

84 MANOR ROAD, NORTH SHEEN

INTERNAL DAYLIGHT REPORT

CLIENT: AVANTON RICHMOND DEVELOPMENT LTD

DATE: APRIL 2023

VERSION: V1

PROJECT: P1685

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- Appendix 1:** Internal CBDM Daylight Results
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1 Executive Summary

- 1.1 Point 2 have been appointed by Avanton, Richmond Development Ltd to undertake a detailed Climate Based Daylight Modelling (CBDM) internal daylight assessment in relation Proposed Development at 84 Manor Road, North Sheen.
- 1.2 Point 2 were originally instructed to undertake a detailed internal daylight assessment based on the ADF methodology adopted within the 2011 version of the BRE Guidelines (BS 8206 Part 2). Our report dated July 2020 accompanied the original planning submission (planning ref: 19/0510/FUL).
- 1.3 The recently published 2022 version of the BRE Guidelines adopts a different assessment methodology based on a more detailed climate-based assessment (BS EN17037). Whilst not considered necessary to assess the scheme against the updated BRE Guidelines (given the stage of the application process), the technical analysis has been updated for robustness. When compared to the July 2020 submission, block B has undergone internal layout alterations (all other blocks remain consistent) and the assessment room sample for the internal daylight and sunlight report has been increased from 19 habitable rooms to 120 habitable rooms.
- 1.4 The scheme has been designed to maximise the daylight levels within the main living areas whilst still providing each unit with a private external amenity space in the form of balconies. Whilst these features can lead to sub-optimal daylight levels within the rooms that are overhung by them, this should be considered against the considerable amenity benefits these areas bring the occupants of these spaces.
- 1.5 The technical results show that 78 out of 120 rooms (65%) will either meet or exceed the minimum CBDM target value based on their use classification. Notably, the majority of the affected rooms are served by balconies and reduce the view of the sky to those rooms that are overhung. A trade-off between private amenity and daylight amenity should therefore be considered within the assessment.
- 1.6 It should be noted that the introduction of the CBDM analysis (as part of the 2022 BRE Guidelines) is more stringent when compared to the superseded Average Daylight Factor (ADF) assessment. It is seen throughout many similar developments that well-designed buildings generally record lower CBDM compliance when compared against the ADF assessment.
- 1.7 In respect of the internal sunlight exposure assessment, the results show that of the 58 assessed LKDs, 36 will record 1.5 hours of sunlight between 1 February and 21 March, equating to 62% compliance. The analysis shows that the majority of rooms that do not meet the BRE's target do not have an orientation directly south and are therefore more marginalised for direct sunlight, that the BRE Guidelines recognise.
- 1.8 With regards to the assessed amenity spaces within the proposed scheme, the results show that all but 2 spaces will meet the BRE's target of achieving at least 2 hours of direct sunlight on 21st March (the BRE's test date). These results are consistent with those recorded within the July 2020 report.

- 1.9 The scheme has been designed to harness good access to natural light amenity within the new dwellings and amendments to balcony and window positions have been made to the massing to maximise the position. The technical analysis demonstrates good internal daylight levels, notwithstanding the more stringent CBDM criteria and widespread provision of balconies (to provide private amenity).
- 1.10 The results of the Internal Daylight Climate Based Daylight Model (CBDM) for the proposed scheme are included in Appendix 1. The results of the internal sunlight exposure assessment can be found within Appendix 2 and the internal Sun Hours on Ground assessment can be found within Appendix 3.

Sources of Information

In the process of compiling this report, the following sources of information have been used:

Point 2 Surveyors

Survey Info

Point Cloud Data

Assael Architecture Limited

Floor plans and elevations (received 16/03/23)

2 Methodology

- 2.1 It is usual to assess any change in daylight and sunlight to neighbouring residential properties by reference to the guidelines set out in the Building Research Establishment (BRE) Report 'Site layout planning for daylight and sunlight - A guide to good practice' by Paul Littlefair.
- 2.2 The new version of the report, published in June 2022 has replaced the previous version from 2011. Whilst the scheme design was developed and optimised in accordance with the 2011 guidelines, we have been instructed to provide an updated report to reflect the new 2022 guidelines. Although the methodology for the assessment of the impact on neighbouring properties has not materially altered, there are significant changes to the assessment of light within new residential developments. A new Climate Based Daylight Modelling (CBDM) methodology replaces the old Average Daylight Factor (ADF) methodology. The new methodology is more complex typically more challenging to achieve in a dense urban context.

Climate Based Daylight Modelling (CBDM)

- 2.3 The new CBDM methodology is based on the British Standard 'Daylight in Buildings' (BS EN17037). This contains advice and guidance on interior daylighting for all buildings across Europe but also has a UK National Annex which provides suggested targets for dwellings in the UK.
- 2.4 BS EN17037 supersedes BS 8206 Part 2 which was based on Average Daylight Factor.
- 2.5 The CBDM methodology is based on target illuminances from daylight. This is the Daylight Illuminance (DI) to be achieved over half the area of the room (measured on a reference plane at tabletop level) for at least half of the daylight hours in a typical year. The calculations are based on weather data files which cover different regions of the UK. The calculations are done for each hour of the day for every day of the year. There are 8760 hours in the year, of which 4380 are daylight hours, and therefore the targets should be achieved for 2190 hours in the year. The methodology uses a more accurate sky model which simulates the movement of the sun throughout the day and accounts for the weather conditions at the time. As a result, CBDM accounts for the presence of sunlight and therefore the orientation of the rooms/windows is accounted for. A south facing room is likely to have access to higher levels of natural light than a north facing room and as a result, in order to comply a north facing room would typically need larger windows.
- 2.6 The UK National Annex gives illuminance recommendations of 100 Lux in bedrooms, 150 Lux in living rooms and 200 Lux in kitchens. These are median illuminances to be achieved over 50% of the assessment grid for at least half of the daylight hours.
- 2.7 Where a room has a shared use, the highest target should apply. However, it also says that Local Authorities could use discretion here and that a living room target of 150 Lux could be used for combined living/kitchen/dining room (LKD) if the kitchens are not treated as habitable spaces, as it may avoid small separate kitchens in the design.

3 Parameters and Assumptions

- 3.1 In relation to the CBDM assessment of the daylight within the proposed scheme, the following assumptions and parameters have been used: light pastel walls with a reflectance of 0.7, light wood veneer floors/ cream carpets with a reflectance of 0.4, and white ceilings with a reflectance of 0.8. All external reflectance levels have been assumed to be 0.2 as per the guidelines.
- 3.2 As per the guidelines, for most windows a transmittance factor of 0.68 has been used, except where there is obscured glazing, a lower transmittance factor of 0.56 has been assumed. A window framing factor of 0.8 has been adopted. A maintenance factor of 8% has been allowed to account for the effect of dirt on the glass in an urban environment. The room assessment grid area excludes a 300mm band around the perimeter of the room, as per the paragraph C28 of the guidelines.
- 3.3 The ADF calculations were based on the previous BRE and British Standards and the following reflectance values were taken from BS 8206 Part 2: pale cream walls with a reflectance of 0.81, light wood veneer floors/ cream carpets with a reflectance of 0.4, and white ceilings with a reflectance of 0.85. Note these values are slightly more favourable than those suggested in the new guidance. The window parameters were the same as those used for the CBDM assessment.



4 Internal Daylight Amenity to the Proposed Development

- 4.1 Plate 01 below demonstrates a 3D view of the Proposed Development, showing the configuration of the massing.

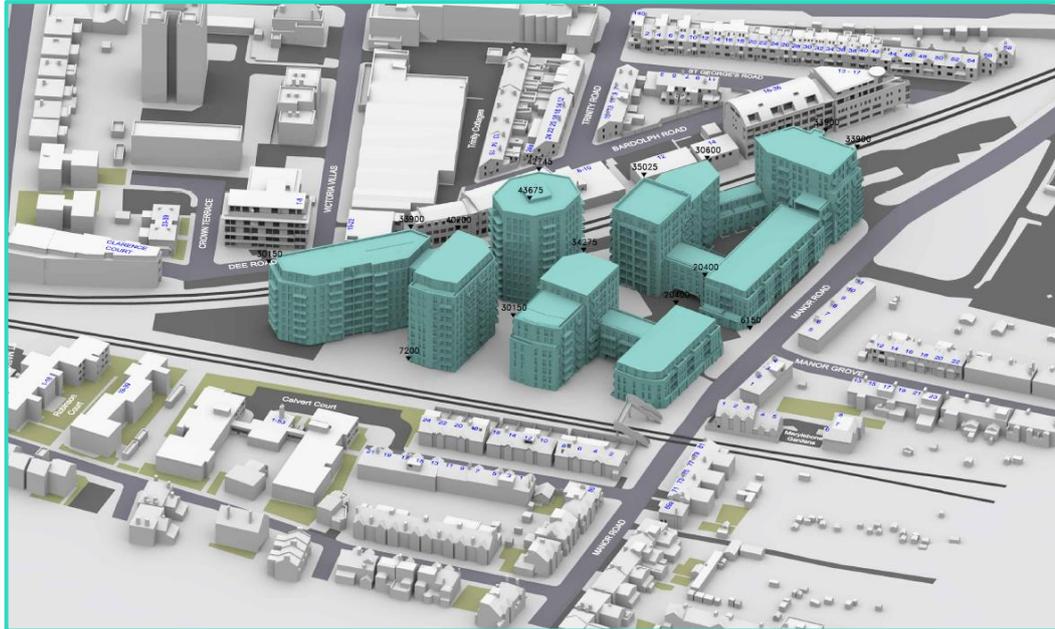


Plate 01 – Proposed 84 Manor Road, North Sheen Scheme– 3D view demonstrating the block configuration on the development site (aqua)

- 4.2 Plate 02 below shows the proposed block location and labels that correspond with Table 01.





Plate 02 – 84 Manor Road, North Sheen – Block Locations

- 4.3 The internal daylight assessment has been undertaken to a selection of the habitable rooms across the proposed scheme that warrant assessment, to provide a comprehensive understanding of the internal daylight potential of the proposed habitable rooms within the scheme proposal. This approach is commonly implemented and is accepted within the industry for schemes of this scale and nature.
- 4.4 The BRE Guidelines set out a criteria specific for each room classification and are as follows:
- Bedroom - Median 100 lux across 50% room's area at desktop height
 - Living room - Median 150 lux across 50% room's area at desktop height
 - Kitchen - Median 200 lux across 50% room's area at desktop height
- 4.5 In circumstances where rooms serve as multifunctional spaces, such as living-kitchen-diners, the BRE Guidelines advocate the application of 150 lux target value where appropriate.
- 4.6 Drawings P1685/TRGT/01-26 located in Appendix 1 show the internal arrangements within the proposal, together with daylight illuminance (Lux level) contours that are achieved for 50% of daylight hours. The drawings also show the median daylight illuminance figure for each room.

4.7 Table 01 below shows the headline internal daylight results, illustrating the BRE compliance when adopting the specific room classification CBDM target values.

Table 01 – Internal Daylight CBDM Results

CBDM Summary												
Address	LKD			BEDROOM			STUDIO			All Rooms		
	Total	Pass	%	Total	Pass	%	Total	Pass	%	Total	Pass	%
Block A1	5	5	100	5	5	100	0	0	0	10	10	100
Block A2	5	2	40	5	4	80	0	0	0	10	6	60
Block A3	3	2	67	6	5	83	1	0	0	10	7	70
Block B	15	6	40	15	14	93	0	0	0	30	20	67
Block C1	5	1	20	9	7	78	0	0	0	14	8	57
Block C2	9	2	22	7	6	86	0	0	0	16	8	50
Block D1	5	2	40	3	3	100	0	0	0	8	5	63
Block D2	11	5	45	11	9	82	0	0	0	22	14	64
Total	58	25	43	61	53	87	1	0	0	120	78	65

4.8 The technical results show that 78 out of 120 rooms (65%) will either meet or exceed the minimum CBDM target value based on their use classification.

4.9 Of the 120 tested habitable rooms, 61 rooms are bedrooms, 58 rooms are multifunctional Living-Kitchen-Diners and 1 rooms are studios. The technical analysis and calculations have taken into consideration the presence of balconies and it should therefore be acknowledged that there is a trade-off between private amenity and daylight amenity.

4.10 The technical analysis shows that the majority of the assessed rooms that do not meet their room classification target values are Living-Kitchen-Diners (LKDs), that require a target median of 150 lux (as advocated within the BRE Guidelines), as outlined within the 2022 BRE Guidelines. This room classification serve multiple room uses and are therefore large and deep spaces. The technical analysis shows that whilst the whole room does not meet the suggested median lux target values, those spaces closest to the apertures record in excess of 150 lux, with the majority recording in excess of 200 lux, and is an indicator for good internal light availability, particularly to those spaces more likely to be used as habitable areas.

4.11 The results show that there are 8 bedrooms that do not meet their specific classification target value, although it should be noted that the BRE Guidelines recognise that this room type does not carry the same expectation for natural light when compared to a living room, by virtue of its functionality.

4.12 In respect of the isolated studio that does not meet its target value, this room records within 30 lux of its 150 lux target value. The results demonstrate that whilst this room is deep and large, the areas closest to the windows record in excess of 200 lux and is considered exceptional for an urban location.

- 4.13 Where rooms do not meet the room specific target values, this is many cases a product of providing private amenity in the form of balconies and ‘winter gardens’. Whilst affording important amenity space, the presence of overhanging balconies can have a limiting effect in terms of light penetration within the room.

INTERNAL SUNLIGHT

- 4.14 The updated BRE guidelines (2022) refer to BS EN 17037 and state that a ‘space should receive a minimum of 1.5 hours of direct sunlight on a selected date between 1 February and 21 March with cloudless conditions’.
- 4.15 The potential amount of sunlight a window can receive depends on the direction it faces. A south facing window has the potential to receive the highest amount of sunlight as well as the highest expectation of sunlight. Conversely, a north facing window has the lowest potential and the occupants of a north facing room would therefore expect to receive very little sunlight. The situation varies between these two extremes and, for existing buildings, the BRE suggest a cut-off of 90 degrees from south, i.e., easterly, or westerly facades. Although the results for the north-facing windows have been presented, as per a strict interpretation of the guidelines, they should be regarded as less important.
- 4.16 For new developments, the BRE suggest that dwellings should be orientated so that at least one main window wall faces within 90 degrees of due south. In practice, for a large block of units in an urban area it is usual for some units to have a northerly aspect. Table O2 below shows the results of the Internal Sunlight Exposure Analysis. The full extent of the internal sunlight results can be found within Appendix 2.

Table O2 – Internal Sunlight Exposure BRE Compliance

84 Manor Road, North Sheen, LKD Internal Sunlight % BRE Compliance			
Address	Pass	Total	% BRE Compliant
Block A1	5	5	100
Block A2	2	5	40
Block A3	3	3	100
Block B	10	15	67
Block C1	5	5	100
Block C2	2	9	22
Block D1	2	5	40
Block D2	7	11	64
Total	36	58	62

- 4.17 The results show that 36 out of 58 Living Kitchen Diners (LKD) (62%) will meet or exceed 1.5 hours of direct sunlight a selected date between 1 February and 21 March with cloudless conditions.

- 4.18 The technical analysis shows that the affected rooms have an orientation largely looking either west or east and not directly south. When compared to rooms that have a greater southern orientation, these rooms are more likely to be challenged for sunlight availability. For instance, each assessed LKD with a northerly aspect does not meet the BRE's 1.5 hour sunlight requirement between 1 February and 21 March.

5 Proposed Amenity Spaces

- 5.1 The Sun Hours on Ground methodology has been undertaken to assess those amenity spaces within the Proposed Development site. The target criteria is to determine whether at least half of the space (50%) will receive at least 2 hours of direct sunlight on the BRE's suggested test date, being 21st March. Importantly, the Sun Hours on Ground (SHoG) assessment outlined within the new 2022 BRE Guidelines is consistent with the superseded 2011 BRE Guidelines.
- 5.2 Plate 02 below demonstrates the Sun Hours on Ground Internal Amenity Assessment results on 21st March. The results of the overshadowing assessment can also be found on drawing P1685/SHA/11-12 within Appendix 4.



