Proposed Lower Ground Floor Flat

1 St Chad's Street, Camden

Daylight / Sunlight Assessment

8th March 2017

Client : Robert W F Humphreys of Humphreys & Sons Ltd - Chartered Surveyors

Energy Assessments | Planning Permission Specialists | Building Regulations Consultants | AutoCAD Drawing Services

Revision Record

Revision	Date	Prepared By	Checked By
A	08.03.17	JW	DC

Revision Comments

Revision A - Original Submission

This report has been prepared by Ecodraw (CW Sustainability Consultants Ltd) in accordance with the instructions of their client, **Robert W F Humphreys of Humphreys & Sons Ltd - Chartered Surveyors**, for their sole and specific use. Any other persons who use any information contained herein do so at their own risk.

Calculations are based solely on the drawings and information provided to us, which have been accepted in good faith as being accurate and valid. The accuracy of this information may have an impact on the daylight / sunlight assessment.

We can make no guarantee as to the status (successful/unsuccessful) of the planning application following the submission of our report.

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1.0 Executive Summary

A daylight and sunlight assessment has been carried out for the proposed lower ground floor flat at 1 St Chad's Street, Camden. This report outlines the results of the assessment in order to assist with the developments planning application.

The methodology used for this assessment follows the most recognised guidance document for daylight and sunlight within dwellings and is titled 'Site Layout Planning for Daylight and Sunlight - A Guide to Good Practice' *Second Edition 2011*; by Paul Littlefair and is published by the Building Research Establishment. The guide is also directly referenced as the standard to meet within the Camden Planning Guidance 6 | Amenity document.

The following daylight and sunlight assessments have been carried out with the use of computer modelling software in order to provide the most accurate results possible.

- Vertical Sky Component (VSC)
- No Sky Line / Daylight Distribution
- Average Daylight Factor
- Annual Probable Sunlight Hours Received.

The VSC results showed that the bedroom and living room would achieve values of 9.96% and 20.06% respectively. As the bedroom has a glazed door the vertical center is lower down, which reduces the VSC result received. The living room value is slightly lower than the targeted 27% within the BRE guide but is fairly typical for a building such as this within an densely populated environment.

As the VSC only indicates the view of the sky from the vertical center of the window a much better indicator of how the rooms utilise the daylight they do receive would be to look their daylight distribution and average daylight factors. The bedroom and living room receive daylight distribution values of 66% and 71.6% respectively. Again although this is lower than the targeted 80%, these results are both good for an urban environment.

In terms of daylight factors the bedroom will receive an average of 2.02%, over double the minimum recommended value, whilst the living room receives an average of 1.24%, only slightly lower than the minimum target of 1.5%. This is because the living room is quite wide, with the window positioned further over one side of the room leaving a couple of dark corners which brings the overall average down. The daylight factor results plan (Figure 6) does show that the living room will receive a good amount of daylight around the center of the room.

The bedroom is north facing and therefore exempt from the sunlight assessment, the living room is within 90° of south and therefore was assessed. It was found that the living room would receive 41% of the total annual probable sunlight hours and 5% of the winter hours, exceeding the target of 25% and 5% within the BRE guide.

In summary this assessment has shown that whilst the bedroom and living room may not meet all the exact requirements set out within the BRE guide, they do both make excellent use of the daylight and sunlight they do receive. Especially considering the densely populated urban environment and the nature of the development being a lower ground floor flat.

2.0 Introduction

Ecodraw (CW Sustainability Consultants Ltd) has been instructed by Robert W F Humphreys of Humphreys & Sons Ltd - Chartered Surveyors to undertake a daylight and sunlight assessment for the proposed lower ground floor flat at 1 St Chad's Street in the London Borough of Camden.

As the proposed development will consist of only internal modifications, there will be no detrimental impact to daylight or sunlight to any neighbouring properties. Therefore this report will assess only the daylight and sunlight within the proposed lower ground floor flat.

The key elements of this report are:

- To review the relevant planning policies with respect to daylight and sunlight that relate to the development.
- Calculate the levels of daylight and sunlight reaching the flat in accordance with standard methodology.
- To summarise and compare the findings against regulation guidelines for daylight and sunlight in new dwellings.

2.1 The Site and Development Proposal

The site is located at 1 St Chad's Street in the London Borough of Camden and can be seen outlined in red in the site plan below.

Figure 1 - 1 St Chad's Street Site Plan

The proposal for the development is to turn the lower ground floor into a self-contained flat with a south facing kitchen/lounge/dining area and a north facing bedroom.

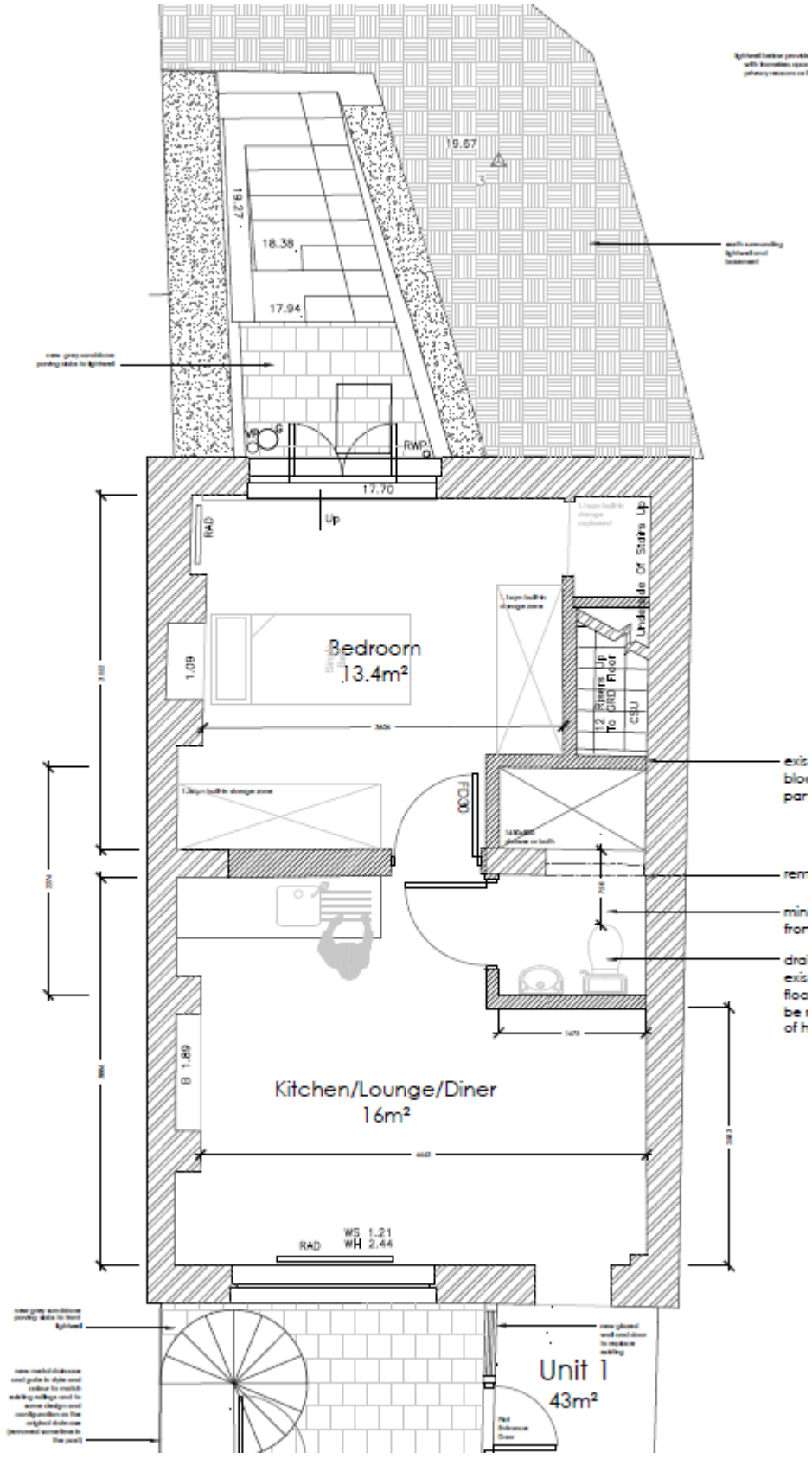


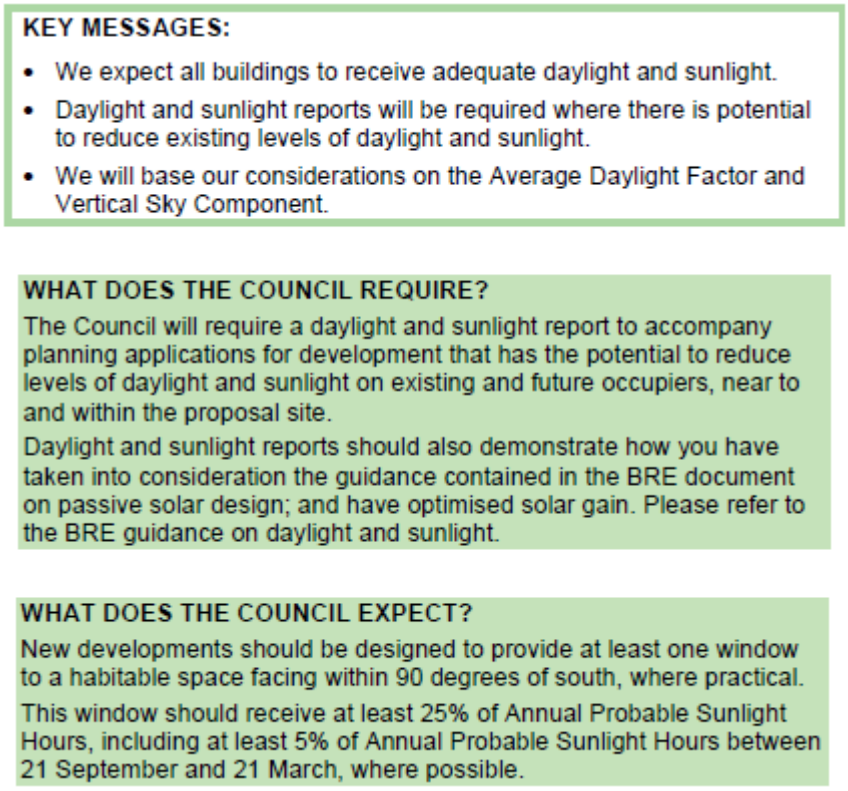
Figure 2 - 1 St Chad's Street Proposed Lower Ground Floor - Floor Plan

2.2 Planning Policy and Guidance

The most recognised guidance document for daylight and sunlight within dwellings is titled 'Site Layout Planning for Daylight and Sunlight - A Guide to Good Practice' *Second Edition 2011*; by Paul Littlefair and is published by the Building Research Establishment.

Although the BRE guide clearly states that its recommendations are not mandatory, it can be used in conjunction with the British Standard BS 8206-2:2008, Lighting for Buildings - Part 2: Code of Practice for Daylighting.

The BRE guide is also referenced as the standard for daylight and sunlight within the Camden Planning Guidance 6 | Amenity, which states that all buildings are expected to receive adequate daylight and sunlight.



