herrington CONSULTING LIMITED

Client: PA Housing Ltd

Daylight and Sunlight Assessment for the Development at The Strathmore Centre, Strathmore Road, Teddington, TW11 8UH

July 2020

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1 Background and Scope of Appraisal

1.1 Study Objectives

Herrington Consulting has been commissioned by PA Housing Ltd to assess the potential impact of the proposed development at The Strathmore Centre, Strathmore Road, Teddington, TW11 8UH , in relation to daylight, sunlight and overshadowing on the neighbouring buildings. The key objectives of the assessment are to:

- assess the baseline conditions at the site;
- analyse the potential impacts of the development on the daylight and sunlight currently received by the neighbouring buildings;
- assess these impacts in line with any relevant planning policies and best practice guidance.

In addition to the assessment of impacts on the neighbouring buildings, this study also includes an assessment of the natural daylight and sunlight that will be available within the habitable rooms of the proposed development.

1.2 Site Location

The site is situated in the area of Teddington in south west London and is located within the London Borough of Richmond upon Thames. The location of the site is shown in Figure 1.1 and the site plan included in Appendix A.1 of this report gives a more detailed reference to the site location and layout.

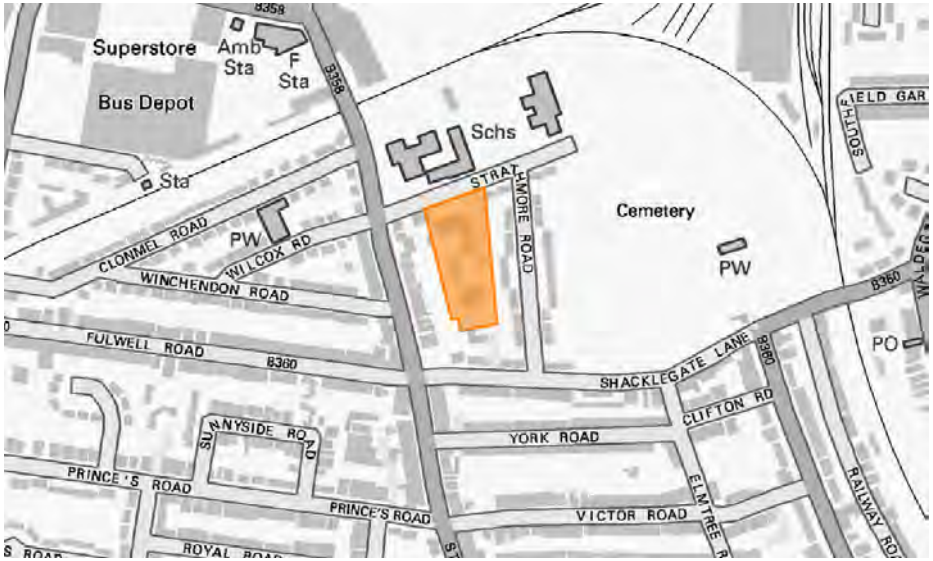


Figure 1.1 – Location map (Contains Ordnance Survey data © Crown copyright and database right 2011)

1.3 The Development

The proposal for development is to demolish the existing buildings construct two 3-storey residential buildings and rebuild Scamps Nursery at the southern end of the site. Drawings of the proposed scheme are included in Appendix A.1 of this report.

The development has been amended in order to improve the daylight availability within a number of kitchens in Block B. These amendments include reducing the floor to ceiling height from 2700mm to 2500mm, lowering the window cill level in first floor Units 15 and 20 and introducing a frosted glass panel in the front door and glazed kitchen screen in the ground floor Units 18, 19 and 24.

2 Policy and Guidance

2.1 National Planning Policy

National Planning Policy Framework (Revised February 2019)

Paragraph 123 on 'Achieving appropriate densities' states that *"c) local planning authorities should refuse applications which they consider fail to make efficient use of land, taking into account the policies in this Framework. In this context, when considering applications for housing, authorities should take a flexible approach in applying policies or guidance relating to daylight and sunlight, where they would otherwise inhibit making efficient use of a site (as long as the resulting scheme would provide acceptable living standards)."*

Guidance on Effective Use of Land (Revised July 2019)

The guidance states that: *'Where a planning application is submitted, local planning authorities will need to consider whether the proposed development would have an unreasonable impact on the daylight and sunlight levels enjoyed by neighbouring occupiers, as well as assessing whether daylight and sunlight within the development itself will provide satisfactory living conditions for future occupants.'*

Further to this, it also states that '*All developments should maintain acceptable living standards. What this means in practice, in relation to assessing appropriate levels of sunlight and daylight, will depend to some extent on the context for the development as well as its detailed design. For example in areas of high-density historic buildings, or city centre locations where tall modern buildings predominate, lower daylight and daylight and sunlight levels at some windows may be unavoidable if new developments are to be in keeping with the general form of their surroundings.*

In such situations good design (such as giving careful consideration to a building's massing and layout of habitable rooms) will be necessary to help make the best use of the site and maintain acceptable living standards.'

2.2 Regional Planning Policy

The London Plan – Spatial Development Strategy for London (2016)

Policy 7.6: 'Architecture' of the adopted London Plan, includes the following statements: *"Buildings and structures should… not cause unacceptable harm to the amenity of surrounding land and buildings, particularly residential buildings, in relation to… overshadowing.". "New development, … should not have a negative impact on the character or amenity of neighbouring sensitive land uses".*

The London Plan – Supplementary Planning Guidance on Housing (2016)

Policy 7.6Bd on 'Standards for privacy, daylight and sunlight' *requires new development to avoid causing 'unacceptable harm' to the amenity of surrounding land and buildings, particularly in relation to privacy and overshadowing '*. It also states that '*An appropriate degree of flexibility needs to be applied when using BRE guidelines to assess the daylight and sunlight impacts of new development on surrounding properties, as well as within new developments themselves. Guidelines should be applied sensitively to higher density development, especially in opportunity areas, town centres, large sites and accessible locations, where BRE advice suggests considering the use of alternative targets'*

In the 'Standards for privacy, daylight and sunlight', Paragraph 1.3.46 states that '*The degree of harm on adjacent properties and the daylight targets within a*

proposed scheme should be assessed drawing on broadly comparable residential typologies within the area and of a similar nature across London'. Similarly, Paragraph 2.3.47 on 'Daylight and Sunlight' includes the following statement '*Quantitative standards on daylight and sunlight should not be applied rigidly, without carefully considering the location and context and standards experienced in broadly comparable housing typologies in London*'.

Standard 32 on 'Daylight and Sunlight' states that '*All homes should provide for direct sunlight to enter at least one habitable room for part of the day. Living areas and kitchen dining spaces should preferably receive direct sunlight*'.

2.3 Local Planning Policy

Richmond upon Thames Local Plan (July 2018)

Policy LP8 – 'Amenity and Living Conditions' states that: '*All development will be required to protect the amenity and living conditions of occupants of new, existing, adjoining and neighbouring properties. The council will: 1. Ensure the design and layout of buildings enables good standards of daylight and sunlight to be achieved in new development and in existing properties affected by new development; where existing daylight and sunlight conditions are already substandard, they should be improved where possible.'*

Paragraph 4.8.5 under 'Daylight, sunlight and solar glare' addresses the BRE guidance: *'In assessing whether sunlight and daylight conditions are good, both inside buildings and in gardens and open spaces, the Council will have regard to the most recent Building Research Establishment guidance, both for new development, and for properties affected by new development. In some circumstances, mathematical calculations to assess daylighting and sunlighting may be an inappropriate measure, and an on-site judgement will often be necessary*.'

Paragraph 4.8.11 under 'Visual intrusion, privacy and outlook' states that *'Outlook is the visual amenity enjoyed by occupants when looking out of their windows or from their garden; how pleasant an outlook is depends on what is being viewed. Loss of daylight/sunlight (based on Building Research Establishment guidance), overshadowing, loss of outlook to the detriment of residential amenity are material planning considerations; however, the loss of a private view from a property is not protected.'*

Local Development Framework – Development Management Plan (November 2011)

Policy DM DC 5: 'Neighbourliness, Sunlighting and Daylighting' states that *'In considering proposals for development the Council will seek to protect adjoining properties from unreasonable loss of privacy, pollution, visual intrusion, noise and disturbance. To protect privacy, for residential development there should normally be a minimum distance of 20 m between main facing windows of habitable rooms. The Council will generally seek to ensure that the design and layout of buildings enables sufficient sunlight and daylight to penetrate into and between buildings, and that adjoining land or properties are protected from overshadowing in accordance with established standards.'*

2.4 Best Practice Guidance

In the absence of official national planning guidance / legislation on daylight and sunlight, the most recognised guidance document is published by the Building Research Establishment and entitled 'Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice', Second Edition, 2011; herein referred to as the 'BRE Guidelines'.

The BRE Guidelines are not mandatory and themselves state that they should not be used as an instrument of planning policy, however in practice they are heavily relied upon as they provide a good guide to approach, methodology and evaluation of daylight and sunlight impacts.

In conjunction with the BRE Guidelines further guidance is given within the British Standard (BS) 8206-2:2008: 'Lighting for buildings - Part 2: Code of practice for daylighting'.

In this assessment, the BRE Guidelines have been used to establish the extent to which the Proposed Development meets current best practice guidelines. In cases where the Development is likely to reduce light to key windows the study has compared results against the BRE criteria.

Whilst the BRE Guidelines provide numerical guidance for daylight, sunlight and overshadowing, these criteria should not be seen as absolute targets. The document states that the intention of the guide is to aid rather than constrain the designer. The Guide is not an instrument of planning policy, therefore whilst the methods given are technically robust, it is acknowledged that some level of flexibility should be applied where appropriate.

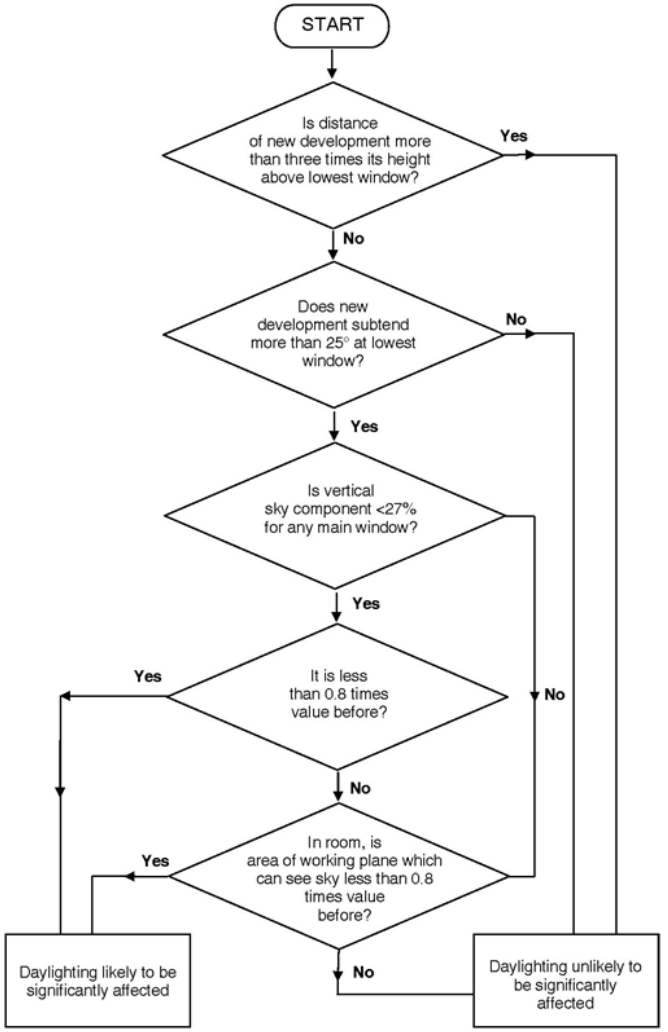
3 Assessment Techniques

3.1 Background

Natural light refers to both daylight and sunlight. However, a distinction between these two concepts is required for the purpose of analysis and quantification of natural light in buildings. In this assessment, the term '*Daylight*' is used for natural light where the source is the sky in overcast conditions, whilst '*Sunlight*' refers specifically to the light coming directly from the sun.

The primary objective of this assessment is to quantify the impacts of the proposed development on the adjacent building[s] and therefore the methods employed by this study are focussed on this objective. These methodologies are described in the following sections of this report and follow the hierarchical approach set out by the BRE Guidelines. The 'decision chart' outlining this process (Figure 20 of the Guidelines) has been reproduced for clarity.

The BRE guidelines are primarily intended for use for residential rooms in adjoining dwellings. However, they may also be applied to any existing non-domestic buildings where the occupants have a reasonable expectation of daylight, which could include schools, hospitals, hotels and offices in specific circumstances. For dwellings, it states that living rooms, dining rooms and kitchens should be assessed. Bedrooms should also be checked, although it states that they are less important. Other rooms, such as bathrooms, toilets, storerooms, circulation areas and garages need not be assessed.



3.2 Vertical Sky Component (VSC)

The Vertical Sky Component (VSC) calculation is the ratio of the direct sky illuminance falling on the outside of a window, to the simultaneous horizontal illuminance under an unobstructed sky. The standard CIE (Commission Internationale d'Éclairage) Overcast Sky is used and the ratio is expressed as a percentage. For example, a window that has an unobstructed view over open fields would benefit from the maximum VSC, which would be close to 40%. For a window to be considered as having a reasonable amount of skylight reaching it, the BRE Guidelines suggests that a minimum VSC value of 27% should be achieved. When assessing the impact of a new development on an existing building the BRE Guidelines sets out the following specific requirement:

If the VSC with the new development in place is both less than 27% and less than 0.8 times its former value, then the reduction in light to the window is likely to be noticeable.

This means that a reduction in the VSC value of up to 20% its former value would be acceptable and thus the impact would be considered negligible. It is important to note that the VSC is a simple geometrical calculation, which provides an early indication of the potential for daylight entering the space. It does not, however, assess or quantify the actual daylight levels inside the rooms.

3.3 No Sky Line

The No Sky Line, or sometimes referred to as No Sky View method, describes the distribution of daylight within rooms by calculating the area of the 'working plane', which can receive a direct view of the sky. The working plane height is generally set at 850mm above floor level within a residential property and 700mm within a commercial property. When assessing the potential impacts on the daylight available to the neighbouring properties, the BRE Guidelines state that if the area within a room receiving direct skylight is reduced by less than 0.8 following the construction of a new development, the impact will be noticeable to the occupants. This is also true if the No Sky Line encroaches onto key areas like kitchen sinks and worktops.

When assessing the provision of daylight to a new development, the BRE Guidelines state that if a significant area of the working plane (normally more than 20%) lies beyond the No Sky Line then the daylight distribution within the room will be poor and supplementary electric lighting will be required.

One benefit of this test is that the resulting contour plans show where the light falls within a room and a judgment can be made as to whether the room will retain light to a reasonable depth. However, this method can only be accurately used to examine the daylight distribution within the rooms where the layout and dimensions are known. In the case of the proposed development, room layouts are replicated from the floor plans provided by the architects or developer. When assessing the impact of a new development on the daylight distribution within existing buildings, however, such information may not be available. As consequence, the internal layout and dimensions of the affected room(s) must then be estimated based on the property type and its overall layout.

3.4 Average Daylight Factor

The Average Daylight Factor (ADF) method calculates the average illuminance within a room as a proportion of the illuminance available to an unobstructed point outdoors under a sky of known luminance and luminance distribution. This is the most detailed of the daylight calculations and considers the physical nature

of the room behind the window, including; window transmittance, and surface reflectivity.

This method of quantifying the availability of daylight within a room does, however, require the internal layout to be known and is generally only used for establishing daylight provision in new rooms. The BRE Guide sets out the following guidelines for the assessment of the ADF:

If a predominantly daylit appearance is required, then the ADF should be 5% or more if there is no supplementary electric lighting, or 2% or more if supplementary electric lighting is provided. In dwellings, the following minimum average daylight factors should be achieved: 1% in bedrooms, 1.5% in living rooms and 2% in kitchens.

3.5 Room Depth Criteria

The BRE Guidelines do include advice for determining recommended room depths to proposed new rooms under specific circumstances using the Room Depth Criteria (RDC). This is more of a rule-of-thumb test that can be used to plan building layouts etc at an early conceptual stage, rather than providing quantitative outputs at the more detailed stage of a development.

This test has numerous limitations when being applied to anything but a simplistic room layout and does not take into account external obstructions. It is therefore not considered to provide any meaningful data on the level or distribution of daylight that is not already provided by the ADF and NSL tests. Consequently, it is only applied in very particular situations.

3.6 Annual Probable Sunlight Hours

It is also possible to quantify the amount of sunlight available to a new development and the recognised methodology for undertaking this analysis is the Annual Probable Sunlight Hours (APSH) method.

To pass this test the centre point of the window will need to receive more than one quarter (25%) of the APSH, including at least 5% APSH in the winter months between 21st September and the 21st March. The BRE Guidelines state that if 'post-development' the available sunlight hours are both less than the amount above and less than 0.8 times their 'pre-development' value, either over the whole year or just within the winter months, then the occupants of the existing building will notice the loss of sunlight. In addition, if the overall annual loss is greater than 4% of APSH, the room may appear colder and less pleasant.

3.7 Overshadowing

The BRE Guidance suggests that where new development may affect one or more amenity areas, then analysis can be undertaken to quantify the loss of sunlight resulting from overshadowing. Typical examples of areas that could be considered as open spaces or amenity areas are main back gardens of houses, allotments, parks and playing fields, children's playgrounds, outdoor swimming pools, sitting-out areas, such as in public squares and focal points for views, such as a group of monuments or fountains. Amenity areas in the form of balconies are not recommended to be assessed under the BRE Guidelines due to their small size and often significant obstruction.

