

INTERNAL ILLUMINANCE ANALYSIS

in connection with the proposed redevelopment at

**SITE AT NO.175 FRIAR STREET
READING RG1 2DG**

Prepared by: **Richard Staig** *BSc MRICS*
Chartered Building Surveyors
30 Red Lion Street
Richmond
TW9 1RB
Tel: 07710 066235

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Wp ref: DLR

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INTERNAL ILLUMINANCE ANALYSIS

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SITE AT NO.175 FRIAR STREET READING RG1 2DG

EXECUTIVE SUMMARY

- 1.1 This Report has been commissioned by Messrs. Mountley Limited to accompany the Application for *Prior Notification requirement under Part MA of the GPDO for the change of use of Class E space to form 6 apartments*. The proposals considered are those prepared by Messrs. JDW Architects.
- 1.2 Following the publication of the information paper entitled "*Site Layout planning for daylight and sunlight: A guide to good practice*" by the *Building Research Establishment* in 1991, the assessment of daylight and sunlight has been generally carried out in accordance with the criteria set by this publication and which is generally taken to be the accepted basis for such assessment and adopted by most Planning Authorities. This publication has been superseded by the *Second Edition* issued October 2011. The *BRE Second Edition 2011* does give numerical guidelines, but recommends that these should be interpreted flexibly.
- 1.3 Within Paragraph 1.6 of the *BRE Second Edition 2011* it states, *inter alia*, "*The advice given here (sic BRE Second Edition 2011) is not mandatory and the guide should not be seen as an instrument of planning policy; its aim is to help rather than constrain the designer. Although it gives numerical guidelines, these should be interpreted flexibly since natural lighting is only one of many factors in site layout design*".
- 1.4 The criteria against which internal illuminance is considered is detailed within *Appendix C* of the *BRE Second Edition 2011* which is used in conjunction with *BS 8206-2 Code of practice for daylighting* and the *CIBSE Lighting Guide LG10 Daylighting and window design*.
- 1.5 The technical analysis, carried out in accordance with *Appendix C* of the *Building Research Establishment* Guidance "*Site Layout planning for daylight and sunlight: A guide to good practice*" *Second Edition* issued *October 2011*, confirms that the internal illuminance for the proposals will accord with that guidance.

INTRODUCTION

- 2.1 This Report has been commissioned by Messrs. Mountley Limited to accompany the Application for *Prior Notification requirement under Part MA of the GPDO for the change of use of Class E space to form 6 apartments*. The proposals considered are those prepared by Messrs. JDW Architects.
- 2.2 I would confirm that I am a Chartered Building Surveyor working predominately in the field of rights of light including daylight and sunlight assessments. I have an extensive and highly specialised knowledge, in these areas having worked in the past for both Anstey Horne & Co. for five years and Schatunowski Brooks (formerly known as Michael Brooks Associates as it was when I joined, then known as GVA Schatunowski Brooks and now part of Avison Young) for three years, as well as Delva Patman Associates - now known as Delva Patman Redler LLP - for four years prior to joining in Partnership Dixon Payne in 2001. All are acknowledged Experts in these fields; I now act under my own banner.
- 2.3 I regularly provide Expert Witness advice in respect of Planning Applications in respect of daylight and sunlight at Planning Inquiries acting for both Appellants and Planning Authorities. I was consulted by the *Building Research Establishment* prior to the revision of their guidelines in 2011 and am part of the further consultation about further revisions currently being considered following the publication of *BS EN 17037:2018*.
- 2.4 The analysis and assessments are described in more detail in subsequent sections of this Report.
- 2.5 The proposals considered are for the refurbishment of the existing building to create 6nr residential units on three floors as shown on drawings prepared by Messrs. JDW Architects.
- 2.6 The technical analysis has used a 3D model survey model prepared by Messrs. ZMapping of the surrounding properties with the 3D modelling of the proposed Flats being constructed from reference to the Architects' drawings.