Plate 02 – 84 Manor Road, North Sheen – Sun on Ground Assessment – 21st March

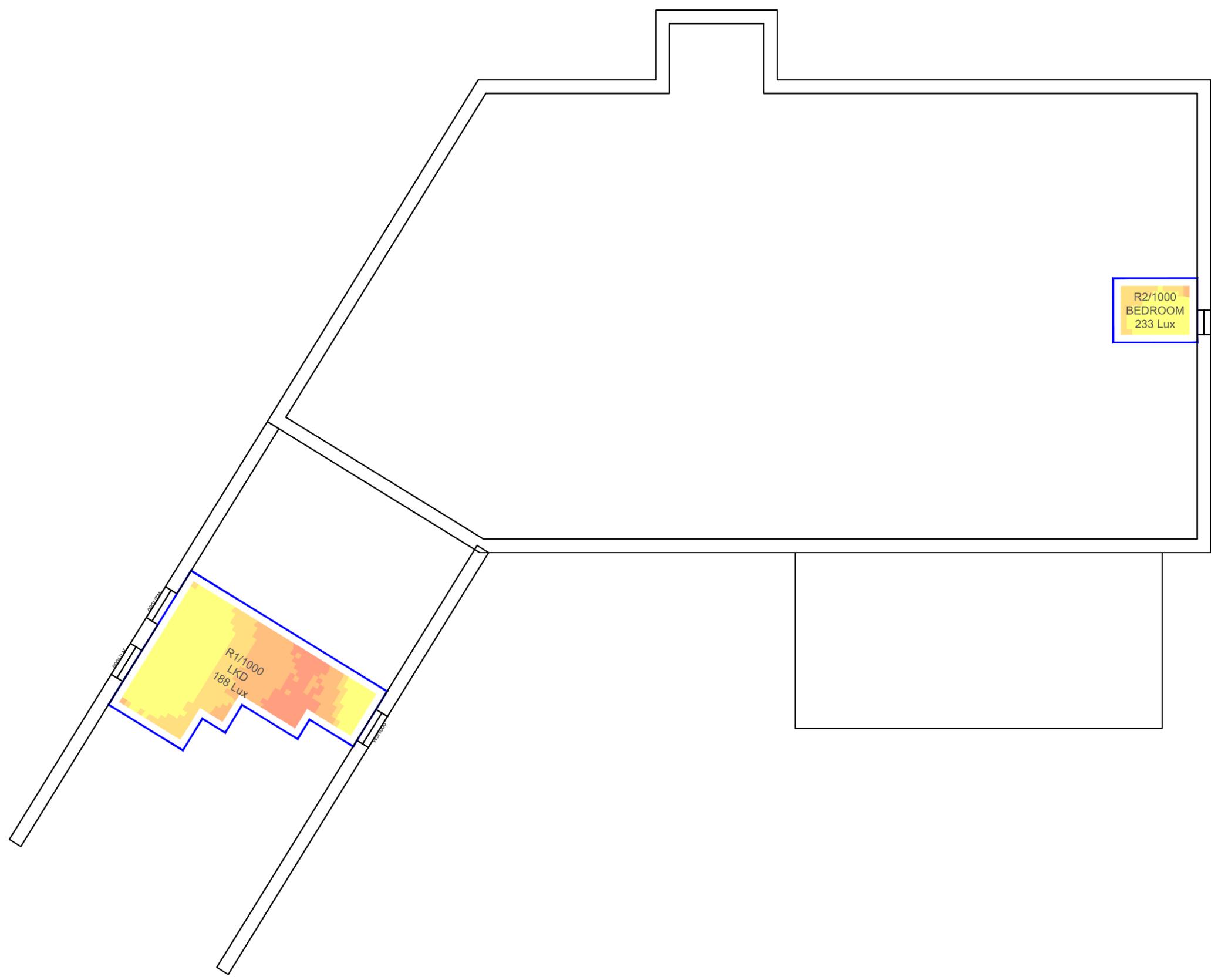
- 5.3 Plate 02 above shows that all but 2 spaces will meet the BRE's target of achieving at least 2 hours of direct sunlight on 21st March. It is worth also noting the scheme has been designed in such a way so far to encourage movement between the spaces to maximise the sunlight potential for future residents and users.
- 5.4 Whilst the BRE Guidelines do not recognise June 21st as a date for assessment, it follows that the amenity spaces will predominantly be used and enjoyed during the summer months.

6 Conclusions

- 6.1 Point 2 have assessed the Proposed Development at 84 Manor Road, North Sheen in accordance with the updated BRE recommended CBDM analysis.
- 6.2 The scheme has been designed to maximise the daylight levels within the main living areas whilst still providing each unit with a private external amenity space in the form of balconies. Whilst these features can lead to sub-optimal daylight levels within the rooms that are overhung by them, this should be considered against the considerable amenity benefits these areas bring the occupants of these spaces.
- 6.3 The technical results show that 78 out of 120 rooms (65%) will either meet or exceed the minimum CBDM target value based on their use classification. Notably, the majority of the affected rooms are served by balconies and reduce the view of the sky to those rooms that are overhung. A trade-off between private amenity and daylight amenity should therefore be considered within the assessment.
- 6.4 It should be noted that the introduction of the CBDM analysis (as part of the 2022 BRE Guidelines) is more stringent when compared to the superseded Average Daylight Factor (ADF) assessment. It is seen throughout many similar developments that well-designed buildings generally record lower CBDM compliance when compared against the ADF assessment.
- 6.5 In respect of the internal sunlight exposure assessment, the results show that of the 58 assessed LKDs, 36 will record 1.5 hours of sunlight between 1 February and 21 March, equating to 62% compliance. The analysis shows that the majority of rooms that do not meet the BRE's target do not have an orientation directly south and are therefore more marginalised for direct sunlight, that the BRE Guidelines recognise.
- 6.6 With regards to the assessed amenity spaces within the proposed scheme, the results show that all but 2 spaces will meet the BRE's target of achieving at least 2 hours of direct sunlight on 21st March (the BRE's test date). These results are consistent with those recorded within the July 2020 report.
- 6.7 The scheme has been designed to harness good access to natural light amenity within the new dwellings and amendments to balcony and window positions have been made to the massing to maximise the position. The technical analysis demonstrates good internal daylight levels, notwithstanding the more stringent CBDM criteria and widespread provision of balconies (to provide private amenity).

Appendix 1:

Internal CBDM Daylight Results



Sources: Point 2 Surveyors
 Survey Info
 Point Cloud Data
 Assael Architecture Limited
 Floor plans(received 16/03/23)
 MNR-AA-BB1 series drawings
 Elevations (received 16/03/23)
 MNR-AA-ALL-ZZ-DR-A series drawings

Key: Daylight Illuminance
 (achieved for 50% of daylight hours)

■ <50 Lux	Median Illuminance (Lux) Levels shown for each room.
■ >50 Lux	Recommended Targets:
■ >100 Lux	Bedroom 100 Lux
■ >150 Lux	Living Room 150 Lux
■ >200 Lux	Kitchen 200 Lux

Project: Homebase
 Richmond

Title: Climate Based Daylight Modeling (CBDM) Assessment
 Median Luminance (Lux) Levels
 Block A1
 Proposed Scheme Dated 16/03/23

Scheme Confirmed:
 --

Date:
 --

Drawn By:
 DB

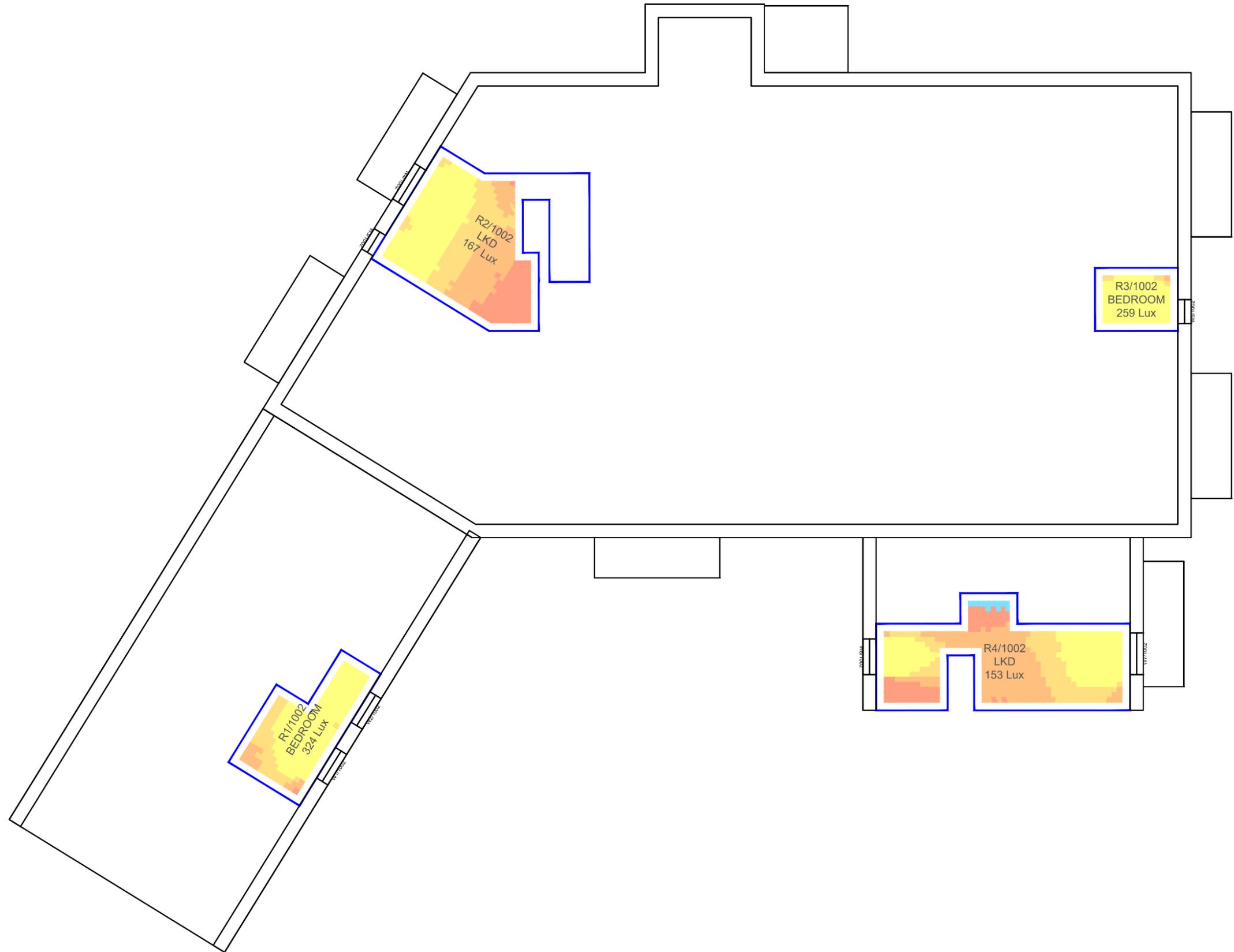
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Date:
 APR 23

Dwg No:
P1685/CBDM/01

Rel:
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Sources: Point 2 Surveyors
 Survey Info
 Point Cloud Data
 Assael Architecture Limited
 Floor plans(received 16/03/23)
 MNR-AA-BB1 series drawings
 Elevations (received 16/03/23)
 MNR-AA-ALL-ZZ-DR-A series drawings

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■ >200 Lux	Kitchen 200 Lux

Project: Homebase Richmond

Title: Climate Based Daylight Modeling (CBDM) Assessment
 Median Luminance (Lux) Levels
 Block A1
 Proposed Scheme Dated 16/03/23

Scheme Confirmed: --

Date: --

Drawn By: DB

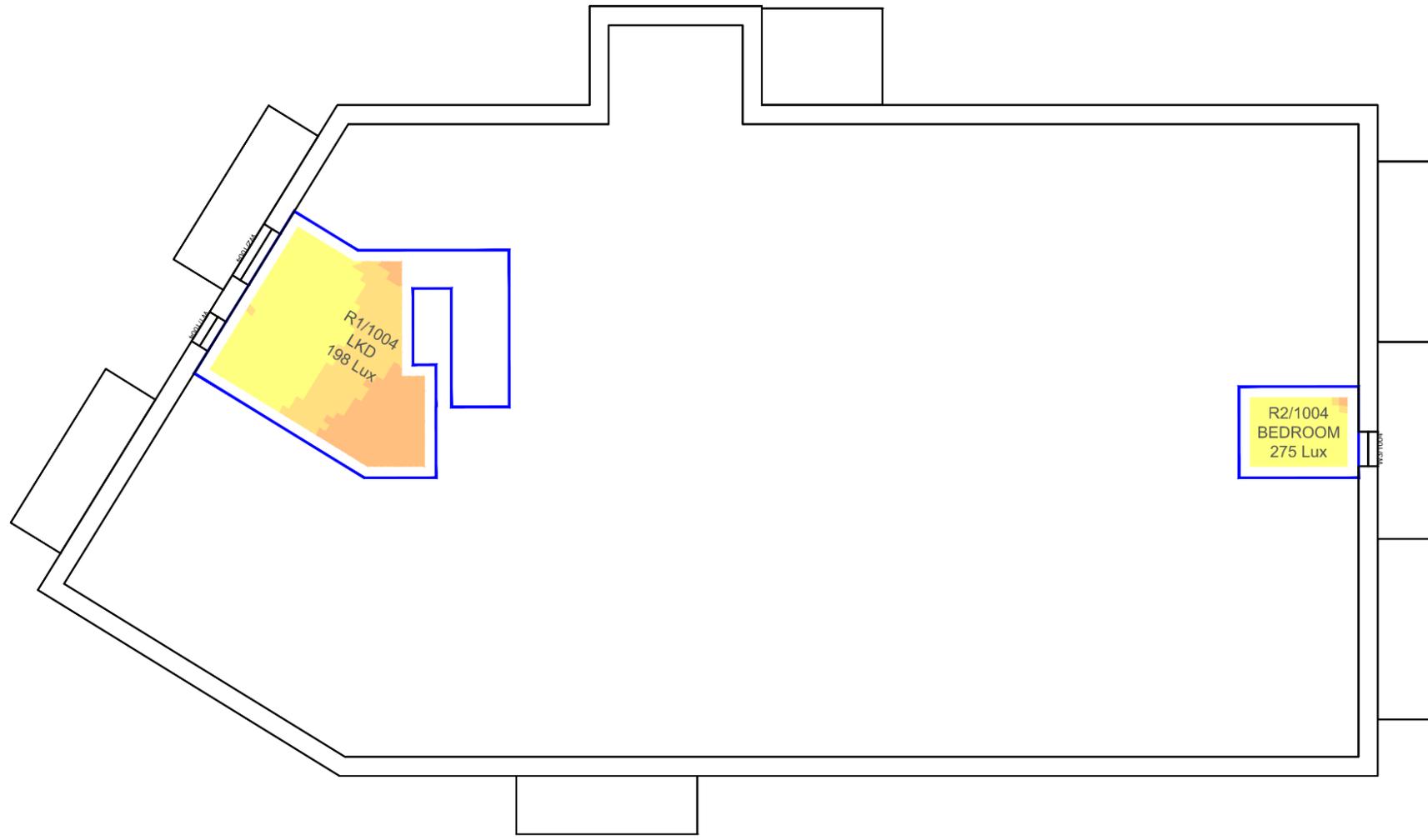
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Date: APR 23

Dwg No: P1685/CBDM/02

Rel: 19





Sources: Point 2 Surveyors
 Survey Info
 Point Cloud Data
 Assael Architecture Limited
 Floor plans(received 16/03/23)
 MNR-AA-BB1 series drawings
 Elevations (received 16/03/23)
 MNR-AA-ALL-ZZ-DR-A series drawings

Key: Daylight Illuminance
 (achieved for 50% of daylight hours)

■ <50 Lux	Median Illuminance (Lux) Levels shown for each room. Recommended Targets: Bedroom 100 Lux Living Room 150 Lux Kitchen 200 Lux
■ >50 Lux	
■ >100 Lux	
■ >150 Lux	
■ >200 Lux	

Project: Homebase Richmond

Title: Climate Based Daylight Modeling (CBDM) Assessment
 Median Luminance (Lux) Levels
 Block A1