Sun Hours on Ground

The BRE Guidelines recommend that for a garden or amenity area to appear adequately sunlit throughout the year, at least 50% of an amenity area should

receive at least 2 hours of sunlight on 21st March. The BRE Guidelines also suggest that if, as a result of a new development, an existing garden or amenity area does not meet these guidelines, and the area which can receive some sun on the 21st March is less than 0.8 times its former value, then the loss of sunlight is likely to be noticeable.

When undertaking this analysis, sunlight from an altitude of 10° or less has been ignored as this is likely to be obscured by planting and undulations in the surrounding topography. Driveways and hard standing for cars is also usually left out of the area used for this calculation. Fences or walls less than 1.5 metres high are also ignored. Front gardens which are relatively small and visible from public footpaths are omitted with only main back gardens needing to be analysed.

The Guidelines also state that "normally, trees and shrubs need not be included, partly because their shapes are almost impossible to predict, and partly because the dappled shade of a tree is more pleasant than a deep shadow of a building". This is especially the case for deciduous trees, which provide welcome shade in the summer whilst allowing sunlight to penetrate during the winter months.

Transient Overshadowing

The BRE Guidelines suggest that where large buildings are proposed, which may affect a number of open spaces or amenity areas, it is useful and illustrative to plot a shadow plan to show the location of shadows at different times of the day and at key times during the year. Typically, the 21st March, the 21st June, and 21st December are used to represent the annual variance of sun position, noting that the position of the sun in the sky during the spring equinox (21st March) is equivalent to that of the autumn equinox.

The BRE Guidelines provide no criteria for the significance of transitory overshadowing other than to suggest that by establishing the different times of day and year when shadow would be cast over surrounding areas, provides an indication as to the significance of the likely effect of a new development. The assessment of transient overshadowing effects is therefore based upon expert judgment, taking into consideration the likely effects of the various baseline conditions and comparing them with the likely significant transient overshadowing effects of the redevelopment proposals.

4 Assessment Methodology

4.1 Method of Baseline Data Collation

The following data and information has been used to inform this study:

- OS Mastermap mapping
- Measured survey data (Twickenham Surveys Ltd – July 2018)
- Scheme drawings in AutoCAD format (Living Architects – November 2019)
- Revised scheme drawings in AutoCAD format (Living Architects - July 2020)
- Aboricultural Tree Survey carried out by ACS (TREES) Consulting (September 2018)
- Aerial photography (Google Maps and Bing)

4.2 Identification of Key Sensitive Receptors

The BRE Guidelines are intended for use for rooms and adjoining dwellings where daylight is required, including living rooms, kitchens and bedrooms. Windows to bathrooms, toilets, storerooms circulation areas and garages are not deemed as requiring daylight and therefore are not identified as sensitive receptors. The BRE document also states that the guidelines may also be applied to any non-domestic building where the occupants have a reasonable expectation of daylight. This would normally include schools, hospitals, hotels, hostels, small workshops and some offices.

The first step in this process is to determine the key sensitive receptors, i.e. which windows may be affected by the proposed development. Key receptors are those windows that face, or are located broadly perpendicular to the proposed development.

If a window falls into this category, the second step is to measure the obstruction angle. This is the angle at the level of the centre of the lowest window between the horizontal plane and the line joining the highest point of nearest obstruction formed from any part of the proposed development. If this angle is less than 25° then it is unlikely to have a substantial effect on the diffuse daylight enjoyed by the existing window and the window is not deemed to be a sensitive receptor. A graphical representation of the 25° rule is illustrated in Figure 4.1 below.

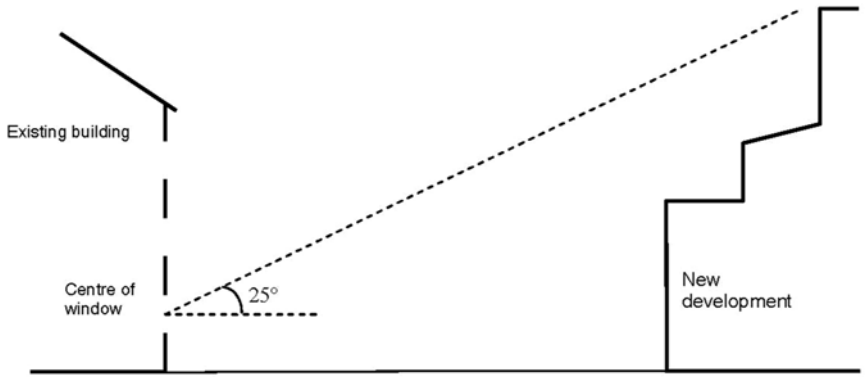


Figure 4.1 – Graphical representation of the 25° Rule (indicative buildings used for illustration purposes only)

As part of this assessment a digital three-dimensional model of the study area has been created for both the 'pre' and 'post' development scenarios. Images of these models are shown by the drawings appended to this report.

Using the 3D model, it is possible to identify all windows having an obstruction angle no greater than 25°. Impacts to these windows are therefore deemed to be negligible in line with the criteria set out within the BRE Guidelines.

There are, however, circumstances where the 25°*degree* rule is not wholly appropriate, for example where the development facing the window does not create a uniform obstruction along the skyline, or where the proposals are not directly adjacent to the receptor window. In these situations, professional judgement is used to differentiate between windows that require more detailed analysis and those that will clearly not be impacted. Where any level of uncertainty exists, the window is taken forward for detailed analysis.

Windows serving non-habitable spaces are not included within the assessment as these are not identified by planning policy or by the BRE Guidelines to be sensitive to changes in daylight and sunlight. Therefore, as part of the identification of sensitive receptor process, the use of each room is, where possible, established and windows serving non-habitable spaces such as toilets, store rooms, stairwells and circulation spaces are identified. Typically kitchens that have a floor area less then 13m^2 are not considered to be habitable spaces in their own right.

Windows serving rooms within commercial premises are assumed to be non-habitable and in accordance with the BRE Guidelines are not identified as sensitive receptors. However, there are special cases where it can be assumed that some non-domestic uses could be deemed to have a reasonable expectation of daylight and therefore could be taken forward for more detailed analysis. Typically, these could be school classrooms, hospital wards, art studios etc, but professional judgement is generally relied upon to determine this and where considered appropriate, windows serving commercial premises are included.

Drawings showing the location of all sensitive receptors that have been assessed as part of this study are included in Appendix A.2 of this report.

In summary, habitable rooms in the following residential buildings have been identified as potential sensitive receptors and have therefore been tested.

- 63 Strathmore Rd
- 11 – 47 Strathmore Rd (Odd-numbered properties)
- 218 – 228 Stanley Road (Even-numbered properties)
- 5 to 8 Fulwell Court
- 1 to 4 Fulwell Court

4.3 Numerical Modelling

The numerical analysis used in this assessment to assess the impact on neighbouring buildings. has been undertaken using the Waldrum Tools (Version 4.1.1.2) software package. Due to amendments to some of the kitchens in Block B (July 2020), the internal analysis has been assessed using Version 5.0.0.1.

4.4 Calculation Assumptions

The following assumptions have been made when undertaking the analysis:

- When assessing the VSC the calculation is based on the centre point of the window position.
- When assessing the ADF for internal rooms and in the absence of specific information, the following parameters are assumed:
  - For new buildings, the glazing type is assumed to be double glazing (Pilkington K Glass 4/16/4 Argon filled) with a light transmittance value of 0.78 (value for double glazed unit not per pane). For existing buildings, a value of 0.68 has been assumed.
  - Correction factor for frames and glazing bars = 0.8
  - Where information from the designer is not available, the following values are used to derive the Maintenance Factor applied to the transmittance values.

Location / setting	Building type (Residential – good maintenance)	Exposure (normal)	Special exposure	Maintenance Factor
Urban	8%	x 1.0	x 1.0	0.92
Rural / suburban	4%	x 1.0	x 1.0	0.96

Table 4.1 – Parameters used for deriving Maintenance Factor (refer to BS 8206-2:2008 Tables A3, A4 and A5)

- The reflectance values used in the ADF analysis of neighbouring buildings are based on typical values for internal surfaces. Where information on internal finishes is not available, the default value of 0.5 prescribed by the BRE Guidelines is adopted.
- The reflectance values used in the ADF analysis of the proposed new buildings are shown in table 4.2 below and are used unless specified otherwise by the designer:

Surface	Value
Internal walls (painted pale cream)	81%
Internal ceiling (painted white)	85%
Internal flooring	30%

Table 4.2 – Reflectance values used in ADF analysis

- Where information on internal room layouts of adjacent properties is not known, best estimates as to room layout and size have been made in order to undertake No Skyline analysis and, if applicable, ADF analysis.
- Where the internal arrangements and room uses have been estimated, it should be noted that this has no bearing upon the tests for VSC or APSH because the reference point is at the centre of the window being tested and windows have been accurately drawn from the survey information where possible. It is relevant to the daylight distribution assessment, but in the absence of suitable plans, estimation is a conventional approach.

- In areas where survey data has not been provided or needs to be supplemented with additional information, photographs, OS mapping and brick counts have been used in the process of building the 3D model of the surrounding and existing buildings.
- When analysing the effect of the new building on the existing buildings, the shading effect of the existing trees has been ignored. This is the recommended practice where deciduous trees that do not form a dense belt or tree line are present (BRE Guidelines – Appendix H).

- In situations where windows are deeply set-back beneath balconies or other overhanging features, it is common for these rooms to have low VSC values as a result of the obstruction caused by the balcony. It widely accepted and acknowledged within the BRE Guidelines that the presence of balconies can mask the impact of a proposed development when using the VSC test and therefore the Guidelines suggest that the window should be tested both 'with' and 'without' the balcony in place. If the ratio of change with the development in place, but with the balconies removed, remains above 0.8, then it can be concluded that it is the presence of the balcony rather than the introduction of a new building that is the main factor in the loss of light.

4.5 Assessment criteria

The numerical assessment criteria specified within the BRE Guidelines is designed to identify the threshold at which point a change in daylight or sunlight would become 'noticeable' to the occupants. Consequently, where the results of the daylight/sunlight analysis demonstrate compliance with the BRE criteria it can be concluded that the impact will be negligible. However, a point that should be stressed here is that 'noticeable' does not necessarily equate to 'unacceptable' and the BRE's standard target values should not always be considered as pass/fail criteria. Whilst the BRE Guidelines provide numerical guidance for daylight, sunlight and overshadowing, these criteria should not be seen as absolute targets since, as the document states, the intention of the guide is to help rather than constrain the designer. The Guide is not an instrument of planning policy, therefore whilst the methods given are technically robust, it is acknowledged that some level of flexibility should be applied where appropriate.

Consequently, based on the numerical assessment criteria set out with the BRE Guidelines and the use of professional judgment, the following assessment criteria have been established and are used in describing the impacts of the proposed development.

Significance	Description	Change Ratio
Negligible	No alteration or a small alteration from the existing scenario. Results demonstrate full compliance with the BRE assessment criteria and therefore occupants are unlikely to notice any change.	1.0 to 0.8
Minor adverse	An alteration from the existing scenario which may be marginally noticeable to the occupant. This may include a marginal infringement of the numerical levels suggested in the BRE Guidelines, which should be viewed in context. A typical change ratio for this level of significance would be 0.7	0.7 to 0.8
Moderate adverse	An alteration from the existing scenario which may cause a moderate noticeable change to the occupant. This may consist of a moderate infringement of the numerical BRE assessment criteria with	0.6 to 0.7
Major adverse	An alteration from the existing scenario which may cause a major noticeable change to the occupant. This may consist of a significant infringement of the numerical BRE assessment criteria.	Less than 0.6

Table 4.3 – Daylight & Sunlight Impact Descriptors

5 Discussion of Daylighting Impacts

Based on the results of the numerical analysis summarised in Appendix A.3, it is possible to draw conclusions on the impacts that the proposed development will have on the neighbouring buildings. These are based on the principle numerical tests that are discussed below.

5.1 Vertical Sky Component Assessment

The BRE Guidelines operate on the general principle that where the retained VSC is 27% or greater, or where the retained VSC has not reduced to less than 0.8 times its former value, then the reduction in daylight is unlikely to be noticeable to the building's occupants and thus the impact can be deemed negligible. The results of the VSC analysis are summarised below.

Property	No. Windows Tested	Windows meeting BRE Guidelines		VSC Windows Transgressions		
		No.	%	Minor adverse	Moderate adverse	Major adverse
63 Strathmore Rd	2	2	100%	0	0	0
47 Strathmore Rd	11	11	100%	0	0	0
45 Strathmore Rd	5	5	100%	0	0	0
43 Strathmore Rd	2	2	100%	0	0	0
41 Strathmore Rd	4	4	100%	0	0	0
39 Strathmore Rd	7	7	100%	0	0	0
37 Strathmore Rd	21	21	100%	0	0	0
35 Strathmore Rd	22	22	100%	0	0	0
33 Strathmore Rd	4	4	100%	0	0	0
31 Strathmore Rd	36	36	100%	0	0	0
29 Strathmore Rd	3	3	100%	0	0	0
27 Strathmore Rd	3	3	100%	0	0	0
25 Strathmore Rd	3	3	100%	0	0	0
23 Strathmore Rd	3	3	100%	0	0	0
21 Strathmore Rd	4	4	100%	0	0	0
19 Strathmore Rd	3	3	100%	0	0	0
17 Strathmore Rd	3	3	100%	0	0	0
15 Strathmore Rd	3	3	100%	0	0	0
13 Strathmore Rd	5	5	100%	0	0	0
11 Strathmore Rd	3	3	100%	0	0	0
228 Stanley Rd	6	6	100%	0	0	0
226 Stanley Rd	6	6	100%	0	0	0
224 Stanley Rd	4	4	100%	0	0	0
222 Stanley Rd	9	9	100%	0	0	0
220 Stanley Rd	6	6	100%	0	0	0
218 Stanley Rd	4	4	100%	0	0	0
5 to 8 Fulwell Court	12	12	100%	0	0	0
1 to 4 Fulwell Court	13	13	100%	0	0	0
Total	**207**	**207**	**100%**	**0**	**0**	**0**

Table 5.1 – Results of Vertical Sky Component (VSC) Analysis

Inspection of the results of this test show that all of the windows either retain a VSC value greater than 27% post development, or have a ratio of change that is 0.8 or above and therefore are fully compliant. Consequently, in line with the assessment criteria set out within the BRE Guidelines it is possible to conclude that the impact will be **negligible**.

5.2 No Sky Line Assessment

In order to pass the No Sky Line Assessment, the BRE Guidelines state that the area of the working plane within the room that has a view of the sky should not be reduced to less than 0.8 times its former value as a result of new development. One benefit of the daylight distribution test is that the resulting contour plans show where the light falls within a room, for both the existing and proposed conditions, and a judgement can be made as to whether the room will retain light to a reasonable depth.

In this case, the dimensions and layouts of the habitable rooms within No. 63, No. 47, No. 45, No. 41, No. 35, No. 33, No.31, No. 19, No. 15, No. 13 and No. 11 Strathmore Road have been based on drawings obtained on the planning portal and estate agent websites. No. 218, No. 222, No. 224 and No. 228 Stanley Road have also been based on drawings obtained on the planning portal or estate agent websites where relevant. The remaining properties have either been based on estimations from on similar neighbouring properties and what can be observed from Google and Bing maps.

The results of the No Sky Line/Daylight Distribution analysis are summarised below.

Property	Number of Rooms Tested	Rooms that meet BRE Guidelines		No Sky Line No. of Rooms Experiencing Transgressions		
		No.	%	Minor adverse	Moderate adverse	Major adverse
63 Strathmore Rd	1	1	100%	0	0	0
47 Strathmore Rd	4	4	100%	0	0	0
45 Strathmore Rd	4	4	100%	0	0	0
43 Strathmore Rd	2	2	100%	0	0	0
41 Strathmore Rd	4	4	100%	0	0	0
39 Strathmore Rd	4	4	100%	0	0	0
37 Strathmore Rd	3	3	100%	0	0	0
35 Strathmore Rd	3	3	100%	0	0	0
33 Strathmore Rd	3	3	100%	0	0	0
31 Strathmore Rd	3	3	100%	0	0	0
29 Strathmore Rd	3	3	100%	0	0	0
27 Strathmore Rd	3	3	100%	0	0	0
25 Strathmore Rd	3	3	100%	0	0	0
23 Strathmore Rd	3	3	100%	0	0	0
21 Strathmore Rd	4	4	100%	0	0	0
19 Strathmore Rd	3	3	100%	0	0	0
17 Strathmore Rd	3	3	100%	0	0	0
15 Strathmore Rd	2	2	100%	0	0	0
13 Strathmore Rd	3	3	100%	0	0	0
11 Strathmore Rd	1	1	100%	0	0	0
228 Stanley Rd	6	6	100%	0	0	0
226 Stanley Rd	6	6	100%	0	0	0
224 Stanley Rd	3	3	100%	0	0	0
222 Stanley Rd	6	6	100%	0	0	0
220 Stanley Rd	4	4	100%	0	0	0
218 Stanley Rd	4	4	100%	0	0	0
5 to 8 Fulwell Court	8	8	100%	0	0	0
1 to 4 Fulwell Court	8	8	100%	0	0	0
Total	**104**	**104**	**100%**	**0**	**0**	**0**

Table 5.2 – Results of No Sky Line (NSL) Analysis

From the results summarised above, it can be seen that as a result of the proposed development, the impact on the daylight distribution within the assessed rooms will be negligible. The reduction in the area of the working plane that has a direct view of the sky will be less than 20% therefore occupants are unlikely to notice any change.

