

Dublin City Council

Saint Anne's Court

Daylight and Sunlight Availability Assessment

Reference: 288354-00-ARUP-XX-XX-RP-YL-0000

C03 | 31 January 2024




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Job number 288354-00

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Document Verification

Project title Saint Anne's Court
Document title Daylight and Sunlight Availability Assessment
Job number 288354-00
Document ref 288354-00-ARUP-XX-XX-RP-YL-0000
File reference

Revision	Date	Filename	288354-00-ARUP-XX-XX-RP-YL-0000		
C01	22 August 2023	Description	Daylight and Sunlight Availability Assessment		
			Prepared by	Checked by	Approved by
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C02	20 December 2023	Filename	288354-00-ARUP-XX-XX-RP-YL-0000		
		Description	Daylight and Sunlight Availability Assessment		
			Prepared by	Checked by	Approved by
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C03	31 January 2024	Filename	288354-00-ARUP-XX-XX-RP-YL-0000		
		Description	Daylight and Sunlight Availability Assessment		
			Prepared by	Checked by	Approved by
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Issue Document Verification with Document



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Executive Summary

This report presents the methods applied, calculations completed, and results found as part of a daylight availability assessment for the proposed development at Saint Anne's Court, All Saints Drive, Dublin 5. The assessment is completed in line with relevant local and national policy, along with various standards and recommendation documents.

A key component to the design of the development is retention of existing trees. As such, and to allow an informed decision to be reached by the planning authority, this report presents results both with and without the trees proposed for retention.

When considering the information presented within the body of the report and the accompanying appendix, the following observations can be made:

Effect of the Proposed Development on the Existing Surrounding Environment

- The effect of the proposed development on all surrounding existing properties can be classified as negligible.

Performance of the Proposed Development with All Trees Removed

- 100% of units meet the minimum recommendation for Exposure to Sunlight.
- 100% of units meet the minimum recommendation for Quality of View.
- 88% of rooms meet the minimum recommendation for Target Illuminance.
- 100% of units meet the minimum recommendation for Protection from Glare.
- 100% of relevant external spaces meet the minimum recommendation for Sunlight in Amenity Areas.

Performance of the Proposed Development with Select Trees Retained

- 80% of units meet the minimum recommendation for Exposure to Sunlight.
- 100% of units meet the minimum recommendation for Quality of View.
- 60% of rooms meet the minimum recommendation for Target Illuminance.
- 100% of units meet the minimum recommendation for Protection from Glare.
- 100% of relevant external spaces meet the minimum recommendation for Sunlight in Amenity Areas.

When considering the trees and their impact on quality of natural light experienced in the proposed development, retaining the trees will offer the following benefits:

- Increased privacy and quality of view to the outside.
- Improved acoustics and less risk of windy conditions.
- Enhanced experience of shadows, temporal contrast and visual interest, three items associated with how people rate the quality of space.
- Better passive shading, lower life cycle carbon and a nature orientated site solution.

Based on the above results and the wider criteria in the body of the report and elsewhere, it is the opinion of the applicant that the results with trees retained constitute the most appropriate holistic design solution for the site.

1. Introduction and Background

In accordance with relevant local and national policy, this report presents a comprehensive daylight and sunlight availability assessment.

The report introduces relevant policy, standards and guidance documents, it presents the results of the assessment completed and it provides a commentary on the outcomes.

1.1 Project Description

This report relates to an application for “Older Persons Housing” project at St. Anne’s Court in Raheny, Dublin 5, in support of a Part 8 application to Dublin City Council. The project aims to replace the existing 61 bed-sit units on the site with 102 dwellings constructed to “Universal Design” and “Universal Design Plus” standards, as per the Dublin City Council Project Brief.

The project achieves 102nr - 1 bed 2 person Universal Design apartments, which include 96nr - 1 bed 2 person Universal Design apartments and 6nr 1 bed 2 person Universal Design Plus apartments. The overall massing is four stories on all elevations.

The project is accessed from All Saints Park, with laneway access to the south of the site. There are 75nr mature trees on the site, and the project strategy is to retain as many as feasible while still meeting the accommodation requirements of the project brief.

2. Relevant Policy

The Dublin City Council Development Plan 2022 – 2028, the Urban Development and Building Height Guidelines for Planning Authorities (2018) and the Sustainable Urban Housing: Design Standards for New Apartments (2022) all reference daylight. The relevant sections are copied below for clarity.

2.1.1 Dublin City Development Plan 2022 – 2028

The Dublin City Development Plan 2022 – 2028 came into effect in December 2022. The draft includes a chapter relating to sunlight and daylight assessments. Section 1.0 of Appendix 16 states the following:

This guide is intended to provide direction to applicants and consultants carrying out such assessments. Its purpose is to offer clarity on the required technical approach, such that a standardised methodology and set of metrics are used by consultants for completing daylight and sunlight assessments. The guide also contains information on what standards are appropriate and what information should be contained in daylight and sunlight reports to enable the planning authority to complete a robust assessment of potential impacts and mitigation measures.

The intended outcome of this guide is to ensure a consistent approach to completing daylight and sunlight assessments. This guide does not outline exact, city wide, expected results or a suite of results that are likely to be considered acceptable by the planning authority. Proposals will continue to be assessed on a case-by-case basis depending on site specific circumstances and location.

This report takes the contents of Appendix 16 of the Dublin City Development Plan 2022 - 2028 into consideration. Note that the Development Plan states that when the updated BR 209 (2011) was to be published, it would take precedence over the recommendations within the Development Plan. BR 209 (2022) came into effect shortly after the Draft Development Plan was published.

2.1.2 Urban Development and Building Height Guidelines for Planning Authorities (2018)

The paragraphs below are taken directly from the Urban Development and Building Height Guidelines for Planning Authorities (2018).

“The form, massing and height of proposed developments should be carefully modulated so as to maximise access to natural daylight, ventilation and views and minimise overshadowing and loss of light.

Appropriate and reasonable regard should be taken of quantitative performance approaches to daylight provision outlined in guides like the Building Research Establishment’s ‘Site Layout Planning for Daylight and Sunlight’ (2nd edition) or BS 8206-2: 2008 – ‘Lighting for Buildings – Part 2: Code of Practice for Daylighting’.

Where a proposal may not be able to fully meet all the requirements of the daylight provisions above, this must be clearly identified and a rationale for any alternative, compensatory design solutions must be set out, in respect of which the planning authority or An Bord Pleanála should apply their discretion, having regard to local factors including specific site constraints and the balancing of that assessment against the desirability of achieving wider planning objectives. Such objectives might include securing comprehensive urban regeneration and or an effective urban design and streetscape solution.”

2.1.3 Sustainable Urban Housing: Design Standards for New Apartments (2022)

The paragraphs below are taken directly from the Sustainable Urban Housing: Design Standards for New Apartments (2022).

“The provision of acceptable levels of natural light in new apartment developments is an important planning consideration as it contributes to the liveability and amenity enjoyed by apartment residents. In assessing development proposals, planning authorities must however weigh up the overall quality of the design and layout of the scheme and the measures proposed to maximise daylight provision with the location of the site and the need to ensure an appropriate scale of urban residential development.

Planning authorities should avail of appropriate expert advice where necessary and have regard to quantitative performance approaches to daylight provision outlined in guides like A New European Standard for Daylighting in Buildings IS EN17037:2018, UK National Annex BS EN 17037:2019 and the associated BRE Guide 209 2022 Edition (June 2022), or any relevant future standards or guidance specific to the Irish context, when undertaken by development proposers which offer the capability to satisfy minimum standards of daylight provision.

Where an applicant cannot fully meet all of the requirements of the daylight provisions above, this must be clearly identified and a rationale for any alternative, compensatory design solutions must be set out, which planning authorities should apply their discretion in accepting taking account of its assessment of specifics. This may arise due to design constraints associated with the site or location and the balancing of that assessment against the desirability of achieving wider planning objectives. Such objectives might include securing comprehensive urban regeneration and or an effective urban design and streetscape solution.”

3. Standards, Guidance and Understanding

3.1 Standards and Guidance

Three documents relating to daylight and sunlight are mentioned in relevant policy. These are:

- *BR 209 (2022) – Site Layout Planning for Daylight and Sunlight, A Guide to Good Practice;*
- *BS EN 17037:2018 Daylight in buildings;* and
- *IS EN 17037:2018 Daylight in buildings.*

These form the basis of the methodology applied in this assessment. From the above documents, a key point of note is that both BR 209 (2022) and BS EN 17037:2028 propose minimum recommendations related specifically for residential developments. Where relevant, these are applied for the purpose of benchmarking.

4. Metrics and Recommendations

The methodology applied in this report follows that outlined within BR 209 (2022), IS EN 17037:2018 and BS EN 17037:2018. The assessment is split across two distinct parts:

- The first examines how the proposed development will impact the existing surrounding environment.
- The second investigates the performance of the proposed development itself.

When assessing the daylight and sunlight availability for each of the above, the metrics described below are applied. This is split into two sections. Each section aligns with the bullets listed above.

4.1 Impact on the Surrounding Environment

4.1.1 Vertical Sky Component (VSC)

Vertical Sky Component (VSC) gives a measure of daylight received on the outside of a window.

This is a measure of the amount of light reaching a window. It is the ratio of that part of illuminance, at a point on a given vertical plane, that is received directly from a CIE standard overcast sky, to illuminance on a horizontal plane due to an unobstructed hemisphere of this sky.

In determining appropriate recommendations for VSC, the following is stated within BR 209 (2022):

If the VSC is greater than 27% then enough skylight should still be reaching the window of the existing building. Any reduction below this level should be kept to a minimum. If the VSC, with the new development in place, is both less than 27% and less than 0.80 times its former value, occupants of the existing building will notice the reduction in the amount of skylight.

Minimum Recommendation

To meet the recommendations of the guidelines in BR 209 (2022), the VSC, with the new development in place, should be greater than 27% or greater than 0.80 times the original value.

4.1.2 Annual Probable Sunlight Hours (APSH) and Winter Probable Sunlight Hours (WPSH)

The probable sunlight hours metric is used in BR 209 (2022) to assess the impact of a new development on sunlight availability in the surrounding dwellings over the course of a year. BR 209 (2022) states:

/'... 'probable sunlight hours' means the total number of hours in the year that the sun is expected to shine on unobstructed ground, allowing for average levels of cloudiness for the location in question (based on sunshine probability data). The sunlight reaching the window is quantified as a percentage of this unobstructed annual total.

In defining appropriate target values for probable sunlight hours, BR 209 (2022) states:

If a room can receive more than one quarter of annual probable sunlight hours (APSH), including at least 5% in the winter months between 21 September and 21 March, then it should still receive enough sunlight. Also, if the overall loss of APSH is 4% or less, the loss of sunlight is small.

Any reduction in sunlight access below these levels should be kept to a minimum. If the available sunlight hours are both less than the amount above and less than 0.80 times their former value, either over the whole year or just in the winter months, and the overall annual loss is greater than 4% of APSH, then the occupants of the existing building will notice the loss of sunlight:... /

Minimum Recommendation

To meet the guidelines for sunlight availability in BR 209 (2022), the existing window should, with the new development in place, receive more than one quarter of annual probable sunlight hours (APSH), including at least 5% in the winter months between 21 September and 21 March or be in excess of 0.80 times its original value. For the window to be considered outside the guidelines, the total reduction in APSH must also be greater than 4%.

4.1.3 No Sky Line (NSL)

The No Sky Line gives an indication into the distribution of daylight in a room. In BR 209 (2022), it is defined as “*The outline on the working plane from which no sky can be seen*”.

In determining how the NSL should be applied in daylight for planning assessments, BR 209 (2022) states:

Where room layouts are known (for example if they are available on the local authority’s planning portal), the impact on the daylighting distribution in the existing building should be found by plotting the no sky line in each of the main rooms.

If, following construction of a new development, the no sky line moves so that the area of the existing room which does not receive direct skylight, is reduced to less than 0.80 times its former value, this will be noticeable to the occupants, and more of the room will be appear poorly lit.

Minimum Recommendation

To be considered as inside the guidelines given in BR 209 (2022), with the new development in place, the area of the existing room which does not receive direct skylight should be greater than 0.80 times its former value.

4.1.4 Sunlight in Amenity Areas (SiAA)

Within BR 209 (2022), recommendations are given as to the quantity of sunlight penetration in amenity areas that is required to produce a well sunlit space throughout the year. This text is given below:

It is recommended that for it to appear adequately sunlit throughout the year, at least half of a garden or amenity area should receive at least two hours of sunlight on 21 March. If as a result of new development, an existing garden or amenity area does not meet the above, and the area which can receive two hours of sun on 21 March is less than 0.80 times its former value, then the loss of sunlight is likely to be noticeable.

Minimum Recommendation

To sit within the guidelines given in BR 209 (2022), an existing amenity space, with the new development in place, should experience in excess of two hours sunlight on March 21st for at least 50% of its area. If the area does not meet this target, the area which can receive more than two hours sunlight on March 21st should be greater than 0.80 times the previous value.

4.2 Performance of the Proposed Development

4.2.1 Target Illuminance (E_v)

Within both BS EN 17037:2018 and IS EN 17037:2018, the concept of daylight provision is described with the text below:

A space is considered to provide adequate daylight if a target illuminance level is achieved across a fraction of the reference plane within a space for at least half of the daylight hours.

In addition, for spaces with vertical or inclined daylight openings, a minimum target illuminance level is also to be achieved across the reference plane.

Recommendations for target illuminance are given within Annex A of both BS EN 17037:2018 and IS EN 17307:2018. These recommendations have been included within BR 209 (2022).

BS EN 17073:2018 and BR 209 (2022) give minimum recommended Target Illuminance values specifically applicable to residential developments. These are laid out below for reference.

Room type	Target Illuminance (lx)
Bedroom	100
Living Room	150
Kitchen	200

Further guidance is offered around the background of these target values and their applicability in rooms that share two uses.

Where one room in a UK dwelling serves more than a single purpose, the UK committee recommends that the target illuminance is that for the room type with the highest value – for example, in a space that combines a living room and a kitchen the target illuminance is recommended to be 200 lx.

NOTE The Clause NA.2 information above is derived from BS 8206-2:2008 Lighting for buildings – Part 2: Code of practice for daylighting, Subclause 5.6.

It is the opinion of the UK committee that the recommendation in Clause A.2 – that a target illuminance level should be achieved across the entire (i.e. 95 %) fraction of the reference plane within a space – need not be applied to rooms in dwellings.

Note that all of the rooms to be assessed in the proposed development are side lit with vertical glazing, or by inclined rooflights. As such, the recommendations given in table A.2. for rooms with horizontal glazing do not apply.

Minimum Recommendation

To achieve the alternate minimum daylight provision recommendations outlined in the national annex of BS EN 17037:2018, the room in question must achieve:

- In kitchens, greater than 200 lux over 50% of the floor area for over half the daylight hours in the year.
- In living rooms, greater than 150 lux over 50% of the floor area for over half the daylight hours in the year.
- In bedrooms, greater than 100 lux over 50% of the floor area for over half the daylight hours in the year.

It should be noted that rooms that serve more than one purpose will have the highest applicable target value applied. For example, in case of a combined kitchen/living/dining room (KLD), the target value applied will be 200 lux.

4.2.2 Exposure to Sunlight (EtS)

EN 17037:2018 outlines recommendations for exposure to sunlight in certain spaces. This refers to at least one space in any given dwelling.

Exposure to sunlight is an important quality criterion of an interior space and can contribute to human well-being. Minimum exposure to sunlight should be provided in patient rooms in hospitals, play rooms in nurseries and at least one habitable space in dwellings. This is achieved through the expression of the minimum number of hours during which this space receives direct sunlight, for a clear cloudless reference day in the year.

In defining what the recommended exposure to sunlight should be, EN 17037:2018 outlines the recommendations below:

For a given reference day (see A.4), a space should receive sunlight for at least a predefined number of hours. Recommended values of sunlight exposure (h) are given in A.4 and calculation methods are described in Annex D.

And then from Annex D:

The recommendation is that a space should receive possible sunlight for a duration according to Table A.6 (supposed to be cloudless) on a selected date between February 1st and March 21st. Table A.6 proposes three levels for sunlight exposure. See Annex D for further details. When applying the recommendation to a whole dwelling, the proposal is that at least one habitable room in the dwelling should have at least exposure to sunlight after Table A.6.

Clause 3.1.10 in BR 209 (2022) states that:

/...For dwellings, at least one habitable room, preferably a main living room, should meet at least the minimum criterion.../

Table A.6 from BS EN 17073:2018 and IS EN 17037:2018 is copied below.

Level of recommendation for exposure to sunlight	Sunlight exposure
Minimum	1.5 hours
Medium	3.0 hours
High	4.0 hours

Minimum Recommendation

To meet the minimum sunlight available recommendations set out in IS EN 17037:2018 and BS EN 17037:2018, at least one habitable room should experience in excess of 1.5 hours sunlight on a given day between February 1st and March 21st. To fully comply with the recommendations given in BR 209 (2022) for dwellings, the criteria should be achieved in a main living room.

4.2.3 Quality of Views

EN 17037:2018 defines quality of view to the exterior. The passages below are copied verbatim.

View to the outside provides visual connection with the surroundings to supply information about the local environment, weather changes and the time of day. This information can relieve the fatigue associated with long periods of being indoors. All occupants of a space should have the opportunity for the refreshment and relaxation afforded by a change of scene and focus. View to the outside should be assessed from selected reference points corresponding to where people are located within the utilized area.

A view is considered to comprise three distinct layers:

- *a layer of sky;*
- *a layer of landscape;*
- *a layer of ground.*

The criteria for view out concern the utilized area. In order to ensure an adequate view out, the following criteria should be met:

- *the glazing material of the view opening should provide a view that is perceived to be clear, undistorted and neutrally coloured;*

- *in the utilized area, view opening(s) as seen from the reference point of the view should have a total horizontal sight angle higher than a minimum value;*
- *the distance to the outside view should be larger than a minimum value;*
- *in the utilized area a minimum number of layers should be seen.*

Recommended values of view out are given in Table A.5 and calculation methods are described in Annex C.

Minimum Recommendation

To comply with the minimum recommendation for quality of view given in IS EN 17037:2018 and BS EN 17037, the following should be achieved:

- Relevant glazing should be clear and undistorted.
- From the utilised area (habitable area), horizontal view angles should be greater than or equal to 14°.
- Exterior distance of the view should be greater than 6m.

4.2.4 Protection from Glare

EN 17037:2018 introduces criteria required to deliver protection from glare.

Glare is a negative sensation and the cause is bright areas with sufficiently greater luminance than the luminance to which the eyes are adapted to, producing annoyance, discomfort or loss in visual performance and visibility. Direct sunlight or high luminance differences between bright and dark areas within the field of view can cause risk of glare.

For any space with daylight openings, it is recommended to use shading devices to reduce risk of glare, and direct view to the sun or a reflection of it should be avoided.

Recommendations for glare protection can be found in Annex E.

Annex E outlines where glare assessments are required:

A glare assessment is suggested in spaces, where the expected activities are comparable to reading, writing or using display devices and the user is not able to choose freely his position and viewing direction.

Annex E also outlined recommended values of Daylight Glare Probability that should be achieved.

Level of Recommendation for Glare Protection	DGP_{e<5%}
Minimum	0.45
Medium	0.40
High	0.35

Given the recent shift in working patterns and with more people now working from home, it is considered appropriate that glare is given due consideration.

Annex E outlines two approaches for determining if appropriate glare protection has been provided. The approach applied in this assessment is given in *E.3.2 Simplified annual glare evaluation*.

For side-lit spaces and following solar protection devices defined in EN 12216 a simplified annual glare evaluation method may be applied for:

- *Solar protection device being opaque in the extended and closed position: e.g. Venetian blinds, plantation shutters, roller shutters...;*

- *Solar protection device where the curtain is made of textile, film or perforated opaque material: e.g roller blinds, vertical blinds, roller shutters...;*
- *non-diffusing glazing with a low or variable light transmittance (e.g. electrochromic glazing).*

Minimum Recommendation

To comply with the minimum glare recommendations given in IS EN 17037:2018 and BS EN 17307, the space should have the capability to experience $DGP_{e<5\%} \leq 0.45$. This recommendation can be discarded in spaces where occupants have the ability to “choose freely” their position and view direction.

4.2.5 Sunlight in Amenity Areas (SiAA)

Within BR 209 (2022), recommendations are given as to the quantity of sunlight penetration in new amenity areas. This text is given below:

It is recommended that for it to appear adequately sunlit throughout the year, at least half of a garden or amenity area should receive at least two hours of sunlight on 21 March.

Minimum Recommendation

To meet the minimum recommendations given in BR 209 (2022), a new amenity space should experience in excess of two hours sunlight on March 21st for at least 50% of its area.

4.3 Summary

The table below summarises our understanding of the metrics relevant to a comprehensive daylight and sunlight availability assessment in Ireland at the time of this application. The column to the left lists out the metric and the column to the right lists the relevant recommendation.

Metric	Recommendation
<i>Impact of the Proposed Development on the Existing Surrounding Environment</i>	
Vertical Sky Component (VSC)	To meet the recommendations of the guidelines in BR 209 (2022), the VSC, with the new development in place, should be greater than 27% or greater than 0.80 times its former value.
Annual Probable Sunlight Hours (APSH)	To meet the guidelines for sunlight availability in BR 209 (2022), the existing window should, with the new development in place, receive more than one quarter of annual probable sunlight hours (APSH), including at least 5% in the winter months between 21 September and 21 March or be in excess of 0.80 times its former value. For the window to be considered outside the guidelines, the total reduction in APSH must also be greater than 4%.
Winter Probable Sunlight Hours (WPSH)	
No Sky Line (NSL)	To be considered as inside the guidelines given in BR 209 (2022), when the new development is in place, the area of the existing room which does not receive direct skylight should be greater than 0.80 times its former value.
Sunlight in Amenity Areas (SiAA)	To sit within the guidelines given in BR 209 (2022), an existing amenity space, with the new development in place, should experience in excess of two hours sunlight on March 21st for at least 50% of its area. If the area does not meet this target, the area which can receive more than two hours sunlight on March 21st should be greater than 0.80 times the previous value.
<i>Performance of the Proposed Development</i>	
Target Illuminance (E _i)	To achieve the alternate minimum daylight provision recommendations outlined in the national annex of BS EN 17037:2018, the room in question must achieve: <ul style="list-style-type: none"> • In kitchens, greater than 200 lux over 50% of the floor area for over half the daylight hours in the year. • In living rooms, greater than 150 lux over 50% of the floor area for over half the daylight hours in the year. • In bedrooms, greater than 100 lux over 50% of the floor area for over half the daylight hours in the year.
Exposure to Sunlight (E _{tS})	To meet the minimum sunlight availability recommendations set out in IS EN 17037:2018 and BS EN 17037:2018, at least one habitable room should experience in excess of 1.5 hours sunlight on a given day between February 1st and March 21st.
Quality of Views	To comply with the minimum recommendation for quality of view given in IS EN 17037:2018 and BS EN 17037, the following should be achieved: <ul style="list-style-type: none"> • Relevant glazing should be clear and undistorted. • From the utilised area, view angles should be greater than or equal to 14°. • Exterior distance of the view should be greater than 6m.
Protection from Glare	To comply with the minimum glare recommendations given in IS EN 17037:2018 and BS EN 17307, the space should have the capability to experience $DGP_{e<5\%} \leq 0.45$. This recommendation can be discarded in spaces where occupants have the ability to “choose freely” their position and view direction.
Sunlight in Amenity Areas (SiAA)	To meet the minimum recommendations given in BR 209 (2022), a new amenity space should experience in excess of two hours sunlight on March 21st for at least 50% of its area.

5. Methodology

5.1 Impact on the Surrounding Environment

Simulations have been completed to compare the existing site condition against the current design proposal.

The following massing models have been considered in the assessment of daylight and sunlight availability in the surrounding environment:

- **The Baseline Condition:** This configuration is the existing site condition before any proposed development works begin. The mirror building method described within Appendix F of BR 209 (2022) has been used to set the baseline condition and determine targets in accordance with the BR 209 (2022).
- **The Proposed Condition:** This configuration represents the subject site including the proposed development and all related works.

These models are used to demonstrate the difference in daylight and sunlight availability in surrounding areas before and after the proposed development would be constructed. The 3d models used for the analysis were provided by Grafton Architects.

The following metrics have been used to assess the effects of the proposed development on the surrounding environment:

- Vertical Sky Component (VSC)
- No Sky Line (NSL)
- Annual Probable Sunlight Hours (APSH)
- Winter Probable Sunlight Hours (WPSH)
- Sunlight in Amenity Areas (SiAA)

Receptors for analysis in the surrounding area were identified using online mapping systems and survey information as made available to us. Where precise information on window location was not available from a survey, the receptor points were placed using information available online and applying reasonable skill and care. The extent of receptors analysed was completed in line with BR 209 (2022). This includes all the windows falling inside an area three times the height of the proposed development. Below is quoted directly from section 2.2.4 of BR 209 (2022):

Loss of light to existing windows need not be analysed if the distance of each part of the new development from the existing window is three or more times its height above the centre of the existing window. In these cases, the loss of light will be small... /

Note that various planning permissions were granted in the surrounding area, and their geometry has been included in the analysis where relevant (DCC 4087-18, 3067-20 and 4733-22).

5.1.1 Classification of Reduction

Appendix H in BR 209 (2022) outlines five categories of impact when conducting environmental impact assessments. These are:

- Negligible
- Minor Adverse
- Moderate Adverse
- Major Adverse
- Beneficial

Alongside these classifications, BR 209 (2022) gives outline descriptions of how each should be applied:

Where the loss of light does not meet the guidelines in this document, the impact is assessed as minor, moderate or major adverse. Factors tending towards a minor adverse impact include:

- *Only a small number of windows or limited area of open space are affected.*
- *The loss of light is only marginally outside of the guidelines.*
- *An affected room has other sources of skylight or sunlight.*
- *The affected building or open space has only a low level requirement for skylight or sunlight.*
- *There are particular reasons why an alternative, less stringent, guideline should be applied, for example an overhang above the window or a window standing unusually close to the boundary.*

Factors tending towards a major adverse impact include:

- *A large number of windows or large area of open space are affected.*
- *The loss of light is substantially outside of the guidelines.*
- *All the windows in a particular property are affected.*
- *The affected indoor or outdoor spaces have a particularly strong requirement for skylight or sunlight, e.g. a living room in a dwelling or a children's playground.*

Beneficial impacts may occur where there is a significant increase in the amount of skylight and sunlight reaching an existing building where it is required, or in the amount of sunlight reaching an open space. Beneficial impacts should be worked out using the same principles as adverse impacts. Thus a tiny increase in light would be classified as negligible impact, not a minor beneficial impact.

These classifications, along with their descriptors and characterisations, have been applied in determining the impact of the proposed development on the surrounding existing environment.

From above, a key point of note, in simple terms, is that the level of impact and associated classification is determined by the 'loss of light'. This includes all of the metrics previously outlined in combination with each other (APSH, WPSH, SiAA and VSC). Individual metrics should not be used to determine a classification. For example, it is possible to reduce skylight to a window, but not reduce sunlight to the same window or reduce sunlight to a garden in the same property.

5.1.2 No Sky Line

The No Sky Line should be assessed for all surrounding spaces where the internal room layouts and façade elevations were available on the Dublin City Council planning portal at the time the assessment was completed.

BR 209 (2022) states that:

In most cases the position of the no sky line has to be found from plans. The calculation can only be carried out where room layouts are known. Using estimated room layouts is likely to give inaccurate results and is not recommended. However here plans are available, for example on the local authority's online planning portal, the calculation should be carried out. Figures D3 to D7 illustrate some common cases. It is usually easiest to have both a plan and section drawn up.

The NSL metric has been applied to the following properties: the Raheny Shamrock Athletic Club Clubhouse (DCC 4733-22), 7&9 All Saints Park (DCC 3067-20) and 8 All Saints Close (DCC 4087-18).

5.2 Performance of the Proposed Development

The performance of the proposed development is assessed using the final architectural arrangements.

The metrics below have been applied:

- Target Illuminance (E_t)
- Exposure to Sunlight (EtS)
- Quality of Views
- Protection from Glare
- Sunlight in Amenity Areas (SiAA)

Definitions for the above are as laid out previously. These metrics are calculated for the proposed site layout and massing, with these results then being compared to the recommendations set out in the metrics and recommendations section of this report.

5.2.1 Simulation Parameters and Other Considerations

All simulations have been completed using backward ray tracing software with appropriately high settings.

The following input parameters have been applied:

- Diffuse Glazing Transmittance 80%
- Glazing Maintenance Factor 0.94
- Floor Reflectance 40% (laminated wood floor)
- Internal Wall Reflectance 70% (painted white plaster with adjustment for art, furniture, etc)
- Ceiling Reflectance 80% (painted white plaster)
- Exterior Surface Reflectance 20% (default value from BR 209)

The parameters above are taken from the proposed specification or from default values given in BR 209.

Other items of note include:

- Grid arrangements for E_t were chosen in accordance with the guidance given in clause C28 of BR 209 (2022).
- Grid placement for VSC, APSH and WPSH was completed in line with BR 209 (2022).
- Grid placement for EtS was completed in line with IS EN 17037:2018 and BS EN 17037:2018.
- Grid placement for Quality of Views was as given in IS EN 17037:2018 and BS EN 17037:2018.

5.2.2 Trees

G1.2 in BR 209 (2022) outlines “Where the effect of a new building on existing buildings nearby is being analysed, it is usual to ignore the effect of existing trees..”. It is on this basis that trees have not been included in the assessment of how the proposed development impacts the existing surrounding environment.

However, G2.1 in BR 209 (2022) states that: “Sometimes, however, trees should be taken into account, for example where a new dwelling is proposed near to large existing trees.” For the analysis of the proposed development, trees were included as per the tree survey that accompanies this application.

The trees for the proposed development have been modelled in line with the guidance in G2, BR 209 (2022). The appendix includes results for daylight provision in proposed apartments both excluding and including trees, the transparency of which has been applied as per Table G1 in BR 209 (2022). The appendix also includes two sets of results for exposure to sunlight, where the trees have been excluded in the first instance and included as opaque objects in the second instance as per G3 in BR 209 (2022).

6. Results and Commentary

6.1 Impact on Surroundings

6.1.1 Summary of Impacts

The image below summarises the impact produced by the proposed development to the surrounding properties. Shown in green are properties that experience a negligible impact. This classification of impact is determined using a combination of the results found for VSC, NSL, APSH and WPSH, and SiAA, using the method of classifying reduction to daylight and sunlight availability given in 5.1.1 and appendix H of BR 209 (2022). A full suite of results, graphics and tables are given within appendix A.2.



Figure 1: Diagram showing the impact experienced on surrounding properties. Annotated in green are properties that experience a negligible impact.

The assessed properties are tagged in the above image as follows: 1. Cara Hall, 2. Athletics Club, 3. Naí Scoil Íde, 4. 1-15 All Saints Park, 5. 1-9 All Saints Drive, 6. Unit 1-5 All Saints Park.

From the summary graphic above and the full details given within relevant tables in Appendix A.2, there are no properties that experience effects outside of the guidelines given in BR 209 (2022). All properties in the existing surrounding environment will experience a negligible impact when using the classification system described in appendix H of BR 209 (2022).

6.1.2 Detailed Results

For all other groups of properties not listed above, an impact classification of negligible is applicable. More specifically, the following observations can be made:

- 96 no. of points tested for VSC will sit inside of the BR 209 (2022) guidelines, such that they are in excess of 27% or in excess of 0.80 times their previous value.
- 67 no. of the points tested for probable sunlight hours (APSH and WPSH) will sit inside of the BR 209 (2022) guidelines, being that their new value is greater than 25% and 5% or in excess of 0.80 times their previous value.

- 19 no. of the amenity spaces tested for direct sunlight sit inside the guidelines of BR 209 (2022), being that the space either experiences more than 2 hours sunlight on March 21st across greater than 50% of its area, or that this value in the proposed condition is in excess of 0.80 times its baseline value.

6.2 Performance of the Proposed Development

The assessment completed simulated the following metrics:

- Target Illuminance (E_t)
- Exposure to Sunlight (EtS)
- Quality of Views
- Protection from Glare
- Sunlight in Amenity Areas (SiAA)

The sections following present a summary of the results found for each metric. Where relevant, an associated commentary is provided.

6.2.1 Results per Metric

6.2.1.1 Target Illuminance (E_t)

The results for specific rooms can be found in section A.1 of the appendix. The same appendix demonstrates both the room usage and the degree to which various rooms meet or do not meet the minimum recommendations.

Excluding Trees

When comparing the results to those laid out in the National Annex of BS EN 17037:2018 and embedded within the appendices of BR 209 (2022), it can be stated that 88% of the rooms in the proposed development will meet the minimum requirements for E_t when no trees are included in the assessment.

Room Type	Percentage of Rooms Meeting the Minimum Recommendation for E_t
All Rooms	88%

In summarising the percentage of rooms that meet the minimum requirements for E_t by room type, the table below splits this out by combined kitchen / living rooms, along with bedrooms.

Room Type	Percentage of Rooms Meeting the Minimum Recommendation for E_t
Bedrooms	77%
LKDs	98%

Including Trees

When comparing the results to those laid out in the National Annex of BS EN 17037:2018 and embedded within the appendices of BR 209 (2022), it can be stated that 60% of the rooms in the proposed development will meet the minimum requirements for daylight provision should all trees be retained.

Room Type	Percentage of Rooms Meeting the Minimum Recommendation for E_t
All Rooms	60%

In summarising the percentage of rooms that meet the minimum requirements for E_t by room type, the table below splits this out by combined kitchen / living rooms, along with bedrooms.

Room Type	Percentage of Rooms Meeting the Minimum Recommendation for E _t
Bedrooms	57%
LKDs	62%

6.2.1.2 Exposure to Sunlight (EtS)

The results for specific units can be found in section A.1 of the appendices. The appendix outlines on a unit-by-unit basis the specific apartments that meet or do not meet the minimum recommendations for exposure to sunlight. This metric is always applied to the main living room in each unit, so the above results relate always to the main combined kitchen / living rooms.

Excluding Trees

100% of the units in the development will experience exposure to sunlight in excess of the minimum recommended value in BR 209 (2022), BS EN 17037:2018 and IS EN 17037:2018.

Including Trees

80% of the units in the development will experience exposure to sunlight in excess of the minimum recommended value in BR 209 (2022), BS EN 17037:2018 and IS EN 17037:2018. Note that, in line with BR 209 (2022), the trees used in this were modelled as completely opaque objects. In reality, the trees will have some transparency and will let through a combination of sunlight and shadows.

6.2.1.3 Quality of Views

An assessment for quality of views has been completed. This followed the methodology outlined in section C.4.1 *Simplified verification method* of BS EN 17037:2018 and IS EN 17073:2018. The percentage of units that meet the various quality of view requirements is given within the table below, which has been determined by a detailed review of the plans and simulations in line with EN 170727.

Quality of View Criteria	Percentage of Units that Meet Minimum Recommendation
Relevant glazing should be clear and undistorted	100%
From the utilised area, view angles should be greater than or equal to 14°	100%
Exterior distance of the view should be greater than 6m	100%

6.2.1.4 Protection from Glare

It is a reasonable assumption that people carrying out visual tasks within the apartments will have the ability to (a) change their position in the room and / or (b) their view direction in that given position should they experience glare frequently, i.e. they will be able to “choose freely” their position and view direction. As such, it is considered that a detailed glare assessment is not applicable in the current development and that each unit will have access to appropriate protection from glare.

6.2.1.5 Sunlight in Amenity Areas (SiAA)

The proposed amenity area is in excess of the guideline values for direct sunlight (SiAA) given in BR 209 (2022). Information relating to specific amenity spaces is given within appendix A.1.

6.3 A Holistic Assessment of Daylight Results

Relevant policy outlines that access to natural light is an important consideration in the planning and delivery of new developments. In this context, it is important to remind ourselves that a holistic approach to the design of natural light focuses on all aspects of the various criteria given in standards and guidance documents, namely:

- Target Illuminance
- Exposure to Sunlight
- Access to View
- Protection from Glare

All standards present these four criteria as having equal weight. None is more important than another. To aid with a holistic appraisal, the appendices present a summary on a unit-by-unit basis, with the results for each of the four metrics given side by side. This table offers a more holistic insight into the daylight environment that will be experienced (e.g. whilst unit ref 87 has a bedroom that experiences below the minimum target illuminance recommendation, it also has access to over 12 hours of direct sunlight on March 21st (far and above the minimum recommendation of 1.5 hours of direct sunlight on March 21st).

When considering the trees and their impact on quality of natural light experienced in the proposed development, retaining the trees will offer the following benefits:

- Increased privacy.
- Improved acoustics.
- Less risk of windy conditions.
- Superior quality of views to the exterior.
- Enhanced experience of shadows, temporal contrast and visual interest, three items associated with how people rate the quality of space.
- Better passive shading and lower life cycle carbon associated with same.
- A solution that pays due consideration to nature.

6.4 Justification and Compensatory Measures

Policy outlines that where a development is falling below the minimum daylight provisions recommended in relevant standards, the applicant is required provide a justification for the design. For the development at St Anne's Court, the following items have relevance in the design and associated results:

- There is a clear aspiration from the applicant to retain as many trees on the site as is possible. This has a knock-on impact to daylight performance, but the occupant considers that retention of these trees is the correct design solution when wider design and policy aspirations are considered.
- In the ground floor bedrooms, there is an obvious requirement to balance access to illuminance with privacy of the occupant. Whilst a number of these rooms will not meet minimum target illuminance recommendations, they are all connected to an apartment with kitchens / living rooms that have appropriate of access to direct sunlight and a quality view.

7. Summary

This report presents the methods applied, calculations completed, and results found as part of a daylight availability assessment for the proposed development at Saint Anne's Court, All Saints Drive, Dublin 5. The assessment is completed in line with relevant local and national policy, along with various standards and recommendation documents.

A key component to the design of the development is retention of existing trees. As such, and to allow an informed decision to be reached by the planning authority, this report presents results both with and without the trees proposed for retention.

When considering the information presented within the body of the report and the accompanying appendix, the following observations can be made:

Effect of the Proposed Development on the Existing Surrounding Environment

- The effect of the proposed development on all surrounding existing properties can be classified as negligible.

Performance of the Proposed Development with All Trees Removed

- 100% of units meet the minimum recommendation for Exposure to Sunlight.
- 100% of units meet the minimum recommendation for Quality of View.
- 88% of rooms meet the minimum recommendation for Target Illuminance.
- 100% of units meet the minimum recommendation for Protection from Glare.
- 100% of relevant external spaces meet the minimum recommendation for Sunlight in Amenity Areas.

Performance of the Proposed Development with Select Trees Retained

- 80% of units meet the minimum recommendation for Exposure to Sunlight.
- 100% of units meet the minimum recommendation for Quality of View.
- 60% of rooms meet the minimum recommendation for Target Illuminance.
- 100% of units meet the minimum recommendation for Protection from Glare.
- 100% of relevant external spaces meet the minimum recommendation for Sunlight in Amenity Areas.

When considering the trees and their impact on quality of natural light experienced in the proposed development, retaining the trees will offer the following benefits:

- Increased privacy and quality of view to the outside.
- Improved acoustics and less risk of windy conditions.
- Enhanced experience of shadows, temporal contrast and visual interest, three items associated with how people rate the quality of space.
- Better passive shading, lower life cycle carbon and a nature orientated site solution.

Based on the above results and the wider criteria in the body of the report and elsewhere, it is the opinion of the applicant that the results with trees retained constitute the most appropriate holistic design solution for the site.

Appendix A

Results, Data and Simulation Outputs

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A.1 Performance of the Proposed Development

A.1.1 Reference Model, Grids and Points

Model



Figure 1 Proposed model condition

Grids

The following images display grid reference numbers for rooms within the proposed development. These can be cross referenced against the result tables given for Target Illuminance and Quality of View in this appendix to find specific results for each apartment or room in the proposed development.

