Daylight & Sunlight Report

Buildings W1 and W2
Development Zone W (Triangle Site)

King's Cross Central
General Partner Ltd

March 2016

King's Cross

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INTRODUCTION

Delva Patman Redler LLP have been instructed by King's Cross Central General Partner (KCCGP) to prepare a daylight and sunlight study to assess the internal daylight and sunlight adequacy to the proposed residential units at the proposed development of part of former railway lands at the Triangle Site, King's Cross Central (Development Zone W) by architects Feilden Clegg Bradley Studios and David Morley Architects.

This report provides the necessary information in support of an application for reserved matters approval for two residential buildings (Buildings W1 and W2) and to discharge requirements of condition 22 within the outline planning permission issued by the Secretary of State dated 22nd July 2008 (the "Triangle Outline Planning Permission").

This study has been carried out in accordance with the recommendations of the Building Research Establishment Report "Site Layout Planning for Daylight & Sunlight 2011" (BRE_209).

The template drawings, which are attached, illustrate the results for the daylight and sunlight assessment and identify the drawings used in these studies.

THE PROPOSALS

The proposals include the erection of 2 blocks of residential accommodation varying in height up to 16 storeys. A third block (Building W3) approved for leisure use under the Triangle Outline Planning Permission would complete the development comprising ground plus 2 storeys will come forward as a separate application for reserved matters approval (RMA). The 3 blocks are arranged around a centralised landscaped garden providing amenity space which will also come forward as a separate RMA.

GUIDELINES

Condition 22 of the Triangle Outline Planning Permission states:

"Applications for the approval of Reserved Matters in relation to the residential accommodation shall be accompanied by details of how the proposed design applies the standards recommended in the Building Research Establishment's 'Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice 1991".

This study has been carried out in accordance with the recommendations of the Building Research Establishment report (BRE) "Site Layout Planning for Daylight & Sunlight 2011" which was subsequently updated from the BRE guide 1991. This is the standard specifically identified in both the London Borough of Camden and Islington planning policies by which daylight and sunlight should be assessed.

The BRE guide is intended for building designers and their clients, consultants and planning officials. The advice given is not mandatory and the report should not be seen as a part of planning policy. Its aim is to help rather than constrain the designer. Although it gives numerical guidelines, these should be interpreted flexibly because natural lighting is only one of many factors in site layout design.

Whilst technical analysis can be carried out in accordance with numerical guidelines and reported factually by comparison with those guidelines, the final assessment as to whether

affected dwellings are left with acceptable amounts of daylight and sunlight in an inner city context need to be interpreted in a practical and subjective manner.

METHODOLOGY

The Daylight & Sunlight assessments have been undertaken in accordance with the Building Research Establishment (BRE) guidelines "Site Layout Planning for Daylight & Sunlight. A Guide to Good Practice".

The BRE guide outlines three main methodologies for the assessment for the daylight to residential property these being the Vertical Sky Component (VSC), the No Sky-Line (NSL) and the Average Daylight Factor (ADF).

In relation to the daylight and sunlight assessments, all rooms within both residential buildings up to and including the second floor (totalling 122 rooms) have been tested. These lowest floors of buildings within an urban context typically represent the 'worst case' scenario. The results can be extrapolated up the buildings and naturally the daylight and sunlight levels will improve as you rise up the building dependant on aspect.

DAYLIGHT

The BRE guide states that the interior daylight provision for new rooms should be checked using the ADF method as described in appendix C of the publication which in turn references the British Standards Institution Code of Practice for daylighting (BS8206 part 2).

The ADF assessment methodology takes into account factors including the VSC value measured at the centre point of the window serving the room in question, the internal surface area of the room, the window glazing transmittance, and the window size. British Standard 8206, Code of Practice for Daylighting recommends ADF values of 1% in bedrooms, 1.5% in living rooms and 2% in kitchens. Bedrooms command the lowest ADF values as they are principally occupied at night time and the need for natural daylight is considered less important.

For the purposes of this report, the ADF method of analysis has been adopted for the internal daylighting illuminance assessment of the development proposals.

SUNLIGHT

The BRE have produced sunlight templates for London, Manchester and Edinburgh indicating the Annual Probable Sunlight Hours (APSH) for these regions. The London template has been selected for this study as the London indicator template is the closest of the three available from BRE in terms of latitude.

Sunlight analysis is undertaken by measuring annual probable sunlight hours (APSH) for the main windows of rooms which face within 90^{o} of due south. The maximum number of annual probable sunlight hours for the London orientation is 1,486 hours. The BRE guidelines propose that the appropriate date for undertaking a sunlight assessment is on 21 March, being the spring equinox. Calculations of both summer and winter availability are made with the winter analysis covering the period from the 21 September to 21 March. For residential accommodation, the main requirement for sunlight is in living rooms and it is regarded as

less important in bedrooms and kitchens. This is because living rooms are considered to be the main room types where the most time is spent during the hours of light.

Due to the orientation of the site in relation to some of the building elevations, not all windows considered for internal daylight assessment will qualify for sunlight assessment because many of the main habitable reception room windows at the site do not face within 90^{o} of due south.