INTERNAL ILLUMINANCE

- 3.1 Following the publication of the information paper entitled "*Site Layout planning for daylight and sunlight: A guide to good practice*" by the *Building Research Establishment* in 1991, the assessment of daylight and sunlight has been generally carried out in accordance with the criteria set by this publication and which is generally taken to be the accepted basis for such assessment and adopted by most Planning Authorities. This publication has been superseded by the *Second Edition* issued *October 2011*. The *BRE Second Edition 2011* does give numerical guidelines, but recommends that these should be interpreted flexibly. Paragraph 1.6 of the *BRE Second Edition 2011* states in entirety "*The guide is intended for building designers and their clients, consultants and planning officials. The advice given here (sic BRE Second Edition 2011) is not mandatory and the guide should not be an instrument of planning policy; its aim is to help rather than constrain the designer. Although it gives numerical guidelines, these should be interpreted flexibly 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 on an area with modern high-rise buildings, a higher degree of obstruction may be unavoidable if new developments are to match the height and proportions of existing buildings. Alternatively, where natural light is of special importance in a building, less obstruction and hence more sunlight and daylight may be deemed necessary. The calculation methods in Appendices A, B and G are entirely flexible in this regard. Appendix F gives advice on how to develop a consistent set of target values for skylight under such circumstances, and Appendix C shows how to relate these to interior daylighting requirements.*
- 3.2 The criteria against which internal illuminance is considered is detailed within *Appendix C* of the *BRE Second Edition 2011* which is used in conjunction with *BS 8206-2 Code of practice for daylighting* and the *CIBSE Lighting Guide LG10 Daylighting and window design*. The guide states that where a predominately daylit appearance is required, the *ADF* should be at least 5% or more if there is no supplementary electric lighting or 2% or more there is. In respect of kitchens, living rooms and bedrooms there are additional recommendations of 2%, 1.5% and 1% respectively. *BS8206-2* further advises that achieving 2% if in living room will give an improved daylight provision whilst 3% - 4% would improve the situation further.
- 3.3 For the detailed technical analysis, in accordance with the *BRE Second Edition 2011*, the 3D model as previously described was utilized and, using specialist computer programmes, calculated the quantum of daylight received to the proposed fenestration of property and individual flats calculated by way of Waldram analysis as detailed within *Appendix B* of the *BRE Second Edition 2011*.

- 3.4 By way of explanation, Percy J. Waldram invented the Waldram diagram as a method of showing on a 2d image the curved and three-dimensional view of the sky from a fixed point. The area of a Waldram diagram drawn to scale is 396cm² which represents the total amount of unobscured sky that can be seen from a vertical plane. The vertical edges of any obstructions are plotted as vertical lines on the diagrams by reference to their angle from the reference point. The head of any obstruction are plotted along the droop line corresponding to their altitudes above the horizontal measured in the section perpendicular to the reference point.

- 3.5 The *ADF* of a room is calculated using the following formula:-

$$ADF = \frac{TM A_w \theta}{A(1-R_{sq})}$$

T = Diffuse visible transmittance of the glazing; assumed 0.68 for clear double glazing

M = Maintenance factor 0.8

A_w = Area of glazing

A = Total surface area of room

R = Average reflectance; 0.5 for assumed light coloured surfaces

Theta = Vertical sky component of window in average daylight factor.

- 3.6 The detailed results for the ground floor are attached and provides that all units comply with the guidance of *Appendix C* in respect of internal illuminance.
- 3.7 By way of clarification, Paragraph 2.1.14 of the *BRE Second Edition 2011* provides that a small internal galley-type kitchen can be provided, but it should be directly linked to a well daylight living room, i.e. an internal illuminance above 1.5% *ADF*.