 Proposed Scheme Dated 16/03/23

Scheme Confirmed: --

Date: --

Drawn By: DB

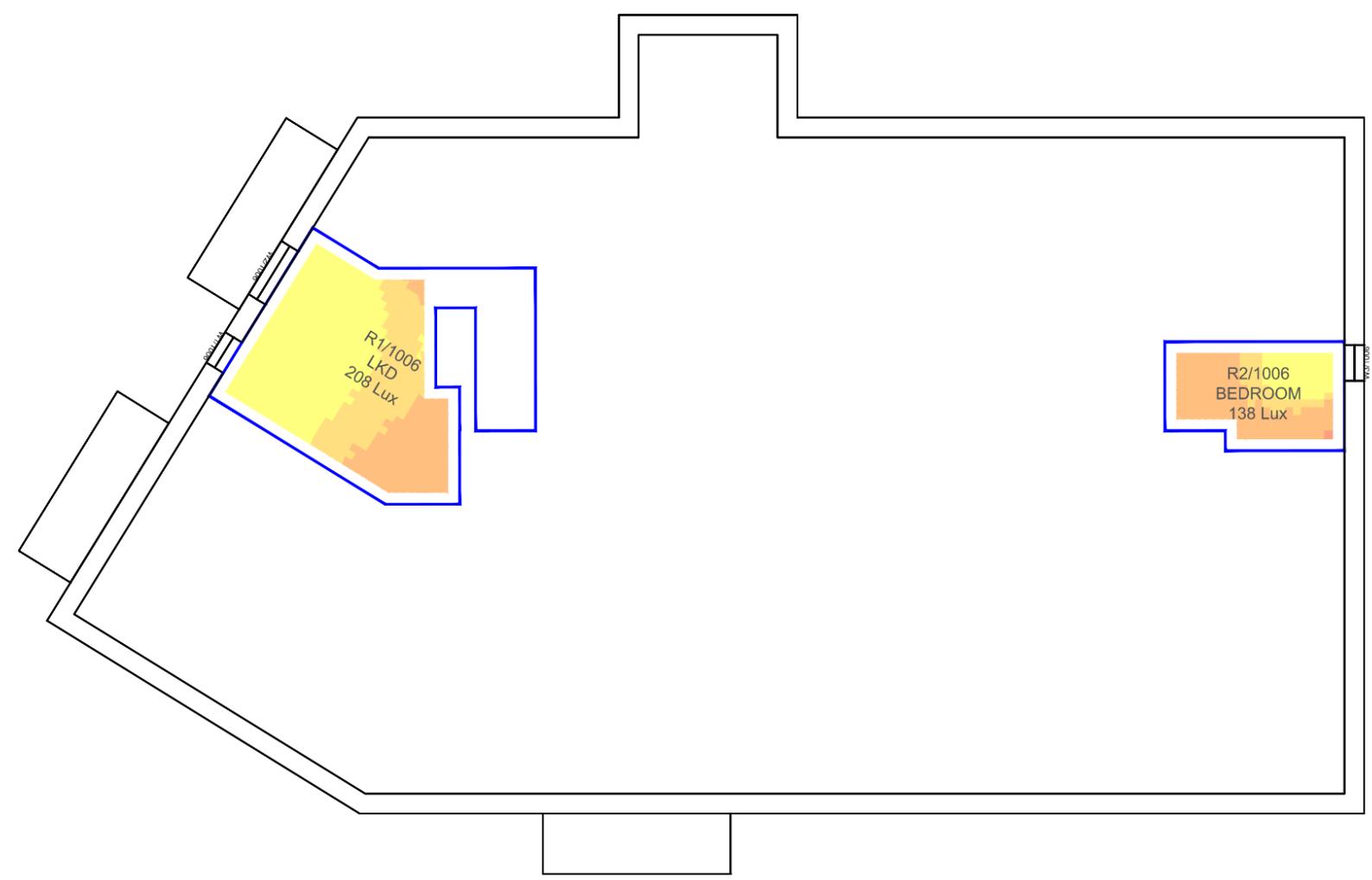
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Date: APR 23

Dwg No: P1685/CBDM/03

Rel: 19





Sources: Point 2 Surveyors
 Survey Info
 Point Cloud Data
 Assael Architecture Limited
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 Elevations (received 16/03/23)
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■ >50 Lux	
■ >100 Lux	
■ >150 Lux	
■ >200 Lux	

Project: Homebase Richmond

Title: Climate Based Daylight Modeling (CBDM) Assessment
 Median Luminance (Lux) Levels
 Block A1
 Proposed Scheme Dated 16/03/23

Scheme Confirmed: --

Date: --

Drawn By: DB

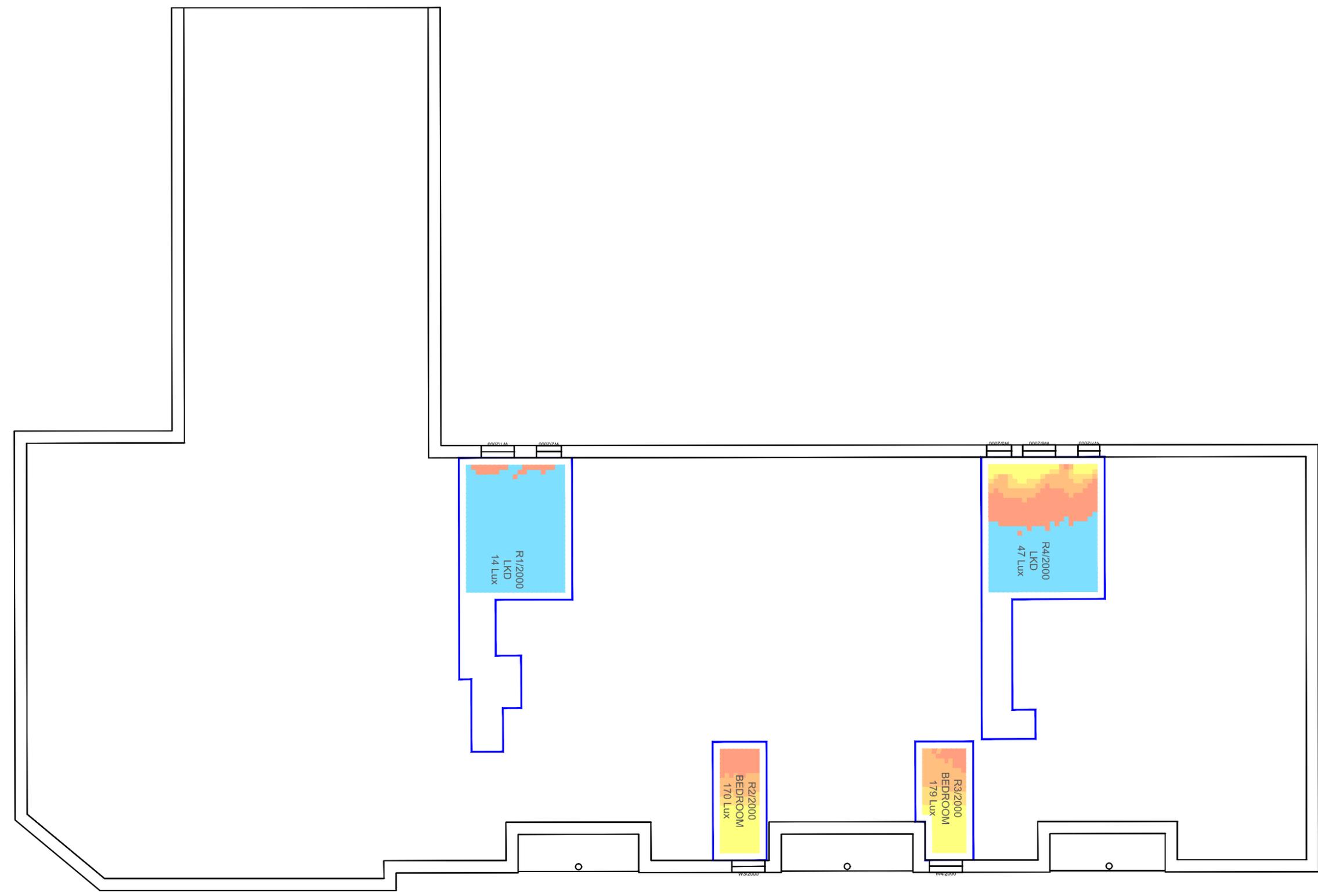
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Date: APR 23

Dwg No: P1685/CBDM/04

Rel: 19





Sources: Point 2 Surveyors
 Survey Info
 Point Cloud Data
 Assael Architecture Limited
 Floor plans(received 16/03/23)
 MNR-AA-BB1 series drawings
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■ >150 Lux	Living Room 150 Lux
■ >200 Lux	Kitchen 200 Lux

Project: Homebase Richmond

Title: Climate Based Daylight Modeling (CBDM) Assessment
 Median Luminance (Lux) Levels
 Block A2
 Proposed Scheme Dated 16/03/23

Scheme Confirmed: --

Date: --

Drawn By: DB

Scale: 1:175@A3

Date: APR 23

Dwg No: P1685/CBDM/05

Rel: 19





Sources: Point 2 Surveyors
 Survey Info
 Point Cloud Data
 Assael Architecture Limited
 Floor plans(received 16/03/23)
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■ >200 Lux	Kitchen 200 Lux

Project: Homebase Richmond

Title: Climate Based Daylight Modeling (CBDM) Assessment
 Median Luminance (Lux) Levels
 Block A2
 Proposed Scheme Dated 16/03/23

Scheme Confirmed: --

Date: --

Drawn By: DB

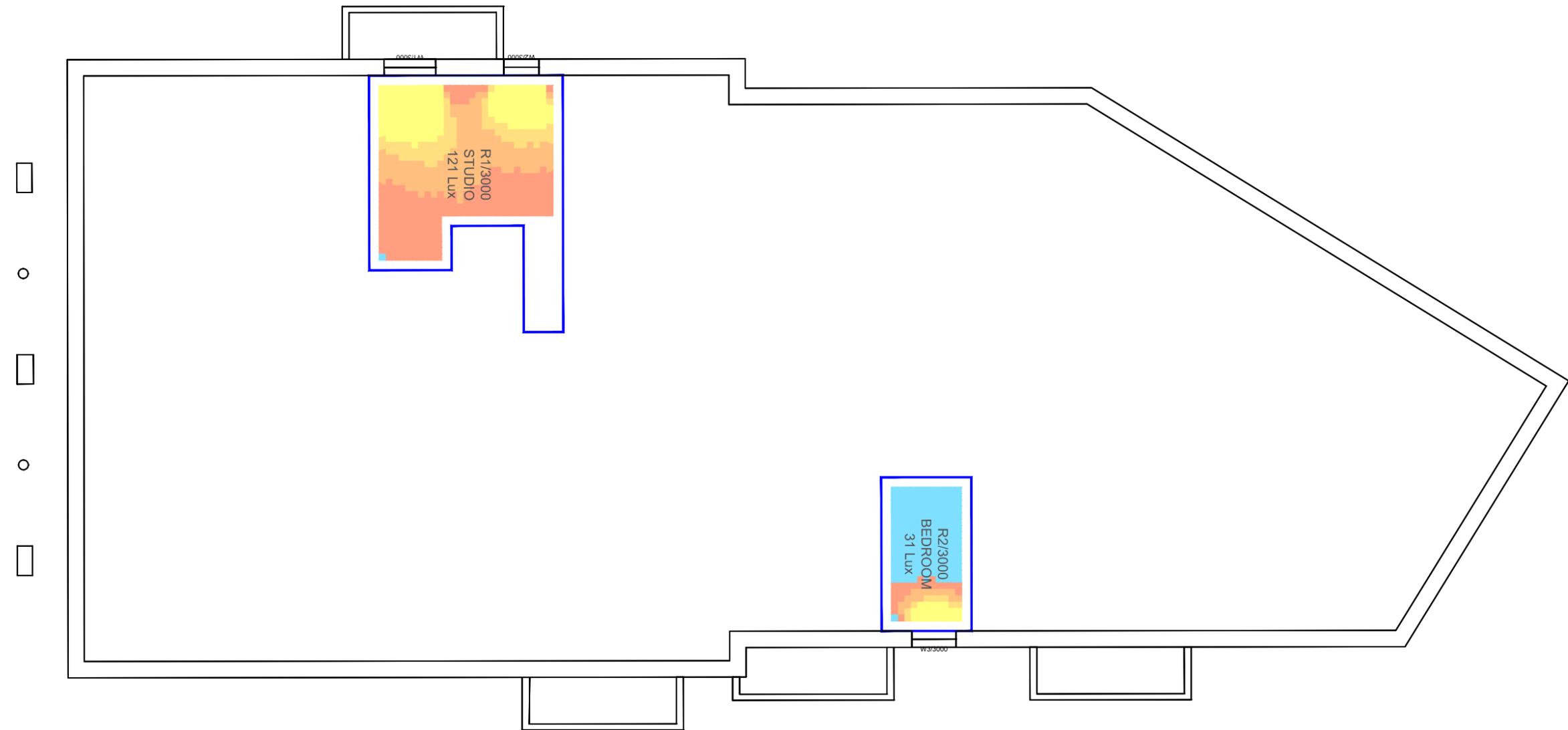
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Date: APR 23

Dwg No: P1685/CBDM/06

Rel: 19





Sources: Point 2 Surveyors
 Survey Info
 Point Cloud Data
 Assael Architecture Limited
 Floor plans(received 16/03/23)
 MNR-AA-BB1 series drawings
 Elevations (received 16/03/23)
 MNR-AA-ALL-ZZ-DR-A series drawings

Key: Daylight Illuminance
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■ >100 Lux	Bedroom 100 Lux
■ >150 Lux	Living Room 150 Lux
■ >200 Lux	Kitchen 200 Lux

Project: Homebase Richmond

Title: Climate Based Daylight Modeling (CBDM) Assessment
 Median Luminance (Lux) Levels
 Block A3
 Proposed Scheme Dated 16/03/23

Scheme Confirmed: --

Date: --

Drawn By: DB

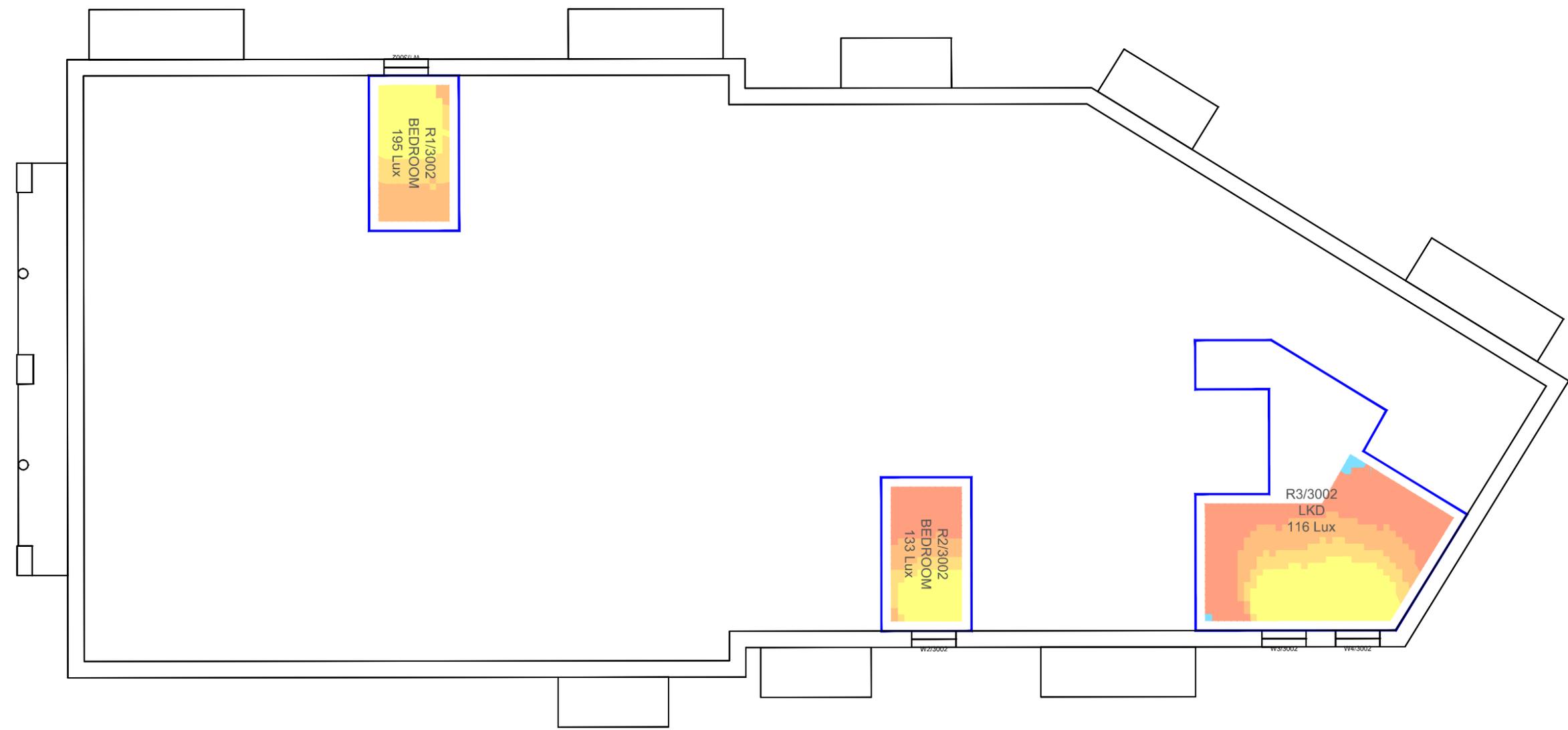
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Date: APR 23