SOURCE DATA

The studies have been undertaken by calculating the daylight based on the template drawings provided within the BRE guidelines. The studies have been undertaken by creating a 3D CAD model of the site and surrounding buildings derived from the following drawings:

Existing and surrounding buildings: 3D Z Map Model

Proposed Scheme:
Feilden Clegg Bradley:
Dwg No's: KXC-W1-001-1768-A-20-100-103 rev 04, 310-311 rev 00, 320-321 rev 00, 330-331 rev 00, 340-341 rev 00

David Morley Architects:
Dwg No's: KXC-W2-001-DMA569-A-20-100-102, 105-108

DPR are aware of the masterplan nature of the Triangle site and adjacent King's Cross Central development. All consented buildings which are currently under construction and/or completed have been included as part of the assessment. These include buildings R4, R5N, T5 and T6.

SIGNIFICANCE CRITERIA

The BRE daylight and sunlight guidance is summarised in table 1 below.

TABLE 1: BRE DAYLIGHT & SUNLIGHT GUIDANCE USED IN THE ASSESSMENT

Issue	Criteria
Internal Daylight Adequacy	A room may be adversely affected if the average daylight factor **(ADF)** is less than 1% for a bedroom, 1.5% for a living room or 2% for a kitchen.
Internal Sunlight	A window may be adversely affected if a point at the centre of the window receives in the year less than 25% of the annual probable sunlight hours including at least 5% of the annual probable sunlight hours (APSH) during the winter months (21 September to 21 March)

It is of note that for daylight and sunlight calculations, total reliance upon numerical values may be misleading particularly low values, as is often the case in dense urban locations such as this. A percentage change of more than 20% may well represent only a very small difference in actual light value.

The BRE guide is predominately set up for suburban situations and strict compliance in a dense urban environment is difficult to achieve.

RESULTS - COMPLETED DEVELOPMENT

DAYLIGHT – SELF TEST ANALYSIS - ADF

The full results of the self-test daylight analysis are presented in Appendix B in tabular and graphic form with a sample attached. A summary of the results of the Average Daylight Factor (ADF) analysis on the relevant overlooking windows are presented in Table 2 below. This identifies the number of habitable rooms which meet or do not meet the BRE guidance. As noted, full details are in appendix B which identifies the type of room and the percentage ADF so it is clear by how much a room does not meet the guidelines.

For the purposes of this assessment, all rooms within both residential buildings up to and including second floor have been considered. Drawings LOC/801-805 (appendix A) show the windows and rooms which have been assessed. Within each building these levels are the lowest level of residential accommodation and represent a 'worst case' scenario.

TABLE 2: NUMBER OF RESIDENTIAL ROOMS MEETING THE BRE GUIDELINES (ADF METHOD)

Address	Total Number of Rooms Tested	Number of Rooms Meeting BRE Guidelines for ADF	Number of Rooms not Meeting BRE Guidelines for ADF
Building W1	**68**	**62**	**6**
Building W2	**54**	**39**	**15**
Total	**122**	**101**	**21**

Table 2 shows that of the 122 rooms assessed from ground to second floor inclusive within Buildings W1 and W2 on the scheme, 101 (82.7%) will comfortably comply with the BRE requirements. 21 rooms do not meet the BRE guidelines to varying degrees.

6 of the 21 rooms are located in Building W1 of which 5 serve bedrooms. These are predominately occupied at night time and generally have a lower expectation for daylight. All living rooms serving each of these units comfortably comply with the BRE standards. The final room that does not meet BRE guidelines within W1 is a ground floor market studio within W1 East. This falls shy of the suggested standard predominately due to the recessed nature of the room which acts as a self-obstruction. It is also at the lowest residential level (ground) with W3 being contributory to the low daylight level experienced in this room. The daylight to all 6 rooms will improve further up the building.

The other 15 rooms that do not meet the BRE guidelines are in Building W2 and have deep recessed balconies or are situated on the northern façade. This naturally inhibits the access of daylight. The recessed balconies have been designed to provide the necessary amenity space as agreed with the local authority. All 15 rooms are proposed to be bedrooms which are predominately occupied at night time and therefore have a naturally lower expectation for day lighting requirements. All living rooms serving each of these units comfortably comply with the BRE standards. Of the 15 rooms, about a third of these face out onto York Way and the daylight to these rooms will improve further up the building. The remaining rooms face north east into the central amenity space and are unlikely to materially improve further up the building.

Initial designs did not include balconies to Building W2. Discussions with officers from both Camden and Islington have led to the integration of balconies for amenity reasons. Initial layouts had living areas in the current bedroom locations sitting behind and opening onto the balconies; however preliminary daylight and sunlight results have resulted in the current

layouts. Living areas have been moved to ensure they are served by windows on the face of the building with the bedrooms sitting behind the recessed balconies.

Overall the self-test daylight analysis to the lowest floors of residential accommodation within Buildings W1 and W2 of the scheme demonstrates that the internal layouts of the proposed units will receive adequate levels of daylight to all but one primary living space. There are some isolated zones where the rooms are recessed behind the main building façades which do not meet the benchmark; however, these are all bedrooms which have a naturally lower expectation for daylight as they are principally occupied at night time.

SUNLIGHT – SELF TEST ANALYSIS - APSH

The full results of the self-test sunlight analysis are presented in Appendix C in tabular and graphic form with a sample attached. A summary of the results of the Annual Probable Sunlight Hours (APSH) analysis on the relevant windows are presented in Table 3.