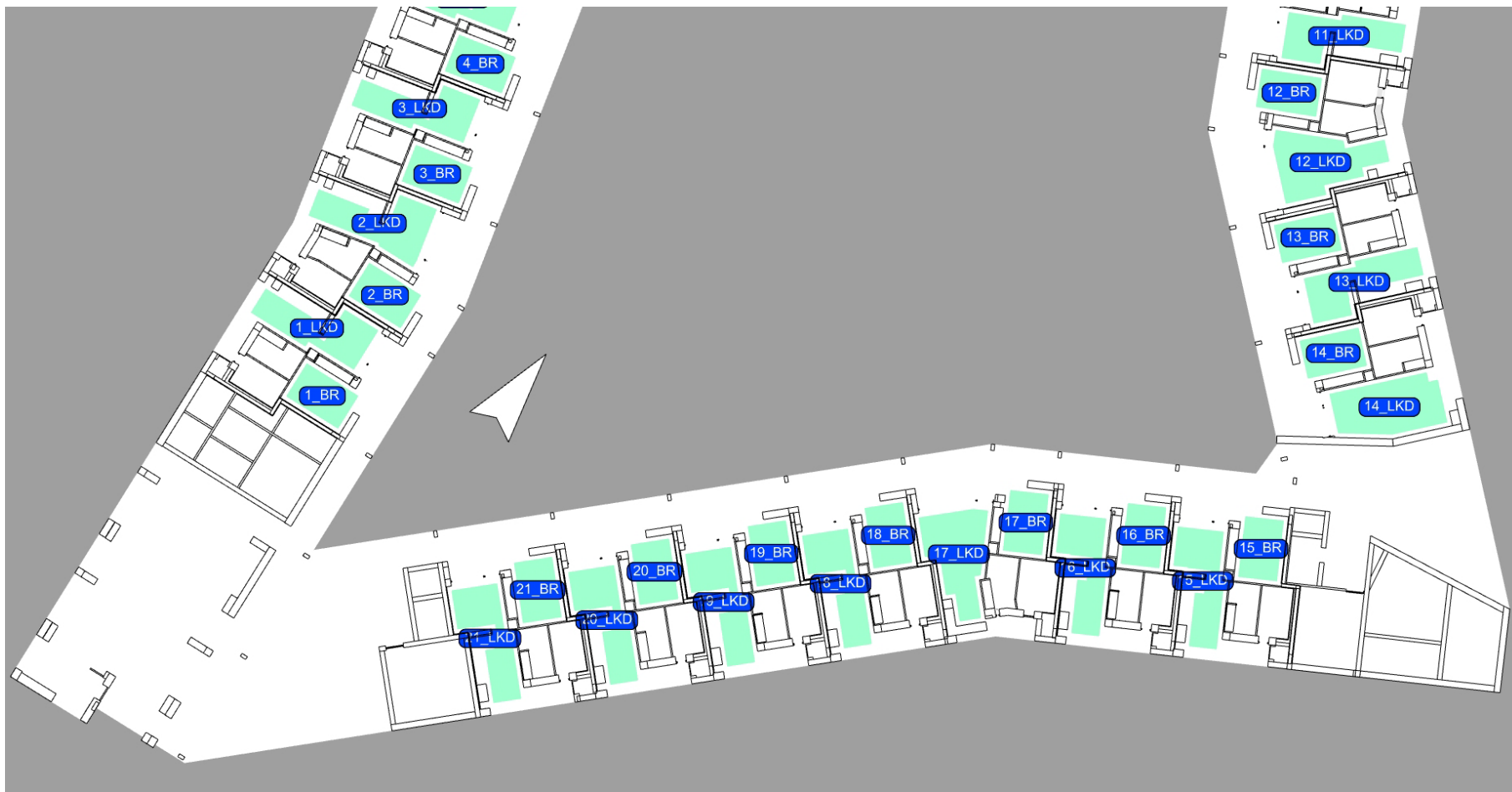


Figure 2: Level 0, Part 1 - Grid Reference

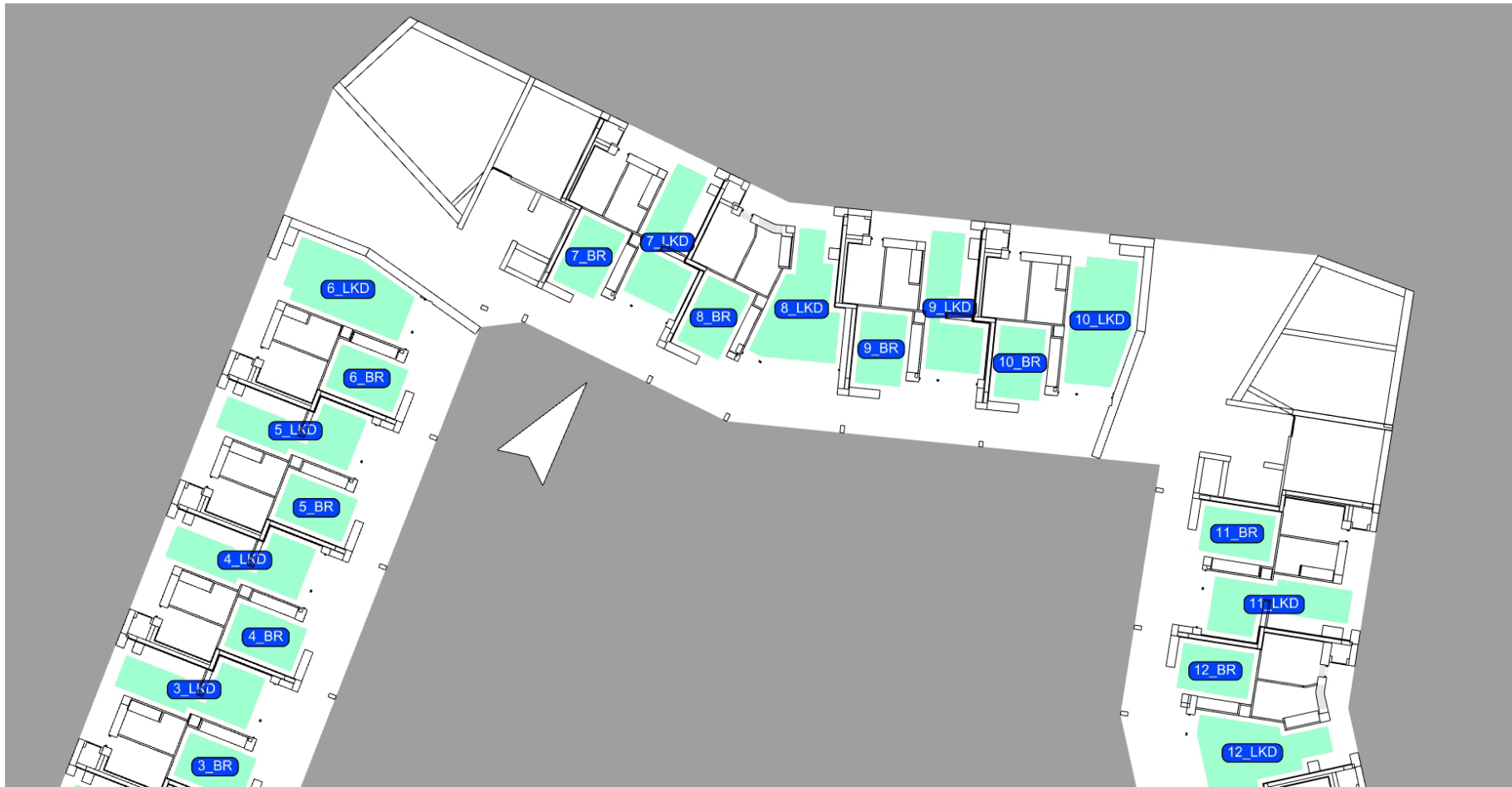


Figure 3: Level 0, Part 2 - Grid Reference

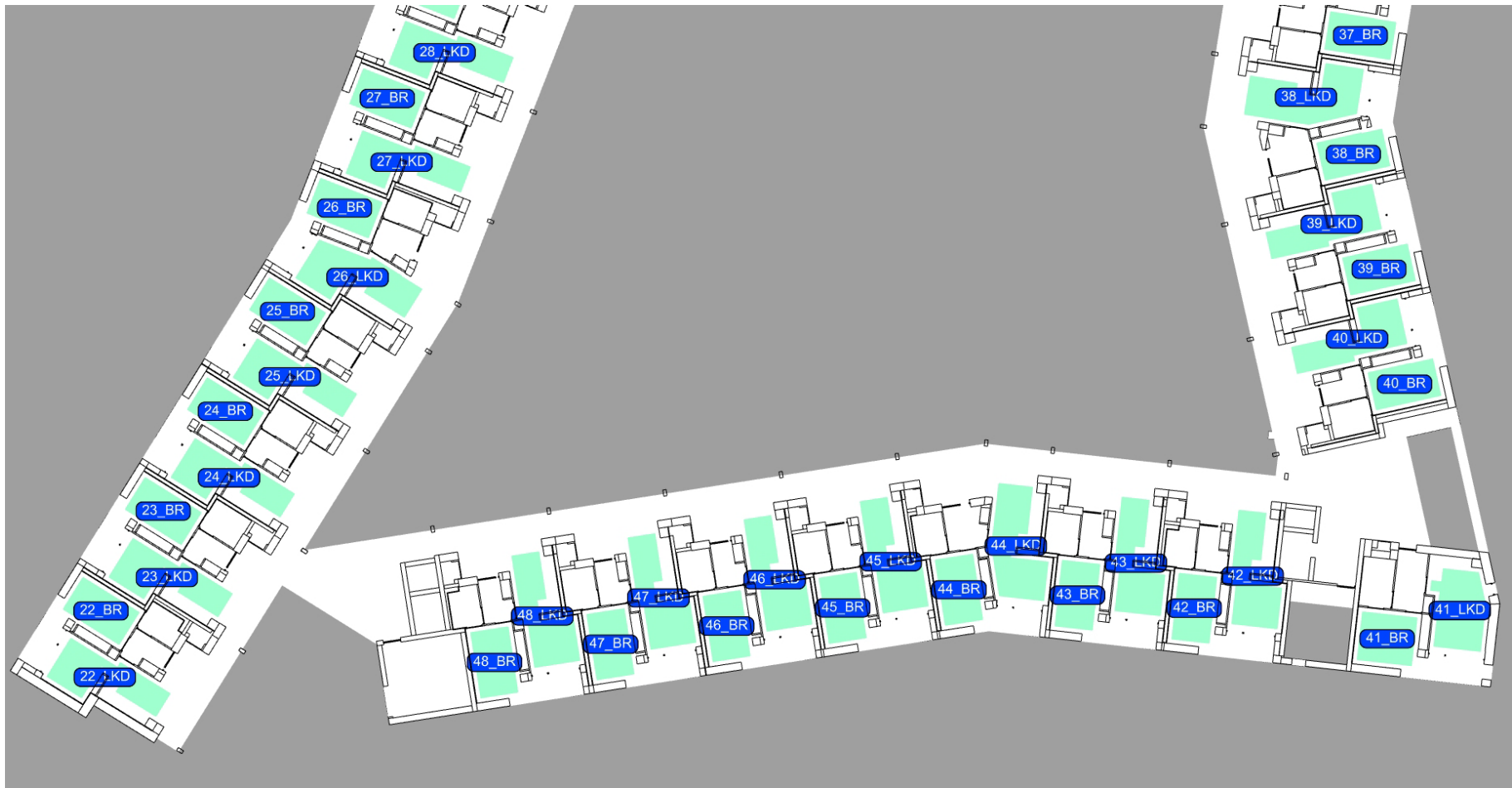


Figure 4: Level 1, Part 1 - Grid Reference

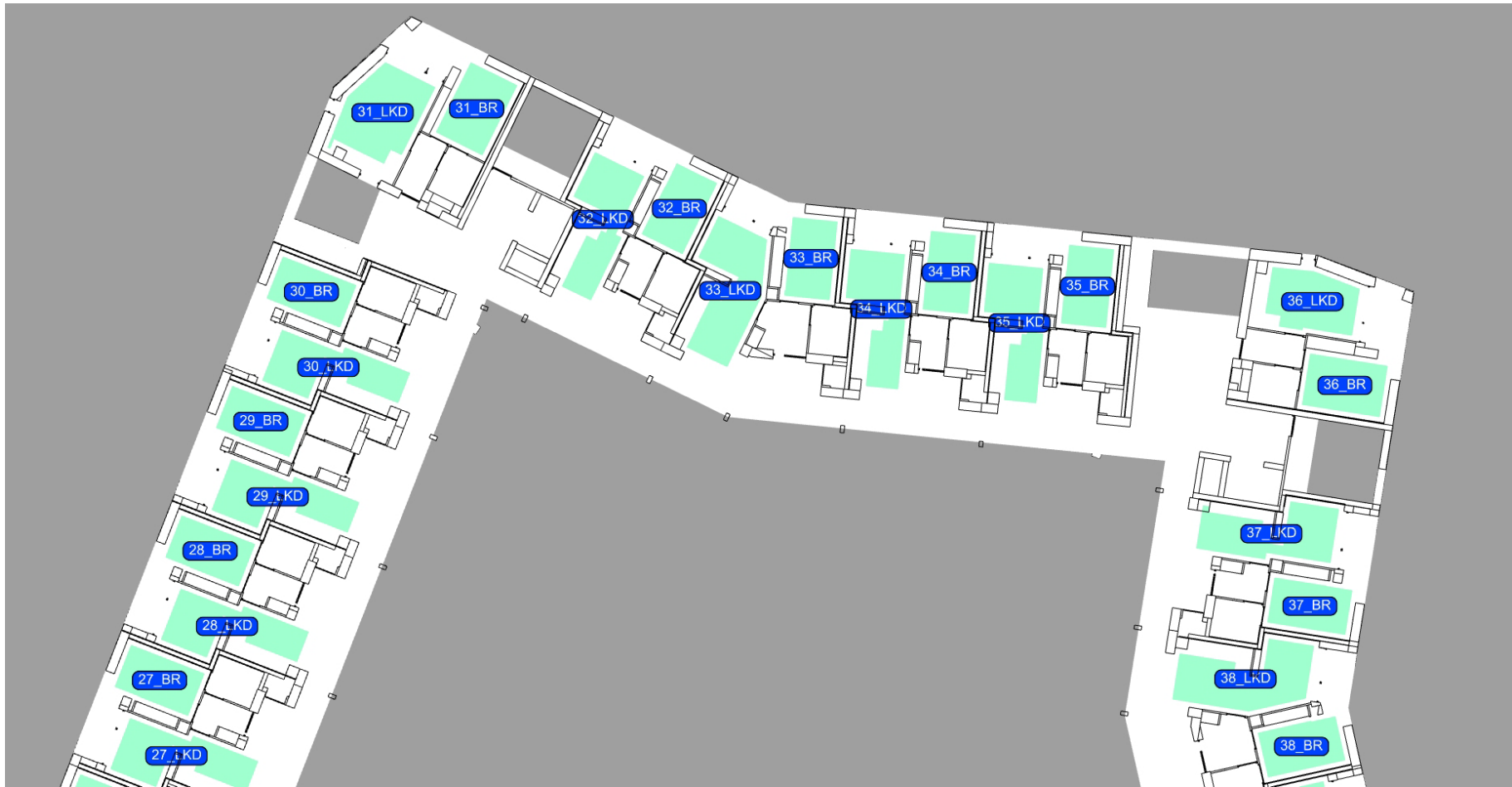


Figure 5: Level 1, Part 2 - Grid Reference

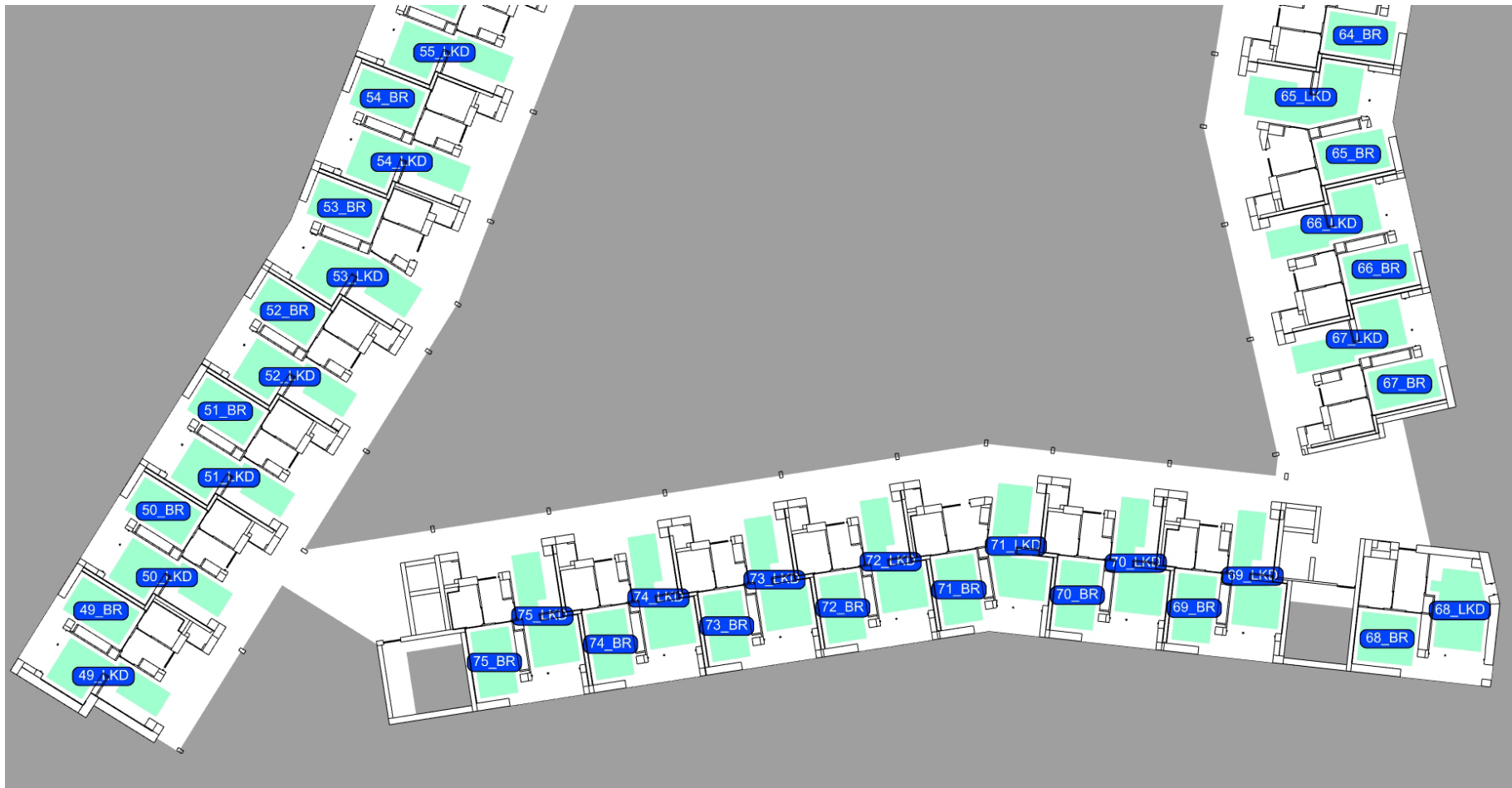


Figure 6: Level 2, Part 1 - Grid Reference



Figure 7: Level 2, Part 2 - Grid Reference

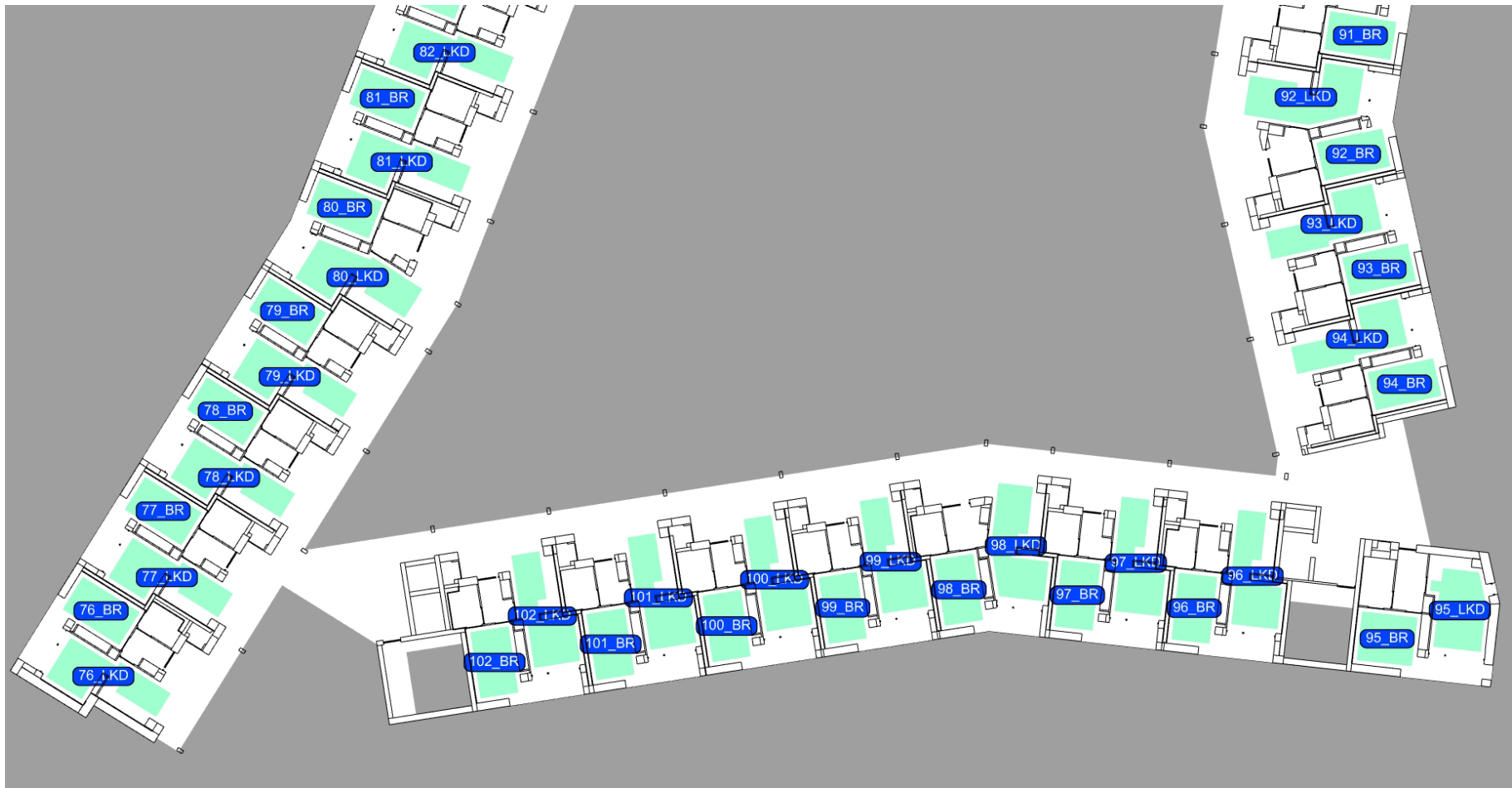


Figure 8: Level 3, Part 1 - Grid Reference



Figure 9: Level 3, Part 2 - Grid Reference

Points

Points

The images below display the reference points used for Exposure to Sunlight of the proposed development. These can be used to cross reference with the tables presented after in order to determine specific values for EtS in individual apartments.

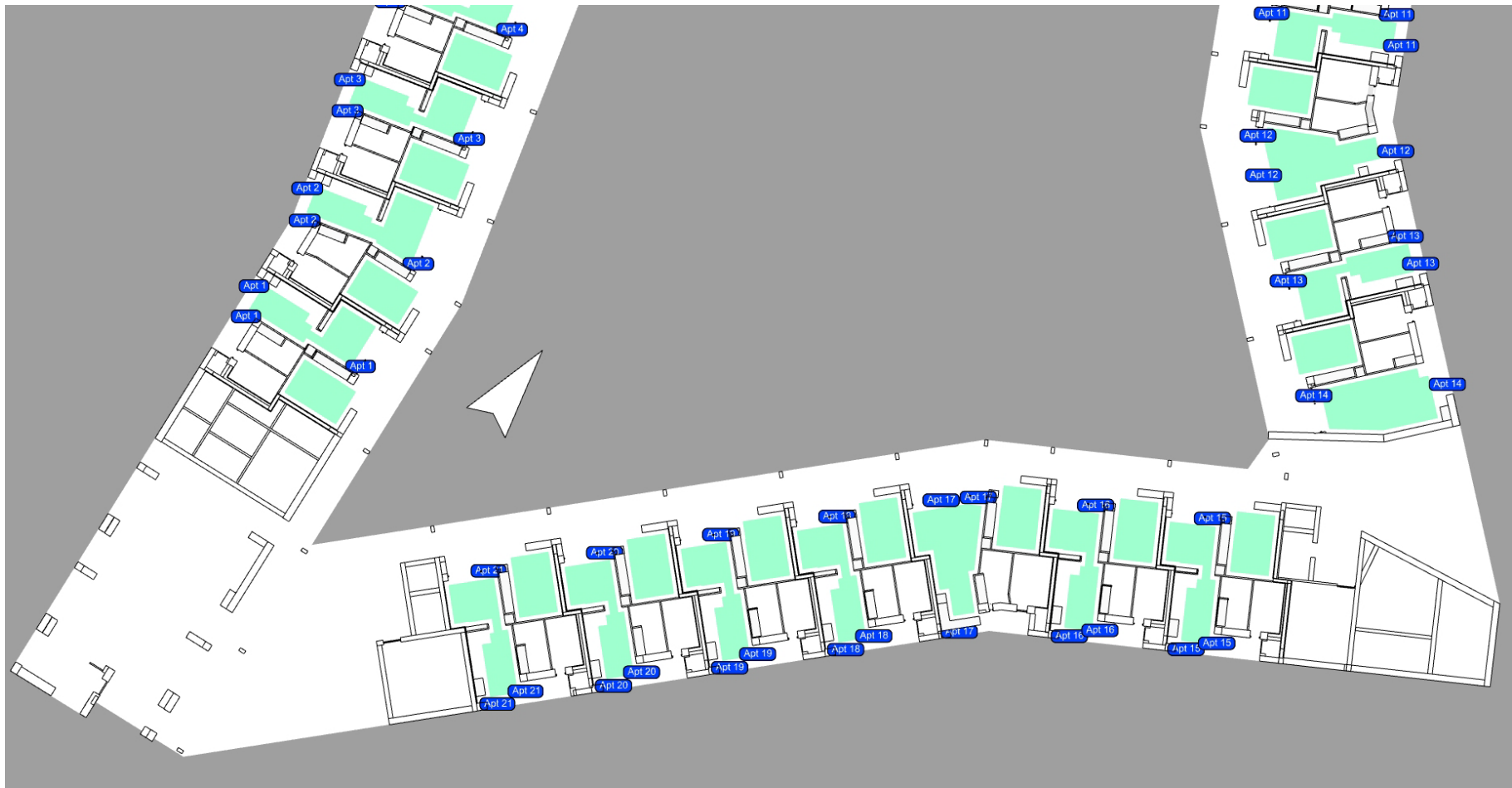


Figure 10: Level 0, Part 1 - Apartment Numbers



Figure 11: Level 0, Part 2 - Apartment Numbers

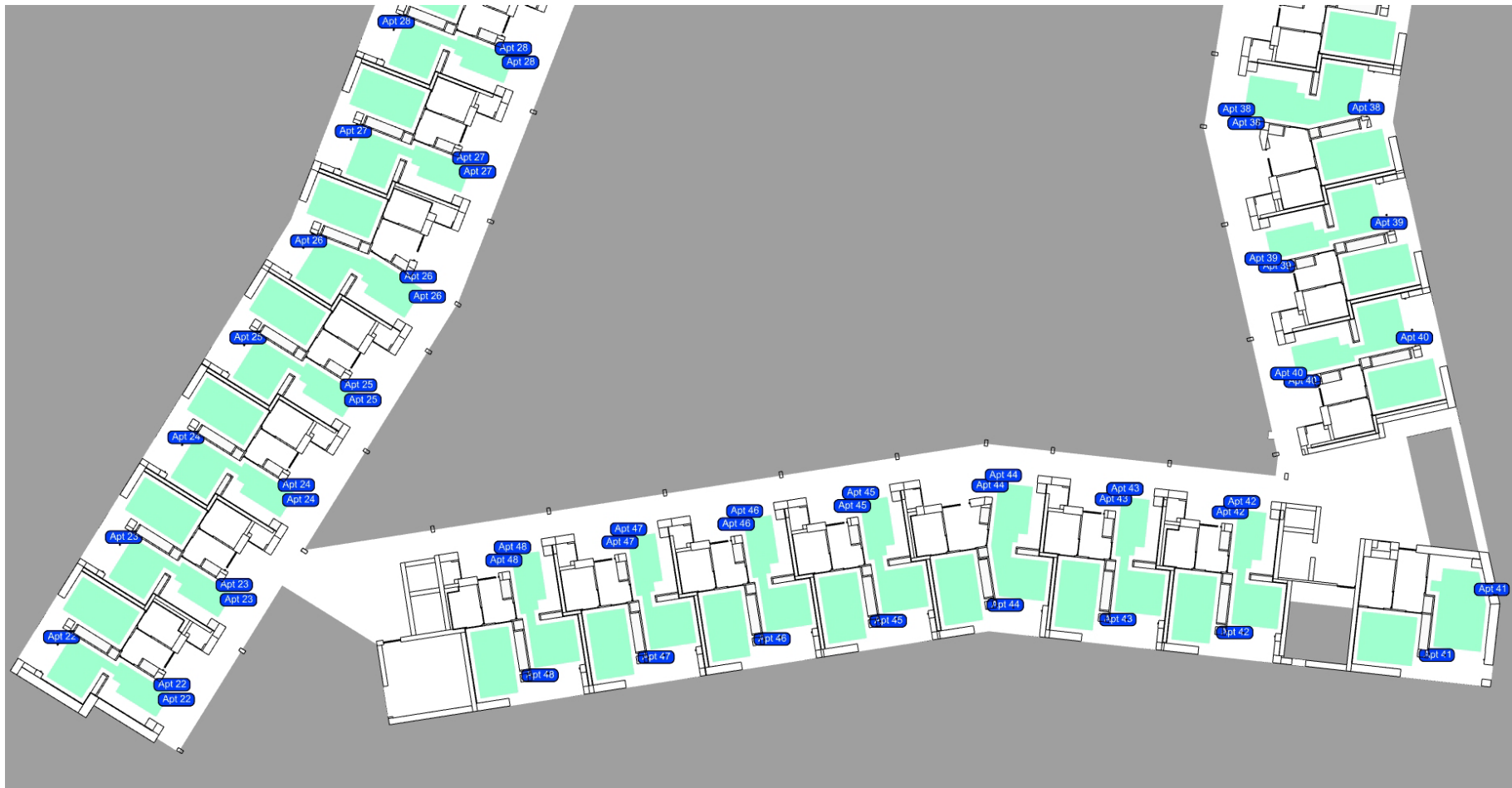


Figure 12: Level 1, Part 1 - Apartment Numbers

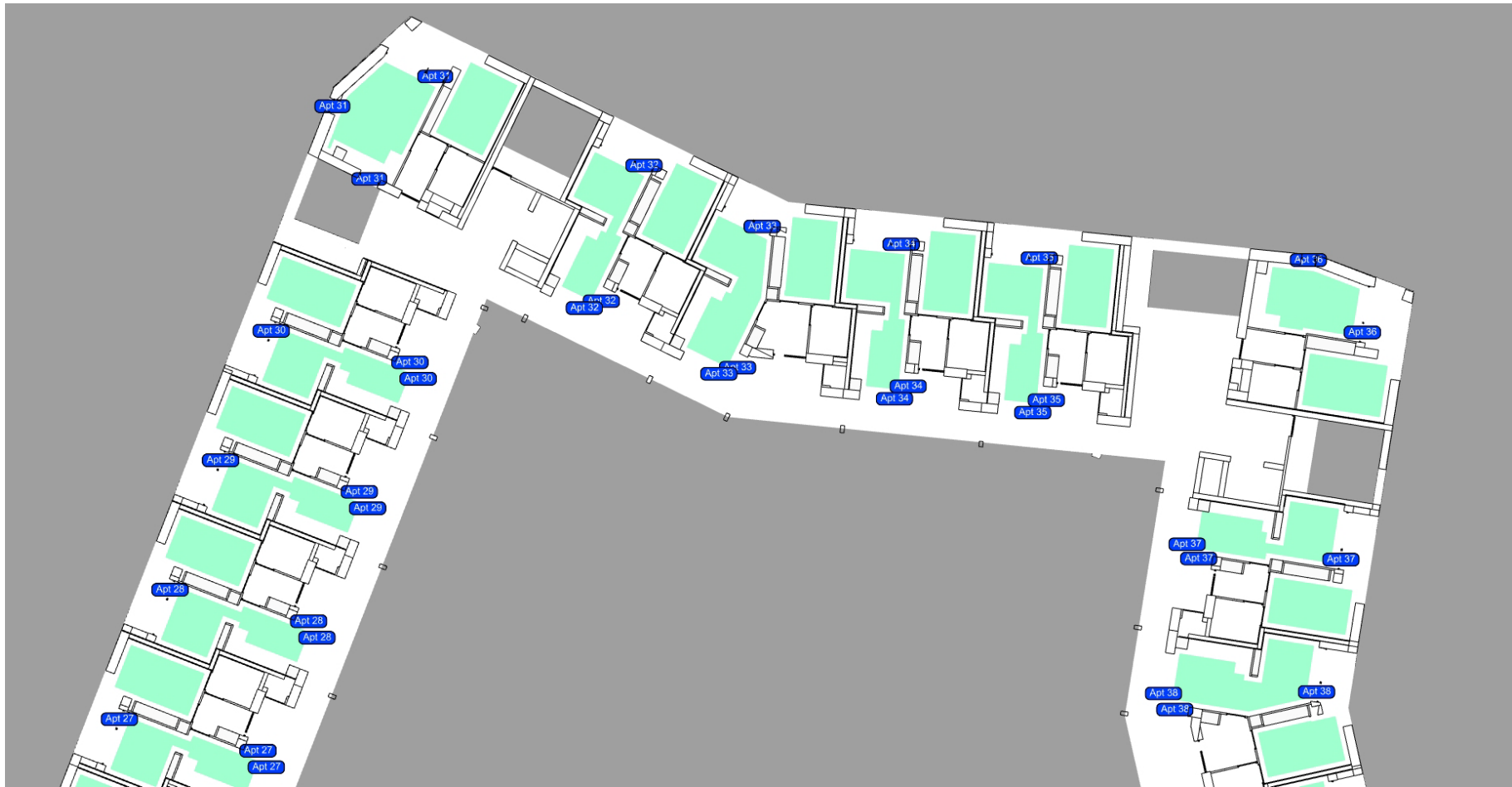


Figure 13: Level 1, Part 2 - Apartment Numbers

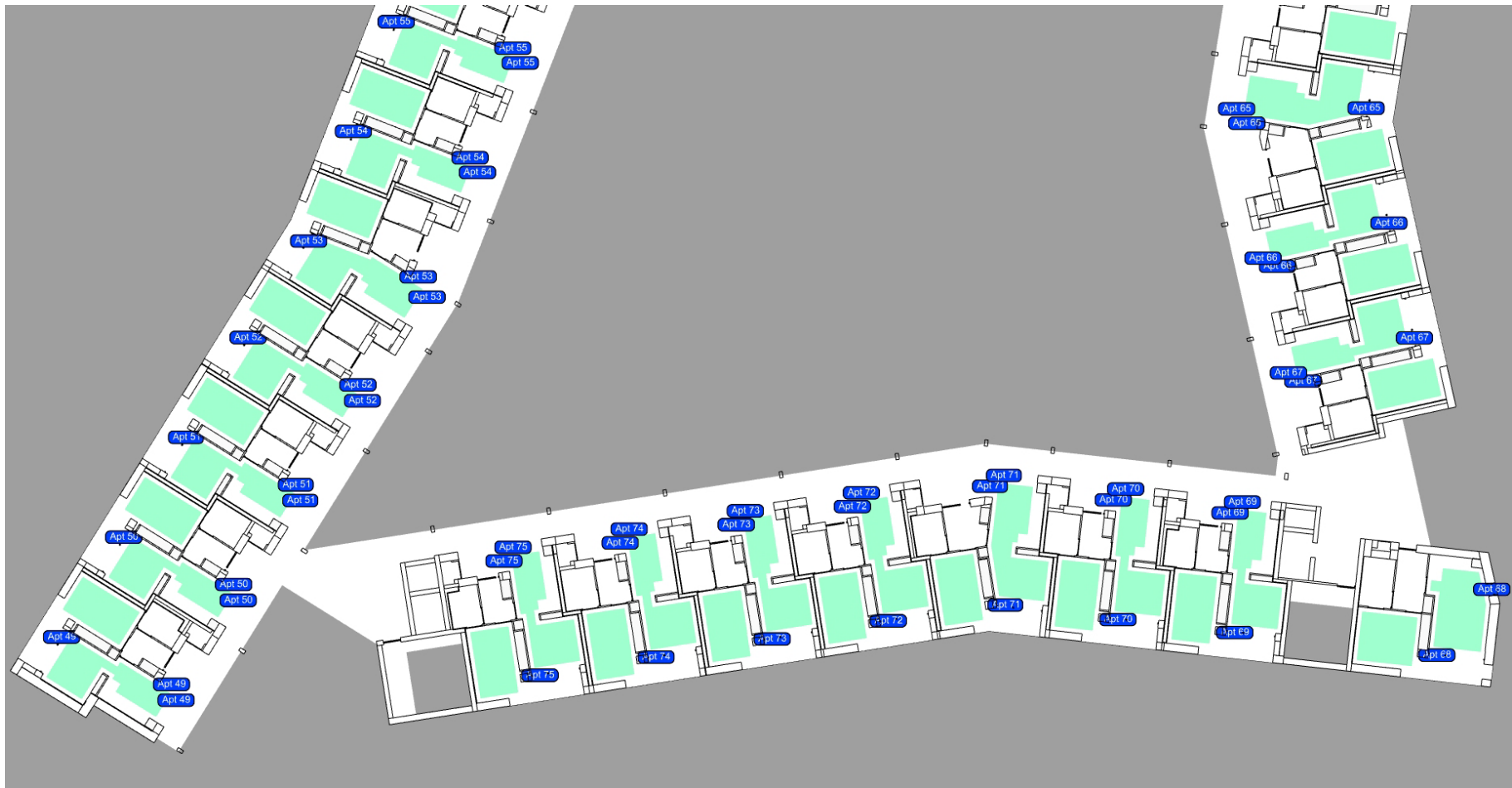


Figure 14: Level 2, Part 1 - Apartment Numbers

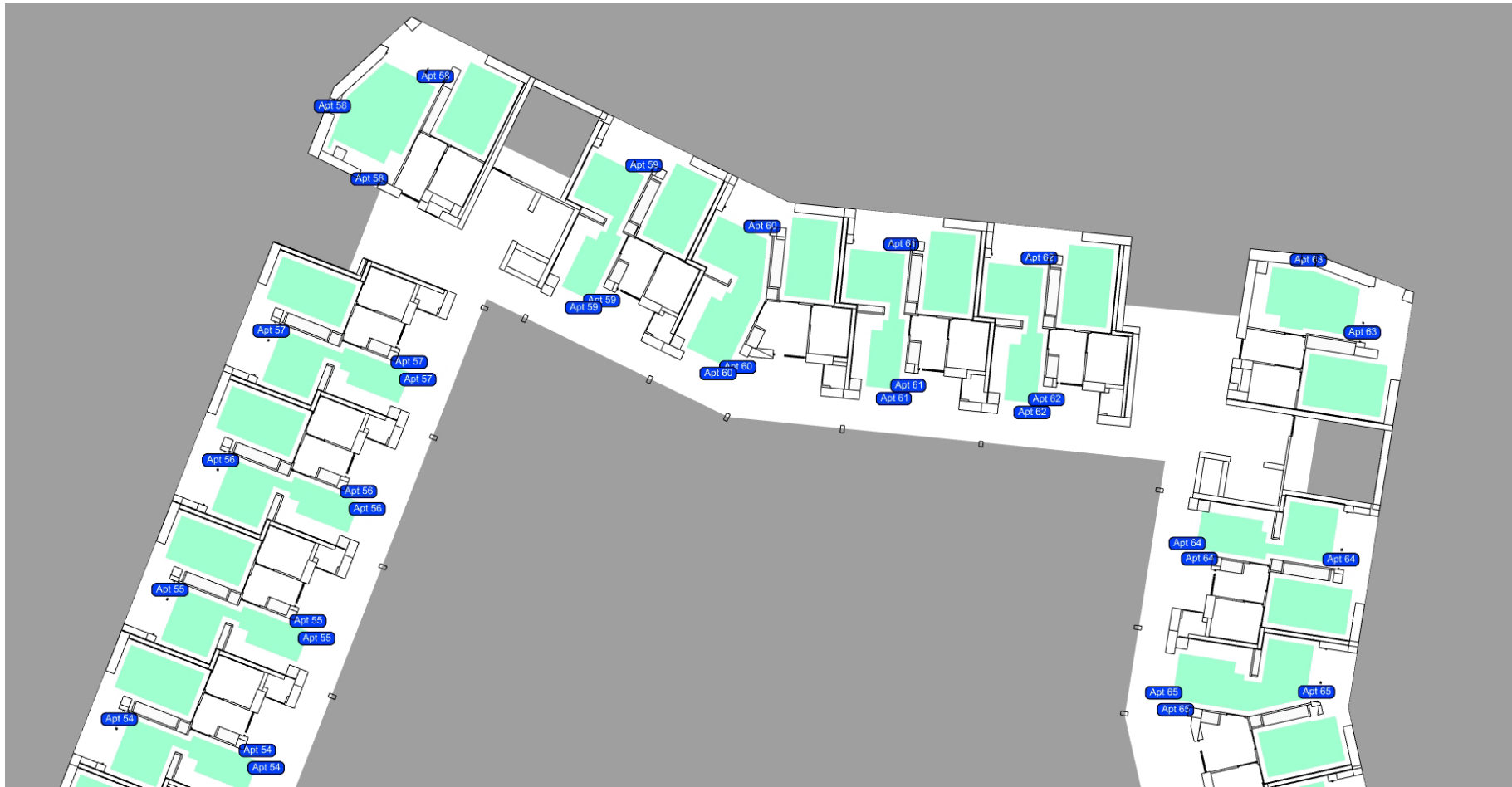


Figure 15: Level 2, Part 2 - Apartment Numbers

A.1.2 Results

A.1.2.1 Target Illuminance (Et)

A.1.2.1.1 Excluding Trees

The table below presents results for LKDs and bedrooms benchmarked against the values given within the national annex of BS EN 17037:2018 and BR 209 (2022). Full explanation of this metric and minimum recommendation is given within the metrics section in the body of this report.

