the south of the site that could be affected.

4.3 The only residential properties that are in close proximity of the site that could be affected by the proposed development are:

- 83 Raleigh Road
- 6 Raleigh Road
- 22 Sandycombe Road
- 24 Sandycombe Road

4.4 At present, the building to the immediate north of the Site (11 Sandycombe Road) is in commercial use. There is however a Planning consent for a new residential development on that site, and as it is reasonably foreseeable that the Planning Consent will be implemented, the future residential buildings yet to be built have been modelled and tested to ensure that the future occupants of that future development will also enjoy an adequate level of amenity.

4.5 For the purpose of Planning, the tests within the BRE Guidelines are usually limited to habitable rooms within 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 therefore are not dependent on natural light for their sole source of amenity.

4.6 For the purpose of the BRE Guidelines a '*habitable'* room is defined as a Family Kitchen, Living Room or Bedroom. Bathrooms, hallways and circulation space are excluded and therefore do not require tested. We have not had access to the interior of any of the existing neighbouring buildings and have therefore relied upon an external inspection and review of any publicly available records to establish the extent, location and layout of existing neighbouring residential premises.

4.7 Annexed at Appendix I are drawing numbers SA44-02-CAD009 and CAD011 which are images of the Site of the 'existing' and 'proposed' buildings on the site set in context with the neighbouring buildings. They are followed in Appendix II by drawing numbers SA44-02-BRE013 and BRE014 which are the Daylight Distribution plans for the neighbouring residential properties.

4.8 Those drawings are then followed at Appendix III by the Daylight Analysis Table setting out the results of the Vertical Sky Components (VSC), Daylight Distribution and Average Daylight Factor (ADF) analysis, and the results of the Sunlight Analysis at Appendix IV. The room and window location references shown on the drawings should be cross-referenced with the equivalent room and window references in the tables.

4.9 Although 83 Raleigh Road and 56 Raleigh Road are in residential use, neither of those properties have windows serving habitable rooms which have a direct outlook onto or over the site. From our inspection, although there are windows in the end flank elevations of both 83 Raleigh Road and 56 Raleigh Road, none of these windows appear to serve habitable rooms and therefore do not need to be tested.

4.10 22 and 24 Sandycombe Road are however orientated so that their principal front elevation faces due east and has a direct outlook onto the site. They comprise a partially glazed entrance door serving 22 Sandycombe Road and two windows at ground floor level and two windows at first floor level. The location of the rooms and windows is illustrated on drawing number BRE103 annexed at Appendix II.

4.11 Those rooms and windows have been tested for VSC, Daylight Distribution and Average Daylight Factors.

4.12 The numerical results of those tests set out in Appendix III clearly demonstrate that not only will the BRE Guidelines be fully satisfied, the residual VSC values will be well above the 27% VSC threshold indicating that all of the windows will continue to receive very good levels of natural light. The results also show that there will be no perceptible loss of internal Daylight Distribution and that each of the rooms will achieve good ADF values.

4.13 As these windows face just within due east, they fall within the BRE sunlight criteria. The results of the sunlight tests are set out in Appendix IV. Those results show that not only will there be full compliance with the BRE sunlight criteria, the residual levels of sunlight will be well above the Annual and Winter APSH targets.

4.14 The Planning Consent for the residential development at 11 Sandycombe Road has yet to be implemented but has nonetheless been modelled and tested.

4.15 Two habitable rooms have been shown on the Planning Application drawings at the southern end of that development comprising a Living/Kitchen/Diner at ground floor level and bedroom at first floor level. Both of those rooms are dual aspect rooms served by two windows with different outlooks. The room layouts are illustrated on drawing number BRE014 annexed at Appendix II.

4.16 The results show that the daylight received by the ground floor L/K/D will comfortably satisfy the BRE Guidelines. However, one window at first floor level was shown to experience a loss of VSC of 25.19%, and therefore exceeds the BRE recommendations. That is window W1/51 serving the first floor bedroom. That bedroom is however a dual aspect bedroom as illustrated on drawing number BRE014, and the principal window serving that bedroom is window W2/51 which faces west. As the room is a dual aspect room, it is necessary to consider the availability of daylight to both windows and the results clearly demonstrate that the impact on daylight will still be well within the BRE recommendations.