TABLE 3: NUMBER OF RESIDENTIAL ROOMS MEETING BRE GUIDELINES (APSH METHOD)

Address	Total Number of Rooms Tested	Number of Rooms Meeting BRE Guidelines for APSH	Number of Rooms not Meeting BRE Guidelines for APSH
Building W1	**19**	**17**	**2**
Building W2	**11**	**3**	**8**
Total	**30**	**20**	**10**

Table 3 shows that of the living rooms assessed from ground to second floor inclusive within Buildings W1 and W2, 20 (66.6%) will comfortably comply with the BRE requirements and 10 will not to a varying degrees.

2 of these rooms are located within Building W1 East and both fall below the benchmark predominately due to the recessed nature of the rooms. The living room and market studio are situated at ground floor level with the windows recessed behind the main building façade. This naturally inhibits the access of light to the room.

The other 8 living rooms are located within Building W2 and fall below the benchmark due to the buildings on the south of York Way in particular building R5N causing the obstruction to light at these lower levels.

CONCLUSIONS

The Triangle Site is situated north of the King's Cross Central main site, bounded to the south west by York Way and Randell's Road to the south.

To assess the daylight adequacy within the proposed residential units of Buildings W1 and W2, the method of assessment used was the Average Daylight Factor (ADF) for daylight and Annual Probable Sunlight Hours (APSH) for Sunlight.

The London Borough of Camden and Islington planning policies identify the Building Research Establishment report "Site Layout Planning for Daylight & Sunlight 2011" by which daylight and sunlight should be assessed.

For the purposes of this report, all rooms within Building W1 and W2 up to and including second floor have been considered. These can be considered to be the 'worst case' floors as naturally light levels will improve as you go up through the buildings.

The internal daylight adequacy analysis generally demonstrates good levels of compliance to all but one main living area. There are some isolated areas where bedrooms are recessed behind the main building façades. The recessed balconies have been designed to provide the necessary amenity space as agreed with the local authority. However these rooms are all bedrooms which generally have a lower level of expectation for daylighting as these rooms are predominately occupied at night times.

The internal sunlight adequacy analysis demonstrates that all but two living room windows in building W1 will comfortably comply. These 2 living rooms fall below the benchmark set in the BRE guidance due to the recessed nature of the rooms. This naturally inhibits the access of sunlight to these rooms.

8 rooms fall below the benchmark in Building W2. This is in part due to the scale and proximity of the neighbouring buildings York Way.

From reviewing the analysis undertaken to date it is clear that the 6 rooms in Building W1 will become fully compliant in daylight internal adequacy levels from third floor and above.

Within Building W2, it is recognised that 15 bedrooms up to and including second floor level will fall below the BRE Guidelines. Daylight levels will improve slightly as you progress up through the building to 5 of the 15 bedrooms facing out onto York Way; however, none of the equivalent recessed bedrooms facing north into the central amenity area will change in terms of outlook. The scheme has evolved and the requirement for amenity has resulted in the bedrooms being designed to be of a recessed nature to accommodate private amenity resulting in the bedrooms falling below the BRE guidelines.

Overall, Feilden Clegg Bradley and David Morley Architects have worked to maximise the internal daylight and sunlight levels to the proposed units through their design process as far as reasonably practical within the constraints of the Triangle Outline Planning Permission.

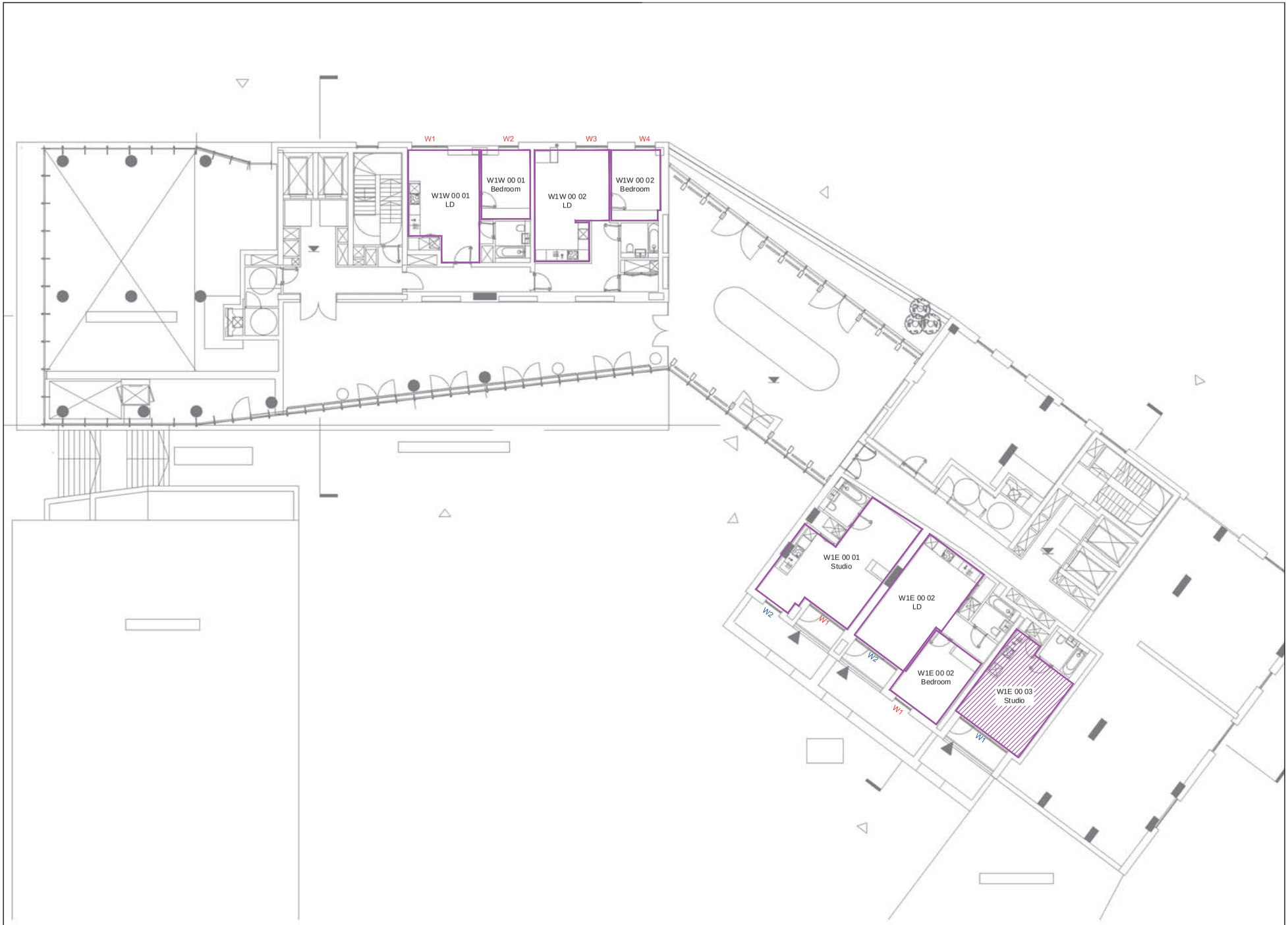
The development proposals by Feilden Clegg Bradley and David Morley Architects are considered to recognise and observe the principles of the London Borough of Camden and Islington planning policies and BRE Guidance in daylight and sunlight terms and deliver good results in this urban context.

