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ROYAL HEIGHTS,

READING

Daylight and Sunlight Report

Overshadowing

• *Daylight & Sunlight* • *Light Pollution* •

Solar Glare • *Daylight Design*

DIRECTOR:	LIAM DUNFORD
CLIENT:	ALLIES
DATE:	APRIL 2018
VERSION:	DRAFT
PROJECT:	P1624

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1 Introduction

- 1.1 This reports relates to the Emre Arolat Architecture Proposed Scheme for the redevelopment of Royal Heights, Reading insofar as it affects the daylight and sunlight amenity to the surrounding residential properties.

2 Planning Overview

- 2.1 Through the planning process the local authority will wish to be reassured that the construction of the new scheme will not materially harm the neighbours' daylight and sunlight beyond BRE and British Standard Guidance.
- 2.2 The Local Authority will be informed in this by the BRE document entitled *Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice 2011* (the BRE guidelines). This document is the principal guidance in this area and sets out the methodology for measuring light and recommends what it considers to be permitted or unobtrusive levels of change.
- 2.3 The BRE guidelines are not mandatory, though local planning authorities and planning inspectors will consider the suitability of a proposed scheme for a site within the context of BRE guidance. Consideration will be given to the urban context within which a scheme is located and the daylight and sunlight will be one of a number of planning considerations which the local authority will weigh.

3 Methodology

- 3.1 It is usual to assess daylight and sunlight in relation to the guidelines set out in the 2011 Building Research Establishment (BRE) Report 'Site layout planning for daylight and sunlight - A guide to good practice' by Paul Littlefair. This document is most widely accepted by planning authorities as the means by which to judge the acceptability of a scheme. One of the primary sources for the BRE Report is the more detailed guidance contained within 'British Standard 8206 Part 2:2008'.
- 3.2 In relation to the properties surrounding a site, usually the local planning authority will only be concerned with the impact to main habitable accommodation (i.e. living rooms, bedrooms and kitchens) within residential properties.
- 3.3 To determine whether a neighbouring existing building may be adversely affected, the initial test provided by the BRE is to establish if any part of the proposal subtends an angle of more than 25° from the lowest window serving the existing building. If this is the case then there may be an adverse effect, and more detailed calculations are required to quantify the extent of any impact.
- 3.4 The BRE guidelines provide two principal measures of daylight for assessing the impact on properties neighbouring a site, namely Vertical Sky Component (VSC) and No-Sky Line (NSL). They also detail a third measure of daylight which is primarily used for assessing amenity within proposed accommodation, namely Average Daylight Factor (ADF).
- 3.5 In terms of sunlight we examine the BRE Annual Probable Sunlight Hours (APSH); and in relation to sunlight amenity to gardens and amenity spaces, we apply the quantitative BRE overshadowing guidance.

- 3.6 These measures of daylight and sunlight are discussed in the following paragraphs -

Diffuse Daylight

- 3.7 **Vertical Sky Component (VSC)** – VSC is a measure of the direct skylight reaching a point from an overcast sky. It is the ratio of the illuminance at a point on a given vertical plane to the illuminance at a point on a horizontal plane due to an unobstructed sky.
- 3.8 For existing buildings, the BRE guideline is based on the loss of VSC at a point at the centre of a window, on the outer plane of the wall.
- 3.9 The BRE guidelines state that if the VSC at the centre of a window is less than 27%, and it is less than 0.8 times its former value (i.e. the proportional reduction is greater than 20%), then the reduction in skylight will be noticeable, and the existing building may be adversely affected.
- 3.10 **No-Sky Line (NSL)** - NSL is a measure of the distribution of daylight within a room. It maps out the region within a room where light can penetrate directly from the sky, and therefore accounts for the size of and number of windows by simple geometry.
- 3.11 The BRE suggest that the area of the working plane within a room that can receive direct skylight should not be reduced to less than 0.8 times its former value (i.e. the proportional reduction in area should not be greater than 20%).
- 3.12 **Average Daylight Factor (ADF)** - ADF is a measure of the overall amount of diffuse daylight within a room. It is the average of the daylight factors across the working plane within a room. This equates to the ratio of the average illuminance across the working plane, to the illuminance due to an unobstructed sky.
- 3.13 In addition to accounting for external obstructions, the ADF accounts for the number of windows and their size in relation to the size of the room, the window transmittance and the reflectance of the internal walls, floor and ceiling.
- 3.14 While the ADF can be calculated from first principles using a lighting simulation software suite such as Radiance, in simple situations it can be approximated using the empirical formula detailed in both British Standard 8206 Part 2:2008 and Appendix C of the BRE Report.
- 3.15 Both the BRE Report and BS 8206 Part 2:2008 provide guidance for acceptable ADF values in the presence of supplementary electric lighting, depending on the room use. These are 1.0% for a bedroom, 1.5% for a living room and 2.0% for a kitchen.

Sunlight

- 3.16 **Annual Probable Sunlight Hours (APSH)** - In relation to sunlight, the BRE recommends that the APSH received at a given window in the proposed case should be at least 25% of the total available, including at least 5% in winter.
- 3.17 Where the proposed values fall short of these, and the absolute loss is greater than 4%, then the proposed values should not be less than 0.8 times their previous value in each period (i.e. the proportional reductions should not be greater than 20%).

- 3.18 The BRE guidelines state that ‘...all main living rooms of dwellings, and conservatories, should be checked if they have a window facing within 90 degrees of due south. Kitchens and bedrooms are less important, although care should be taken not to block out too much sun’.

The APSH figures are calculated for each window, and where a room is served by more than one window the contribution of each is accounted for in the overall figures for the room. The acceptability criteria are applied to overall room based figures.

4 Sources of Information

Point 2 Surveyors	-	Site Photos
Zmapping Ltd	-	3D Context Model Royal heights_281217_Solids.dwg
Ordnance Survey Ltd	-	Digital O/S Extract
Emre Arolat Architecture	-	Proposed Information Massing model.skp 220-BC-2-22-{10-20}_{Level 0-9 & Roof} Plan.dwg 220-BC-2-23-{01-05} {AA to EE} sections.dwg
Estate Agency Plans	-	Grantley Heights

5 Standard Survey Limitations

- 5.1 Although we have undertaken as detailed an inspection as possible, we are required by our professional indemnity insurers to notify you that our report is based upon the Standard Terms and Conditions provided along with our fee proposal. Our understanding of the existing massing, including the surrounding context was established from a site visit, a 3D context model and aerial photography.
- 5.2 In addition to our standard limitations the following limitations and assumptions also apply.
- Best estimates were made in establishing building use (residential or commercial) and room uses; generally, these were made from external observations and recourse to planning records where available.
 - When floor plans of surrounding properties were not available, room depths have been assumed from external observations. Where no indicators of room depth were available a standard of 4m, 6m or 8m depths have been used.
 - In accordance with BRE Guidelines¹ balconies, where present have been removed from calculations.

¹ BRE Guideline 209 Site Layout & Planning A Guide to Good Practice (2011) Paragraph 2.2.11

6 The Site

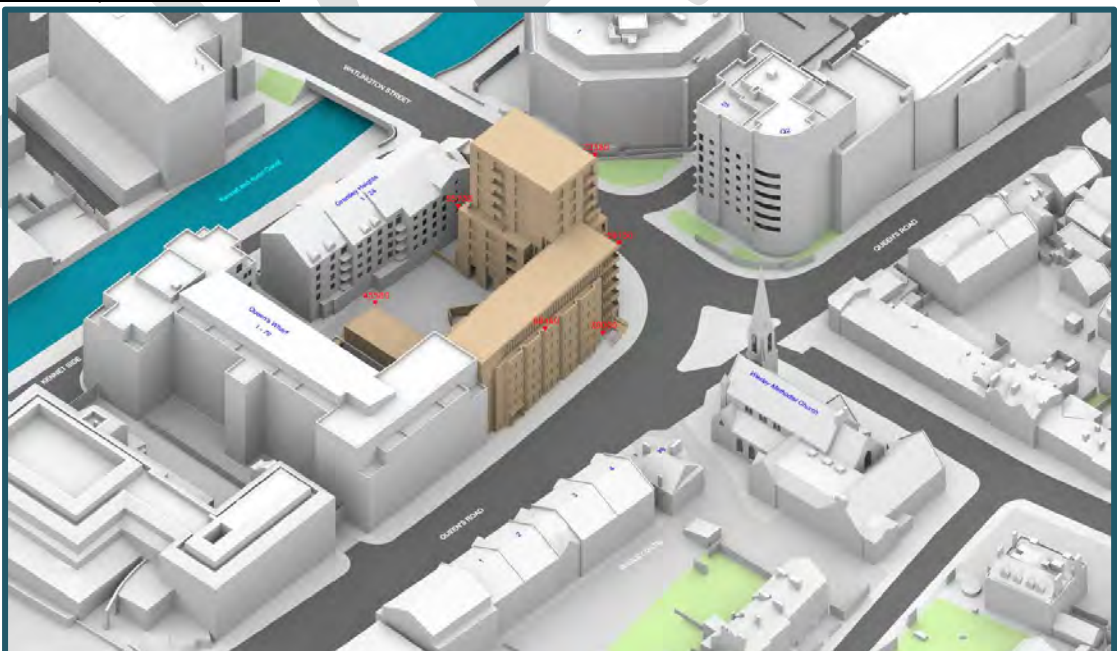
6.1 The site is located in the Royal Borough of Reading



Drawing Reference: P1624/02 – 3D View – Existing Building

6.2 Our understanding of the site location and existing building that occupies the site can be seen within drawings P1624/01-03 and can be found within Appendix A.

7 The Proposed Scheme



Drawing Reference: P1624/27 – 3D View – Proposed Scheme

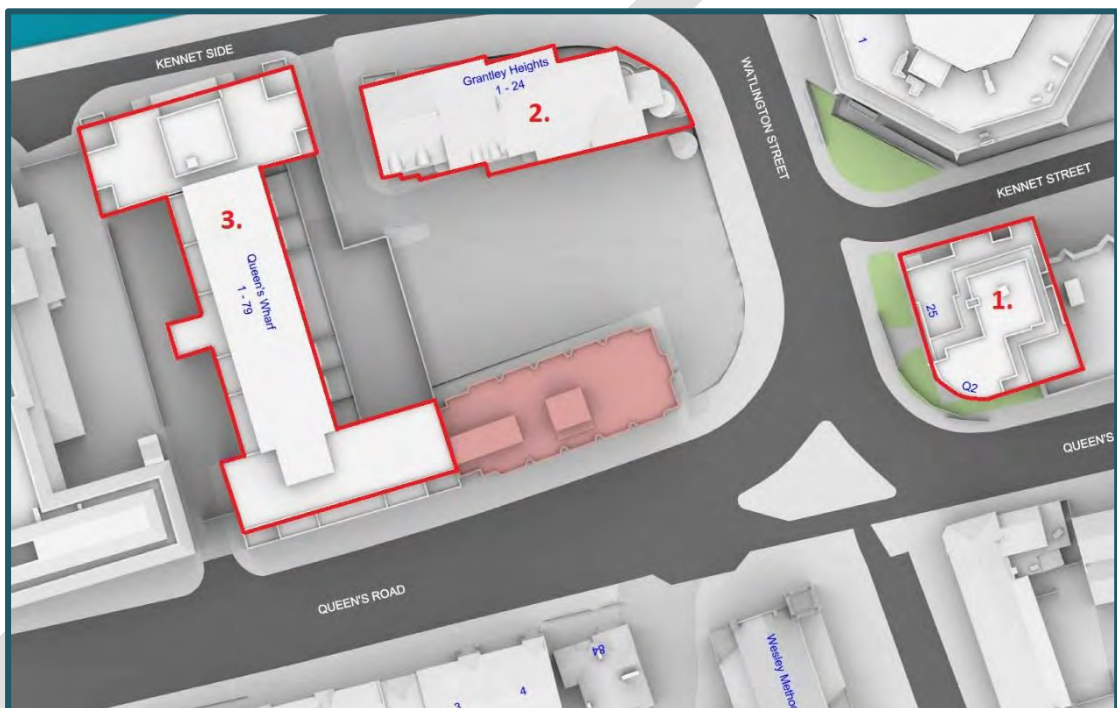
7.1 Our understanding of the proposed scheme is illustrated in drawings P1624/26-28 located within Appendix A.