CONCLUSION

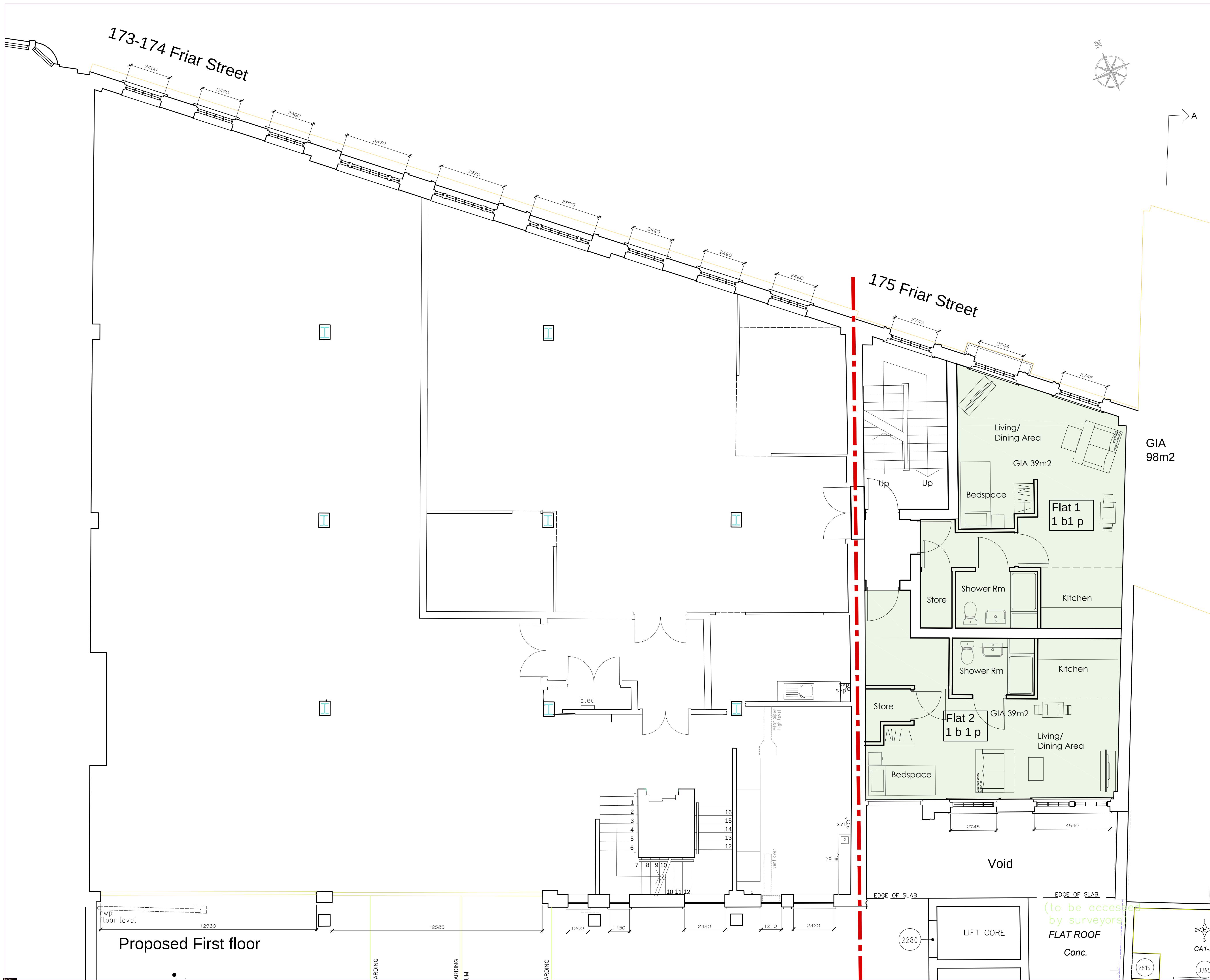
- 5.1 Following the publication of the information paper entitled "*Site Layout planning for daylight and sunlight: A guide to good practice*" by the *Building Research Establishment* in 1991, the assessment of daylight and sunlight has been generally carried out in accordance with the criteria set by this publication and which is generally taken to be the accepted basis for such assessment and adopted by most Planning Authorities. This publication has been superseded by the *Second Edition* issued *October 2011*. The *BRE Second Edition 2011* does give numerical guidelines, but recommends that these should be interpreted flexibly. Paragraph 1.6 of the *BRE Second Edition 2011* states in entirety "*The guide is intended for building designers and their clients, consultants and planning officials. The advice given here (sic BRE Second Edition 2011) is not mandatory and the guide should not be an instrument of planning policy; its aim is to help rather than constrain the designer. Although it gives numerical guidelines, these should be interpreted flexibly 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 on an area with modern high-rise buildings, a higher degree of obstruction may be unavoidable if new developments are to match the height and proportions of existing buildings. Alternatively, where natural light is of special importance in a building, less obstruction and hence more sunlight and daylight may be deemed necessary. The calculation methods in Appendices A, B and G are entirely flexible in this regard. Appendix F gives advice on how to develop a consistent set of target values for skylight under such circumstances, and Appendix C shows how to relate these to interior daylighting requirements.*
- 5.2 The criteria against which internal illuminance is considered is detailed within *Appendix C* of the *BRE Second Edition 2011* which is used in conjunction with *BS 8206-2 Code of practice for daylighting* and the *CIBSE Lighting Guide LG10 Daylighting and window design* and the technical analysis confirms that the internal illuminances of the proposed residential dwellings comply with that guidance.