Delva Patman Redler LLP

APPENDIX A

LOCATION DRAWINGS

14090/LOC/801-805



Building W1 - Ground Floor - Key Window Locations

NO DIMENSIONS TO BE SCALED FROM THIS DRAWING:

Proposed

Rooms Failing

W1/08 Window Tested Daylight only

W1/08 Window Tested Daylight & Sunlight

SOURCE DATA

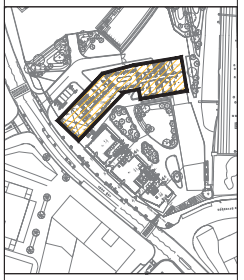
Drawings Used:
Proposed Scheme:
Feilden Clegg Bradley:
Dwg No's:
KXC-W1-001-1768-A-20-100 REV 04 - W1 PLAN Level 00 (Podium)

NOTES

Triple Glazed Transmittance value of 70% used for ADF assessments.

Cross Hatched Rooms do not comply with BS 8206-2:2008.

Site Plan



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REV	Description	Drawn	Chkd	Date

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TITLE:
KING'S CROSS CENTRAL
TRIANGLE
-
-
DAYLIGHT / SUNLIGHT ANALYSIS

DRAWING:
Building W1
Daylight / Sunlight Analysis
Key Window Locations
-
-
-
-

DRAWN: LT	JOB NO: 14090
SCALE: NTS	
DATE: 01/12/2015	
DWG NO: LOC/801	REV: -

NO DIMENSIONS TO BE SCALED FROM THIS DRAWING:

Proposed

Rooms Failing

W1/08 Window Tested Daylight only

W1/08 Window Tested Daylight & Sunlight

SOURCE DATA

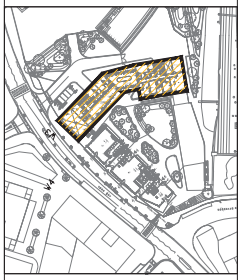
Drawings Used:
Proposed Scheme:
Feilden Clegg Bradley:
Dwg No's:
KXC-W1-001-1768-A-20-101 REV 04 - W1 PLAN Level 01

NOTES

Triple Glazed Transmittance value of 70% used for ADF assessments.

Cross Hatched Rooms do not comply with BS 8206-2:2008.

Site Plan



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REV	Description	Drawn	Chkd	Date

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TITLE:
KING'S CROSS CENTRAL
TRIANGLE
-
-
DAYLIGHT / SUNLIGHT ANALYSIS

DRAWING:
Building W1
Daylight / Sunlight Analysis
Key Window Locations
-
-
-
-

DRAWN: LT	JOB NO: 14090
SCALE: NTS	
DATE: 01/12/2015	
DWG NO: LOC/802	REV: -

Building W1 - First Floor - Key Window Locations

NO DIMENSIONS TO BE SCALED FROM THIS DRAWING:

Proposed

Rooms Failing

W1/08 Window Tested Daylight only

W1/08 Window Tested Daylight & Sunlight

SOURCE DATA

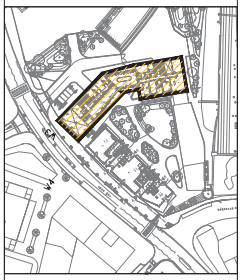
Drawings Used:
Proposed Scheme:
Feilden Clegg Bradley:
Dwg No's:
KXC-W1-001-1768-A-20-102 REV 04 - W1 PLAN Level 02

NOTES

Triple Glazed Transmittance value of 70% used for ADF assessments.

Cross Hatched Rooms do not comply with BS 8206-2:2008.