8 The Surrounding Properties

8.1 The following surrounding properties contain residential accommodation and, due to their proximity to the development site, have been assessed in terms of the effects of the proposed development upon their daylight and sunlight amenity:

1. Q2, Reading
2. Grantley Heights
3. Queen's Wharf

8.2 The location of these properties can be on the number referenced site plan below:



Site Plan with Number Referencing

8.3 We will discuss the effects of the proposed scheme upon the surrounding residential properties in turn below.

1. Q2, Reading

- 8.4 Located to the east of the development and reference '1' on the above site plan this property is residential throughout with a commercial element on the ground floor. We are not in receipt of layouts for the property thus room dimensions have been assumed from external observations at 11sqm, 19sqm and 26sqm. Based on these assumptions there are 66 windows serving 30 site facing rooms.

Daylight

- 8.5 All windows and associated rooms experience fully BRE compliant alterations in VSC and NSL; the majority of windows actually retaining above 27% VSC after construction of the proposed scheme.

Sunlight

- 8.6 All site facing rooms which have a window orientated within 90 degrees due south experience fully BRE compliant changes in Annual Probable Sunlight Hours.

2. Grantley Heights

- 8.7 Located to the north of the development site and referenced '2' on the site plan this property contains residential accommodation throughout. We have built the internal layouts to the property using various Estate Agency Floor Plans for the building. There are 45 windows serving 36 site facing rooms, comprising of 20 bedrooms, 8 kitchens and 8 living rooms.



'Window Arrangement – Blue = Bedrooms, Orange = Kitchens, Green = Living Rooms

- 8.8 This elevation is hard on the site boundary. Under the circumstances we have turned to Appendix F of the BRE Guide which states “...in cases where an existing building has windows that are unusually close to the site boundary...To ensure that new development matches the height and proportions of existing buildings, the VSC and APSH targets for these windows could be set to those for a ‘mirror-image’ building of the same height and size, an equal distance away the other side of the boundary.” (BRE Guide 209, paragraph F5).



Drawing References: P1624/23 – Appendix F, Mirror-Massing Assessment

- 8.9 3D views of the above mirror assessment are referenced P1624/23-25 located in Appendix A.

Daylight

- 8.10 The results of the mirror massing assessment show that the retained levels of daylight as a result of the proposed scheme are far better than those proposed of a mirror-massed option.
- 8.11 The proposed scheme therefore demonstrates compliance with the Appendix F methodology stipulated within the BRE Guidelines.
- 8.12 It should also be noted that the retained levels of daylight to the site facing habitable rooms are commensurate with typical urban located residential premises, particular inner-city such as this.

Sunlight

- 8.13 All rooms which have a window orientated within 90 degrees south retain better levels of APSH than those proposed of a mirror-massed option. In fact, every room actually retains over 25 APSH, with 5 Winter after construction of the proposed scheme in any event and therefore demonstrates full compliance with BRE Guidance in relation to sunlight amenity.

3. Queen's Wharf

- 8.14 Located to the west of the site and referenced '3' on the site plan this property contains residential accommodation. We are not in receipt of layouts for the property thus room dimensions have been assumed from external observations. There are 99 windows which we have assumed to serve 78 site facing rooms.

Daylight

- 8.15 All windows experience fully BRE compliant changes in VSC as a result of the proposed scheme; the greatest proportionate reduction being 15.9%. BRE Guidance states reductions up to 20% will be unnoticeable.
- 8.16 2 of the assumed rooms (R1/1101 and R2/1101) at first floor experience derogations from BRE Guidance in terms of NSL analysis.



Window Arrangement – Queen's Wharf Identifying NSL derogation

- 8.17 The above image identifies in yellow the two assumed rooms experiencing derogations. From the size of the windows, the rooms are most likely to secondary living space, such as bedrooms which BRE Guidance states are less important. Given the unnoticeable changes in VSC to these windows, together with the lesser expectation of daylight and that NSL is typically only considered where room layouts are known (BRE Guide 209, para 2.2.6) we consider these reductions to be acceptable.

Sunlight

- 8.18 All site facing rooms with a window orientated within 90 degrees due south experience fully BRE compliant changes in sunlight amenity as a result of the scheme.

9 Conclusion

Daylight to Surrounding Residential Properties

- 9.1 With regard to surrounding properties, the changes in daylight to Q2 and Queen's Wharf is considered to be negligible on the basis of all proportionate reductions in VSC being less than 20% their former value. Whilst there was two rooms in Queen's Wharf that experience some derogation from BRE Guidance in relation to NSL criteria, it has to be borne that NSL is usually only considered where room layouts are known and indeed that the rooms' in questions appear to have a lesser expectation of daylight.
- 9.2 Turning to Grantley Heights; this building places an unfair burden by building windows directly onto the site boundary, making greater proportionate reductions virtually unavoidable as a result of any reasonable development. As such it is appropriate to turn to Appendix F of the BRE Guide and, applying the recommended Mirror-Massing assessment which is designed to set an alternate target value for windows placed unusually close to the boundary, it is demonstrated that the proposed scheme offers better levels of daylight than the mirrored baseline. We would also submit that the retained levels of daylight to this building in any event are commensurate with typical urban properties, particularly within inner-city sites such as this.

- 9.3 The proposed scheme demonstrates good compliance with BRE Guidance in terms of daylight amenity.

Sunlight to Surrounding Residential Properties

- 9.4 Full technical analysis indicates that all residential properties experience alterations in APSH well-within keeping of the BRE recommendations, meaning the occupants will not notice a change in their existing levels of sunlight.
- 9.5 The proposed scheme demonstrates full compliance with BRE guidance in terms of sunlight amenity.
- 9.6 We fully support this planning application in terms of daylight and sunlight amenity.

Appendix A – Drawings

DRAFT



Sources: 3D Context
Zmapping (received 03/01/18)
Royal heights_281217_Solids.dwg
Emre Arolat Architecture
Proposed Info (received 11/12/17)
218-P-A-21 Proposed Floor Plans.dwg
218-P-A-13 Proposed Elevations.dwg

Key: Existing Buildings
Proposed Scheme

Project: Royal Heights,
Reading

Title: Plan View
Existing Building

Point 2 Surveyors Ltd,
3rd Floor,
17 Slingsby Place,
London WC2E 9AB
0207 836 5828
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Scheme Confirmed: --

Date : --

Drawn By: AFA/JB/NI

Scale: 1:500 @ A3

Date: Jan 18

Dwg No: P1624_01

Rel: 01



Sources: 3D Context
Zmapping (received 03/01/18)
Royal heights_281217_Solids.dwg
Emre Arolat Architecture
Proposed Info (received 11/12/17)
218-P-A-21 Proposed Floor Plans.dwg
218-P-A-13 Proposed Elevations.dwg

Key: — Existing Buildings
— Proposed Scheme
All Heights in mm AOD

Project: Royal Heights,
Reading

Title: 3D View
Existing Building

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Scheme Confirmed: --

Date : --

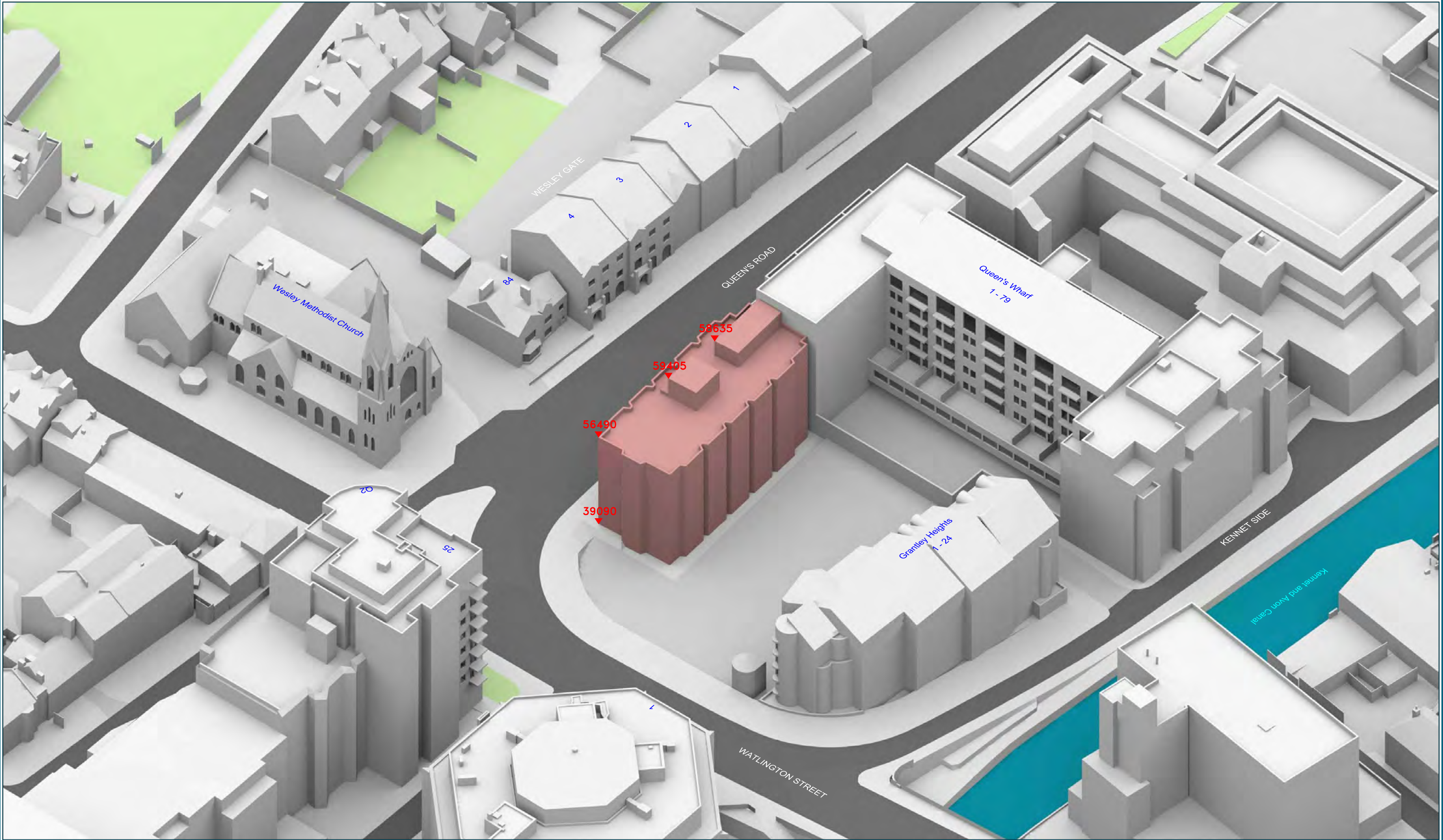
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Scale: nts @ A3