Dwg No: **P1685/CBDM/07**

Rel: **19**





Sources: Point 2 Surveyors
 Survey Info
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■ >200 Lux	Kitchen 200 Lux

Project: Homebase Richmond

Title: Climate Based Daylight Modeling (CBDM) Assessment
 Median Luminance (Lux) Levels
 Block A3
 Proposed Scheme Dated 16/03/23

Scheme Confirmed: --

Date: --

Drawn By: DB

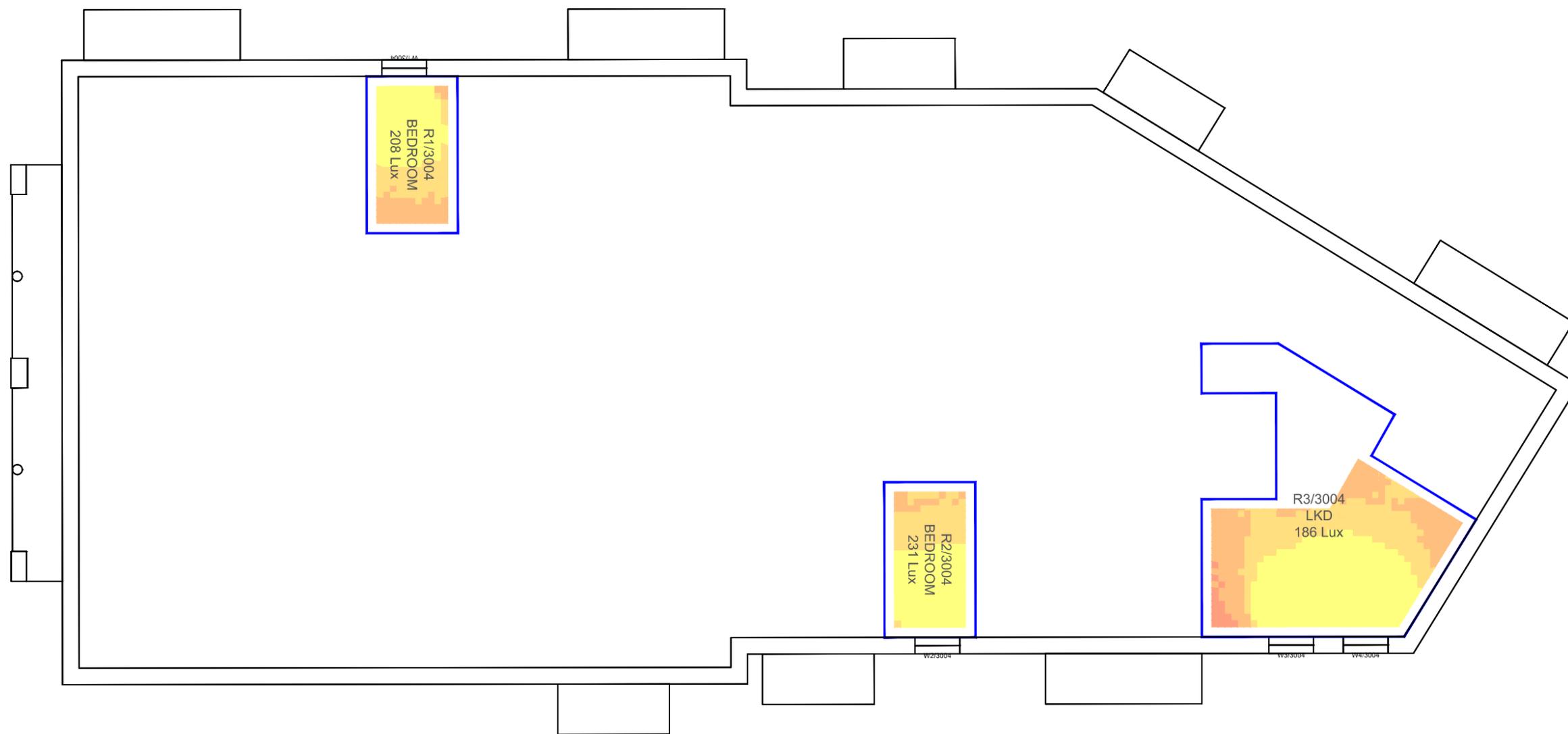
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Date: APR 23

Dwg No: **P1685/CBDM/08**

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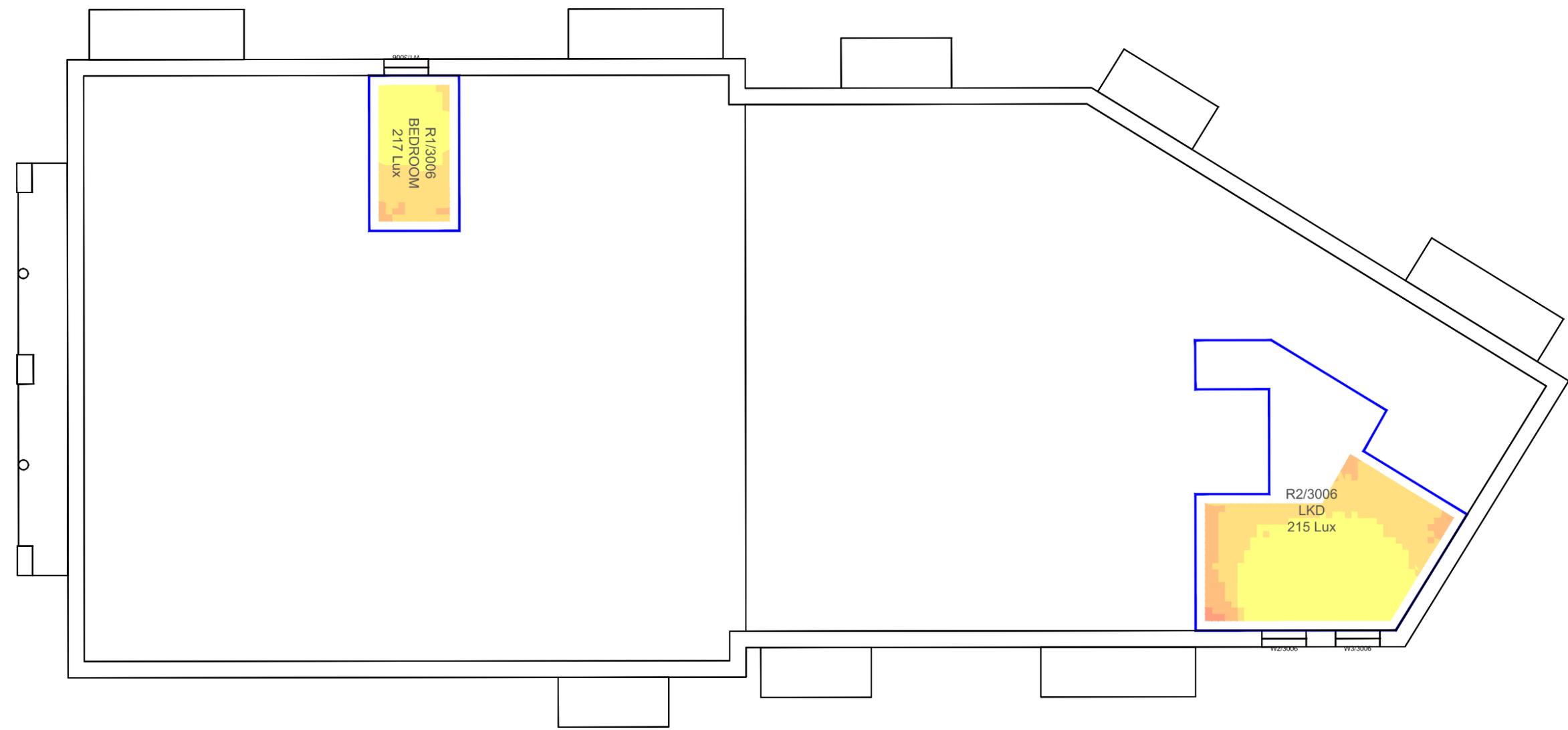
Sources: Point 2 Surveyors
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Scheme Confirmed: --	Date: --

Project: Homebase Richmond	
Drawn By: DB	Scale: 1:150@A3
Date: APR 23	Date: APR 23

Title: Climate Based Daylight Modeling (CBDM) Assessment Median Luminance (Lux) Levels Block A3 Proposed Scheme Dated 16/03/23	
Dwg No: P1685/CBDM/09	Rel: 19





Sources: Point 2 Surveyors
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■ <50 Lux	Median Illuminance (Lux) Levels shown for each room. Recommended Targets: Bedroom 100 Lux Living Room 150 Lux Kitchen 200 Lux
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■ >100 Lux	
■ >150 Lux	
■ >200 Lux	

Project: Homebase Richmond

Title: Climate Based Daylight Modeling (CBDM) Assessment
 Median Luminance (Lux) Levels
 Block A3

 Proposed Scheme Dated 16/03/23

Scheme Confirmed: --

Date: --

Drawn By: DB

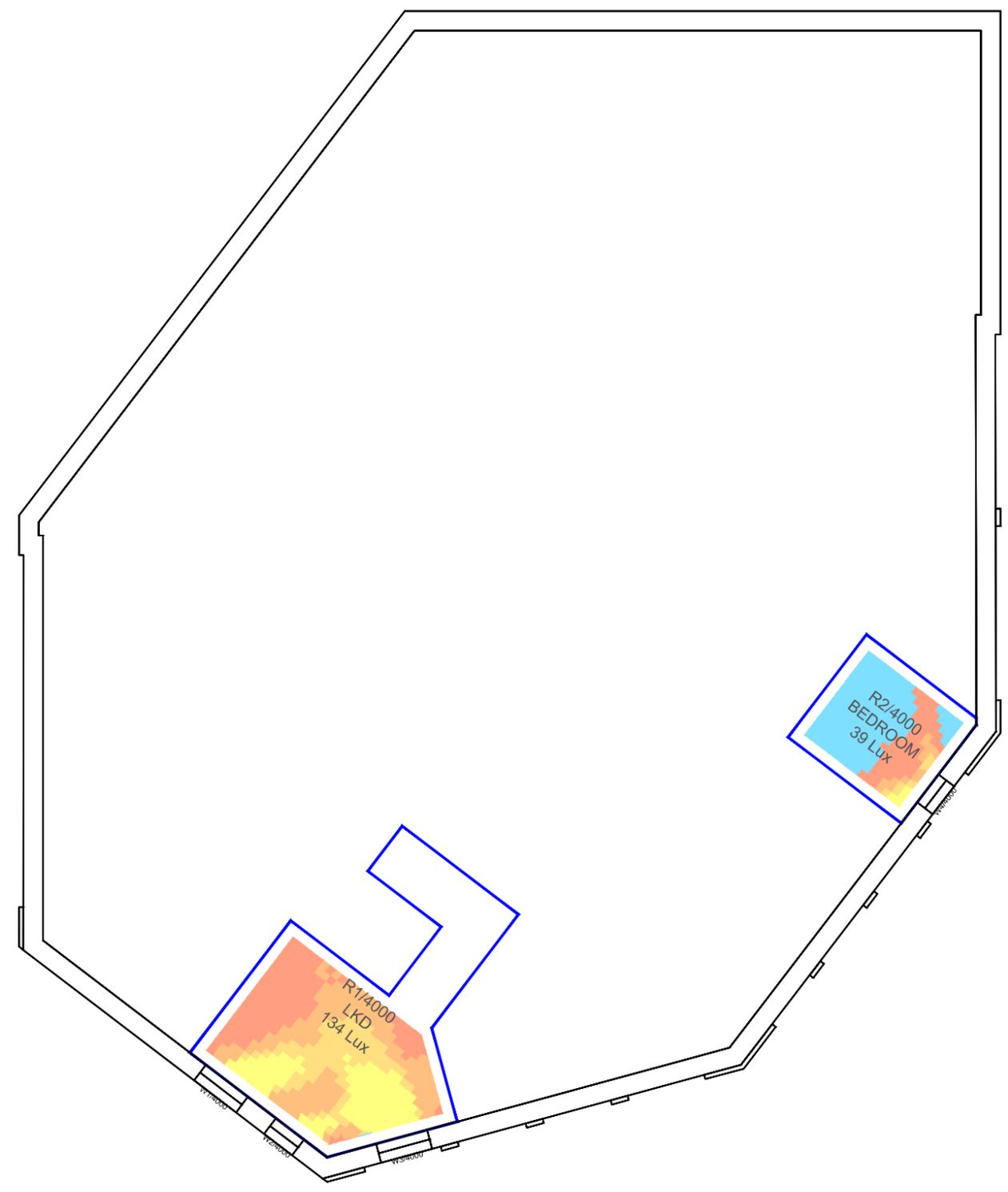
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Date: APR 23

Dwg No: **P1685/CBDM/10**

Rel: **19**





Sources: Point 2 Surveyors
 Survey Info
 Point Cloud Data
 Assael Architecture Limited
 Floor plans(received 16/03/23)
 MNR-AA-BB1 series drawings
 Elevations (received 16/03/23)
 MNR-AA-ALL-ZZ-DR-A series drawings

Key: Daylight Illuminance
 (achieved for 50% of daylight hours)

■ <50 Lux	Median Illuminance (Lux) Levels shown for each room. Recommended Targets: Bedroom 100 Lux Living Room 150 Lux Kitchen 200 Lux
■ >50 Lux	
■ >100 Lux	
■ >150 Lux	
■ >200 Lux	

Project: Homebase
 Richmond

Title: Climate Based Daylight Modeling (CBDM) Assessment
 Median Luminance (Lux) Levels
 Block B

 Proposed Scheme Dated 16/03/23

Scheme Confirmed: --

Date: --

Drawn By: DB

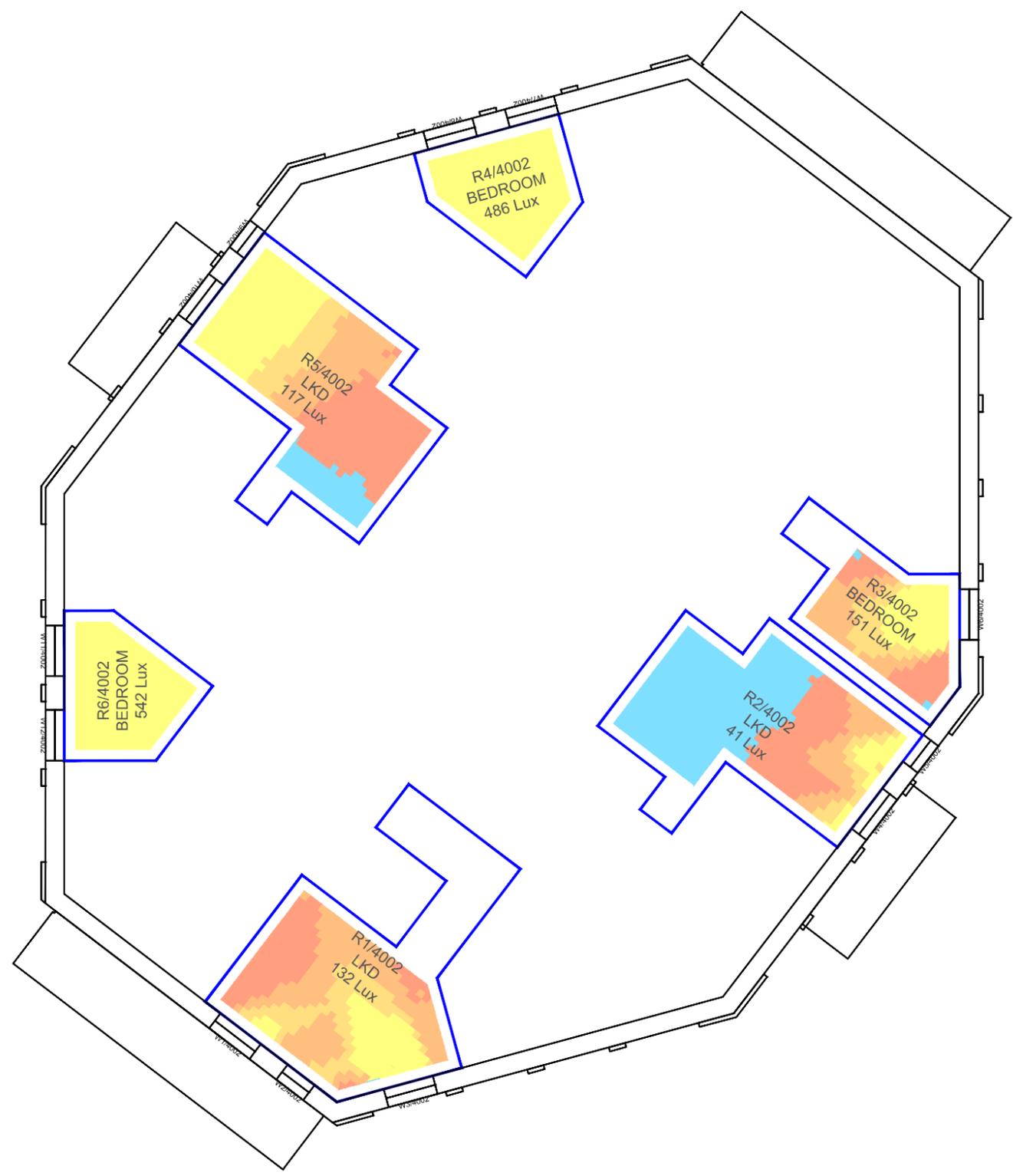
Scale: 1:150@A3

Date: APR 23

Dwg No: P1685/CBDM/11

Rel: 19





Sources: Point 2 Surveyors
 Survey Info
 Point Cloud Data
 Assael Architecture Limited
 Floor plans(received 16/03/23)
 MNR-AA-BB1 series drawings
 Elevations (received 16/03/23)
 MNR-AA-ALL-ZZ-DR-A series drawings