Site Plan



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REV	Description	Drawn	Chkd	Date

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TITLE:
KING'S CROSS CENTRAL
TRIANGLE
-
-
DAYLIGHT / SUNLIGHT ANALYSIS

DRAWING:
Building W1
Daylight / Sunlight Analysis
Key Window Locations
-
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-

DRAWN: LT	JOB NO: 14090
SCALE: NTS	
DATE: 01/12/2015	

DWG NO: LOC/803

REV: -

Building W1 - Second Floor - Key Window Locations

Building W2 - First Floor - Key Window Locations

NO DIMENSIONS TO BE SCALED FROM THIS DRAWING:

Proposed

Rooms Failing

W1/08 Window Tested Daylight only

W1/08 Window Tested Daylight & Sunlight

SOURCE DATA

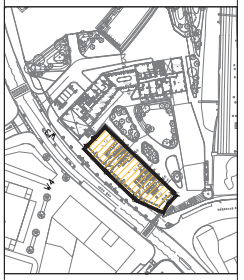
Drawings Used:
Proposed Scheme:
David Morley Architects:
Dwg No's:
KXC-W2-001-DMA569-A-20-101-00

NOTES

Triple Glazed Transmittance value of 70% used for ADF assessments.

Cross Hatched Rooms do not comply with BS 8206-2:2008.

Site Plan



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REV	Description	Drawn	Chkd	Date

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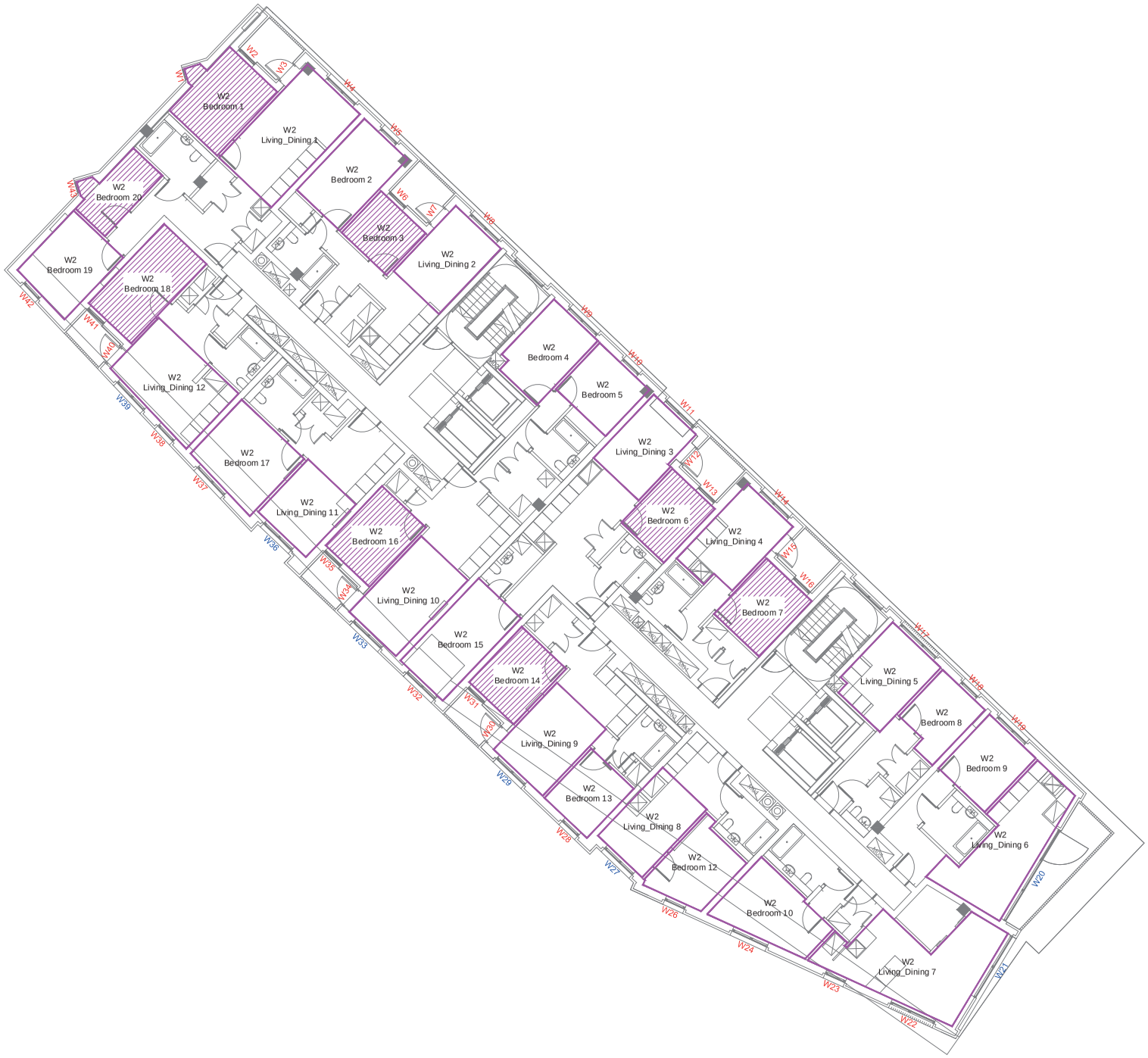
TITLE:
KING'S CROSS CENTRAL TRIANGLE
-
-
DAYLIGHT / SUNLIGHT ANALYSIS