Imagery

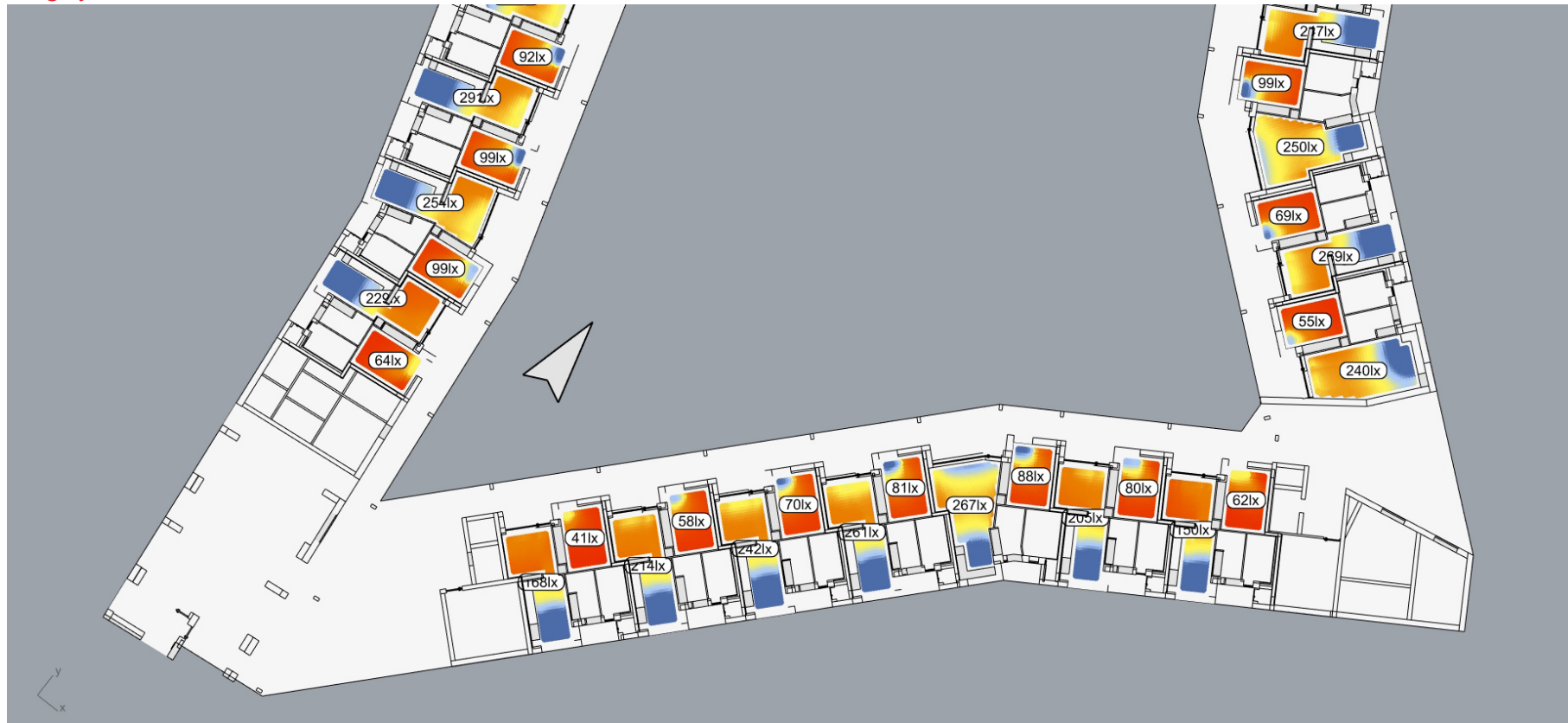


Figure 16: Level 0, Part 1 - Et

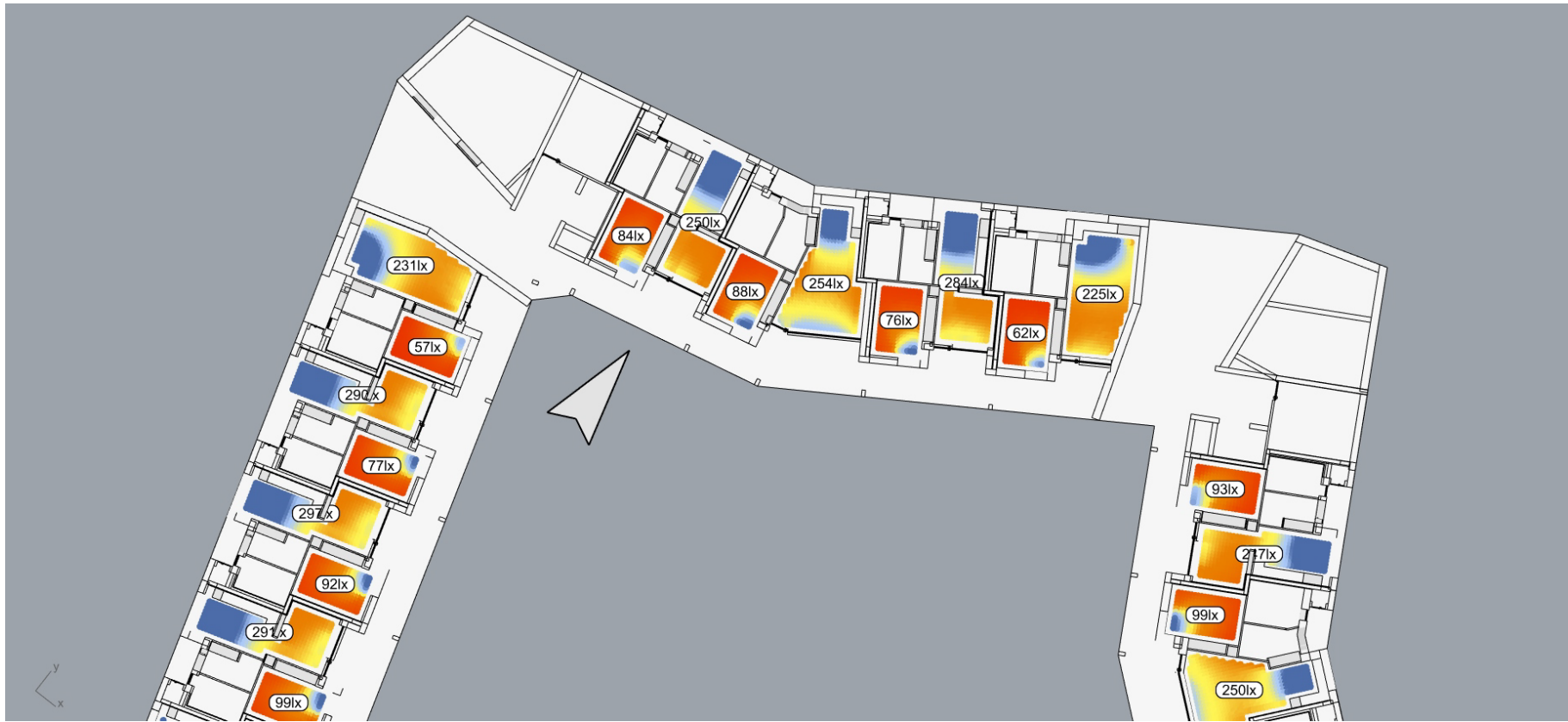


Figure 17: Level 0, Part 2 - Et

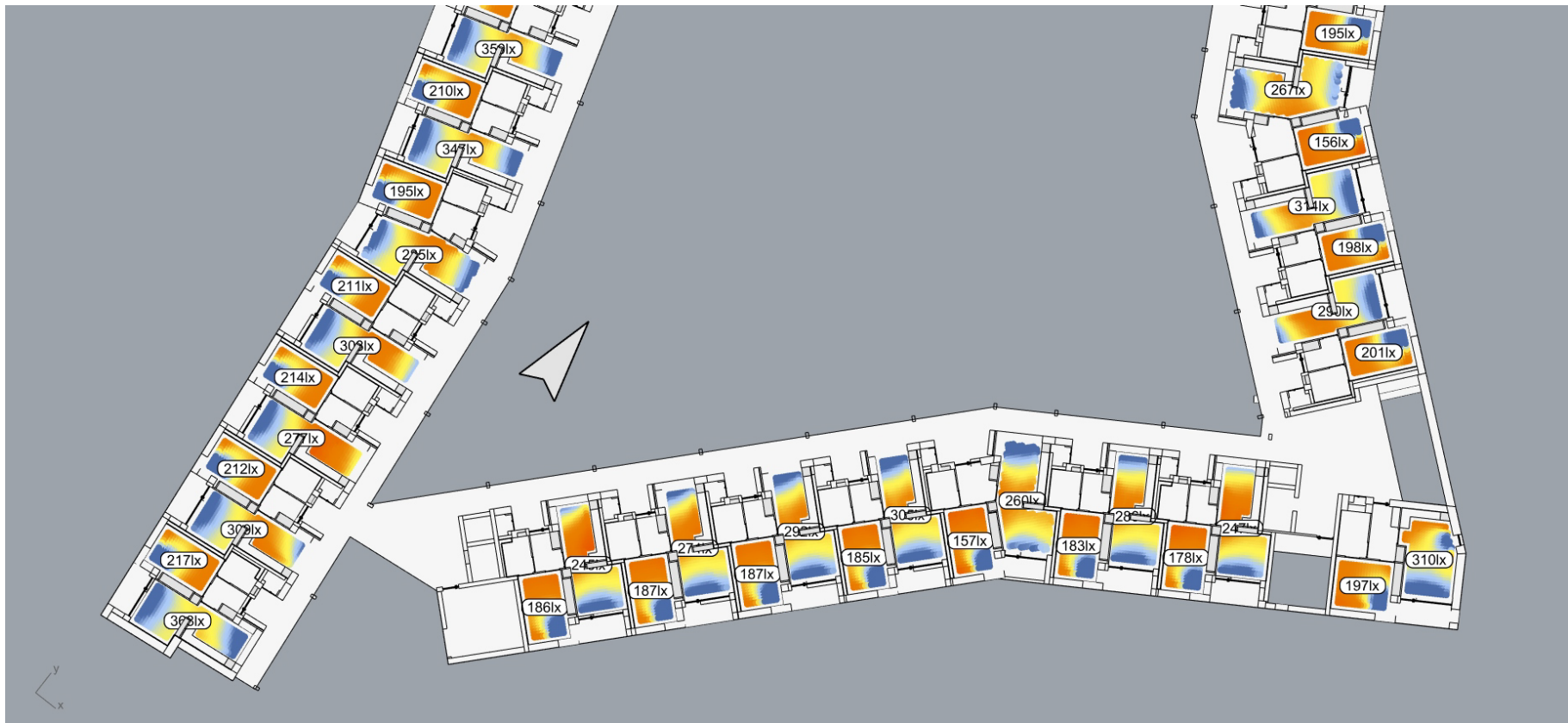


Figure 18: Level 1, Part 1 - Et

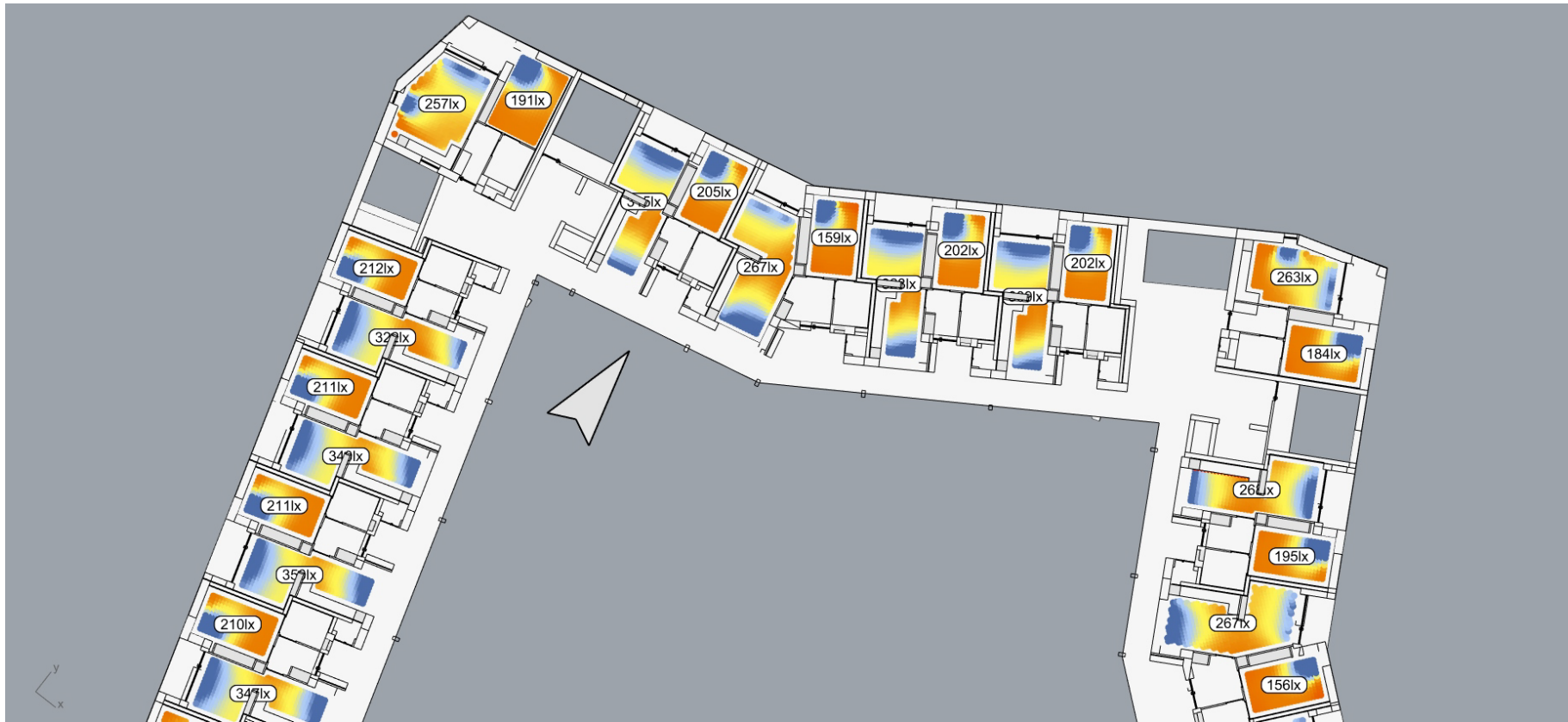


Figure 19: Level 1, Part 2 - Et

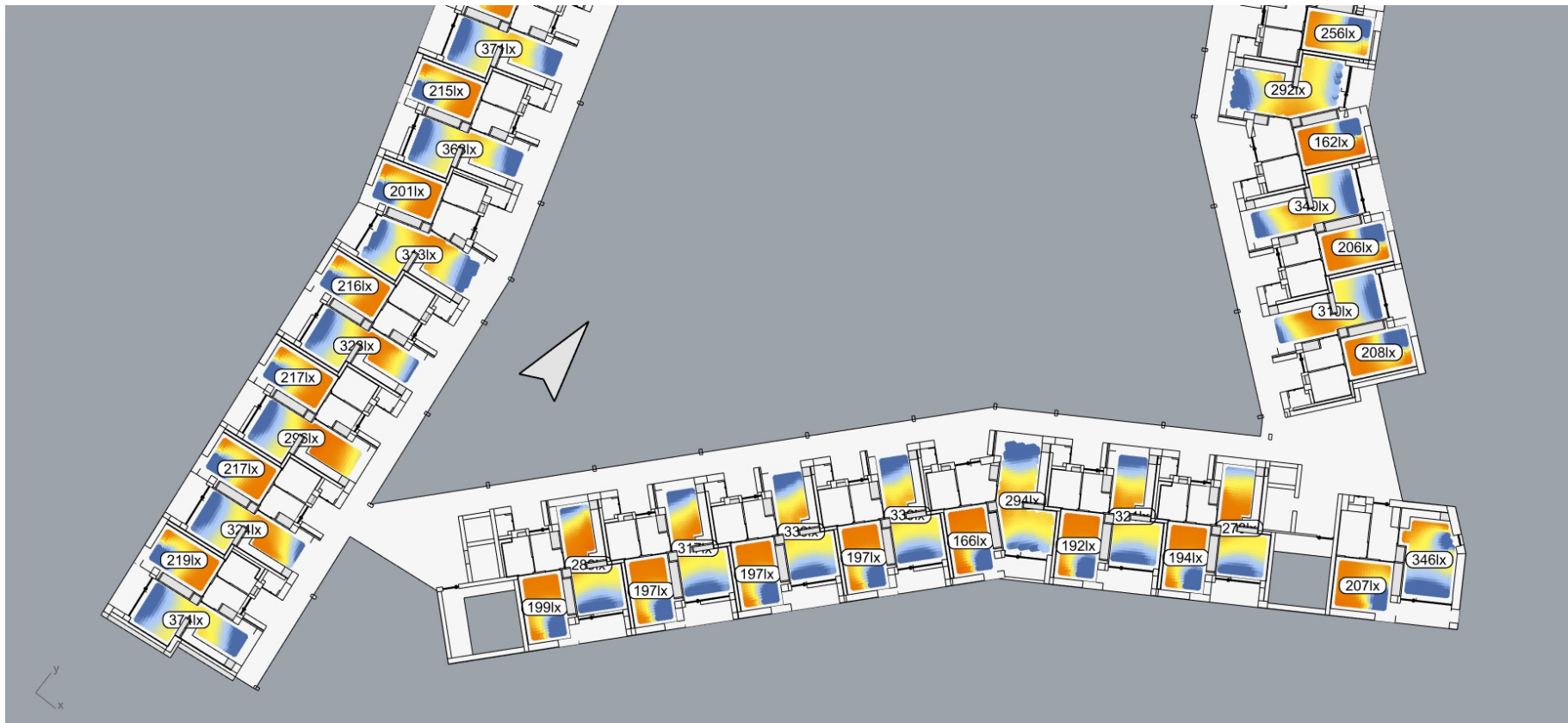


Figure 20: Level 2, Part 1 - Et

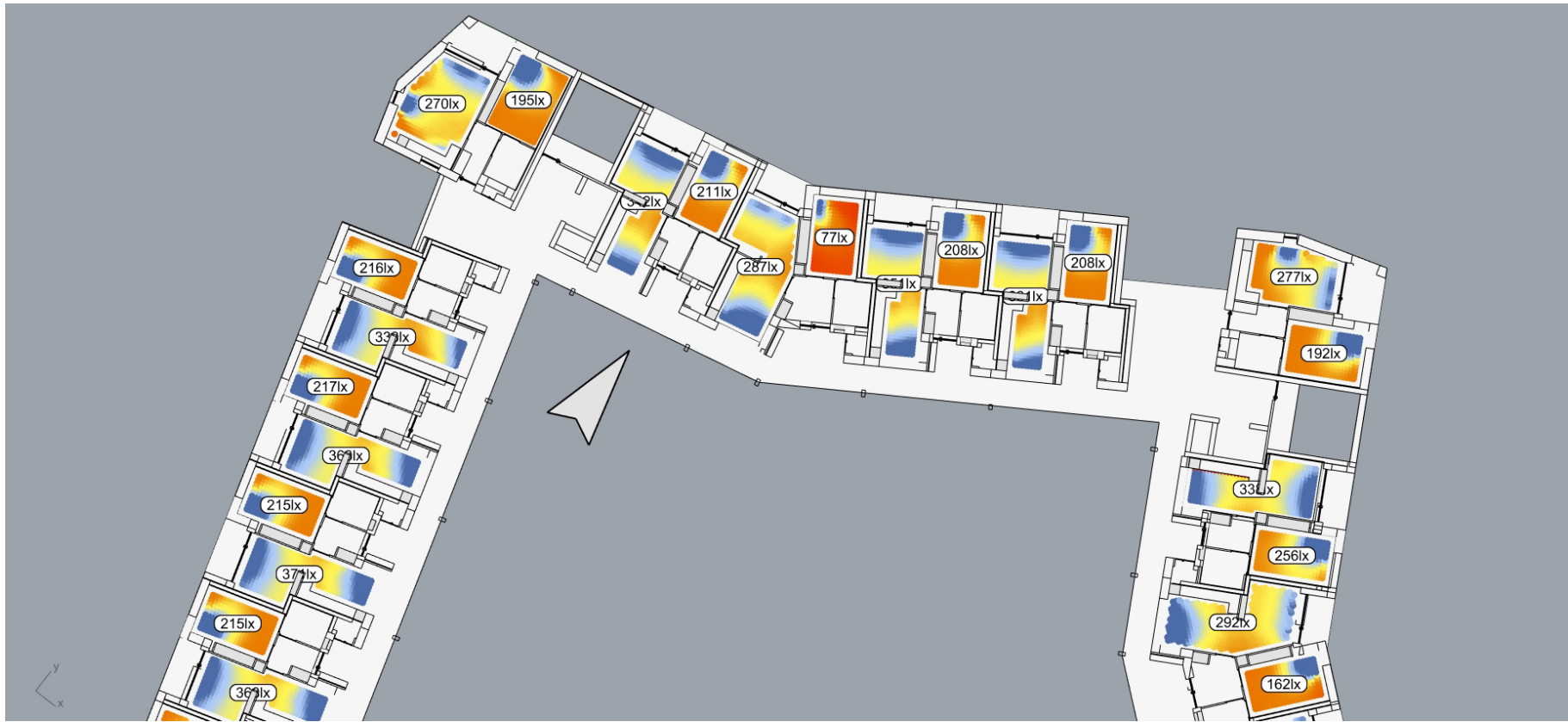


Figure 21: Level 2, Part 2 - Et

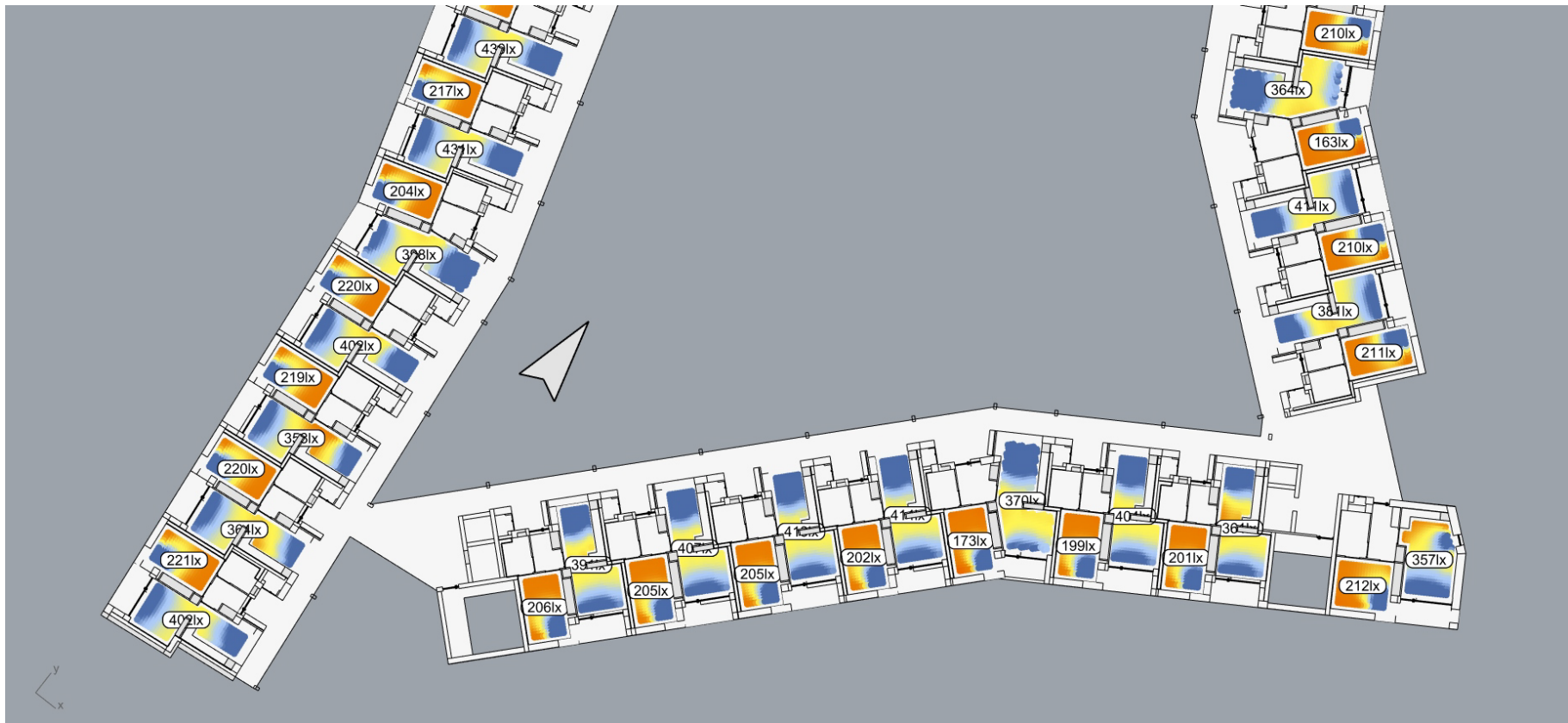


Figure 22: Level 3, Part 1 - Et

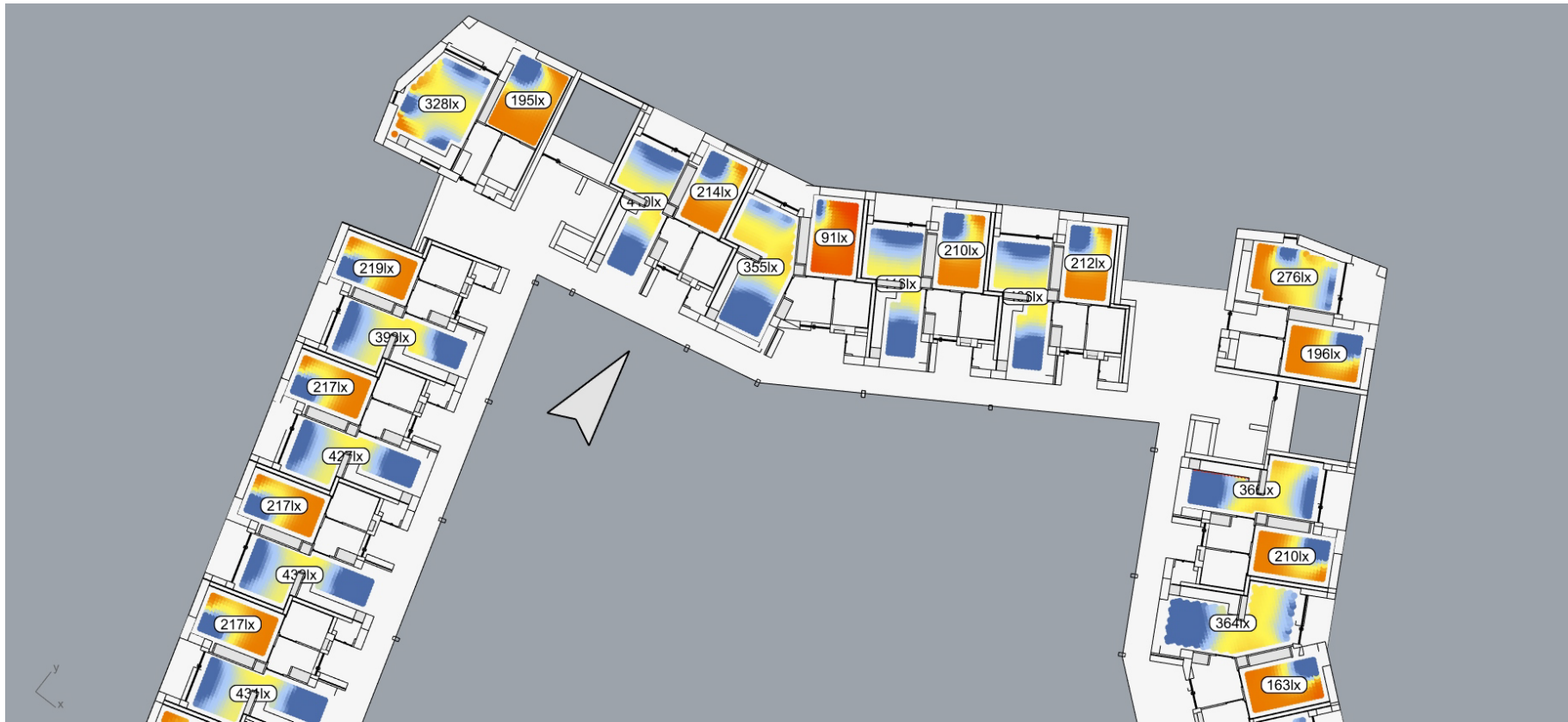


Figure 23: Level 3, Part 2 - Et

Tabulated

Target Illuminance (Et) – Trees Excluded				
Apartment Reference	Grid Reference	Room Type	Et	Meets Minimum Recommendation?
1	1_BR	Bedroom	64	No
1	1_LKD	LKD	229	Yes
2	2_BR	Bedroom	99	No
2	2_LKD	LKD	254	Yes
3	3_BR	Bedroom	99	No
3	3_LKD	LKD	291	Yes
4	4_BR	Bedroom	92	No
4	4_LKD	LKD	297	Yes
5	5_BR	Bedroom	77	No
5	5_LKD	LKD	290	Yes
6	6_BR	Bedroom	57	No
6	6_LKD	LKD	231	Yes
7	7_BR	Bedroom	84	No
7	7_LKD	LKD	250	Yes
8	8_BR	Bedroom	88	No
8	8_LKD	LKD	254	Yes
9	9_BR	Bedroom	76	No
9	9_LKD	LKD	284	Yes
10	10_BR	Bedroom	62	No
10	10_LKD	LKD	225	Yes
11	11_BR	Bedroom	93	No

Target Illuminance (Et) – Trees Excluded				
Apartment Reference	Grid Reference	Room Type	Et	Meets Minimum Recommendation?
11	11_LKD	LKD	247	Yes
12	12_BR	Bedroom	99	No
12	12_LKD	LKD	250	Yes
13	13_BR	Bedroom	69	No
13	13_LKD	LKD	269	Yes
14	14_BR	Bedroom	55	No
14	14_LKD	LKD	240	Yes
15	15_BR	Bedroom	62	No
15	15_LKD	LKD	150	No
16	16_BR	Bedroom	80	No
16	16_LKD	LKD	205	Yes
17	17_BR	Bedroom	88	No
17	17_LKD	LKD	267	Yes
18	18_BR	Bedroom	81	No
18	18_LKD	LKD	261	Yes
19	19_BR	Bedroom	70	No
19	19_LKD	LKD	242	Yes
20	20_BR	Bedroom	58	No
20	20_LKD	LKD	214	Yes
21	21_BR	Bedroom	41	No
21	21_LKD	LKD	168	No
22	22_BR	Bedroom	217	Yes

Target Illuminance (Et) – Trees Excluded				
Apartment Reference	Grid Reference	Room Type	Et	Meets Minimum Recommendation?
22	22_LKD	LKD	368	Yes
23	23_BR	Bedroom	212	Yes
23	23_LKD	LKD	309	Yes
24	24_BR	Bedroom	214	Yes
24	24_LKD	LKD	277	Yes
25	25_BR	Bedroom	211	Yes
25	25_LKD	LKD	303	Yes
26	26_BR	Bedroom	195	Yes
26	26_LKD	LKD	285	Yes
27	27_BR	Bedroom	210	Yes
27	27_LKD	LKD	347	Yes
28	28_BR	Bedroom	211	Yes
28	28_LKD	LKD	350	Yes
29	29_BR	Bedroom	211	Yes
29	29_LKD	LKD	340	Yes
30	30_BR	Bedroom	212	Yes
30	30_LKD	LKD	322	Yes
31	31_BR	Bedroom	191	Yes
31	31_LKD	LKD	257	Yes
32	32_BR	Bedroom	205	Yes
32	32_LKD	LKD	315	Yes
33	33_BR	Bedroom	159	Yes

Target Illuminance (Et) – Trees Excluded				
Apartment Reference	Grid Reference	Room Type	Et	Meets Minimum Recommendation?
33	33_LKD	LKD	267	Yes
34	34_BR	Bedroom	202	Yes
34	34_LKD	LKD	323	Yes
35	35_BR	Bedroom	202	Yes
35	35_LKD	LKD	309	Yes
36	36_BR	Bedroom	184	Yes
36	36_LKD	LKD	263	Yes
37	37_BR	Bedroom	195	Yes
37	37_LKD	LKD	268	Yes
38	38_BR	Bedroom	156	Yes
38	38_LKD	LKD	267	Yes
39	39_BR	Bedroom	198	Yes
39	39_LKD	LKD	314	Yes
40	40_BR	Bedroom	201	Yes
40	40_LKD	LKD	290	Yes
41	41_BR	Bedroom	197	Yes
41	41_LKD	LKD	310	Yes
42	42_BR	Bedroom	178	Yes
42	42_LKD	LKD	247	Yes
43	43_BR	Bedroom	183	Yes
43	43_LKD	LKD	286	Yes
44	44_BR	Bedroom	157	Yes

Target Illuminance (Et) – Trees Excluded				
Apartment Reference	Grid Reference	Room Type	Et	Meets Minimum Recommendation?
44	44_LKD	LKD	260	Yes
45	45_BR	Bedroom	185	Yes
45	45_LKD	LKD	305	Yes
46	46_BR	Bedroom	187	Yes
46	46_LKD	LKD	292	Yes
47	47_BR	Bedroom	187	Yes
47	47_LKD	LKD	274	Yes
48	48_BR	Bedroom	186	Yes
48	48_LKD	LKD	245	Yes
49	49_BR	Bedroom	219	Yes
49	49_LKD	LKD	374	Yes
50	50_BR	Bedroom	217	Yes
50	50_LKD	LKD	324	Yes
51	51_BR	Bedroom	217	Yes
51	51_LKD	LKD	296	Yes
52	52_BR	Bedroom	216	Yes
52	52_LKD	LKD	323	Yes
53	53_BR	Bedroom	201	Yes
53	53_LKD	LKD	313	Yes
54	54_BR	Bedroom	215	Yes
54	54_LKD	LKD	368	Yes
55	55_BR	Bedroom	215	Yes

Target Illuminance (Et) – Trees Excluded				
Apartment Reference	Grid Reference	Room Type	Et	Meets Minimum Recommendation?
55	55_LKD	LKD	371	Yes
56	56_BR	Bedroom	217	Yes
56	56_LKD	LKD	363	Yes
57	57_BR	Bedroom	216	Yes
57	57_LKD	LKD	338	Yes
58	58_BR	Bedroom	195	Yes
58	58_LKD	LKD	270	Yes
59	59_BR	Bedroom	211	Yes
59	59_LKD	LKD	342	Yes
60	60_BR	Bedroom	77	No
60	60_LKD	LKD	287	Yes
61	61_BR	Bedroom	208	Yes
61	61_LKD	LKD	351	Yes
62	62_BR	Bedroom	208	Yes
62	62_LKD	LKD	331	Yes
63	63_BR	Bedroom	192	Yes
63	63_LKD	LKD	277	Yes
64	64_BR	Bedroom	256	Yes
64	64_LKD	LKD	338	Yes
65	65_BR	Bedroom	162	Yes
65	65_LKD	LKD	292	Yes
66	66_BR	Bedroom	206	Yes

Target Illuminance (Et) – Trees Excluded				
Apartment Reference	Grid Reference	Room Type	Et	Meets Minimum Recommendation?
66	66_LKD	LKD	340	Yes
67	67_BR	Bedroom	208	Yes
67	67_LKD	LKD	310	Yes
68	68_BR	Bedroom	207	Yes
68	68_LKD	LKD	346	Yes
69	69_BR	Bedroom	194	Yes
69	69_LKD	LKD	278	Yes
70	70_BR	Bedroom	192	Yes
70	70_LKD	LKD	321	Yes
71	71_BR	Bedroom	166	Yes
71	71_LKD	LKD	294	Yes
72	72_BR	Bedroom	197	Yes
72	72_LKD	LKD	339	Yes
73	73_BR	Bedroom	197	Yes
73	73_LKD	LKD	330	Yes
74	74_BR	Bedroom	197	Yes
74	74_LKD	LKD	317	Yes
75	75_BR	Bedroom	199	Yes
75	75_LKD	LKD	289	Yes
76	76_BR	Bedroom	221	Yes
76	76_LKD	LKD	402	Yes
77	77_BR	Bedroom	220	Yes

Target Illuminance (Et) – Trees Excluded				
Apartment Reference	Grid Reference	Room Type	Et	Meets Minimum Recommendation?
77	77_LKD	LKD	364	Yes
78	78_BR	Bedroom	219	Yes
78	78_LKD	LKD	358	Yes
79	79_BR	Bedroom	220	Yes
79	79_LKD	LKD	402	Yes
80	80_BR	Bedroom	204	Yes
80	80_LKD	LKD	398	Yes
81	81_BR	Bedroom	217	Yes
81	81_LKD	LKD	431	Yes
82	82_BR	Bedroom	217	Yes
82	82_LKD	LKD	430	Yes
83	83_BR	Bedroom	217	Yes
83	83_LKD	LKD	427	Yes
84	84_BR	Bedroom	219	Yes
84	84_LKD	LKD	398	Yes
85	85_BR	Bedroom	195	Yes
85	85_LKD	LKD	328	Yes
86	86_BR	Bedroom	214	Yes
86	86_LKD	LKD	410	Yes
87	87_BR	Bedroom	91	No
87	87_LKD	LKD	355	Yes
88	88_BR	Bedroom	210	Yes

Target Illuminance (Et) – Trees Excluded				
Apartment Reference	Grid Reference	Room Type	Et	Meets Minimum Recommendation?
88	88_LKD	LKD	416	Yes
89	89_BR	Bedroom	212	Yes
89	89_LKD	LKD	406	Yes
90	90_BR	Bedroom	196	Yes
90	90_LKD	LKD	276	Yes
91	91_BR	Bedroom	210	Yes
91	91_LKD	LKD	366	Yes
92	92_BR	Bedroom	163	Yes
92	92_LKD	LKD	364	Yes
93	93_BR	Bedroom	210	Yes
93	93_LKD	LKD	411	Yes
94	94_BR	Bedroom	211	Yes
94	94_LKD	LKD	381	Yes
95	95_BR	Bedroom	212	Yes
95	95_LKD	LKD	357	Yes
96	96_BR	Bedroom	201	Yes
96	96_LKD	LKD	361	Yes
97	97_BR	Bedroom	199	Yes
97	97_LKD	LKD	404	Yes
98	98_BR	Bedroom	173	Yes
98	98_LKD	LKD	370	Yes
99	99_BR	Bedroom	202	Yes

Target Illuminance (Et) – Trees Excluded				
Apartment Reference	Grid Reference	Room Type	Et	Meets Minimum Recommendation?
99	99_LKD	LKD	414	Yes
100	100_BR	Bedroom	205	Yes
100	100_LKD	LKD	413	Yes
101	101_BR	Bedroom	205	Yes
101	101_LKD	LKD	407	Yes
102	102_BR	Bedroom	206	Yes
102	102_LKD	LKD	391	Yes