Key: Daylight Illuminance
 (achieved for 50% of daylight hours)

■ <50 Lux	Median Illuminance (Lux) Levels shown for each room.
■ >50 Lux	Recommended Targets:
■ >100 Lux	Bedroom 100 Lux
■ >150 Lux	Living Room 150 Lux
■ >200 Lux	Kitchen 200 Lux

Project: Homebase Richmond

Title: Climate Based Daylight Modeling (CBDM) Assessment
 Median Luminance (Lux) Levels
 Block B
 Proposed Scheme Dated 16/03/23

Scheme Confirmed: --

Date: --

Drawn By: DB

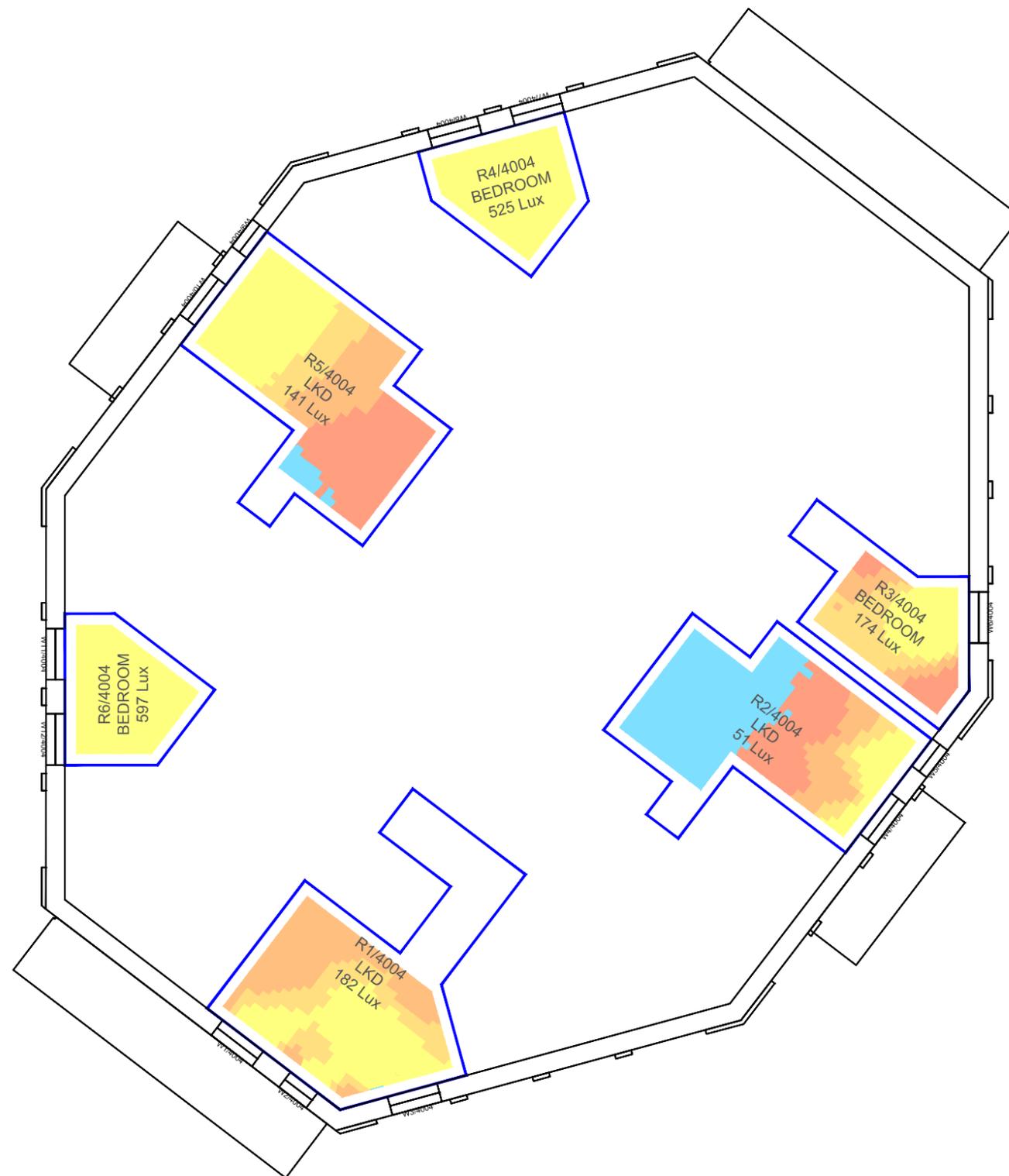
Scale: 1:150@A3

Date: APR 23

Dwg No: P1685/CBDM/12

Rel: 19





Sources: Point 2 Surveyors
 Survey Info
 Point Cloud Data
 Assael Architecture Limited
 Floor plans(received 16/03/23)
 MNR-AA-BB1 series drawings
 Elevations (received 16/03/23)
 MNR-AA-ALL-ZZ-DR-A series drawings

Key: Daylight Illuminance
 (achieved for 50% of daylight hours)

■ <50 Lux	Median Illuminance (Lux) Levels shown for each room.
■ >50 Lux	Recommended Targets:
■ >100 Lux	Bedroom 100 Lux
■ >150 Lux	Living Room 150 Lux
■ >200 Lux	Kitchen 200 Lux

Scheme Confirmed: -- Date: --

Project: Homebase Richmond

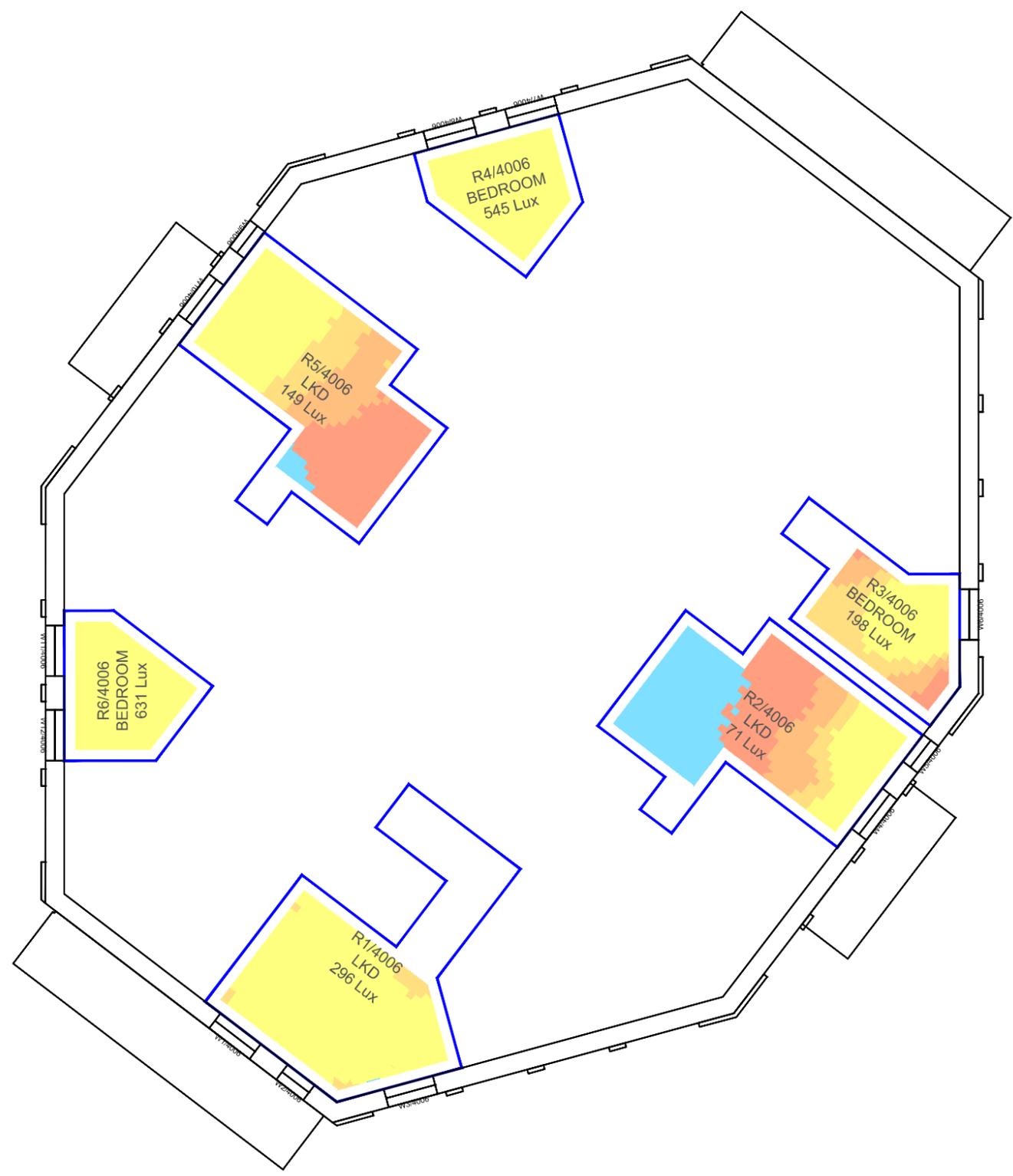
Drawn By: DB Scale: 1:150@A3 Date: APR 23

Title: Climate Based Daylight Modeling (CBDM) Assessment
 Median Luminance (Lux) Levels
 Block B

Proposed Scheme Dated 16/03/23

Dwg No: **P1685/CBDM/13** Rel: **19**





Sources: Point 2 Surveyors
 Survey Info
 Point Cloud Data
 Assael Architecture Limited
 Floor plans(received 16/03/23)
 MNR-AA-BB1 series drawings
 Elevations (received 16/03/23)
 MNR-AA-ALL-ZZ-DR-A series drawings

Key: Daylight Illuminance
 (achieved for 50% of daylight hours)

■ <50 Lux	Median Illuminance (Lux) Levels shown for each room.
■ >50 Lux	Recommended Targets:
■ >100 Lux	Bedroom 100 Lux
■ >150 Lux	Living Room 150 Lux
■ >200 Lux	Kitchen 200 Lux

Project: Homebase Richmond

Title: Climate Based Daylight Modeling (CBDM) Assessment
 Median Luminance (Lux) Levels
 Block B
 Proposed Scheme Dated 16/03/23

Scheme Confirmed: --

Date: --

Drawn By: DB

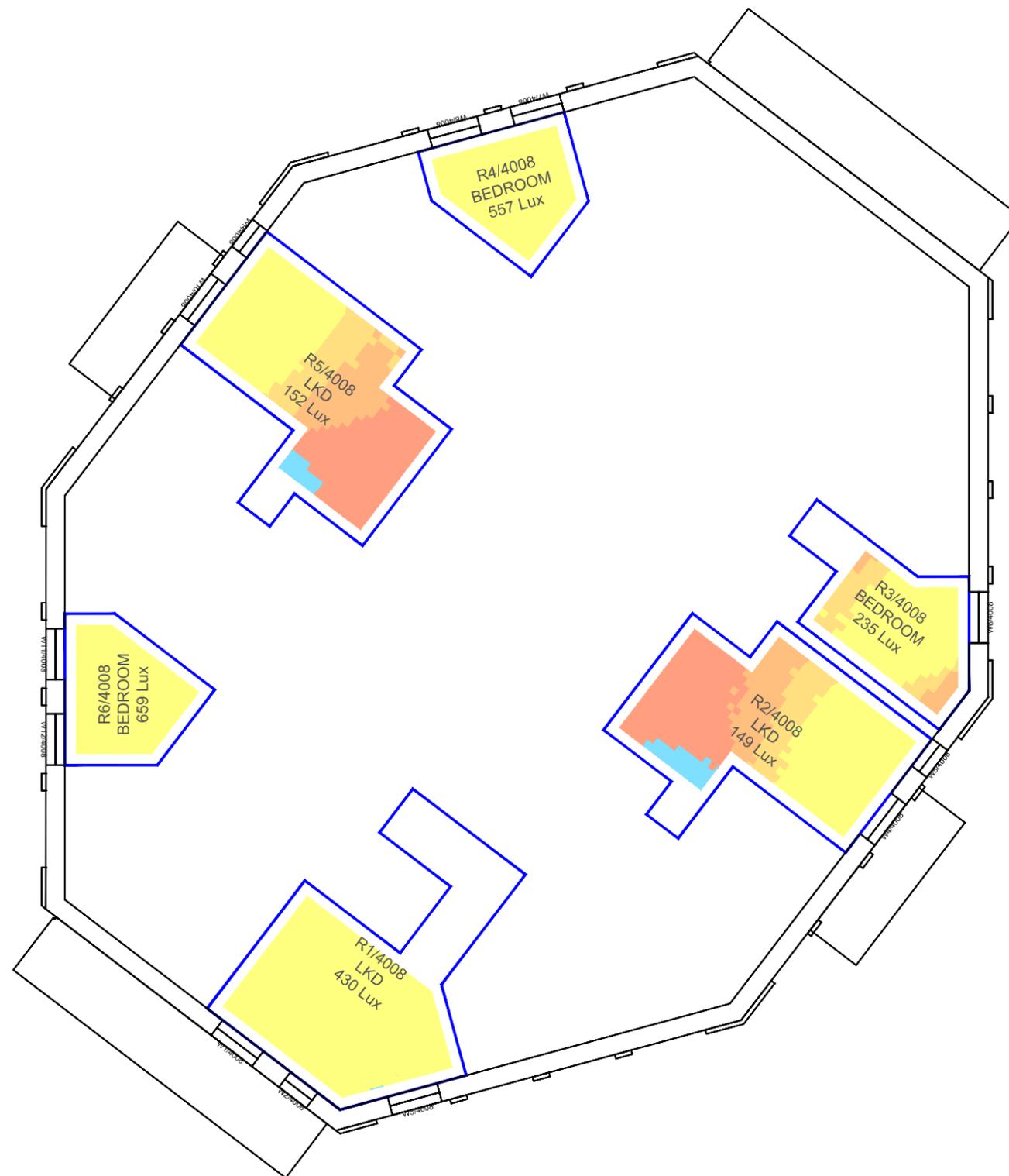
Scale: 1:150@A3

Date: APR 23

Dwg No: P1685/CBDM/14

Rel: 19





Sources: Point 2 Surveyors
 Survey Info
 Point Cloud Data
 Assael Architecture Limited
 Floor plans(received 16/03/23)
 MNR-AA-BB1 series drawings
 Elevations (received 16/03/23)
 MNR-AA-ALL-ZZ-DR-A series drawings

Key: Daylight Illuminance
 (achieved for 50% of daylight hours)

■ <50 Lux	Median Illuminance (Lux) Levels shown for each room.
■ >50 Lux	Recommended Targets:
■ >100 Lux	Bedroom 100 Lux
■ >150 Lux	Living Room 150 Lux
■ >200 Lux	Kitchen 200 Lux