KEY MESSAGES:

- We expect all buildings to receive adequate daylight and sunlight.
- Daylight and sunlight reports will be required where there is potential to reduce existing levels of daylight and sunlight.
- We will base our considerations on the Average Daylight Factor and Vertical Sky Component.

WHAT DOES THE COUNCIL REQUIRE?

The Council will require a daylight and sunlight report to accompany planning applications for development that has the potential to reduce levels of daylight and sunlight on existing and future occupiers, near to and within the proposal site.

Daylight and sunlight reports should also demonstrate how you have taken into consideration the guidance contained in the BRE document on passive solar design; and have optimised solar gain. Please refer to the BRE guidance on daylight and sunlight.

WHAT DOES THE COUNCIL EXPECT?

New developments should be designed to provide at least one window to a habitable space facing within 90 degrees of south, where practical.

This window should receive at least 25% of Annual Probable Sunlight Hours, including at least 5% of Annual Probable Sunlight Hours between 21 September and 21 March, where possible.

Figure 3 - Camden Planning Guidance on Daylight and Sunlight

As the Camden Planning Guidance specifically references the BRE Guide, it will be used as the basis for this daylight and sunlight assessment.

Although the guide gives numerical guidelines that the development should try to meet, the guide itself does state that 'these should be interpreted flexibly since natural lighting is only one of many factors in site layout design. In special circumstances the developer or planning authority may wish to use different target values. For example, in a historic city centre, or in an area with modern high rise buildings'.

2.3 Methodology

The methodology and calculations set out within the BRE Guide 'Site Layout Planning for Daylight and Sunlight - A Guide to Good Practice' *Second Edition 2011* were used to carry out the daylight and sunlight assessment at 1 St Chad's Street, Camden.

2.3.1 Daylight

Vertical Sky Component (VSC)

The Vertical Sky Component (VSC) is a ratio (expressed as a percentage) of the direct sky illuminance falling on the outside mid-point of a window, to the horizontal illuminance under a standard CIE overcast sky. For example, a window looking across an unobstructed field would achieve the highest possible value of just under 40% (39.6%).

For a window to be considered as receiving a good level of daylight, a VSC value of 27% should be achieved. However it should be noted that this target is derived for a low-density suburban housing model. For inner city environments a VSC value greater than 20% can be considered to be receiving a good level of daylight.

No Sky Line / Daylight Distribution

The No Sky Line calculation investigates the distribution of daylight across a room at working plan height. It represents the line in the room where beyond it, there will be no view of the sky. Daylight distribution is similar but instead determines the total area of a room that will be able to see the sky.

If a significant area of the working plan (normally more than 20%) is beyond the no sky line i.e. there is no view of the sky, then the distribution of the light will be poor. This again may be difficult to achieve within a high density urban environment, therefore it is suggested that a 50% no sky line area would demonstrate a good distribution of daylight.

Average Daylight Factor

The average daylight factor is the ratio of the average illuminance on the working plane in a room, divided by the outside illuminance on a horizontal surface under a CIE overcast sky. The ratio is usually expressed as a percentage and guidance for adequate levels of daylight are laid out within the British Standard BS 8206-2:2008, Lighting for Buildings - Part 2: Code of Practice for Daylighting and referenced within the BRE guide.

Room type	Minimum average daylight factor %
Bedrooms	1
Living rooms	1.5
Kitchens	2

Figure 4 - BS 8206-2:2008 Minimum Average Daylight Factors

Due to the urban environment of the proposed flat a lesser target for the daylight factor may need to be considered.

2.3.2 Sunlight

Annual Probable Sunlight Hours

To determine if an adequate amount of sunlight is achieved within a room the following criteria needs to be met. At least one main window wall should face within 90° of due south and at least one window should receive at least 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.

The term Annual probable sunlight hours means the total amount of hours during a year in which direct sunlight will reach the ground. The winter annual probable sunlight hours are the same thing but only during the 21st September and 21st March.

The BRE guidelines are only intended for rooms where the occupants have a reasonable expectation for daylight. These include rooms such as living rooms, kitchens and bedrooms. Rooms such as toilets, stores or corridors do not need to be analysed. Therefore within the proposed lower ground floor flat only the kitchen/lounge area and bedroom need to have their levels of daylight examined.

The BRE guidelines state that the annual probable sunlight hours calculation only needs to be carried out on living room windows and only if they face within 90° of due south. As the proposed lower ground floor flat has a south facing living room, it will be examined to determine its annual probable sunlight received.

EDSL TAS Dynamic Simulation Modelling software was used to carry out the daylight and sunlight calculations, as this can provide a more accurate means of assessment over the 'by hand' indicator method outlined with the BRE guide. The computer model also uses actual CIBSE hourly weather data for the proposed location, in this instance London weather data was used.

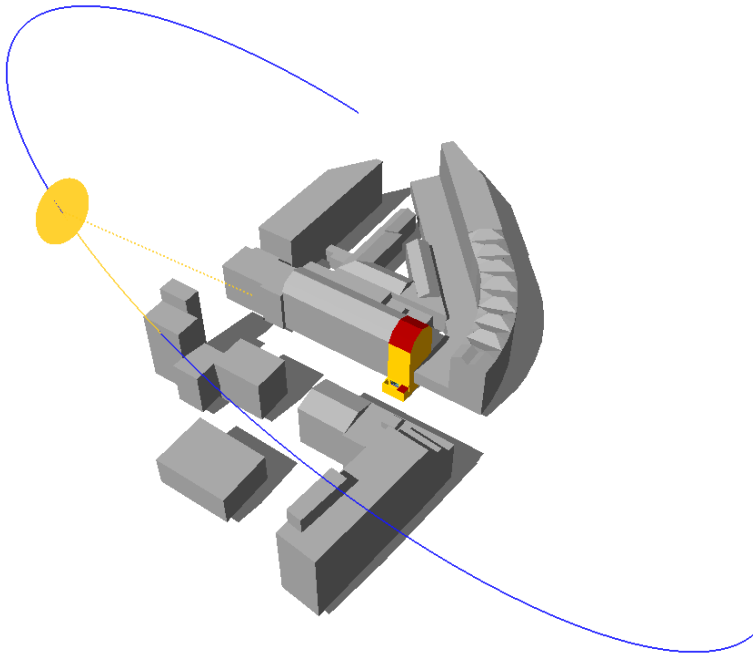


Figure 5 - EDSL TAS Computer Model of the 1 St Chad's Street Site

3.0 Daylight Assessment

The kitchen/lounge/dining room (living room) and bedroom have both been assessed for their levels of natural daylight received.

3.1 Vertical Sky Component (VSC)

The VSC calculated for the main living room and bedroom windows can be found in the table below.

Room	Window Ref	Orientation	VSC (%)
Bedroom	W1	326°	9.96
Living Room	W2	146°	20.06

The VSC results show that the Bedroom is receiving a lower value than targeted for an urban environment at 9.96%. This is because the glazing to the bedroom is a door, therefore the vertical center of the window is lower down, which would also bring the VSC value down.

As this value only demonstrates the amount of sky visible from the vertical center of the window, the other daylight assessment calculations provide a much better understanding of how much daylight will actually enter each room.

3.2 No Sky Line / Daylight Distribution

For the no sky line / daylight distribution calculation the working plane height was assumed to be 0.85m as proposed by the BRE Guide for dwellings.

The daylight distribution calculated for the main living room and bedroom can be found in the table below. (The bedroom area is slightly smaller than indicated on the floor plans as the storage areas have not been included for within the calculation)

Room	Total Room Area (m^2)	Area with View of the Sky (m^2)	Daylight Distribution (%)
Bedroom	10.19	6.74	66
Living Room	16.21	11.61	71.6

The daylight distribution results show that both the bedroom and living room will receive a good distribution of natural light across their floor areas at a working plane height of 0.85m, for an urban environment.

3.3 Average Daylight Factor

For the average daylight factor calculation the windows were assumed to be clear double glazing with a light transmittance value of 0.80.

Room	Average Daylight Factor (%)
Bedroom	2.02
Living Room	1.24

The results show that the bedroom will receive a good average daylight factor of approximately 2%. The living room receives an average daylight factor of 1.24%, slightly lower than the recommended figure of 1.5%. However due to the urban environment this could still be considered as a good natural daylight factor to receive.

How the daylight factor changes across the rooms can be seen in figure 6 below.

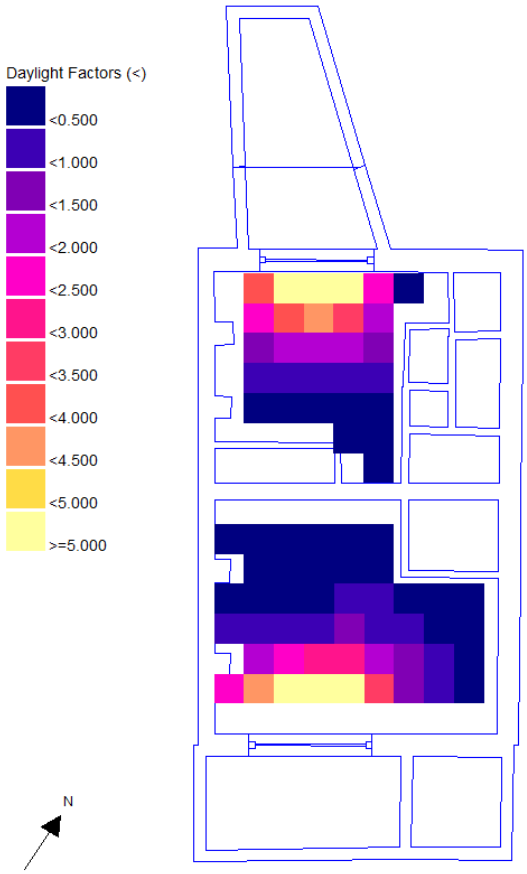


Figure 6 - Average Daylight Factors

4.0 Sunlight Assessment

4.1 Annual Probable Sunlight Hours

Only windows within 90° of due south need to have the amount of sunlight they can receive assessed. Therefore as the bedroom is north facing it will not apply for the sunlight assessment. The results for the living room can be seen in the table below.

Room	Total Annual Probable Sunlight Hours (%)	Winter Annual Probable Sunlight Hours (%)
Living Room	41	5

The sunlight assessment results show the total annual probable sunlight hours received will be 41%, higher than the target of 25%. The winter annual probable sunlight hours will be 5%, exactly the minimum amount of sunlight specified to demonstrate that an adequate amount is received.

5.0 Conclusion

The bedroom and living room for the proposed lower ground floor flat at 1 St Chad's Street, Camden have had their levels of natural daylight and sunlight assessed in order to determine whether or not they will meet the requirements set out within the Camden Planning Guidance and BRE guide.

The bedroom area is north facing and although it receives a poor VSC of 9.96%, this only indicates the view of the sky from the vertical center of the window. As the bedroom has a glazed door the vertical center is lower down, which would reduce the VSC result received.

A much better indicator of how the bedroom utilises the daylight it does receive would be to look at its daylight distribution and average daylight factor occurring within the room. The bedroom will achieve a daylight distribution of 66%, lower than the 80% recommended by the BRE guide but still a very good value considering the urban environment of the development.