April 14, 2022

Richard Staig *BSc MRICS*
Chartered Building Surveyor
30 Red Lion Street
Richmond
TW9 1RB

T. 07710 066235

APPENDIX – LAYOUT DRAWING, RESULTS & WALDRAM DIAGRAMS



Notes:

dimensions:
All building and site dimensions, levels and sewer invert levels at connection points are to be checked and verified on site by the contractor before the commencement of works. All dimensions are to be checked prior to the placement of orders for materials or the fabrication of work and any discrepancy, omission or error is to be reported to the Architect immediately for verification.

specification:
The Contractor is to comply with current Building Legislation, British Standard Specifications, Building Regulations etc, whether or not specifically stated on this drawing. This drawing must be checked against and read in conjunction with any structural or other relevant specialist and design documentation provided.

revisions:
REV A 8/4/22 ISSUED FOR PLANNING

GIA
98m2

PLANNING

client:
Mounley Group

project:

173 - 175 Friar Street & 27 - 32 Market Place
Reading
Friar Street PD Flats Conversion

description:
proposed first floor plan



head office:
the old stone masons, 10 st johns st,
abergavenny, monmouthshire, np7 5rt
tel: 01873 851125 fax: 01873 851127

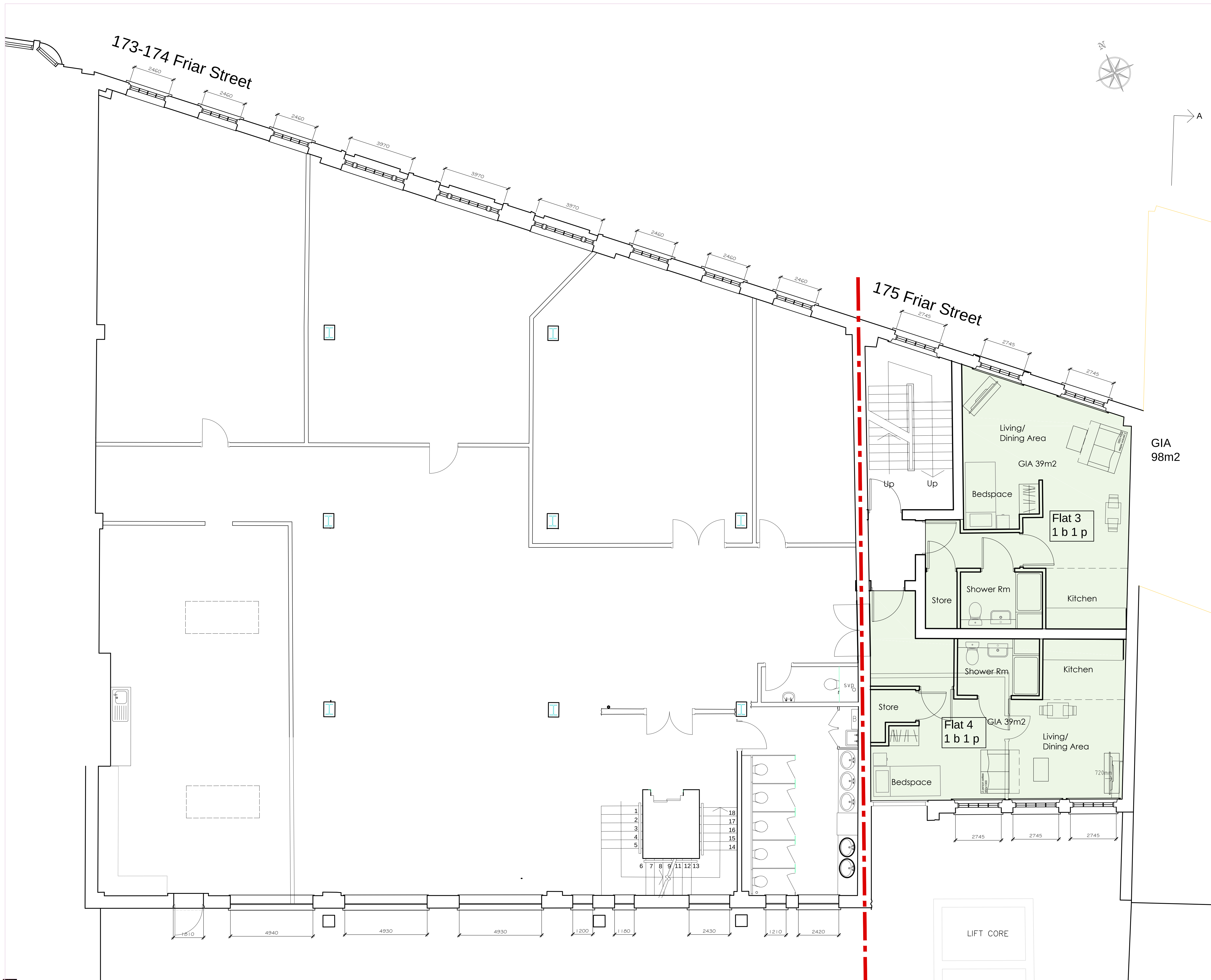
newport:
first floor, 5 gold tops,
newport, south wales. np20 4pg
tel: 01633 245020