A.1.2.1.2 Including Trees

Imagery

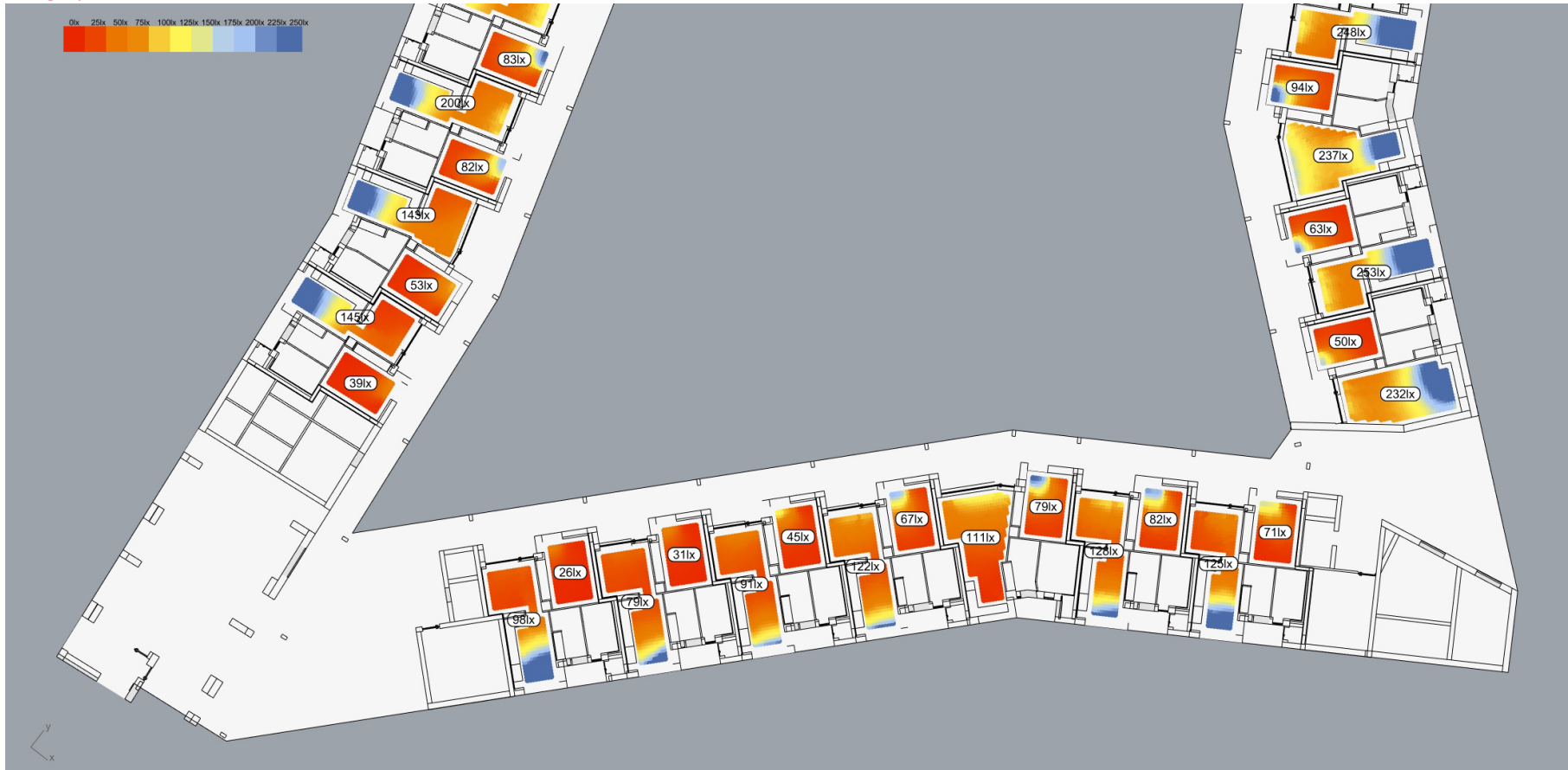


Figure 24: Level 0, Part 1 - Et

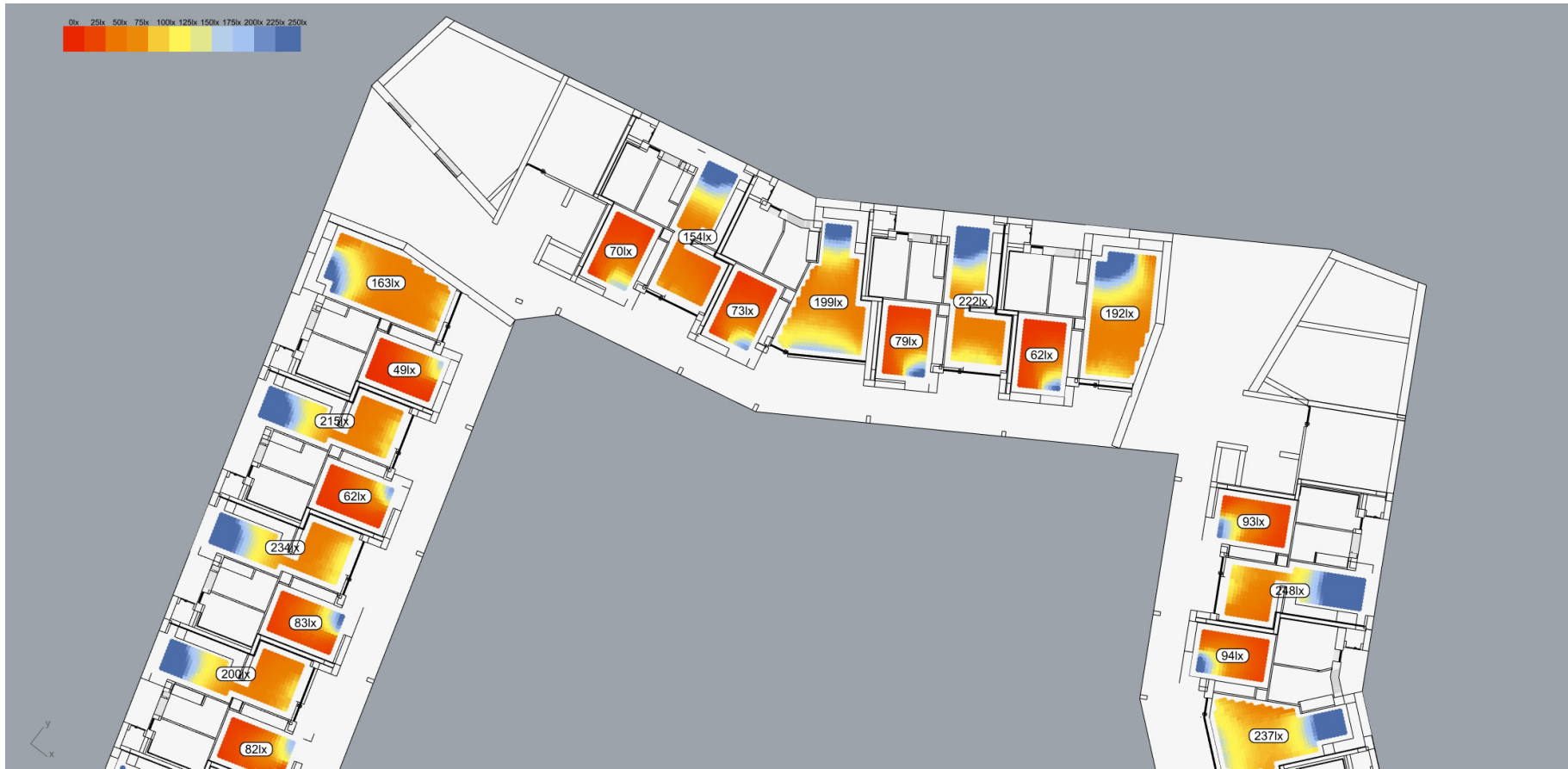


Figure 25: Level 0, Part 2 - Et

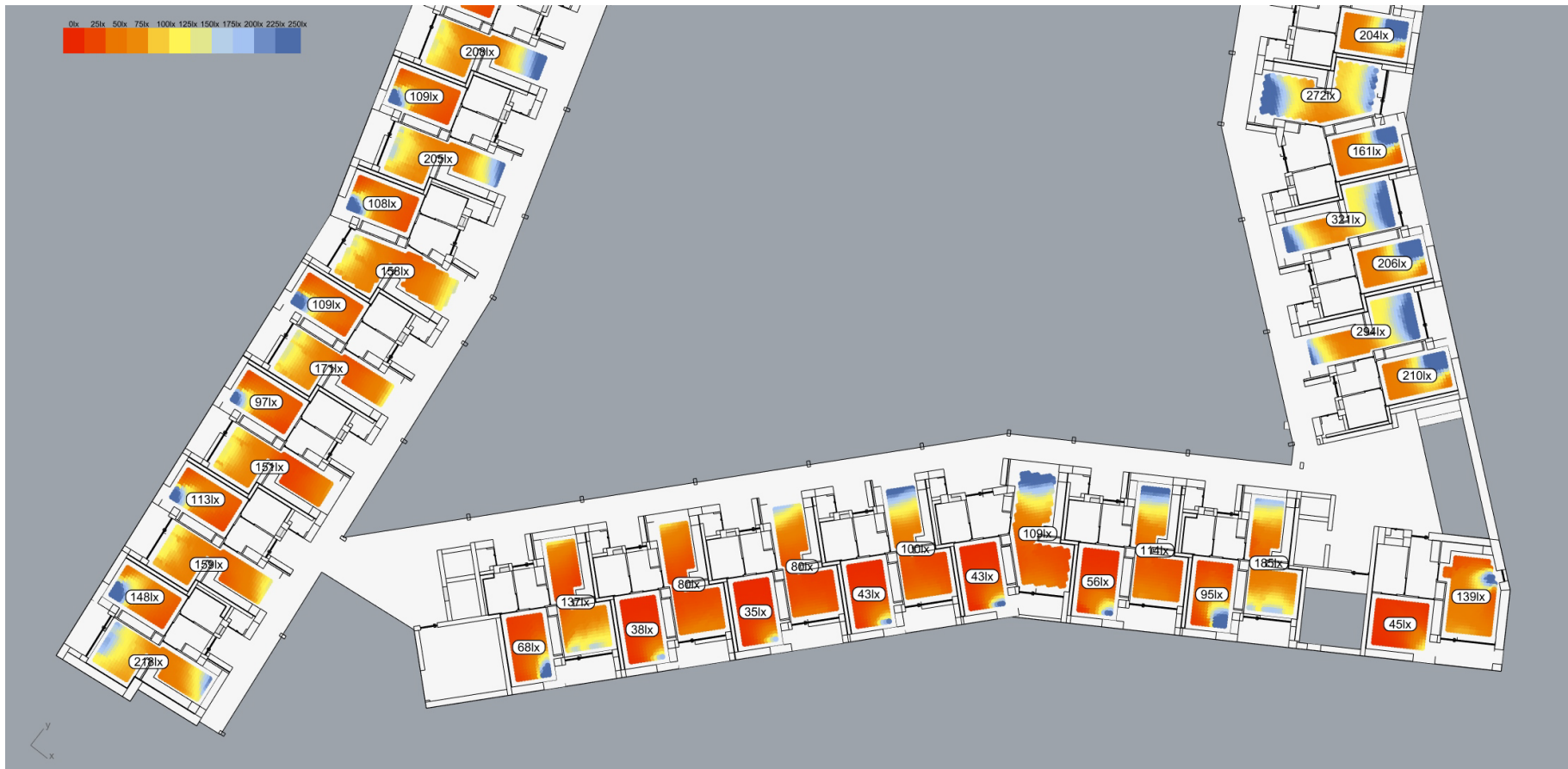


Figure 26: Level 1, Part 1 - Et

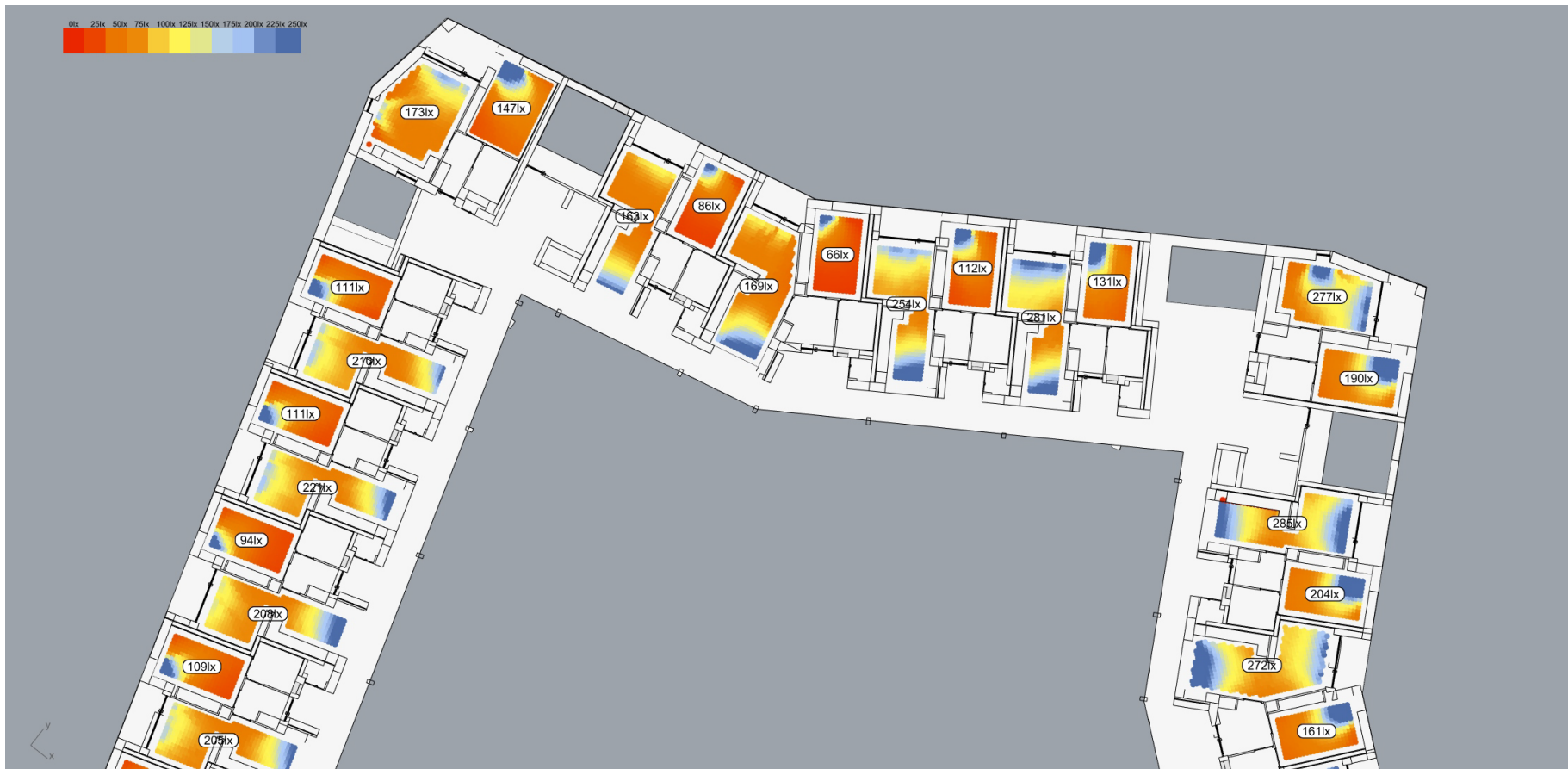


Figure 27: Level 1, Part 2 - Et

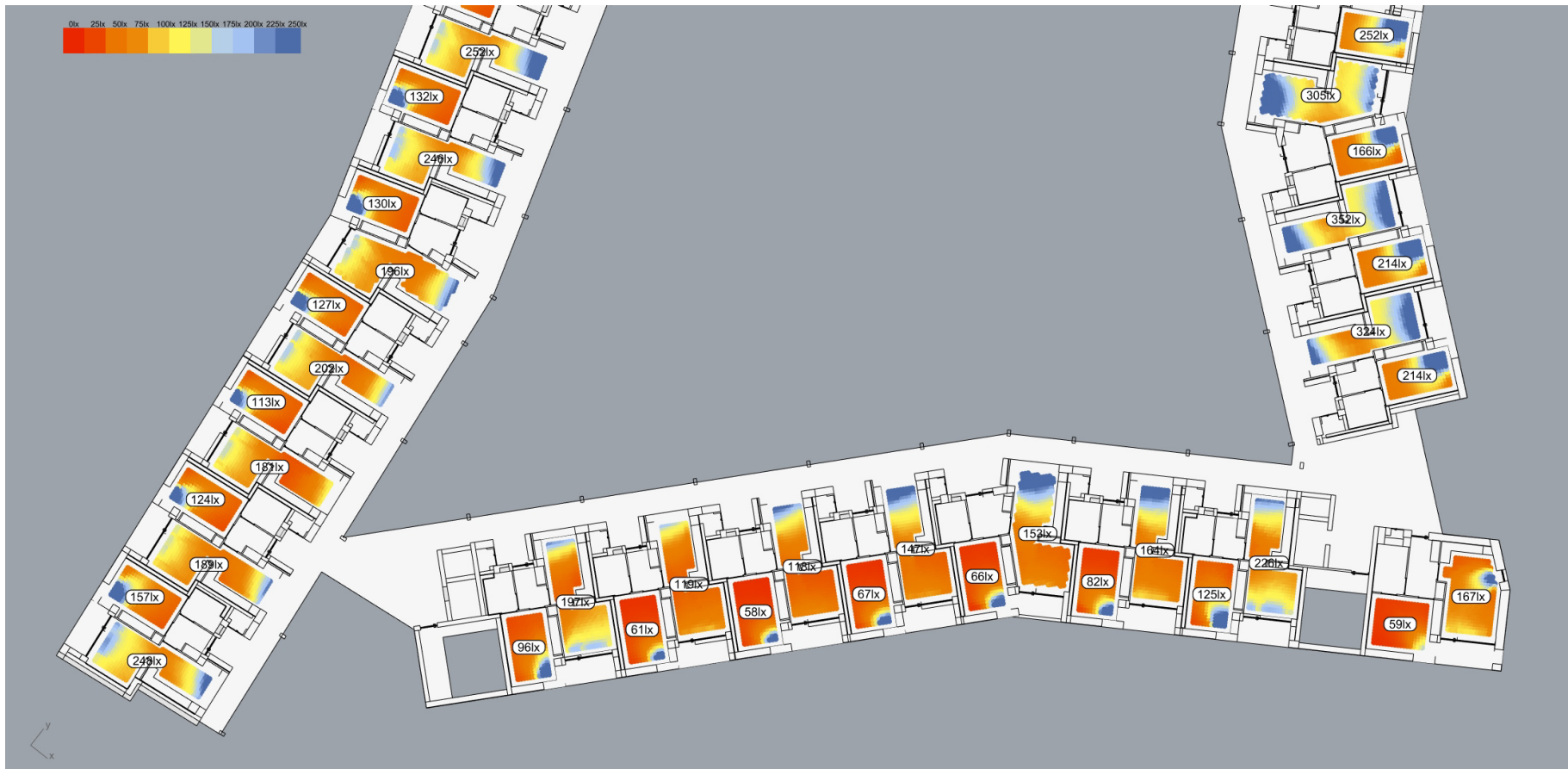


Figure 28: Level 2, Part 1 - Et

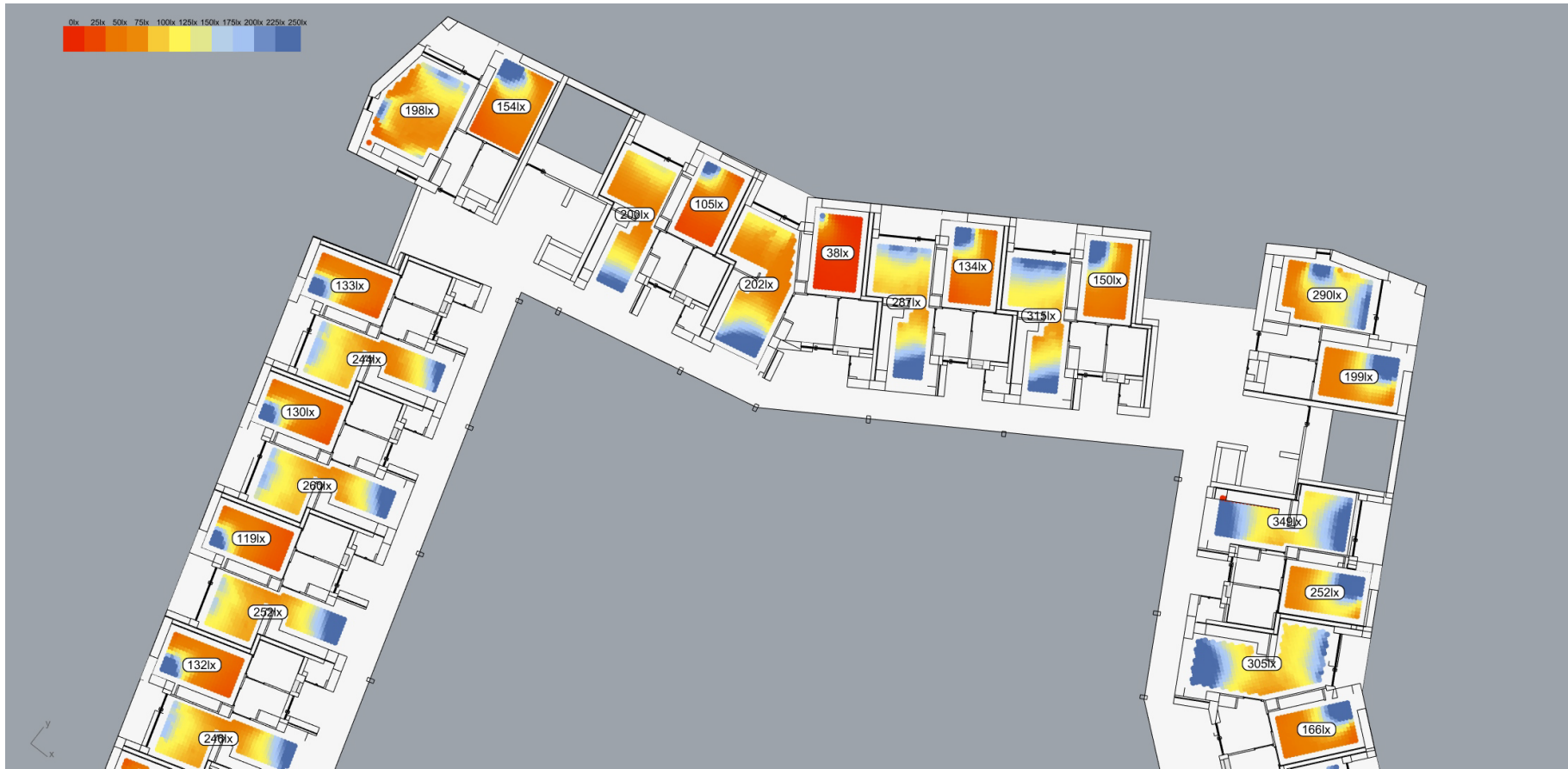


Figure 29: Level 2, Part 2 - Et

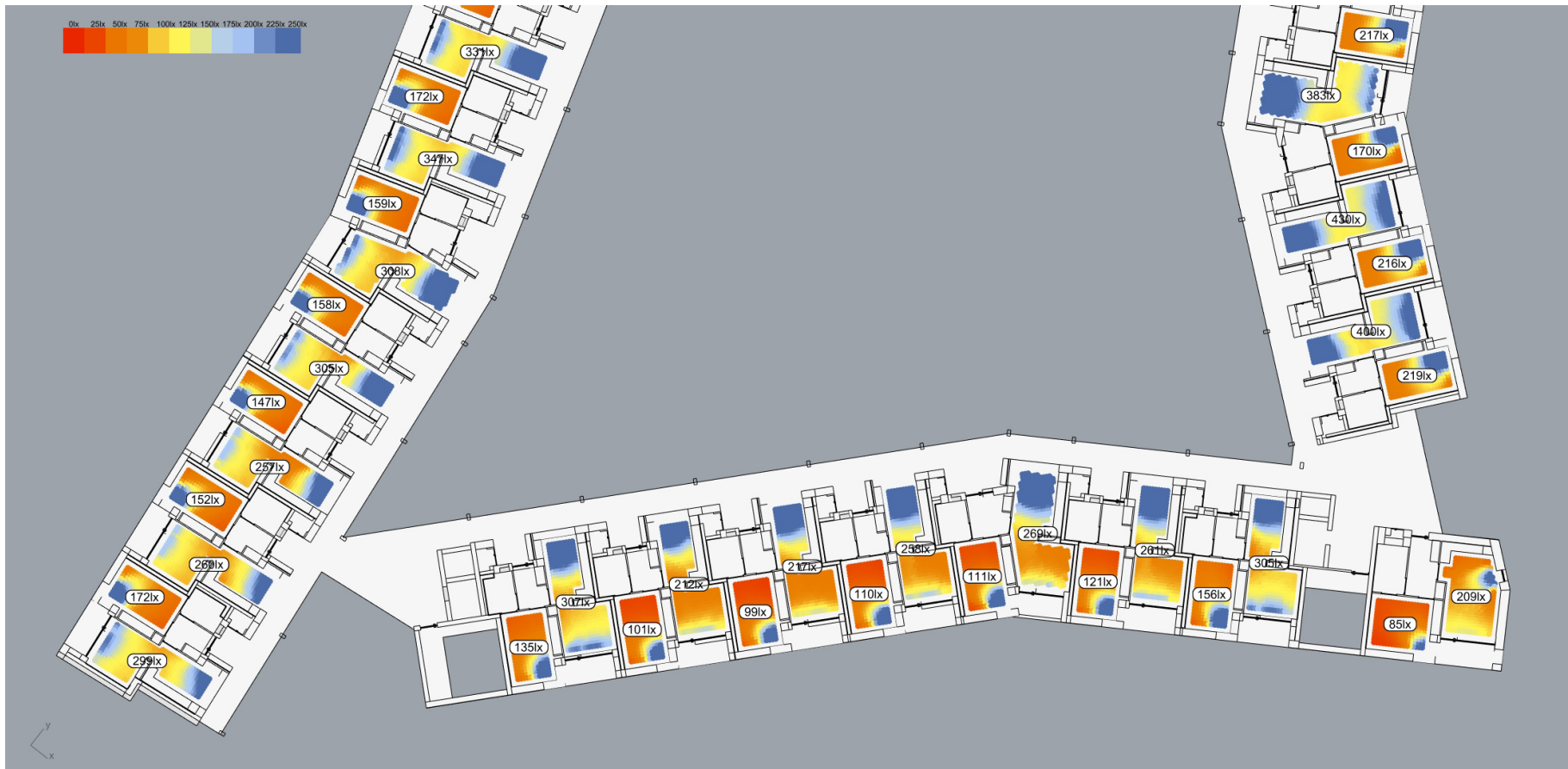


Figure 30: Level 3, Part 1 - Et

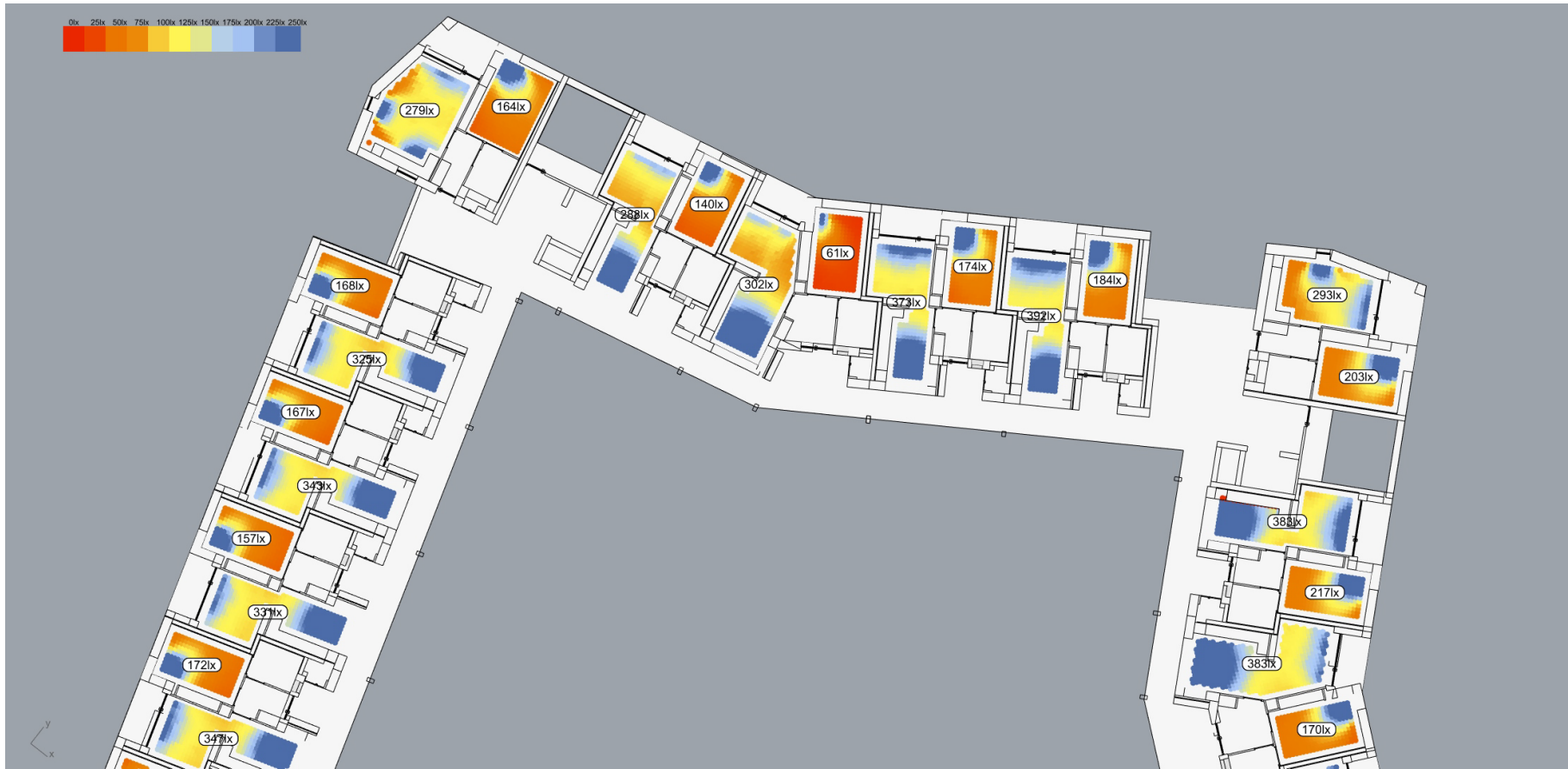


Figure 31: Level 3, Part 2 - Et

Tabulated

Target Illuminance (Et) – Trees Included				
Apartment Reference	Grid Reference	Room Type	Et	Meets Minimum Recommendation?
1	1_BR	Bedroom	39	No
1	1_LKD	LKD	145	No
2	2_BR	Bedroom	53	No
2	2_LKD	LKD	143	No
3	3_BR	Bedroom	82	No
3	3_LKD	LKD	200	Yes
4	4_BR	Bedroom	83	No
4	4_LKD	LKD	234	Yes
5	5_BR	Bedroom	62	No
5	5_LKD	LKD	215	Yes
6	6_BR	Bedroom	49	No
6	6_LKD	LKD	163	No
7	7_BR	Bedroom	70	No
7	7_LKD	LKD	154	No
8	8_BR	Bedroom	73	No
8	8_LKD	LKD	199	No
9	9_BR	Bedroom	79	No
9	9_LKD	LKD	222	Yes
10	10_BR	Bedroom	62	No
10	10_LKD	LKD	192	No
11	11_BR	Bedroom	93	No

Target Illuminance (Et) – Trees Included				
Apartment Reference	Grid Reference	Room Type	Et	Meets Minimum Recommendation?
11	11_LKD	LKD	248	Yes
12	12_BR	Bedroom	94	No
12	12_LKD	LKD	237	Yes
13	13_BR	Bedroom	63	No
13	13_LKD	LKD	253	Yes
14	14_BR	Bedroom	50	No
14	14_LKD	LKD	232	Yes
15	15_BR	Bedroom	71	No
15	15_LKD	LKD	125	No
16	16_BR	Bedroom	82	No
16	16_LKD	LKD	128	No
17	17_BR	Bedroom	79	No
17	17_LKD	LKD	111	No
18	18_BR	Bedroom	67	No
18	18_LKD	LKD	122	No
19	19_BR	Bedroom	45	No
19	19_LKD	LKD	91	No
20	20_BR	Bedroom	31	No
20	20_LKD	LKD	79	No
21	21_BR	Bedroom	26	No
21	21_LKD	LKD	98	No
22	22_BR	Bedroom	148	Yes

Target Illuminance (Et) – Trees Included				
Apartment Reference	Grid Reference	Room Type	Et	Meets Minimum Recommendation?
22	22_LKD	LKD	218	Yes
23	23_BR	Bedroom	113	Yes
23	23_LKD	LKD	159	No
24	24_BR	Bedroom	97	No
24	24_LKD	LKD	151	No
25	25_BR	Bedroom	109	Yes
25	25_LKD	LKD	171	No
26	26_BR	Bedroom	108	Yes
26	26_LKD	LKD	158	No
27	27_BR	Bedroom	109	Yes
27	27_LKD	LKD	205	Yes
28	28_BR	Bedroom	94	No
28	28_LKD	LKD	208	Yes
29	29_BR	Bedroom	111	Yes
29	29_LKD	LKD	221	Yes
30	30_BR	Bedroom	111	Yes
30	30_LKD	LKD	210	Yes
31	31_BR	Bedroom	147	Yes
31	31_LKD	LKD	173	No
32	32_BR	Bedroom	86	No
32	32_LKD	LKD	163	No
33	33_BR	Bedroom	66	No

Target Illuminance (Et) – Trees Included				
Apartment Reference	Grid Reference	Room Type	Et	Meets Minimum Recommendation?
33	33_LKD	LKD	169	No
34	34_BR	Bedroom	112	Yes
34	34_LKD	LKD	254	Yes
35	35_BR	Bedroom	131	Yes
35	35_LKD	LKD	281	Yes
36	36_BR	Bedroom	190	Yes
36	36_LKD	LKD	277	Yes
37	37_BR	Bedroom	204	Yes
37	37_LKD	LKD	285	Yes
38	38_BR	Bedroom	161	Yes
38	38_LKD	LKD	272	Yes
39	39_BR	Bedroom	206	Yes
39	39_LKD	LKD	321	Yes
40	40_BR	Bedroom	210	Yes
40	40_LKD	LKD	294	Yes
41	41_BR	Bedroom	45	No
41	41_LKD	LKD	139	No
42	42_BR	Bedroom	95	No
42	42_LKD	LKD	185	No
43	43_BR	Bedroom	56	No
43	43_LKD	LKD	114	No
44	44_BR	Bedroom	43	No

Target Illuminance (Et) – Trees Included				
Apartment Reference	Grid Reference	Room Type	Et	Meets Minimum Recommendation?
44	44_LKD	LKD	109	No
45	45_BR	Bedroom	43	No
45	45_LKD	LKD	100	No
46	46_BR	Bedroom	35	No
46	46_LKD	LKD	80	No
47	47_BR	Bedroom	38	No
47	47_LKD	LKD	80	No
48	48_BR	Bedroom	68	No
48	48_LKD	LKD	137	No
49	49_BR	Bedroom	157	Yes
49	49_LKD	LKD	248	Yes
50	50_BR	Bedroom	124	Yes
50	50_LKD	LKD	189	No
51	51_BR	Bedroom	113	Yes
51	51_LKD	LKD	181	No
52	52_BR	Bedroom	127	Yes
52	52_LKD	LKD	202	Yes
53	53_BR	Bedroom	130	Yes
53	53_LKD	LKD	196	No
54	54_BR	Bedroom	132	Yes
54	54_LKD	LKD	246	Yes
55	55_BR	Bedroom	119	Yes

Target Illuminance (Et) – Trees Included				
Apartment Reference	Grid Reference	Room Type	Et	Meets Minimum Recommendation?
55	55_LKD	LKD	252	Yes
56	56_BR	Bedroom	130	Yes
56	56_LKD	LKD	260	Yes
57	57_BR	Bedroom	133	Yes
57	57_LKD	LKD	244	Yes
58	58_BR	Bedroom	154	Yes
58	58_LKD	LKD	198	No
59	59_BR	Bedroom	105	Yes
59	59_LKD	LKD	200	Yes
60	60_BR	Bedroom	38	No
60	60_LKD	LKD	202	Yes
61	61_BR	Bedroom	134	Yes
61	61_LKD	LKD	287	Yes
62	62_BR	Bedroom	150	Yes
62	62_LKD	LKD	315	Yes
63	63_BR	Bedroom	199	Yes
63	63_LKD	LKD	290	Yes
64	64_BR	Bedroom	252	Yes
64	64_LKD	LKD	349	Yes
65	65_BR	Bedroom	166	Yes
65	65_LKD	LKD	305	Yes
66	66_BR	Bedroom	214	Yes

Target Illuminance (Et) – Trees Included				
Apartment Reference	Grid Reference	Room Type	Et	Meets Minimum Recommendation?
66	66_LKD	LKD	352	Yes
67	67_BR	Bedroom	214	Yes
67	67_LKD	LKD	324	Yes
68	68_BR	Bedroom	59	No
68	68_LKD	LKD	167	No
69	69_BR	Bedroom	125	Yes
69	69_LKD	LKD	226	Yes
70	70_BR	Bedroom	82	No
70	70_LKD	LKD	164	No
71	71_BR	Bedroom	66	No
71	71_LKD	LKD	153	No
72	72_BR	Bedroom	67	No
72	72_LKD	LKD	147	No
73	73_BR	Bedroom	58	No
73	73_LKD	LKD	118	No
74	74_BR	Bedroom	61	No
74	74_LKD	LKD	119	No
75	75_BR	Bedroom	96	No
75	75_LKD	LKD	197	No
76	76_BR	Bedroom	172	Yes
76	76_LKD	LKD	299	Yes
77	77_BR	Bedroom	152	Yes

Target Illuminance (Et) – Trees Included				
Apartment Reference	Grid Reference	Room Type	Et	Meets Minimum Recommendation?
77	77_LKD	LKD	260	Yes
78	78_BR	Bedroom	147	Yes
78	78_LKD	LKD	257	Yes
79	79_BR	Bedroom	158	Yes
79	79_LKD	LKD	305	Yes
80	80_BR	Bedroom	159	Yes
80	80_LKD	LKD	308	Yes
81	81_BR	Bedroom	172	Yes
81	81_LKD	LKD	347	Yes
82	82_BR	Bedroom	157	Yes
82	82_LKD	LKD	331	Yes
83	83_BR	Bedroom	167	Yes
83	83_LKD	LKD	343	Yes
84	84_BR	Bedroom	168	Yes
84	84_LKD	LKD	325	Yes
85	85_BR	Bedroom	164	Yes
85	85_LKD	LKD	279	Yes
86	86_BR	Bedroom	140	Yes
86	86_LKD	LKD	288	Yes
87	87_BR	Bedroom	61	No
87	87_LKD	LKD	302	Yes
88	88_BR	Bedroom	174	Yes

Target Illuminance (Et) – Trees Included				
Apartment Reference	Grid Reference	Room Type	Et	Meets Minimum Recommendation?
88	88_LKD	LKD	373	Yes
89	89_BR	Bedroom	184	Yes
89	89_LKD	LKD	392	Yes
90	90_BR	Bedroom	203	Yes
90	90_LKD	LKD	293	Yes
91	91_BR	Bedroom	217	Yes
91	91_LKD	LKD	383	Yes
92	92_BR	Bedroom	170	Yes
92	92_LKD	LKD	383	Yes
93	93_BR	Bedroom	216	Yes
93	93_LKD	LKD	430	Yes
94	94_BR	Bedroom	219	Yes
94	94_LKD	LKD	400	Yes
95	95_BR	Bedroom	85	No
95	95_LKD	LKD	209	Yes
96	96_BR	Bedroom	156	Yes
96	96_LKD	LKD	305	Yes
97	97_BR	Bedroom	121	Yes
97	97_LKD	LKD	261	Yes
98	98_BR	Bedroom	111	Yes
98	98_LKD	LKD	269	Yes
99	99_BR	Bedroom	110	Yes

Target Illuminance (Et) – Trees Included				
Apartment Reference	Grid Reference	Room Type	Et	Meets Minimum Recommendation?
99	99_LKD	LKD	258	Yes
100	100_BR	Bedroom	99	No
100	100_LKD	LKD	217	Yes
101	101_BR	Bedroom	101	Yes
101	101_LKD	LKD	212	Yes
102	102_BR	Bedroom	135	Yes
102	102_LKD	LKD	307	Yes

A.1.2.2 Exposure to Sunlight (EtS)