In terms of daylight factor the bedroom will receive an average of 2.02%, over double the figure recommended by the BRE guide. Showing that the bedroom makes excellent use of the daylight it does receive. As the bedroom is north facing it is exempt from the sunlight assessment.

The living room receives a VSC of 20.06%, slightly lower than the recommended 27% by the BRE guide but fairly typical for a building such as this within an densely populated environment. Whilst the living rooms daylight distribution is also good at around 71.6%, it does receive a slightly lower average daylight factor of 1.24% whereas the target within the BRE guide is 1.5%.

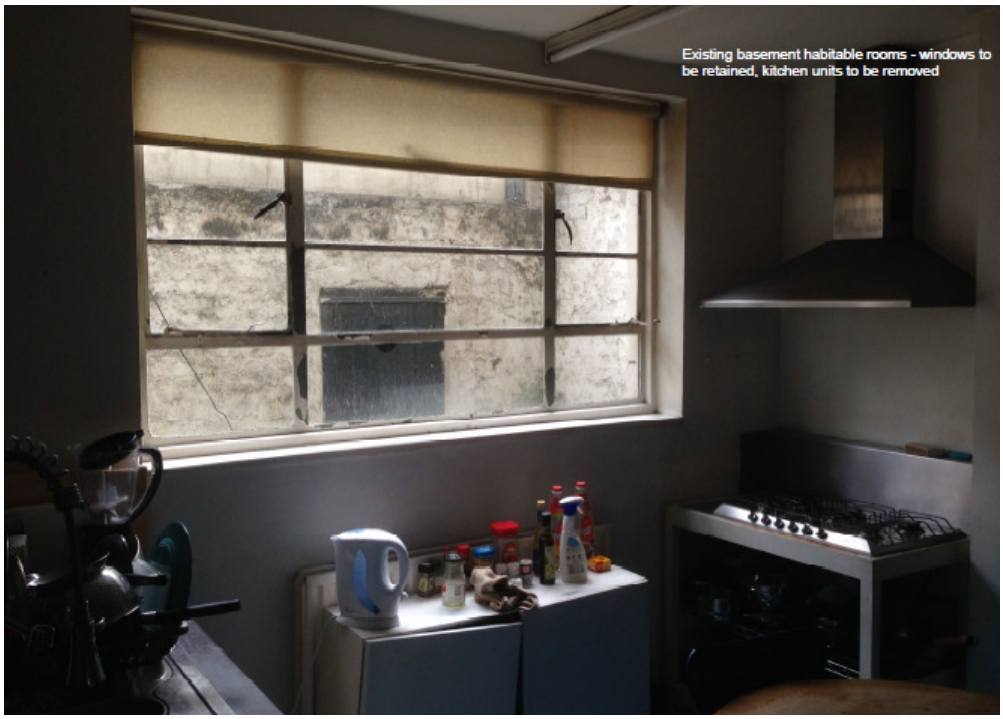
This is because the living room is quite wide, with the window positioned further over one side of the room leaving a couple of dark corners which brings the overall average down. The daylight factor results plan (Figure 6) does show that the living room will receive a good amount of daylight around the center of the room.

As the living room is within 90° of south it also needed to be assessed for the amount of sunlight it receives. The results showed that the living room would receive 41% of the total annual probable sunlight hours and 5% of the winter annual probable sunlight hours. This beats the 25% target for the total hours and meets the 5% target for the winter hours, therefore this shows that the living room will receive over the acceptable amount of sunlight.

In conclusion this assessment has shown that whilst the bedroom and living room may not meet all the exact requirements set out within the BRE guide, they do both make excellent use of the daylight and sunlight they do receive. Especially considering the densely populated urban environment and the nature of the development being a lower ground floor flat.

Appendix A - Site Photographs

Front Elevation

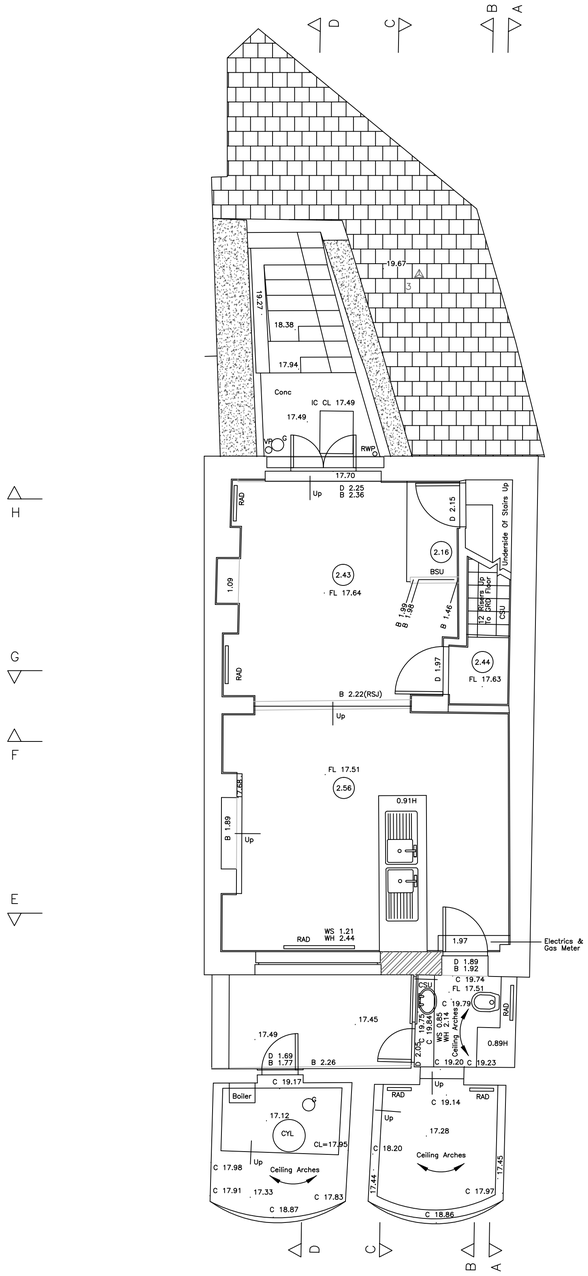


Existing Front Elevation Lower Ground Floor Window

Existing Rear Elevation Lower Ground Floor Window

1 St Chad's Street, View from Google Earth

Appendix B - Architects Drawings



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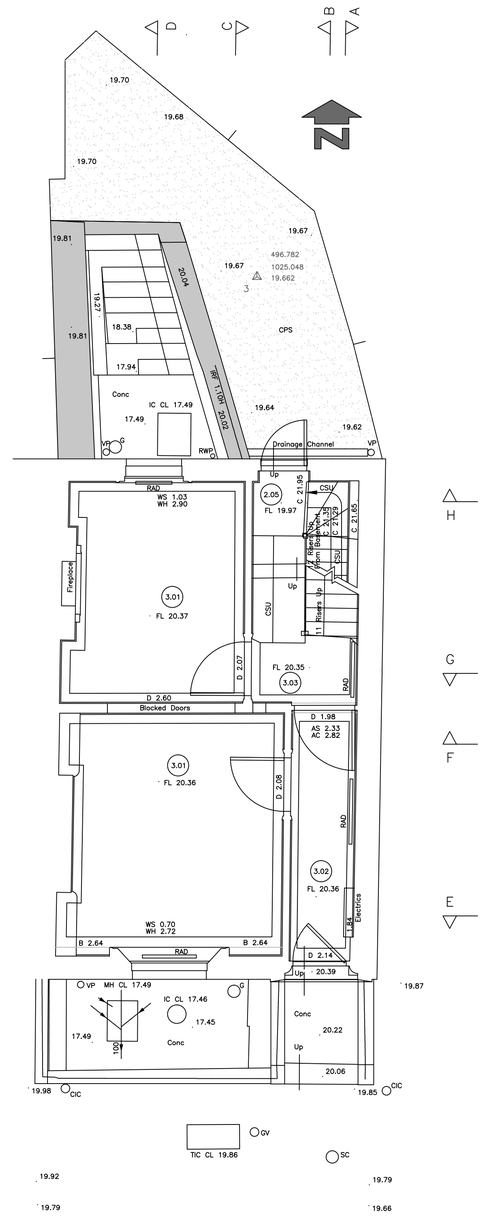

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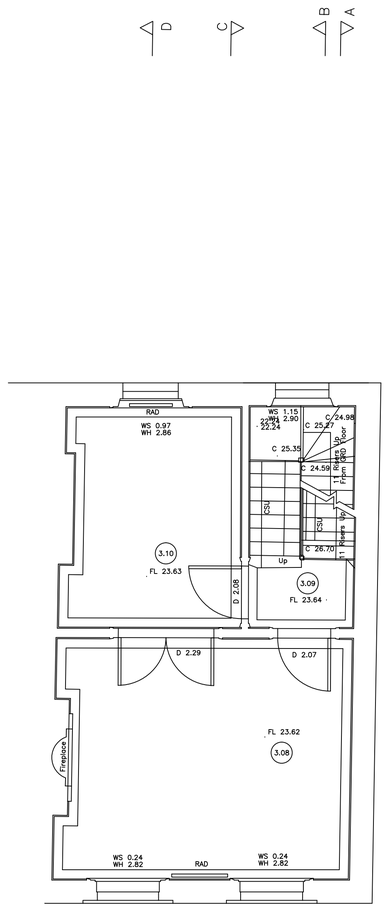
*INCORPORATES SITE PLAN



03 EXISTING FIRST FLOOR PLAN
1:50

metres 1 2 3 4 5 6 7 8 9 10

1:50 Scale Bar

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REVISION D C DATE

CLIENT.
Dr L Das

ADDRESS.
1 St Chad's Street
Kings Cross
WC1H 8BD

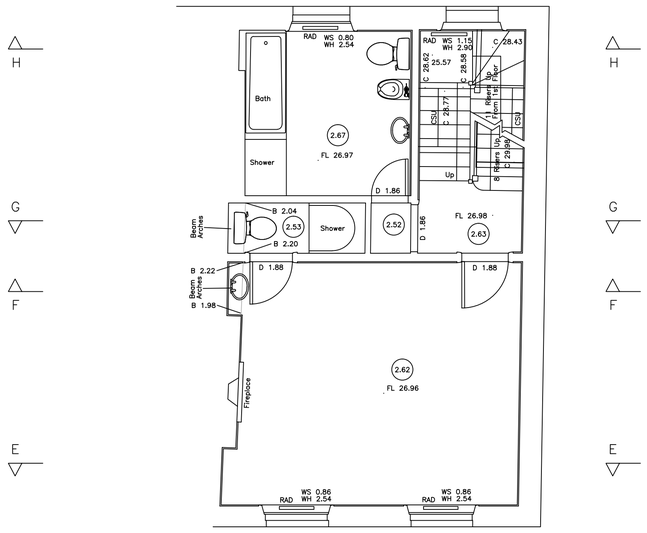
PROJECT.
Flat Conversion

TITLE.
Existing Floorplans

PURPOSE OF ISSUE.
Planning Permission Application

SCALE. see dwg (at A1) D C DATE Nov 2015

JOB NO. 15-1-8BD DRAWING No. PL001 REVISION A



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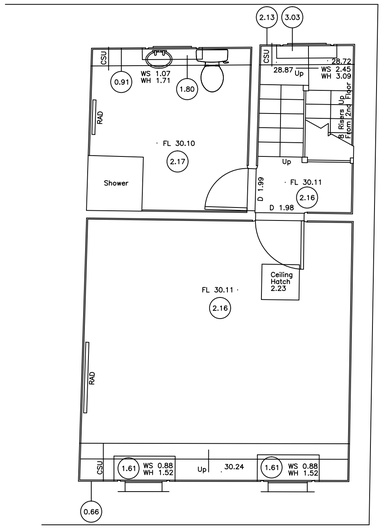