Daylight and Sunlight Received Within the Proposed New Dwellings

4.17 The guidance on assessing the adequacy of daylight within 'New' dwellings is set out in the British Standard Code of Practice for Daylighting, BS8206 Part 2, 2008, rather than the BRE Guidelines. The important distinction is that daylight for 'New' dwellings should be measured using Average Daylight Factors rather than the use of Vertical Sky Components. The Average Daylight Factor is a measure of the amount of daylight within the interior of a room and is sometimes seen as a more accurate and representative measure of internal lighting conditions as it is calculated using a greater number of input variables and co-efficients. It also enables the architect/designer to make changes to the design in order to maximise or optimise internal lighting conditions through suitable design changes.

4.18 The daylight and sunlight tests for the proposed new habitable rooms have been limited to the rooms at first floor level as the analysis demonstrated that all of those rooms comfortably satisfied the Daylight and Sunlight Standards and as the rooms at second floor level will receive higher levels of daylight and sunlight, it therefore follows that the results for the second floor will be better and therefore do not require testing.

4.19 Annexed at Appendix V is drawing number SA44-03-BRE017 which illustrates the room locations and layouts at first floor level. Appendix VI contains the results of the daylight amenity analysis for those rooms and that table also contains the results of the separate sunlight analysis. Those results clearly demonstrate that all of the rooms will achieve ADF values well above the target standards of 1.5%df for the L/K/D's, and more than 1%df for the Bedrooms. The results do in fact show that in the vast majority of cases, the ADF values will be well in excess of the British Standard recommendations and therefore demonstrate that the levels of internal daylight will be very good.

4.20 The results of the sunlight analysis also clearly demonstrate that where windows falls within the BRE sunlight criteria, i.e. face within 90 degrees of due south, they will all comfortably satisfy the BRE Guidelines, receiving levels of Annual and Winter sunlight well above the BRE standards. It is therefore clear that the quality of amenity that will be enjoyed by the future occupants of the completed development will be well above the recognised design standards.

5. Summary and Conclusion

5.1 The only existing neighbouring residential properties that have windows serving habitable rooms that face directly onto the Site and fall within the BRE Guidelines are 22 and 24 Sandycombe Road and the future residential development of 11 Sandycombe Road.

5.2 The results of the daylight and sunlight analysis demonstrate that the proposed development will have no material impact on the amenity enjoyed by those existing neighbouring dwellings and that the occupants of those properties will continue to enjoy a good level of amenity.

5.3 The availability of daylight and sunlight within all of the proposed new habitable rooms will comfortably satisfy the targets in the British Standard Code of Practice for Daylighting and this demonstrates that the future occupants of those rooms will also enjoy a good level of amenity.

5.4 In overall conclusion, the performance of the proposed development, both in terms of impact on neighbouring amenity, and the level of amenity within the proposed new development, will be more than adequate and perform very well. It therefore follows that the Council's policy objectives have been satisfied.

GVA Schatunowski Brooks

Appendix I

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Sources of Information

Existing And Surrounding Buildings
RPS Group Drawing No's:
JKK_8676_01 Rev A, JKK_8676_02 Rev A

Proposed Scheme
Goldcrest Architects 3d Model Sent 25 Nov 2015
5409-P01-3DView-{3D}.dwg