5.3 Summary of Daylighting Impacts

The proposed development at The Strathmore Centre, Strathmore Road, Teddington, TW11 8UH has been evaluated against the criteria set out by the BRE Guidelines for the assessment of the potential impacts on the daylight of the neighbouring properties. 27 properties have been identified as sensitive receptors for this study, No. 63, No. 11 – 47 Strathmore Rd (odd-numbered properties), No. 218 – 228 Stanley Road (even-numbered properties), 5 to 8 Fulwell Court and 1 to 4 Fulwell Court, and therefore, the habitable rooms and the windows serving these rooms have been tested.

When the magnitude of reduction is considered, it is evident that this will be within the acceptable limits set out within the BRE Guidelines. Consequently, it is possible to conclude that any changes to the daylight received by the habitable rooms of the neighbouring buildings will not be significant and is unlikely to be noticeable by the occupants.

6 Sunlight and Overshadowing Analysis

6.1 Annual Probable Sunlight Hours Assessment

The Annual Probable Sunlight Hours (APSH) tests have been carried out using the numerical model described in Section 4.3. The assessment requirements for the APSH test, as set out in the BRE Guidelines, have been reiterated below. For the assessment to conclude that the sunlighting of the existing dwelling could be adversely affected, all three of the following tests need to have been failed:

Test A - Does the window receive less than 25% of the APSH, or less than 5% the APSH between 21st September and 21st March?

Test B - Does the assessed window receive less than 0.8 times its former sunlight hours during either the 'whole year' or 'winter' period?

Test C - Is the reduction in sunlight received over the whole of the year greater than 4% of the APSH?

However, these tests are only applicable to windows that face within 90 degrees of due south. Consequently, in line with the guidelines and assessment methodologies set out within the BRE document, the analysis of sunlight impacts has only been carried out for these windows. Windows facing within 90 degrees of due north are not analysed and impacts are deemed to be negligible.

It should also be noted that where rooms have windows on more than one elevation, it is acceptable to sum the non-coincident sunlight hours to achieve a 'room total'. This approach is acknowledged by the BRE Guidelines and facilitates a greater understanding of the sunlight received within a room by taking into account the fact that some windows will receive sunlight at different times during the day.

When examining the results of the three sunlight tests, it is first necessary to understand why there are three separate tests and more importantly, why it is not necessary to pass all three to demonstrate that there is no adverse impact. The BRE Guidelines clearly state that for the proposed development to be considered to have an adverse effect on the available sunlight to neighbouring windows, all three tests would need to have been failed.

This is because sunlight is not assessed in terms of its contribution to the overall lighting levels within the room. The value attributed to sunlight is its transient presence and the way in which it can make a room appear bright and cheerful. There are also therapeutic values associated with sunlight and therefore it can be seen that these are not quantitative metrics that can be assessed using a single pass/fail criteria test. It is also necessary to understand that the amount of sunlight received by a window is strongly influenced by the orientation of the window elevation and any surrounding obstructions.

As a consequence of these factors, the assessment methodology embodied within the three separate tests allows the change in sunlight to be assessed in terms of the magnitude of change, absolute change and the retained level of sunlight. To conclude that a new development has no adverse impact, all that is required is for one of the three tests to be passed. The APSH test has been carried out and the detailed results of the analysis are included in Appendix A.3 and a summary of the results are shown in Table 6.1 below.

Property	Number of Windows Tested	Annual			Winter		
		Windows that meet BRE Guidelines		No. of Windows Experiencing Adverse Impacts	Windows that meet BRE Guidelines		No. of Windows Experiencing Adverse Impacts
		No.	%		No.	%	
63 Strathmore Rd	2	2	100%	0	2	100%	0
47 Strathmore Rd	11	11	100%	0	11	100%	0
45 Strathmore Rd	4	4	100%	0	4	100%	0
43 Strathmore Rd	2	2	100%	0	2	100%	0
41 Strathmore Rd	4	4	100%	0	4	100%	0
39 Strathmore Rd	7	7	100%	0	7	100%	0
37 Strathmore Rd	17	17	100%	0	17	100%	0
35 Strathmore Rd	18	18	100%	0	18	100%	0
33 Strathmore Rd	4	4	100%	0	4	100%	0
31 Strathmore Rd	22	22	100%	0	22	100%	0
29 Strathmore Rd	3	3	100%	0	3	100%	0
27 Strathmore Rd	3	3	100%	0	3	100%	0
25 Strathmore Rd	3	3	100%	0	3	100%	0
23 Strathmore Rd	3	3	100%	0	3	100%	0
21 Strathmore Rd	4	4	100%	0	4	100%	0
19 Strathmore Rd	3	3	100%	0	3	100%	0
17 Strathmore Rd	3	3	100%	0	3	100%	0
15 Strathmore Rd	3	3	100%	0	3	100%	0
13 Strathmore Rd	5	5	100%	0	5	100%	0
11 Strathmore Rd	2	2	100%	0	2	100%	0
228 Stanley Rd	*North facing*						
226 Stanley Rd	*North facing*						

224 Stanley Rd	1	1	100%	0	1	100%	0
222 Stanley Rd	*North facing*						
220 Stanley Rd	*North facing*						
218 Stanley Rd	*North facing*						
5 to 8 Fulwell Court	2	2	100%	0	2	100%	0
1 to 4 Fulwell Court	*North facing*						
Total	**126**	**126**	**100%**	**0**	**126**	**100%**	**0**

Table 6.1 – Results of APSH Analysis

When the results of the APSH analysis summarised in Table 6.1 are inspected, it can be seen that all windows and rooms pass at least one of the three sunlight tests. Consequently, it has been demonstrated that the proposed scheme will have a negligible impact on neighbouring buildings.

6.2 Sun on the Ground

The BRE Guidelines acknowledge that good site layout planning for daylight and sunlight should not limit itself to providing good natural light inside buildings. Sunlight in the space between buildings has an important effect on the overall appearance and ambiance of a development.

The 2011 BRE Guidelines suggest that the Spring Equinox (21st March) is a suitable date for the assessment and therefore using the specialist software described in Section 4.3, the path of the sun is tracked to determine where the sun would reach the ground and where it would not.

The BRE guidelines recommend that at least half of a garden or amenity area should receive at least 2 hours of sunlight on March 21st or the area which receives 2 hours of direct sunlight should not be reduced to less than 0.8 times its former value (i.e. there should be no more than a 20% reduction).

Typical examples of areas that could be considered as open spaces or amenity areas are main back gardens of houses, allotments, parks and playing fields, children's playgrounds, outdoor swimming pools, sitting-out areas, such as in public squares and focal points for views.

The gardens of the following properties have been identified as sensitive amenity areas and the results of the sun on the ground analysis are summarised in Table 6.2.

- Rear gardens to No. 63 & 11-47 (odd-numbered properties) Strathmore Road
- Rear gardens to No. 218-228 (even-numbered properties) Stanley Road
- Rear gardens to 1-4 Fulwell Court, Stanley Road
- Rear gardens to 5-8 Fulwell Court, Stanley Road
- Caretaker's Yard at Stanley Primary School

The graphical results of the overshadowing analysis are included in Appendix A.2.

Amenity area	Percentage of area lit for 2 hours or more on the 21st March		Ratio of change	Compliant with BRE criteria?
	Existing	Proposed		
63 Strathmore Rd	75%	75%	n/a	Yes
47 Strathmore Rd	68%	68%	n/a	Yes
45 Strathmore Rd	63%	62%	0.99	Yes
43 Strathmore Rd	65%	64%	0.99	Yes
41 Strathmore Rd	70%	69%	0.99	Yes
39 Strathmore Rd	68%	67%	0.99	Yes
37 Strathmore Rd	67%	66%	0.98	Yes
35 Strathmore Rd	66%	65%	0.99	Yes
33 Strathmore Rd	64%	63%	0.98	Yes
31 Strathmore Rd	63%	63%	n/a	Yes
29 Strathmore Rd	67%	66%	0.99	Yes
27 Strathmore Rd	66%	66%	n/a	Yes
25 Strathmore Rd	56%	56%	n/a	Yes
23 Strathmore Rd	65%	65%	n/a	Yes
21 Strathmore Rd	67%	67%	n/a	Yes

19 Strathmore Rd	58%	58%	n/a	Yes
17 Strathmore Rd	55%	55%	n/a	Yes
15 Strathmore Rd	48%	48%	n/a	Yes
13 Strathmore Rd	60%	60%	n/a	Yes
11 Strathmore Rd	58%	58%	n/a	Yes
228 Stanley Rd	87%	87%	n/a	Yes
226 Stanley Rd	81%	81%	n/a	Yes
224 Stanley Rd	87%	87%	n/a	Yes
222 Stanley Rd	82%	82%	n/a	Yes
220 Stanley Rd	72%	72%	n/a	Yes
218 Stanley Rd	77%	77%	n/a	Yes
5 to 8 Fulwell Court – Area 1	65%	65%	n/a	Yes
5 to 8 Fulwell Court – Area 2	72%	72%	n/a	Yes
1 to 4 Fulwell Court – Area 1	58%	58%	n/a	Yes
1 to 4 Fulwell Court – Area 2	41%	41%	n/a	Yes
Stanley Primary School Caretaker's Yard	59%	59%	n/a	Yes

Table 6.2 – Results of the Sun on Ground analysis

From the above results, it can be seen that with the proposed scheme in place, the majority of neighbouring amenity areas benefit from two hours or more of direct sunlight to well over 50% of their area on the 21st March. In addition, it can be seen that as a result of the proposed development, the area sunlit for two hours or more will not be reduced by more than 20% which is the acceptable reduction limit prescribed by the BRE Guidelines. Infact, the largest reduction experienced is only 2%, which is well within the acceptable threshold.

Consequently, it can be concluded that the proposed development will not result in a noticeable increase in overshadowing to the neighbouring gardens.

6.3 Transient Overshadowing

Where amenity areas are used at specific times of day or year, it is useful and illustrative to comment on the overshadowing that will occur throughout the day and at different times of the year. However, with traditional rear gardens and public open spaces that are potentially used all year round, it is acknowledged by the BRE Guidelines that the 21st March equinox is used, as this represents a much worst case than an assessment during the summer when shadows are shorter and impacts of new development are less magnified.

It is also worth highlighting that whilst the BRE Guidelines do not provide any thresholds or assessment criteria for overshadowing analysis carried out at any date other than the 21st March. All that is quoted in the Guidelines is an acknowledgement that some degree of transient overshadowing should be expected from new development. Consequently, unless there is a specific reason to assess overshadowing at a specific time of day, the use of transient shadow plots is not recommended by the BRE Guidelines.

In this situation, it is not considered that any of the amenity areas that are potentially affected by the proposed development would be described as being sensitive to overshadowing at any particular time of day. Consequently, transient overshadowing is not considered appropriate for this assessment.

6.4 Solar Glare

Solar glare or dazzle can affect neighbouring buildings and pose potential hazards for road users under certain circumstances. The BRE Guidelines highlight two particular cases where this can be a problem; these being where there are large areas of reflective glass or cladding on the façade, or where large areas of glass or cladding slope back such that high-altitude sunlight can be reflected along the ground.

When the proposed design is considered, it can be seen that the building does not slope back, nor does it include large areas of reflective glass or cladding. Given the building design and the BRE Guideline's stance on this matter, it is not considered necessary or appropriate to incorporate an analysis of solar glare.

7 Daylight and Sunlight Provision to Proposed Development

7.1 Overview

As discussed in Section 4, the primary test for daylight within the proposed development is the Average Daylight Factor (ADF) test and this is discussed in detail in the following section. The No Sky Line (NSL) analysis has also been carried out to provide supporting information on the distribution of daylight within each of the habitable rooms. The NSL results are processed by the computational model in both graphical and numerical formats and these are included in the appendix to this report.

It is the intention of the BRE Guidelines to aid, rather than constrain the designer and as such a range of qualitative and quantitative tests are outlined, which vary in complexity. During the early stages of design, it is often appropriate to use the more simplistic rule-of-thumb tests. However, when assessing a final design at the planning application stage, it is more appropriate to rely upon the more detailed and quantitative analysis techniques. These allow window size and position, glazing type, room layout and dimensions etc to be taken into consideration. Consequently, the assessment of natural daylight provision has been based primarily on the results of the ADF test, although reference to the NSL results is made when deemed necessary.

7.2 Assessment of Daylight Provision to New Rooms

Using the analytical techniques discussed in Section 4, the Average Daylight Factor (ADF) for the habitable rooms within the proposed development has been calculated. It is fist important to note that in accordance with the guidance set out in both the BRE Guidelines and the BS 8206-2:2008 document, rooms that have a dual use, i.e. an open plan kitchen and lounge, are assessed as a single room and assessed against the room use with the highest daylighting requirement.

The results are summarised in Table 7.1.

Block	Unit number & Floor level	No. of Rooms	No. of Rooms meeting ADF target value	Meets BRE criteria
Block A	Ground - Unit 1	4	4	Yes
	Ground - Unit 2	4	4	Yes
	First - Unit 3	4	4	Yes
	First - Unit 4	4	4	Yes
	Second – Unit 5	2	2	Yes
	Second – Unit 6	2	2	Yes
	Ground – Unit 7	4	4	Yes
	Ground – Unit 8	4	4	Yes
	First - Unit 19	4	4	Yes
	First - Unit 10	4	4	Yes
	Second – Unit 11	2	1	No
	Second – Unit 12	2	2	Yes
Total		***40***	***39***	

Block	Unit number & Floor level	No. of Rooms	No. of Rooms meeting ADF target value	Meets BRE criteria
Block B	Ground - Unit 13	5	5	Yes
	First - Unit 14	5	5	Yes
	First - Unit 15	4	3	No
	Second - Unit 16	4	4	Yes
	Second – Unit 17	3	3	Yes
	Ground – Unit 18	4	3	No
	Ground – Unit 19	4	3	No
	First – Unit 20	4	3	No
	First – Unit 21	5	4	No
	Second – Unit 22	3	3	Yes
	Second – Unit 23	4	4	Yes
	Ground - Unit 24	4	3	No
	Ground - Unit 25	5	5	Yes
	First - Unit 26	5	5	Yes
	First - Unit 27	5	4	No
	Second – Unit 28	4	4	Yes
	Second – Unit 29	3	2	No
	Ground – Unit 30	5	4	No
Total		***76***	***67***	

Table 7.1 – Calculated ADF Values

From the results summarised above and the full results in Appendix A.4, it can be seen that the vast majority of proposed habitable rooms within both Block A and Block B far exceed the ADF target values set out by the BRE Guidelines. Consequently, it can be concluded that these habitable spaces will be well lit throughout the year and will have a reduced reliance on supplementary electric lighting.

There are 9 out of 116 rooms which are not meeting the aspirational Average Daylight Factor target values. However, in this assessment, the surrounding trees have been modelled as solid, opaque features and therefore these results represent a worst-case scenario. In Appendix H on 'Trees and Hedges' within the BRE Guidelines, it is suggested that an additional calculation be applied calculated to take into account the transparency of the trees. This calculation is discussed in Section 7.3.

7.3 Assessment of Impact of Trees

There is potential for the provision of daylight to some of the new rooms within the development to be affected by a number of trees that surround the site.

Quantifying the impact that trees have on daylighting is not a straightforward process as the tree canopy only causes partial shade; additionally, the daylight radiating through it varies depending on the time of year and the amount of leaf cover. The BRE Guidelines include specific analytic procedures that allow the impact that trees have on the provision of daylight to be quantified and this is expressed in terms of the Average Daylight Factor (ADF). The procedure is different to that normally used when simply taking account of adjacent building and requires each tree to be accurately reproduced within the 3D numerical model. This has been achieved using the dimensions and descriptions of the trees included within the Tree Survey (ACS Consulting – Sept 2018).

The basis of the analysis is that the ADF is calculated for two scenarios. The first calculation ignores the presence of the trees whilst the second includes the trees as fully opaque features (as discussed in Section 7.2). A formula is then applied that includes a transparency factor, which is specific to each species of tree for both 'in leaf' (summer) and 'bare branch' (winter) conditions.

It is important to note that the species transparency factor is fairly restricted as the BRE Guidelines only reference transparency factors for a limited number of tree species in Appendix H. Furthermore, only one tree species transparency factor can be applied to a single room. Therefore, professional judgement has been made as to which tree species transparency factor should be applied to each room within the existing and proposed development.

This analysis has been carried out for the 9 habitable rooms within the proposed development Block A and Block B that did not meet the aspirational ADF target values when the trees are modelled as opaque features. The Arboricultural Report/Tree Survey used for this assessment is included in Appendix A.1.

The results of the ADF analysis is summarised in Table 7.2.