e: mail: info@jdwarehitects.co.uk
w: www.jdwarchitects.co.uk

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date: sheet of:
Mar'22

job drwg. no: rev:
jw1077 - 036 A

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Notes:

dimensions:
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revisions:

REV A 8/4/22 ISSUED FOR PLANNING

PLANNING

Client:

Project:

Mountley Group
173 - 175 Friar Street & 27 - 32 Market Place
Reading
Friar Street PD Flats Conversion

Description:

proposed second floor plan

jdw
architects ltd

head office:
the old stone masons, 10 st johns st,
abergavenny, monmouthshire, np7 5rt
tel: 01873 851125 fax: 01873 851127

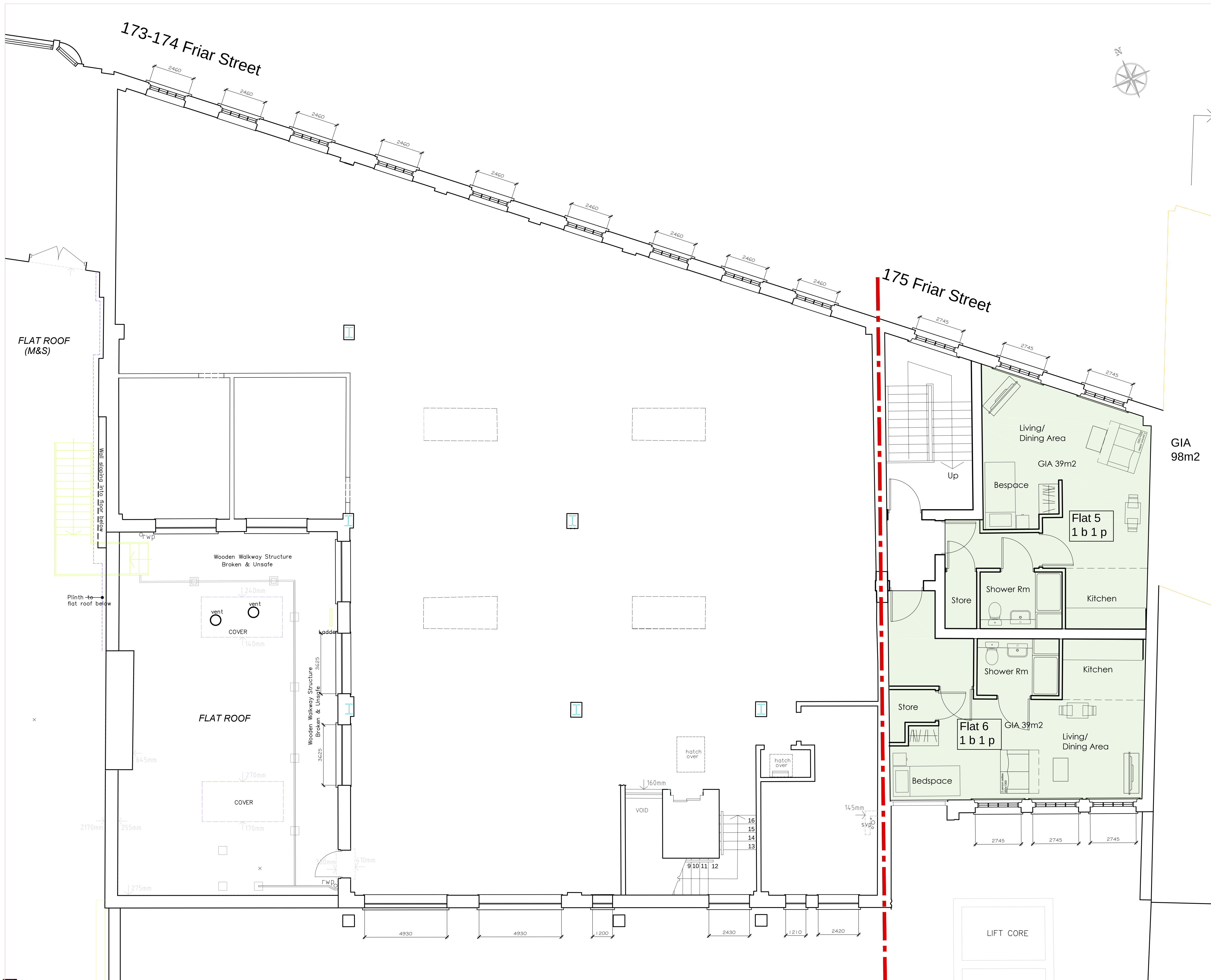
newport:
first floor, 5 gold tops,
newport, south wales, np20 4pg
tel: 01633 245020