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

Project Name
Sandycombe Road
Richmond, TW9

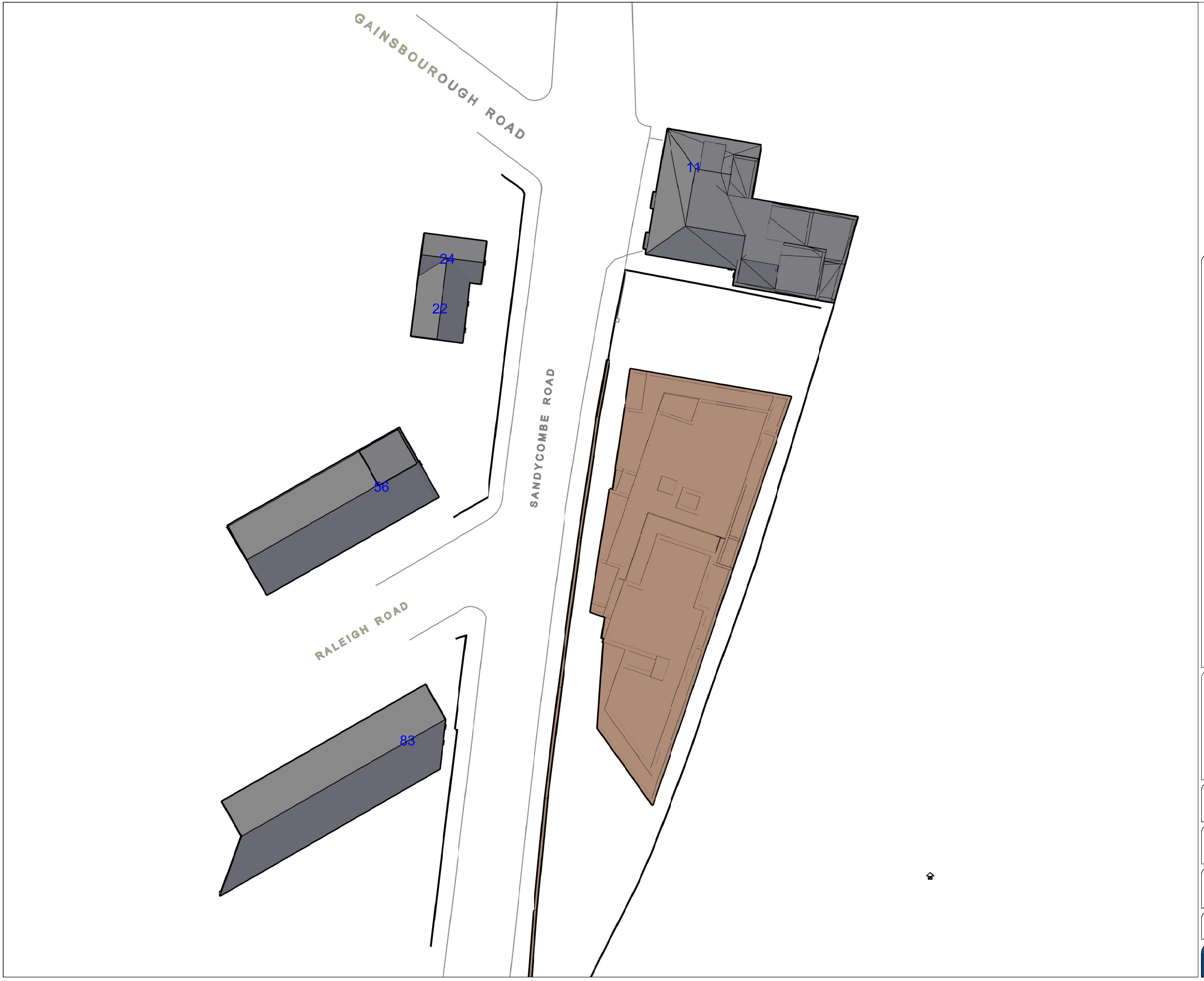
Client
Goldcrest Land Plc

Drawing Title
Existing Site Plan

Drawn By	Chk'd By	Scale @ A3	Date
MO	-	1/400	25/11/2015

Project No.	Drawing No.	Revision
SA44-02	CAD 001	-

SITE PLAN
A3



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Drawing Title
Proposed Site Plan