Unit number & Floor level	Room number and use	ADF Summer	ADF Winter*	Target ADF value	Compliant with BRE Criteria?
Second – Unit 11	R8 Bedroom	0.9%	**1.0%**	1.0%	Yes
First - Unit 15	R25 LD	1.5%	**1.5%**	1.5%	Yes
Ground – Unit 18	R24 LD	1.3%	**1.4%**	1.5%	No
Ground – Unit 19	R21 LD	0.8%	**1.1%**	1.5%	No
First – Unit 20	R22 LD	0.9%	**1.1%**	1.5%	No
First – Unit 21	R21 LD	1.1%	**1.3%**	1.5%	No
Ground - Unit 24	R20 LD	0.6%	**0.9%**	1.5%	No
First - Unit 27	R16 Living Room	1.0%	**1.7%**	1.5%	Yes
Second – Unit 29	R10 LKD	0.6%	**1.1%**	2.0%	No
Ground – Unit 30	R17 Bedroom	0.7%	**0.8%**	1.0%	No

Table 7.2 – Calculated ADF Values considering tree transparency

The British Standard Code of Practice for Daylighting, BS8206-2 sets out the minimum recommended values of ADF for different types of room and these values are included in Table 8.2 for reference. When considering the impact of trees on daylight provision, the BRE Guidelines state the following:

Where the ADF values are exceeded for both summer and winter conditions, the daylight would be considered to be adequate. Where the minimum value is exceeded in winter but not summer, daylight provision year-round is likely to be adequate, but it is clear that the trees are having some effect on daylight.

Therefore, where the ADF values are below the minimum recommended values for the winter the daylight, this would not be considered to be adequate.

From the results in Table 7.2, it can be seen that the ADF value for three of the ten tested rooms is exceeded during the winter and therefore it can be concluded that the daylight provision annually is likely to be adequate within these rooms. There are seven out of 116 rooms which are not meeting the aspirational target values, however it can be seen from Table 7.2 that a number of the remaining rooms are only falling marginally short of meeting the aspirational target value.

7.4 Provision of Sunlight to New Rooms

The BRE Guidelines provide guidance in respect of sunlight quality for new developments stating: "in housing, the main requirement for sunlight is in living rooms, where it is valued at any time of the day, but especially in the afternoon. Sunlight is also required in conservatories. It is viewed as less important in bedrooms and in kitchens where people prefer it in the morning rather than the afternoon."

The assessment criteria set out within the BRE document are discussed in Section 4.3 of this report, but in general terms the overall objective sought by the guidelines is as follows:

"In general, a dwelling or non-domestic building which has a particular requirement for sunlight, will appear reasonably sunlit provided that at least one main window faces within 90 degrees of due south; and the centre of at least one window to a main living room can receive 25% of annual probable sunlight hours, including at least 5% of annual probable sunlight hours in the winter months between 21st September and 21st March".

It is also worth noting that in paragraph 3.1.11 of the BRE guidance it is suggested that if a room faces significantly north of due east or west it is unlikely to meet the recommended levels of sunlight. A further observation from paragraph 5.3 of the BS 8206-2 is that with regards to sunlight duration, the degree of satisfaction is related to the expectation of sunlight. Therefore, if a room is north facing or if the building is in a densely-built urban area, the expectation of sunlight will be lower.

It should be noted that where rooms have more than one window, it is acceptable to sum the non-coincident sunlight hours to achieve a 'room total'. This approach is acknowledged by the BRE Guidelines and facilitates a greater understanding of the sunlight received within a room by taking into account the fact that some windows will receive sunlight at different times during the day.

Following the approach prescribed by the BRE Guidelines where preference for sunlight is given to the main living area of a proposed unit, in this case only the Living/ Kitchen/ Dining (LKD) areas, Living/Dining Rooms (LD) or Living Rooms within the proposed units have been included in the table of results below. The complete set of results of the APSH analysis which includes the remainder rooms within the units are presented on Appendix A.4 of this report.

The results of this analysis are summarised in Table 7.3 and they are calculated with the surrounding trees as opaque features. Where the main habitable unit does not meet the ASPH target value, we have applied a transparency factor for the trees in accordance with Appendix H of the BRE Guidelines.

Block A Floor level	Unit number	Room Use	Percentage APSH		Meets BRE Criteria
			All year	Winter	
Ground	Unit 1	Living Room	72	19	Yes
Ground	Unit 2	Living Room	57	12	Yes

First	Unit 3	Living Room	78	22	Yes
First	Unit 4	Living Room	69	19	Yes
Second	Unit 5	LKD	84	28	Yes
Second	Unit 6	LKD	98	29	Yes
Ground	Unit 7	Living Room	74	22	Yes
Ground	Unit 8	Living Room	74	21	Yes
First	Unit 9	Living Room	78	26	Yes
First	Unit 10	Living Room	81	26	Yes
Second	Unit 11	LKD	82	29	Yes
Second	Unit 12	LKD	84	28	Yes

Block B Floor level	**Unit number**	**Room Use**	**Percentage APSH**		**Meets BRE Criteria**
			All year	**Winter**	
Ground	Unit 13	LD	38	7	Yes
First	Unit 14	LD	47	14	Yes
First	Unit 15	LD	21	8	-
With tree transparency:			*24*	*12*	*No*
Second	Unit 16	LD	55	15	Yes
Second	Unit 17	LD	47	12	Yes
Ground	Unit 18	LD	14	3	-
With tree transparency:			*19*	*7*	*No*
Ground	Unit 19	LD	2	2	-
With tree transparency:			*10*	*2*	*No*
First	Unit 20	LD	8	5	-
With tree transparency:			*25*	*3*	*Yes*
First	Unit 21	LD	13	2	-
With tree transparency:			*17*	*2*	*No*
Second	Unit 22	LD	47	13	Yes
Second	Unit 23	LD	42	9	Yes
Ground	Unit 24	LD	1	0	-
With tree transparency:			*6*	*1*	*No*
Ground	Unit 25	Living Room	80	24	Yes
First	Unit 26	Living Room	86	29	Yes
First	Unit 27	Living Room	0	0	-
With tree transparency:			*18*	*8*	*No*
Second	Unit 28	Living Room	90	30	Yes
Second	Unit 29	LKD	0	0	-
With tree transparency:			*21*	*9*	*No*
Ground	Unit 30	Living Room	13	12	-
With tree transparency:			*26*	*13*	*Yes*

Table 7.3 – Results of APSH analysis for main habitable rooms

From the results summarised in Table 8.2, it can be seen that the main living area for 23 of the 30 proposed units receive in excess of the target values set out by the BRE Guidelines of 25% annual probable sun hours and 5% winter probable sunlight hours. As consequence, it can be concluded that these units will be well sunlit throughout the year.

There are seven units where the main habitable room does not pass the APSH target values. However, when assessing the full set of APSH results it can be seen that six of the units have at least one bedroom and a kitchen that will receive in excess of the aspirational target value. Therefore, it should be considered that these units will be well sunlit.

Only Unit 29 does not have any habitable rooms that will meet the APSH target, however the LKD in this unit will receive around 21% APSH and 9% WPSH which is only marginally below the aspirational 25% APSH target. It should be noted that the window to this LKD looks directly towards a large tree and therefore the availability of sunlight will vary throughout the year, improving during the winter months when the tree canopy is reduced. Therefore, the sunlight availability should be considered reasonable for this room.

In addition, all of the proposed units will meet the London Plan's Standard 32 on 'Daylight and Sunlight' which states that '*All homes should provide for direct sunlight to enter at least one habitable room for part of the day. Living areas and kitchen dining spaces should preferably receive direct sunlight*'.

7.5 Direct Sunlighting to Amenity Spaces

The BRE Guidelines acknowledge that good site layout planning for daylight and sunlight should not limit itself to providing good natural light inside buildings. Sunlight in the space between buildings has an important effect on the overall appearance and ambiance of a development. The worst situation is to have significant areas on which the sun does not shine for a large part of the year. These areas would, in general, be damp, chilly and uninviting.

The BRE Guidelines set out the following principle benefits of sunlight in the spaces between buildings:

- To provide attractive sunlit views (all year)
- To make outdoor activities, like sitting out and children's play more pleasant (mainly during the warmer months)
- To encourage plant growth (mainly in spring and summer)
- To dry out the ground, reducing moss and slime (mainly during the colder months)
- To melt frost, ice and snow (in winter)
- To dry clothes (all year)

The assessment criteria set out within the BRE Guidelines is based on the recommendation that for an amenity space to appear adequately sunlit throughout the year, at least half of this area should receive at least two hours of sunlight on 21st March.

Inspection of the site plan shows that the residents in Block A and Block B will have access to two communal amenity areas in the form of a shared garden to the east of Block A and shared garden with playground to the west of Block B/south of Block A. Both of these amenity areas will receive in excess of 2 hours of direct sunlight to over 50% of their area on the 21st March.

8 Conclusions

The detailed analysis undertaken as part of this assessment has examined the impact of the proposed development at The Strathmore Centre, Strathmore Road on the amount of daylight enjoyed by the neighbouring buildings. Twenty-seven properties have been identified as sensitive receptors for this study and therefore, the habitable rooms and the windows serving these rooms within these properties have been tested.

In line with the assessment criteria prescribed by the BRE Guideline, it has been shown that the reduction in daylighting to the windows and rooms of the neighbouring buildings will be within the acceptable limits set out within the BRE Guidelines. Consequently, it is possible to conclude that any changes to the daylight received by the habitable rooms of the neighbouring buildings will not be significant and is unlikely to be noticeable by the occupants.

The assessment of the impact of the proposed development on the sunlight enjoyed by the neighbouring buildings has also shown that despite some reductions seen in the number of probable sunlight hours enjoyed by these windows and rooms, these are again within the limits prescribed by the BRE Guidelines as being acceptable. Furthermore, the assessment of the sunlight available to the neighbouring amenity areas indicates that all of the amenity areas will experience minimal change to the sunlight levels they currently enjoy.

In summary, the development proposals have been appraised in line with the guidelines set out in the BRE document. When assessed against the criteria for establishing whether the proposed development will have a significant impact, it has been possible to conclude that the development will not result in a notable reduction in the amount of either daylight or sunlight enjoyed by the neighbouring buildings.

In addition to the impact on its neighbours, the provision of natural daylight and sunlight to the habitable rooms within the proposed development itself has also been quantified. This analysis has shown that the vast majority of proposed habitable rooms exceed the minimum target values for natural daylight set out within the BRE Guidelines and the British Standards. Consequently, it can be concluded that these habitable spaces will be well lit and will have a reduced reliance on supplementary electric lighting.

There are six rooms in Block B and one room in Block A which are falling short of meeting the aspirational ADF target value. However, it should be taken into account that NPPF (2019) states that *'..when considering applications for housing, authorities should take a flexible approach in applying policies or guidance relating to daylight and sunlight, where they would otherwise inhibit making efficient use of a site (as long as the resulting scheme would provide acceptable living standards)."* Given that the vast majority of rooms within proposed units exceed the aspirational daylight target values, and those that do not only fall marginally short, it should be considered that the development as a whole will provide acceptable living standards.

It has also been possible to demonstrate that in the vast majority of proposed units, either the main habitable room or multiple secondary habitable rooms will receive well in excess of the 'all year' and 'winter' target levels of direct sunlight. As a consequence of the light and additional visual interest provided by this direct sunlight, the amenity value of these rooms will be enhanced.

A Appendices

Appendix A.1 – Scheme Drawings

Appendix A.2 – Graphical Model Outputs

Appendix A.3 – Tabulated Results for Daylight & Sunlight Calculations (Impacts on Neighbours)

Appendix A.4 – Tabulated Results for Daylight & Sunlight Calculations (Provision to New Development)

Appendix A.1 – Scheme Drawings

Appendix A.2 – Graphical Model Outputs

Existing Site Scenario
East View

Proposed Site Scenario
East View

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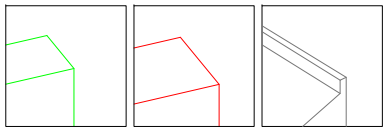
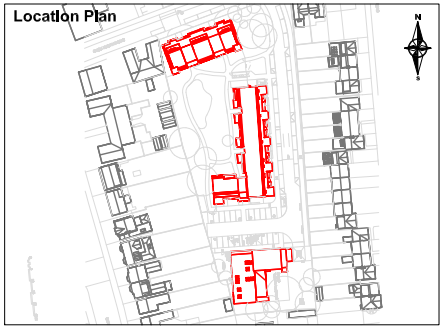
Legend



Location Plan



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DWG REF.
3D Model - Existing & Proposed Site Scenarios.

DWG No.
2594_01

Existing Site Scenario
West View

Proposed Site Scenario
West View

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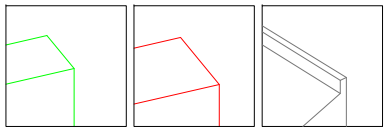

Location Plan

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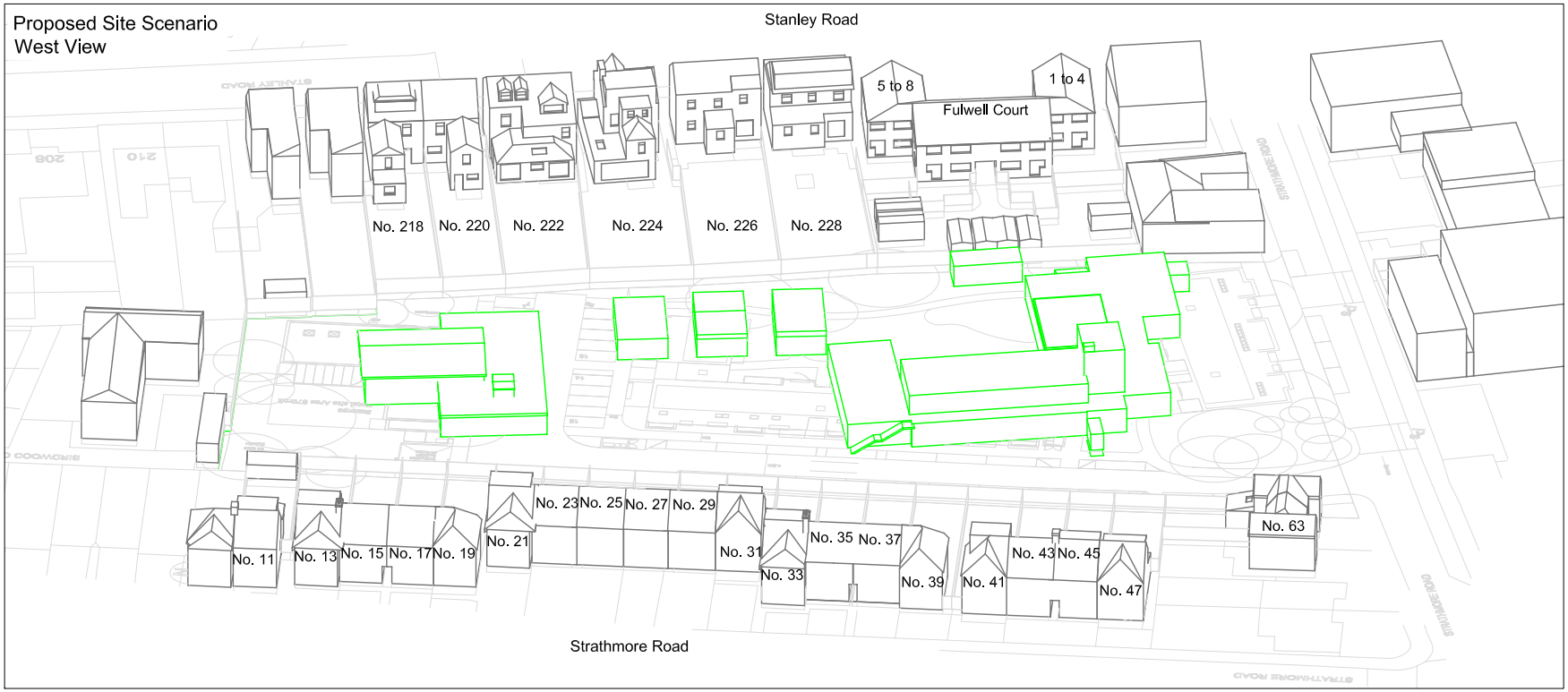
DWG REF.
3D Model - Existing & Proposed Site Scenarios.