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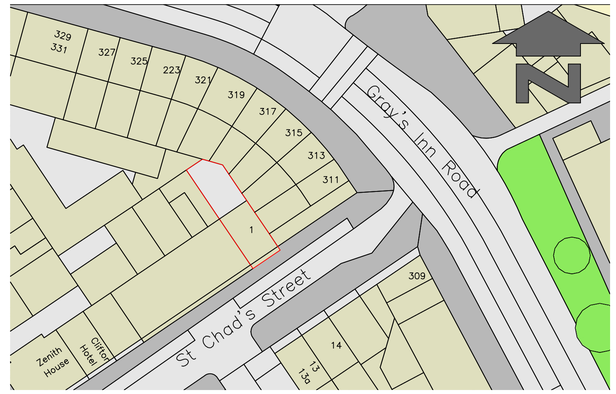

015A EXISTING BLOCK PLAN
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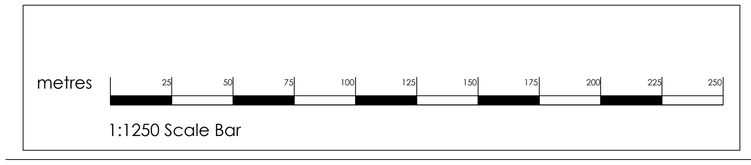
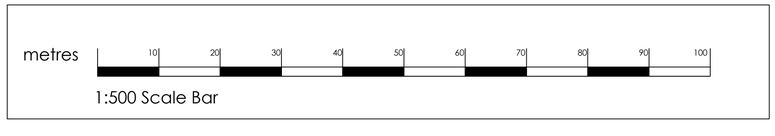
*unchanged by the proposed scheme

15 SITE LOCATION PLAN
1:1250





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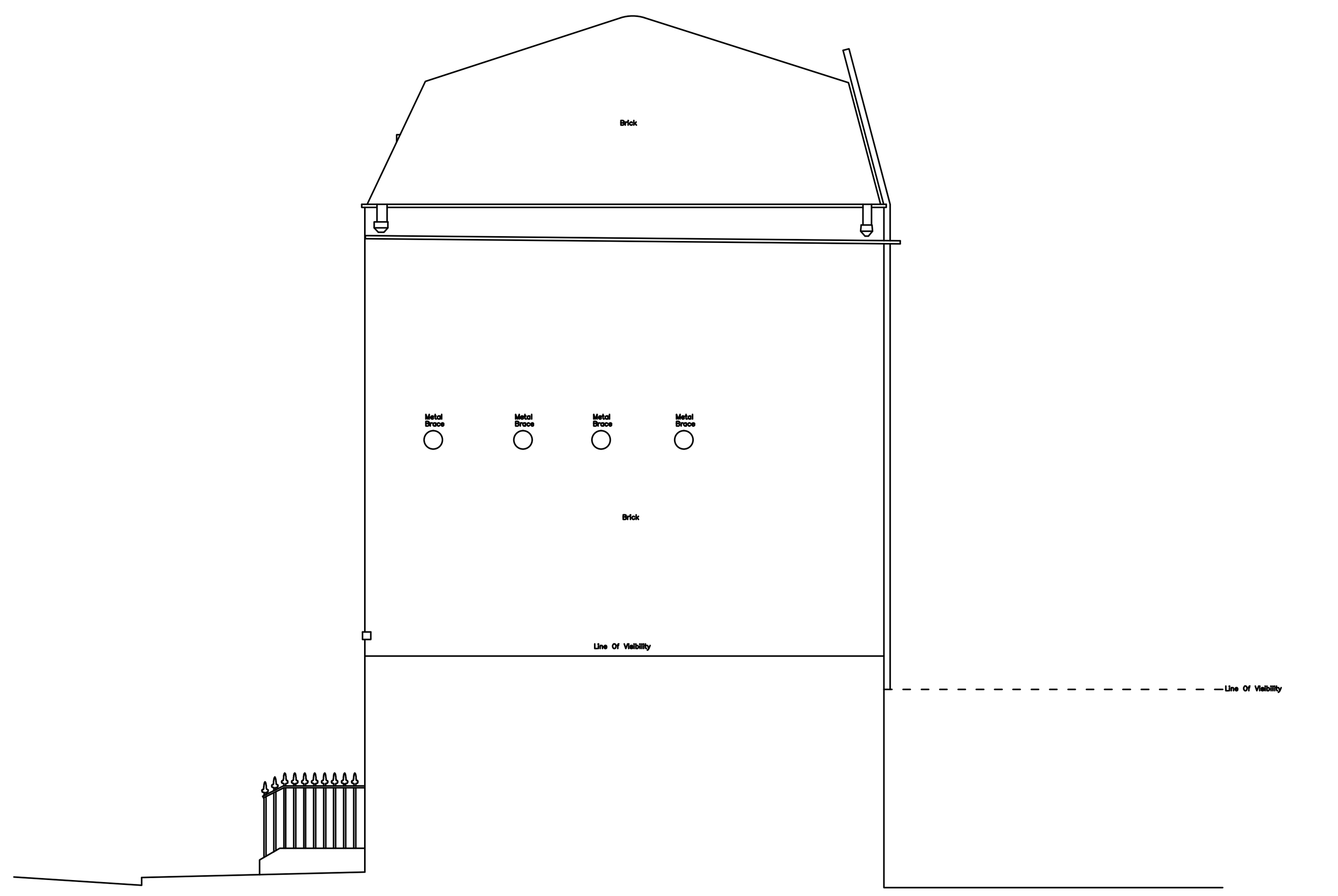
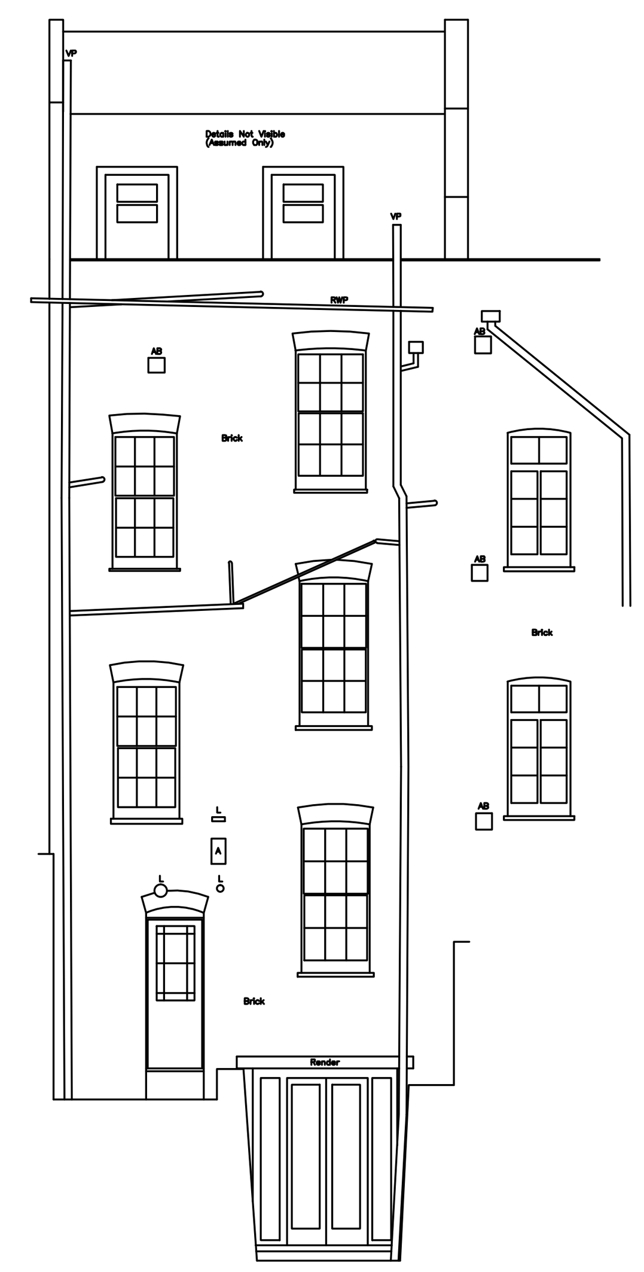
15-1-8BD	PL002	A