A.1.2.2.1 Excluding Trees

Imagery

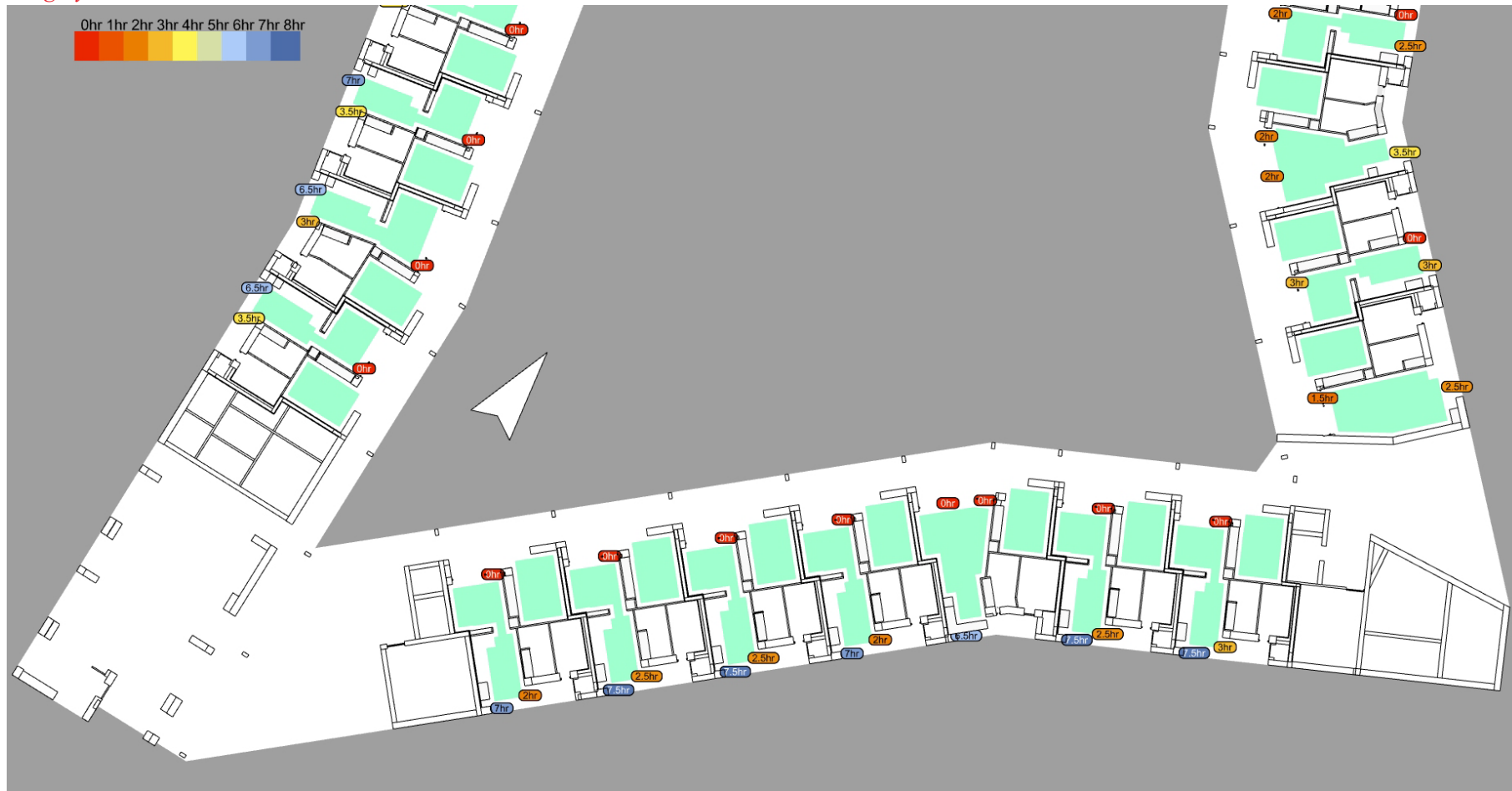


Figure 32: Level 0, Part 1 - EtS



Figure 33: Level 0, Part 2 - EtS

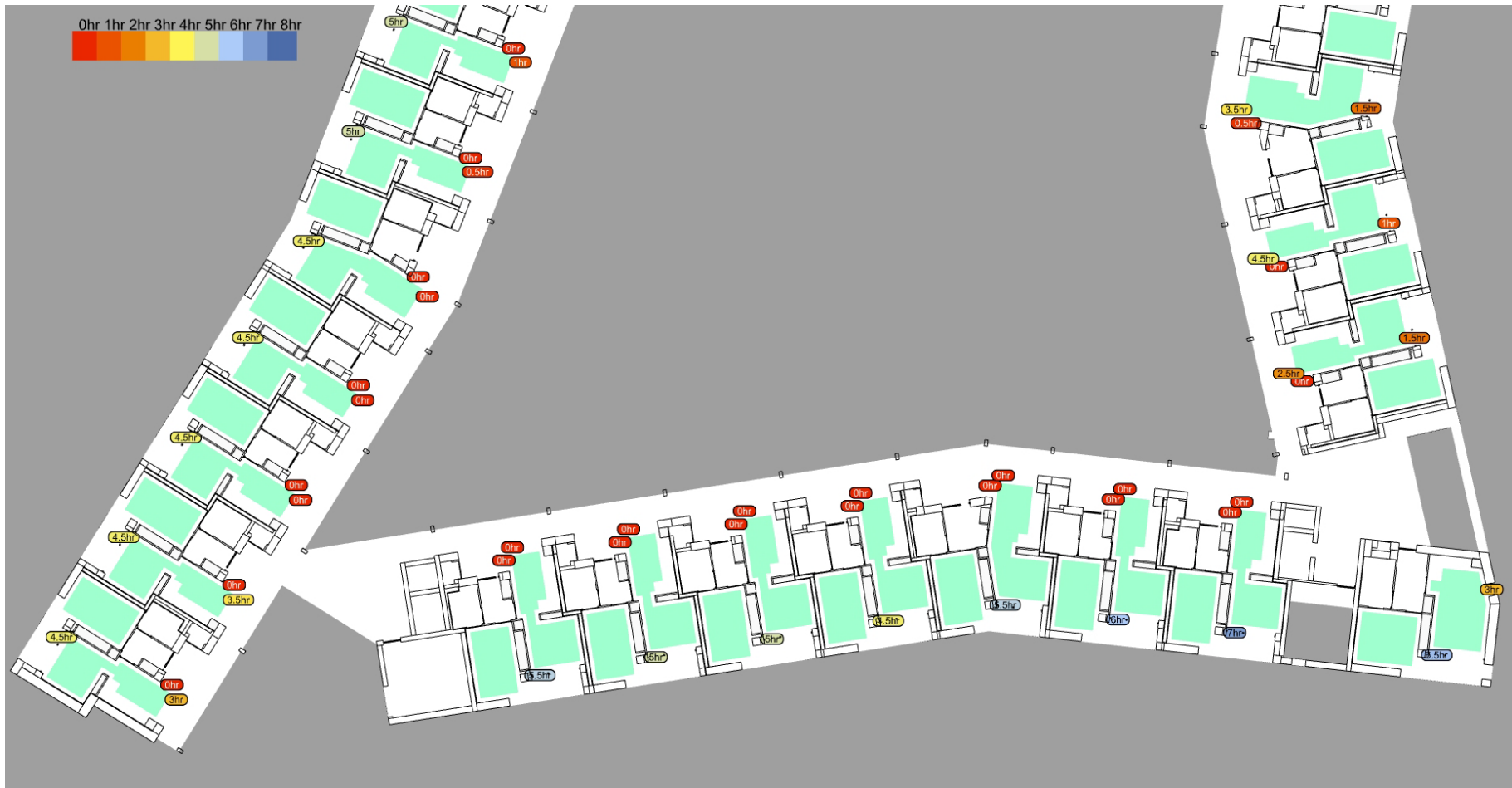


Figure 34: Level 1, Part 1 - EtS



Figure 35: Level 1, Part 2 - EtS

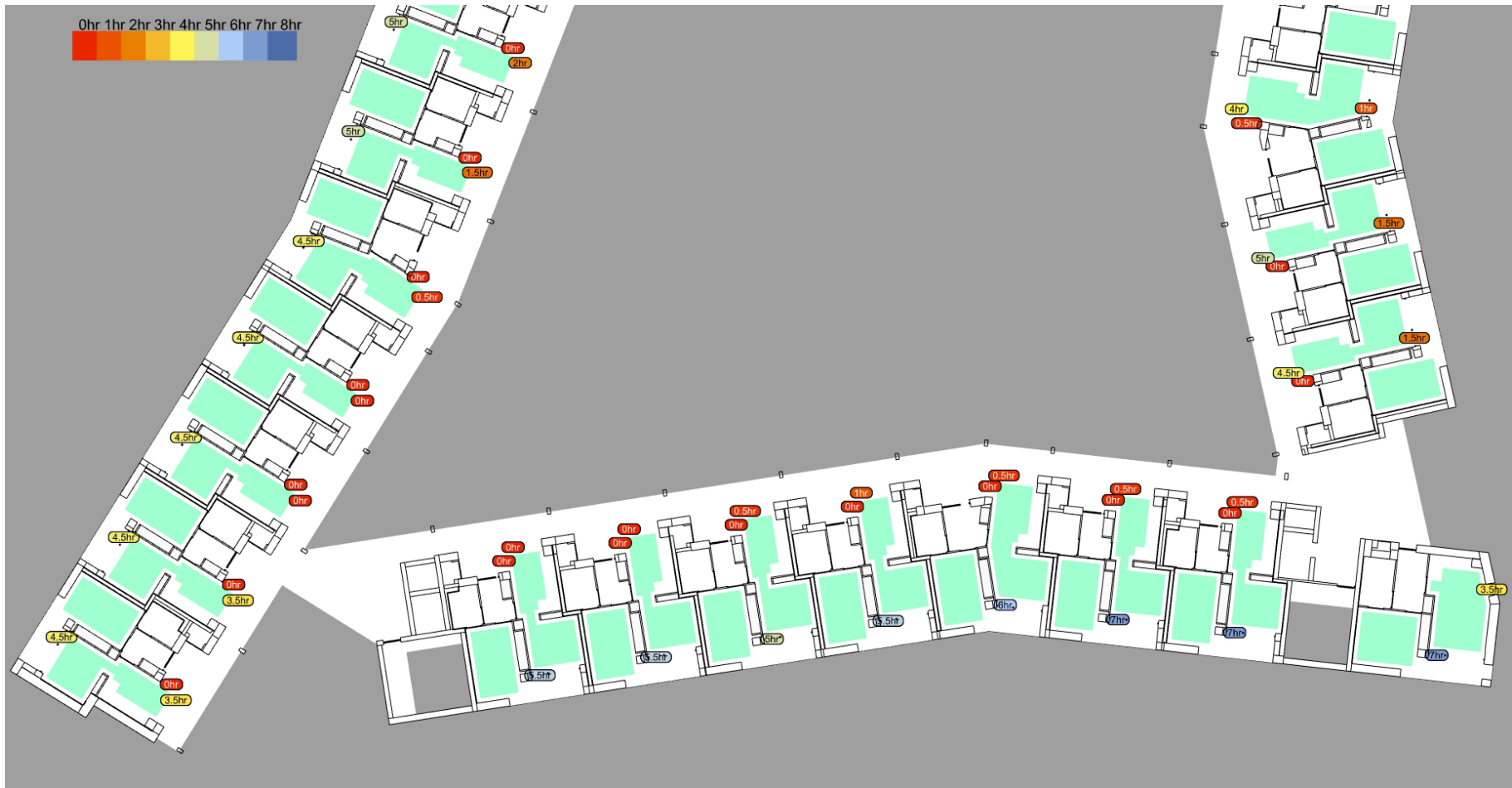


Figure 36: Level 2, Part 1 - EtS



Figure 37: Level 2, Part 2 - EtS

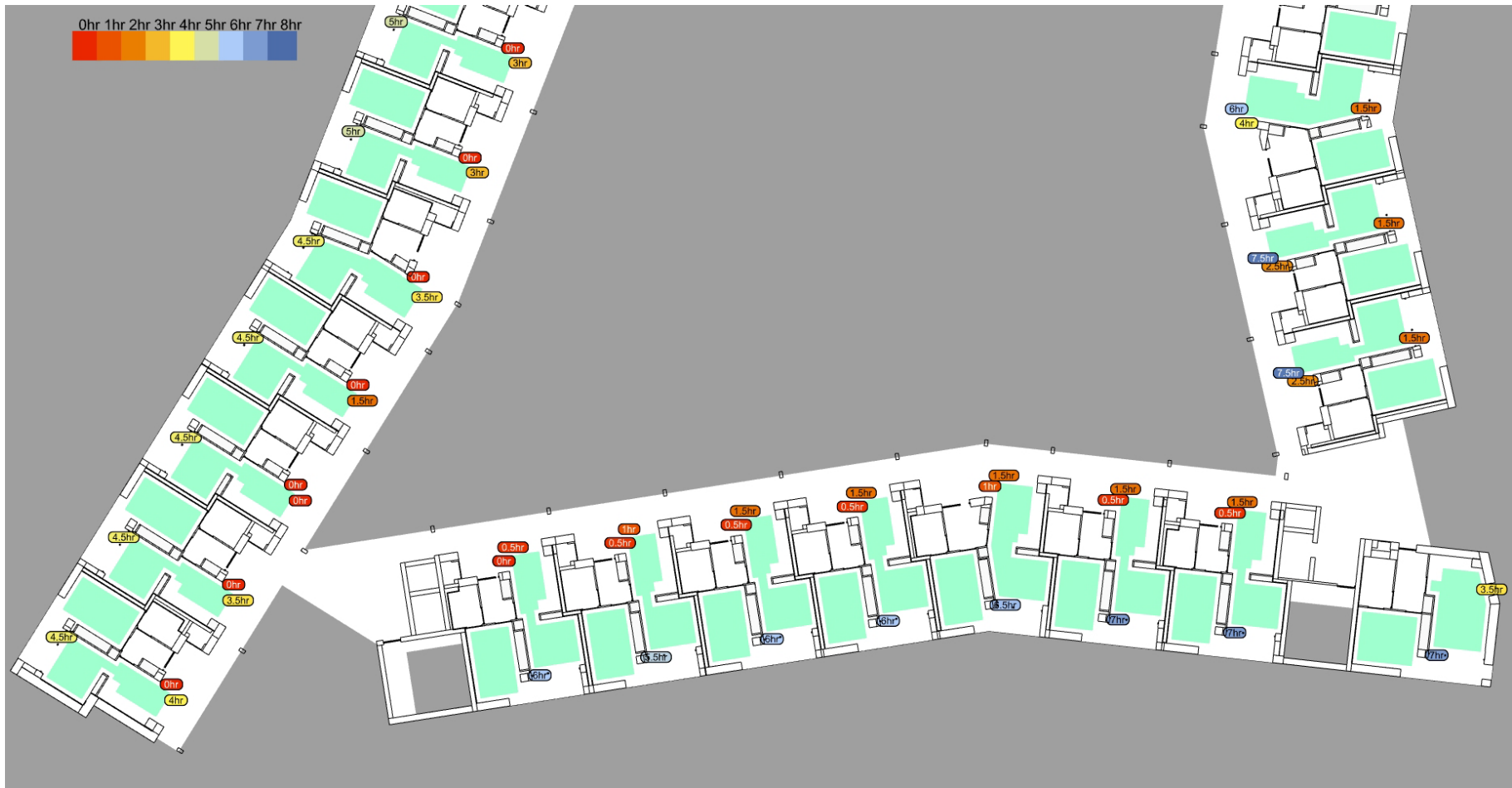


Figure 38: Level 3, Part 1 - EtS



Figure 39: Level 3, Part 2 - EtS

Tabulated

The table below presents results for EtS on main living room windows in each apartment. The apartment reference number in the left column can be cross referenced with the graphics given above to determine where specific results are experienced. The column on the right sets out if minimum recommendations are met or not. Full details of the metric and minimum recommendations are given in the metrics section previously outlined in the body of the report.

Exposure to Sunlight (EtS) – Trees Excluded

Apartment	Total Cumulative Sunlight Hours	Meets Minimum Recommendation?
1	10	Meets Minimum Recommendation
2	9.5	Meets Minimum Recommendation
3	11	Meets Minimum Recommendation
4	11	Meets Minimum Recommendation
5	11	Meets Minimum Recommendation
6	8	Meets Minimum Recommendation
7	1.5	Meets Minimum Recommendation
8	3.5	Meets Minimum Recommendation
9	4.5	Meets Minimum Recommendation
10	2.5	Meets Minimum Recommendation
11	4.5	Meets Minimum Recommendation
12	7	Meets Minimum Recommendation
13	5.5	Meets Minimum Recommendation
14	4	Meets Minimum Recommendation
15	11	Meets Minimum Recommendation
16	10	Meets Minimum Recommendation
17	6.5	Meets Minimum Recommendation
18	9	Meets Minimum Recommendation
19	10	Meets Minimum Recommendation
20	10	Meets Minimum Recommendation
21	9	Meets Minimum Recommendation
22	7.5	Meets Minimum Recommendation
23	8	Meets Minimum Recommendation

Exposure to Sunlight (EtS) – Trees Excluded

Apartment	Total Cumulative Sunlight Hours	Meets Minimum Recommendation?
24	5	Meets Minimum Recommendation
25	4.5	Meets Minimum Recommendation
26	4.5	Meets Minimum Recommendation
27	5.5	Meets Minimum Recommendation
28	6	Meets Minimum Recommendation
29	6.5	Meets Minimum Recommendation
30	7	Meets Minimum Recommendation
31	12	Meets Minimum Recommendation
32	5	Meets Minimum Recommendation
33	7	Meets Minimum Recommendation
34	5.5	Meets Minimum Recommendation
35	4	Meets Minimum Recommendation
36	5	Meets Minimum Recommendation
37	6.5	Meets Minimum Recommendation
38	5	Meets Minimum Recommendation
39	5.5	Meets Minimum Recommendation
40	4	Meets Minimum Recommendation
41	9.5	Meets Minimum Recommendation
42	7	Meets Minimum Recommendation
43	6	Meets Minimum Recommendation
44	5.5	Meets Minimum Recommendation
45	4.5	Meets Minimum Recommendation
46	5	Meets Minimum Recommendation

Exposure to Sunlight (EtS) – Trees Excluded

Apartment	Total Cumulative Sunlight Hours	Meets Minimum Recommendation?
47	5	Meets Minimum Recommendation
48	5.5	Meets Minimum Recommendation
49	8	Meets Minimum Recommendation
50	8	Meets Minimum Recommendation
51	5	Meets Minimum Recommendation
52	4.5	Meets Minimum Recommendation
53	5	Meets Minimum Recommendation
54	6.5	Meets Minimum Recommendation
55	7	Meets Minimum Recommendation
56	7	Meets Minimum Recommendation
57	7.5	Meets Minimum Recommendation
58	12	Meets Minimum Recommendation
59	6	Meets Minimum Recommendation
60	7	Meets Minimum Recommendation
61	6	Meets Minimum Recommendation
62	4	Meets Minimum Recommendation
63	5	Meets Minimum Recommendation
64	6.5	Meets Minimum Recommendation
65	5	Meets Minimum Recommendation
66	6.5	Meets Minimum Recommendation
67	6	Meets Minimum Recommendation
68	11	Meets Minimum Recommendation
69	7.5	Meets Minimum Recommendation

Exposure to Sunlight (EtS) – Trees Excluded

Apartment	Total Cumulative Sunlight Hours	Meets Minimum Recommendation?
70	7.5	Meets Minimum Recommendation
71	6.5	Meets Minimum Recommendation
72	6	Meets Minimum Recommendation
73	5	Meets Minimum Recommendation
74	5.5	Meets Minimum Recommendation
75	5.5	Meets Minimum Recommendation
76	8.5	Meets Minimum Recommendation
77	8	Meets Minimum Recommendation
78	4.5	Meets Minimum Recommendation
79	6	Meets Minimum Recommendation
80	8	Meets Minimum Recommendation
81	8	Meets Minimum Recommendation
82	8	Meets Minimum Recommendation
83	8.5	Meets Minimum Recommendation
84	8.5	Meets Minimum Recommendation
85	16	Meets Minimum Recommendation
86	11	Meets Minimum Recommendation
87	13	Meets Minimum Recommendation
88	11	Meets Minimum Recommendation
89	9	Meets Minimum Recommendation
90	5	Meets Minimum Recommendation
91	11	Meets Minimum Recommendation
92	12	Meets Minimum Recommendation

Exposure to Sunlight (EtS) – Trees Excluded		
Apartment	Total Cumulative Sunlight Hours	Meets Minimum Recommendation?
93	12	Meets Minimum Recommendation
94	12	Meets Minimum Recommendation
95	11	Meets Minimum Recommendation
96	9	Meets Minimum Recommendation
97	9	Meets Minimum Recommendation
98	9	Meets Minimum Recommendation
99	8	Meets Minimum Recommendation
100	8	Meets Minimum Recommendation
101	7	Meets Minimum Recommendation
102	6.5	Meets Minimum Recommendation

A.1.2.2.2 Including Trees

Imagery

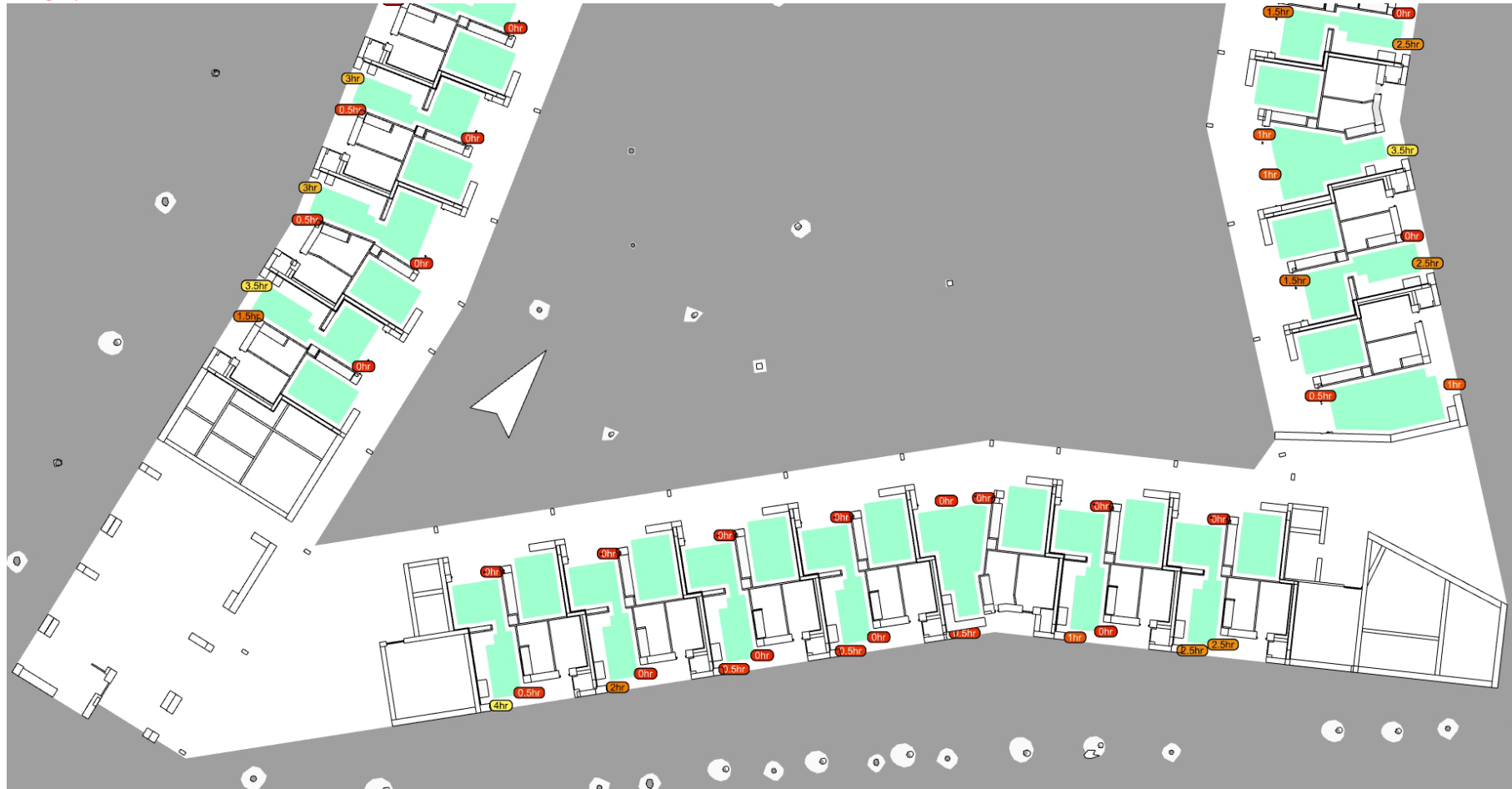


Figure 40: Level 0, Part 1 - EtS



Figure 41: Level 0, Part 2 - EtS

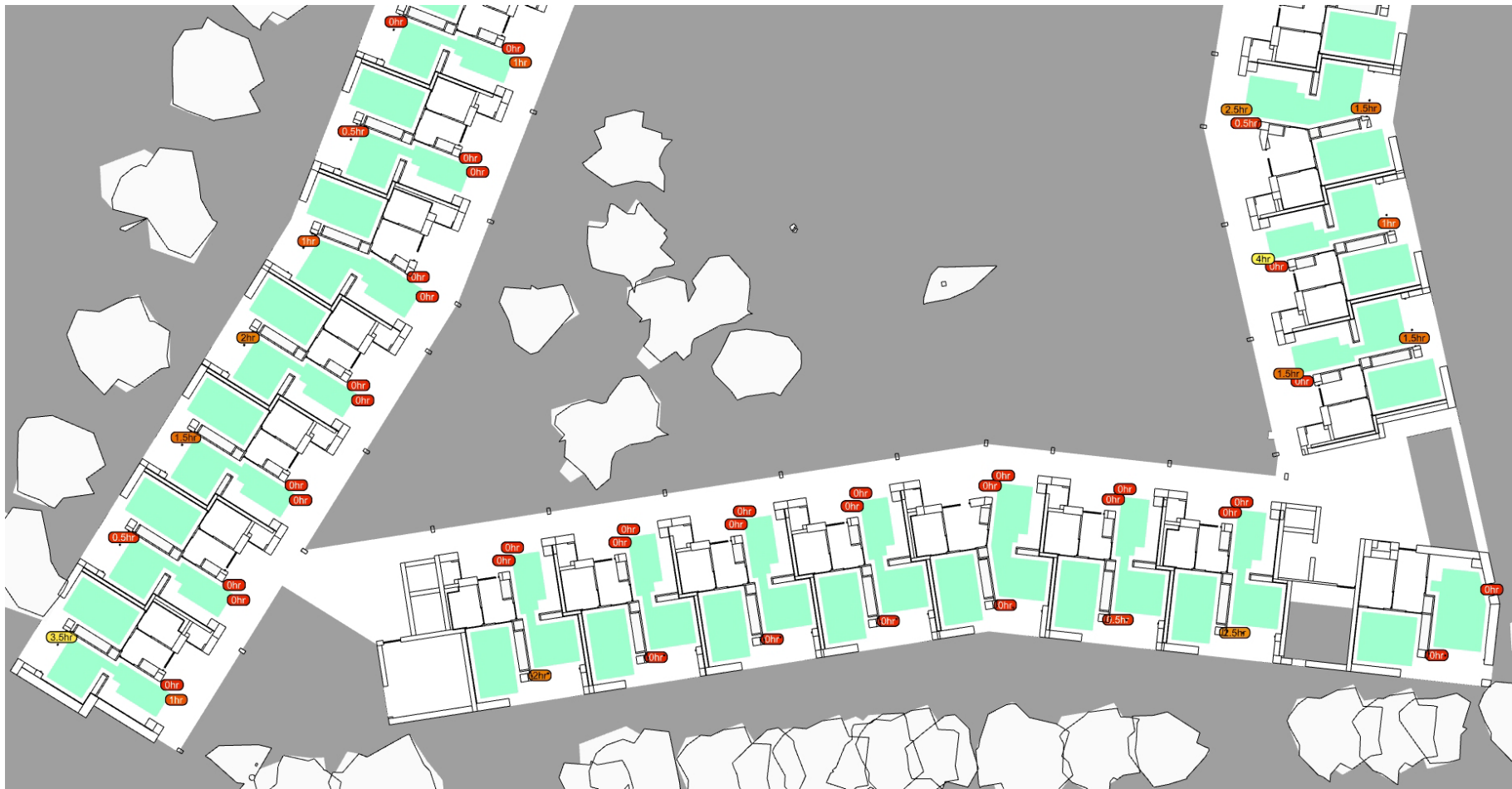


Figure 42: Level 1, Part 1 - EtS



Figure 43: Level 1, Part 2 - EtS

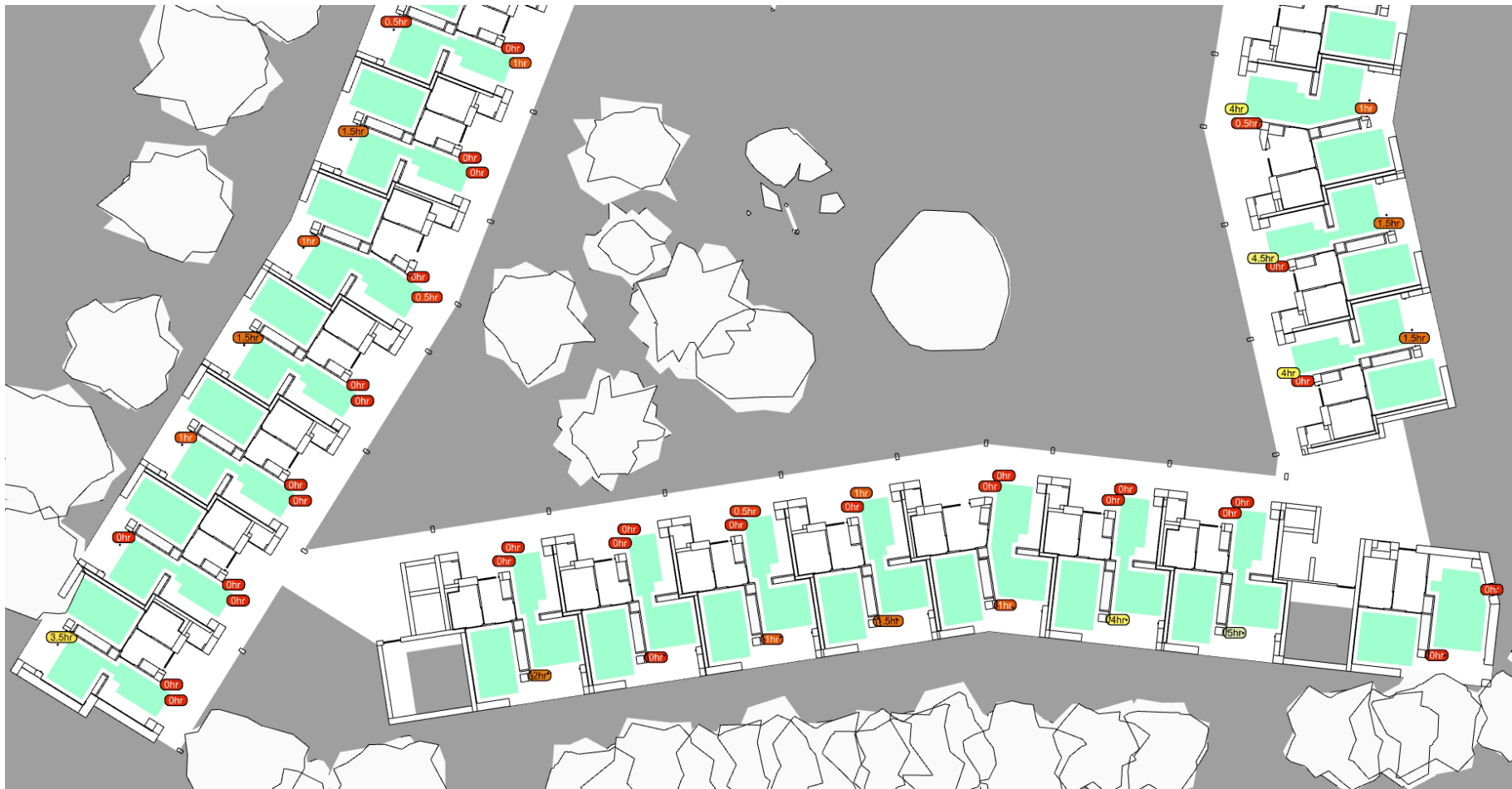


Figure 44: Level 2, Part 1 - EtS



Figure 45: Level 2, Part 2 - EtS

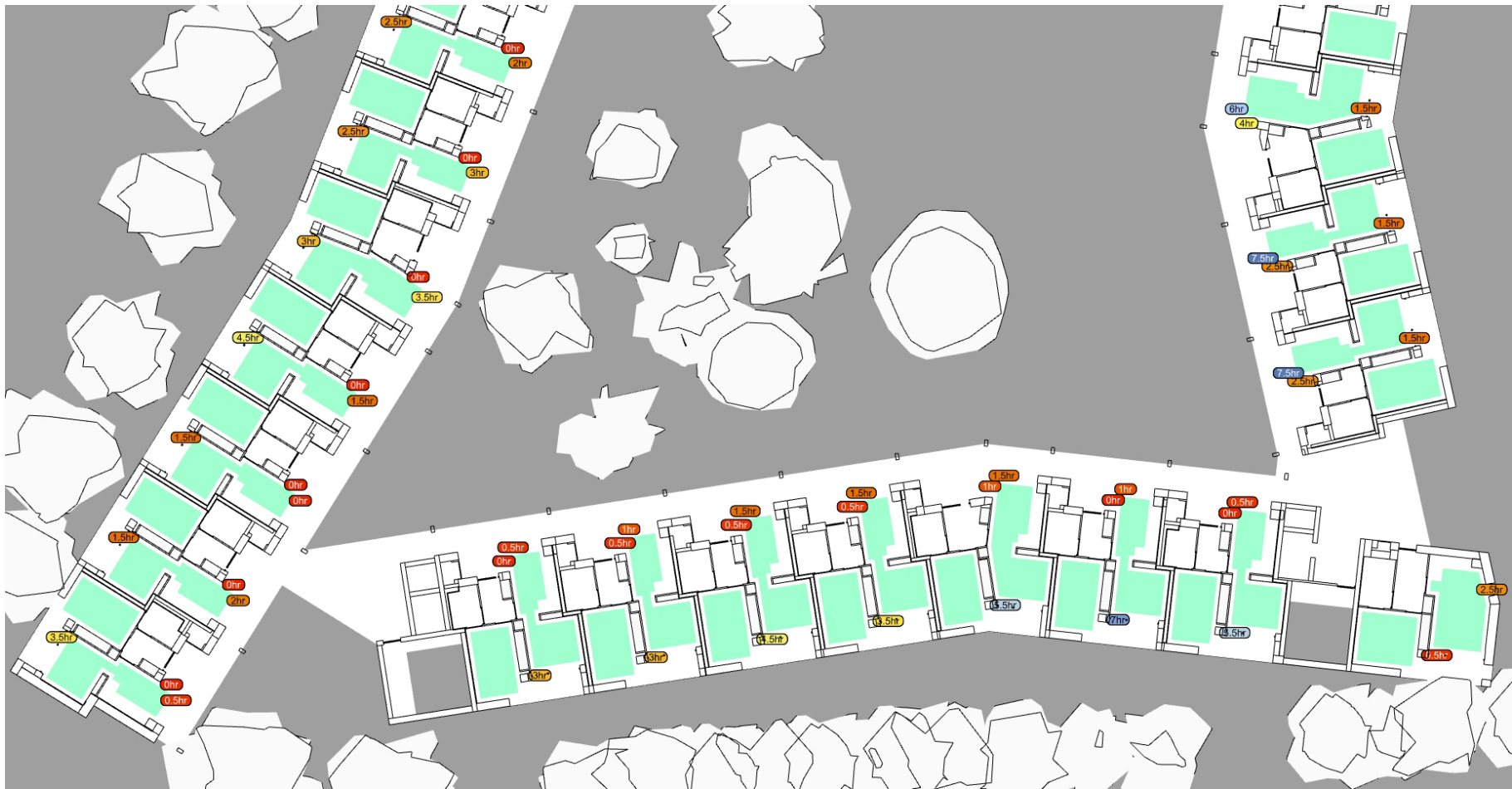


Figure 46: Level 3, Part 1 - EtS



Figure 47: Level 3, Part 2 - EtS

Tabulated

Exposure to Sunlight (EtS) – Trees Included		
Apartment	Total Cumulative Sunlight Hours	Meets Minimum Recommendation?
1	5	Meets Minimum Recommendation
2	3.5	Meets Minimum Recommendation
3	3.5	Meets Minimum Recommendation
4	3	Meets Minimum Recommendation
5	3.5	Meets Minimum Recommendation
6	3	Meets Minimum Recommendation
7	2	Meets Minimum Recommendation
8	3	Meets Minimum Recommendation
9	3	Meets Minimum Recommendation
10	1.5	Meets Minimum Recommendation
11	4	Meets Minimum Recommendation
12	5.5	Meets Minimum Recommendation
13	4	Meets Minimum Recommendation
14	1.5	Meets Minimum Recommendation
15	5	Meets Minimum Recommendation
16	1	Does Not Meet Minimum Recommendation
17	0.5	Does Not Meet Minimum Recommendation
18	0.5	Does Not Meet Minimum Recommendation
19	0.5	Does Not Meet Minimum Recommendation
20	2	Meets Minimum Recommendation
21	4.5	Meets Minimum Recommendation
22	4.5	Meets Minimum Recommendation
23	0.5	Does Not Meet Minimum Recommendation

Exposure to Sunlight (EtS) – Trees Included		
Apartment	Total Cumulative Sunlight Hours	Meets Minimum Recommendation?
24	1.5	Meets Minimum Recommendation
25	2	Meets Minimum Recommendation
26	1	Does Not Meet Minimum Recommendation
27	0.5	Does Not Meet Minimum Recommendation
28	1	Does Not Meet Minimum Recommendation
29	1	Does Not Meet Minimum Recommendation
30	2	Meets Minimum Recommendation
31	3.5	Meets Minimum Recommendation
32	3.5	Meets Minimum Recommendation
33	6	Meets Minimum Recommendation
34	5.5	Meets Minimum Recommendation
35	3.5	Meets Minimum Recommendation
36	4	Meets Minimum Recommendation
37	7	Meets Minimum Recommendation
38	4.5	Meets Minimum Recommendation
39	5	Meets Minimum Recommendation
40	3	Meets Minimum Recommendation
41	0	Does Not Meet Minimum Recommendation
42	2.5	Meets Minimum Recommendation
43	0.5	Does Not Meet Minimum Recommendation
44	0	Does Not Meet Minimum Recommendation
45	0	Does Not Meet Minimum Recommendation
46	0	Does Not Meet Minimum Recommendation

Exposure to Sunlight (EtS) – Trees Included

Apartment	Total Cumulative Sunlight Hours	Meets Minimum Recommendation?
47	0	Does Not Meet Minimum Recommendation
48	2	Meets Minimum Recommendation
49	3.5	Meets Minimum Recommendation
50	0	Does Not Meet Minimum Recommendation
51	1	Does Not Meet Minimum Recommendation
52	1.5	Meets Minimum Recommendation
53	1.5	Meets Minimum Recommendation
54	1.5	Meets Minimum Recommendation
55	1.5	Meets Minimum Recommendation
56	3	Meets Minimum Recommendation
57	3	Meets Minimum Recommendation
58	7	Meets Minimum Recommendation
59	5	Meets Minimum Recommendation
60	7.5	Meets Minimum Recommendation
61	5.5	Meets Minimum Recommendation
62	3.5	Meets Minimum Recommendation
63	4	Meets Minimum Recommendation
64	7	Meets Minimum Recommendation
65	5.5	Meets Minimum Recommendation
66	6	Meets Minimum Recommendation
67	5.5	Meets Minimum Recommendation
68	0	Does Not Meet Minimum Recommendation
69	5	Meets Minimum Recommendation

Exposure to Sunlight (EtS) – Trees Included		
Apartment	Total Cumulative Sunlight Hours	Meets Minimum Recommendation?
70	4	Meets Minimum Recommendation
71	1	Does Not Meet Minimum Recommendation
72	2.5	Meets Minimum Recommendation
73	1.5	Meets Minimum Recommendation
74	0	Does Not Meet Minimum Recommendation
75	2	Meets Minimum Recommendation
76	4	Meets Minimum Recommendation
77	3.5	Meets Minimum Recommendation
78	1.5	Meets Minimum Recommendation
79	6	Meets Minimum Recommendation
80	6.5	Meets Minimum Recommendation
81	5.5	Meets Minimum Recommendation
82	4.5	Meets Minimum Recommendation
83	5	Meets Minimum Recommendation
84	6	Meets Minimum Recommendation
85	13	Meets Minimum Recommendation
86	11	Meets Minimum Recommendation
87	12.5	Meets Minimum Recommendation
88	10	Meets Minimum Recommendation
89	8.5	Meets Minimum Recommendation
90	5	Meets Minimum Recommendation
91	11	Meets Minimum Recommendation
92	11.5	Meets Minimum Recommendation

Exposure to Sunlight (EtS) – Trees Included		
Apartment	Total Cumulative Sunlight Hours	Meets Minimum Recommendation?
93	11.5	Meets Minimum Recommendation
94	11.5	Meets Minimum Recommendation
95	3	Meets Minimum Recommendation
96	6	Meets Minimum Recommendation
97	8	Meets Minimum Recommendation
98	8	Meets Minimum Recommendation
99	5.5	Meets Minimum Recommendation
100	6.5	Meets Minimum Recommendation
101	4.5	Meets Minimum Recommendation
102	3.5	Meets Minimum Recommendation

A.1.3 Quality of View Results

Note: the reference grids for View are identical to the grids used for target illuminance. The images below present results for points within the space with a view of the landscape or sky layer.