Date: Jan 18

Dwg No: **P1624_02**

Rel: 01



Sources: 3D Context
Zmapping (received 03/01/18)
Royal heights_281217_Solids.dwg
Emre Arolat Architecture
Proposed Info (received 11/12/17)
218-P-A-21 Proposed Floor Plans.dwg
218-P-A-13 Proposed Elevations.dwg

Key: Existing Buildings
Proposed Scheme
All Heights in mm AOD

Project: Royal Heights,
Reading

Title: 3D View
Existing Building

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Scheme Confirmed: --

Date : --

Drawn By: AFA/JB/NI

Scale: nts @ A3

Date: Jan 18

Dwg No: **P1624_03**

Rel: 01



Sources: 3D Context
Zmapping (received 03/01/18)
Royal heights_281217_Solids.dwg
Emre Arolat Architecture
Proposed Info (received 26/03/18)
Massing model_14.skp

Key: Existing Buildings
Proposed Scheme

Project: Royal Heights,
Reading

Title: Plan View
Grantley Heights Mirror Massing

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Scheme Confirmed: --

Date : --

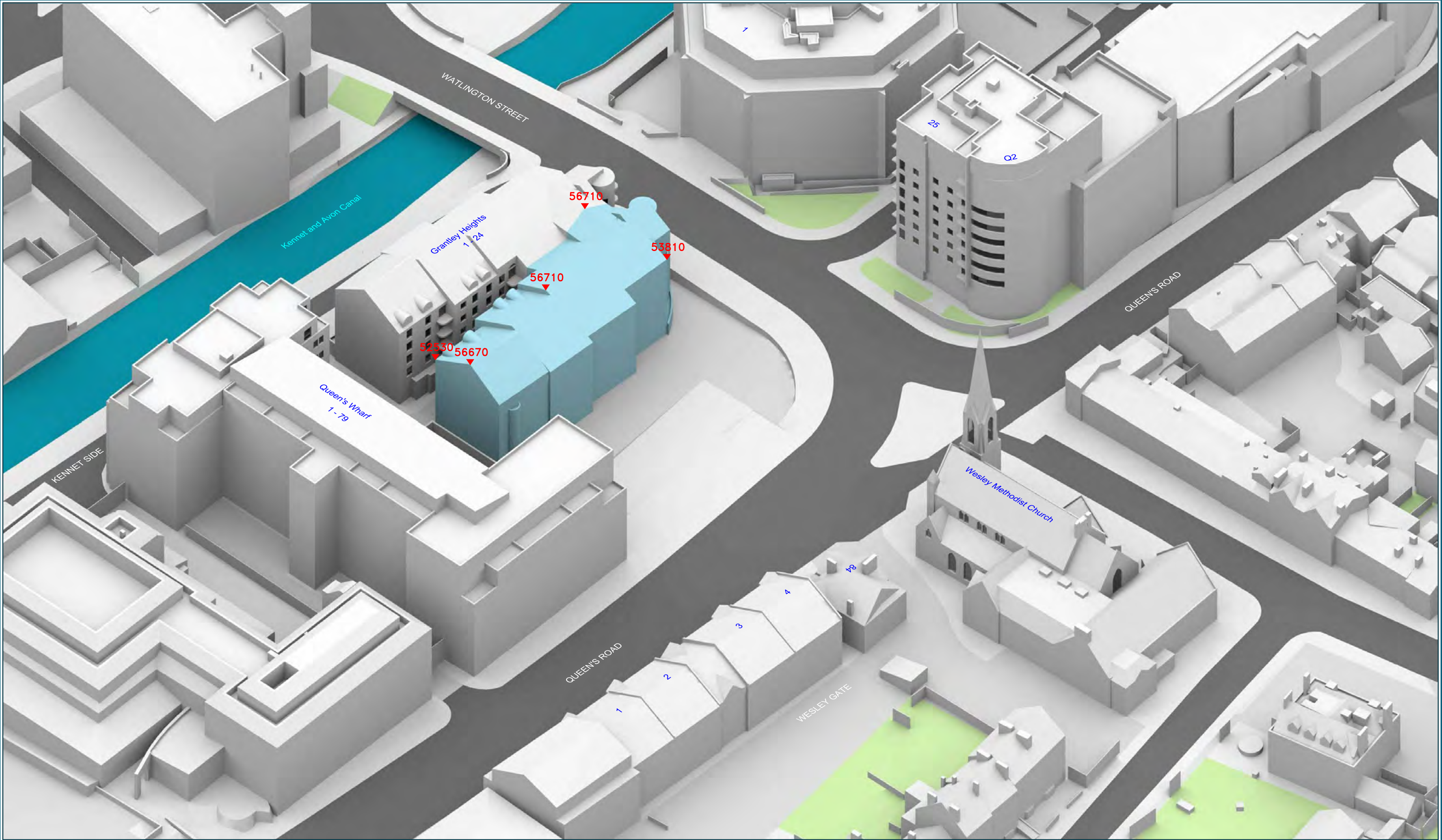
Drawn By: NI

Scale: 1:500 @ A3

Date: Mar 18

Dwg No: P1624_23

Rel: 05



Sources: 3D Context
Zmapping (received 03/01/18)
Royal heights_281217_Solids.dwg
Emre Arolat Architecture
Proposed Info (received 26/03/18)
Massing model_14.skp

Key: — Existing Buildings
— Proposed Scheme
All Heights in mm AOD

Project: Royal Heights,
Reading

Title: 3D View
Grantley Heights Mirror Massing

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Scheme Confirmed: --

Date : --

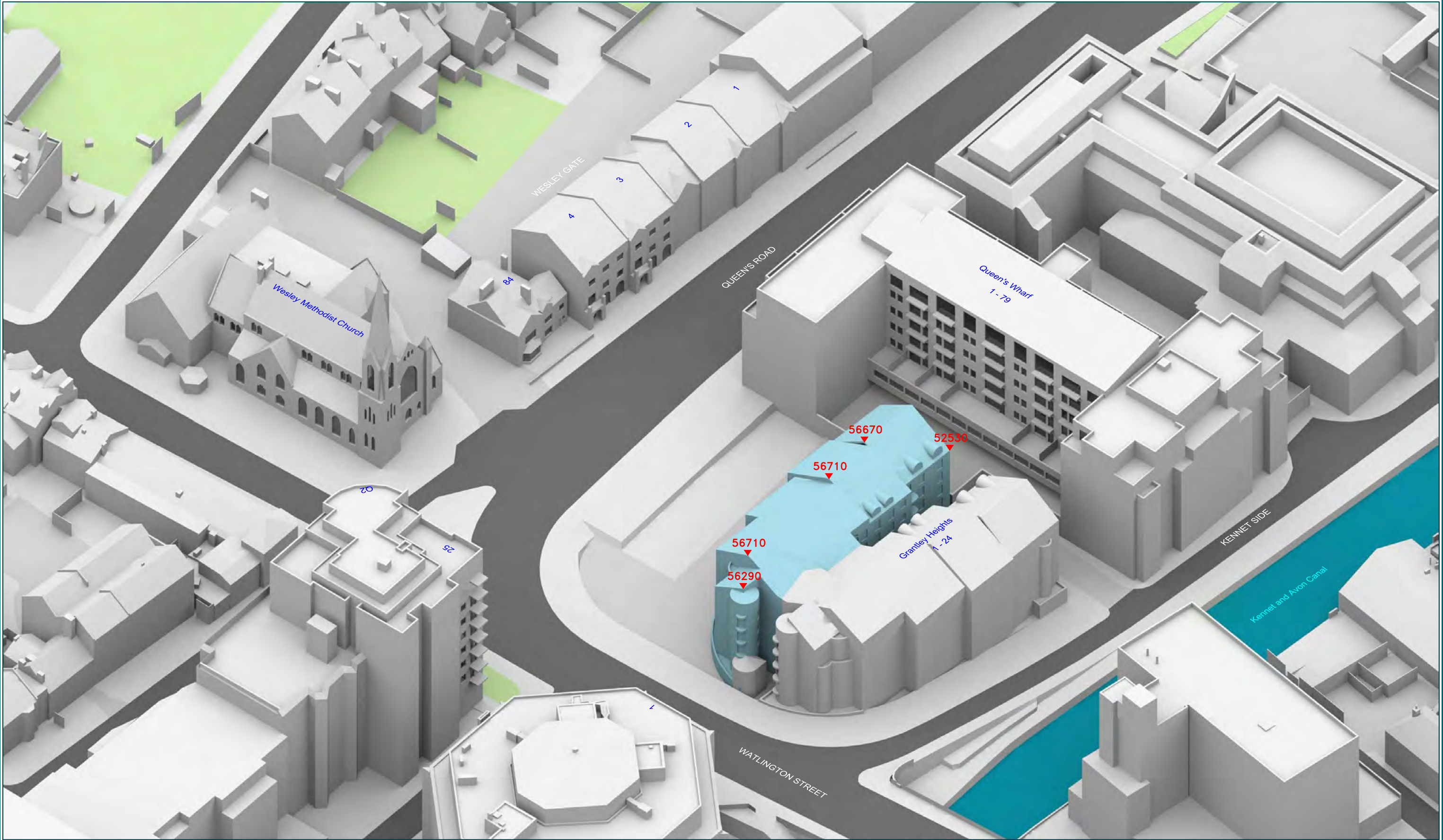
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Scale: nts @ A3

Date: Mar 18

Dwg No: **P1624_24**

Rel: 05



Sources: 3D Context
Zmapping (received 03/01/18)
Royal heights_281217_Solids.dwg
Emre Arolat Architecture
Proposed Info (received 26/03/18)
Massing model_14.skp

Key: Existing Buildings
Proposed Scheme
All Heights in mm AOD

Project: Royal Heights,
Reading

Title: 3D View
Grantley Heights Mirror Massing

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Scheme Confirmed: --

Date : --

Drawn By: NI

Scale: nts @ A3

Date: Mar 18

Dwg No: P1624_25

Rel: 05



Sources: 3D Context
Zmapping (received 03/01/18)
Royal heights_281217_Solids.dwg
Emre Arolat Architecture
Proposed 3D Model (received 30/04/18)
Massing model.skp
Proposed 2D Plans (received 30/04/18)
220-BC-2-22-{10-20}_{Level 0-9 & Roof} Plan.dwg
220-BC-2-23-{01-05} {AA to EE} sections.dwg