06 EXISTING FRONTAL ELEVATION
1:100



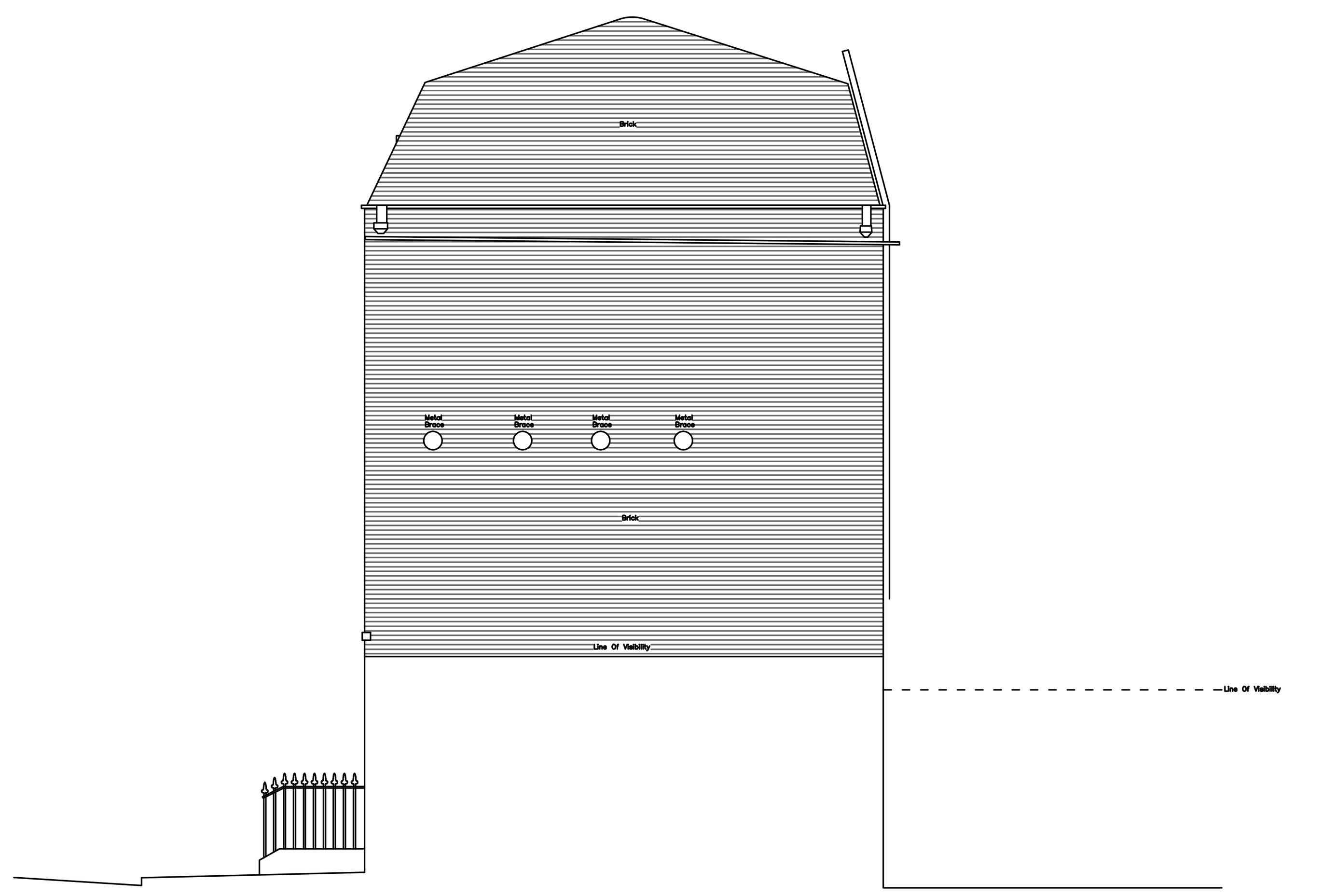
07 EXISTING RIGHT FLANK ELEVATION
1:100



08 EXISTING REAR ELEVATION
1:100

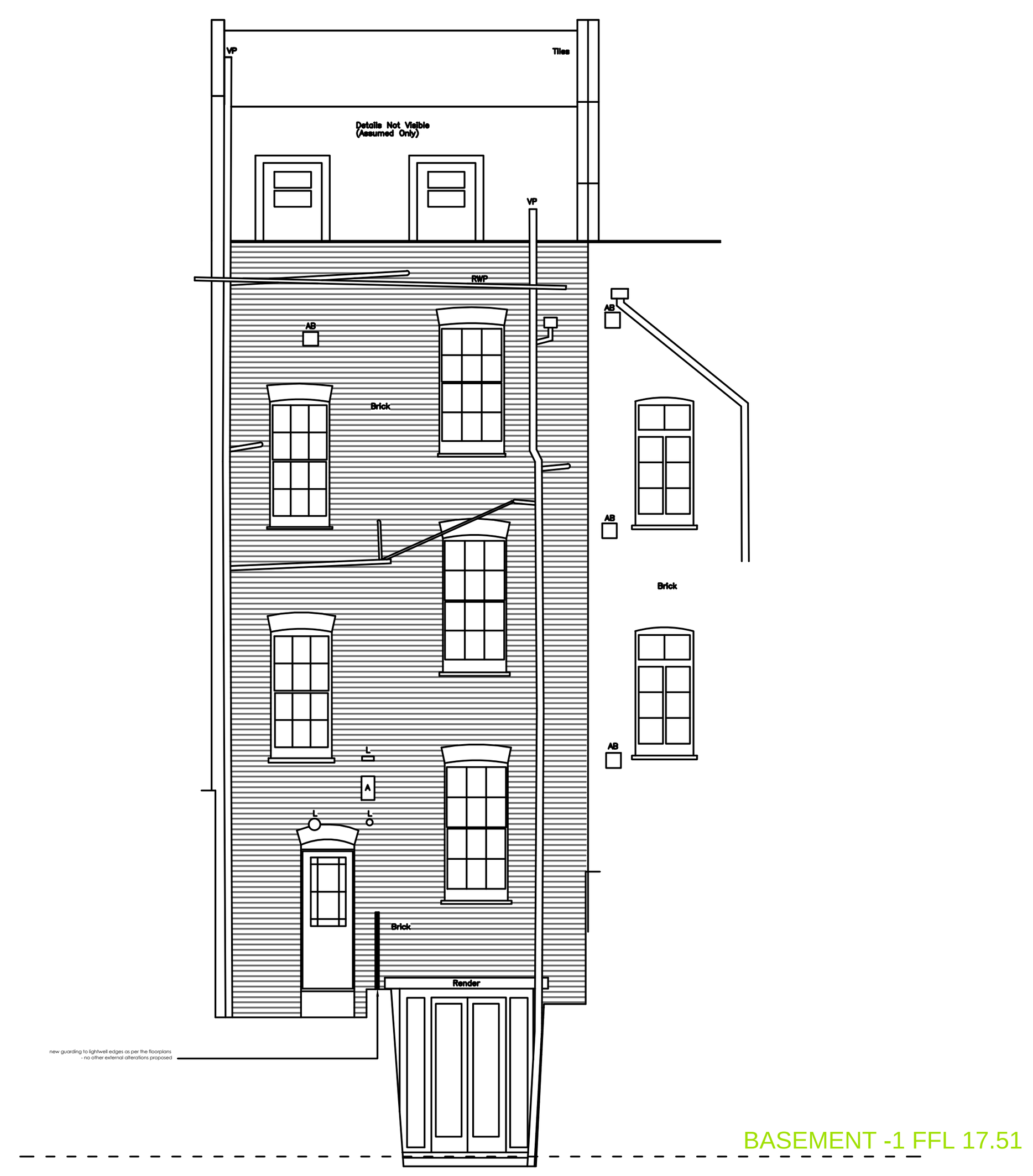
09 PROPOSED FRONTAL ELEVATION
1:100

*NB the only alteration to the frontal elevation will be the re-instatement of the original ground floor to basement level external staircase and gate, which will be re-instated to match the original



10 PROPOSED RIGHT FLANK ELEVATION
1:100

*NB there will be no alteration to the right flank elevation and it will remain as existing



11 PROPOSED REAR ELEVATION
1:100

*NB the only alteration to the rear elevation will be the new ground floor extension