Imagery

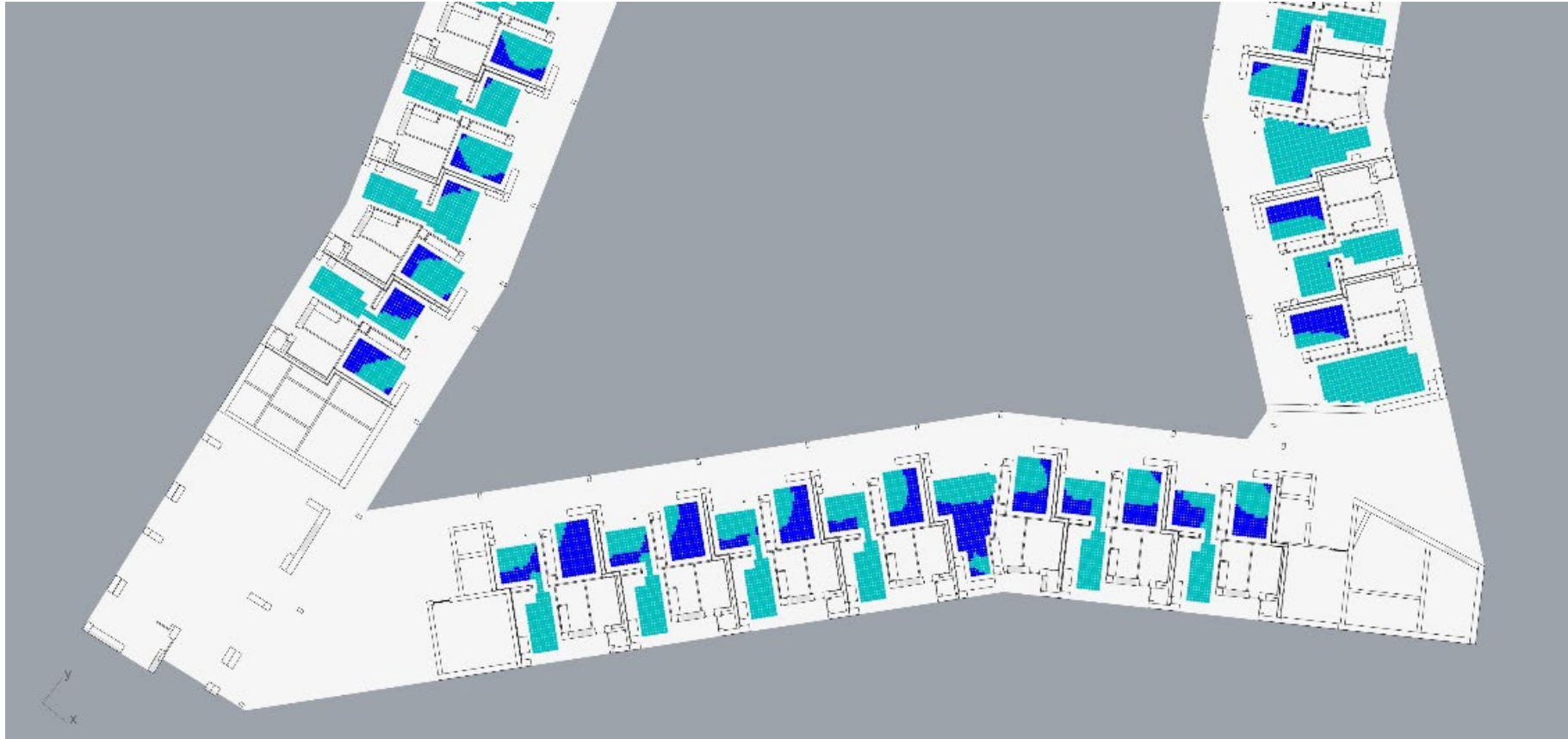


Figure 48: Level 0, Part 1 - View

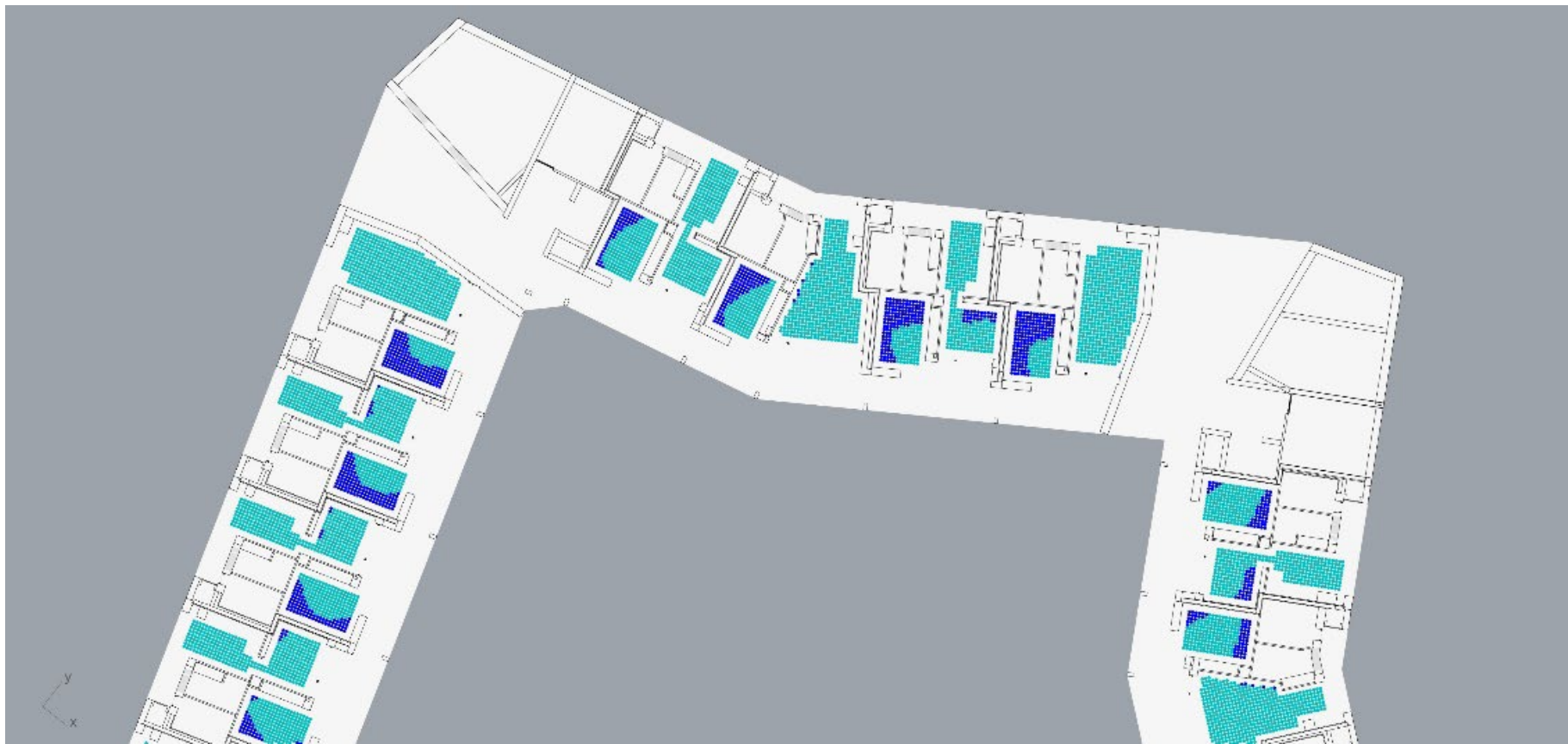


Figure 49: Level 0, Part 2 - View

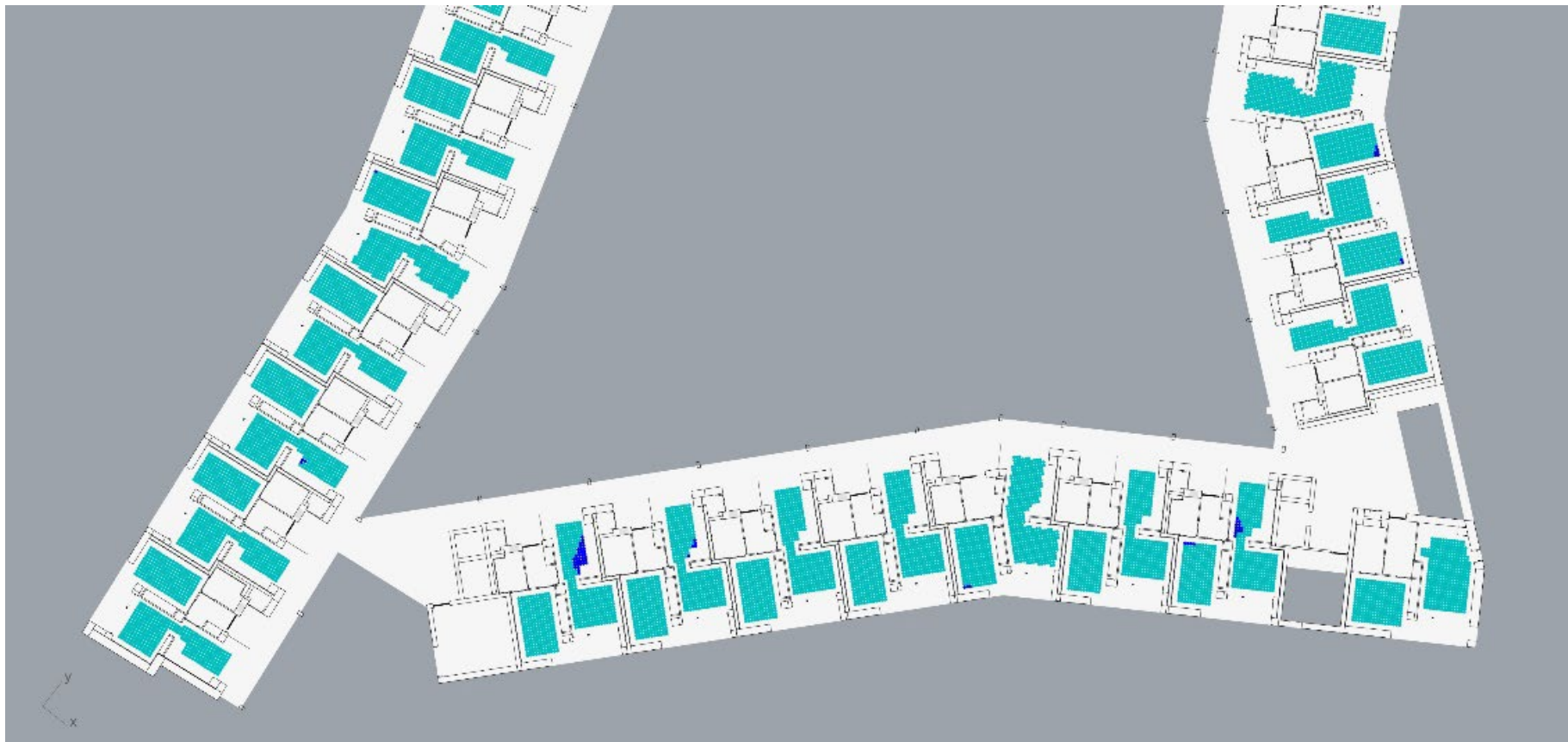


Figure 50: Level 1, Part 1 - View



Figure 51: Level 1, Part 2 - View

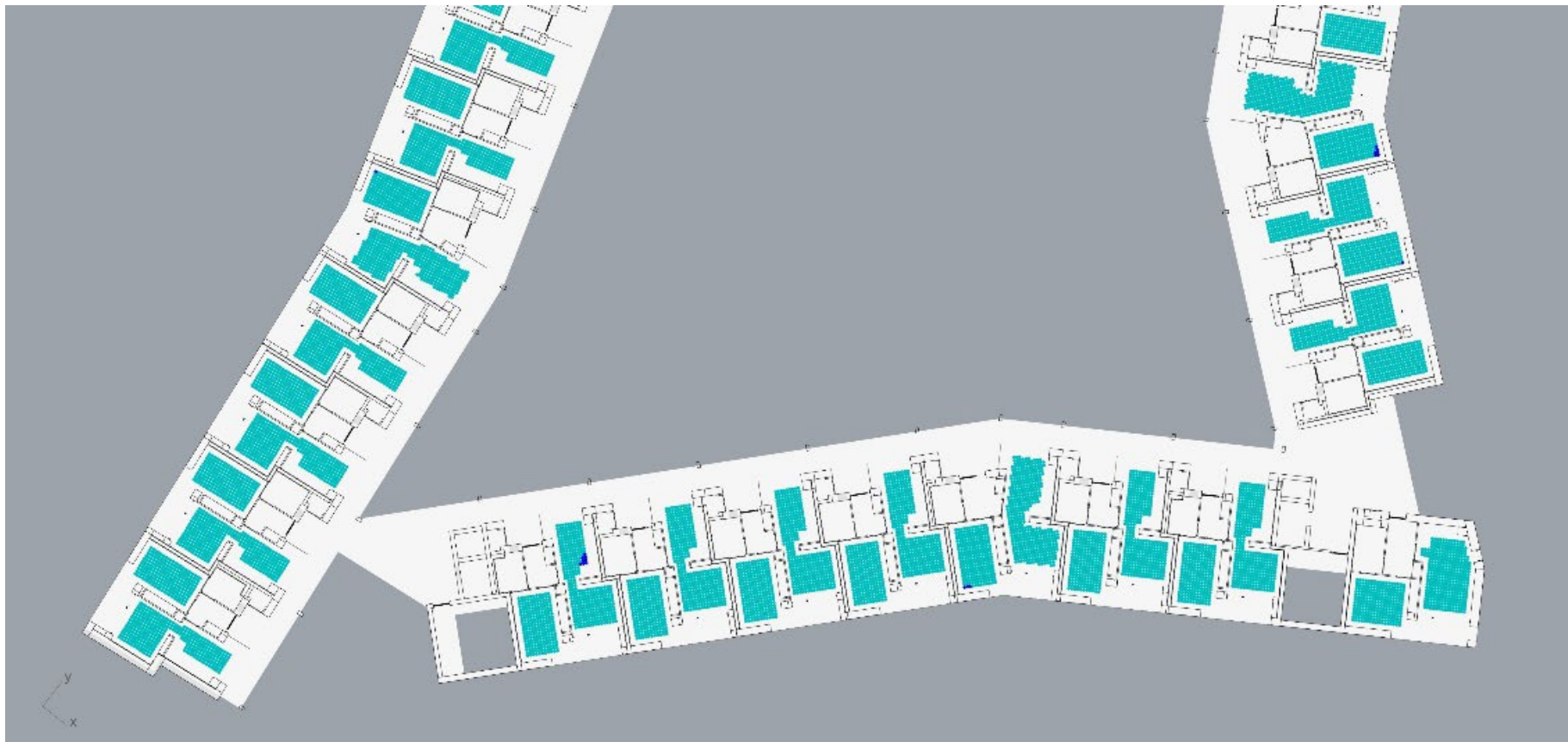


Figure 52: Level 2, Part 1 - View



Figure 53: Level 2, Part 2 - View

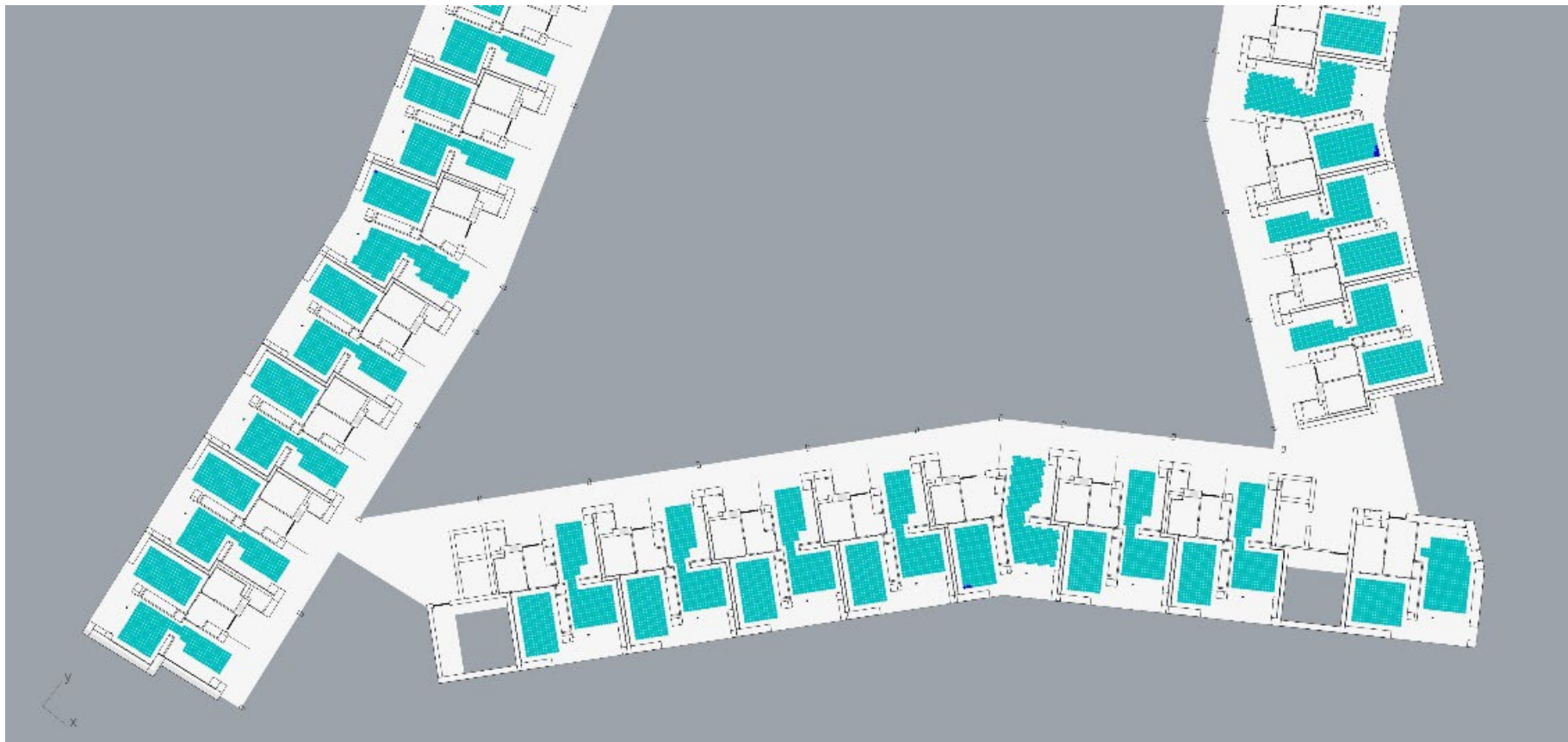


Figure 54: Level 3, Part 1 - View



Figure 55: Level 3, Part 2 - View

A.1.4 Sunlight in Amenity Areas (SiAA)

The following table presents the Sunlight in Amenity Areas results for the amenity space in the proposed development.

Imagery

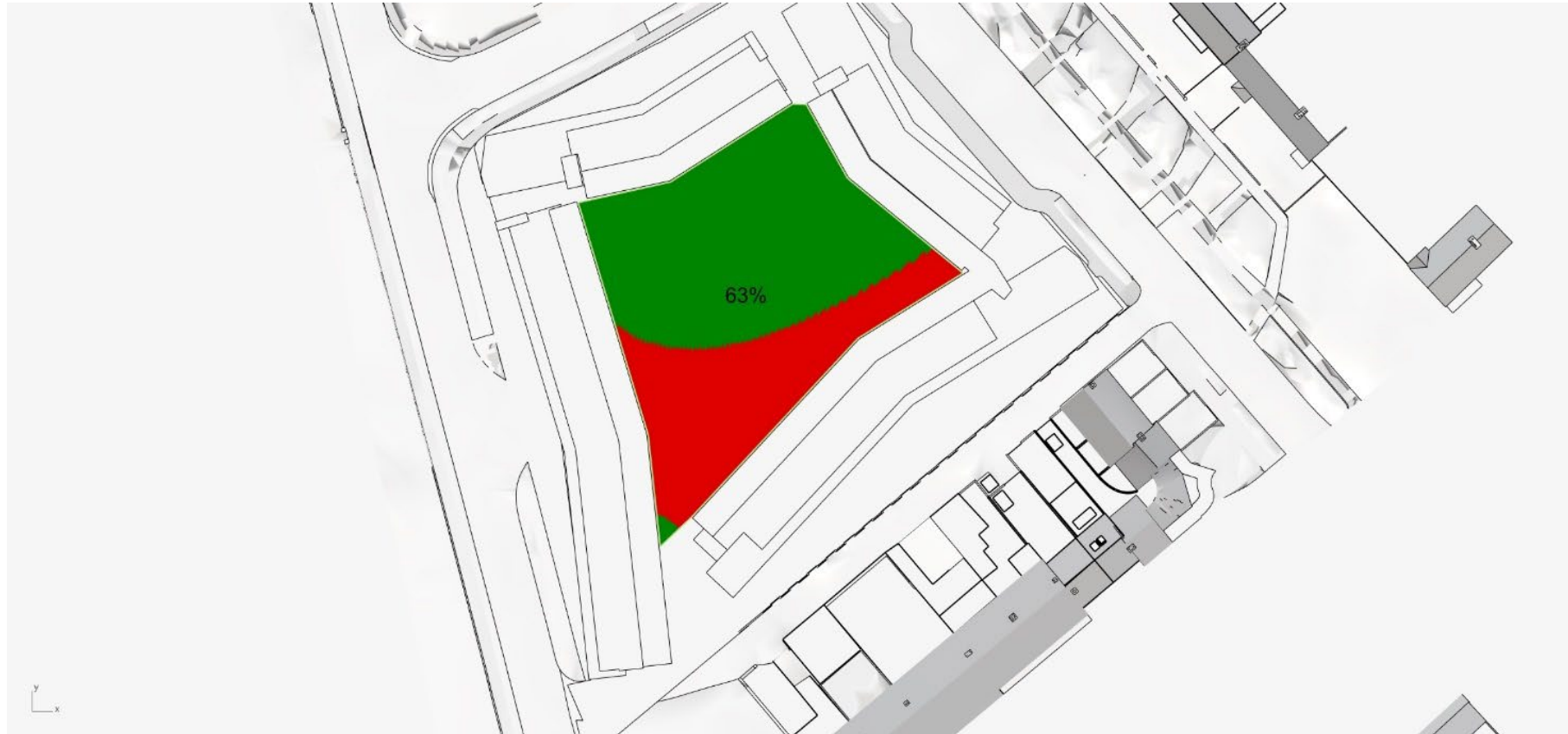


Figure 56: Proposed – Sunlight in Amenity Areas (21st March)

Tabulated

The table below sets out the result for SiAA in the proposed development.

Grid Reference	Percentage of Area Receiving More than 2 Hours of Sunlight on 21 st March (Proposed)	Meets Minimum Recommendation?
0	63%	Yes

A.2 Impact on the Surrounding Environment

This appendix provides detailed results on how the proposed development impacts on the existing surrounding environment.

A.2.1 Reference Model, Grids and Points

Model

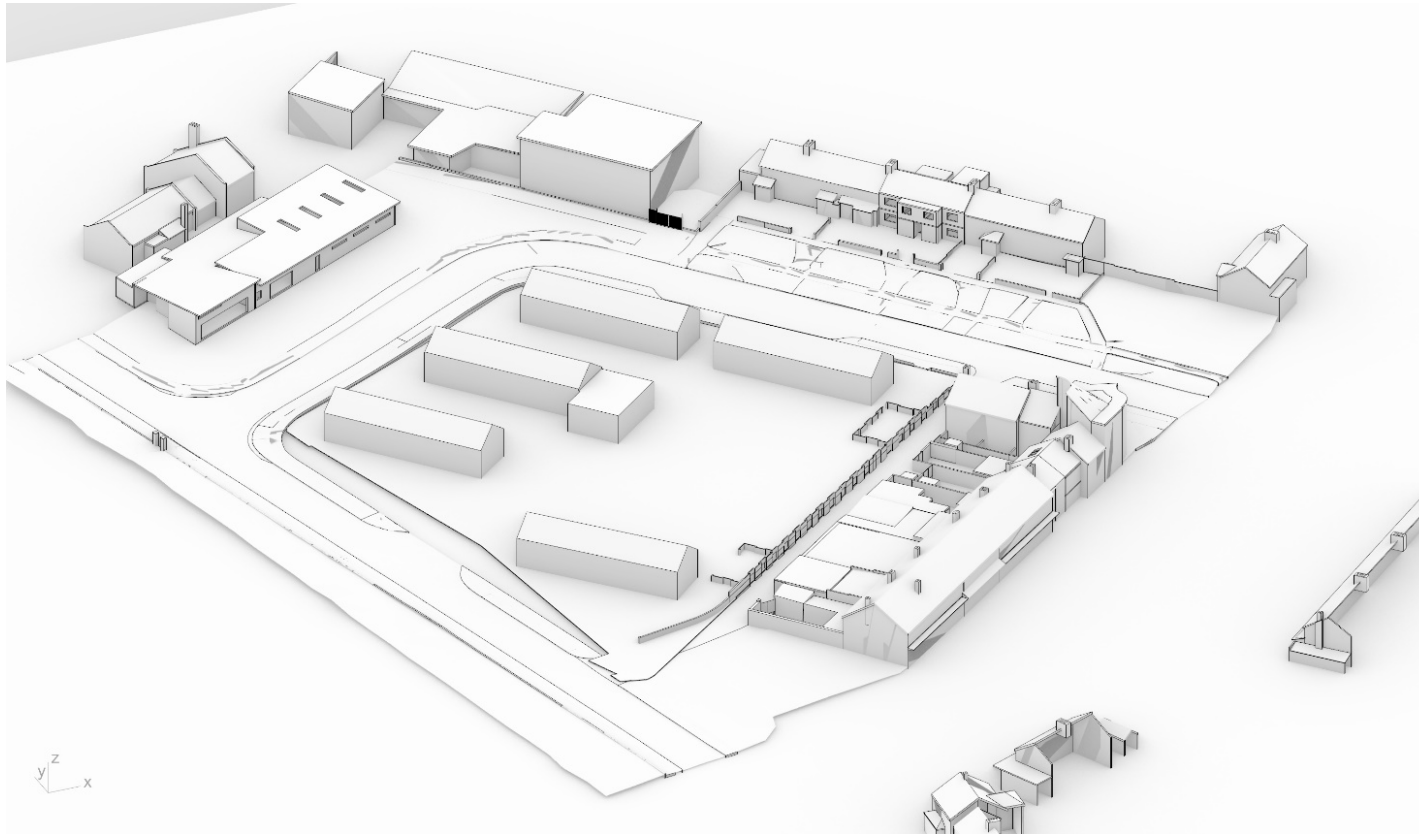


Figure 57 Existing site model condition



Figure 58 Proposed model condition

Reference Points and Grids

The images in this section highlight the surrounding points tested for VSC, APSH, WPSH and SiAA. They can be cross referenced with the result tables that follow to investigate levels of change in daylight and sunlight availability in the existing surrounding properties.

The NSL metric has been applied to the following properties: the Raheny Shamrock Athletic Club Clubhouse (DCC 4733-22), 7&9 All Saints Park (DCC 3067-20) and 8 All Saints Close (DCC 4087-18).

Points for VSC, APSH and WPSH:



Figure 59: Impact Reference Points - Part 1



Figure 60: Impact Reference Points - Part 2



Figure 61: Impact Reference Points - Part 3

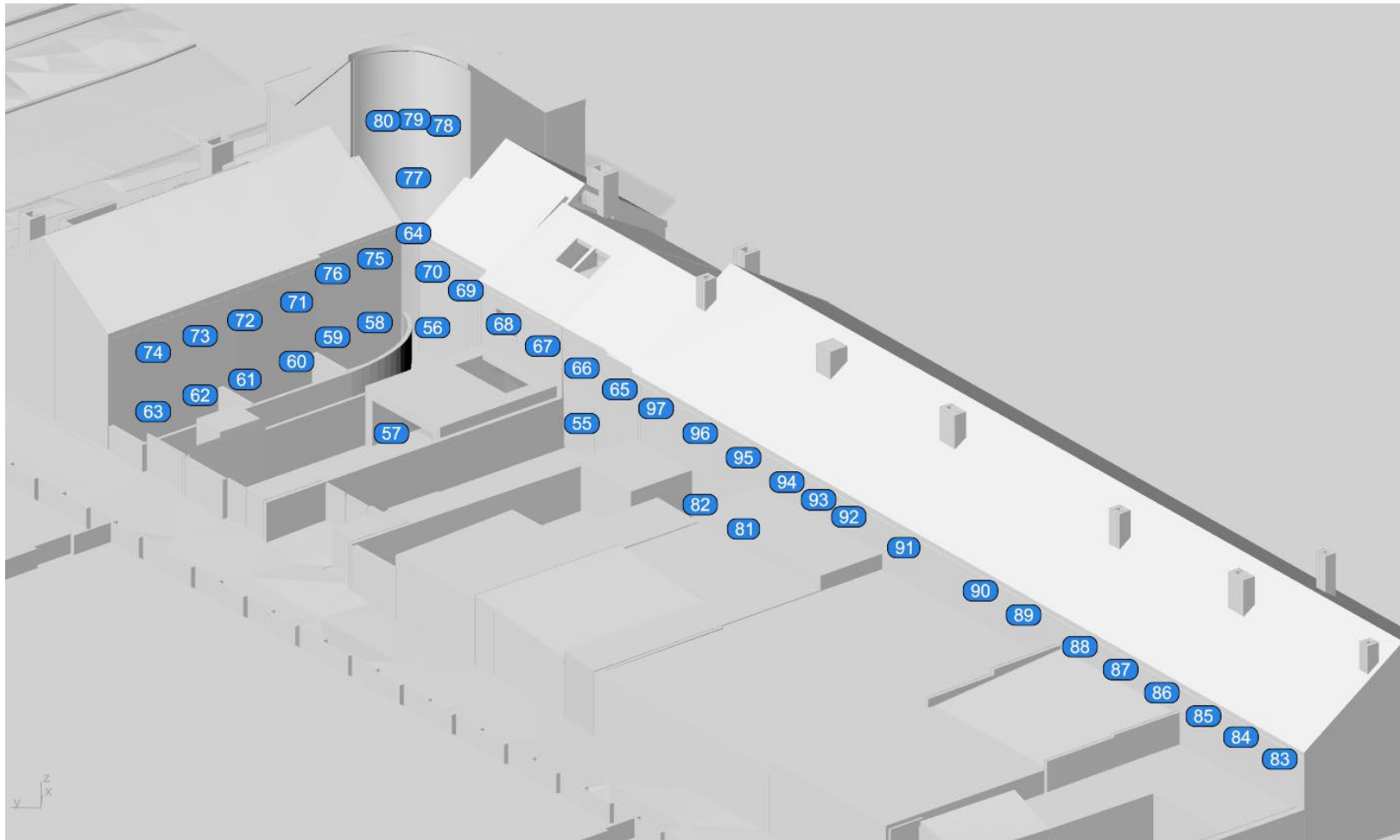


Figure 62: Impact Reference Points - Part 4

Grids for NSL:



Figure 63: Athletics Club - Grid Numbers

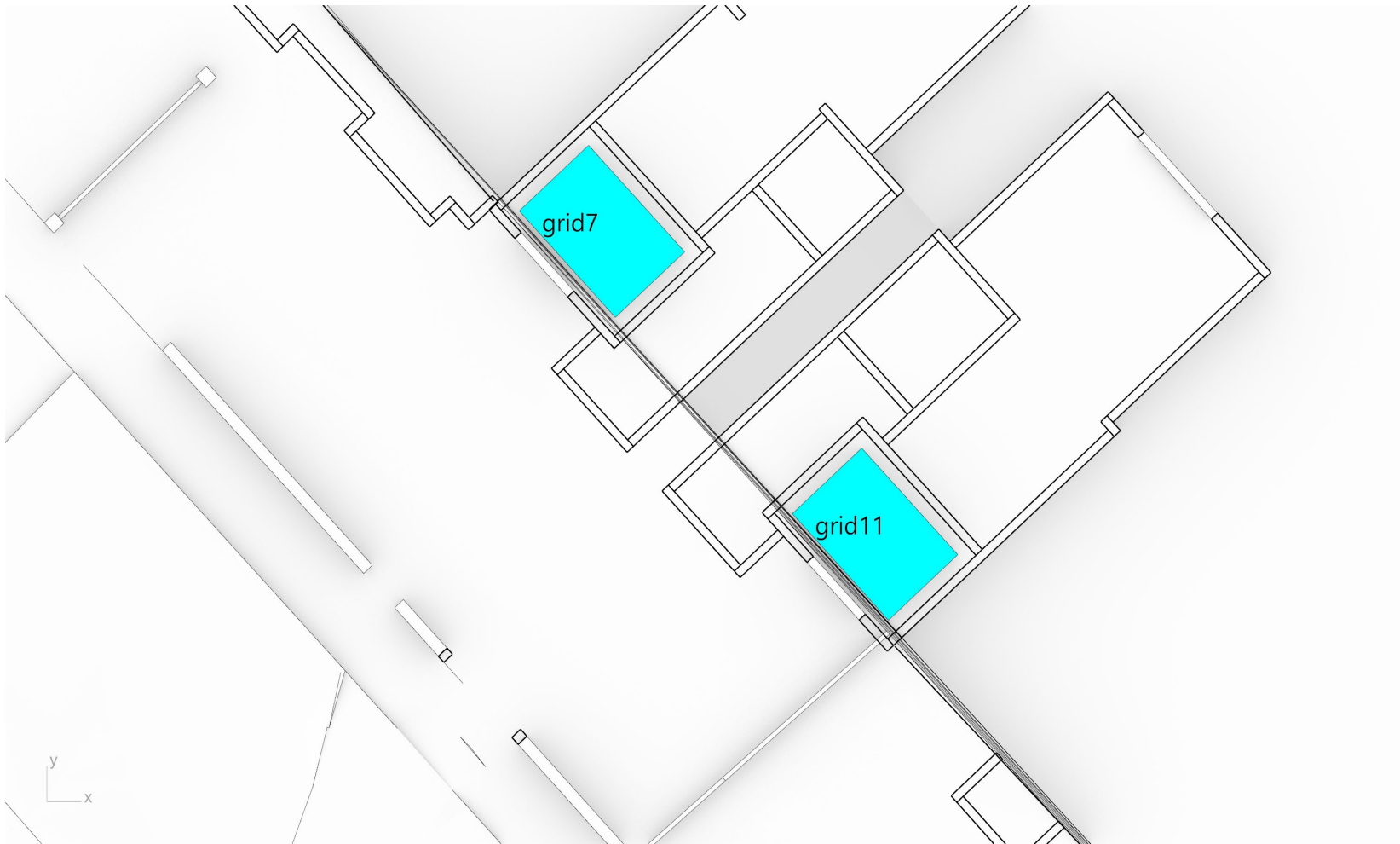


Figure 64: 7&9 All Saints Park 1 - Grid Numbers

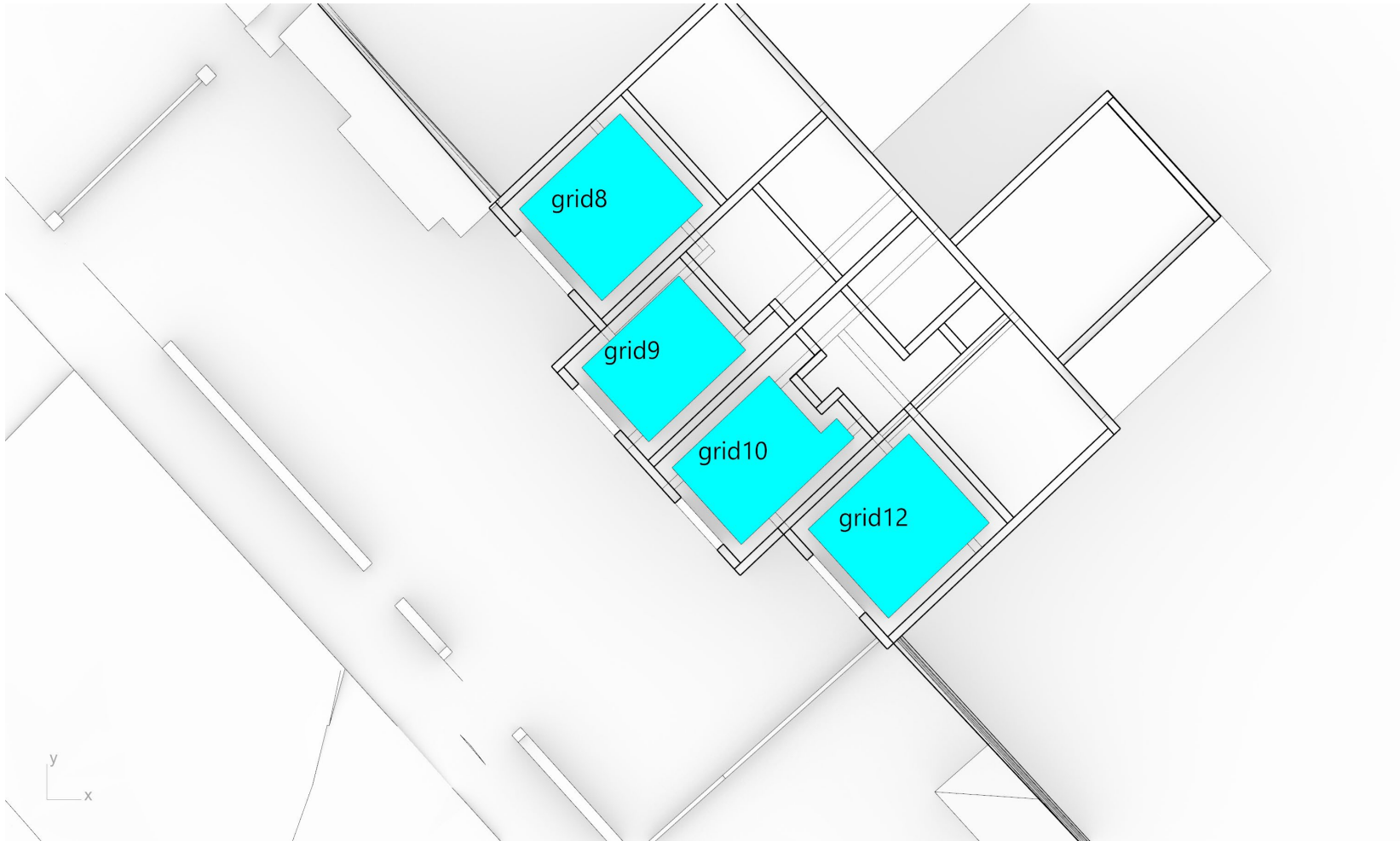


Figure 65: 7&9 All Saints Park 2 - Grid Numbers

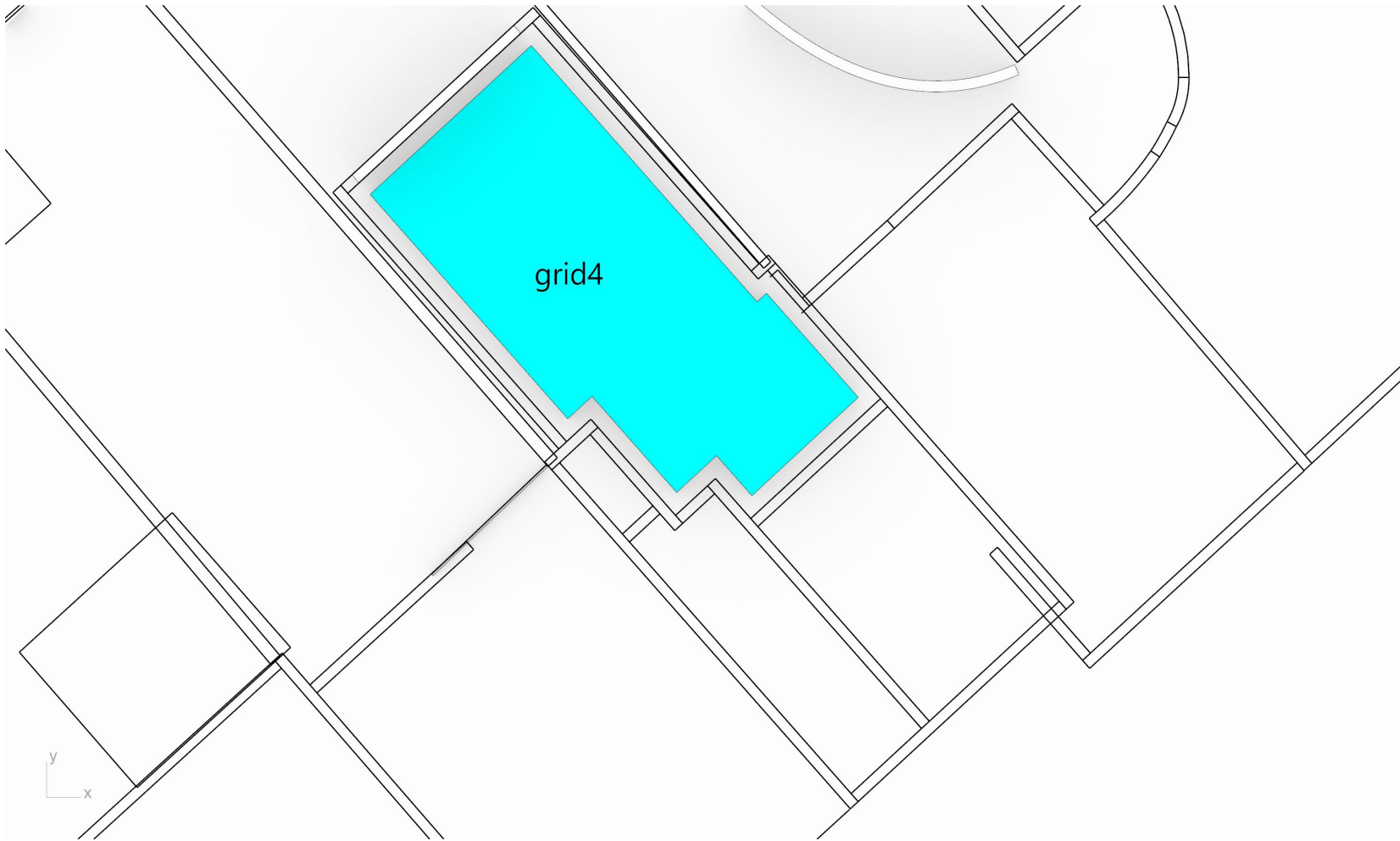


Figure 66: 8 All Saints Close 1 - Grid Numbers

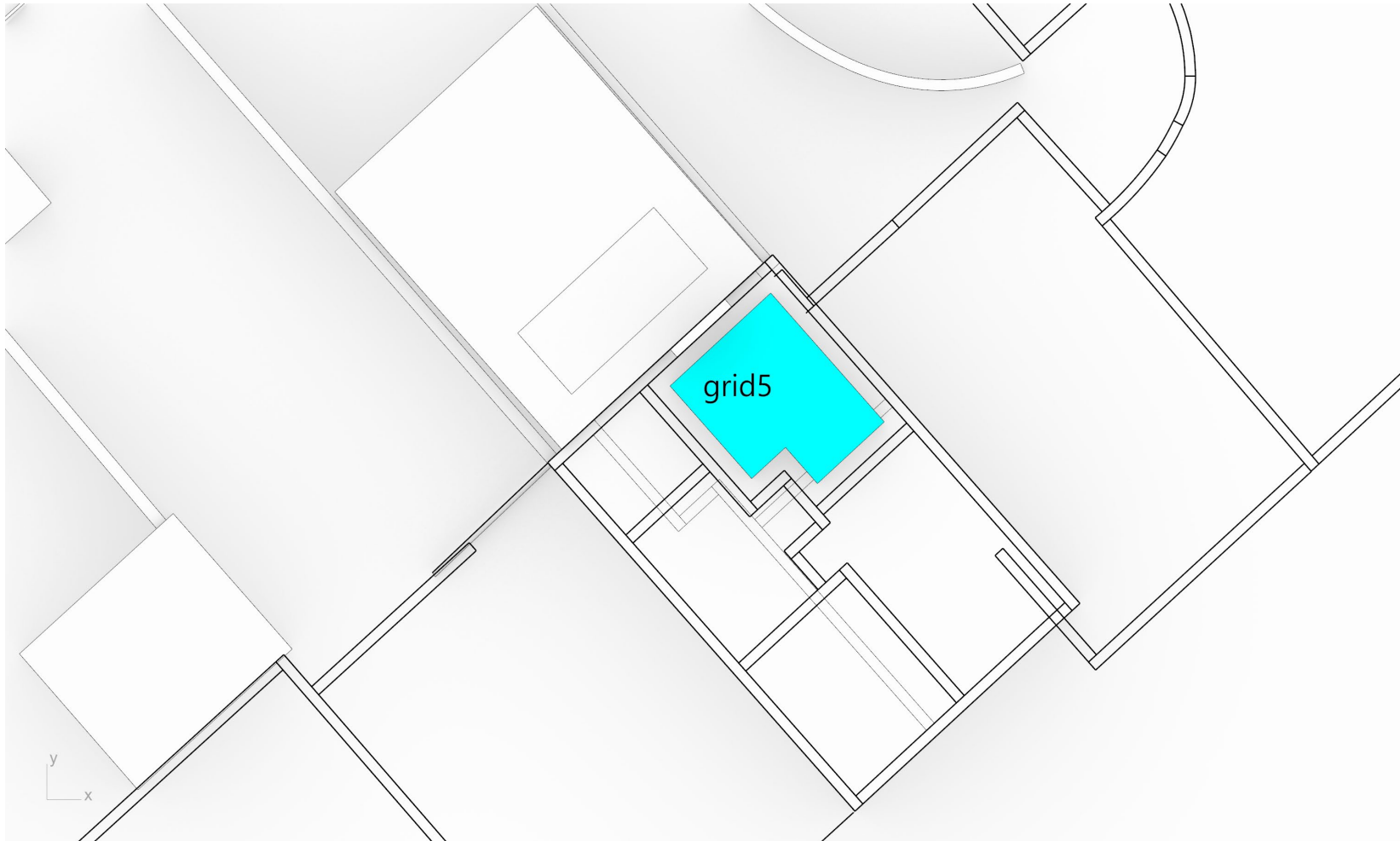


Figure 67: 8 All Saints Close 2 - Grid Numbers

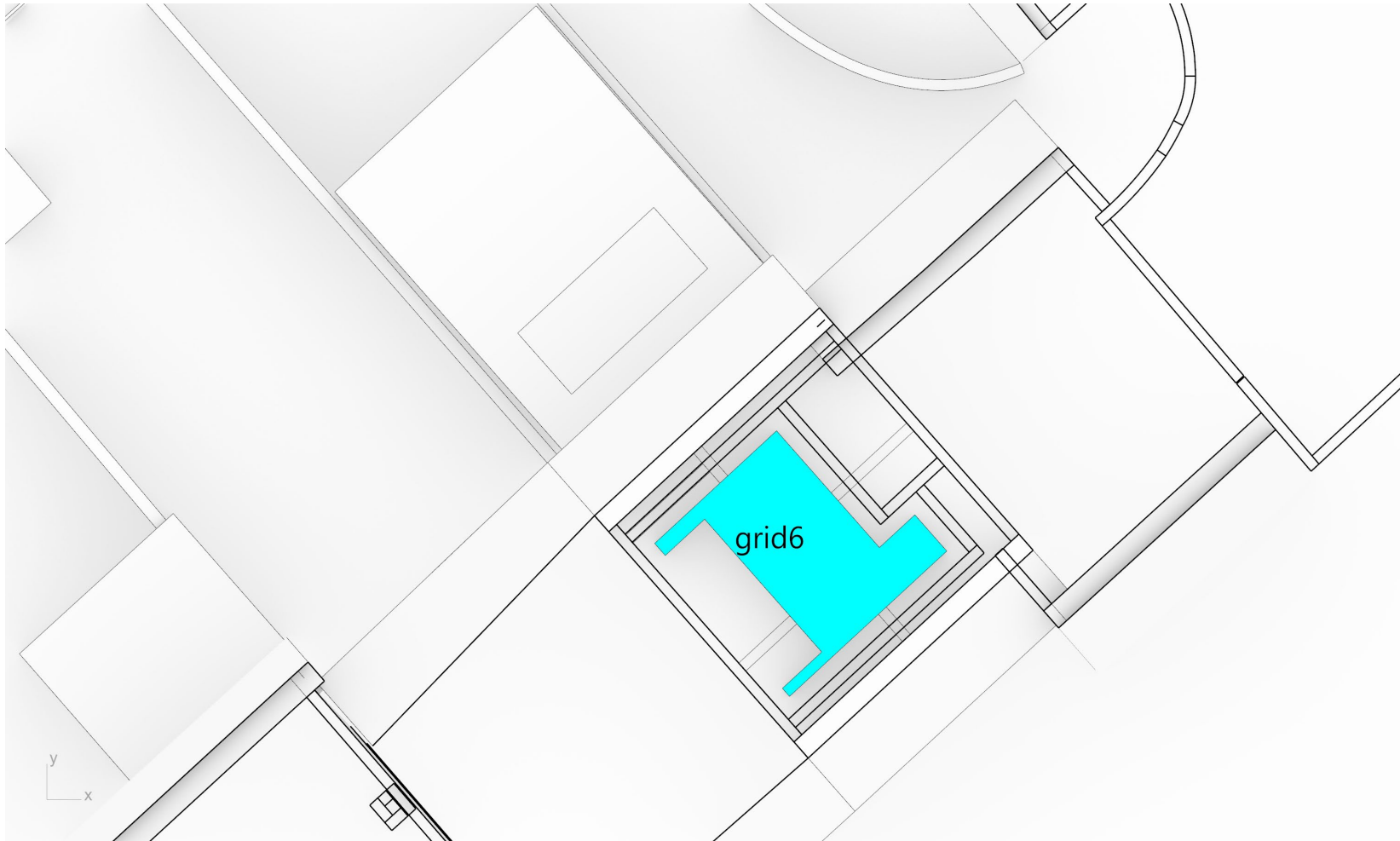


Figure 68: 8 All Saints Close 3 - Grid Numbers

Grids for Sunlight in Amenity Spaces



Figure 69: Sunlight in Amenity Areas, Part 1 – Grid Numbers



Figure 70: Sunlight in Amenity Areas, Part 1 – Grid Numbers

A.2.2 Results

A.2.2.1 Vertical Sky Component (VSC)