e: mail: info@jdwarchitects.co.uk
w: www.jdwarchitects.co.uk

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date: sheet of:
Mar '22

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jw1077 - 037 A

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Notes:

dimensions:
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specification:
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revisions:

REV A 8/4/22 ISSUED FOR PLANNING

GIA
98m2

PLANNING

client:
Mounley Group

project:

173 - 175 Friar Street & 27 - 32 Market Place
Reading
Friar Street PD Flats Conversion

description:

proposed third floor plan



head office:
the old stone masons, 10 st johns st,
abergavenny, monmouthshire, np20 4pg
tel: 01873 851125 fax: 01873 851127

newport:
first floor, 5 gold tops,
newport, south wales, np20 4pg
tel: 01633 245020

e: mail: info@jdwarehitects.co.uk
w: www.jdwarchitects.co.uk

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Mar '22

job drwg. no. rev:
jw1077 - 038 A

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BRE SECOND EDITION 2011
SITE AT 175 FRIARS STREET READING
INTERNAL ILLUMINANCE

Building Name	Floor Name	Room Name	Room Use	Window Ref	Glass Transmittance	Glazed Area	Clear Sky Pr	Room Surface Area	Average Surface Reflectance	Below Working Plane Factor	ADF Pr	Reqd Val	Meets BRE Criteria
FLAT1													
B2	First	R1	Studio	W1-L	0.68	0.454033	54.477464	115.774944	0.5	0.15	0.024603	1.5	YES
B2	First	R1	Studio	W1-U	0.68	2.429074	54.450471	115.774944	0.5	1	0.877064		
B2	First	R1	Studio	W2-L	0.68	0.450028	53.966675	115.774944	0.5	0.15	0.024157		
B2	First	R1	Studio	W2-U	0.68	2.407647	53.93284	115.774944	0.5	1	0.861063		
											1.786887		
FLAT 2													
B2	First	R2	Studio	W3-L	0.68	0.202713	65.311901	120.50093	0.5	0.15	0.01268	1.5	YES
B2	First	R2	Studio	W3-U	0.68	3.427688	65.614617	120.50093	0.5	1	1.435964		
B2	First	R2	Studio	W4-L	0.68	0.123688	62.688756	120.50093	0.5	0.15	0.007426		
B2	First	R2	Studio	W4-U	0.68	2.091453	62.97952	120.50093	0.5	1	0.840987		