Drawn By	Chk'd By	Scale @ A3	Date
MO	-	1/400	25/11/2015

Project No.	Drawing No.	Revision
SA44-02	CAD 011	-

SITE PLAN
A3

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Appendix II

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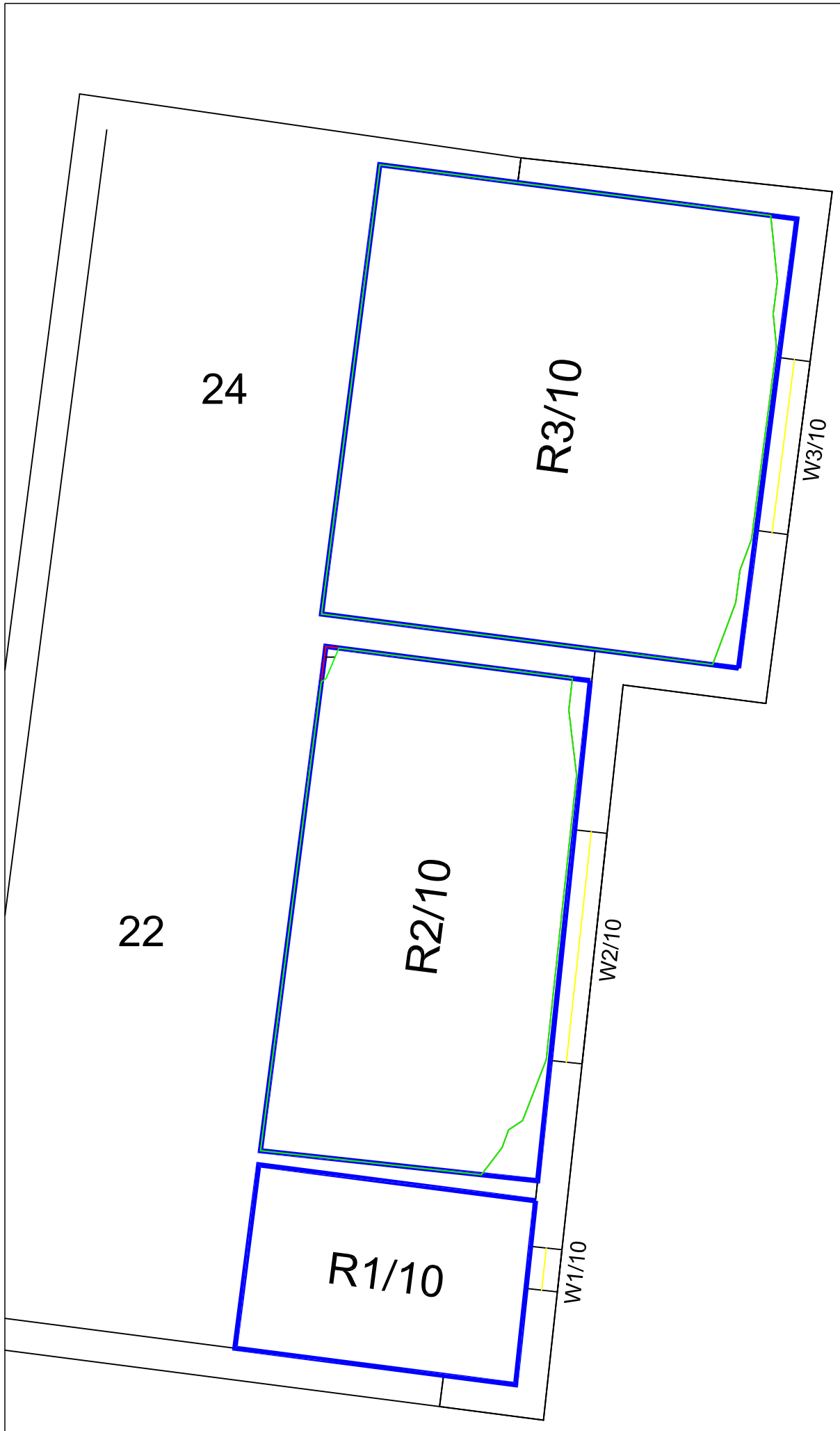
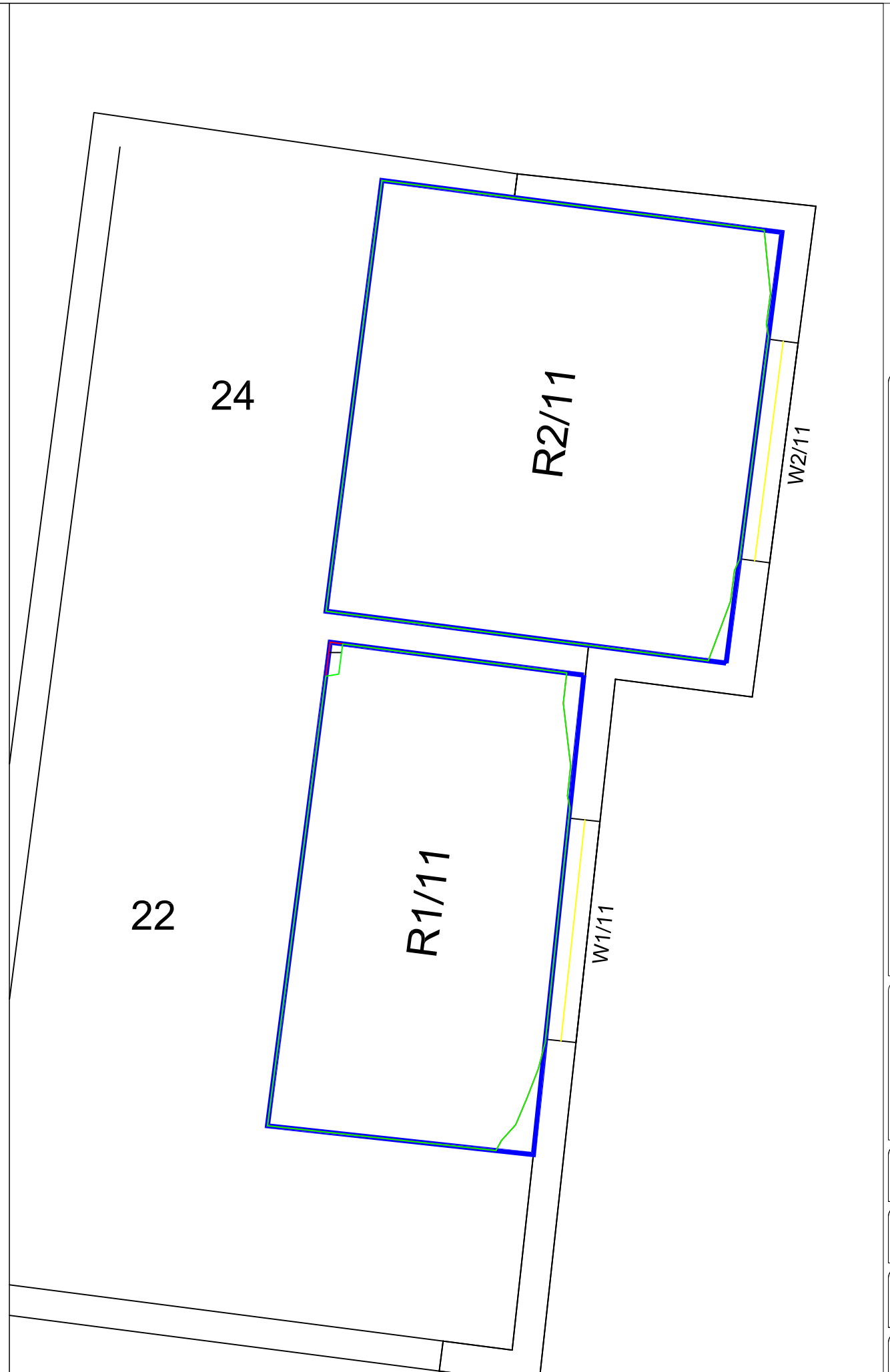