Imagery

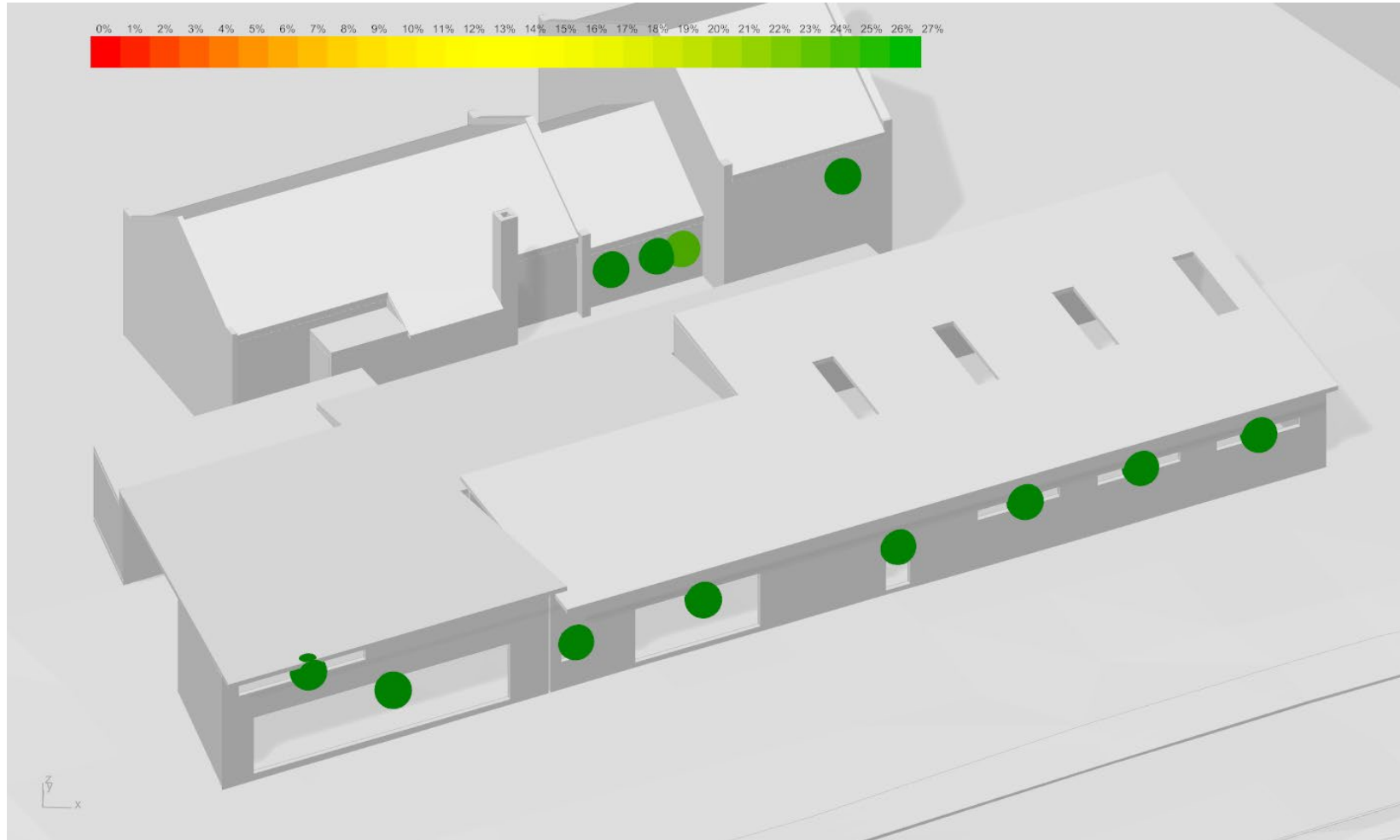


Figure 71: VSC Baseline - Part 1

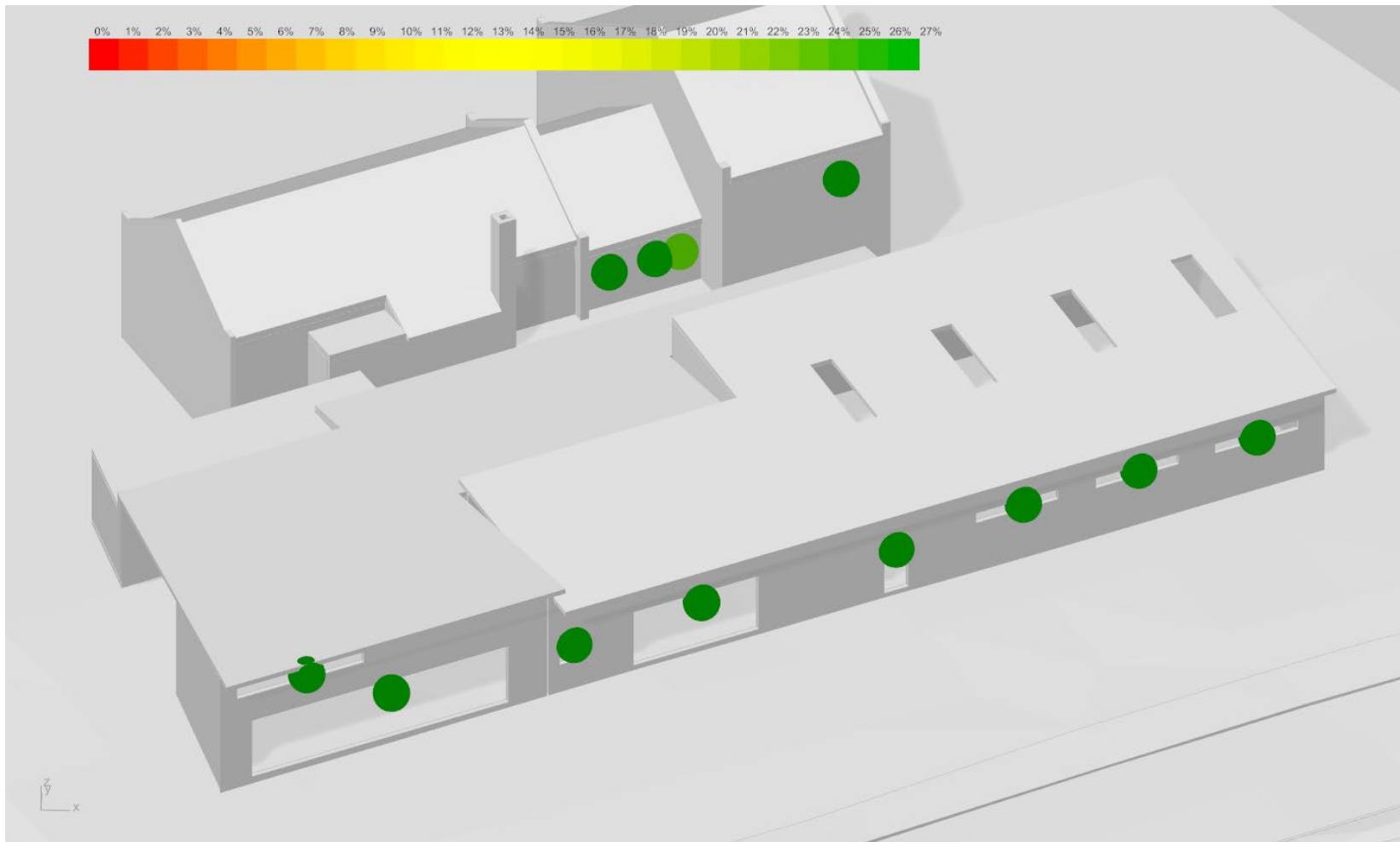


Figure 72: VSC Proposed - Part 1

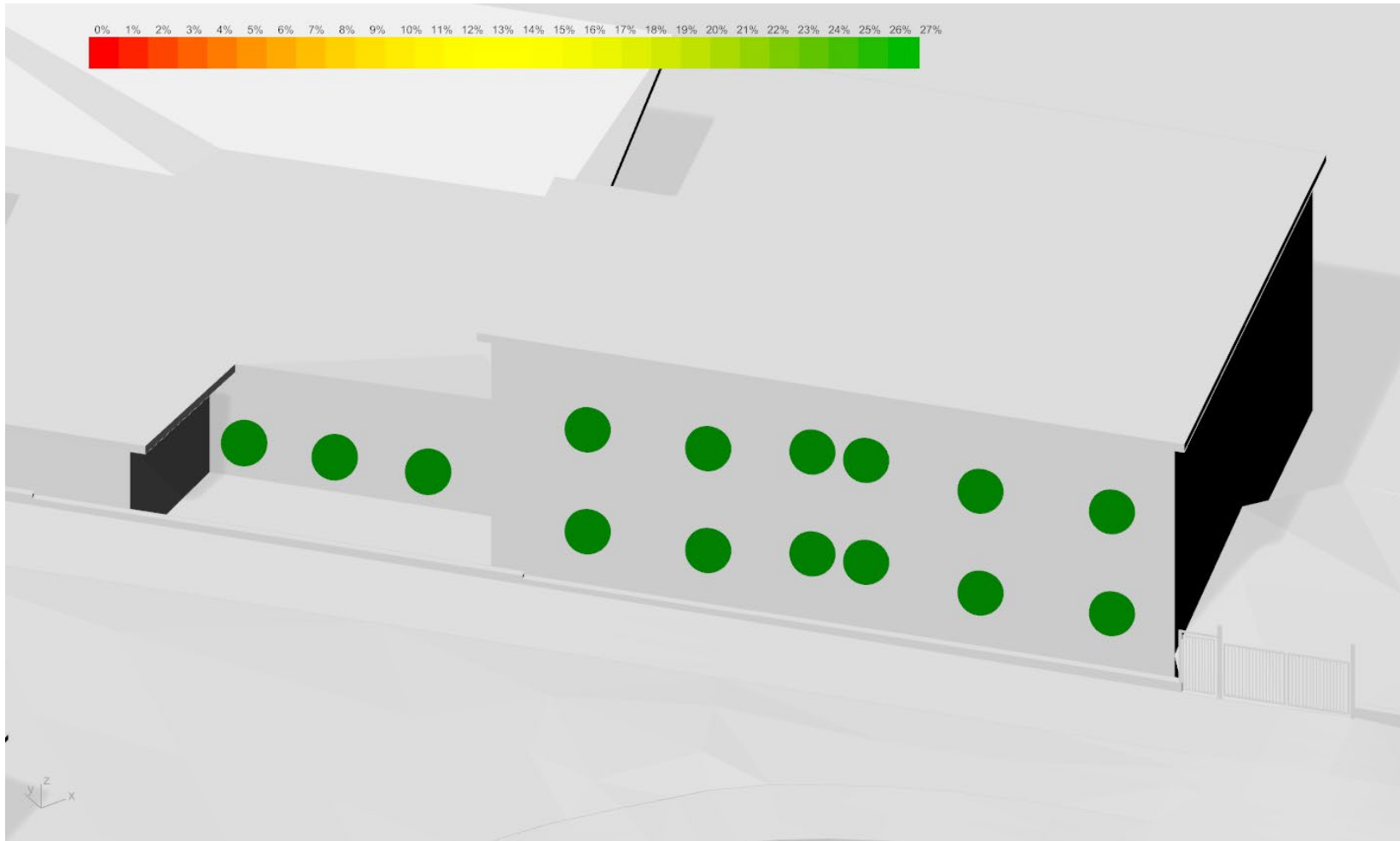


Figure 73: VSC Baseline - Part 2

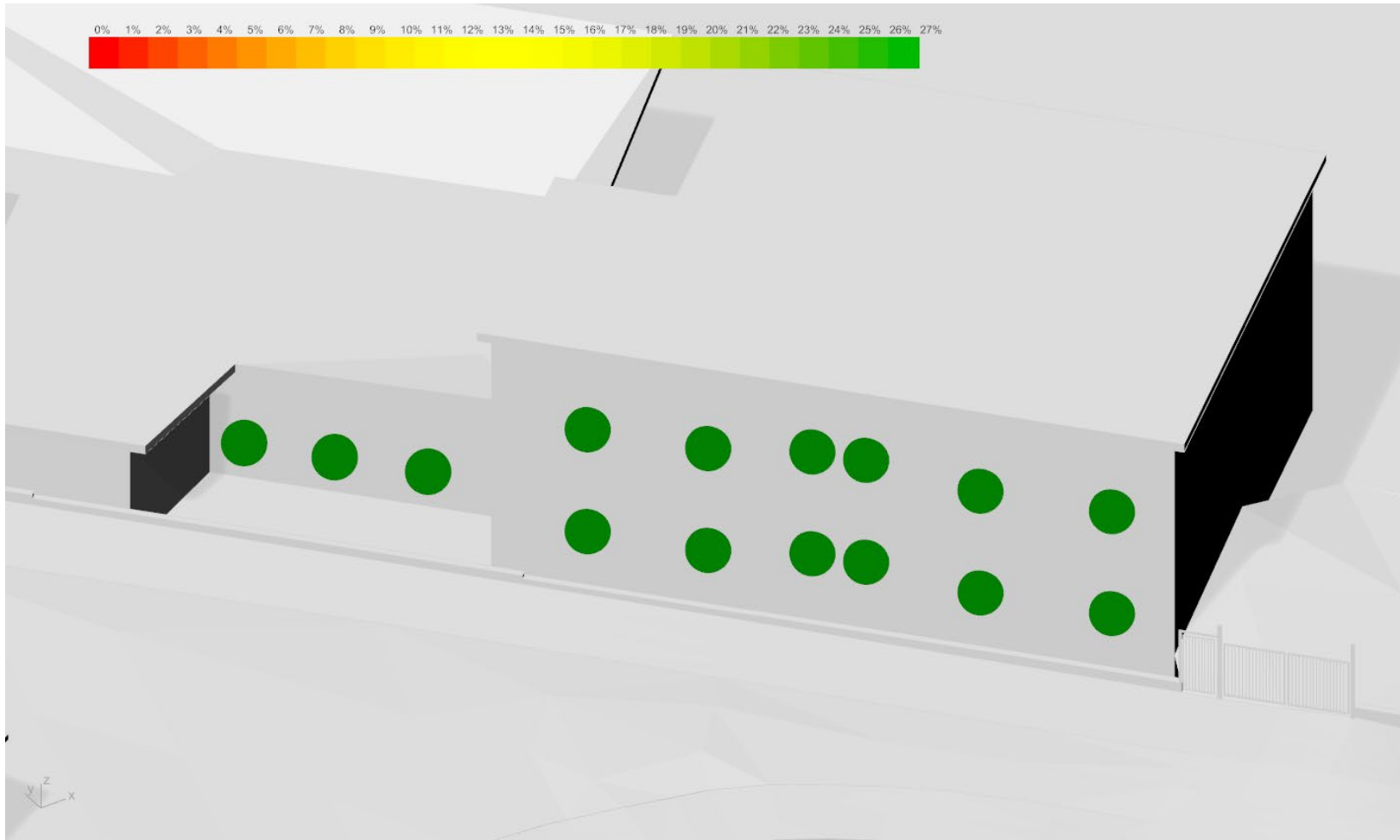


Figure 74: VSC Proposed - Part 2

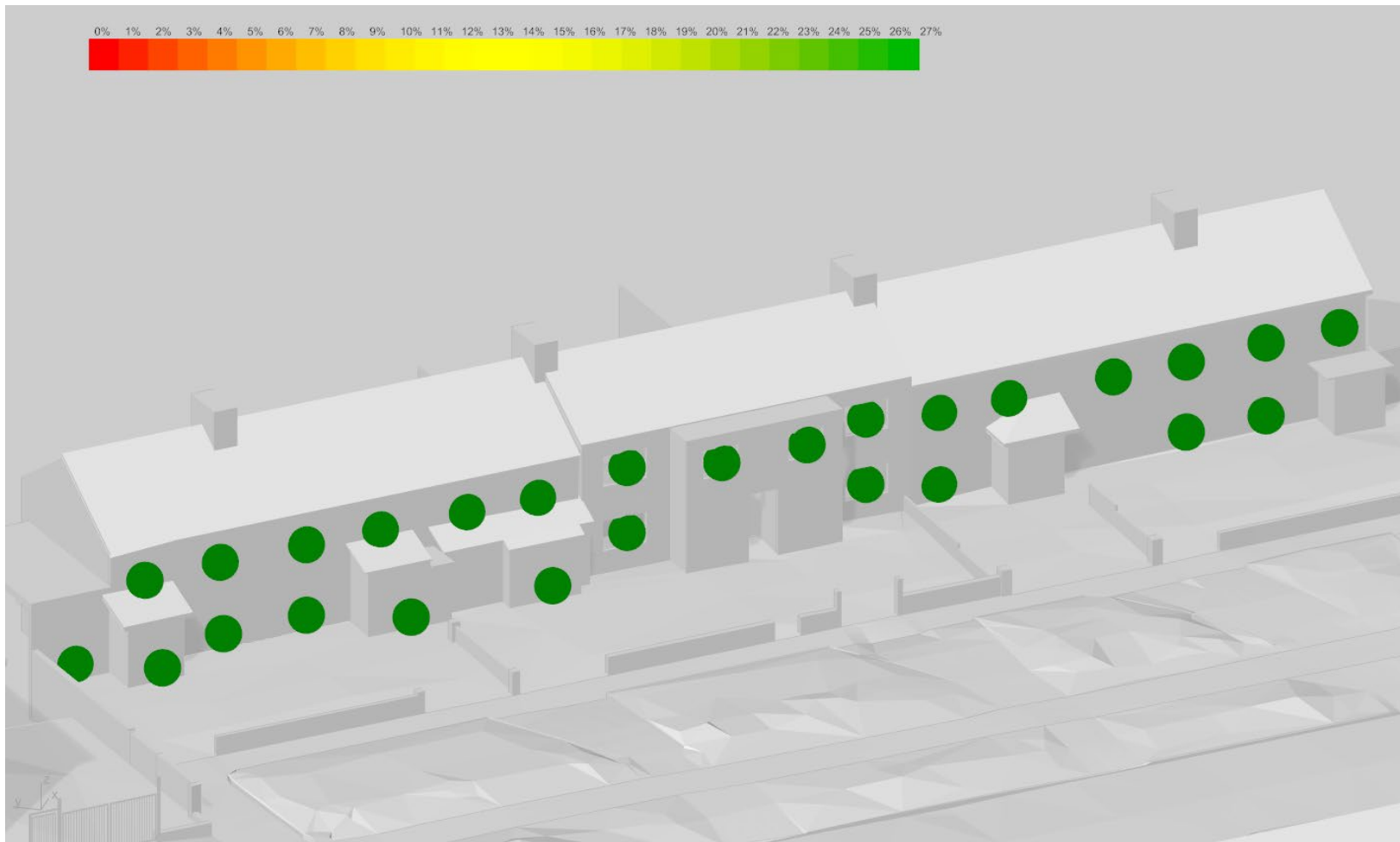


Figure 75: VSC Baseline - Part 3

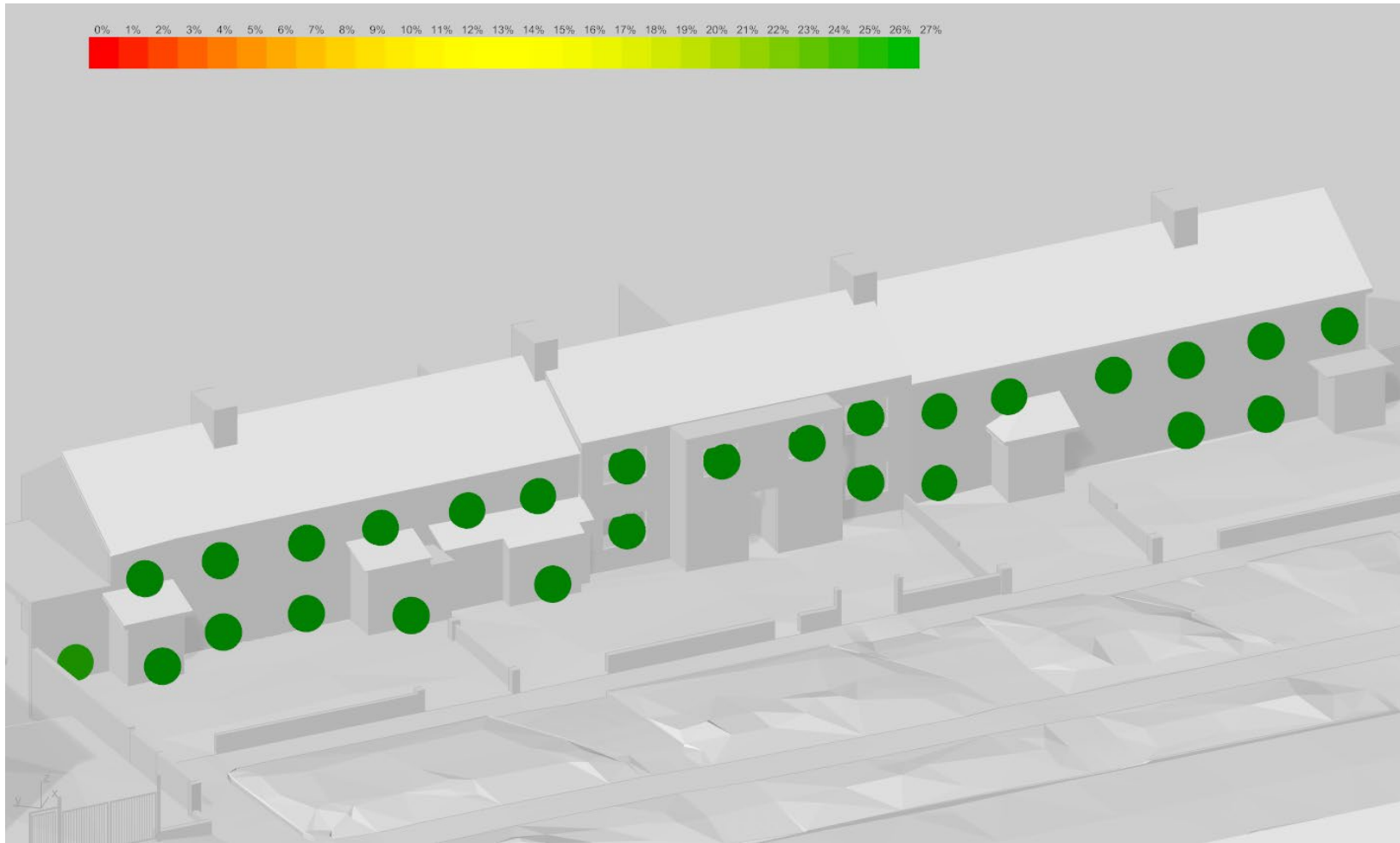


Figure 76: VSC Proposed - Part 3

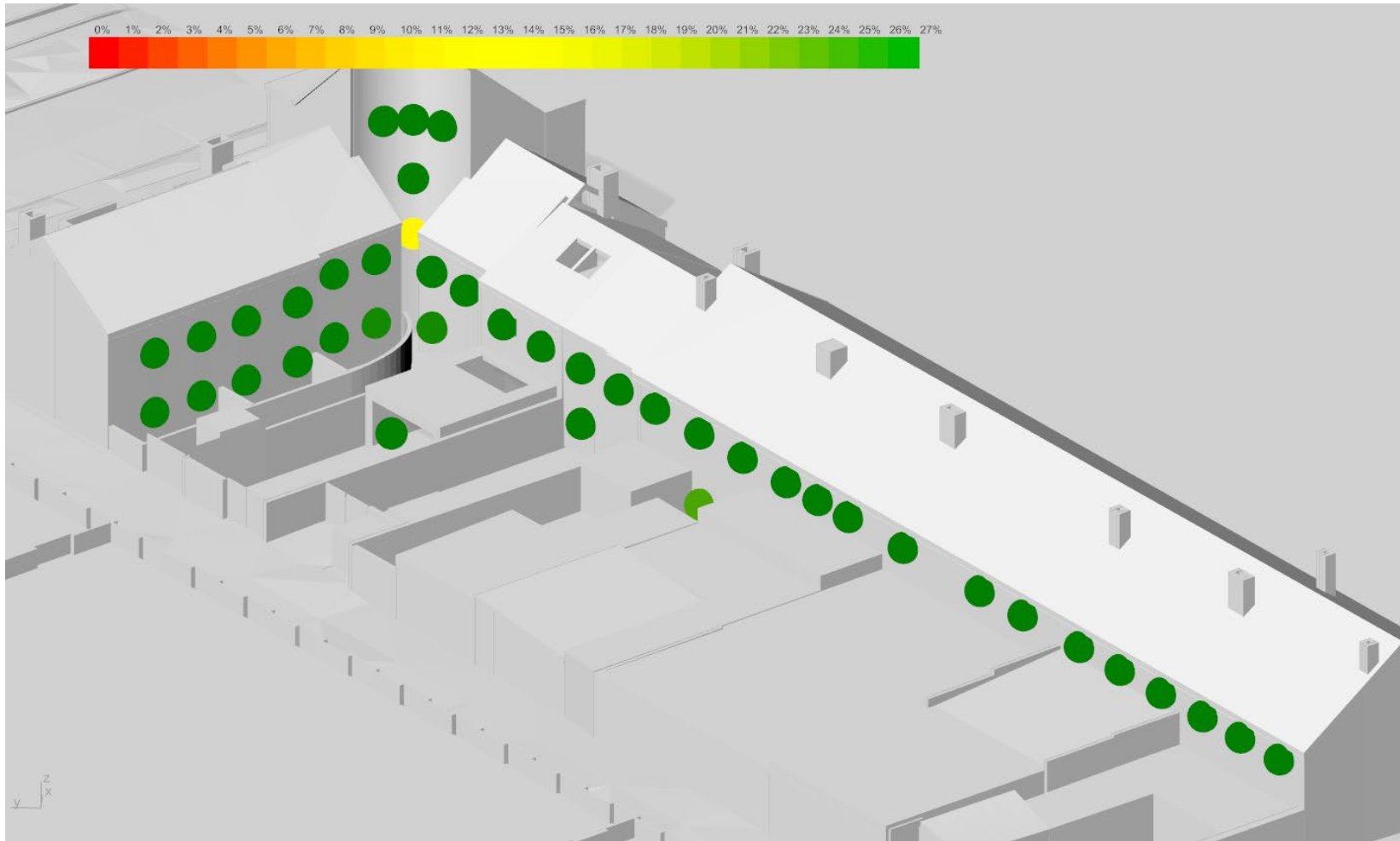


Figure 77: VSC Baseline - Part 4



Figure 78: VSC Proposed - Part 4

Tabulated

The following tables present the VSC results for each window of the surrounding buildings for the baseline and proposed site conditions.

Vertical Sky Component					
Building Reference	Point	Recommendation	Baseline	Proposed	Ratio
Cara Hall, All Saints Drive	1	27	27.5	27.5	1.00
Cara Hall, All Saints Drive	2	27	25.5	25.5	1.00
Cara Hall, All Saints Drive	3	27	22	22	1.00
Cara Hall, All Saints Drive	4	27	37	37	1.00
Athletics Club, All Saints Drive	5	27	35.5	28.5	0.80
Athletics Club, All Saints Drive	6	27	34	28.5	0.84
Athletics Club, All Saints Drive	7	27	35	28	0.80
Athletics Club, All Saints Drive	8	27	32	28	0.88
Athletics Club, All Saints Drive	9	27	33	27.5	0.83
Athletics Club, All Saints Drive	10	27	32.5	26.5	0.82
Athletics Club, All Saints Drive	11	27	39.5	33.5	0.85
Athletics Club, All Saints Drive	12	27	33.5	28	0.84
Naí Scoil Íde, All Saints Drive	13	27	37.5	32.5	0.87
Naí Scoil Íde, All Saints Drive	14	27	38	33.5	0.88
Naí Scoil Íde, All Saints Drive	15	27	37.5	33.5	0.89
Naí Scoil Íde, All Saints Drive	16	27	38	34.5	0.91
Naí Scoil Íde, All Saints Drive	17	27	34.5	32	0.93
Naí Scoil Íde, All Saints Drive	18	27	38	34.5	0.91
Naí Scoil Íde, All Saints Drive	19	27	34.5	32	0.93
Naí Scoil Íde, All Saints Drive	20	27	38.5	34	0.88

Vertical Sky Component					
Building Reference	Point	Recommendation	Baseline	Proposed	Ratio
Naí Scoil Íde, All Saints Drive	21	27	38.5	35	0.91
Naí Scoil Íde, All Saints Drive	22	27	40	35.5	0.89
Naí Scoil Íde, All Saints Drive	23	27	40	35.5	0.89
Naí Scoil Íde, All Saints Drive	24	27	40	37	0.93
Naí Scoil Íde, All Saints Drive	25	27	40	37.5	0.94
Naí Scoil Íde, All Saints Drive	26	27	40	37	0.93
Naí Scoil Íde, All Saints Drive	27	27	40	37	0.93
1-15 All Saints Park	28	27	37	35	0.95
1-15 All Saints Park	29	27	37.5	35.5	0.95
1-15 All Saints Park	30	27	35	31.5	0.90
1-15 All Saints Park	31	27	38	32.5	0.86
1-15 All Saints Park	32	27	38	33.5	0.88
1-15 All Saints Park	33	27	35	30	0.86
1-15 All Saints Park	34	27	35.5	31.5	0.89
1-15 All Saints Park	35	27	35	31	0.89
1-15 All Saints Park	36	27	27.5	24	0.87
1-15 All Saints Park	37	27	34	29.5	0.87
1-15 All Saints Park	38	27	33	29.5	0.89
1-15 All Saints Park	39	27	40	37.5	0.94
1-15 All Saints Park	40	27	40	36.5	0.91
1-15 All Saints Park	41	27	39	35.5	0.91
1-15 All Saints Park	42	27	39.5	37	0.94

Vertical Sky Component					
Building Reference	Point	Recommendation	Baseline	Proposed	Ratio
1-15 All Saints Park	43	27	39.5	36	0.91
1-15 All Saints Park	44	27	39.5	37	0.94
1-15 All Saints Park	45	27	40	35	0.88
1-15 All Saints Park	46	27	40	35	0.88
1-15 All Saints Park	47	27	39.5	34.5	0.87
1-15 All Saints Park	48	27	39	34.5	0.88
1-15 All Saints Park	49	27	39	34.5	0.88
1-15 All Saints Park	50	27	39	35.5	0.91
1-15 All Saints Park	51	27	37	32.5	0.88
1-15 All Saints Park	52	27	38	33.5	0.88
1-15 All Saints Park	53	27	40	35.5	0.89
1-15 All Saints Park	54	27	40	35.5	0.89
1-9 All Saints Close	55	27	34.5	27.5	0.80
1-9 All Saints Close	56	27	24.5	20	0.82
1-9 All Saints Close	57	27	35	23.5	0.67
1-9 All Saints Close	58	27	24.5	22.5	0.92
1-9 All Saints Close	59	27	28	25.5	0.91
1-9 All Saints Close	60	27	32	29	0.91
1-9 All Saints Close	61	27	33.5	30.5	0.91
1-9 All Saints Close	62	27	32.5	29.5	0.91
1-9 All Saints Close	63	27	32.5	27.5	0.85
1-9 All Saints Close	64	27	12	11	0.92

Vertical Sky Component					
Building Reference	Point	Recommendation	Baseline	Proposed	Ratio
1-9 All Saints Close	65	27	38.5	30.5	0.79
1-9 All Saints Close	66	27	38.5	30.5	0.79
1-9 All Saints Close	67	27	38	30	0.79
1-9 All Saints Close	68	27	37	29.5	0.80
1-9 All Saints Close	69	27	34	28	0.82
1-9 All Saints Close	70	27	31.5	27	0.86
1-9 All Saints Close	71	27	36.5	33.5	0.92
1-9 All Saints Close	72	27	37.5	33.5	0.89
1-9 All Saints Close	73	27	37.5	33.5	0.89
1-9 All Saints Close	74	27	38.5	34	0.88
1-9 All Saints Close	75	27	34	31.5	0.93
1-9 All Saints Close	76	27	34	31.5	0.93
1-9 All Saints Close	77	27	32.5	30	0.92
1-9 All Saints Close	78	27	36	34	0.94
1-9 All Saints Close	79	27	36.5	34	0.93
1-9 All Saints Close	80	27	35.5	34	0.96
Unit 1-5, All Saints Park	81	27	19	18	0.95
Unit 1-5, All Saints Park	82	27	22	21	0.95
Unit 1-5, All Saints Park	83	27	40	33.5	0.84
Unit 1-5, All Saints Park	84	27	40	33	0.83
Unit 1-5, All Saints Park	85	27	40	32.5	0.81
Unit 1-5, All Saints Park	86	27	40	32	0.80

Vertical Sky Component					
Building Reference	Point	Recommendation	Baseline	Proposed	Ratio
Unit 1-5, All Saints Park	87	27	40	32	0.80
Unit 1-5, All Saints Park	88	27	40	32	0.80
Unit 1-5, All Saints Park	89	27	40	32	0.80
Unit 1-5, All Saints Park	90	27	40	31.5	0.79
Unit 1-5, All Saints Park	91	27	40	32	0.80
Unit 1-5, All Saints Park	92	27	40	32	0.80
Unit 1-5, All Saints Park	93	27	40	32	0.80
Unit 1-5, All Saints Park	94	27	40	32.5	0.81
Unit 1-5, All Saints Park	95	27	39.5	31.5	0.80
Unit 1-5, All Saints Park	96	27	39.5	32	0.81
Unit 1-5, All Saints Park	97	27	39.5	32	0.81