											2.297056		
FLAT 3													
B2	Second	R1	Studio	W1-L	0.68	0.454033	57.910806	115.774944	0.5	0.15	0.028416	1.5	YES
B2	Second	R1	Studio	W1-U	0.68	2.429074	57.867428	115.774944	0.5	1	1.012735		
B2	Second	R1	Studio	W2-L	0.68	1.741755	56.526175	115.774944	0.5	0.15	0.106402		
B2	Second	R1	Studio	W2-U	0.68	2.972283	57.057495	115.774944	0.5	1	1.221867		
											2.369419		
FLAT 4													
B2	Second	R2	Studio	W3-L	0.68	0.202713	72.928243	120.50093	0.5	0.15	0.01535	1.5	YES
B2	Second	R2	Studio	W3-U	0.68	3.427688	72.060397	120.50093	0.5	1	1.709791		
B2	Second	R2	Studio	W4-L	0.68	0.123688	68.264239	120.50093	0.5	0.15	0.008767		
B2	Second	R2	Studio	W4-U	0.68	2.091453	67.583447	120.50093	0.5	1	0.978439		
											2.712347		
FLAT 5													
B2	Third	R1	Studio	W1-L	0.68	0.454033	60.949357	115.774944	0.5	0.15	0.029907	1.5	YES
B2	Third	R1	Studio	W1-U	0.68	2.429074	60.86838	115.774944	0.5	1	1.065255		
B2	Third	R1	Studio	W2-L	0.68	0.450028	59.970278	115.774944	0.5	0.15	0.029167		
B2	Third	R1	Studio	W2-U	0.68	2.407647	59.902599	115.774944	0.5	1	1.039105		
											2.163433		
FLAT 6													
B2	Third	R2	Studio	W3-L	0.68	0.202713	78.631679	120.50093	0.5	0.15	0.016551	1.5	YES
B2	Third	R2	Studio	W3-U	0.68	3.427688	77.224391	120.50093	0.5	1	1.832318		
B2	Third	R2	Studio	W4-L	0.68	0.123688	71.905818	120.50093	0.5	0.15	0.009235		
B2	Third	R2	Studio	W4-U	0.68	2.091453	70.984725	120.50093	0.5	1	1.027681		
											2.885784		

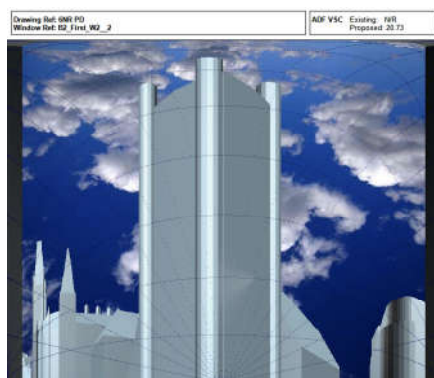
**BRE SECOND EDITION 2011
SITE AT 175 FRIARS STREET READING
ADF WALDRAM DIAGRAMS**



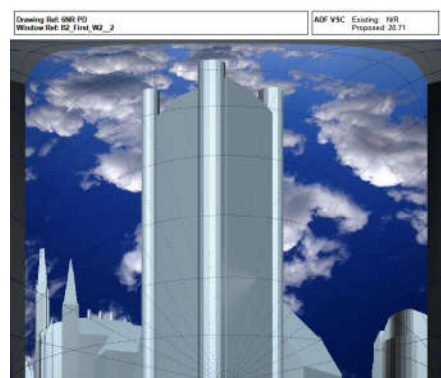
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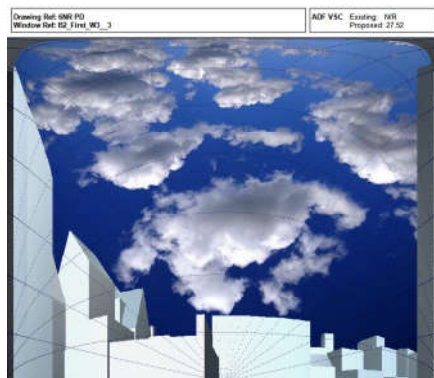
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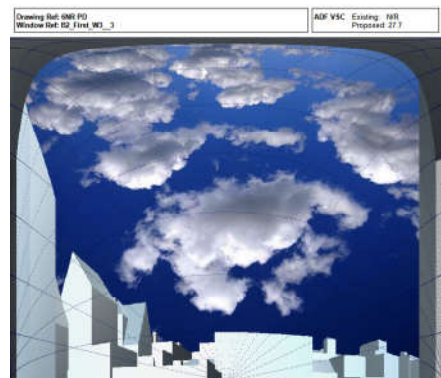
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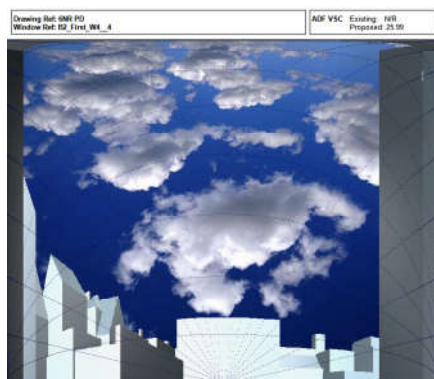
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ADFVSC-B2_First_W3__3-B