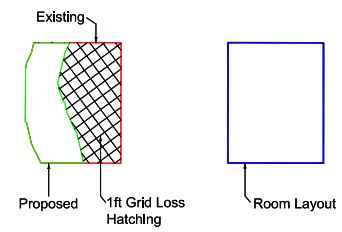
Ground Floor



First Floor

Legend

Daylight



Existing No-Sky Line Contour

Proposed No-Sky Line Contour

Sources of Information

Existing And Surrounding Buildings
RPS Group Drawing No's:
JKK_8676_01 Rev A, JKK_8676_02 Rev A

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Project Name
Sandycombe Road
Richmond, TW9

Client
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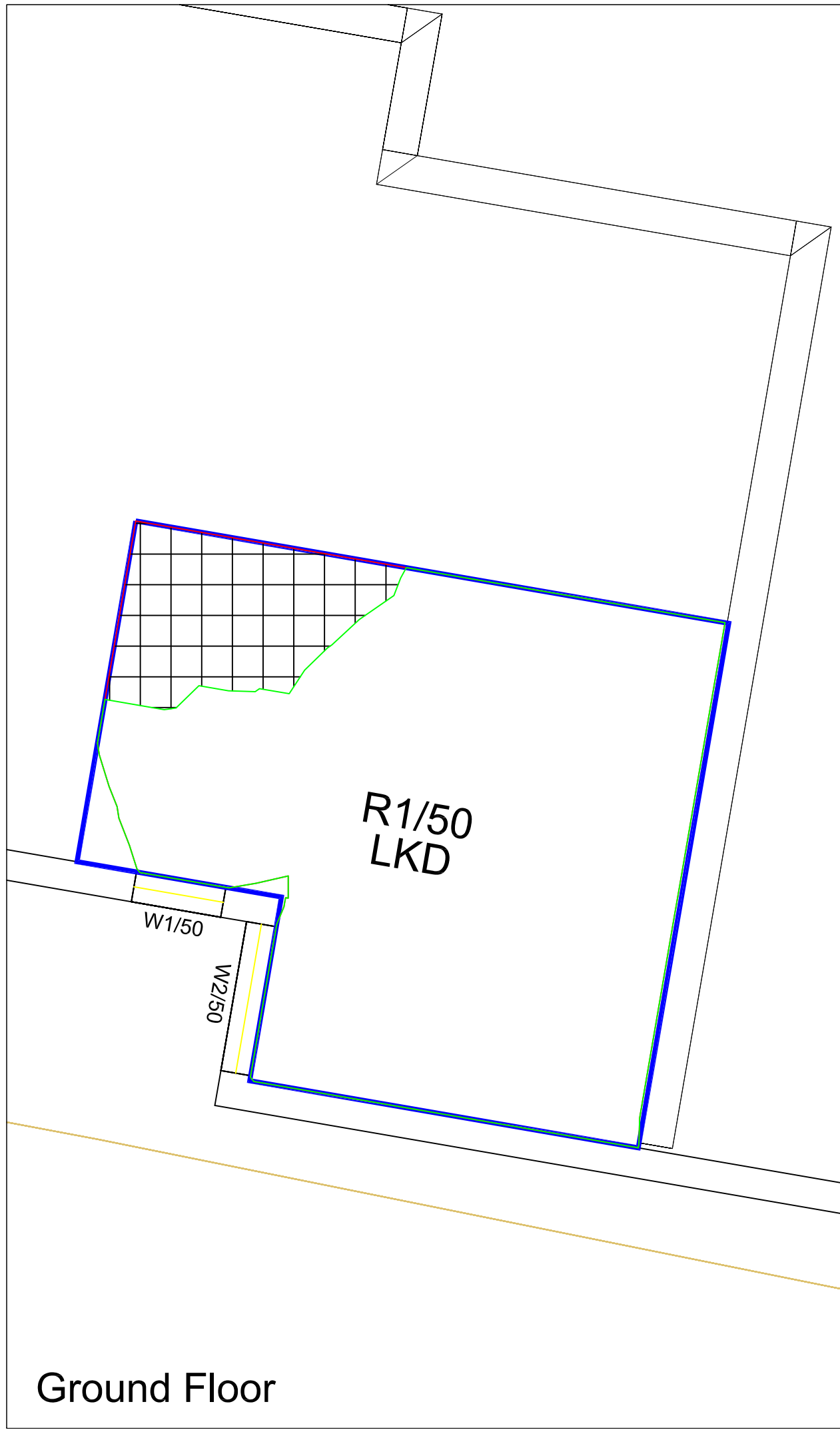
Drawing Title
No-Skyline Contours For
22 & 24 Sandycombe Road