Key: — Existing Buildings
— Proposed Scheme

Project: Royal Heights,
Reading

Title: Plan View
Proposed Scheme Dated 30/04/18

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Scheme Confirmed: --

Date : --

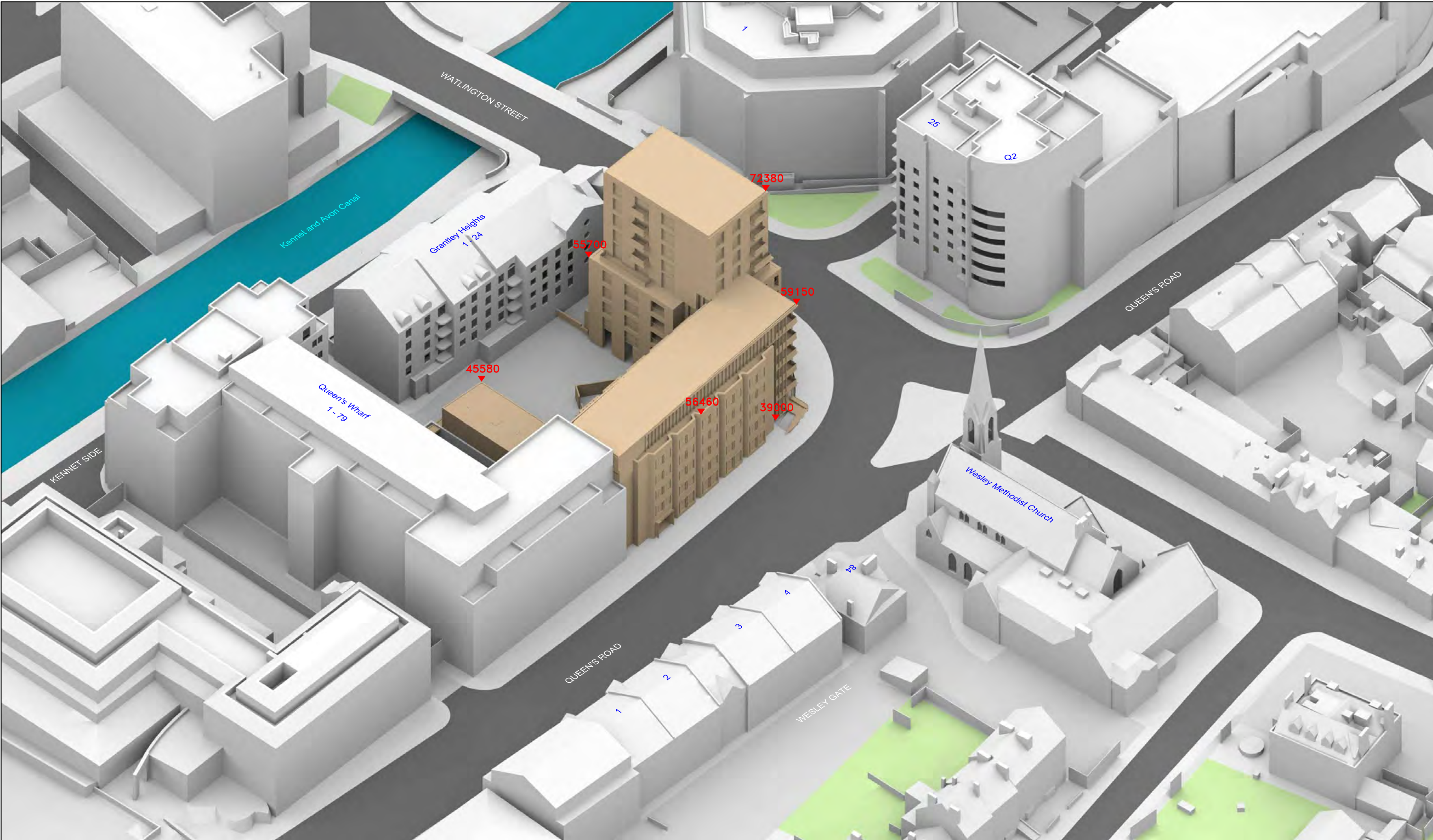
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Scale: 1:500 @ A3

Date: Apr 18

Dwg No: **P1624/26**

Rel: 08



Sources: 3D Context
Zmapping (received 03/01/18)
Royal heights_281217_Solids.dwg
Emre Arolat Architecture
Proposed 3D Model (received 30/04/18)
Massing model.skp
Proposed 2D Plans (received 30/04/18)
220-BC-2-22-{10-20}_[Level 0-9 & Roof] Plan.dwg
220-BC-2-23-{01-05} {AA to EE} sections.dwg

Key: — Existing Buildings
— Proposed Scheme
All Heights in mm AOD

Project: Royal Heights,
Reading

Title: 3D View
Proposed Scheme Dated 30/04/18

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Scheme Confirmed: --

Date : --

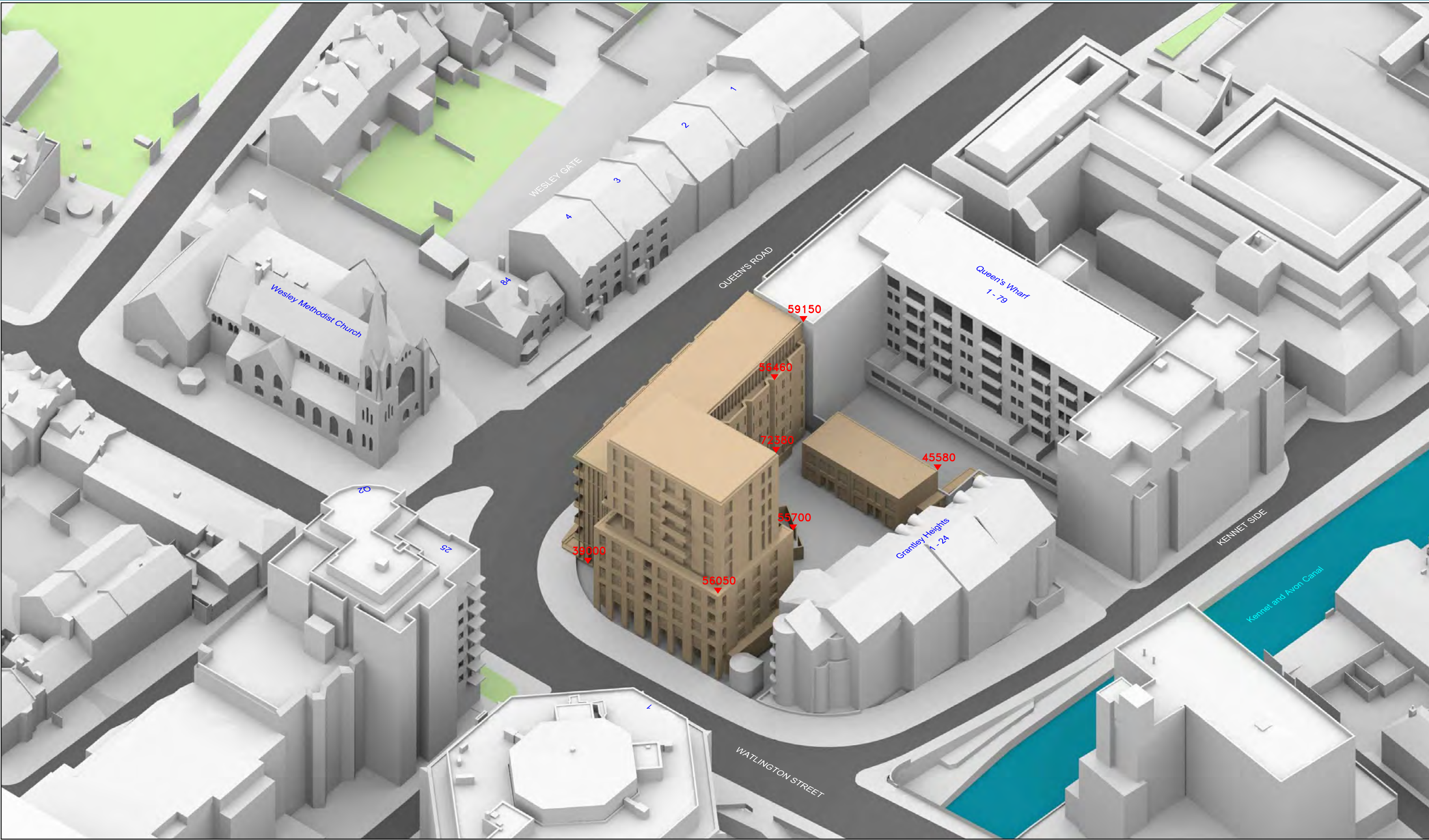
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Scale: nts @ A3

Date: Apr 18

Dwg No: **P1624/27**

Rel: 08



Sources: 3D Context
Zmapping (received 03/01/18)
Royal heights_281217_Solids.dwg
Emre Arolat Architecture
Proposed 3D Model (received 30/04/18)
Massing model.skp
Proposed 2D Plans (received 30/04/18)
220-BC-2-22-{10-20}_{Level 0-9 & Roof} Plan.dwg
220-BC-2-23-{01-05} {AA to EE} sections.dwg

Key: — Existing Buildings
— Proposed Scheme
All Heights in mm AOD

Project: Royal Heights,
Reading

Title: 3D View
Proposed Scheme Dated 30/04/18

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Scheme Confirmed: --

Date : --

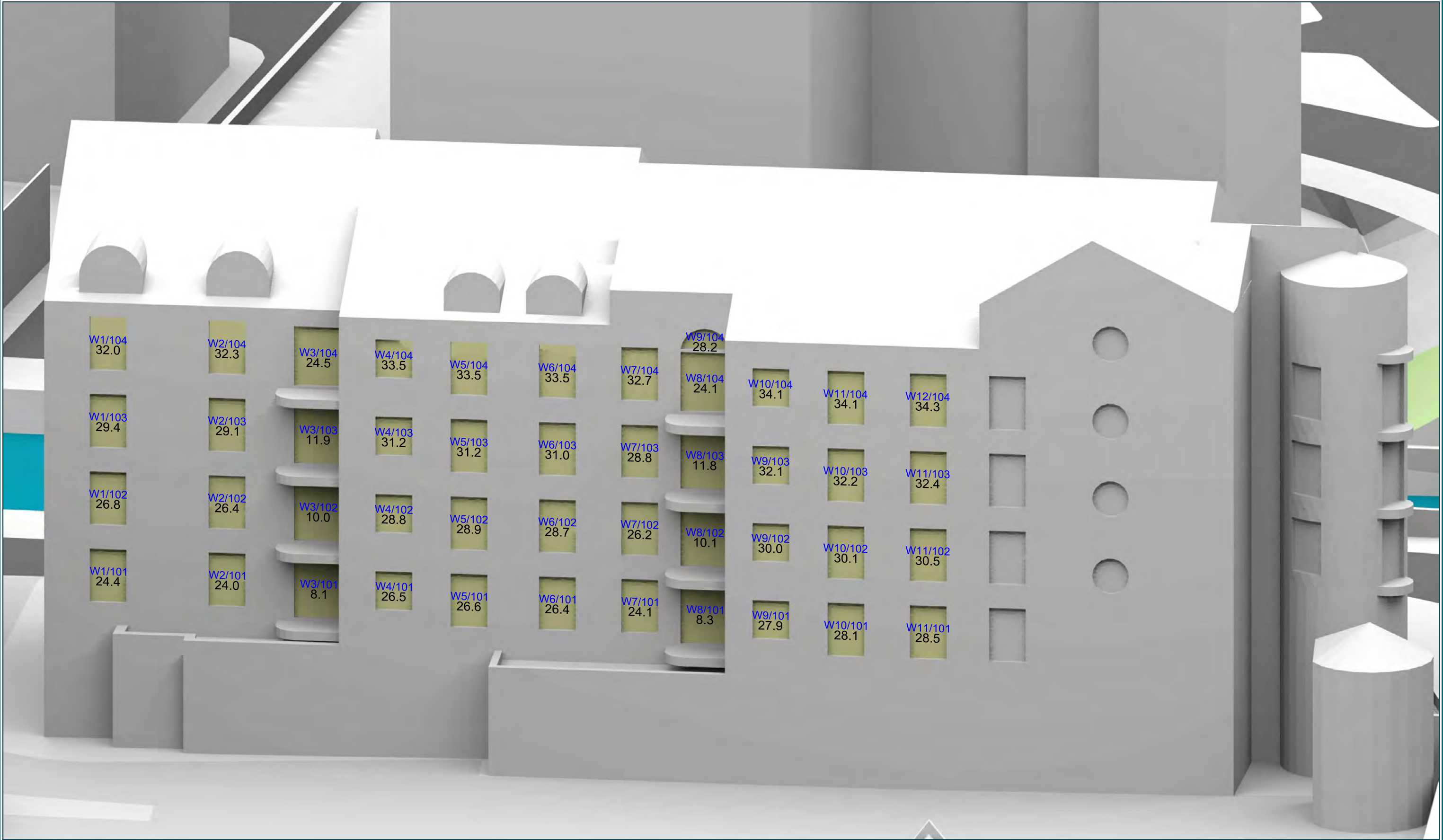
Drawn By: SDJ

Scale: nts @ A3

Date: Apr 18

Dwg No: **P1624/28**

Rel: 08



Sources: 3D Context Zmapping (received 03/01/18) Royal heights_281217_Solids.dwg Emre Arolat Architecture Proposed Info (received 09/02/18) Daylight - Sunlight.skp	Key:		Project: Royal Heights, Reading			Title: Window Locations 1-25 Grantley Heights Proposed Scheme Dated 09/02/18 Existing VSC		Point 2 Surveyors Ltd, 3rd Floor, 17 Slingsby Place, London WC2E 9AB 0207 836 5828 www.point2surveyors.com POINT surveyors
	Scheme Confirmed: --		Date : --	Drawn By: BW	Scale: nts @ A3	Date: Mar 18	Dwg No: P1624/WMR/06	Rel: 04