DWG No.
2594_02

Proposed Site Scenario
West View



Proposed Site Scenario
East View

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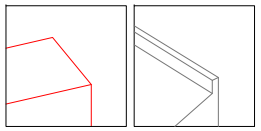

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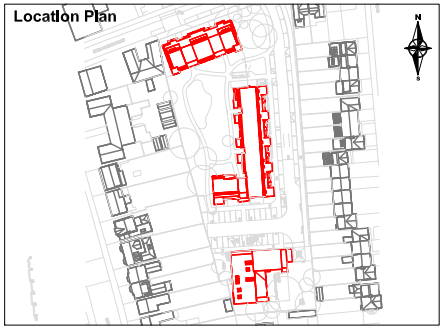

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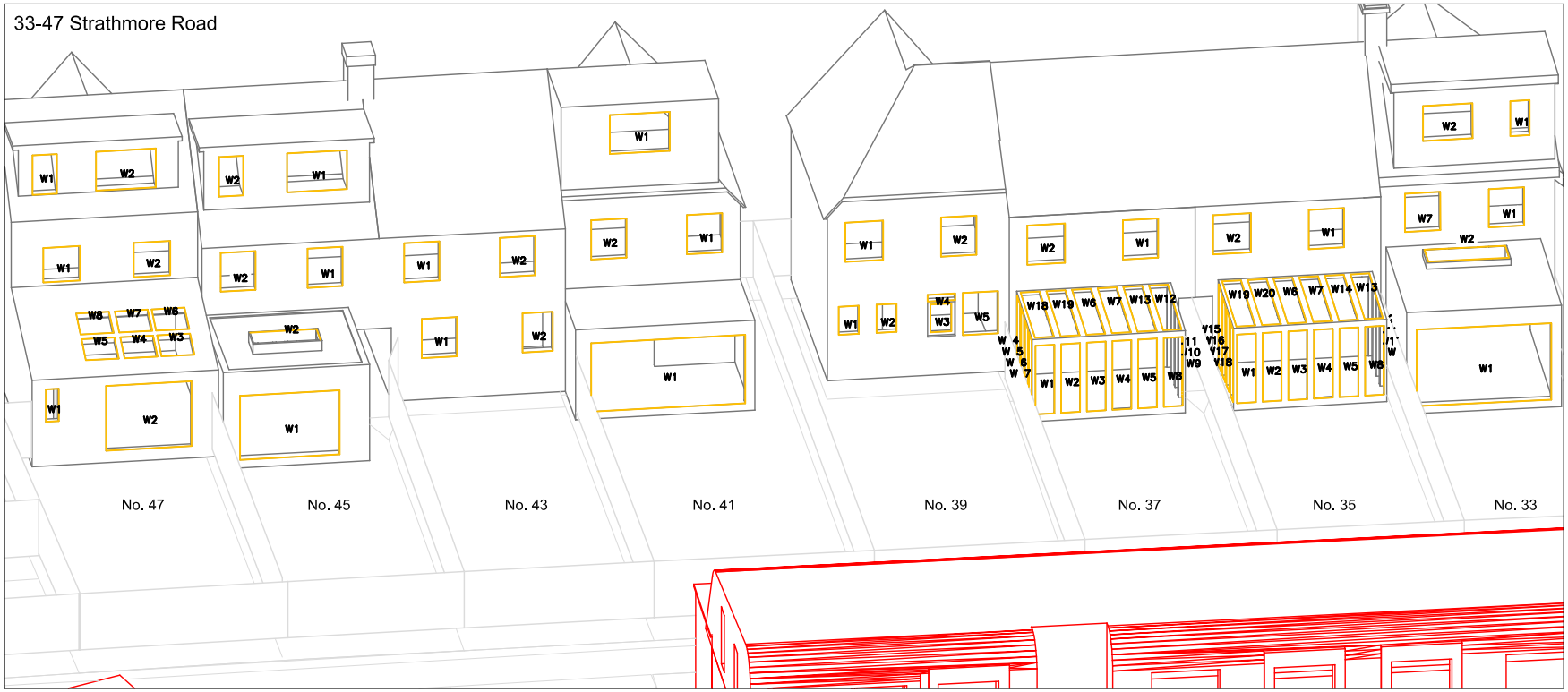
DWG REF.: Identification of Neighbouring Properties.

DWG No.: 2594_03



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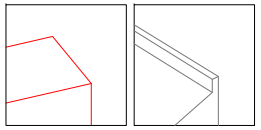

Location Plan

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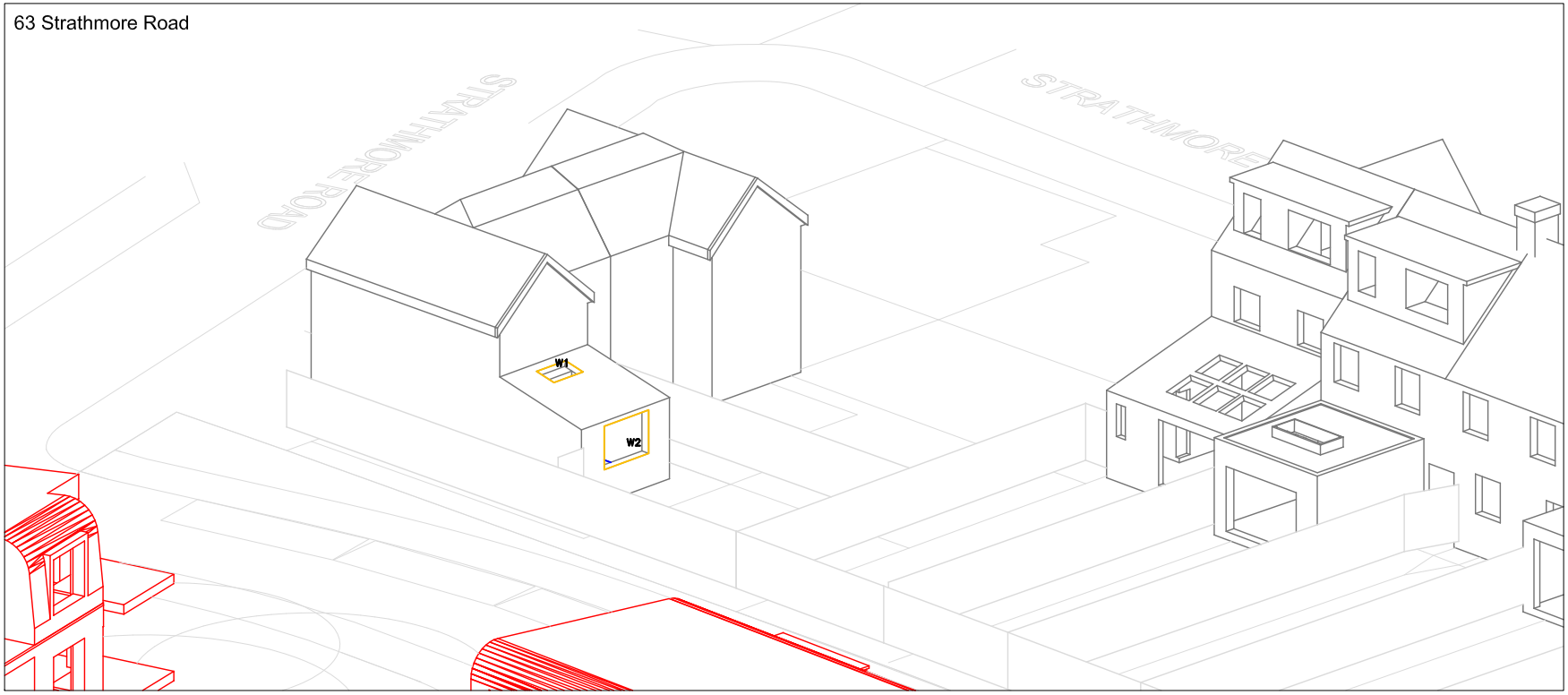
DWG REF.: Location of Window Receptors

DWG No.: 2594_04

11-15 Strathmore Road

63 Strathmore Road



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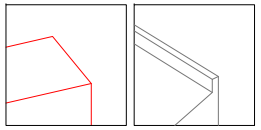
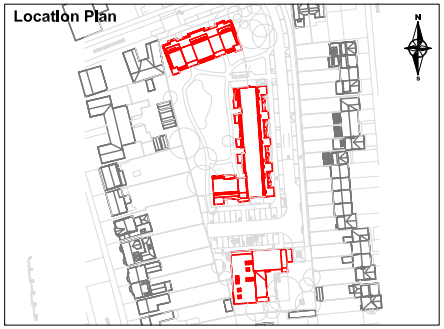


Proposed Buildings | Surrounding Buildings

Location Plan



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DWG REF.: Location of Window Receptors.

DWG No.: 2594_05

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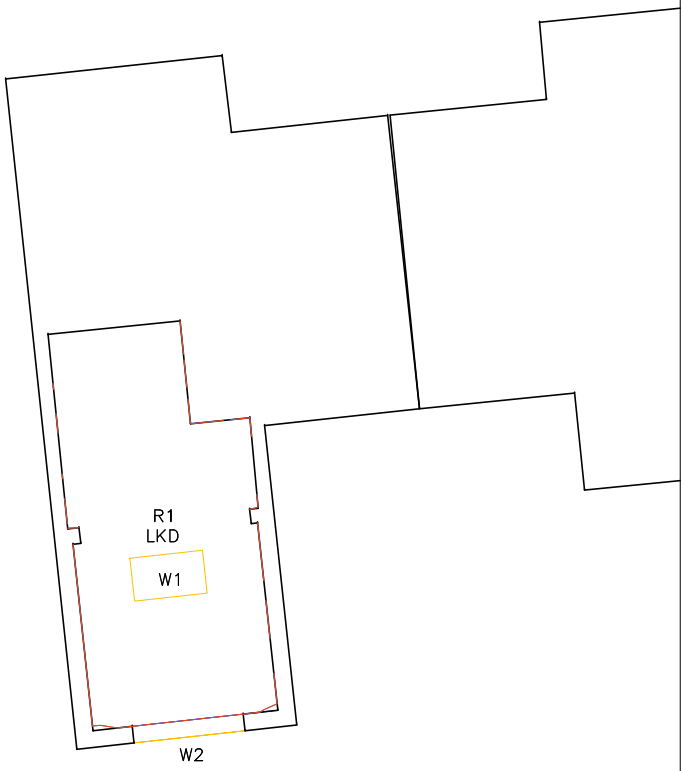
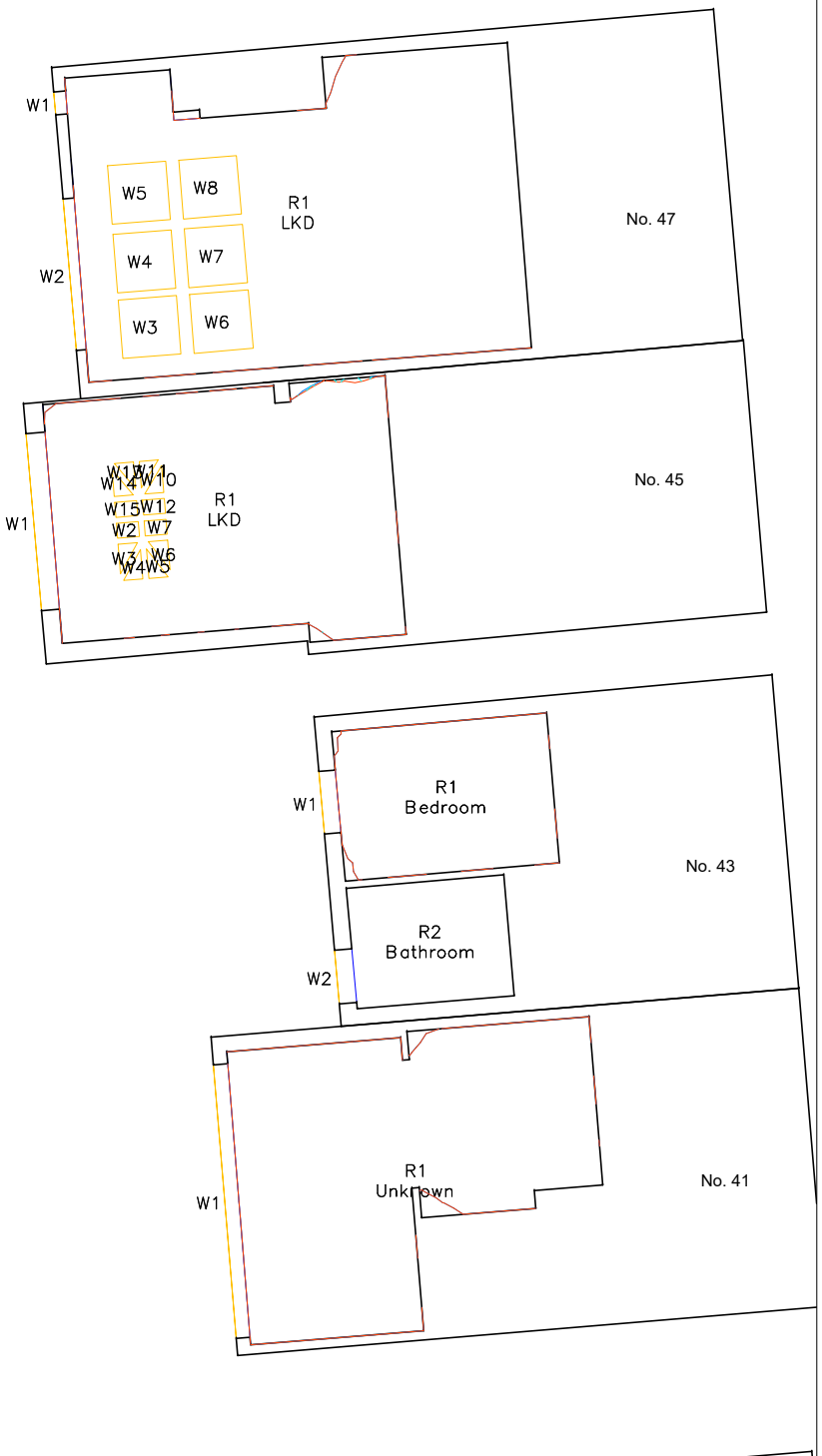


41-47 Strathmore Road
Ground Floor



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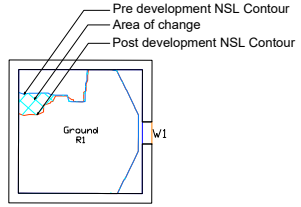

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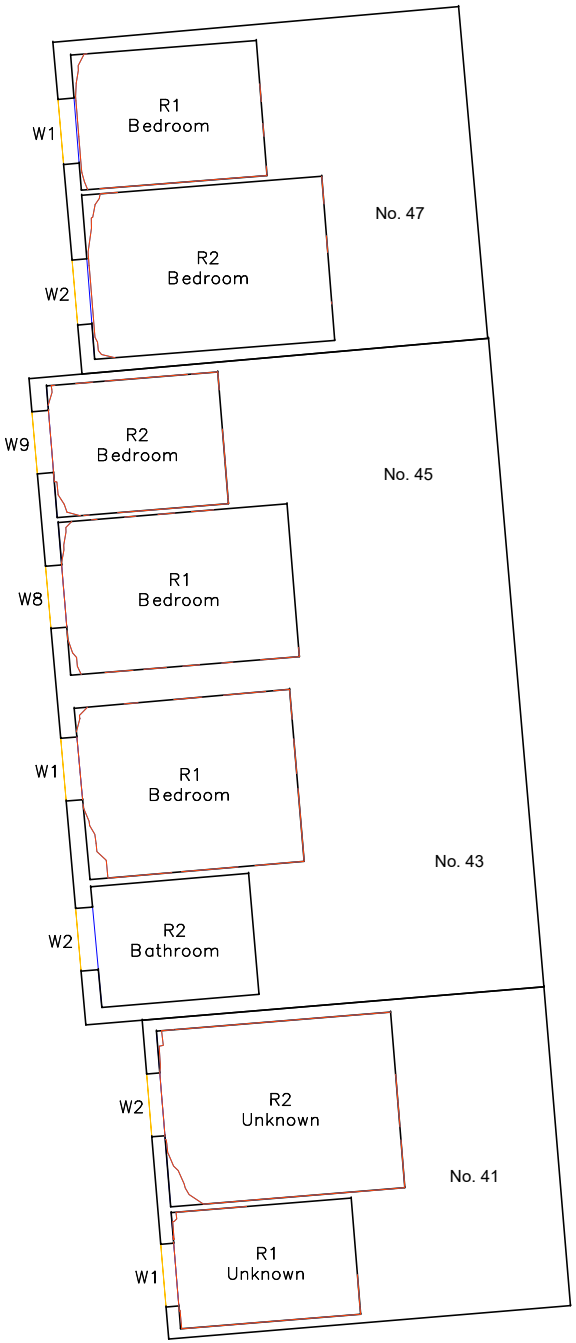
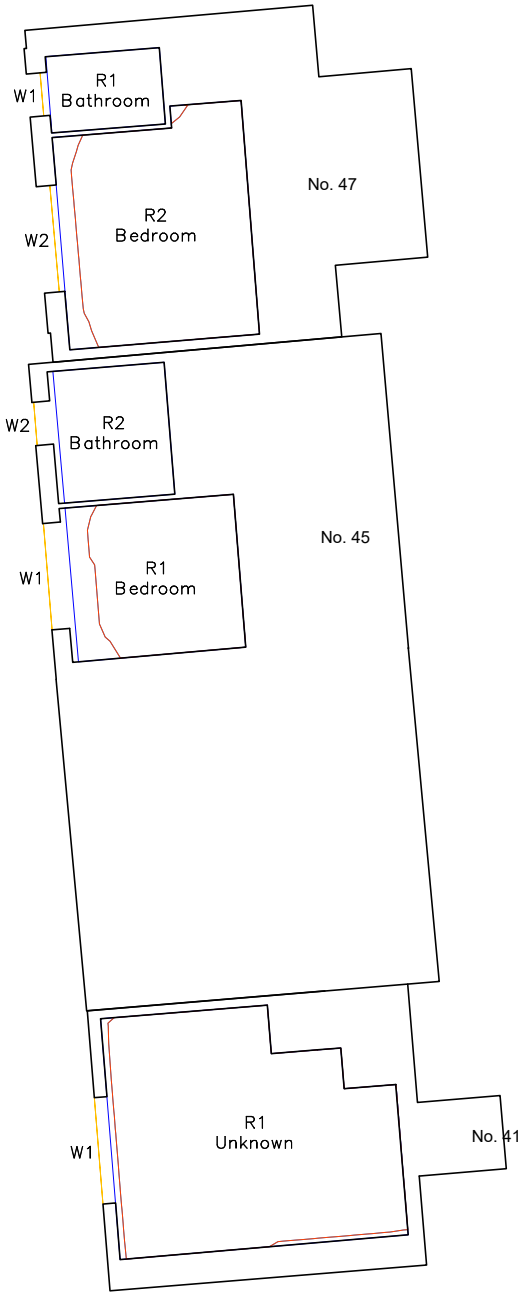
DWG REF.
NSL contours.