Drawn By	Chk'd By	Scale @ A3	Date
MO	-	1/50	25/11/2015

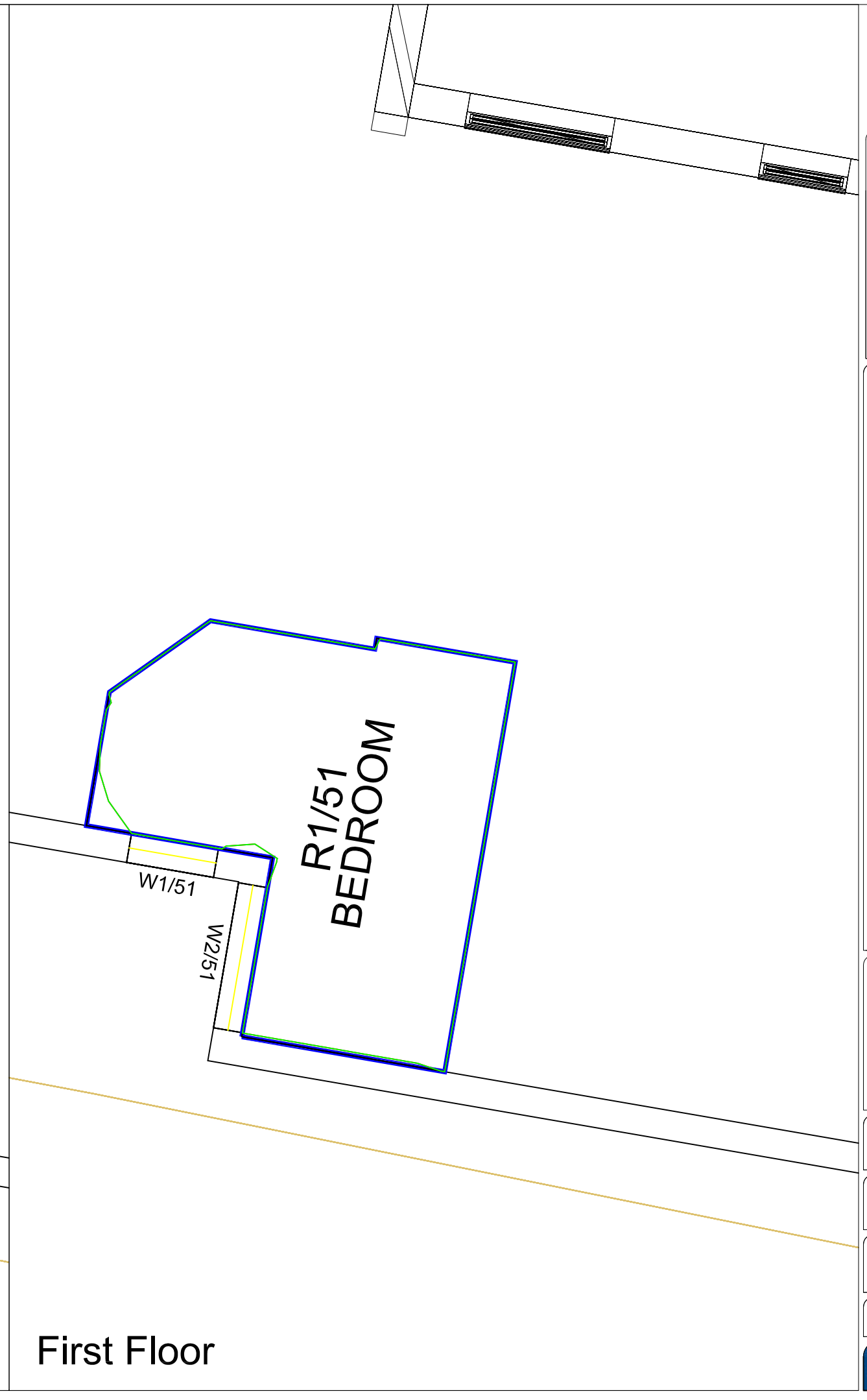
Project No.	Drawing No.	Revision
SA44-02	BRE 013	-

DAYLIGHT

A3



Ground Floor

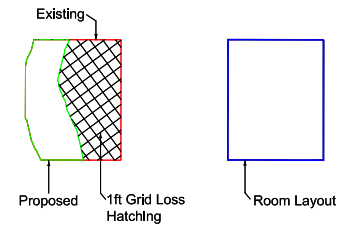


First Floor

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.