1:100 Scale Bar

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REVISION D C DATE

CLIENT.
Dr L Das

ADDRESS.
1 St Chad's Street
Kings Cross
WC1H 8BD

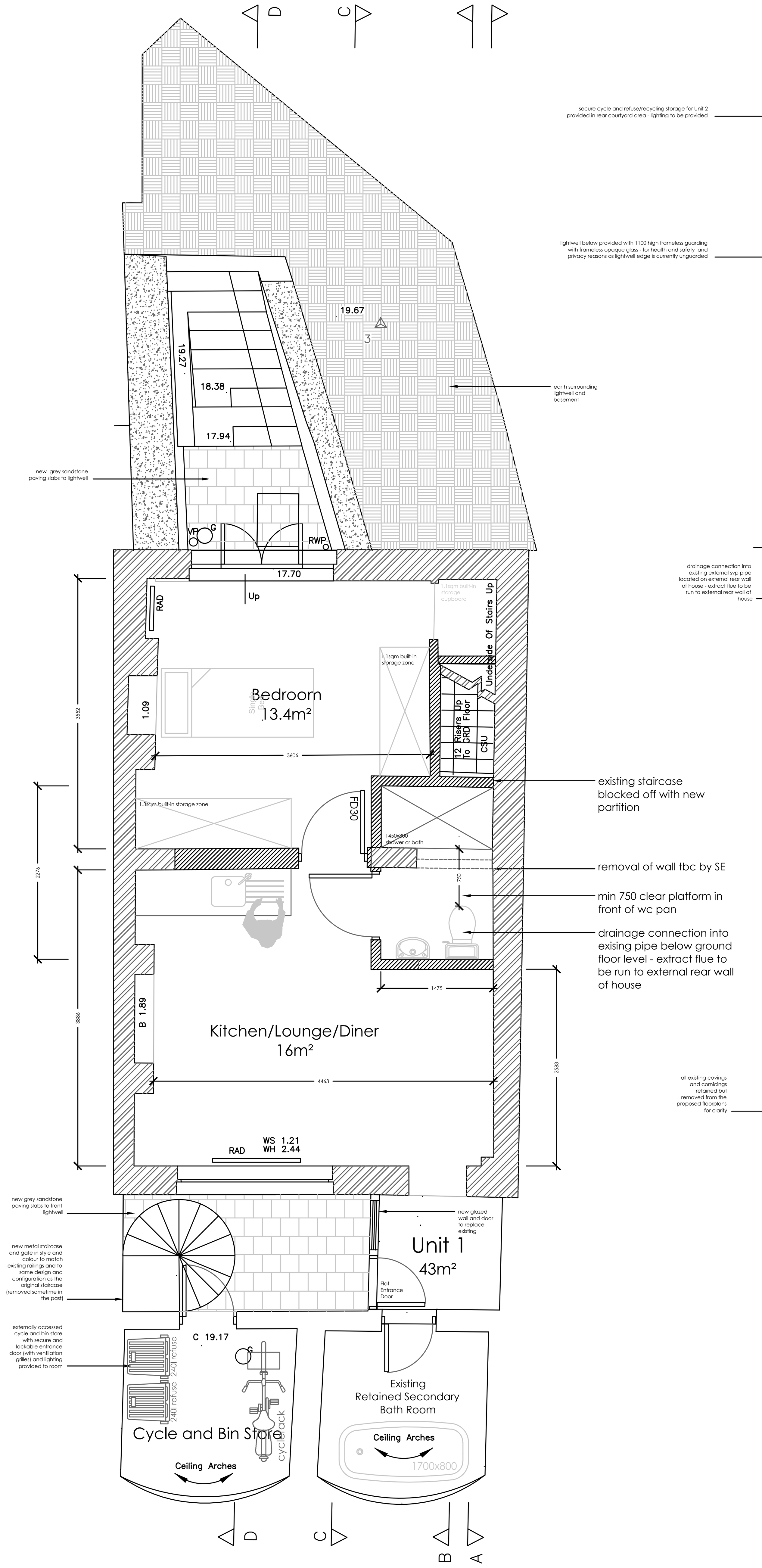
PROJECT.
Flat Conversion

TITLE.
Existing and Proposed
Elevations

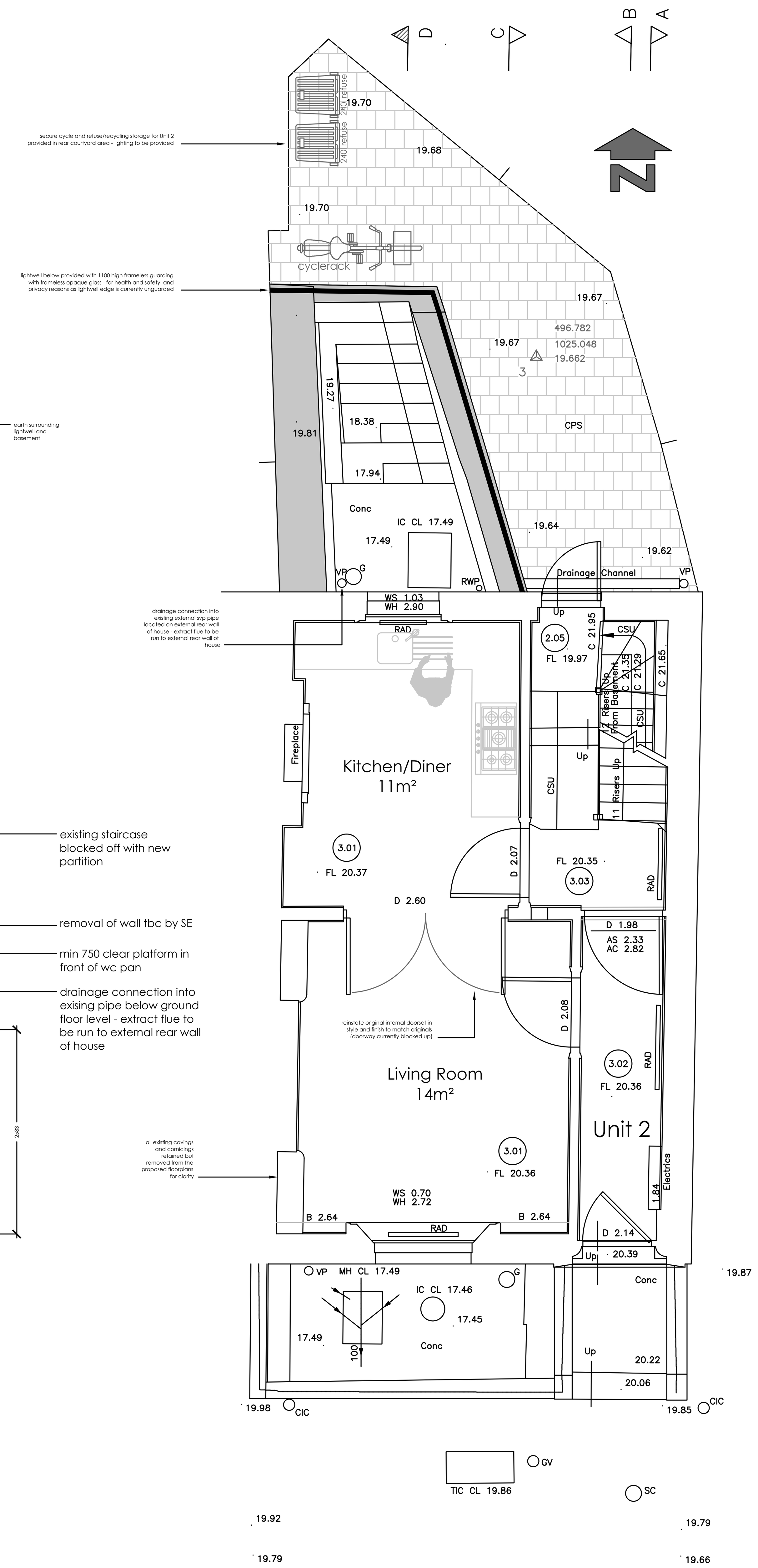
PURPOSE OF ISSUE.
Planning Permission Application

SCALE.	D	C	DATE
see dwg (at A1)			Nov 2015

JOB NO.	DRAWING No.	REVISION
15-1-8BD	PL003	A

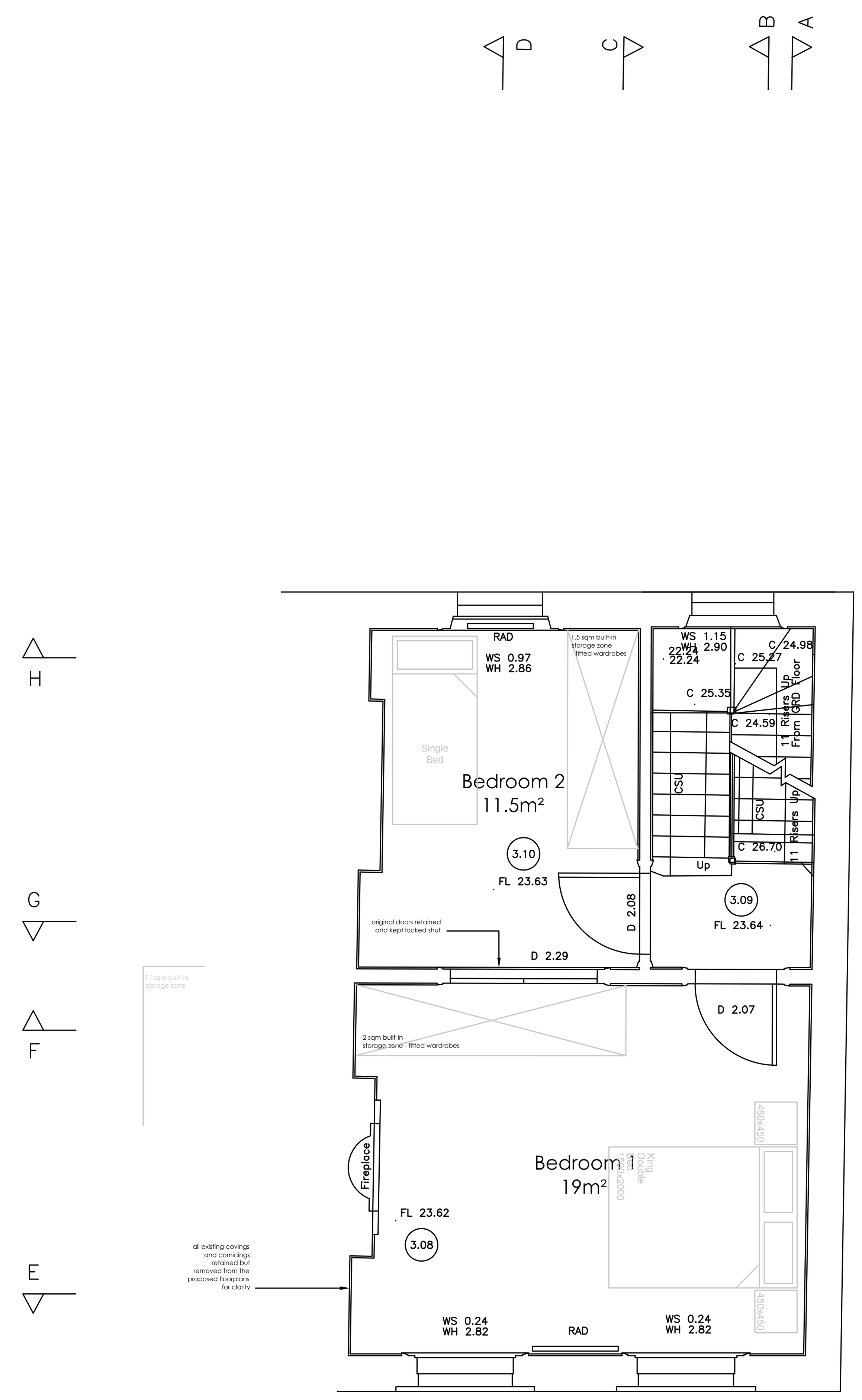


12 PROPOSED LOWER GROUND FLOOR PLAN
1:50



13 PROPOSED GROUND FLOOR PLAN
1:50
*INCORPORATES SITE PLAN

D C B A



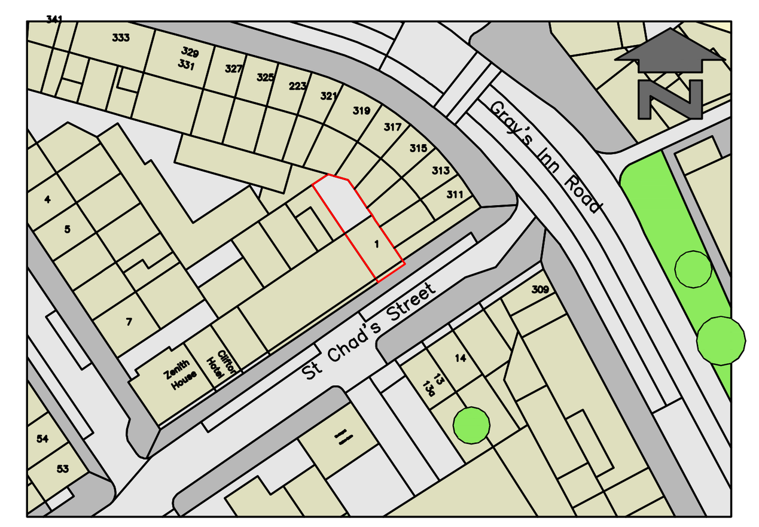
14 PROPOSED FIRST FLOOR PLAN
1:50

D C B A

WALLS LEGEND

- BLOCKWORK
- BRICKWORK
- STUDWORK
- REMOVED WALLS
- BEAMS

*NEW PROPOSED WALLS SHOWN IN BLACK HATCH



15 SITE LOCATION PLAN
1:1250

metres 1 2 3 4 5 6 7 8 9 10

1:50 Scale Bar

metres 25 50 75 100 125 150 175 200 225 250

1:1250 Scale Bar

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REVISION D C DATE

CLIENT.
Dr L Das

ADDRESS.
1 St Chad's Street
Kings Cross
WC1H 8BD

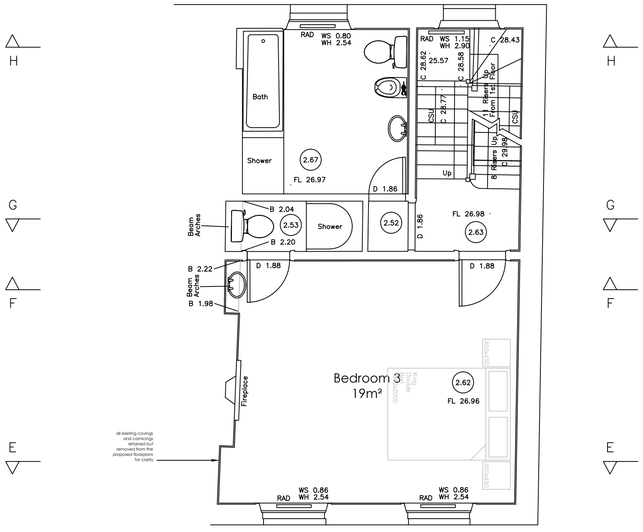
PROJECT.
Flat Conversion

TITLE.
Proposed Floorplans 1

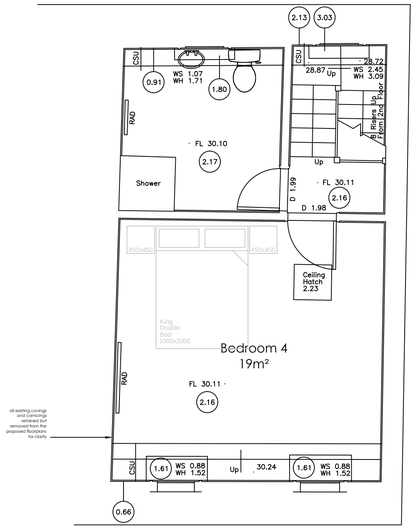
PURPOSE OF ISSUE.
Planning Permission Application

SCALE. see dwg (at A1) D C DATE Nov 2015

JOB NO. 15-1-8BD DRAWING No. PL004 REVISION B



16 PROPOSED SECOND FLOOR PLAN
1:50



17 PROPOSED THIRD FLOOR PLAN
1:50

WALLS LEGEND

- BLOCKWORK
- BRICKWORK
- STUDWORK
- REMOVED WALLS
- BEAMS

*NEW PROPOSED WALLS SHOWN IN BLACK HATCH

metres 1 2 3 4 5 6 7 8 9 10

1:50 Scale Bar

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REVISION D C DATE

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1 St Chad's Street
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WC1H 8BD