DWG No.
2594_07

41 - 47 Strathmore Road
First Floor



41, 45 & 47 Strathmore Road
Second Floor



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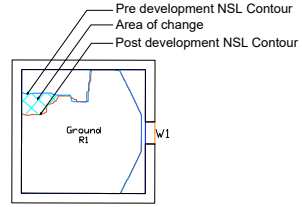

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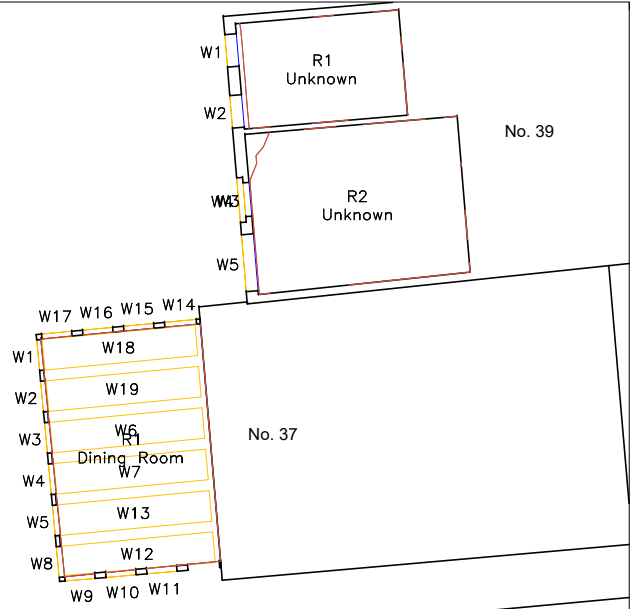
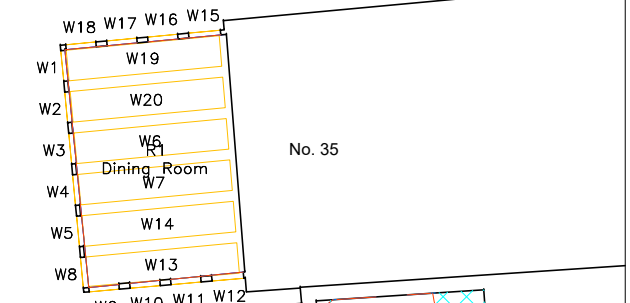
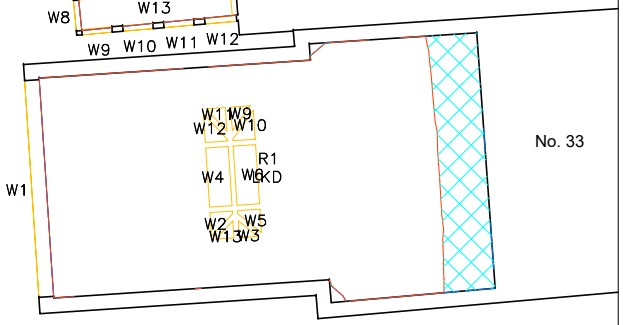
DWG REF.: NSL contours.

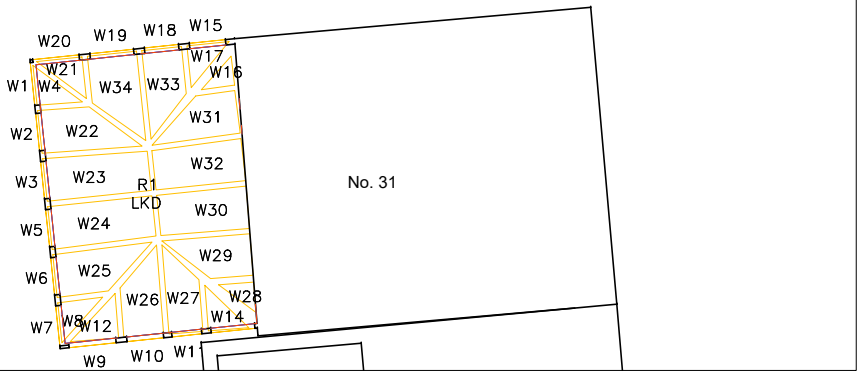
DWG No.: 2594_08

31 - 39 Strathmore Road
Ground Floor

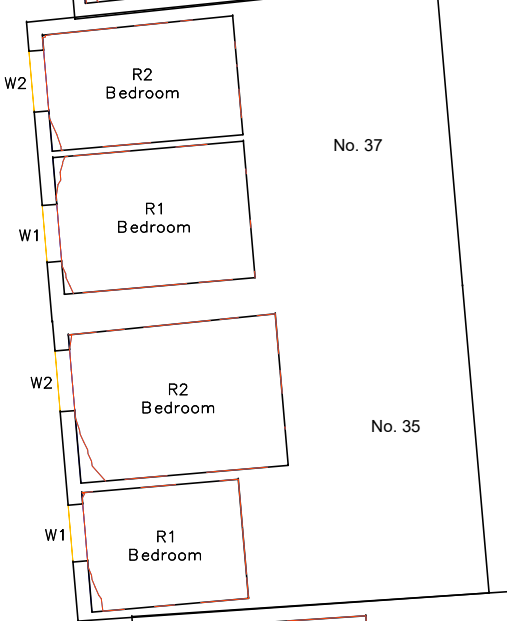


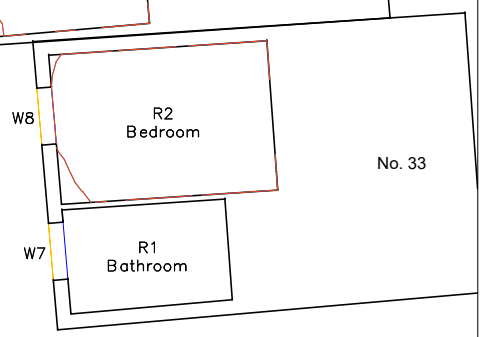


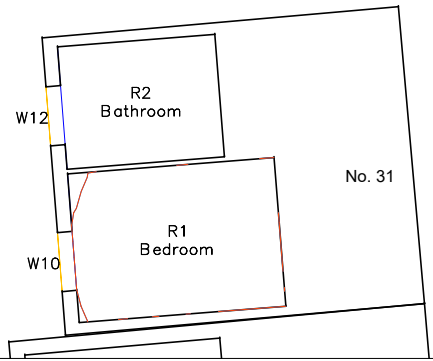




31 - 39 Strathmore Road
First Floor







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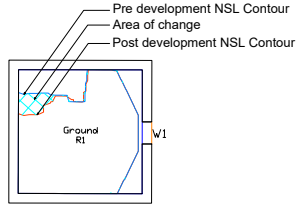

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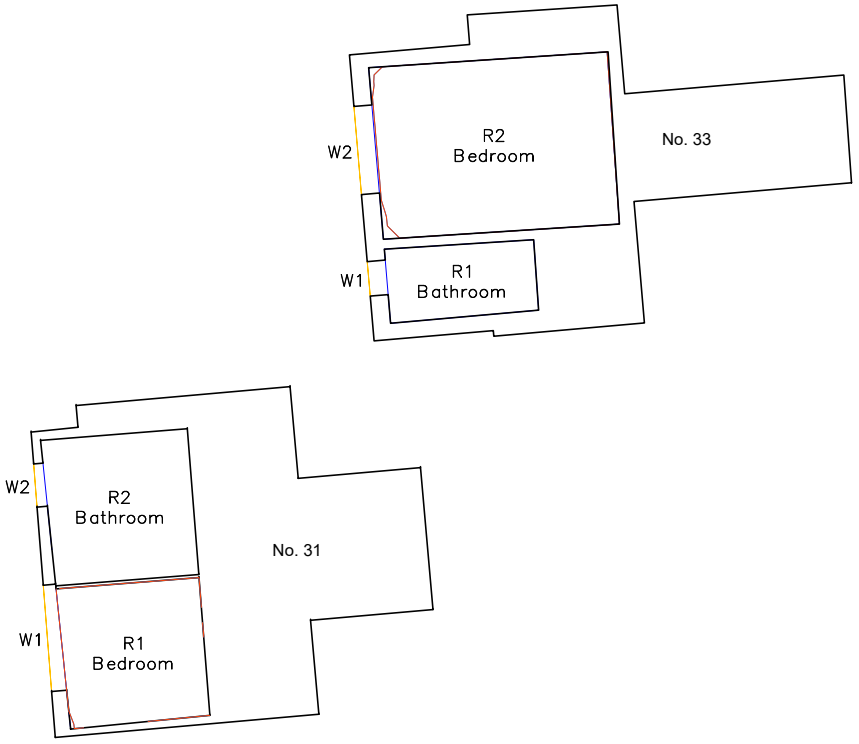
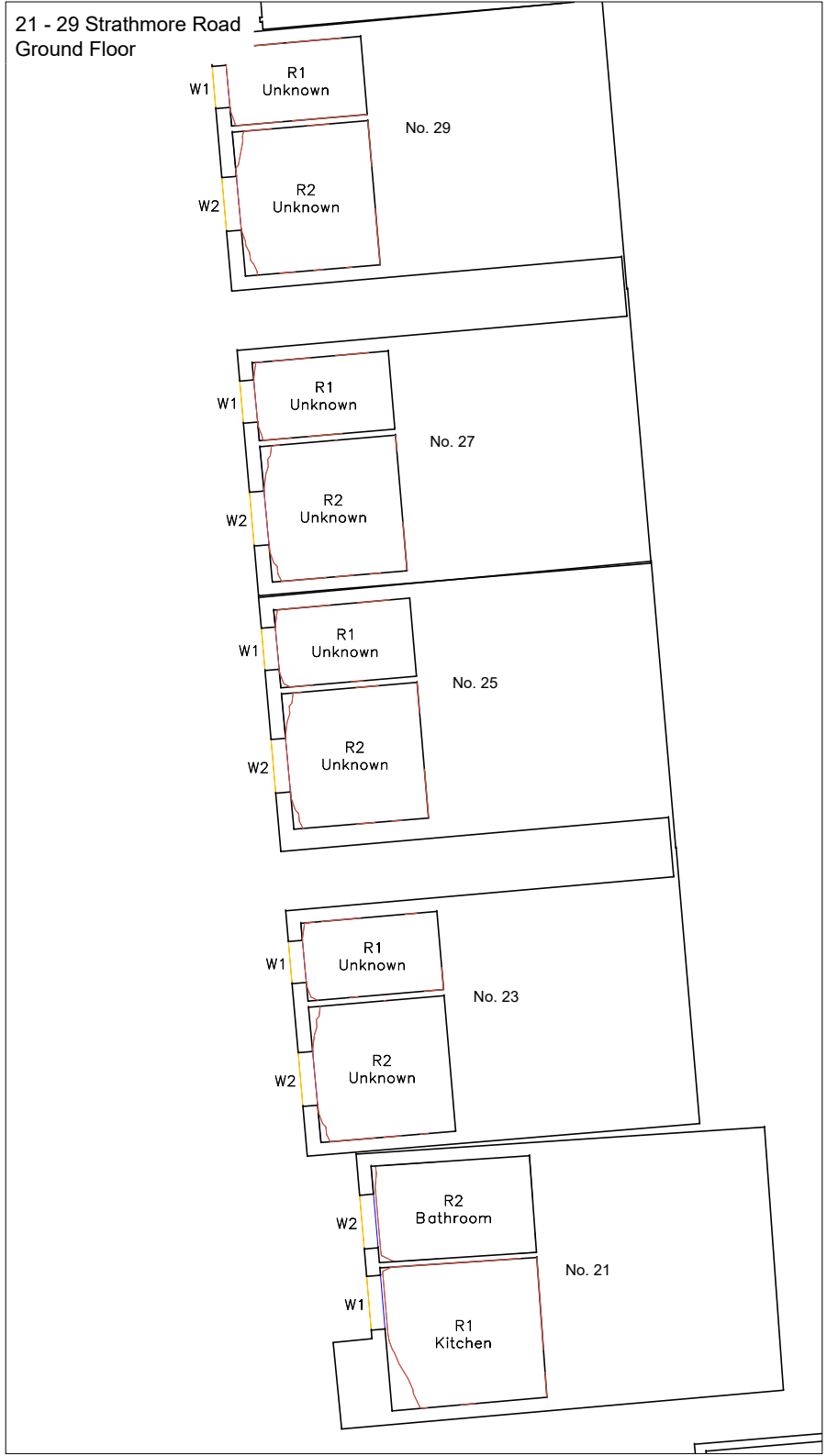
DWG No.: 2594_09

31 & 33 Strathmore Road
Second Floor



21 - 29 Strathmore Road
Ground Floor



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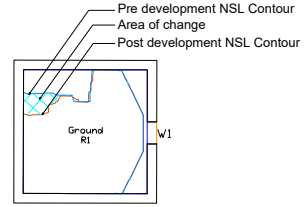

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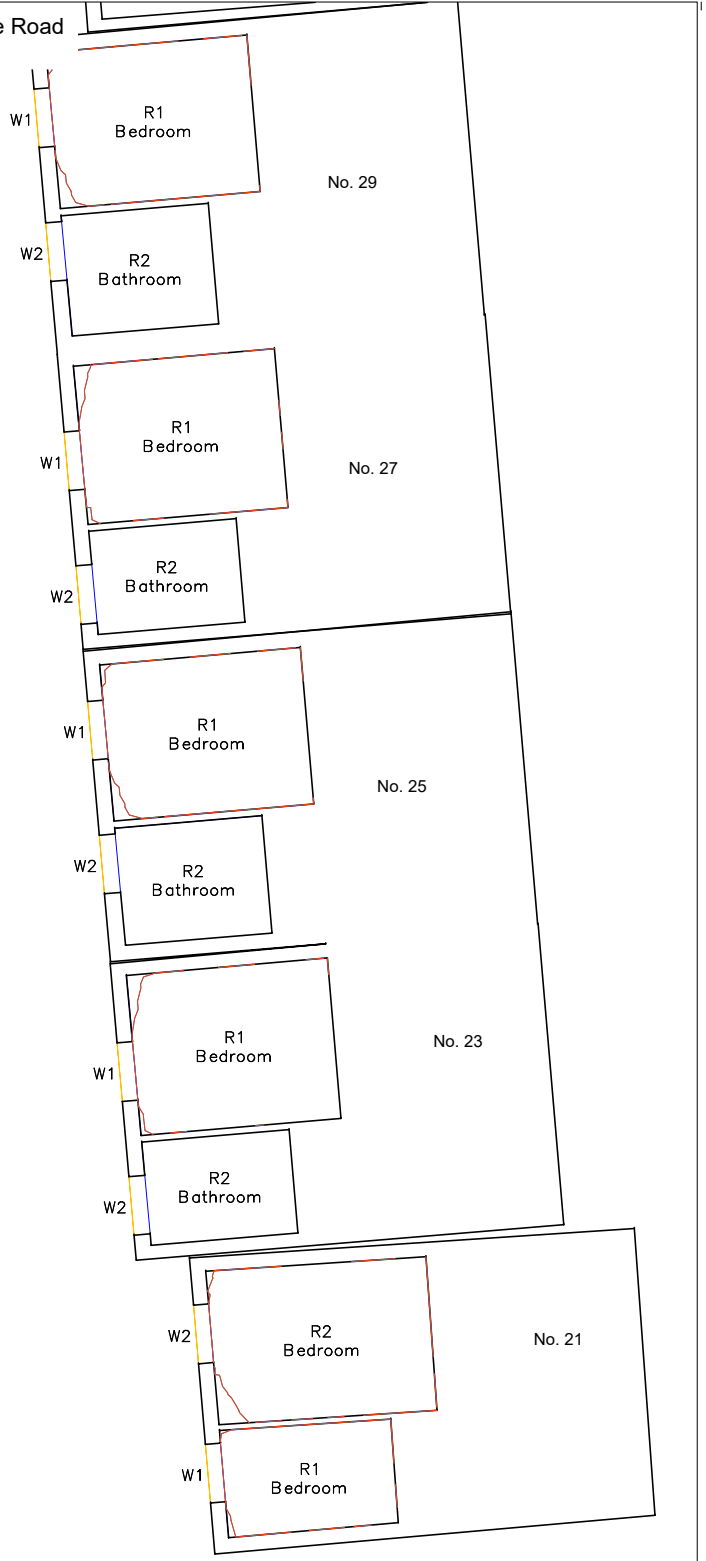
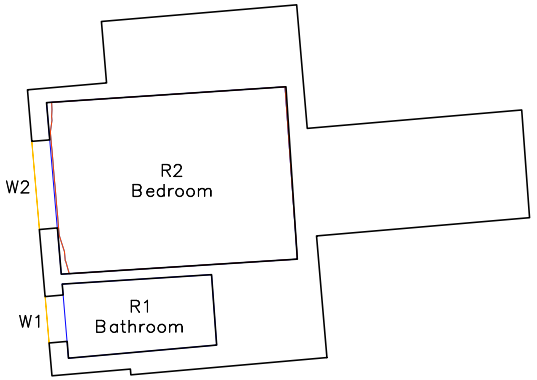
DWG No.: 2594_10

21 - 29 Strathmore Road
First Floor



21 Strathmore Road
Second Floor



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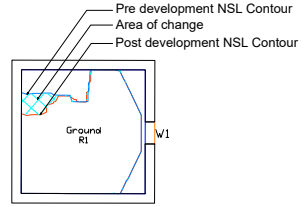