Scheme Confirmed: -- Date: --

Project: Homebase Richmond

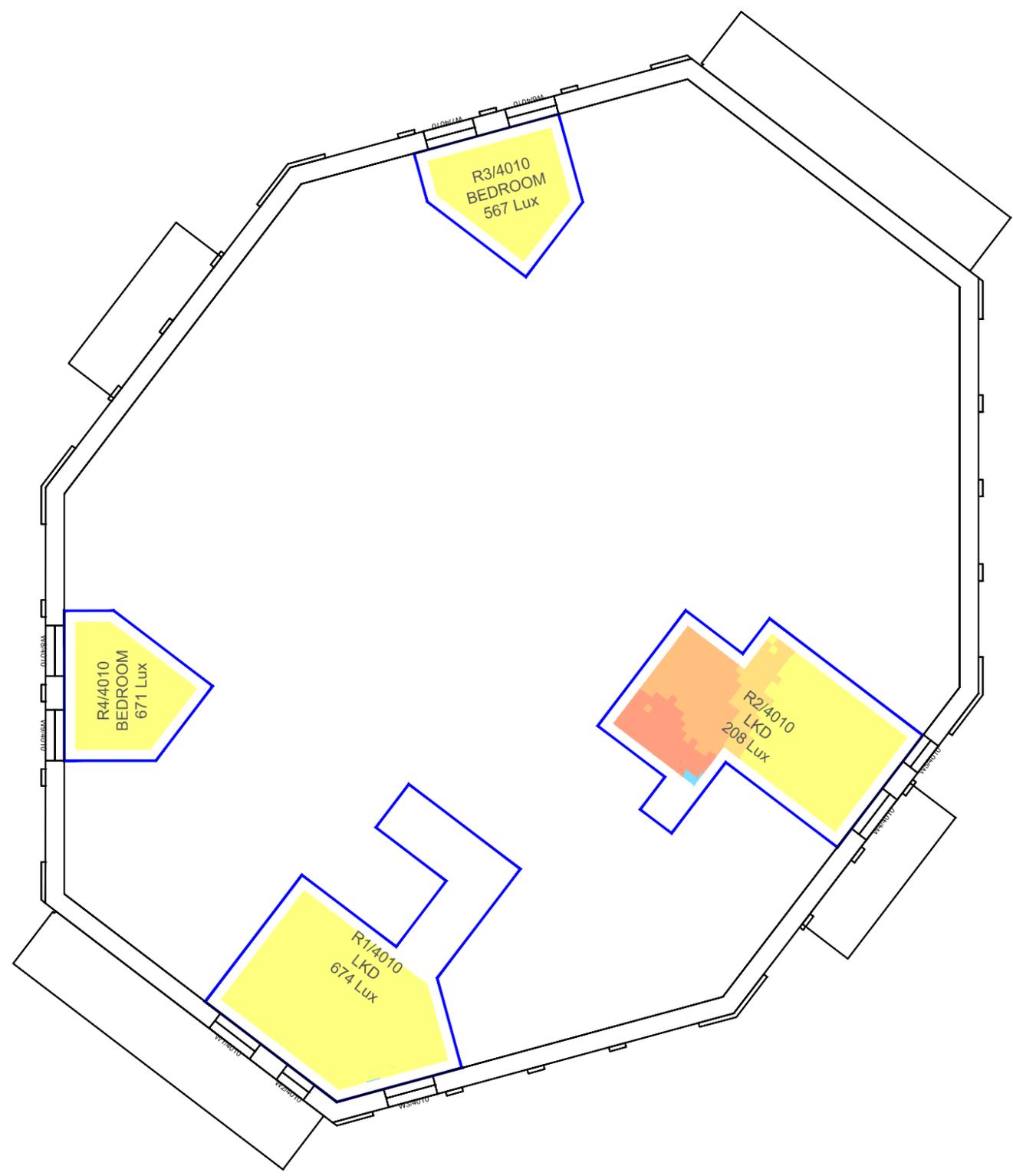
Drawn By: DB Scale: 1:150@A3 Date: APR 23

Title: Climate Based Daylight Modeling (CBDM) Assessment
 Median Luminance (Lux) Levels
 Block B

Proposed Scheme Dated 16/03/23

Dwg No: **P1685/CBDM/15** Rel: **19**





Sources: Point 2 Surveyors
 Survey Info
 Point Cloud Data
 Assael Architecture Limited
 Floor plans(received 16/03/23)
 MNR-AA-BB1 series drawings
 Elevations (received 16/03/23)
 MNR-AA-ALL-ZZ-DR-A series drawings

Key: Daylight Illuminance
 (achieved for 50% of daylight hours)

■ <50 Lux	Median Illuminance (Lux) Levels shown for each room.
■ >50 Lux	Recommended Targets:
■ >100 Lux	Bedroom 100 Lux
■ >150 Lux	Living Room 150 Lux
■ >200 Lux	Kitchen 200 Lux

Project: Homebase Richmond

Title: Climate Based Daylight Modeling (CBDM) Assessment
 Median Luminance (Lux) Levels
 Block B
 Proposed Scheme Dated 16/03/23

Scheme Confirmed: --

Date: --

Drawn By: DB

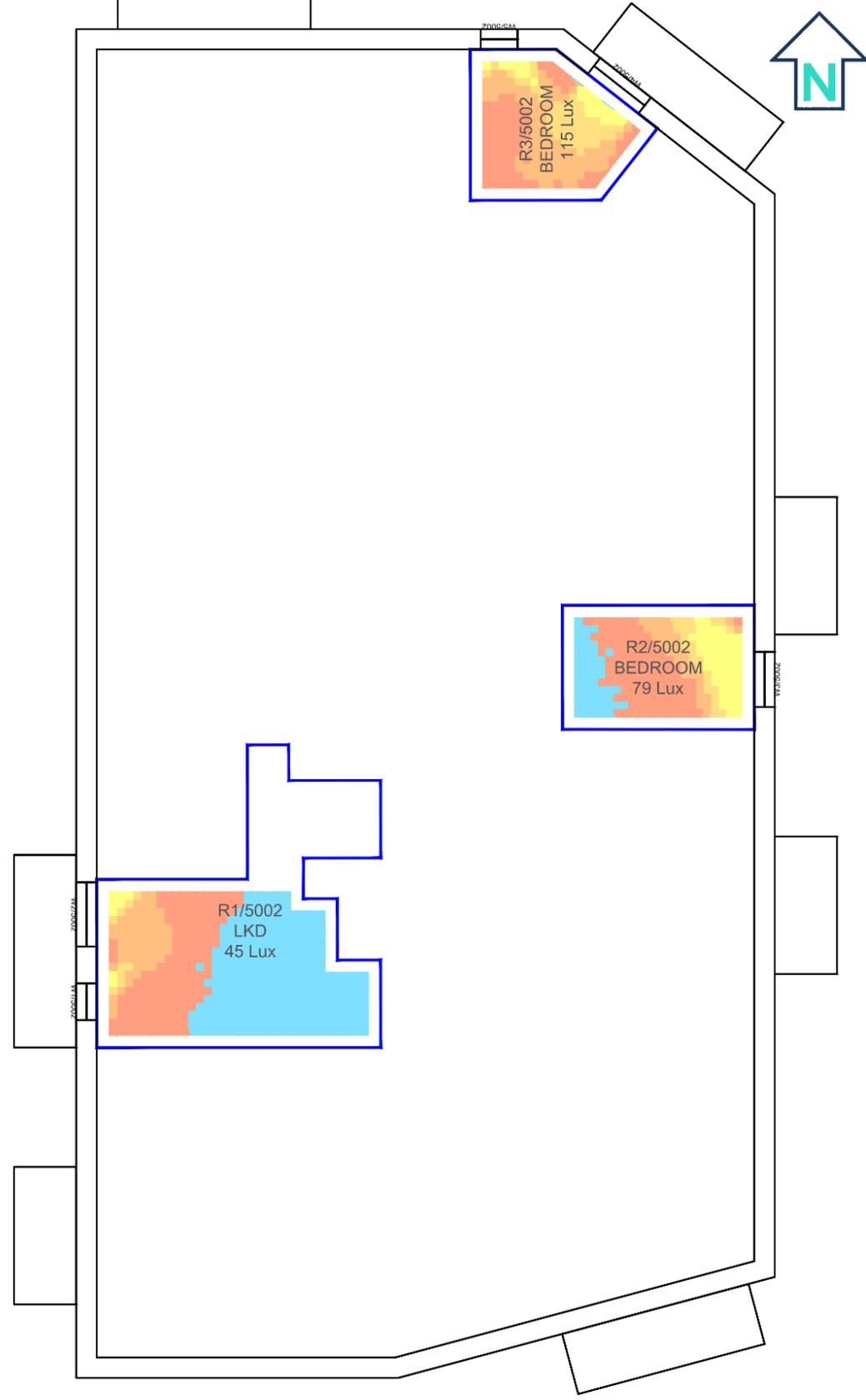
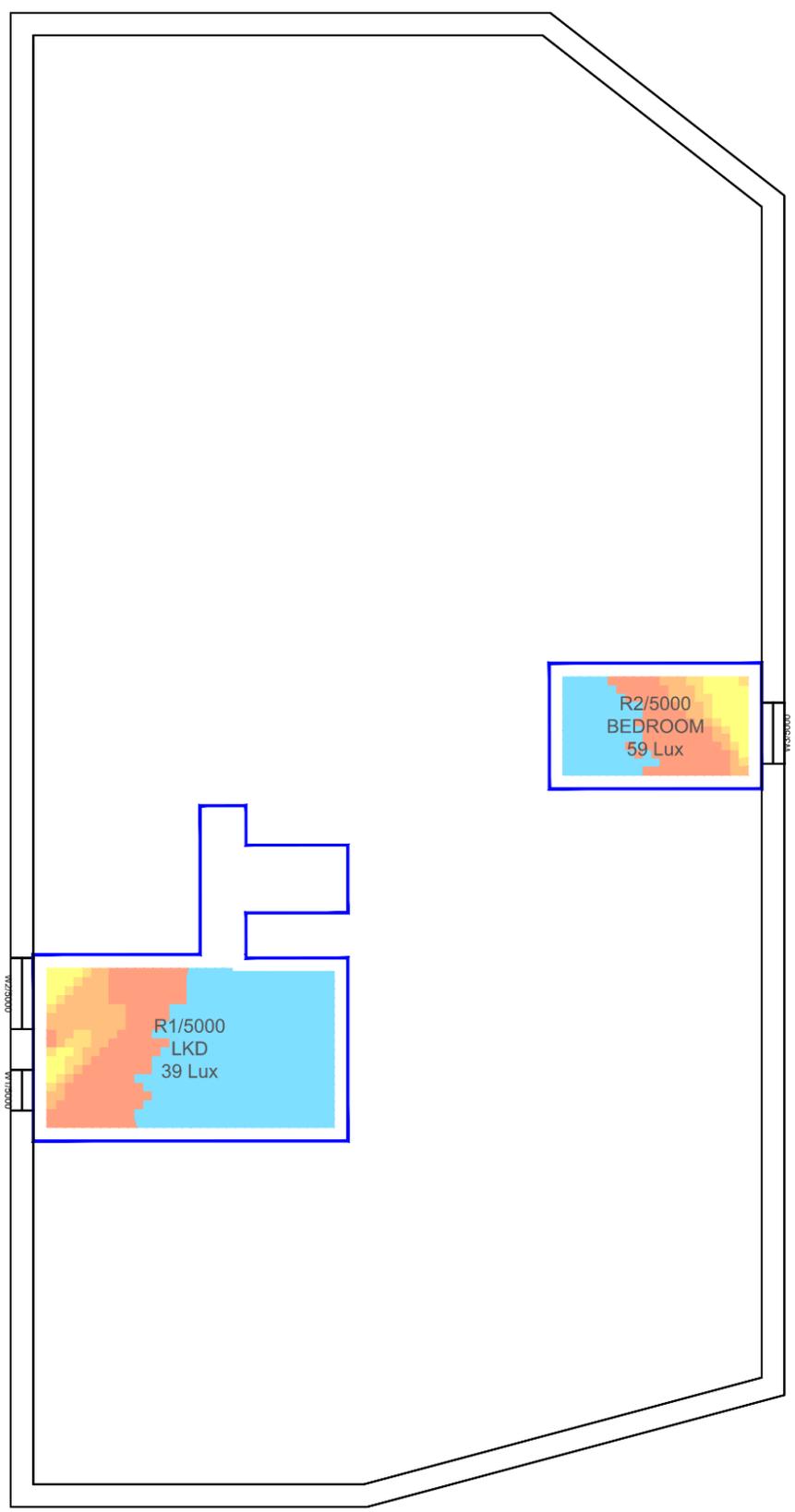
Scale: 1:150@A3

Date: APR 23

Dwg No: **P1685/CBDM/16**

Rel: **19**





Sources: Point 2 Surveyors
 Survey Info
 Point Cloud Data
 Assael Architecture Limited
 Floor plans(received 16/03/23)
 MNR-AA-BB1 series drawings
 Elevations (received 16/03/23)
 MNR-AA-ALL-ZZ-DR-A series drawings

Key: Daylight Illuminance
 (achieved for 50% of daylight hours)

■ <50 Lux	Median Illuminance (Lux) Levels shown for each room.
■ >50 Lux	Recommended Targets:
■ >100 Lux	Bedroom 100 Lux
■ >150 Lux	Living Room 150 Lux
■ >200 Lux	Kitchen 200 Lux

Project: Homebase Richmond

Title: Climate Based Daylight Modeling (CBDM) Assessment
 Median Luminance (Lux) Levels
 Block C1
 Proposed Scheme Dated 16/03/23

Scheme Confirmed: --

Date: --

Drawn By: DB

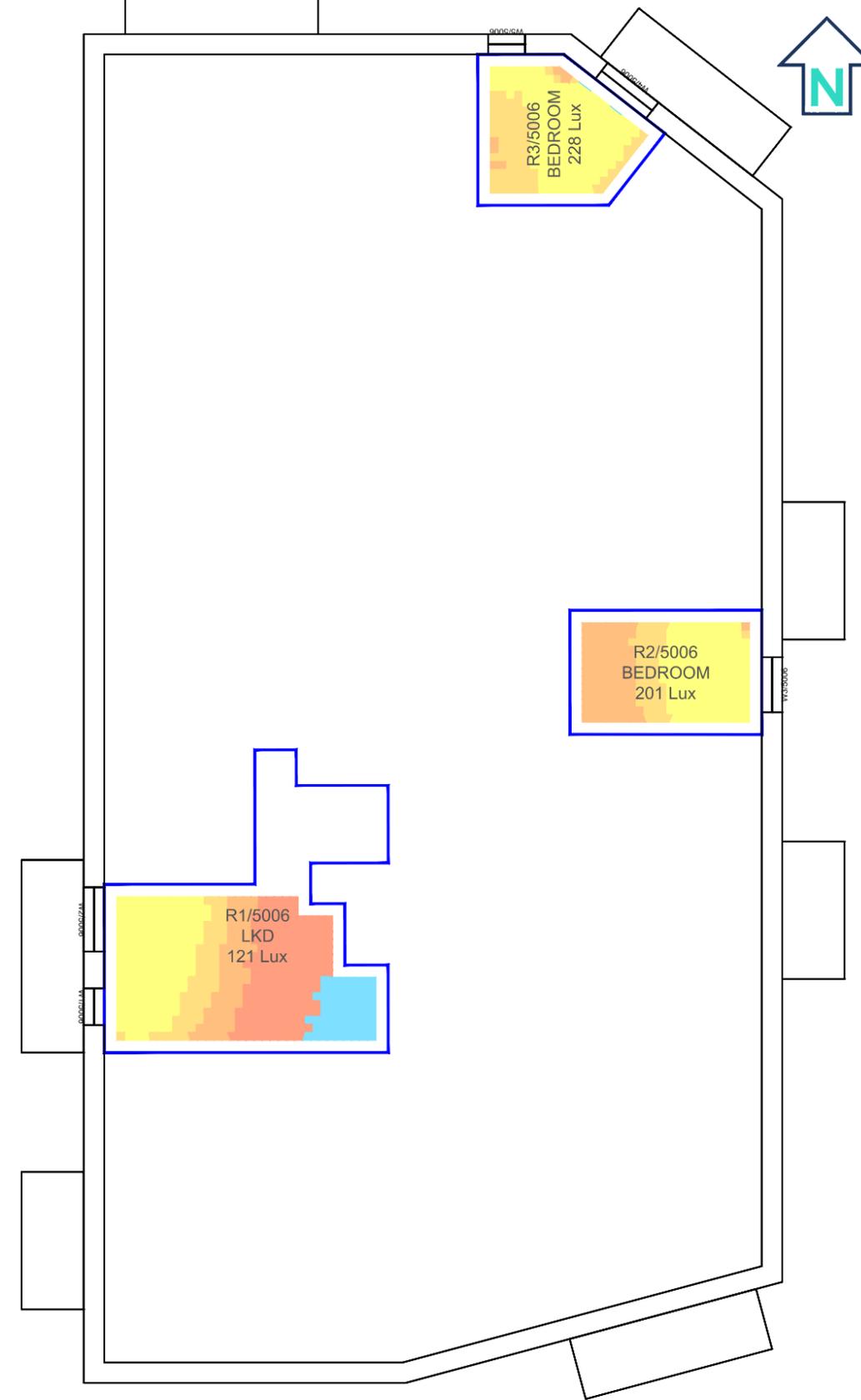
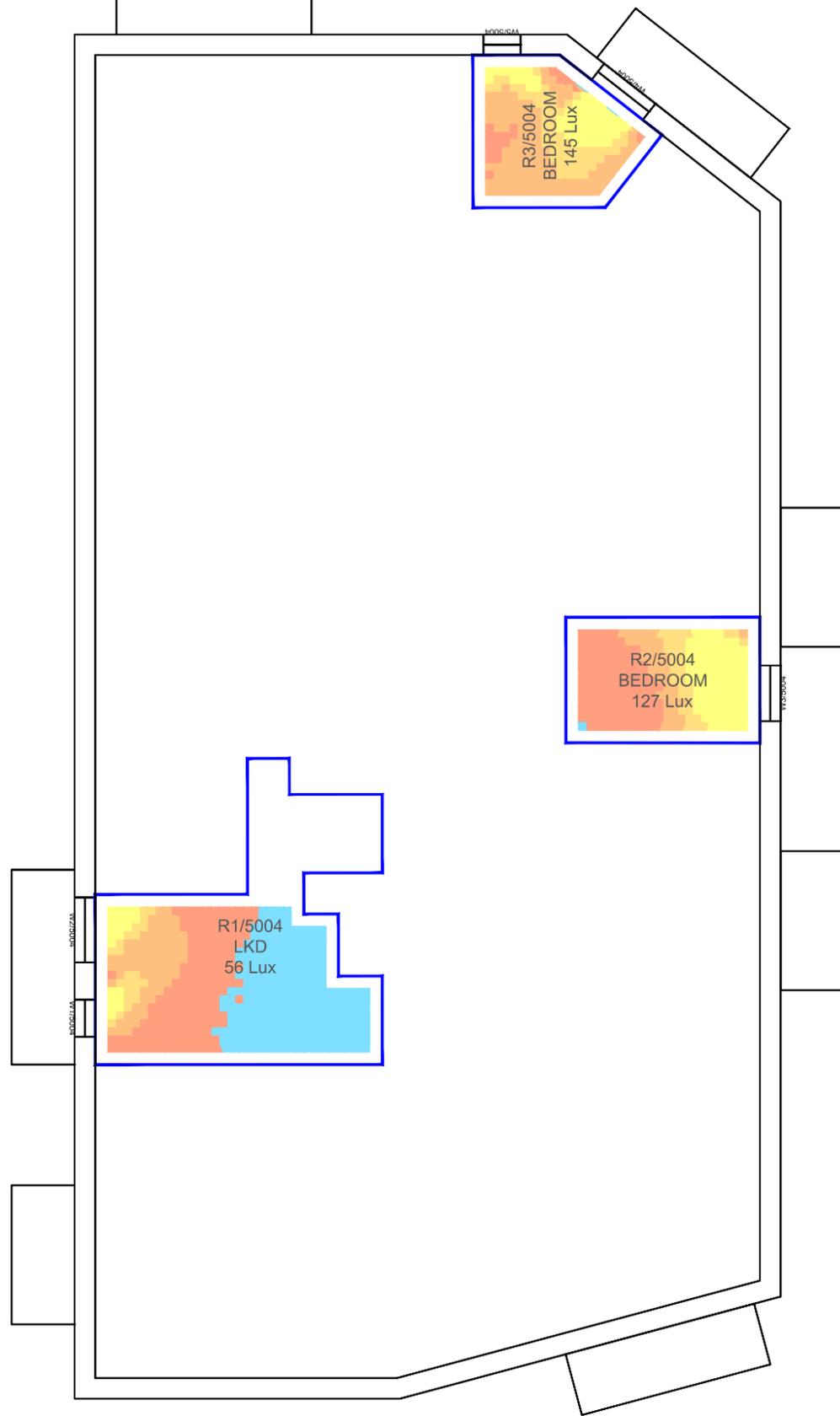
Scale: 1:150@A3