PROJECT.
Flat Conversion

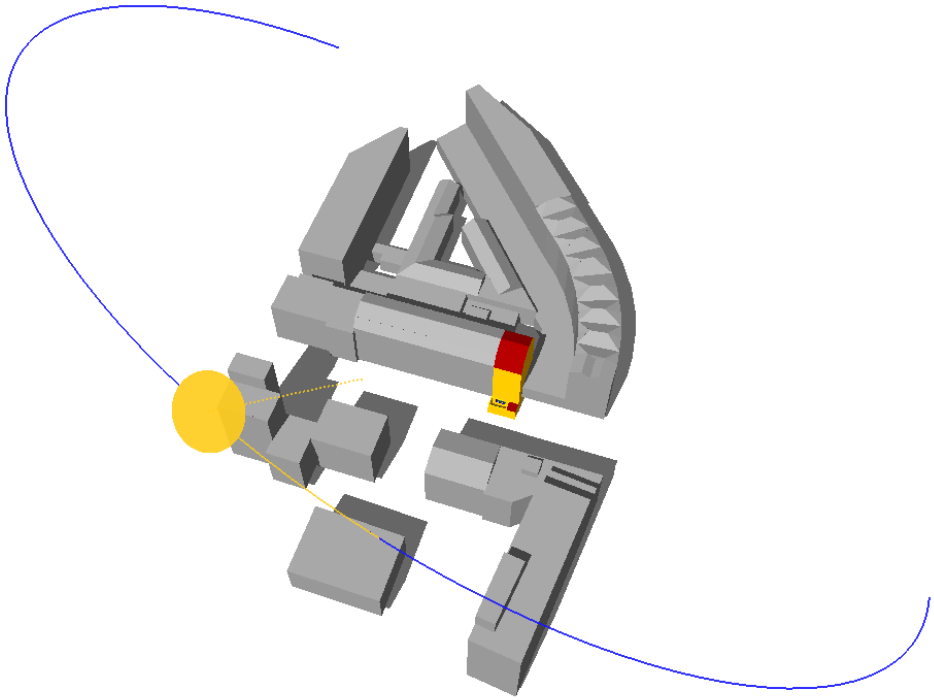
TITLE.
Proposed Floorplans 2

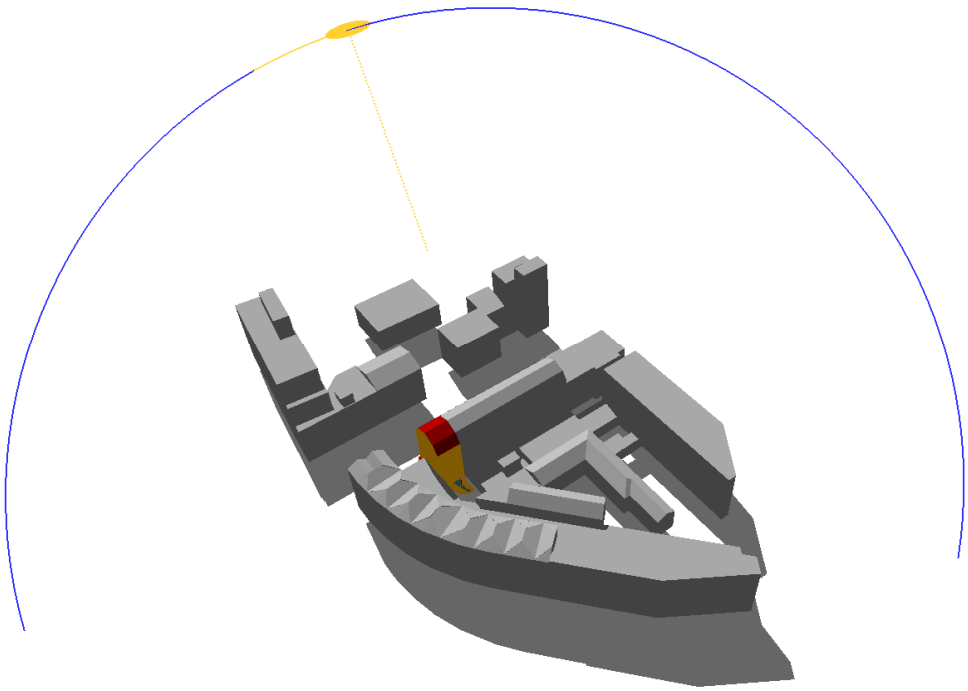
PURPOSE OF ISSUE.
Planning Permission Application

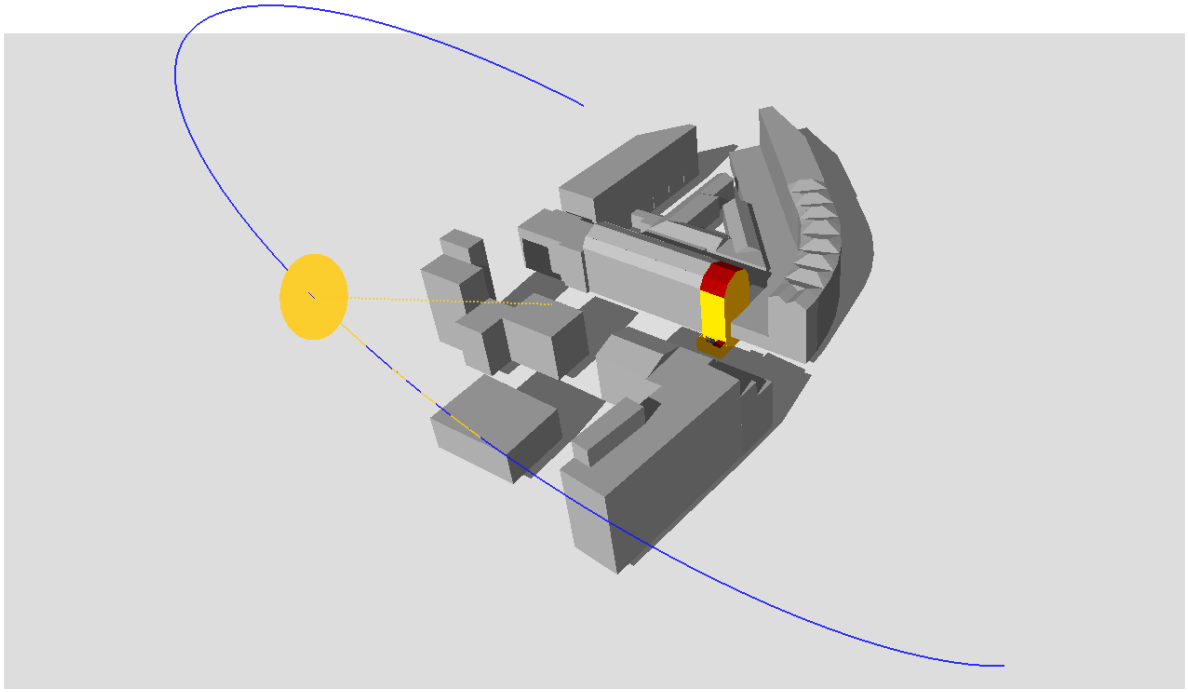
SCALE. see dwg (at A1) | D C | DATE Nov 2015

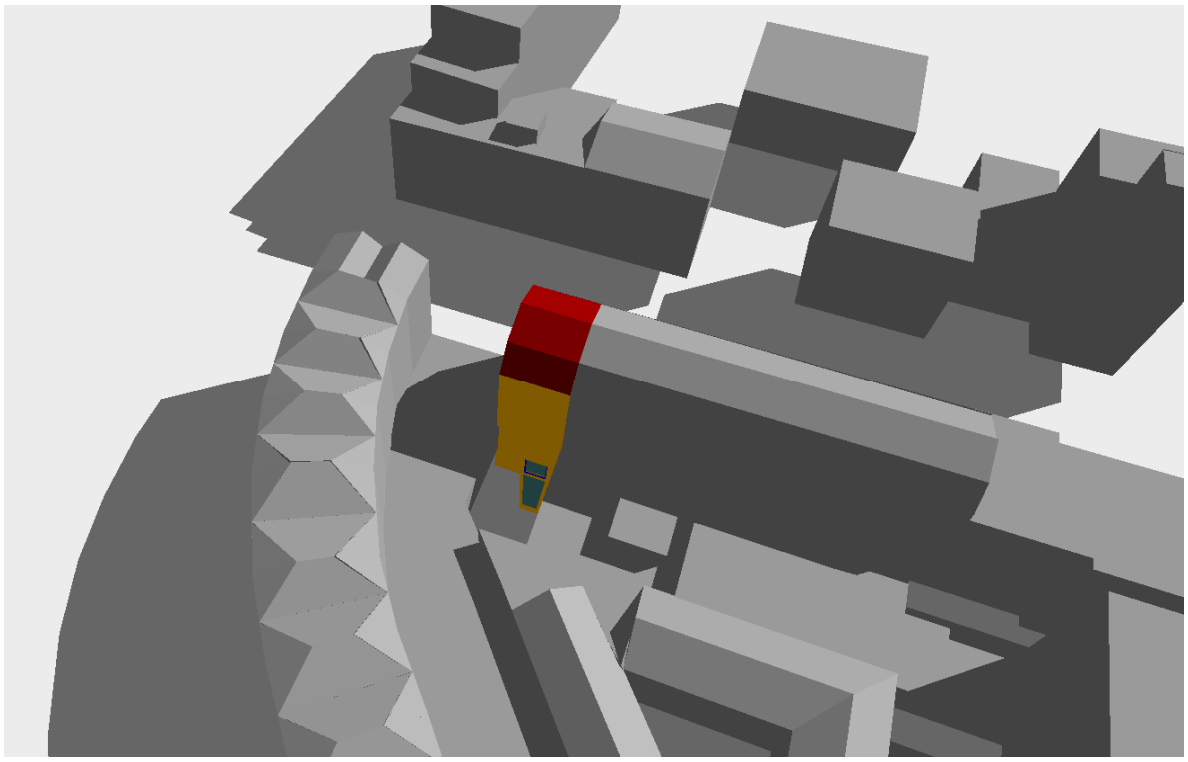
JOB NO. 15-1-8BD | DRAWING No. PL005 | REVISION A