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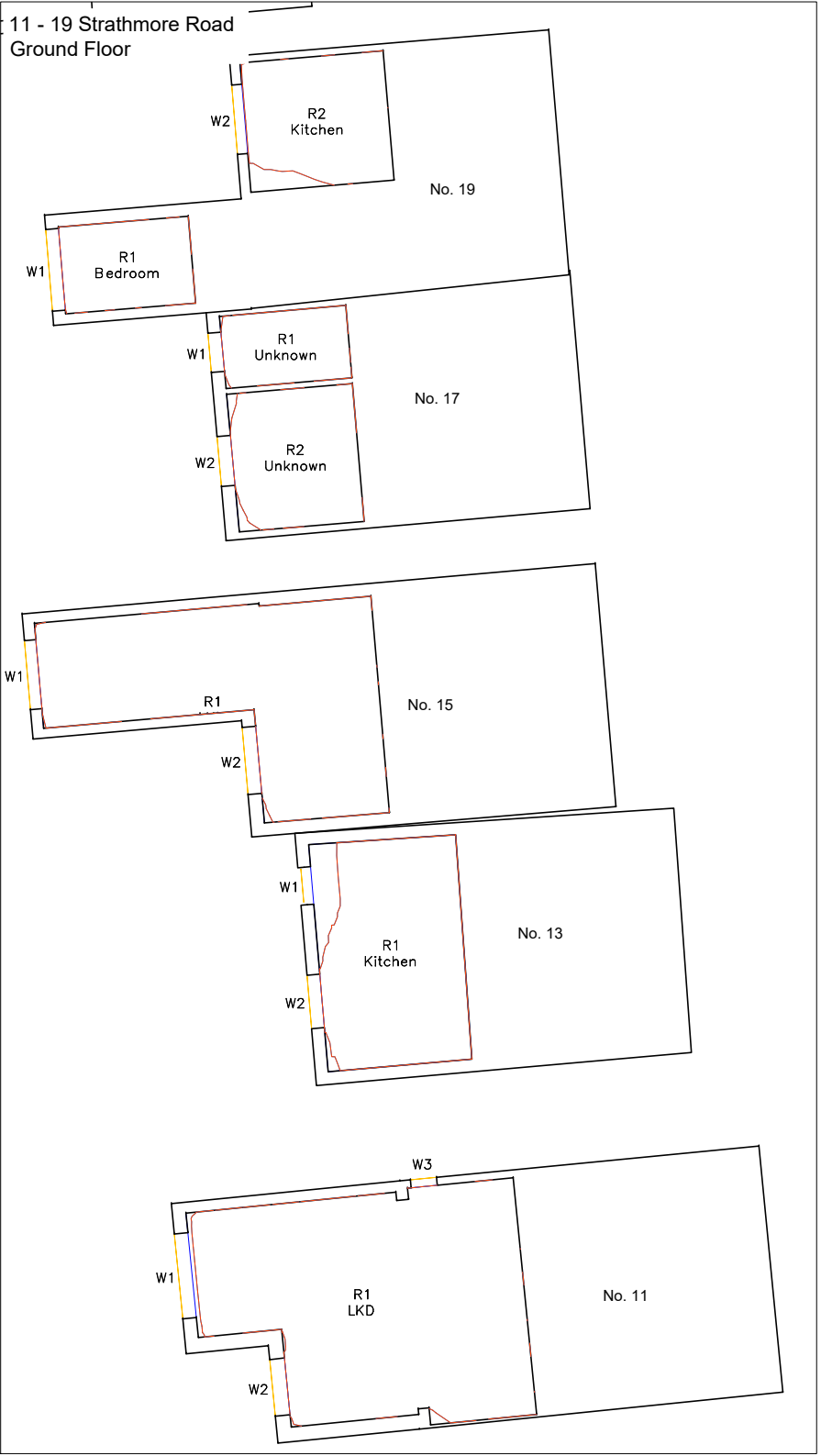
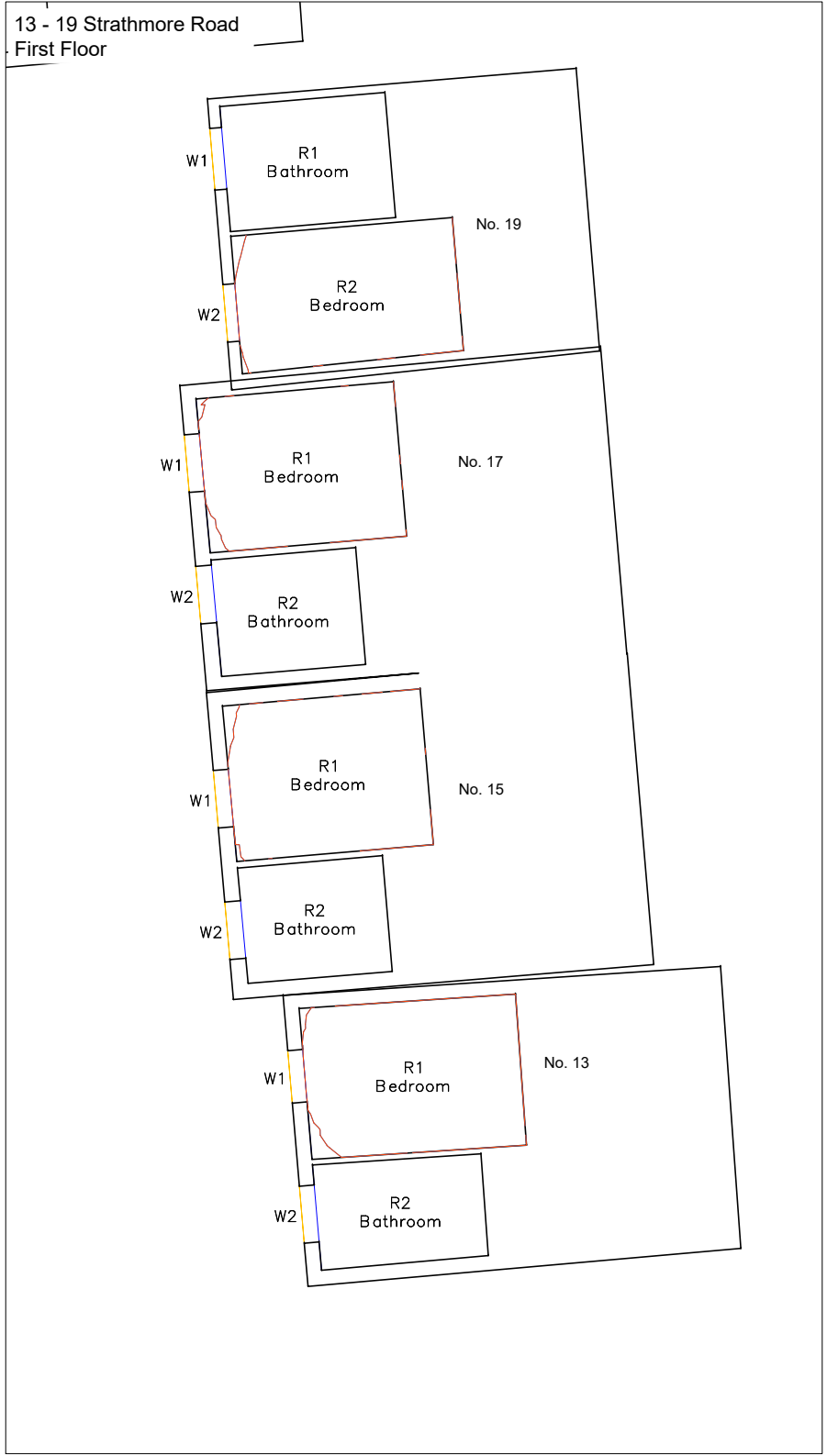
DWG REF.
NSL contours.

DWG No.
2594_11

11 - 19 Strathmore Road
Ground Floor



13 - 19 Strathmore Road
First Floor



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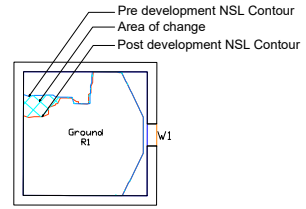

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PROJECT: Strathmore Road, Teddington

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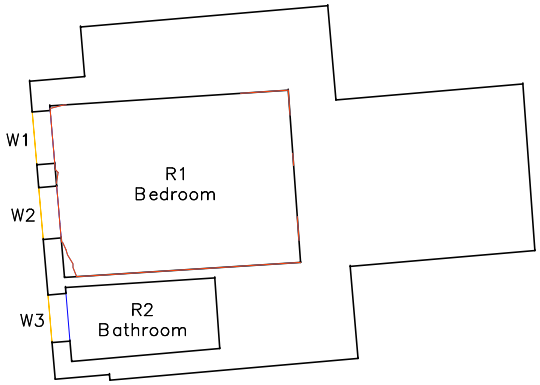
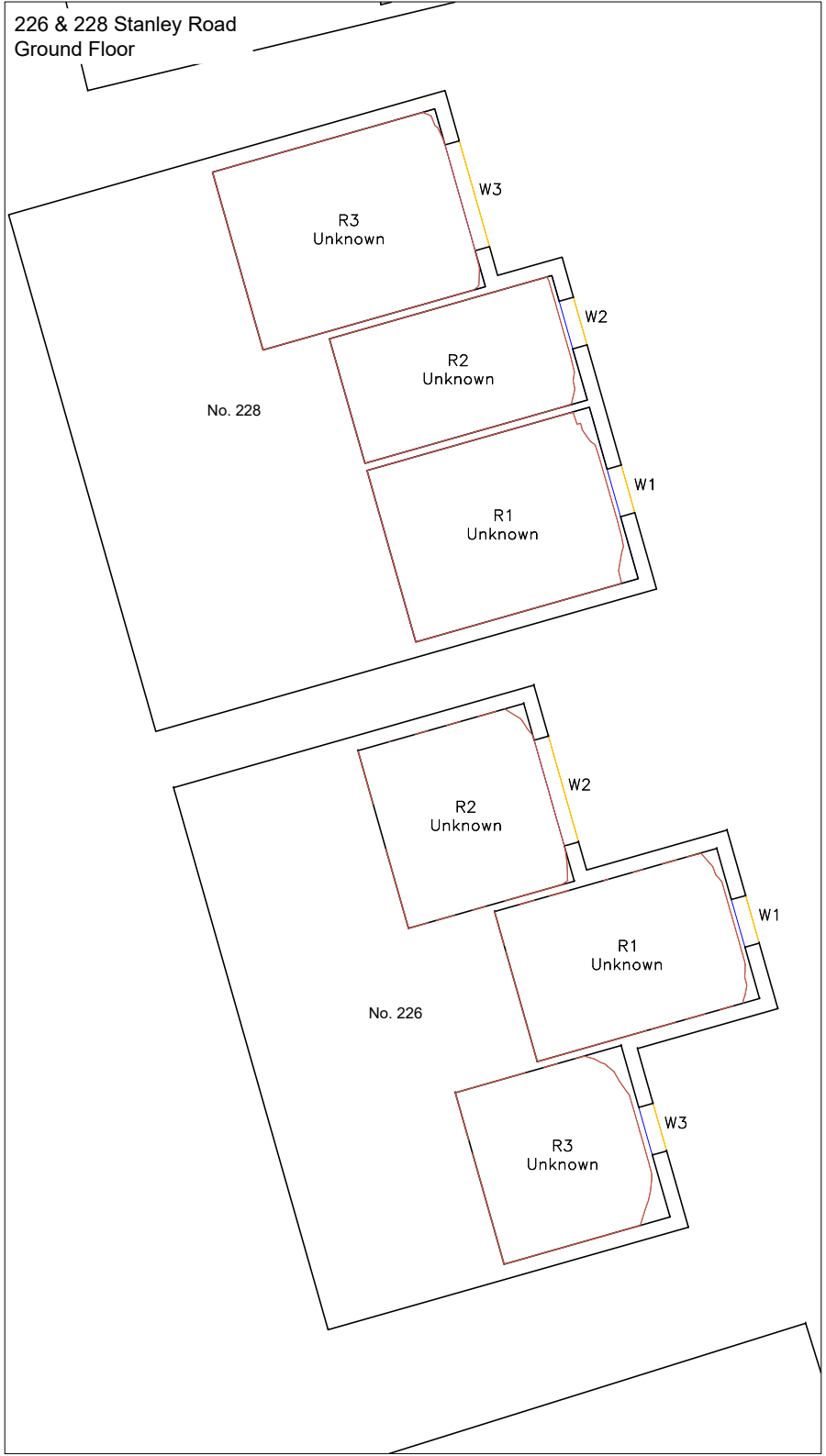
DWG REF.: NSL contours.

DWG No.: 2594_12

13 Strathmore Road
Second Floor



226 & 228 Stanley Road
Ground Floor



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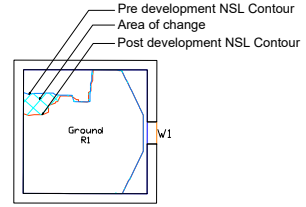

Location Plan

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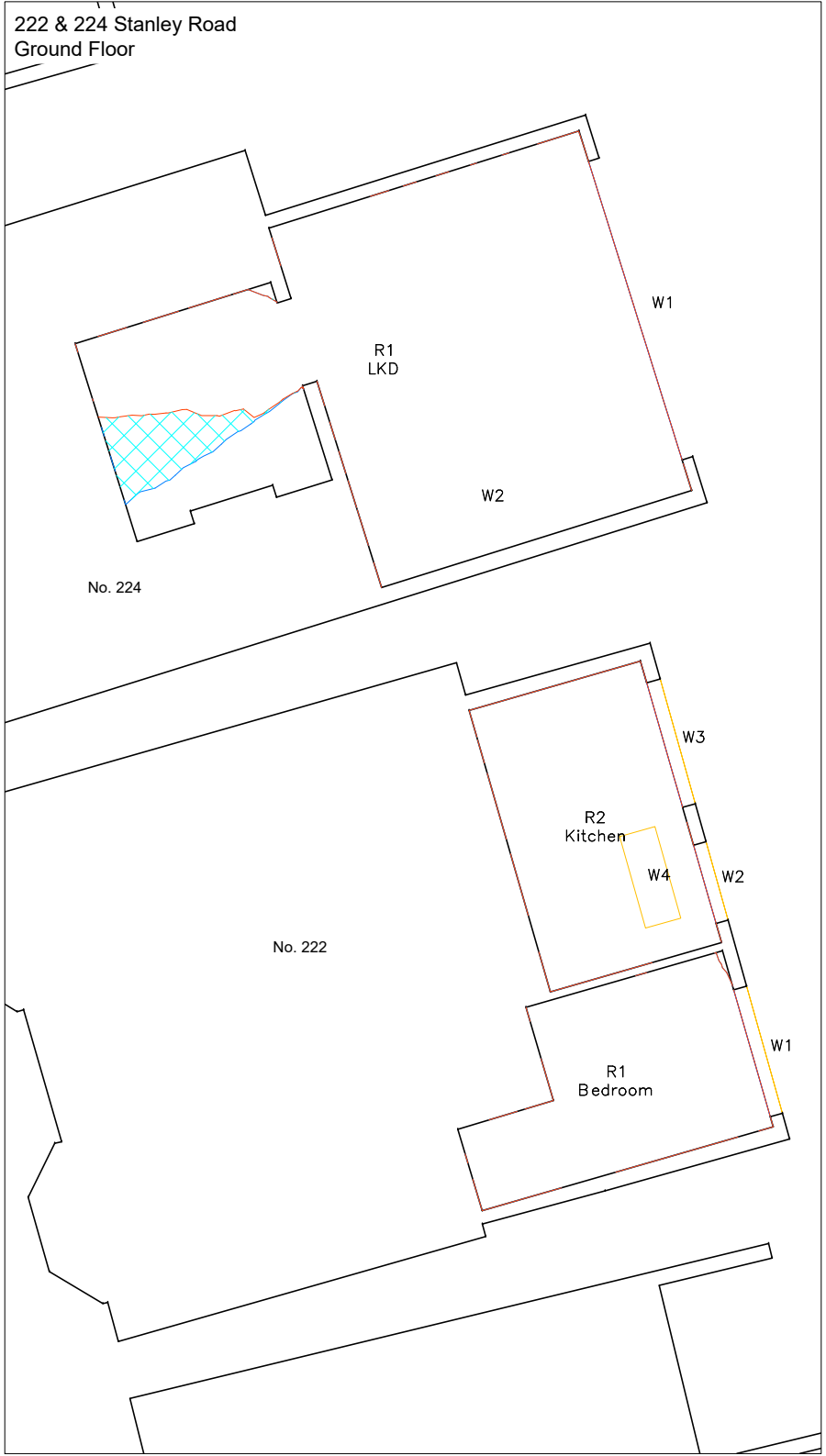
Not to scale	2594	KC	VK/AP

DWG REF.
NSL contours.