Appendix B – Technical Analysis

DRAFT

Room	Room Use	Window	EXISTING VSC	PROPOSED VSC	LOSS VSC	%LOSS VSC
Q2, Watlington Steet						
R1/31		W1/31	21.01	20.29	0.72	3.43
R1/31		W2/31	15.69	13.39	2.30	14.66
R1/31		W3/31	34.69	27.22	7.47	21.53
R1/31		W4/31	34.88	28.07	6.81	19.52
R2/31		W5/31	33.62	27.64	5.98	17.79
R3/31		W6/31	34.04	28.63	5.41	15.89
R4/31		W7/31	24.40	19.62	4.78	19.59
R1/32		W1/32	23.52	22.71	0.81	3.44
R1/32		W2/32	17.80	15.61	2.19	12.30
R1/32		W3/32	36.04	28.95	7.09	19.67
R1/32		W4/32	36.22	29.80	6.42	17.73
R2/32		W5/32	34.90	29.29	5.61	16.07
R3/32		W6/32	35.29	30.24	5.05	14.31
R4/32		W7/32	25.37	20.91	4.46	17.58
R1/33		W1/33	26.15	25.25	0.90	3.44
R1/33		W2/33	20.34	18.30	2.04	10.03
R1/33		W3/33	37.22	30.70	6.52	17.52
R1/33		W4/33	37.37	31.52	5.85	15.65
R2/33		W5/33	35.99	30.93	5.06	14.06
R3/33		W6/33	36.38	31.82	4.56	12.53
R4/33		W7/33	26.20	22.17	4.03	15.38
R1/34		W1/34	28.69	27.73	0.96	3.35
R1/34		W2/34	22.77	20.95	1.82	7.99
R1/34		W3/34	38.08	32.34	5.74	15.07
R1/34		W4/34	38.18	33.10	5.08	13.31
R2/34		W5/34	36.75	32.43	4.32	11.76
R3/34		W6/34	37.13	33.25	3.88	10.45
R4/34		W7/34	26.76	23.33	3.43	12.82
R1/35		W1/35	30.74	29.73	1.01	3.29
R1/35		W2/35	24.71	23.13	1.58	6.39
R1/35		W3/35	38.67	33.87	4.80	12.41
R1/35		W4/35	38.73	34.54	4.19	10.82
R2/35		W5/35	37.28	33.74	3.54	9.50

Room	Room Use	Window	EXISTING VSC	PROPOSED VSC	LOSS VSC	%LOSS VSC
R3/35		W6/35	37.64	34.50	3.14	8.34
R4/35		W7/35	27.12	24.38	2.74	10.10
R1/36		W1/36	32.42	31.43	0.99	3.05
R1/36		W2/36	26.22	24.91	1.31	5.00
R1/36		W3/36	39.10	35.18	3.92	10.03
R1/36		W4/36	39.11	35.71	3.40	8.69
R2/36		W5/36	37.66	34.79	2.87	7.62
R3/36		W6/36	38.03	35.50	2.53	6.65
R4/36		W7/36	27.42	25.20	2.22	8.10
Q2, Queens Road						
R5/31		W8/31	31.28	28.00	3.28	10.49
R5/31		W9/31	34.85	31.79	3.06	8.78
R5/31		W10/31	35.25	33.21	2.04	5.79
R5/31		W11/31	35.30	34.19	1.11	3.14
R5/32		W8/32	32.45	29.40	3.05	9.40
R5/32		W9/32	36.14	33.30	2.84	7.86
R5/32		W10/32	36.53	34.65	1.88	5.15
R5/32		W11/32	36.63	35.61	1.02	2.78
R5/33		W8/33	33.46	30.72	2.74	8.19
R5/33		W9/33	37.25	34.69	2.56	6.87
R5/33		W10/33	37.63	35.95	1.68	4.46
R5/33		W11/33	37.73	36.82	0.91	2.41
R5/34		W8/34	34.14	31.87	2.27	6.65
R5/34		W9/34	38.00	35.88	2.12	5.58
R5/34		W10/34	38.38	37.00	1.38	3.60
R5/34		W11/34	38.45	37.74	0.71	1.85
R5/35		W8/35	34.58	32.79	1.79	5.18
R5/35		W9/35	38.46	36.80	1.66	4.32
R5/35		W10/35	38.84	37.77	1.07	2.75
R5/35		W11/35	38.91	38.37	0.54	1.39
R5/36		W8/36	34.89	33.43	1.46	4.18
R5/36		W9/36	38.78	37.45	1.33	3.43
R5/36		W10/36	39.14	38.28	0.86	2.20
R5/36		W11/36	39.18	38.75	0.43	1.10
1-25 Grantley Heights - Mirror Assessment						
R1/101		W1/101	12.88	21.24	-8.36	-64.91

Room	Room Use	Window	EXISTING VSC	PROPOSED VSC	LOSS VSC	%LOSS VSC
R2/101	LIVINGROOM	W2/101	9.51	20.79	-11.28	-118.61
R2/101	LIVINGROOM	W3/101	0.67	7.54	-6.87	-1025.37
R3/101	KITCHEN	W4/101	5.58	21.07	-15.49	-277.60
R4/101	BEDROOM	W5/101	4.60	20.25	-15.65	-340.22
R5/101	BEDROOM	W6/101	3.87	19.31	-15.44	-398.97
R6/101	LIVINGROOM	W7/101	2.99	17.98	-14.99	-501.34
R6/101	LIVINGROOM	W8/101	0.36	7.07	-6.71	-1863.89
R7/101	KITCHEN	W9/101	0.00	17.19	-17.19	0.00
R8/101	BEDROOM	W10/101	0.00	15.87	-15.87	0.00
R9/101	BEDROOM	W11/101	0.00	13.30	-13.30	0.00
R1/102		W1/102	16.99	23.76	-6.77	-39.85
R2/102	LIVINGROOM	W2/102	13.82	23.23	-9.41	-68.09
R2/102	LIVINGROOM	W3/102	1.16	9.41	-8.25	-711.21
R3/102	KITCHEN	W4/102	9.01	23.48	-14.47	-160.60
R4/102	BEDROOM	W5/102	7.47	22.60	-15.13	-202.54
R5/102	BEDROOM	W6/102	6.49	21.58	-15.09	-232.51
R6/102	LIVINGROOM	W7/102	5.02	20.00	-14.98	-298.41
R6/102	LIVINGROOM	W8/102	0.57	8.71	-8.14	-1428.07
R7/102	KITCHEN	W9/102	0.00	19.19	-19.19	0.00
R8/102	BEDROOM	W10/102	0.00	17.72	-17.72	0.00
R9/102	BEDROOM	W11/102	0.00	14.84	-14.84	0.00
R1/103		W1/103	22.72	26.48	-3.76	-16.55
R2/103	LIVINGROOM	W2/103	20.47	26.11	-5.64	-27.55
R2/103	LIVINGROOM	W3/103	5.09	11.35	-6.26	-122.99
R3/103	KITCHEN	W4/103	15.74	26.03	-10.29	-65.37
R4/103	BEDROOM	W5/103	13.32	25.12	-11.80	-88.59
R5/103	BEDROOM	W6/103	12.07	24.07	-12.00	-99.42
R6/103	LIVINGROOM	W7/103	10.18	22.70	-12.52	-122.99
R6/103	LIVINGROOM	W8/103	1.09	10.42	-9.33	-855.96

Room	Room Use	Window	EXISTING VSC	PROPOSED VSC	LOSS VSC	%LOSS VSC
R7/103	KITCHEN	W9/103	0.00	21.32	-21.32	0.00
R8/103	BEDROOM	W10/103	0.00	19.71	-19.71	0.00
R9/103	BEDROOM	W11/103	0.00	16.63	-16.63	0.00
R1/104		W1/104	28.70	29.32	-0.62	-2.16
R2/104	LIVINGROOM	W2/104	28.00	29.09	-1.09	-3.89
R2/104	LIVINGROOM	W3/104	21.05	24.03	-2.98	-14.16
R3/104	KITCHEN	W4/104	26.48	28.64	-2.16	-8.16
R4/104	BEDROOM	W5/104	24.37	27.73	-3.36	-13.79
R5/104	BEDROOM	W6/104	23.04	26.78	-3.74	-16.23
R6/104	LIVINGROOM	W7/104	21.44	25.44	-4.00	-18.66
R6/104	LIVINGROOM	W8/104	14.88	22.80	-7.92	-53.23
R6/104	LIVINGROOM	W9/104	23.28	24.81	-1.53	-6.57
R7/104	KITCHEN	W10/104	0.00	23.52	-23.52	0.00
R8/104	BEDROOM	W11/104	0.00	21.81	-21.81	0.00
R9/104	BEDROOM	W12/104	0.00	18.82	-18.82	0.00
1-25 Grantley Heights						
R1/101		W1/101	24.40	21.24	3.16	12.95
R2/101	LIVINGROOM	W2/101	24.04	20.79	3.25	13.52
R2/101	LIVINGROOM	W3/101	8.12	7.54	0.58	7.14
R3/101	KITCHEN	W4/101	26.46	21.07	5.39	20.37
R4/101	BEDROOM	W5/101	26.56	20.25	6.31	23.76
R5/101	BEDROOM	W6/101	26.39	19.31	7.08	26.83
R6/101	LIVINGROOM	W7/101	24.13	17.98	6.15	25.49
R6/101	LIVINGROOM	W8/101	8.29	7.07	1.22	14.72
R7/101	KITCHEN	W9/101	27.92	17.19	10.73	38.43
R8/101	BEDROOM	W10/101	28.09	15.87	12.22	43.50
R9/101	BEDROOM	W11/101	28.50	13.30	15.20	53.33
R1/102		W1/102	26.83	23.76	3.07	11.44
R2/102	LIVINGROOM	W2/102	26.40	23.23	3.17	12.01