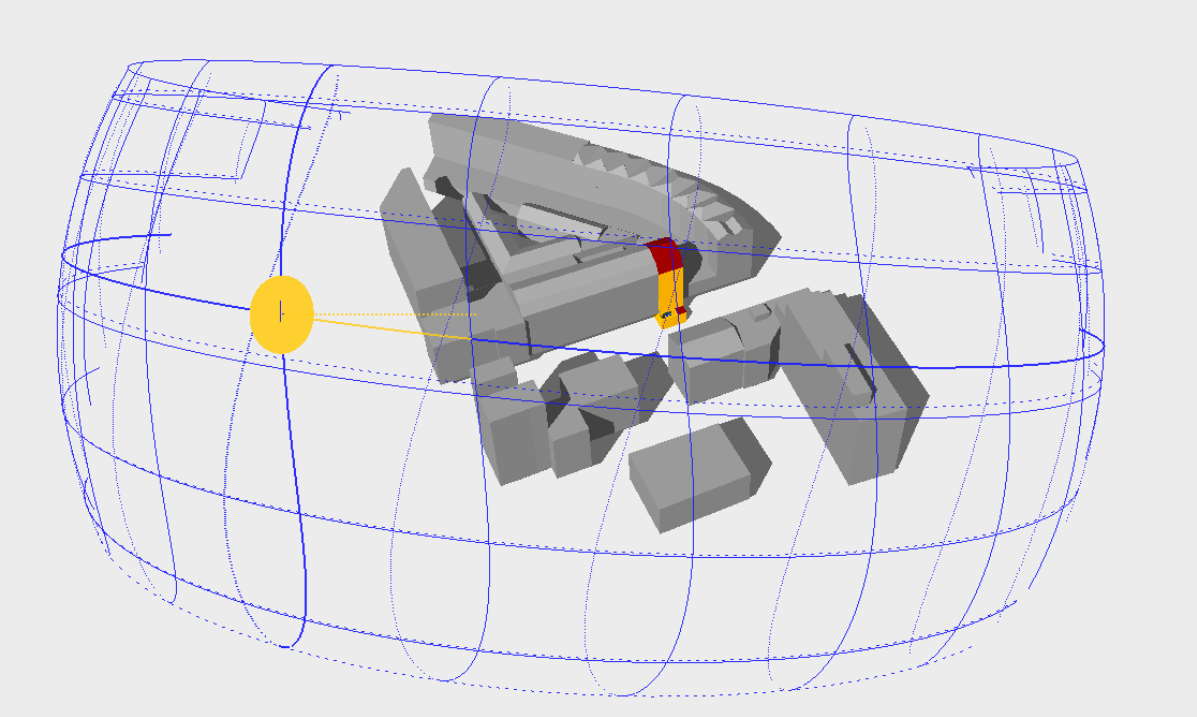
Appendix C - EDSL TAS Computer Model Images

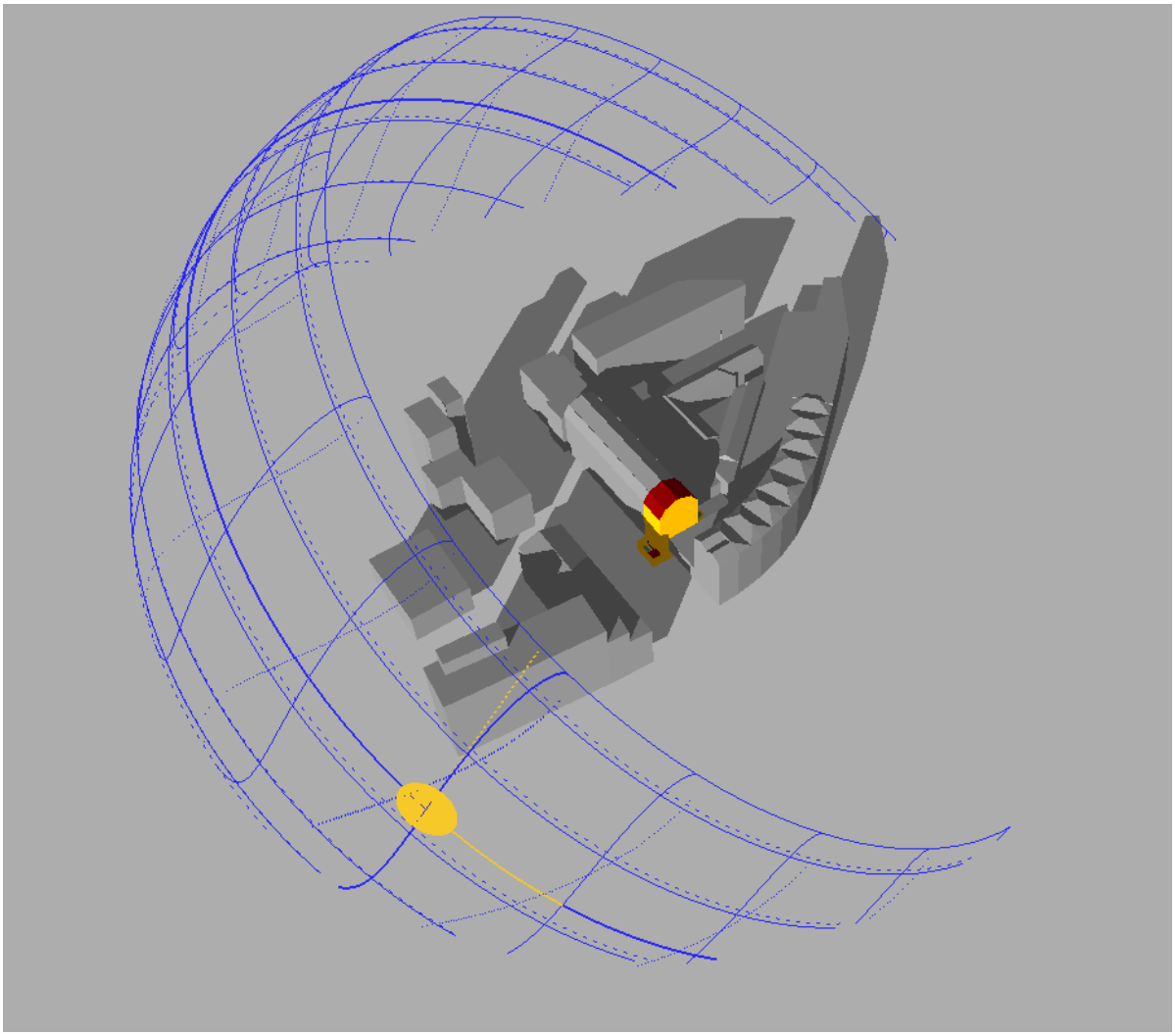


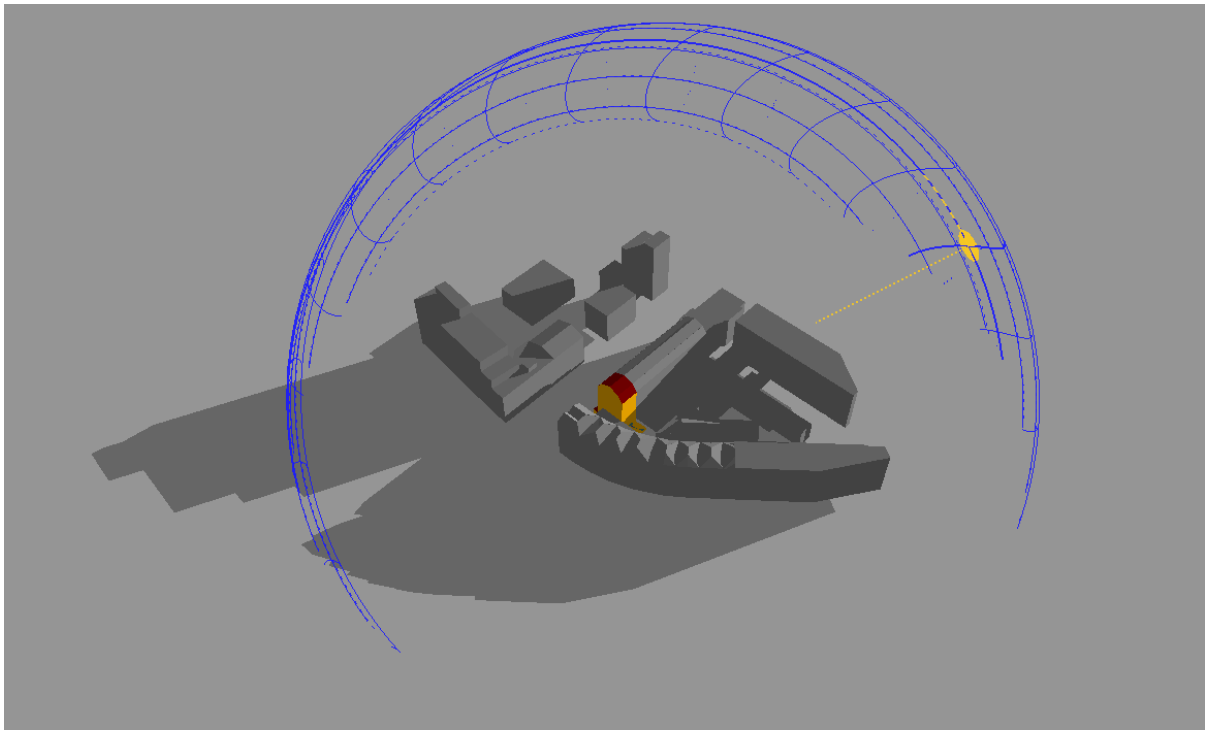












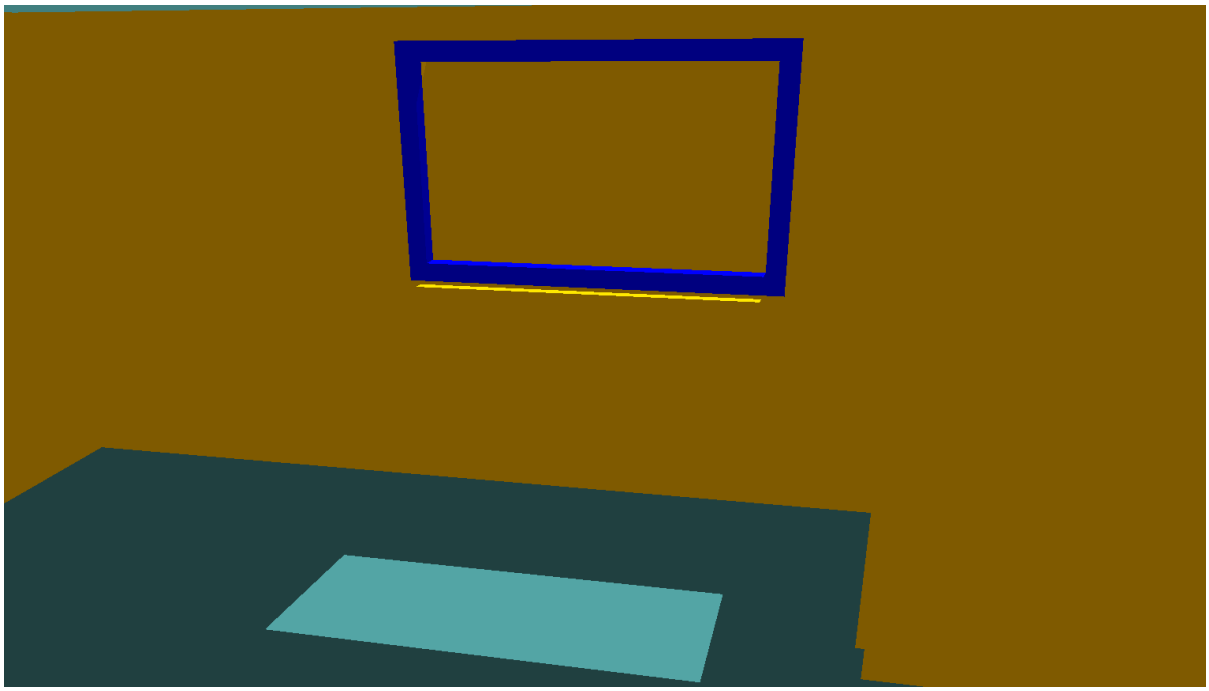


Image Showing Direct Sunlight Reaching the Living Room