DRAWING:
Building W2
Daylight / Sunlight Analysis
Key Window Locations
-
-
-
-

DRAWN: LT	JOB NO: 14090
SCALE: NTS	
DATE: 01/12/2015	
DWG NO: LOC/804	REV: -



Building W2 - Second Floor - Key Window Locations

NO DIMENSIONS TO BE SCALED FROM THIS DRAWING:

Proposed

Rooms Failing

W1/08 Window Tested Daylight only

W1/08 Window Tested Daylight & Sunlight

SOURCE DATA

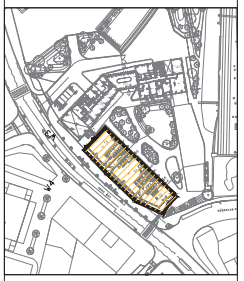
Drawings Used:
Proposed Scheme:
David Morley Architects:
Dwg No's:
KXC-W2-001-DMA569-A-20-102-00

NOTES

Triple Glazed Transmittance value of 70% used for ADF assessments.

Cross Hatched Rooms do not comply with BS 8206-2:2008.

Site Plan



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TITLE:
KING'S CROSS CENTRAL TRIANGLE
-
-
DAYLIGHT / SUNLIGHT ANALYSIS

DRAWING:
Building W2
Daylight / Sunlight Analysis
Key Window Locations
-
-
-
-

DRAWN: LT	JOB NO: 14090
SCALE: NTS	
DATE: 01/12/2015	
DWG NO: LOC/805	REV: -

APPENDIX B

DAYLIGHT (ADF) TABLES

SELF TEST

Dwg No	Address	Floor Level	Room Name	Window ID	ADF (Room) %age	Pass Rate %age	Condition
-	W1W 00 01	Ground	LD	W1	3.38%	1.50%	Pass
-			Bedroom	W2	3.30%	1.00%	Pass
-	W1W 00 02	Ground	LD	W3	2.86%	1.50%	Pass
-			Bedroom	W4	3.31%	1.00%	Pass
-	W1W 01 01	First	Bedroom	W1	2.36%	1.00%	Pass
-			LD	W2	7.45%	1.50%	Pass
-				W3			
-				W4			
-	W1W 01 02	First	Bedroom	W1	1.00%	1.00%	Pass
-			Bedroom	W2	0.90%	1.00%	Fail
-			LD	W3	1.73%	1.50%	Pass
-				W4			
-				W5			
-				W6			
-	W1W 01 03	First	Bedroom	W2	2.53%	1.00%	Pass
-			LD	W1	4.06%	1.50%	Pass
-	W1W 01 04	First	LD	W1	2.09%	1.50%	Pass
-				W2			
-			Bedroom	W3	1.63%	1.00%	Pass
-	W1W 01 05	First	LD	W1	4.36%	1.50%	Pass
-			Bedroom	W2	2.79%	1.00%	Pass
-	W1W 01 06	First	Bedroom	W1	1.81%	1.00%	Pass
-			Bedroom	W2	2.13%	1.00%	Pass
-			LD	W3	1.58%	1.50%	Pass
-				W4			
-				W5			
-	W1W 01 07	First	LD	W1	6.60%	1.50%	Pass
-				W2			
-			Bedroom	W3	2.36%	1.00%	Pass
-	W1W 02 01	Second	Bedroom	W1	2.44%	1.00%	Pass
-			LD	W2	7.60%	1.50%	Pass
-				W3			
-				W4			
-	W1W 02 02	Second	Bedroom	W1	1.05%	1.00%	Pass
-			Bedroom	W2	0.97%	1.00%	Fail
-			LD	W3	1.85%	1.50%	Pass
-				W4			
-				W5			
-				W6			
-	W1W 02 03	Second	LD	W1	4.10%	1.50%	Pass
-			Bedroom	W2	2.55%	1.00%	Pass
-	W1W 02 04	Second	LD	W1	2.19%	1.50%	Pass
-				W2			
-			Bedroom	W3	1.84%	1.00%	Pass
-	W1W 02 05	Second	LD	W1	4.40%	1.50%	Pass
-			Bedroom	W2	2.82%	1.00%	Pass
-	W1W 02 06	Second	Bedroom	W1	1.83%	1.00%	Pass
-			Bedroom	W2	2.26%	1.00%	Pass
-			LD	W3	1.73%	1.50%	Pass
-				W4			
-				W5			