Room	Room Use	Window	EXISTING VSC	PROPOSED VSC	LOSS VSC	%LOSS VSC
R2/102	LIVINGROOM	W3/102	10.02	9.41	0.61	6.09
R3/102	KITCHEN	W4/102	28.81	23.48	5.33	18.50
R4/102	BEDROOM	W5/102	28.87	22.60	6.27	21.72
R5/102	BEDROOM	W6/102	28.66	21.58	7.08	24.70
R6/102	LIVINGROOM	W7/102	26.20	20.00	6.20	23.66
R6/102	LIVINGROOM	W8/102	10.05	8.71	1.34	13.33
R7/102	KITCHEN	W9/102	30.03	19.19	10.84	36.10
R8/102	BEDROOM	W10/102	30.13	17.72	12.41	41.19
R9/102	BEDROOM	W11/102	30.45	14.84	15.61	51.26
R1/103		W1/103	29.36	26.48	2.88	9.81
R2/103	LIVINGROOM	W2/103	29.11	26.11	3.00	10.31
R2/103	LIVINGROOM	W3/103	11.92	11.35	0.57	4.78
R3/103	KITCHEN	W4/103	31.16	26.03	5.13	16.46
R4/103	BEDROOM	W5/103	31.19	25.12	6.07	19.46
R5/103	BEDROOM	W6/103	31.01	24.07	6.94	22.38
R6/103	LIVINGROOM	W7/103	28.81	22.70	6.11	21.21
R6/103	LIVINGROOM	W8/103	11.79	10.42	1.37	11.62
R7/103	KITCHEN	W9/103	32.12	21.32	10.80	33.62
R8/103	BEDROOM	W10/103	32.16	19.71	12.45	38.71
R9/103	BEDROOM	W11/103	32.39	16.63	15.76	48.66
R1/104		W1/104	31.97	29.32	2.65	8.29
R2/104	LIVINGROOM	W2/104	32.30	29.09	3.21	9.94
R2/104	LIVINGROOM	W3/104	24.52	24.03	0.49	2.00
R3/104	KITCHEN	W4/104	33.47	28.64	4.83	14.43
R4/104	BEDROOM	W5/104	33.49	27.73	5.76	17.20
R5/104	BEDROOM	W6/104	33.50	26.78	6.72	20.06
R6/104	LIVINGROOM	W7/104	32.70	25.44	7.26	22.20
R6/104	LIVINGROOM	W8/104	24.14	22.80	1.34	5.55
R6/104	LIVINGROOM	W9/104	28.15	24.81	3.34	11.87

Room	Room Use	Window	EXISTING VSC	PROPOSED VSC	LOSS VSC	%LOSS VSC
R7/104	KITCHEN	W10/104	34.12	23.52	10.60	31.07
R8/104	BEDROOM	W11/104	34.11	21.81	12.30	36.06
R9/104	BEDROOM	W12/104	34.25	18.82	15.43	45.05
Queens Wharf, 47 Queen's Road						
R1/1101		W1/1101	17.82	15.01	2.81	15.77
R2/1101		W2/1101	18.76	15.91	2.85	15.19
R3/1101		W3/1101	18.62	15.66	2.96	15.90
R3/1101		W4/1101	20.23	17.26	2.97	14.68
R4/1101		W5/1101	21.87	18.87	3.00	13.72
R4/1101		W6/1101	22.07	19.03	3.04	13.77
R5/1101		W7/1101	27.40	24.38	3.02	11.02
R6/1101		W8/1101	27.58	24.61	2.97	10.77
R7/1101		W9/1101	23.42	20.64	2.78	11.87
R8/1101		W10/1101	27.77	25.12	2.65	9.54
R9/1101		W11/1101	27.53	25.03	2.50	9.08
R10/1101		W12/1101	22.30	19.93	2.37	10.63
R10/1101		W13/1101	21.85	19.48	2.37	10.85
R11/1101		W14/1101	19.74	17.83	1.91	9.68
R11/1101		W15/1101	17.70	15.52	2.18	12.32
R12/1101		W16/1101	16.91	14.93	1.98	11.71
R13/1101		W17/1101	14.36	13.32	1.04	7.24
R13/1101		W18/1101	16.20	15.09	1.11	6.85
R14/1101		W19/1101	17.53	16.33	1.20	6.85
R15/1101		W20/1101	19.72	18.53	1.19	6.03
R16/1101		W21/1101	20.38	19.20	1.18	5.79
R1/1102		W1/1102	19.04	16.45	2.59	13.60
R2/1102		W2/1102	20.43	17.79	2.64	12.92
R3/1102		W3/1102	20.57	17.82	2.75	13.37
R3/1102		W4/1102	23.00	20.19	2.81	12.22

Room	Room Use	Window	EXISTING VSC	PROPOSED VSC	LOSS VSC	%LOSS VSC
R4/1102		W5/1102	24.47	21.63	2.84	11.61
R4/1102		W6/1102	25.25	22.39	2.86	11.33
R5/1102		W7/1102	30.03	27.22	2.81	9.36
R6/1102		W8/1102	30.21	27.43	2.78	9.20
R7/1102		W9/1102	26.71	24.11	2.60	9.73
R8/1102		W10/1102	30.59	28.16	2.43	7.94
R9/1102		W11/1102	30.49	28.20	2.29	7.51
R10/1102		W12/1102	25.89	23.72	2.17	8.38
R10/1102		W13/1102	25.29	23.12	2.17	8.58
R11/1102		W14/1102	23.47	21.45	2.02	8.61
R11/1102		W15/1102	20.49	18.52	1.97	9.61
R12/1102		W16/1102	19.30	17.51	1.79	9.27
R13/1102		W17/1102	17.20	15.46	1.74	10.12
R14/1102		W18/1102	15.75	14.69	1.06	6.73
R14/1102		W19/1102	18.07	16.94	1.13	6.25
R15/1102		W20/1102	19.65	18.49	1.16	5.90
R16/1102		W21/1102	22.58	21.37	1.21	5.36
R17/1102		W22/1102	23.48	22.28	1.20	5.11
R1/1103		W1/1103	20.48	18.11	2.37	11.57
R2/1103		W2/1103	22.44	20.03	2.41	10.74
R3/1103		W3/1103	22.94	20.39	2.55	11.12
R3/1103		W4/1103	25.58	22.99	2.59	10.13
R4/1103		W5/1103	27.29	24.69	2.60	9.53
R4/1103		W6/1103	27.92	25.30	2.62	9.38
R5/1103		W7/1103	32.56	30.03	2.53	7.77
R6/1103		W8/1103	32.86	30.36	2.50	7.61
R7/1103		W9/1103	29.29	27.00	2.29	7.82
R8/1103		W10/1103	33.26	31.11	2.15	6.46
R9/1103		W11/1103	33.13	31.12	2.01	6.07

Room	Room Use	Window	EXISTING VSC	PROPOSED VSC	LOSS VSC	%LOSS VSC
R10/1103		W12/1103	28.87	26.94	1.93	6.69
R10/1103		W13/1103	28.58	26.65	1.93	6.75
R11/1103		W14/1103	26.82	25.04	1.78	6.64
R11/1103		W15/1103	23.78	22.04	1.74	7.32
R12/1103		W16/1103	22.24	20.66	1.58	7.10
R13/1103		W17/1103	19.49	17.93	1.56	8.00
R14/1103		W18/1103	17.29	16.32	0.97	5.61
R14/1103		W19/1103	20.34	19.30	1.04	5.11
R15/1103		W20/1103	22.21	21.12	1.09	4.91
R16/1103		W21/1103	26.06	24.80	1.26	4.83
R17/1103		W22/1103	27.23	25.89	1.34	4.92
R1/1104		W1/1104	22.47	20.39	2.08	9.26
R2/1104		W2/1104	25.47	23.39	2.08	8.17
R3/1104		W3/1104	26.36	24.22	2.14	8.12
R3/1104		W4/1104	28.74	26.55	2.19	7.62
R4/1104		W5/1104	30.31	28.10	2.21	7.29
R4/1104		W6/1104	30.76	28.54	2.22	7.22
R5/1104		W7/1104	35.24	33.10	2.14	6.07
R6/1104		W8/1104	35.50	33.41	2.09	5.89
R7/1104		W9/1104	31.74	29.80	1.94	6.11
R8/1104		W10/1104	35.89	34.05	1.84	5.13
R9/1104		W11/1104	35.80	34.09	1.71	4.78
R10/1104		W12/1104	31.70	30.05	1.65	5.21
R10/1104		W13/1104	31.64	29.97	1.67	5.28
R11/1104		W14/1104	30.29	28.75	1.54	5.08
R11/1104		W15/1104	27.82	26.33	1.49	5.36
R12/1104		W16/1104	25.97	24.63	1.34	5.16
R13/1104		W17/1104	22.11	20.78	1.33	6.02
R14/1104		W18/1104	19.47	18.65	0.82	4.21
R14/1104		W19/1104	23.00	22.12	0.88	3.83

Room	Room Use	Window	EXISTING VSC	PROPOSED VSC	LOSS VSC	%LOSS VSC
R15/1104		W20/1104	25.68	24.73	0.95	3.70
R16/1104		W21/1104	30.24	29.14	1.10	3.64
R17/1104		W22/1104	31.42	30.24	1.18	3.76
R1/1105		W1/1105	29.18	27.41	1.77	6.07
R3/1105		W2/1105	35.47	33.65	1.82	5.13
R4/1105		W3/1105	37.51	35.84	1.67	4.45
R5/1105		W4/1105	37.90	36.27	1.63	4.30
R7/1105		W5/1105	38.05	36.59	1.46	3.84
R8/1105		W6/1105	38.07	36.71	1.36	3.57
R10/1105		W7/1105	37.98	36.70	1.28	3.37
R11/1105		W8/1105	36.65	35.44	1.21	3.30
R12/1105		W9/1105	29.57	28.44	1.13	3.82
R13/1105		W10/1105	33.58	32.75	0.83	2.47
R13/1105		W11/1105	31.84	30.57	1.27	3.99
R14/1105		W12/1105	26.34	25.38	0.96	3.64

Room/ Floor	Room Use	Whole Room	Prev sq ft	New sq ft	Loss sq ft	%Loss
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Q2, Watlington Steet

R1/31		289.3	285.6	285.6	0.0	0.0
R2/31		122.0	119.9	107.0	12.9	10.8
R3/31		125.9	123.5	116.1	7.4	6.0
R4/31		125.5	120.9	120.9	0.0	0.0
R1/32		289.3	285.8	285.8	0.0	0.0
R2/32		122.0	119.9	116.4	3.5	2.9
R3/32		125.9	123.5	122.3	1.2	1.0
R4/32		125.5	120.9	120.9	0.0	0.0
R1/33		289.3	287.7	287.7	0.0	0.0
R2/33		122.0	119.9	118.3	1.5	1.3
R3/33		125.9	123.5	123.5	0.0	0.0
R4/33		125.5	120.9	120.9	0.0	0.0
R1/34		289.3	289.1	289.1	0.0	0.0
R2/34		122.0	119.9	119.4	0.5	0.4
R3/34		125.9	123.5	123.5	0.0	0.0
R4/34		125.5	120.9	120.9	0.0	0.0
R1/35		289.3	289.3	289.3	0.0	0.0
R2/35		122.0	119.9	119.9	0.0	0.0
R3/35		125.9	123.5	123.5	0.0	0.0
R4/35		125.5	120.9	120.9	0.0	0.0
R1/36		289.3	289.3	289.3	0.0	0.0
R2/36		122.0	119.9	119.9	0.0	0.0
R3/36		125.9	123.5	123.5	0.0	0.0
R4/36		125.5	120.9	120.9	0.0	0.0

Q2, Queens Road

R5/31		214.5	214.4	214.0	0.4	0.2
R5/32		214.5	214.4	214.2	0.3	0.1
R5/33		214.5	214.4	214.2	0.2	0.1
R5/34		214.5	214.4	214.4	0.0	0.0
R5/35		214.5	214.4	214.4	0.0	0.0
R5/36		214.5	214.4	214.4	0.0	0.0