ADFVSC-B2_First_W3__3-U



ADFVSC-B2_First_W4__4-B



ADFVSC-B2_First_W4__4-U

**BRE SECOND EDITION 2011
SITE AT 175 FRIARS STREET READING
ADF WALDRAM DIAGRAMS**



ADVVSC-B2_Second_W1__1-B



ADVVSC-B2_Second_W1__1-U



ADVVSC-B2_Second_W2__2-B



ADVVSC-B2_Second_W2__2-U



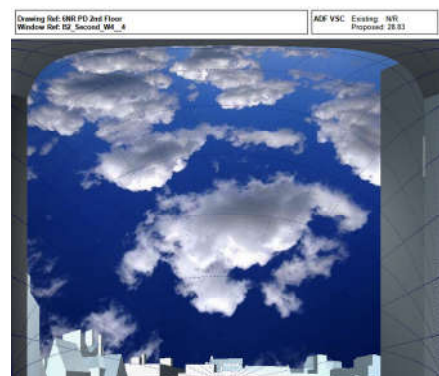
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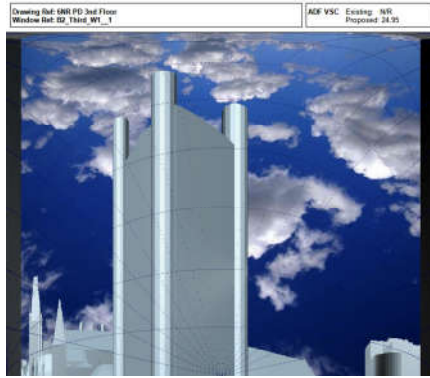


ADVVSC-B2_Second_W4__4-B



ADVVSC-B2_Second_W4__4-U

**BRE SECOND EDITION 2011
SITE AT 175 FRIARS STREET READING
ADF WALDRAM DIAGRAMS**



ADFVSC-B2_Third_W1__1-B



ADFVSC-B2_Third_W1__1-U



ADFVSC-B2_Third_W2__2-B



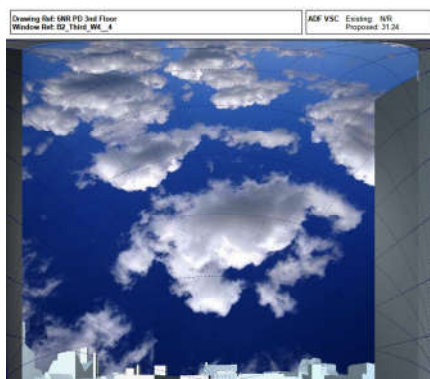
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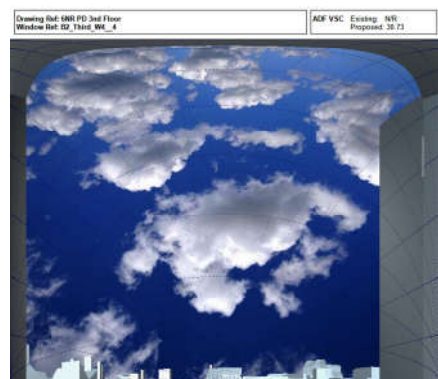
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ADFVSC-B2_Third_W4__4-B



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