DWG No.
2594_13

226 & 228 Stanley Road
First Floor

222 & 224 Stanley Road
Ground Floor



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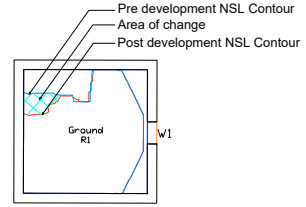
Legend



Location Plan

Rev	Description	Date
00	First issue	31/01/2020

CLIENT
PA Housing Ltd

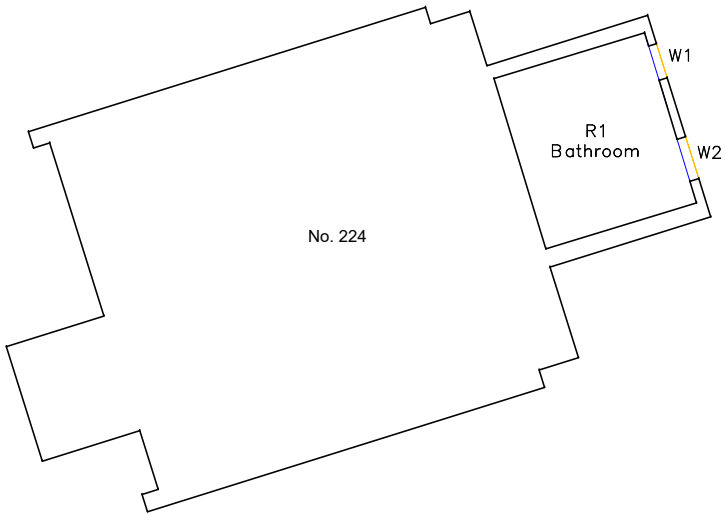
PROJECT
Strathmore Road, Teddington

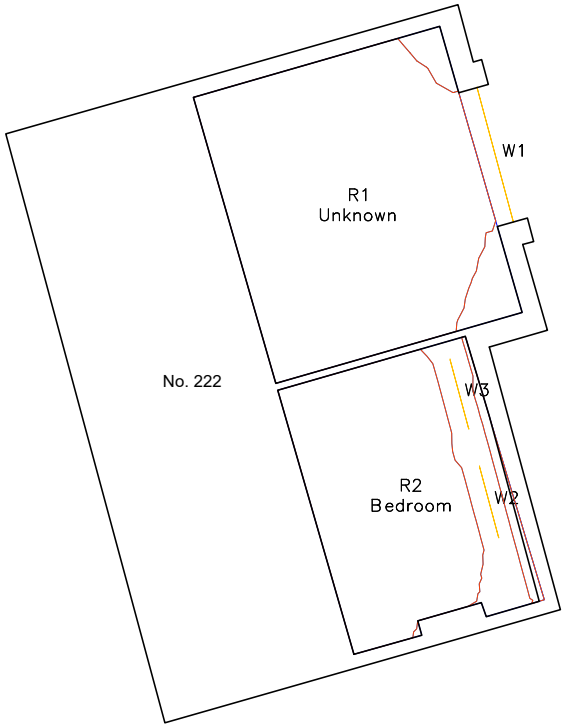
SCALE	PROJ REF	ANALYST	DRAWN BY
Not to scale	2594	KC	VK/AP

DWG REF.	DWG No.
NSL contours.	2594_14

222 & 224 Stanley Road
First Floor

222 & 224 Stanley Road
Second Floor





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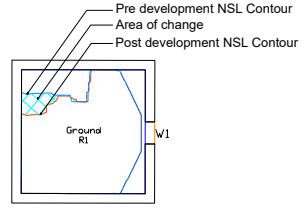

Location Plan

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CLIENT: PA Housing Ltd

PROJECT: Strathmore Road, Teddington

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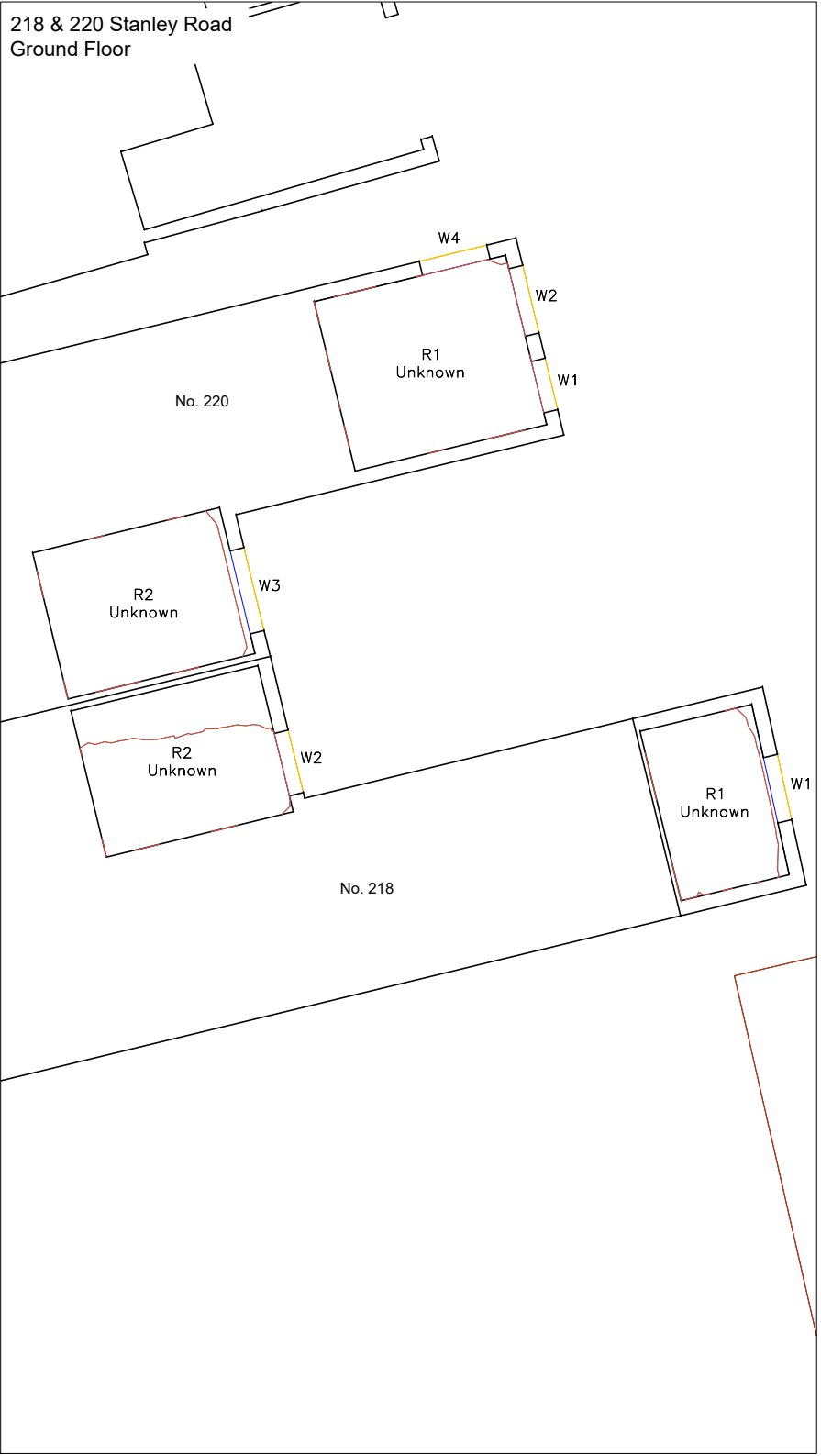
DWG REF.: NSL contours.

DWG No.: 2594_15



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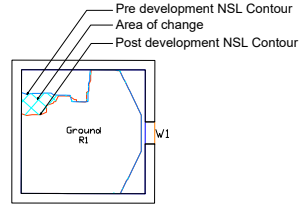

Location Plan

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PA Housing Ltd

PROJECT
Strathmore Road, Teddington

SCALE	PROJ REF	ANALYST	DRAWN BY
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DWG REF.
NSL contours.

DWG No.
2594_16

1 to 4 & 5 to 8 Fulwell Court
Ground Floor

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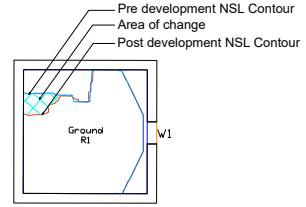

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Strathmore Road, Teddington

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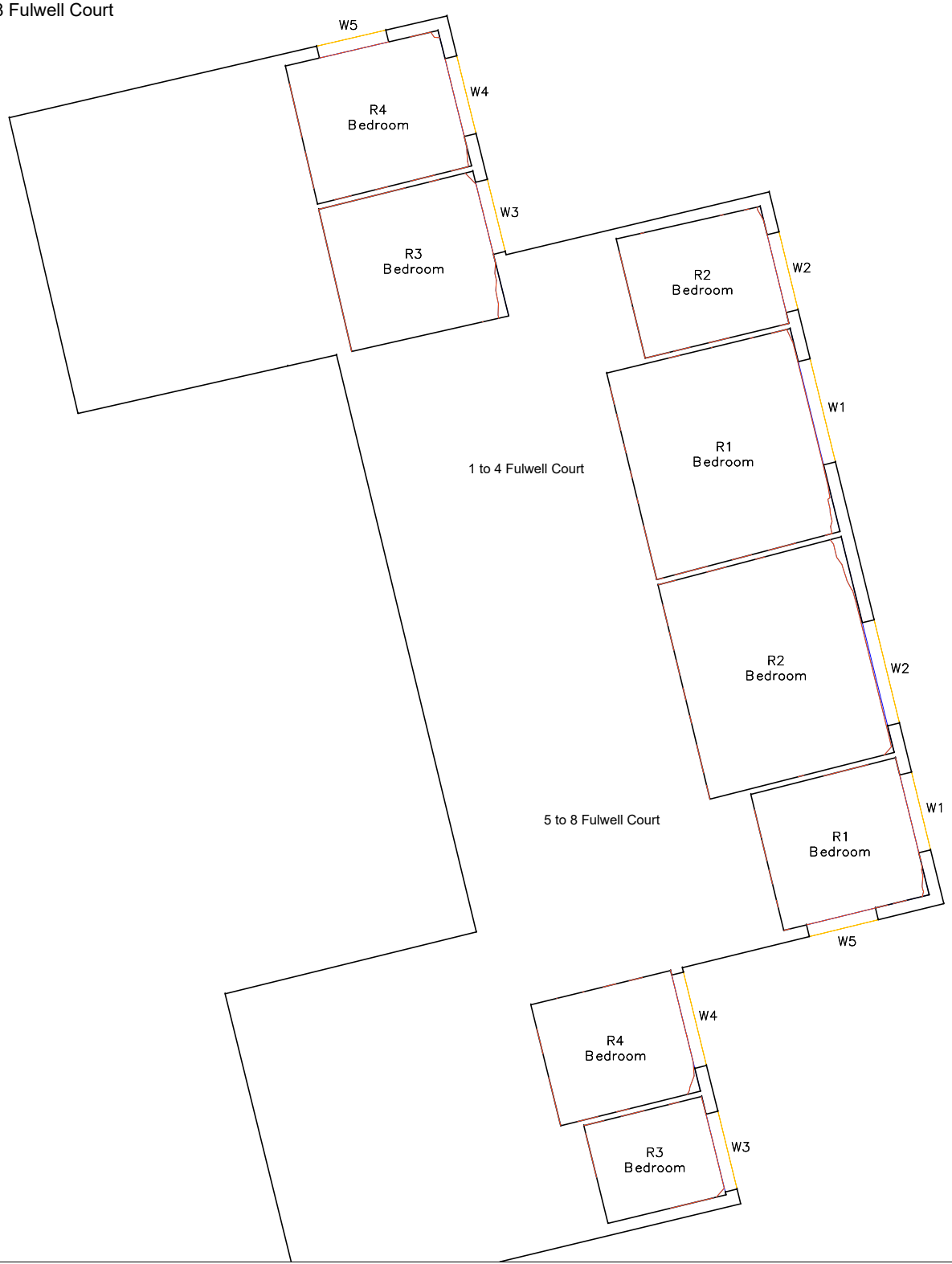
Not to scale	2594	KC	VK/AP

DWG REF.
NSL contours.

DWG No.
2594_17

1 to 4 & 5 to 8 Fulwell Court
First Floor



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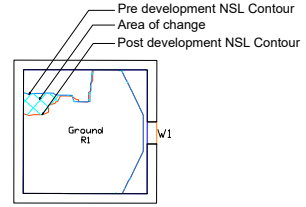

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PROJECT
Strathmore Road, Teddington

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DWG REF.
NSL contours.

DWG No.
2594_18

37 - 47 & 62 Strathmore Road
Amenity Areas

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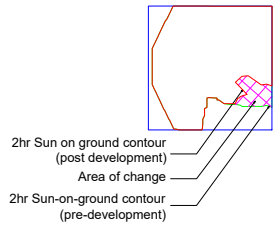

Location Plan

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PROJECT
Strathmore Road, Teddington

SCALE	PROJ REF	ANALYST	DRAWN BY
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DWG REF.
2hr SoG amenity contours.

DWG No.
2594_19

21 - 35 Strathmore Road
Amenity Areas

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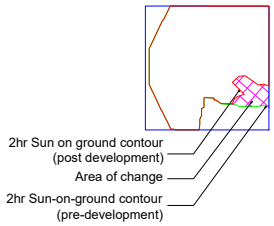

Location Plan

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PROJECT: Strathmore Road, Teddington

SCALE	PROJ REF	ANALYST	DRAWN BY
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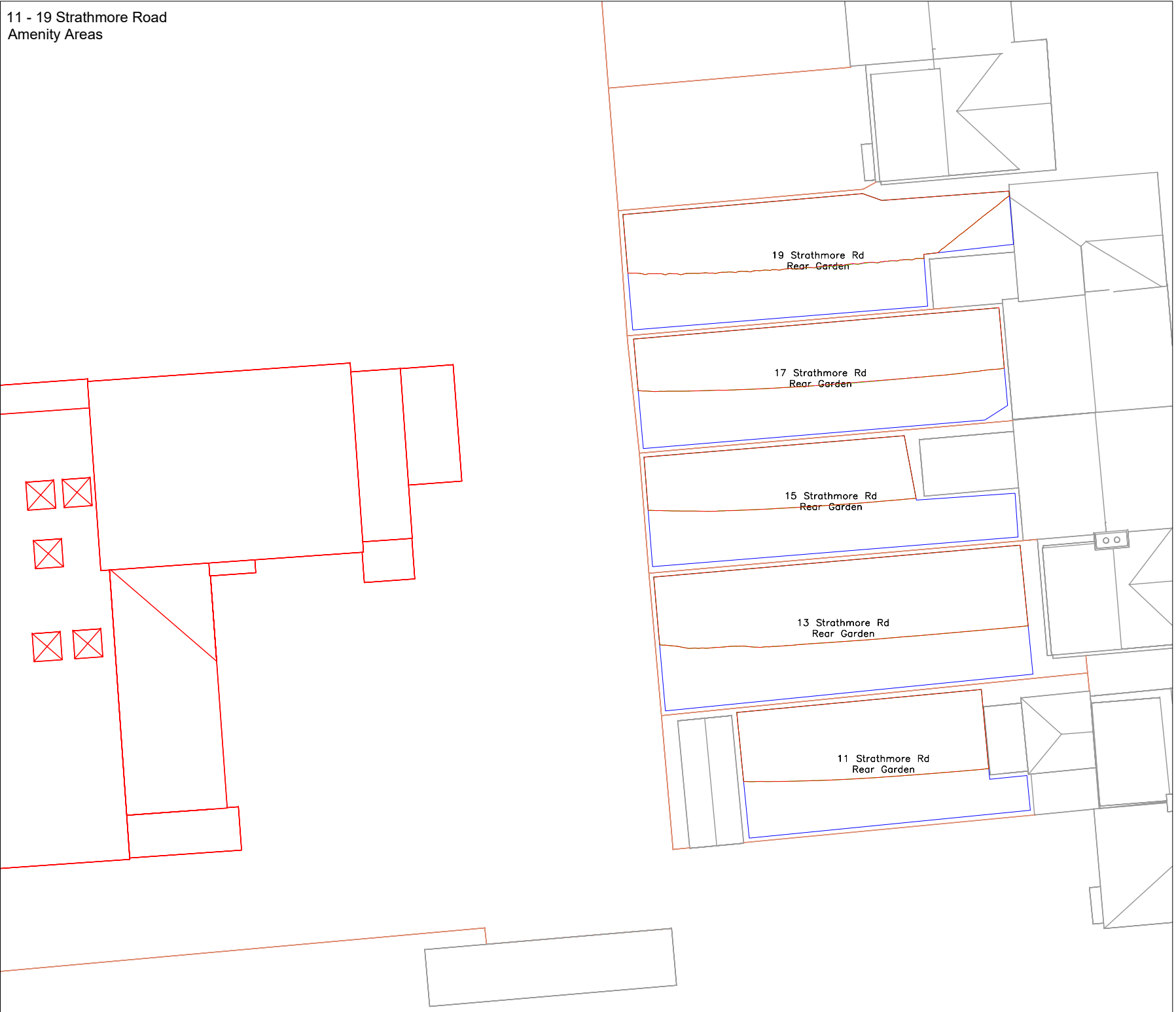
DWG REF.: 2hr SoG amenity contours.

DWG No.: 2594_20

11 - 19 Strathmore Road
Amenity Areas



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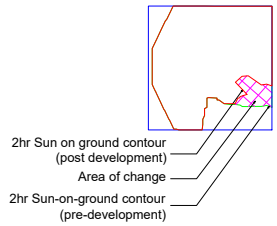

Location Plan

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PROJECT
Strathmore Road, Teddington

SCALE	PROJ REF	ANALYST	DRAWN BY
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DWG REF.
2hr SoG amenity contours.

DWG No.
2594_21

224 - 228 Stanley Road
Amenity Areas

228 Stanley Road
Rear Garden

226 Stanley Road
Rear Garden

224 Stanley Road
Rear Garden

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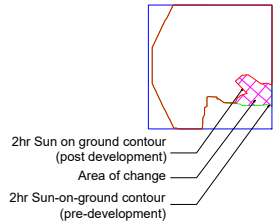

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DWG REF.
2hr SoG amenity contours.

DWG No.
2594_22