Date: APR 23

Dwg No: **P1685/CBDM/17**

Rel: **19**





Sources: Point 2 Surveyors
 Survey Info
 Point Cloud Data
 Assael Architecture Limited
 Floor plans(received 16/03/23)
 MNR-AA-BB1 series drawings
 Elevations (received 16/03/23)
 MNR-AA-ALL-ZZ-DR-A series drawings

Key: Daylight Illuminance
 (achieved for 50% of daylight hours)

■ <50 Lux	Median Illuminance (Lux) Levels shown for each room. Recommended Targets: Bedroom 100 Lux Living Room 150 Lux Kitchen 200 Lux
■ >50 Lux	
■ >100 Lux	
■ >150 Lux	
■ >200 Lux	

Scheme Confirmed: --	Date: --
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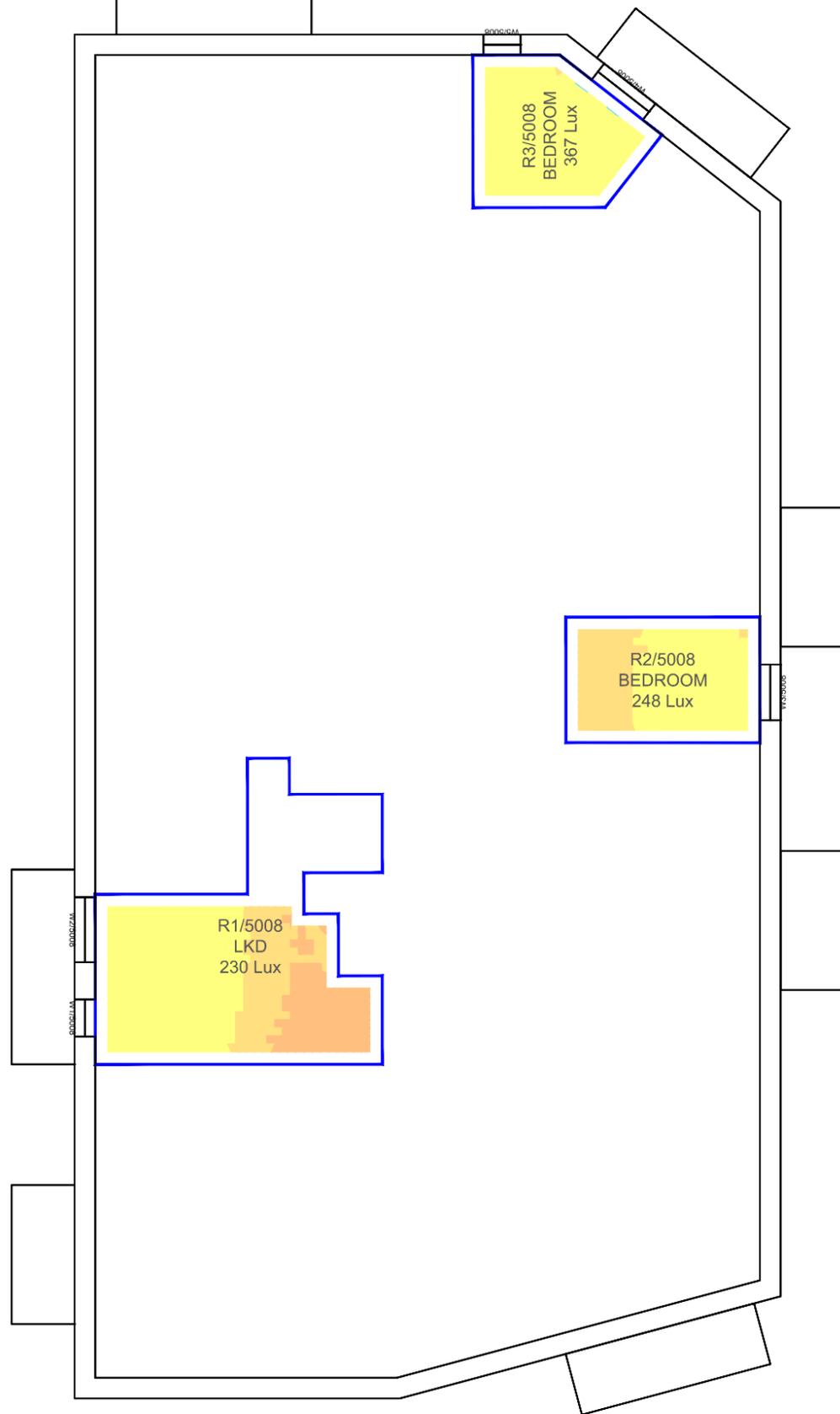
Project: Homebase Richmond

Drawn By: DB	Scale: 1:150@A3	Date: APR 23
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Title: Climate Based Daylight Modeling (CBDM) Assessment
 Median Luminance (Lux) Levels
 Block C1
 Proposed Scheme Dated 16/03/23

Dwg No: P1685/CBDM/18	Rel: 19
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Sources: Point 2 Surveyors
 Survey Info
 Point Cloud Data
 Assael Architecture Limited
 Floor plans(received 16/03/23)
 MNR-AA-BB1 series drawings
 Elevations (received 16/03/23)
 MNR-AA-ALL-ZZ-DR-A series drawings

Key: Daylight Illuminance
 (achieved for 50% of daylight hours)

■ <50 Lux	Median Illuminance (Lux) Levels shown for each room. Recommended Targets: Bedroom 100 Lux Living Room 150 Lux Kitchen 200 Lux
■ >50 Lux	
■ >100 Lux	
■ >150 Lux	
■ >200 Lux	

Scheme Confirmed: --	Date: --
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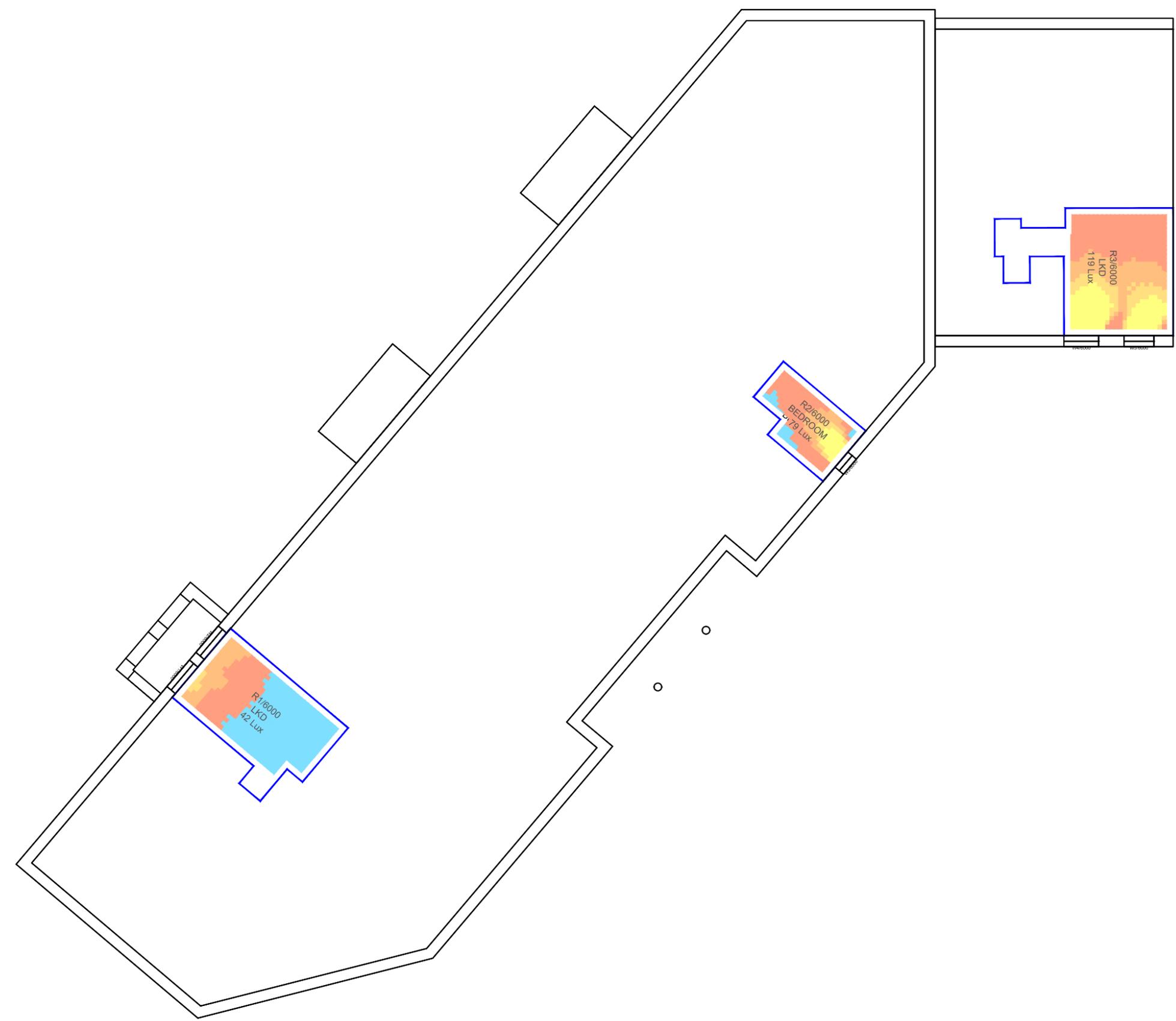
Project: Homebase Richmond

Drawn By: DB	Scale: 1:150@A3	Date: APR 23
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Title: Climate Based Daylight Modeling (CBDM) Assessment
 Median Luminance (Lux) Levels
 Block C1
 Proposed Scheme Dated 16/03/23

Dwg No: P1685/CBDM/19	Rel: 19
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Sources: Point 2 Surveyors
 Survey Info
 Point Cloud Data
 Assael Architecture Limited
 Floor plans(received 16/03/23)
 MNR-AA-BB1 series drawings
 Elevations (received 16/03/23)
 MNR-AA-ALL-ZZ-DR-A series drawings

Key: Daylight Illuminance
 (achieved for 50% of daylight hours)

■ <50 Lux	Median Illuminance (Lux) Levels shown for each room. Recommended Targets: Bedroom 100 Lux Living Room 150 Lux Kitchen 200 Lux
■ >50 Lux	
■ >100 Lux	
■ >150 Lux	
■ >200 Lux	

Project: Homebase
 Richmond

Title: Climate Based Daylight Modeling (CBDM) Assessment
 Median Luminance (Lux) Levels
 Block C2

 Proposed Scheme Dated 16/03/23

Scheme Confirmed: --

Date: --

Drawn By: DB

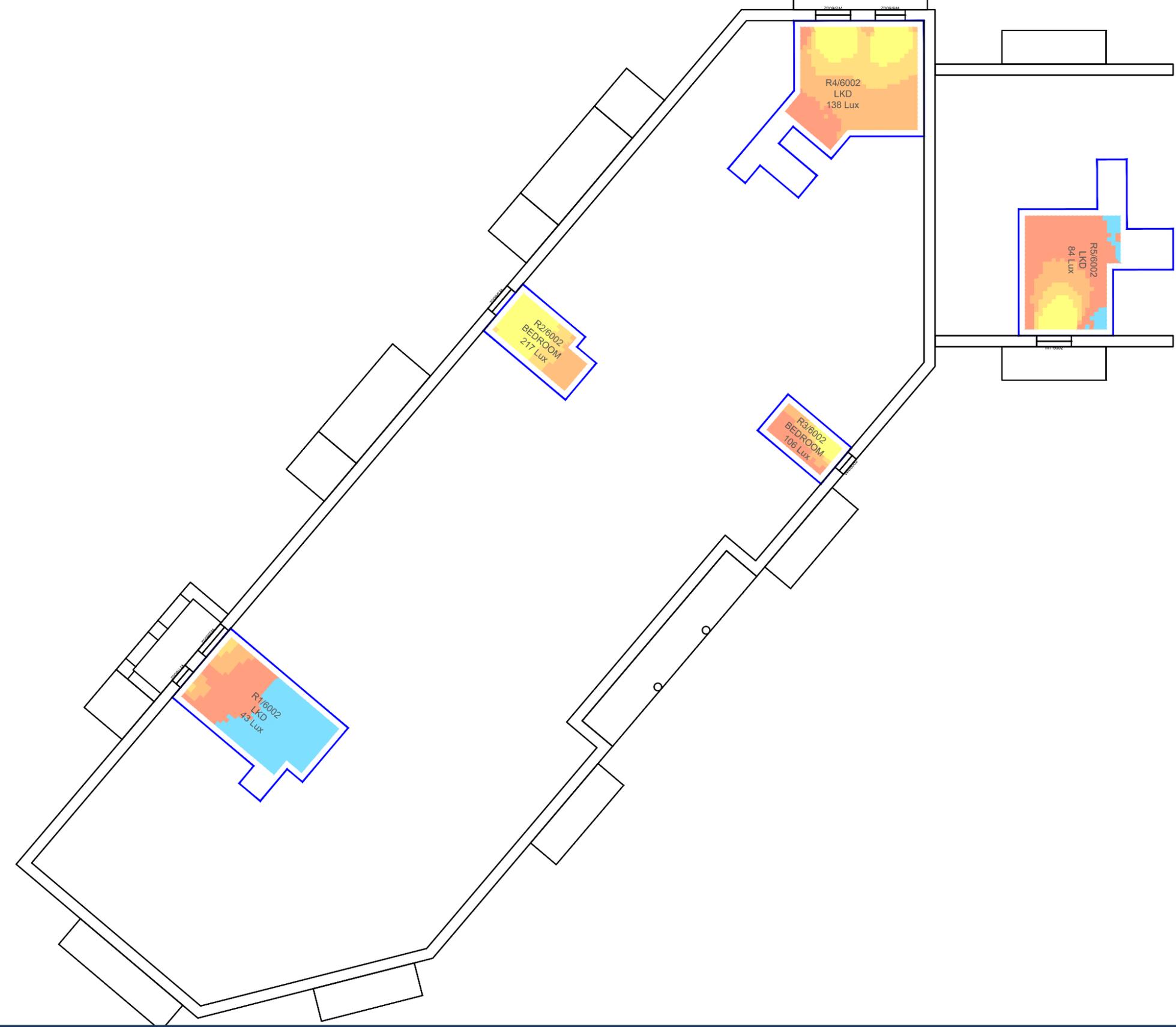
Scale: 1:150@A3

Date: APR 23

Dwg No: P1685/CBDM/20

Rel: 19





Sources: Point 2 Surveyors
 Survey Info
 Point Cloud Data
 Assael Architecture Limited
 Floor plans(received 16/03/23)
 MNR-AA-BB1 series drawings
 Elevations (received 16/03/23)
 MNR-AA-ALL-ZZ-DR-A series drawings