Legend

Daylight



Existing No-Sky Line Contour

Proposed No-Sky Line Contour

Sources of Information

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Client
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Drawing Title
No-Skyline Contours For
11 Sandycombe Road

Drawn By	Chk'd By	Scale @ A3	Date
MO	-	1/50	25/11/2015

Project No.	Drawing No.	Revision
SA44-02	BRE 014	-

DAYLIGHT

A3

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Appendix III

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Daylight Analysis
Sandycombe Road
25-Nov-15

Room/Floor	Room Use	Window	%VSC			% Daylight Factor			Proposed No Sky	
			Exist	Prop	% Loss	Exist	Prop	% Loss	% of Room Area	% Loss of Existing
22 Sandycombe Road										
Gnd Floor										
R2/10		W2/10	33.90	30.51	>27	2.15	1.97	8.60%	95.75%	0.23%
1st Floor										
R1/11		W1/11	36.77	33.72	>27	1.77	1.63	7.70%	97.39%	0.31%
24 Sandycombe Road										
Gnd Floor										
R3/10		W3/10	35.64	32.94	>27	1.35	1.26	6.67%	97.68%	0.00%
1st Floor										
R2/11		W2/11	37.56	35.10	>27	1.46	1.37	6.15%	99.08%	0.00%
11 Sandycombe Road										
Gnd Floor										
R1/50	LKD	W1/50	16.85	14.28	15.25%	0.94	0.89	4.90%	84.90%	13.18%
		W2/50	16.08	16.07	0.06%					
1st Floor										
R1/51	BEDROOM	W1/51	25.76	19.27	25.19%	1.88	1.72	8.51%	98.04%	0.00%
		W2/51	25.02	23.67	5.40%					

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Appendix IV

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Sunlight Analysis
Sandycombe Road
25-Nov-15

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

		Existing %			Proposed %					
Room use	Window Ref	Summer	Winter	Total	Summer	Winter	Total	% Loss of Summer	% Loss of Winter	% Loss of Total
22 Sandycombe Road										
Gnd Floor										
	W2/10	36.00	13.00	49.00	36.00	8.00	44.00	0.00%	38.46%	10.20%
1st Floor										
	W1/11	36.00	15.00	51.00	36.00	11.00	47.00	0.00%	26.67%	7.84%
24 Sandycombe Road										
Gnd Floor										
	W3/10	35.00	15.00	50.00	35.00	10.00	45.00	0.00%	33.33%	10.00%
1st Floor										
	W2/11	36.00	16.00	52.00	36.00	14.00	50.00	0.00%	12.50%	3.85%
11 Sandycombe Road										
Gnd Floor										
LKD	W1/50	32.00	7.00	39.00	32.00	1.00	33.00	0.00%	85.71%	15.38%
1st Floor										
BEDROOM	W1/51	33.00	18.00	51.00	33.00	10.00	43.00	0.00%	44.44%	15.69%

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Appendix V

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Legend

Daylight

Proposed

Room Layout

Proposed No-Sky Line Contour

Sources of Information

Existing And Surrounding Buildings
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JKK_8676_01 Rev A, JKK_8676_02 Rev A

Proposed Scheme
Goldcrest Architects 3d Model Sent 25 Nov 2015
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Drawing No's:
P01 100, P01 101, P01 102, P01 103, P01 104,
P01 201, P01 202, P01 203, P01 051

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Client
Goldcrest Land Plc

Drawing Title
No-Skyline Contours For
Proposed Scheme

Drawn By	Chk'd By	Scale @ A3	Date
MO	-	1/200	26/11/2015

Project No.	Drawing No.	Revision
SA44-03	BRE 017	-

DAYLIGHT

A3