1-25 Grantley Heights

R1/101		210.9	116.9	100.3	16.6	14.2
R2/101	LIVINGROOM	251.0	143.8	123.4	20.4	14.2
R3/101	KITCHEN	86.5	74.1	60.4	13.6	18.4
R4/101	BEDROOM	112.1	96.4	77.6	18.8	19.5
R5/101	BEDROOM	122.6	84.5	68.1	16.4	19.4
R6/101	LIVINGROOM	241.0	171.5	123.7	47.8	27.9
R7/101	KITCHEN	86.3	72.1	50.9	21.2	29.4
R8/101	BEDROOM	112.3	96.3	63.1	33.2	34.5
R9/101	BEDROOM	123.3	94.2	57.7	36.5	38.7
R1/102		210.9	156.6	136.3	20.4	13.0
R2/102	LIVINGROOM	251.0	187.6	162.7	24.9	13.3
R3/102	KITCHEN	86.5	85.7	77.3	8.4	9.8
R4/102	BEDROOM	112.1	110.0	97.5	12.5	11.4
R5/102	BEDROOM	122.6	108.1	85.6	22.5	20.8

Room/ Floor	Room Use	Whole Room	Prev sq ft	New sq ft	Loss sq ft	%Loss
R6/102	LIVINGROOM	241.0	203.7	162.1	41.6	20.4
R7/102	KITCHEN	86.3	84.5	65.2	19.4	23.0
R8/102	BEDROOM	112.3	109.9	81.2	28.7	26.1
R9/102	BEDROOM	123.3	107.5	71.5	36.0	33.5
R1/103		210.9	183.9	183.8	0.1	0.1
R2/103	LIVINGROOM	251.0	237.0	219.1	18.0	7.6
R3/103	KITCHEN	86.5	85.7	84.8	0.9	1.1
R4/103	BEDROOM	112.1	110.0	106.8	3.1	2.8
R5/103	BEDROOM	122.6	121.2	113.1	8.1	6.7
R6/103	LIVINGROOM	241.0	235.1	223.5	11.6	4.9
R7/103	KITCHEN	86.3	84.8	79.9	5.0	5.9
R8/103	BEDROOM	112.3	110.2	100.4	9.8	8.9
R9/103	BEDROOM	123.3	121.3	91.0	30.3	25.0
R1/104		210.9	200.9	200.9	0.0	0.0
R2/104	LIVINGROOM	251.0	243.6	243.6	0.0	0.0
R3/104	KITCHEN	86.5	85.7	85.7	0.0	0.0
R4/104	BEDROOM	112.1	110.0	109.2	0.7	0.6
R5/104	BEDROOM	122.6	121.3	120.2	1.1	0.9
R6/104	LIVINGROOM	241.0	237.0	234.5	2.6	1.1
R7/104	KITCHEN	86.3	84.8	80.3	4.5	5.3
R8/104	BEDROOM	112.3	110.2	101.1	9.1	8.3
R9/104	BEDROOM	123.3	121.3	107.7	13.7	11.3

Queens Wharf, 47 Queen's Road

R1/1101	83.7	81.5	52.8	28.7	35.2
R2/1101	75.5	61.5	46.1	15.4	25.0
R3/1101	214.7	209.7	205.7	3.9	1.9
R4/1101	221.4	218.2	218.2	0.0	0.0
R5/1101	82.2	81.4	72.4	9.0	11.1
R6/1101	85.9	84.9	74.7	10.2	12.0
R7/1101	238.0	235.1	235.1	0.0	0.0
R8/1101	85.9	84.9	84.9	0.0	0.0
R9/1101	82.2	81.4	73.6	7.8	9.6
R10/1101	221.4	218.7	218.7	0.0	0.0
R11/1101	214.7	203.0	203.0	0.0	0.0
R12/1101	75.5	45.0	45.0	0.0	0.0
R13/1101	105.6	96.9	95.2	1.7	1.8
R14/1101	89.4	49.8	49.8	0.0	0.0
R15/1101	89.4	81.6	79.7	2.0	2.5
R16/1101	93.5	63.5	63.1	0.3	0.5
R1/1102	83.7	82.6	66.7	15.8	19.1
R2/1102	75.5	66.9	61.4	5.4	8.1
R3/1102	214.7	210.7	210.0	0.7	0.3
R4/1102	221.4	218.8	218.8	0.0	0.0
R5/1102	82.2	81.4	72.7	8.8	10.8
R6/1102	85.9	85.0	75.5	9.5	11.2
R7/1102	238.0	235.7	235.7	0.0	0.0
R8/1102	85.9	85.0	85.0	0.0	0.0
R9/1102	82.2	81.4	74.8	6.6	8.1
R10/1102	221.4	219.2	219.2	0.0	0.0
R11/1102	214.7	211.9	211.9	0.0	0.0
R12/1102	75.5	65.4	65.4	0.0	0.0

Room/ Floor	Room Use	Whole Room	Prev sq ft	New sq ft	Loss sq ft	%Loss
R13/1102		62.2	58.7	58.7	0.0	0.0
R14/1102		105.6	105.5	105.5	0.0	0.0
R15/1102		89.4	61.0	61.0	0.0	0.0
R16/1102		89.4	87.8	87.8	0.0	0.0
R17/1102		93.5	79.5	79.5	0.0	0.0
R1/1103		83.7	82.7	74.9	7.9	9.6
R2/1103		75.5	70.3	66.4	3.9	5.5
R3/1103		214.7	212.1	212.1	0.0	0.0
R4/1103		221.4	219.3	219.3	0.0	0.0
R5/1103		82.2	81.4	74.6	6.8	8.4
R6/1103		85.9	85.0	77.4	7.6	8.9
R7/1103		238.0	237.2	237.2	0.0	0.0
R8/1103		85.9	85.0	85.0	0.0	0.0
R9/1103		82.2	81.4	76.5	4.9	6.0
R10/1103		221.4	219.4	219.4	0.0	0.0
R11/1103		214.7	212.1	212.1	0.0	0.0
R12/1103		75.5	72.2	72.2	0.0	0.0
R13/1103		62.2	61.9	61.9	0.0	0.0
R14/1103		105.6	105.5	105.5	0.0	0.0
R15/1103		89.4	66.6	66.6	0.0	0.0
R16/1103		89.4	87.8	87.8	0.0	0.0
R17/1103		93.5	89.4	89.4	0.0	0.0
R1/1104		83.7	82.8	79.1	3.7	4.5
R2/1104		75.5	74.0	72.4	1.6	2.2
R3/1104		214.7	213.0	213.0	0.0	0.0
R4/1104		221.4	220.2	220.2	0.0	0.0
R5/1104		82.2	81.4	78.1	3.3	4.1
R6/1104		85.9	85.0	81.4	3.6	4.2
R7/1104		238.0	237.5	237.5	0.0	0.0
R8/1104		85.9	85.0	85.0	0.0	0.0
R9/1104		82.2	81.4	79.7	1.8	2.2
R10/1104		221.4	220.2	220.2	0.0	0.0
R11/1104		214.7	213.0	213.0	0.0	0.0
R12/1104		75.5	74.0	74.0	0.0	0.0
R13/1104		62.2	62.0	62.0	0.0	0.0
R14/1104		105.6	105.5	105.5	0.0	0.0
R15/1104		89.4	79.4	79.4	0.0	0.0
R16/1104		89.4	87.8	87.8	0.0	0.0
R17/1104		93.5	91.7	91.7	0.0	0.0
R1/1105		163.7	163.0	163.0	0.0	0.0
R3/1105		214.7	214.2	214.2	0.0	0.0
R4/1105		221.4	220.9	220.9	0.0	0.0
R5/1105		172.7	171.9	171.9	0.0	0.0
R7/1105		238.0	237.5	237.5	0.0	0.0
R8/1105		172.7	171.9	171.9	0.0	0.0
R10/1105		221.4	220.9	220.9	0.0	0.0
R11/1105		214.7	214.2	214.2	0.0	0.0
R12/1105		142.2	141.8	141.8	0.0	0.0
R13/1105		138.7	138.1	138.1	0.0	0.0
R14/1105		66.7	64.4	64.4	0.0	0.0

Room	Window	Room Use	Window		Room		Winter %Loss	Annual %Loss	Winter APSH	Annual APSH	Winter %Loss	Annual %Loss	Winter APSH	Annual APSH
			Existing	Proposed	Existing	Proposed								
			Winter APSH	Annual APSH	Winter APSH	Annual APSH								
Q2, Watlington Steet														
R1/31	W1/31		0	3	0	0	-	100.0						
R1/31	W2/31		0	9	0	0	-	100.0						
R1/31	W3/31		18	54	18	44	0.0	18.5						
R1/31	W4/31		17	53	17	45	0.0	15.1	18	54	18	46	0.0	14.8
R2/31	W5/31		13	49	13	41	0.0	16.3	13	49	13	41	0.0	16.3
R3/31	W6/31		15	50	15	43	0.0	14.0	15	50	15	43	0.0	14.0
R4/31	W7/31		6	30	6	25	0.0	16.7	6	30	6	25	0.0	16.7
R1/32	W1/32		0	4	0	1	-	75.0						
R1/32	W2/32		0	10	0	1	-	90.0						
R1/32	W3/32		19	56	18	45	5.3	19.6						
R1/32	W4/32		18	55	17	46	5.6	16.4	19	56	18	48	5.3	14.3
R2/32	W5/32		14	50	14	42	0.0	16.0	14	50	14	42	0.0	16.0
R3/32	W6/32		15	50	15	43	0.0	14.0	15	50	15	43	0.0	14.0
R4/32	W7/32		6	30	6	25	0.0	16.7	6	30	6	25	0.0	16.7
R1/33	W1/33		0	4	0	1	-	75.0						
R1/33	W2/33		0	10	0	1	-	90.0						
R1/33	W3/33		19	56	18	46	5.3	17.9						
R1/33	W4/33		18	55	18	47	0.0	14.5	19	56	19	49	0.0	12.5
R2/33	W5/33		14	50	14	42	0.0	16.0	14	50	14	42	0.0	16.0

Room	Window	Room Use	Window						Room					
			Existing		Proposed		Winter %Loss	Annual %Loss	Existing		Proposed		Winter %Loss	Annual %Loss
			Winter APSH	Annual APSH	Winter APSH	Annual APSH			Winter APSH	Annual APSH	Winter APSH	Annual APSH		
R3/33	W6/33		15	50	15	43	0.0	14.0	15	50	15	43	0.0	14.0
R4/33	W7/33		6	31	6	25	0.0	19.4	6	31	6	25	0.0	19.4
R1/34	W1/34		0	4	0	1	-	75.0						
R1/34	W2/34		0	10	0	2	-	80.0						
R1/34	W3/34		20	57	19	47	5.0	17.5						
R1/34	W4/34		19	56	18	47	5.3	16.1	20	57	19	50	5.0	12.3
R2/34	W5/34		15	51	15	44	0.0	13.7	15	51	15	44	0.0	13.7
R3/34	W6/34		15	50	15	44	0.0	12.0	15	50	15	44	0.0	12.0
R4/34	W7/34		6	31	6	26	0.0	16.1	6	31	6	26	0.0	16.1
R1/35	W1/35		0	4	0	1	-	75.0						
R1/35	W2/35		0	10	0	3	-	70.0						
R1/35	W3/35		20	58	20	52	0.0	10.3						
R1/35	W4/35		19	56	19	49	0.0	12.5	20	58	20	52	0.0	10.3
R2/35	W5/35		15	51	15	45	0.0	11.8	15	51	15	45	0.0	11.8
R3/35	W6/35		15	50	15	44	0.0	12.0	15	50	15	44	0.0	12.0
R4/35	W7/35		6	31	6	26	0.0	16.1	6	31	6	26	0.0	16.1
R1/36	W1/36		0	4	0	1	-	75.0						
R1/36	W2/36		0	10	0	6	-	40.0						
R1/36	W3/36		20	58	20	53	0.0	8.6						
R1/36	W4/36		19	57	19	51	0.0	10.5	20	58	20	54	0.0	6.9