Dwg No	Address	Floor Level	Room Name	Window ID	ADF (Room) %age	Pass Rate %age	Condition
-	W1W 02 07	Second	LD	W1	6.68%	1.50%	Pass
-				W2			
-			Bedroom	W3	2.39%	1.00%	Pass
-	W1E 00 01	Ground	Studio	W1	1.71%	1.50%	Pass
-				W2			
-	W1E 00 02	Ground	LD	W2	1.00%	1.50%	Fail
-			Bedroom	W1	1.94%	1.00%	Pass
-	W1E 00 03	Ground	Studio	W1	0.70%	1.50%	Fail
-	W1E 01 01	First	LD	W1	3.12%	1.50%	Pass
-				W2			
-				W3			
-				W4			
-			Bedroom	W5	1.55%	1.00%	Pass
-	W1E 01 02	First	Bedroom	W1	0.82%	1.00%	Fail
-			LD	W2	1.50%	1.50%	Pass
-				W3			
-	W1E 01 03	First	Bedroom	W1	1.83%	1.00%	Pass
-			LD	W2	9.17%	1.50%	Pass
-				W3			
-				W4			
-			Bedroom	W5	2.86%	1.00%	Pass
-	W1E 01 04	First	Bedroom	W1	0.11%	1.00%	Fail
-			LD	W2	1.53%	1.50%	Pass
-				W3			
-	W1E 01 05	First	Bedroom	W1	5.87%	1.00%	Pass
-			LD	W2	9.32%	1.50%	Pass
-				W3			
-				W4			
-			Bedroom	W5	3.11%	1.00%	Pass
-	W1E 01 06	First	Bedroom	W1	4.16%	1.00%	Pass
-			LD	W2	2.49%	1.50%	Pass
-				W3			
-				W4			
-	W1E 02 01	Second	LD	W1	3.55%	1.50%	Pass
-				W2			
-				W3			
-				W4			
-			Bedroom	W5	1.60%	1.00%	Pass
-	W1E 02 02	Second	Bedroom	W1	1.27%	1.00%	Pass
-			LD	W2	1.80%	1.50%	Pass
-				W3			
-	W1E 02 03	Second	Bedroom	W1	1.88%	1.00%	Pass
-			LD	W2	9.33%	1.50%	Pass
-				W3			
-				W4			
-			Bedroom	W5	2.90%	1.00%	Pass
-	W1E 02 04	Second	Bedroom	W1	0.24%	1.00%	Fail
-			LD	W2	1.77%	1.50%	Pass
-				W3			
-	W1E 02 05	Second	Bedroom	W1	5.95%	1.00%	Pass

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See Dwg No: 14090/LOC/801-803

Dwg No	Address	Floor Level	Room Name	Window ID	ADF (Room) %age	Pass Rate %age	Condition
-	W1E 02 05	Second	LD	W2	9.45%	1.50%	Pass
-				W3			
-				W4			
-			Bedroom	W5	3.16%	1.00%	Pass
-	W1E 02 06	Second	Bedroom	W1	4.22%	1.00%	Pass
-			LD	W2	2.80%	1.50%	Pass
-				W3			
-				W4			

Dwg No	Address	Floor Level	Room Name	Window ID	ADF (Room) %age	Pass Rate %age	Condition

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See Dwg No: 14090/LOC/801-803

Dwg No	Address	Floor Level	Room Name	Window ID	ADF (Room) %age	Pass Rate %age	Condition
-	W2	First	Bedroom 1	W32	0.56%	1.00%	Fail
-			Living/Dining 1	W1	2.98%	1.50%	Pass
-				W2			
-			Bedroom 2	W3	0.06%	1.00%	Fail
-			Bedroom 3	W4	2.06%	1.00%	Pass
-			Living/Dining 2	W5	3.08%	1.50%	Pass
-				W6			
-			Bedroom 4	W7	0.24%	1.00%	Fail
-			Bedroom 5	W8	1.94%	1.00%	Pass
-			Living/Dining 3	W9	3.50%	1.50%	Pass
-				W10			
-			Bedroom 6	W11	0.33%	1.00%	Fail
-			Living/Dining 4	W14	3.07%	1.50%	Pass
-				W15			
-			Bedroom 7	W12	2.72%	1.00%	Pass
-			Living/Dining 5	W17	2.93%	1.50%	Pass
-			Bedroom 8	W13	0.35%	1.00%	Fail
-			Living/Dining 6	W19	2.00%	1.50%	Pass
-				W20			
-			Bedroom 9	W16	1.32%	1.00%	Pass
-			Bedroom 10	W18	0.02%	1.00%	Fail
-			Living/Dining 7	W22	1.81%	1.50%	Pass
-				W23			
-				W24			
-			Living/Dining 8	W28	2.60%	1.50%	Pass
-				W29			
-			Bedroom 11	W21	2.31%	1.00%	Pass
-			Bedroom 12	W25	1.80%	1.00%	Pass
-			Bedroom 13	W26	2.78%	1.00%	Pass
-			Bedroom 14	W27	0.41%	1.00%	Fail
-			Bedroom 15	W30	2.48%	1.00%	Pass
-				W31			
-		Second	Bedroom 1	W1	0.69%	1.00%	Fail
-				W2			
-			Living/Dining 1	W3	1.96%	1.50%	Pass
-				W4			
-			Bedroom 2	W5	1.64%	1.00%	Pass
-			Bedroom 3	W6	0.62%	1.00%	Fail
-			Living/Dining 2	W7	3.48%	1.50%	Pass
-				W8			
-			Bedroom 4	W9	3.71%	1.00%	Pass
-			Bedroom 5	W10	2.46%	1.00%	Pass
-			Living/Dining 3	W11	4.36%	1.50%	Pass
-				W12			
-			Bedroom 6	W13	0.53%	1.00%	Fail
-			Living/Dining 4	W14	3.93%	1.50%	Pass
-				W15			
-			Bedroom 7	W16	0.54%	1.00%	Fail
-			Living/Dining 5	W17	3.78%	1.50%	Pass
-			Bedroom 8	W18	2.59%	1.00%	Pass
-			Living/Dining 6	W20	4.15%	1.50%	Pass
-			Bedroom 9	W19	4.28%	1.00%	Pass