Key: Daylight Illuminance
 (achieved for 50% of daylight hours)

■ <50 Lux	Median Illuminance (Lux) Levels shown for each room. Recommended Targets: Bedroom 100 Lux Living Room 150 Lux Kitchen 200 Lux
■ >50 Lux	
■ >100 Lux	
■ >150 Lux	
■ >200 Lux	

Project: Homebase Richmond

Title: Climate Based Daylight Modeling (CBDM) Assessment
 Median Luminance (Lux) Levels
 Block C2
 Proposed Scheme Dated 16/03/23

Scheme Confirmed: --

Date: --

Drawn By: DB

Scale: 1:150@A3

Date: APR 23

Dwg No: P1685/CBDM/21

Rel: 19





Sources: Point 2 Surveyors
 Survey Info
 Point Cloud Data
 Assael Architecture Limited
 Floor plans(received 16/03/23)
 MNR-AA-BB1 series drawings
 Elevations (received 16/03/23)
 MNR-AA-ALL-ZZ-DR-A series drawings

Key: Daylight Illuminance
 (achieved for 50% of daylight hours)

	<50 Lux	Median Illuminance (Lux) Levels shown for each room. Recommended Targets: Bedroom 100 Lux Living Room 150 Lux Kitchen 200 Lux
	>50 Lux	
	>100 Lux	
	>150 Lux	
	>200 Lux	

Project: Homebase Richmond

Title: Climate Based Daylight Modeling (CBDM) Assessment
 Median Luminance (Lux) Levels
 Block C2
 Proposed Scheme Dated 16/03/23

Scheme Confirmed: --

Date: --

Drawn By: DB

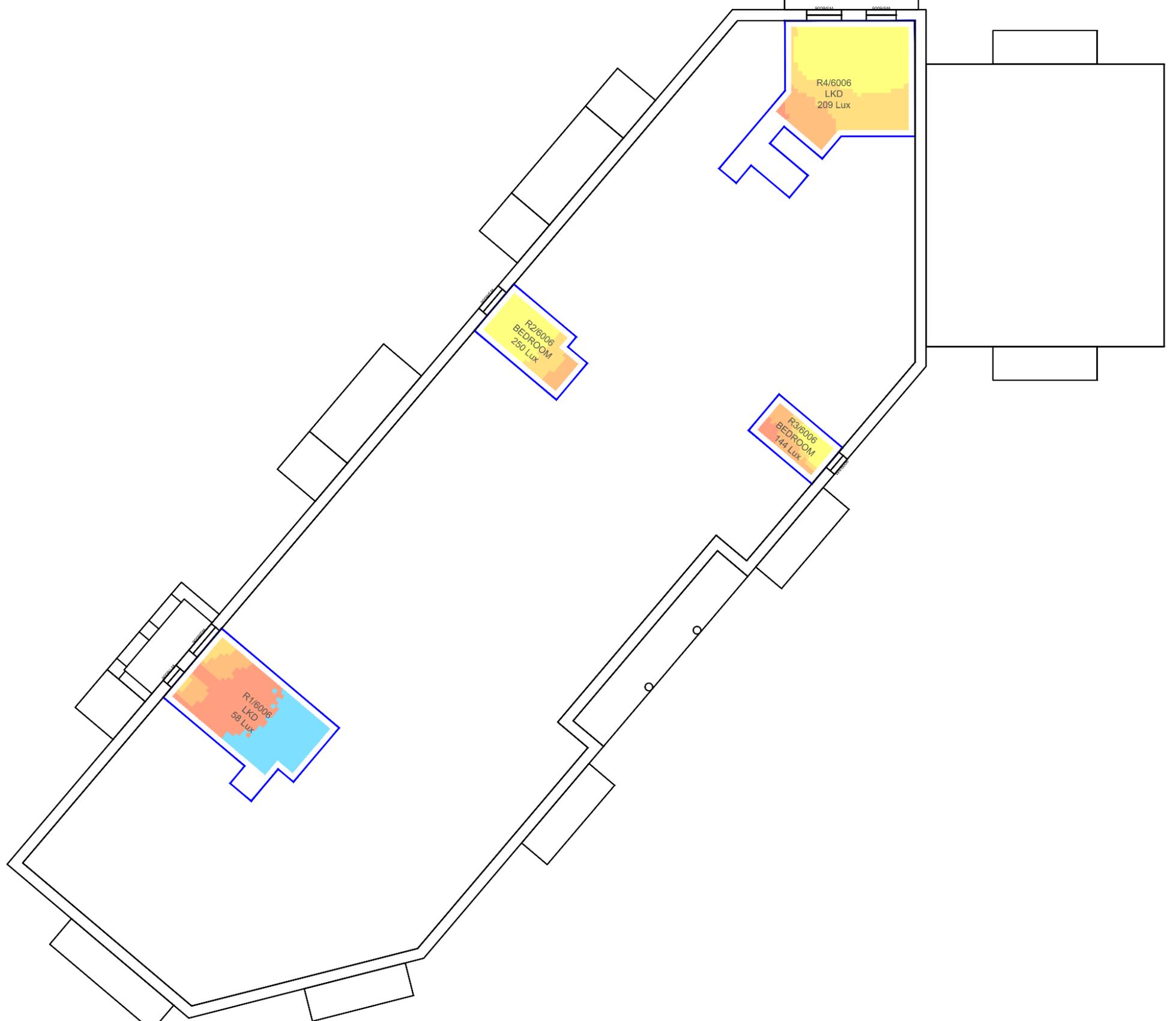
Scale: 1:150@A3

Date: APR 23

Dwg No: P1685/CBDM/22

Rel: 19





Sources: Point 2 Surveyors
 Survey Info
 Point Cloud Data
 Assael Architecture Limited
 Floor plans(received 16/03/23)
 MNR-AA-BB1 series drawings
 Elevations (received 16/03/23)
 MNR-AA-ALL-ZZ-DR-A series drawings

Key: Daylight Illuminance
 (achieved for 50% of daylight hours)

■ <50 Lux	Median Illuminance (Lux) Levels shown for each room. Recommended Targets: Bedroom 100 Lux Living Room 150 Lux Kitchen 200 Lux
■ >50 Lux	
■ >100 Lux	
■ >150 Lux	
■ >200 Lux	

Project: Homebase
 Richmond

Title: Climate Based Daylight Modeling (CBDM) Assessment
 Median Luminance (Lux) Levels
 Block C2

 Proposed Scheme Dated 16/03/23

Scheme Confirmed: --

Date: --

Drawn By: DB

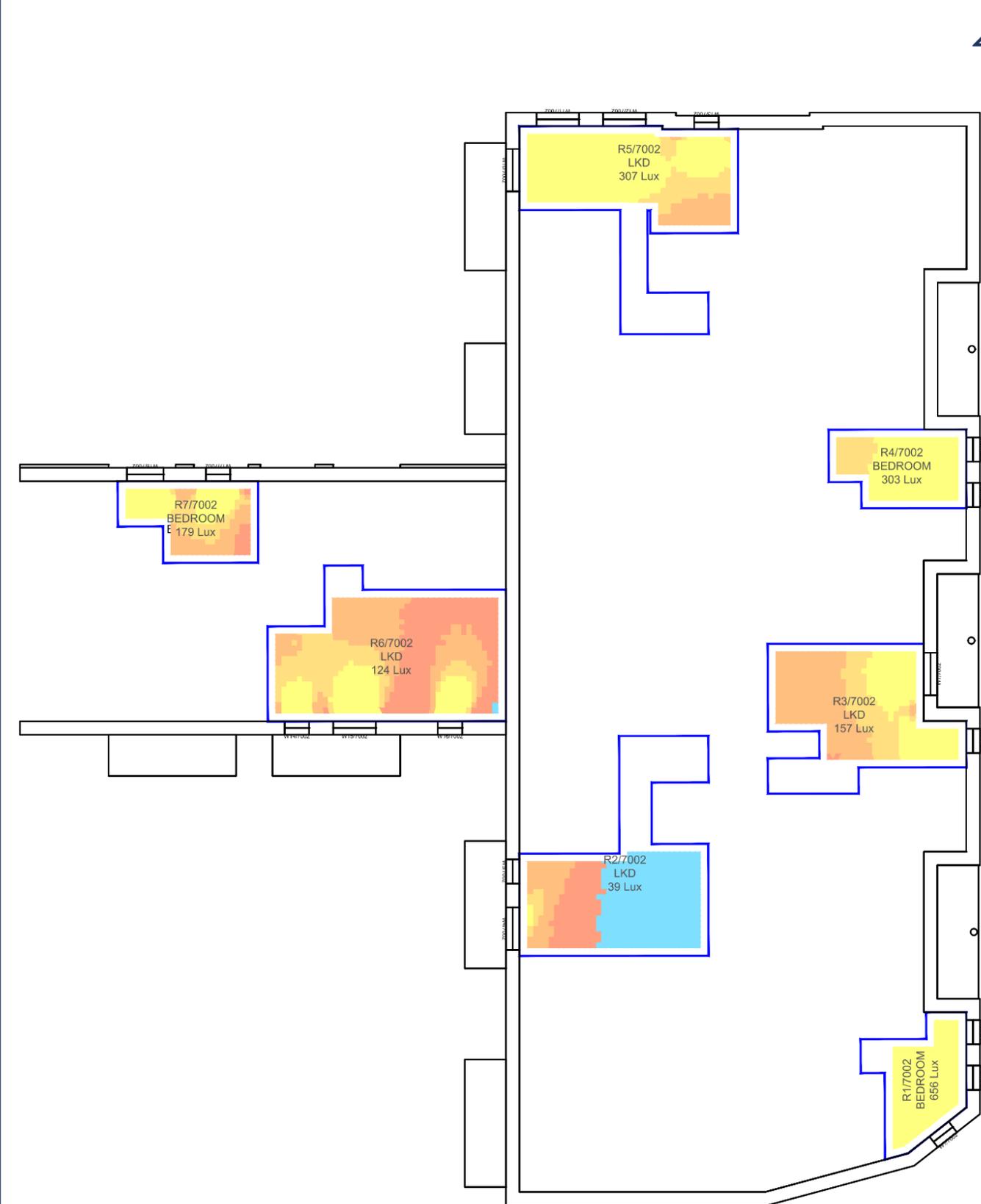
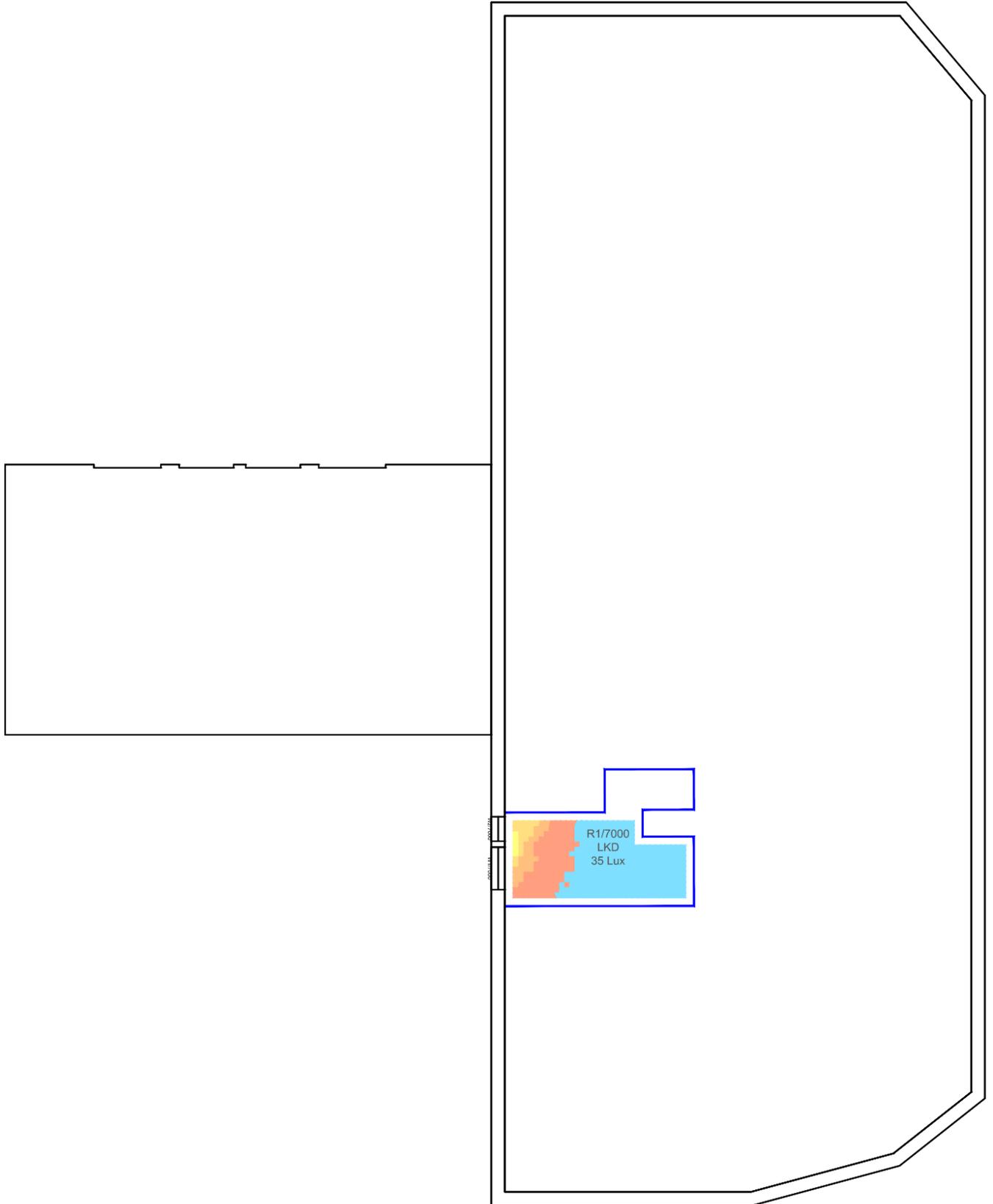
Scale: 1:150@A3

Date: APR 23

Dwg No: P1685/CBDM/23

Rel: 19





Sources: Point 2 Surveyors
 Survey Info
 Point Cloud Data
 Assael Architecture Limited
 Floor plans(received 16/03/23)
 MNR-AA-BB1 series drawings
 Elevations (received 16/03/23)
 MNR-AA-ALL-ZZ-DR-A series drawings

Key: Daylight Illuminance
 (achieved for 50% of daylight hours)

■ <50 Lux	Median Illuminance (Lux) Levels shown for each room.
■ >50 Lux	Recommended Targets:
■ >100 Lux	Bedroom 100 Lux
■ >150 Lux	Living Room 150 Lux
■ >200 Lux	Kitchen 200 Lux

Project: Homebase Richmond

Title: Climate Based Daylight Modeling (CBDM) Assessment
 Median Luminance (Lux) Levels
 Block D1
 Proposed Scheme Dated 16/03/23

Scheme Confirmed: --

Date: --

Drawn By: DB

Scale: 1:200@A3

Date: APR 23

Dwg No: **P1685/CBDM/24**

Rel: **19**