Room	Window	Room Use	Window						Room					
			Existing		Proposed		Winter %Loss	Annual %Loss	Existing		Proposed		Winter %Loss	Annual %Loss
			Winter APSH	Annual APSH	Winter APSH	Annual APSH			Winter APSH	Annual APSH	Winter APSH	Annual APSH		
R2/36	W5/36		16	52	16	47	0.0	9.6	16	52	16	47	0.0	9.6
R3/36	W6/36		15	50	15	45	0.0	10.0	15	50	15	45	0.0	10.0
R4/36	W7/36		6	31	6	28	0.0	9.7	6	31	6	28	0.0	9.7
Q2, Queens Road														
R5/31	W8/31		20	58	20	53	0.0	8.6						
R5/31	W9/31		23	64	23	59	0.0	7.8						
R5/31	W10/31		25	71	25	66	0.0	7.0						
R5/31	W11/31		26	75	26	70	0.0	6.7	26	75	26	70	0.0	6.7
R5/32	W8/32		21	59	21	55	0.0	6.8						
R5/32	W9/32		24	65	24	61	0.0	6.2						
R5/32	W10/32		25	71	25	67	0.0	5.6						
R5/32	W11/32		26	75	26	71	0.0	5.3	27	76	27	72	0.0	5.3
R5/33	W8/33		21	60	21	56	0.0	6.7						
R5/33	W9/33		24	66	24	62	0.0	6.1						
R5/33	W10/33		25	72	25	68	0.0	5.6						
R5/33	W11/33		26	76	26	72	0.0	5.3	27	77	27	73	0.0	5.2
R5/34	W8/34		21	60	21	57	0.0	5.0						
R5/34	W9/34		24	66	24	63	0.0	4.5						
R5/34	W10/34		25	72	25	69	0.0	4.2						
R5/34	W11/34		26	76	26	74	0.0	2.6	27	77	27	75	0.0	2.6
R5/35	W8/35		21	60	21	57	0.0	5.0						
R5/35	W9/35		24	66	24	64	0.0	3.0						
R5/35	W10/35		26	73	26	71	0.0	2.7						

Room	Window	Room Use	Window		Room		Winter %Loss	Annual %Loss	Winter APSH	Annual APSH	Winter %Loss	Annual %Loss	Winter APSH	Annual APSH
			Existing	Proposed	Existing	Proposed								
			Winter APSH	Annual APSH	Winter APSH	Annual APSH								
R5/35	W11/35		26	76	26	74	0.0	2.6	27	77	27	75	0.0	2.6
R5/36	W8/36		21	60	21	58	0.0	3.3						
R5/36	W9/36		24	66	24	64	0.0	3.0						
R5/36	W10/36		26	73	26	71	0.0	2.7						
R5/36	W11/36		26	76	26	74	0.0	2.6	27	77	27	75	0.0	2.6
1-25 Grantley Heights														
R1/101	W1/101		12	58	8	43	33.3	25.9	12	58	8	43	33.3	25.9
R2/101	W2/101	LIVINGROOM	14	59	10	49	28.6	16.9						
R2/101	W3/101	LIVINGROOM	10	17	9	16	10.0	5.9	14	59	10	49	28.6	16.9
R3/101	W4/101	KITCHEN	11	62	8	46	27.3	25.8	11	62	8	46	27.3	25.8
R4/101	W5/101	BEDROOM	11	62	8	46	27.3	25.8	11	62	8	46	27.3	25.8
R5/101	W6/101	BEDROOM	11	60	9	43	18.2	28.3	11	60	9	43	18.2	28.3
R6/101	W7/101	LIVINGROOM	13	54	10	43	23.1	20.4						
R6/101	W8/101	LIVINGROOM	10	20	10	20	0.0	0.0	13	54	10	43	23.1	20.4
R7/101	W9/101	KITCHEN	15	68	11	45	26.7	33.8	15	68	11	45	26.7	33.8
R8/101	W10/101	BEDROOM	15	67	8	39	46.7	41.8	15	67	8	39	46.7	41.8
R9/101	W11/101	BEDROOM	15	67	7	34	53.3	49.3	15	67	7	34	53.3	49.3
R1/102	W1/102		15	66	12	52	20.0	21.2	15	66	12	52	20.0	21.2

Room	Window	Room Use	Window						Room					
			Existing		Proposed		Winter %Loss	Annual %Loss	Existing		Proposed		Winter %Loss	Annual %Loss
			Winter APSH	Annual APSH	Winter APSH	Annual APSH			Winter APSH	Annual APSH	Winter APSH	Annual APSH		
R2/102	W2/102	LIVINGROOM	15	60	12	52	20.0	13.3						
R2/102	W3/102	LIVINGROOM	11	19	11	19	0.0	0.0	16	62	13	54	18.8	12.9
R3/102	W4/102	KITCHEN	15	68	12	52	20.0	23.5	15	68	12	52	20.0	23.5
R4/102	W5/102	BEDROOM	15	68	12	52	20.0	23.5	15	68	12	52	20.0	23.5
R5/102	W6/102	BEDROOM	15	66	11	46	26.7	30.3	15	66	11	46	26.7	30.3
R6/102	W7/102	LIVINGROOM	16	57	12	47	25.0	17.5						
R6/102	W8/102	LIVINGROOM	13	23	12	22	7.7	4.3	16	57	12	47	25.0	17.5
R7/102	W9/102	KITCHEN	17	72	13	49	23.5	31.9	17	72	13	49	23.5	31.9
R8/102	W10/102	BEDROOM	18	73	10	46	44.4	37.0	18	73	10	46	44.4	37.0
R9/102	W11/102	BEDROOM	19	74	9	41	52.6	44.6	19	74	9	41	52.6	44.6
R1/103	W1/103		19	71	15	59	21.1	16.9	19	71	15	59	21.1	16.9
R2/103	W2/103	LIVINGROOM	21	68	17	58	19.0	14.7						
R2/103	W3/103	LIVINGROOM	17	26	15	24	11.8	7.7	21	69	17	59	19.0	14.5
R3/103	W4/103	KITCHEN	20	74	16	58	20.0	21.6	20	74	16	58	20.0	21.6
R4/103	W5/103	BEDROOM	21	74	17	57	19.0	23.0	21	74	17	57	19.0	23.0
R5/103	W6/103	BEDROOM	20	71	15	52	25.0	26.8	20	71	15	52	25.0	26.8
R6/103	W7/103	LIVINGROOM	22	64	15	51	31.8	20.3						
R6/103	W8/103	LIVINGROOM	18	29	15	26	16.7	10.3	23	65	15	51	34.8	21.5

Room	Window	Room Use	Window						Room					
			Existing		Proposed		Winter %Loss	Annual %Loss	Existing		Proposed		Winter %Loss	Annual %Loss
			Winter APSH	Annual APSH	Winter APSH	Annual APSH			Winter APSH	Annual APSH	Winter APSH	Annual APSH		
R7/103	W9/103	KITCHEN	22	79	15	52	31.8	34.2	22	79	15	52	31.8	34.2
R8/103	W10/103	BEDROOM	22	79	14	51	36.4	35.4	22	79	14	51	36.4	35.4
R9/103	W11/103	BEDROOM	21	78	11	47	47.6	39.7	21	78	11	47	47.6	39.7
R1/104	W1/104		23	79	21	72	8.7	8.9	23	79	21	72	8.7	8.9
R2/104	W2/104	LIVINGROOM	24	78	22	67	8.3	14.1						
R2/104	W3/104	LIVINGROOM	20	55	20	55	0.0	0.0	24	78	22	67	8.3	14.1
R3/104	W4/104	KITCHEN	25	84	22	70	12.0	16.7	25	84	22	70	12.0	16.7
R4/104	W5/104	BEDROOM	24	81	22	67	8.3	17.3	24	81	22	67	8.3	17.3
R5/104	W6/104	BEDROOM	24	79	21	61	12.5	22.8	24	79	21	61	12.5	22.8
R6/104	W7/104	LIVINGROOM	24	73	20	56	16.7	23.3						
R6/104	W8/104	LIVINGROOM	20	54	20	54	0.0	0.0						
R6/104	W9/104	LIVINGROOM	23	64	22	58	4.3	9.4	26	75	22	58	15.4	22.7
R7/104	W10/104	KITCHEN	25	83	21	59	16.0	28.9	25	83	21	59	16.0	28.9
R8/104	W11/104	BEDROOM	25	83	17	56	32.0	32.5	25	83	17	56	32.0	32.5
R9/104	W12/104	BEDROOM	25	83	15	54	40.0	34.9	25	83	15	54	40.0	34.9
Queens Wharf, 47 Queen's Road														
R13/1101	W17/1101		6	32	5	28	16.7	12.5						

Room	Window	Room Use	Window						Room					
			Existing		Proposed		Winter %Loss	Annual %Loss	Existing		Proposed		Winter %Loss	Annual %Loss
			Winter APSH	Annual APSH	Winter APSH	Annual APSH			Winter APSH	Annual APSH	Winter APSH	Annual APSH		
R13/1101	W18/1101		6	35	4	30	33.3	14.3	6	35	5	31	16.7	11.4
R14/1101	W19/1101		8	38	6	33	25.0	13.2	8	38	6	33	25.0	13.2
R15/1101	W20/1101		10	40	7	36	30.0	10.0	10	40	7	36	30.0	10.0
R16/1101	W21/1101		10	40	7	36	30.0	10.0	10	40	7	36	30.0	10.0
R14/1102	W18/1102		8	34	7	31	12.5	8.8						
R14/1102	W19/1102		9	39	7	34	22.2	12.8	9	39	8	36	11.1	7.7
R15/1102	W20/1102		10	41	8	36	20.0	12.2	10	41	8	36	20.0	12.2
R16/1102	W21/1102		11	46	9	42	18.2	8.7	11	46	9	42	18.2	8.7
R17/1102	W22/1102		11	48	9	44	18.2	8.3	11	48	9	44	18.2	8.3
R14/1103	W18/1103		9	40	9	38	0.0	5.0						
R14/1103	W19/1103		11	45	10	42	9.1	6.7	11	45	11	43	0.0	4.4
R15/1103	W20/1103		13	48	11	44	15.4	8.3	13	48	11	44	15.4	8.3
R16/1103	W21/1103		15	56	13	52	13.3	7.1	15	56	13	52	13.3	7.1
R17/1103	W22/1103		16	57	14	53	12.5	7.0	16	57	14	53	12.5	7.0
R14/1104	W18/1104		10	43	10	42	0.0	2.3						
R14/1104	W19/1104		13	49	12	47	7.7	4.1	13	49	13	48	0.0	2.0
R15/1104	W20/1104		14	55	12	51	14.3	7.3	14	55	12	51	14.3	7.3

Room	Window	Room Use	Window						Room					
			Existing		Proposed		Winter %Loss	Annual %Loss	Existing		Proposed		Winter %Loss	Annual %Loss
			Winter APSH	Annual APSH	Winter APSH	Annual APSH			Winter APSH	Annual APSH	Winter APSH	Annual APSH		
R16/1104	W21/1104		17	66	15	62	11.8	6.1	17	66	15	62	11.8	6.1
R17/1104	W22/1104		19	72	17	68	10.5	5.6	19	72	17	68	10.5	5.6
R13/1105	W10/1105		21	77	20	76	4.8	1.3						
R13/1105	W11/1105		10	42	8	39	20.0	7.1	21	78	20	77	4.8	1.3
R14/1105	W12/1105		15	54	13	51	13.3	5.6	15	54	13	51	13.3	5.6