Dwg No	Address	Floor Level	Room Name	Window ID	ADF (Room) %age	Pass Rate %age	Condition
-	W2	Second	Bedroom 10	W24	2.42%	1.00%	Pass
-			Living/Dining 7	W21	7.37%	1.50%	Pass
-				W22			
-				W23			
-			Living/Dining 8	W27	2.91%	1.50%	Pass
-			Bedroom 12	W26	1.46%	1.00%	Pass
-			Bedroom 13	W28	1.70%	1.00%	Pass
-			Living/Dining 9	W29	2.68%	1.50%	Pass
-				W30			
-			Bedroom 14	W31	0.02%	1.00%	Fail
-			Living/Dining 10	W33	2.71%	1.50%	Pass
-				W34			
-			Bedroom 15	W32	2.23%	1.00%	Pass
-			Bedroom 16	W35	0.04%	1.00%	Fail
-			Living/Dining 11	W36	3.35%	1.50%	Pass
-			Bedroom 17	W37	2.53%	1.00%	Pass
-			Living/Dining 12	W38	3.97%	1.50%	Pass
-				W39			
-				W40			
-			Bedroom 18	W41	0.08%	1.00%	Fail
-			Bedroom 19	W42	1.74%	1.00%	Pass
-			Bedroom 20	W43	0.90%	1.00%	Fail

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See Dwg No: 14090/LOC/804-805

APPENDIX C

SUNLIGHT (APSH) TABLES

SELF TEST

Dwg No	Address	Floor Level	Room Name	Window ID	APSH %				Winter %			
					Existing	Proposed	% Diff	Pass/Fail	Existing	Proposed	% Diff	Pass/Fail
-	W1W 01 01	First	LD	W2	N/A	44	N/A	N/A	N/A	12	N/A	N/A
-	W1W 01 02	First	LD	W6	N/A	32	N/A	N/A	N/A	6	N/A	N/A
-	W1W 01 04	First	LD	W1	N/A	30	N/A	N/A	N/A	3	N/A	N/A
-	W1W 01 06	First	LD	W3	N/A	37	N/A	N/A	N/A	5	N/A	N/A
-	W1W 02 01	Second	LD	W2	N/A	45	N/A	N/A	N/A	13	N/A	N/A
-	W1W 02 02	Second	LD	W6	N/A	35	N/A	N/A	N/A	7	N/A	N/A
-	W1W 02 04	Second	LD	W1	N/A	32	N/A	N/A	N/A	5	N/A	N/A
-	W1W 02 06	Second	LD	W3	N/A	39	N/A	N/A	N/A	6	N/A	N/A
-	W1E 00 01	Ground	LKD	W2	N/A	34	N/A	N/A	N/A	4	N/A	N/A
-	W1E 00 02	Ground	LD	W2	N/A	7	N/A	N/A	N/A	7	N/A	N/A
-	W1E 00 03	Ground	LKD	W1	N/A	5	N/A	N/A	N/A	5	N/A	N/A
-	W1E 01 01	First	LD	W3	N/A	44	N/A	N/A	N/A	9	N/A	N/A
-	W1E 01 02	First	LD	W3	N/A	47	N/A	N/A	N/A	8	N/A	N/A
-	W1E 01 04	First	LD	W3	N/A	42	N/A	N/A	N/A	6	N/A	N/A
-	W1E 01 06	First	LD	W4	N/A	34	N/A	N/A	N/A	4	N/A	N/A
-	W1E 02 01	Second	LD	W3	N/A	48	N/A	N/A	N/A	12	N/A	N/A
-	W1E 02 02	Second	LD	W3	N/A	56	N/A	N/A	N/A	13	N/A	N/A
-	W1E 02 04	Second	LD	W3	N/A	52	N/A	N/A	N/A	8	N/A	N/A
-	W1E 02 06	Second	LD	W4	N/A	45	N/A	N/A	N/A	7	N/A	N/A

Dwg No	Address	Floor Level	Room Name	Window ID	APSH %				Winter %			
					Existing	Proposed	% Diff	Pass/Fail	Existing	Proposed	% Diff	Pass/Fail

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See Dwg No:14090/LOC/801-803

Dwg No	Address	Floor Level	Room Name	Window ID	APSH %				Winter %			
					Existing	Proposed	% Diff	Pass/Fail	Existing	Proposed	% Diff	Pass/Fail
-	W2	First	Living/Dining 5	W17	N/A	14	N/A	N/A	N/A	2	N/A	N/A
-			Living/Dining 6	W20	N/A	17	N/A	N/A	N/A	1	N/A	N/A
-			Living/Dining 7	W24	N/A	11	N/A	N/A	N/A	0	N/A	N/A
-			Living/Dining 8	W29	N/A	24	N/A	N/A	N/A	2	N/A	N/A
-		Second	Living/Dining 6	W20	N/A	28	N/A	N/A	N/A	10	N/A	N/A
-			Living/Dining 7	W21	N/A	51	N/A	N/A	N/A	12	N/A	N/A
-			Living/Dining 8	W27	N/A	15	N/A	N/A	N/A	2	N/A	N/A
-			Living/Dining 9	W29	N/A	19	N/A	N/A	N/A	3	N/A	N/A
-			Living/Dining 10	W33	N/A	21	N/A	N/A	N/A	1	N/A	N/A
-			Living/Dining 11	W36	N/A	17	N/A	N/A	N/A	0	N/A	N/A
-			Living/Dining 12	W39	N/A	25	N/A	N/A	N/A	1	N/A	N/A

Dwg No	Address	Floor Level	Room Name	Window ID	APSH %				Winter %			
					Existing	Proposed	% Diff	Pass/Fail	Existing	Proposed	% Diff	Pass/Fail

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