A.2.2.2 Annual and Winter Probable Sunlight Hours (A& W PSH) Results

Imagery

APSH

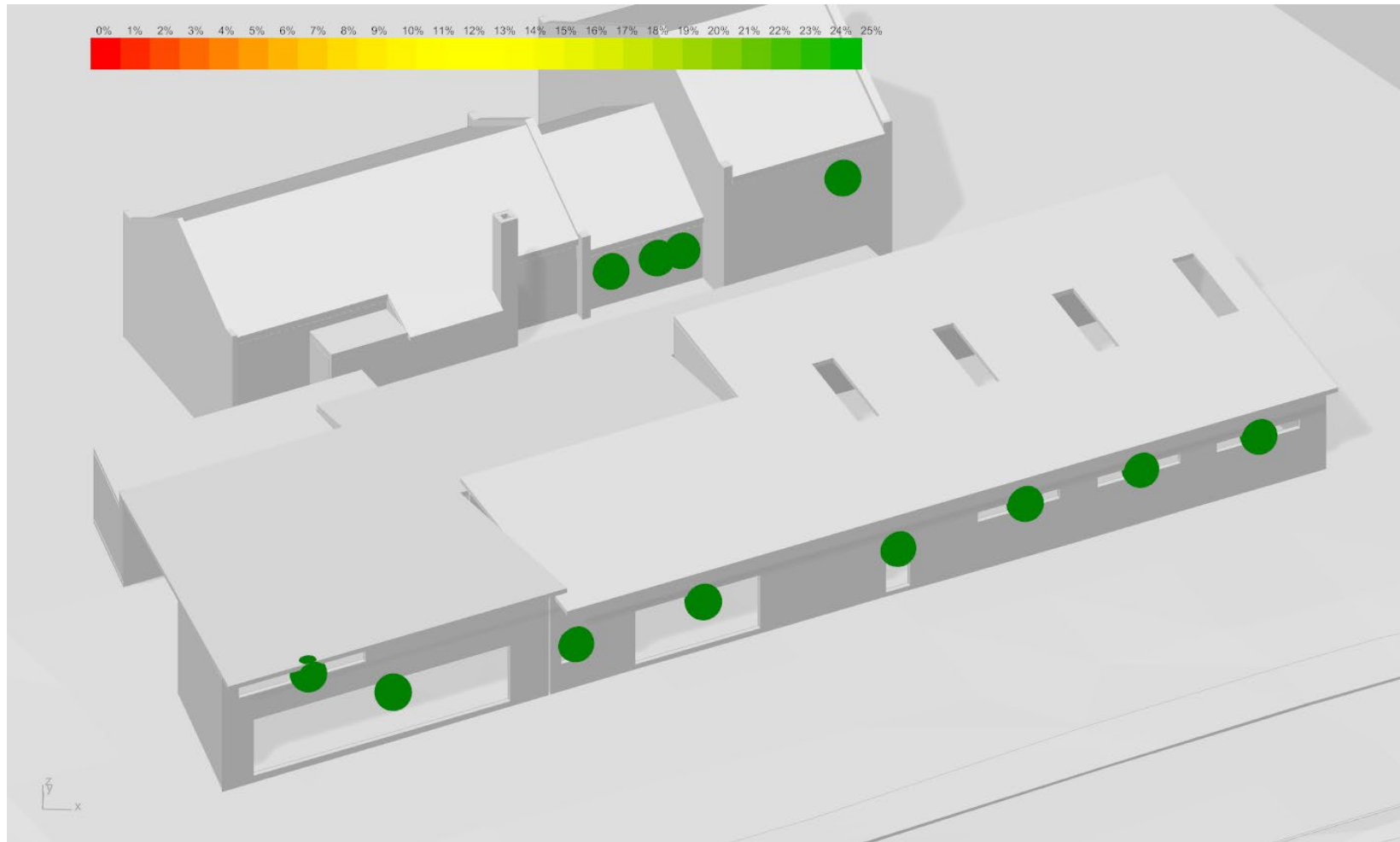


Figure 79: APSH Baseline - Part 1

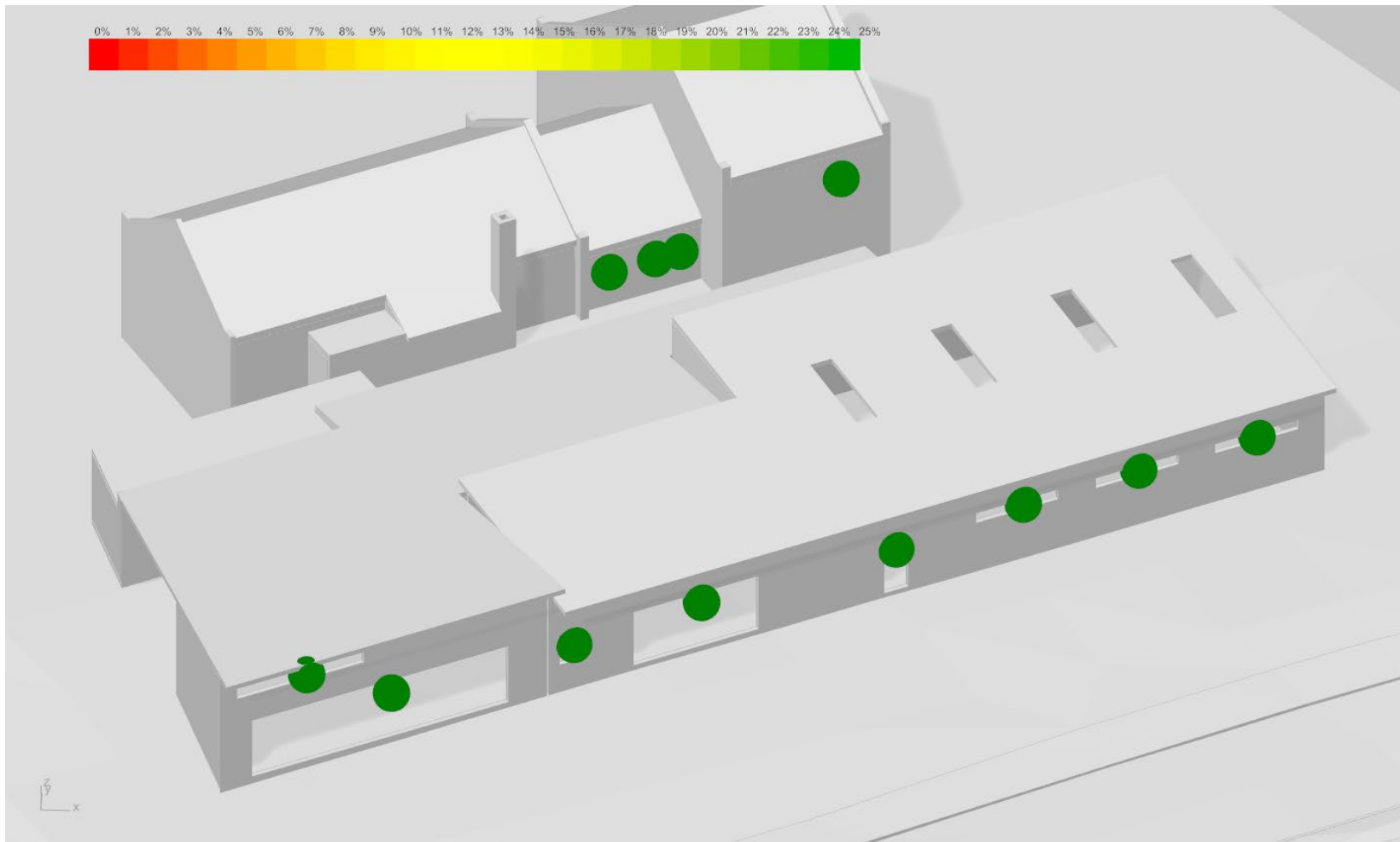


Figure 80: APSH Proposed - Part 1

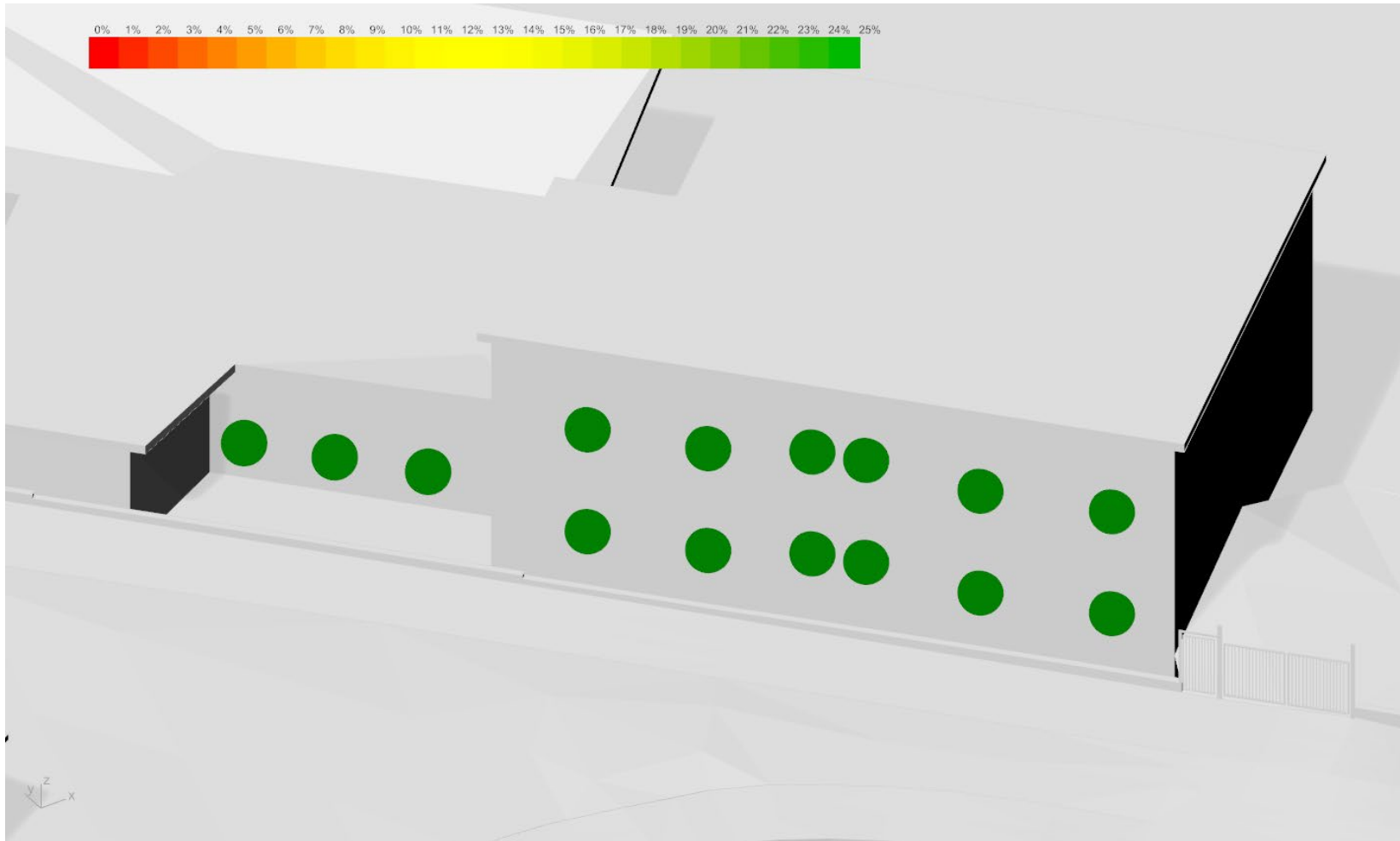


Figure 81: APSH Baseline - Part 2

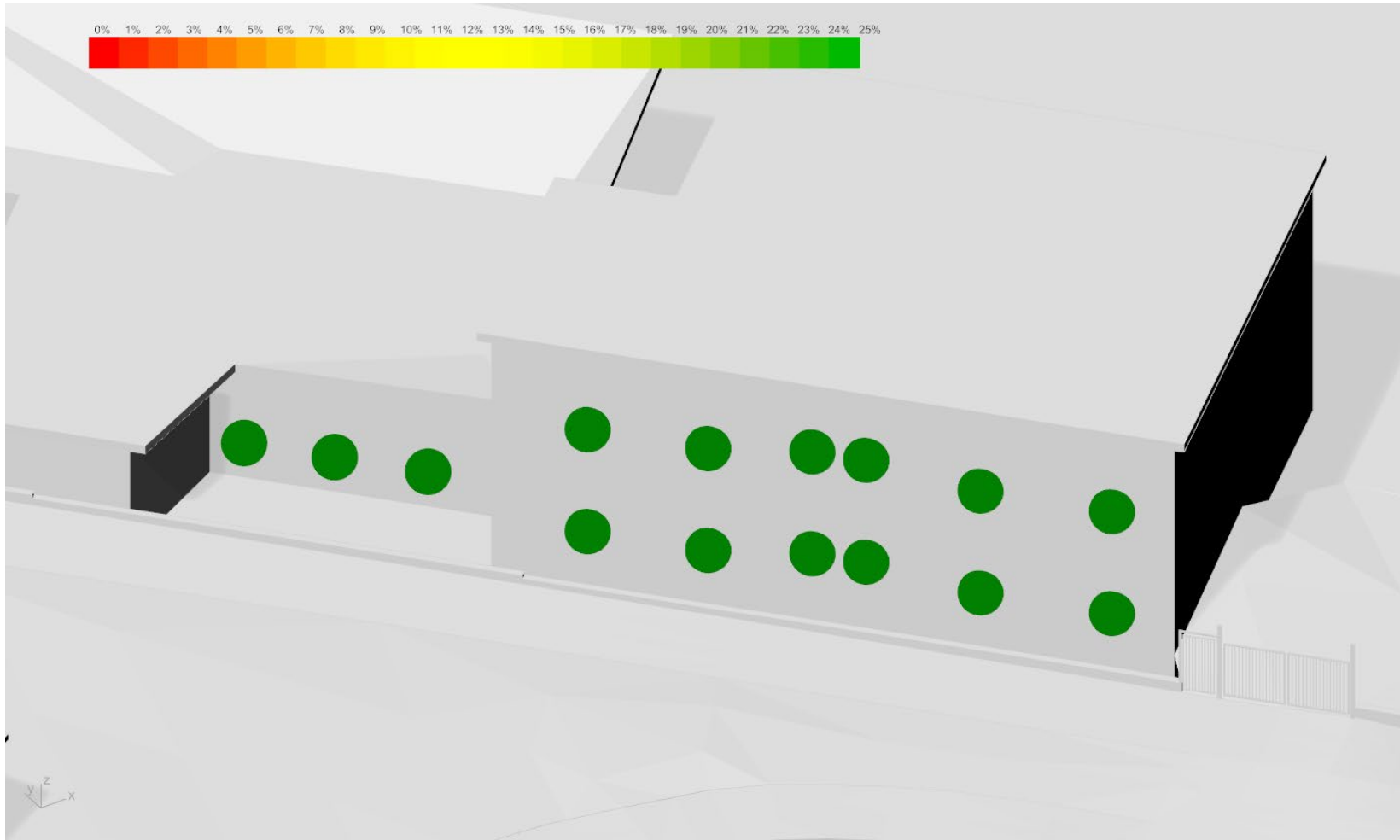


Figure 82: APSH Proposed - Part 2

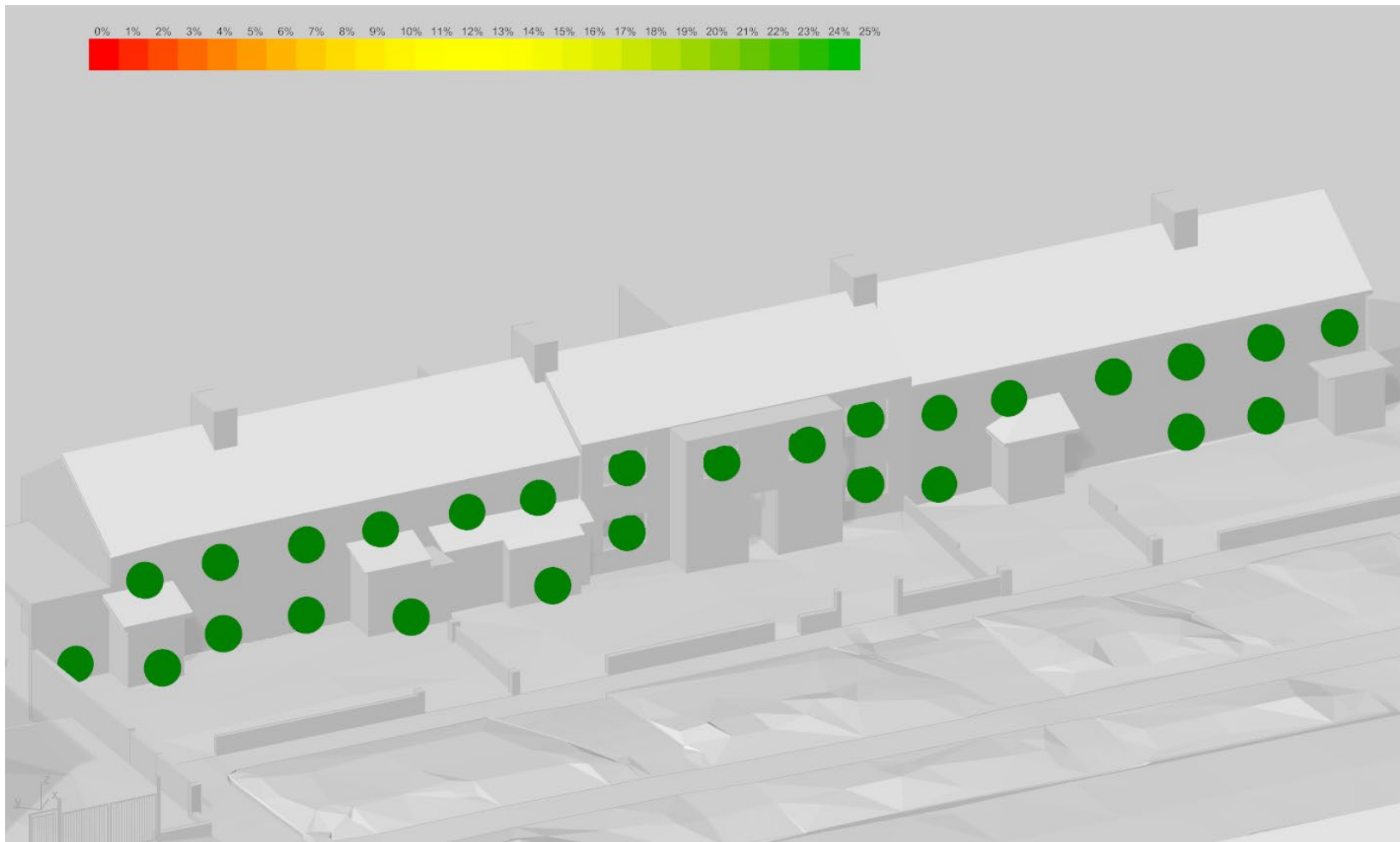


Figure 83: APSH Baseline - Part 3

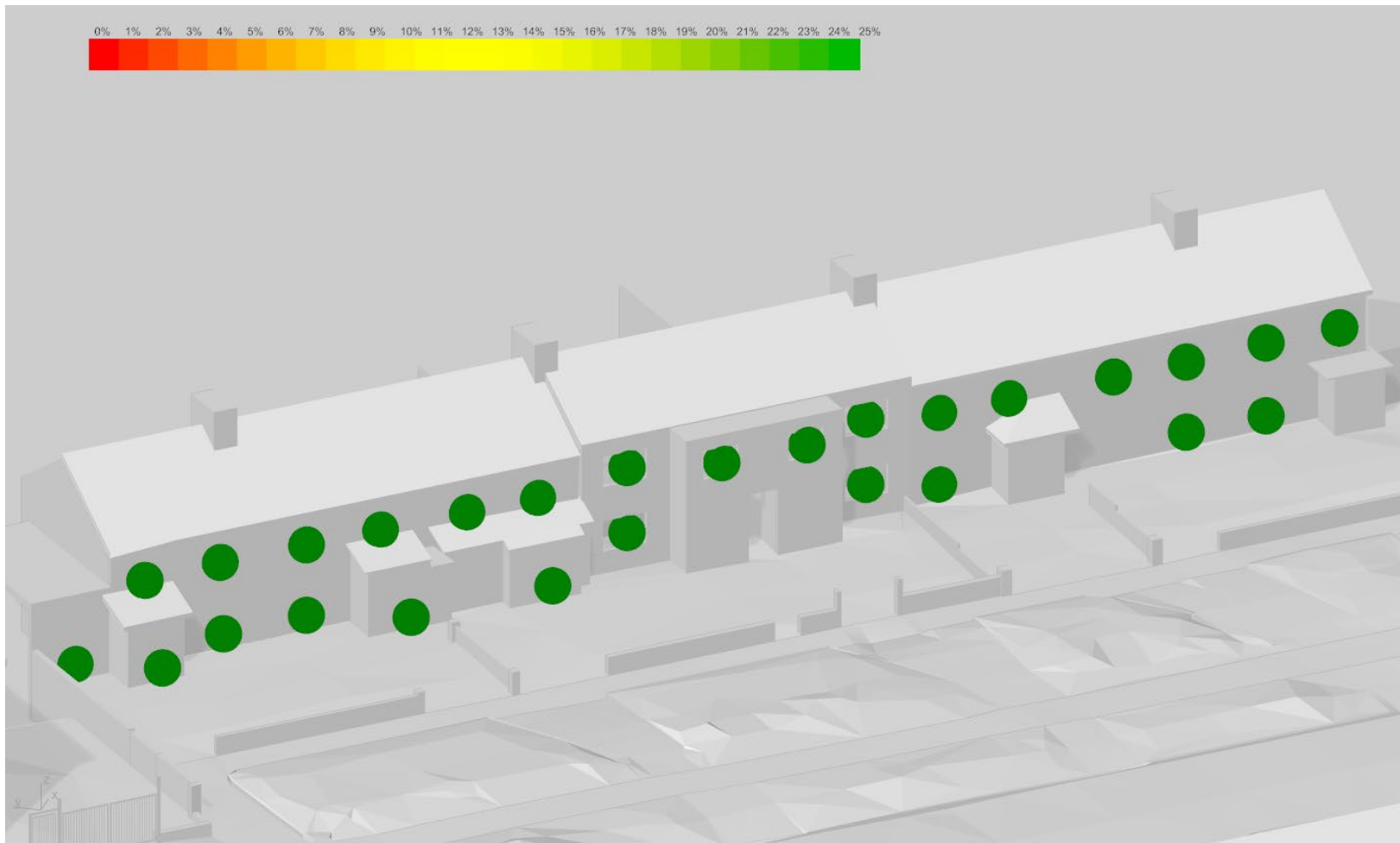


Figure 84: APSH Proposed - Part 3



Figure 85: APSH Baseline - Part 4



Figure 86: APSH Proposed - Part 4

WPSH

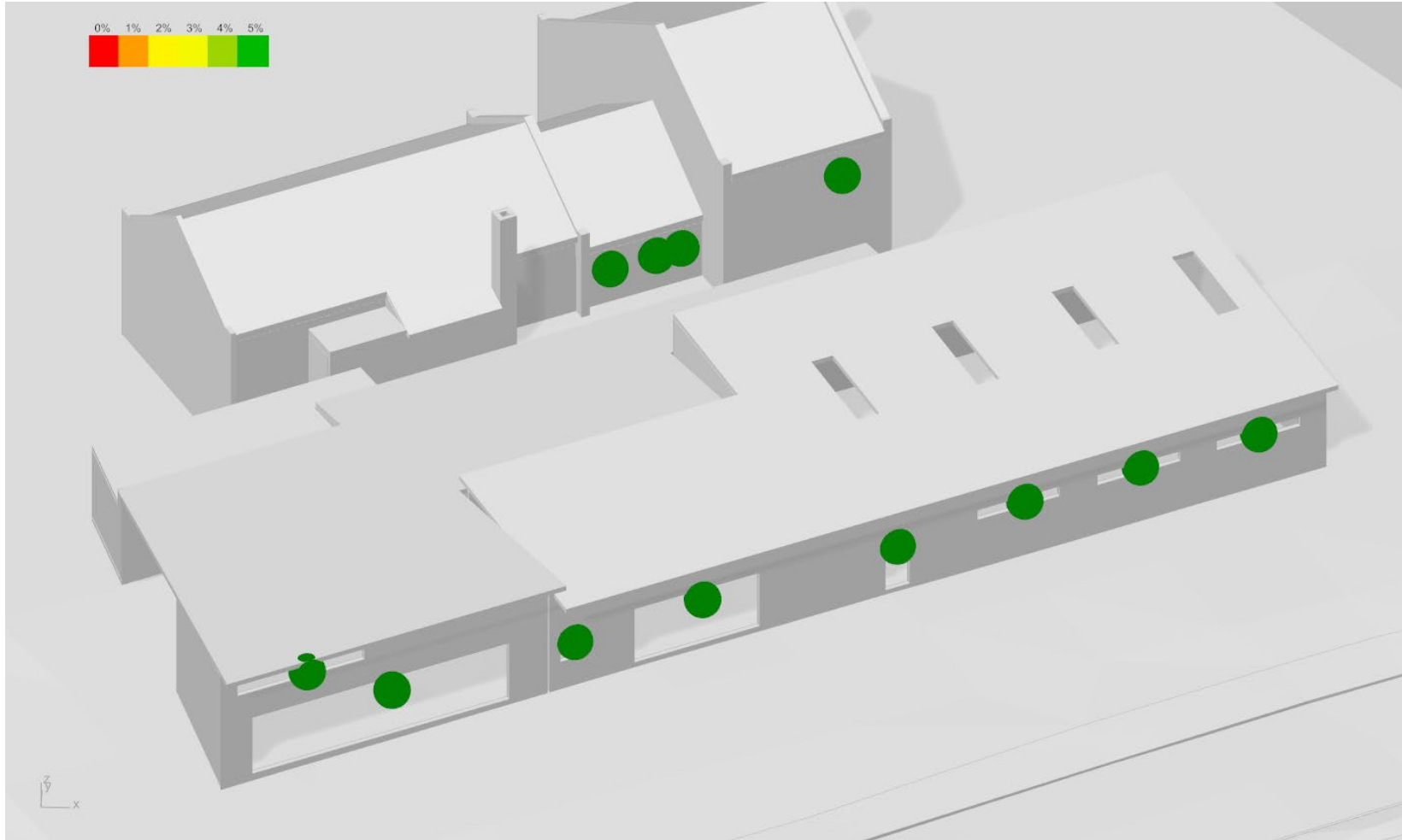


Figure 87: WPSH Baseline - Part 1

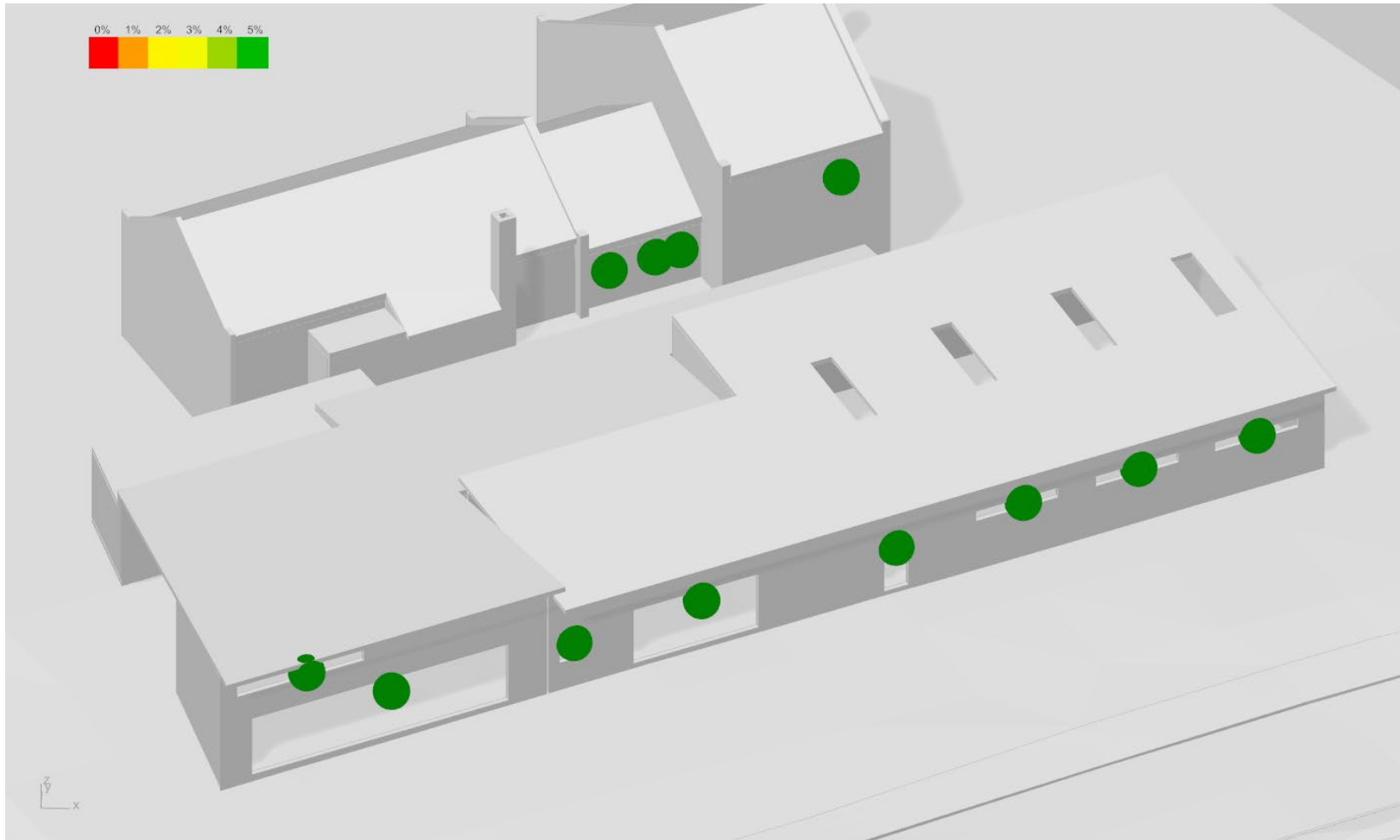


Figure 88: WPSH Proposed - Part 1

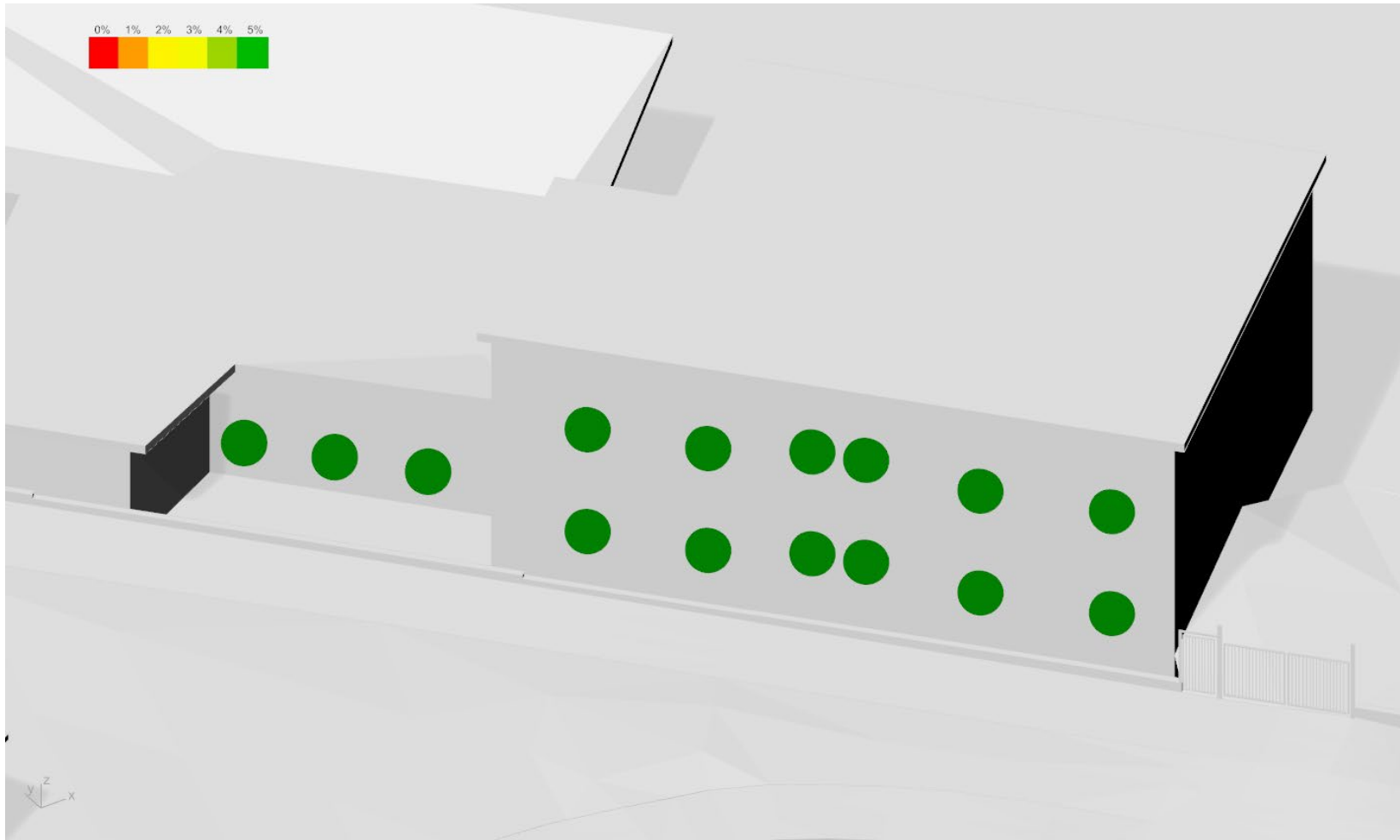


Figure 89: WPSH Baseline - Part 2

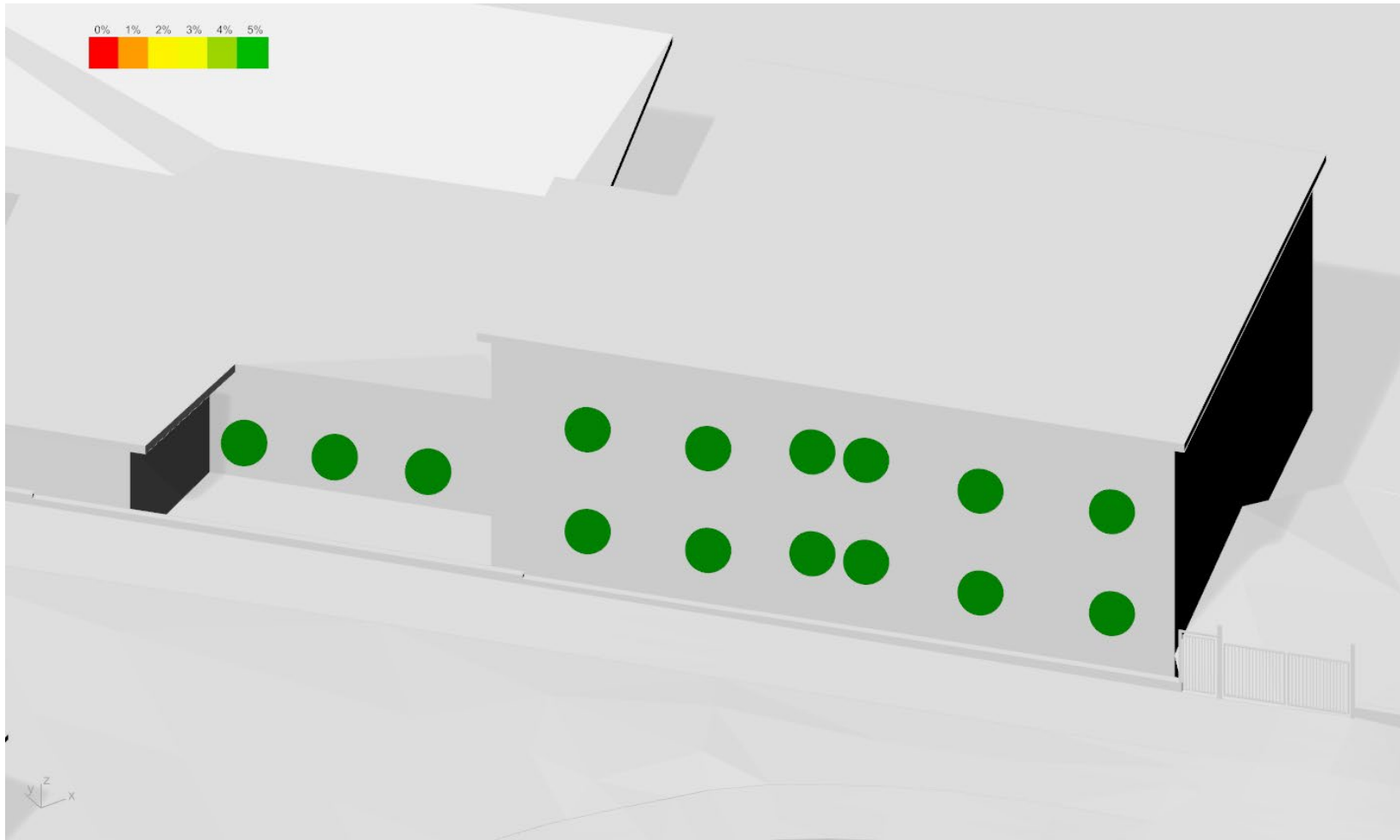


Figure 90: WPSH Proposed - Part 2

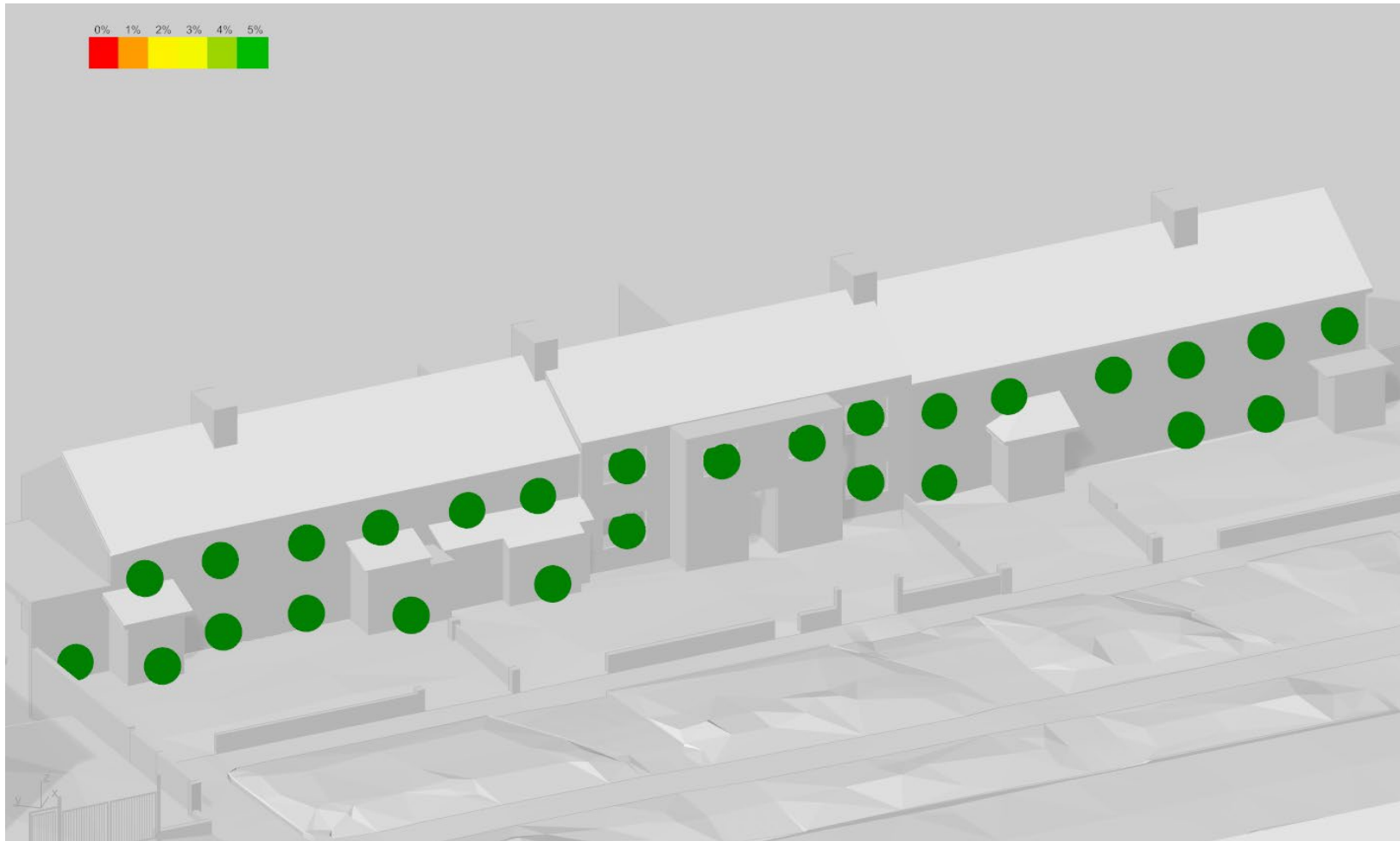


Figure 91: WPSH Baseline - Part 3

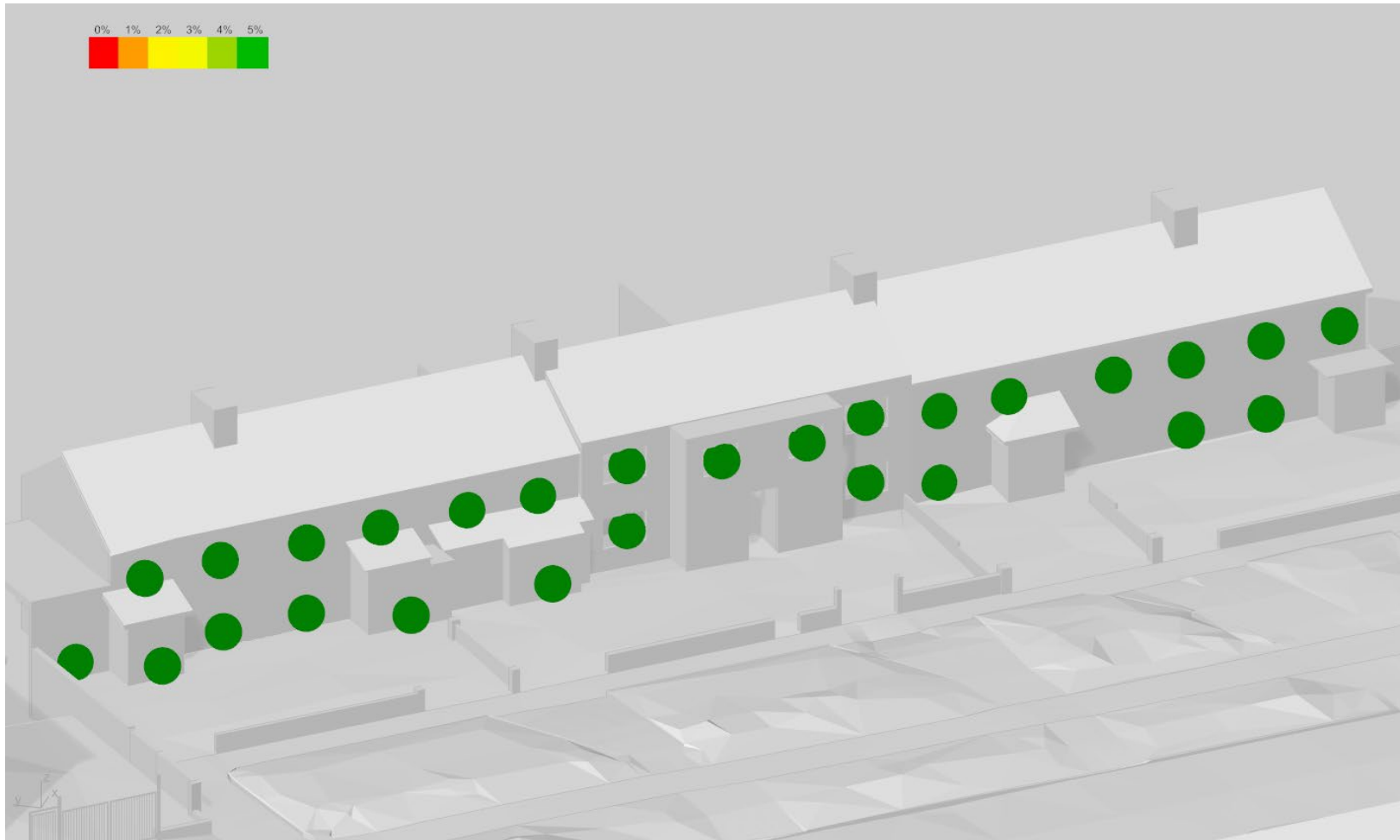


Figure 92: WPSH Proposed - Part 3

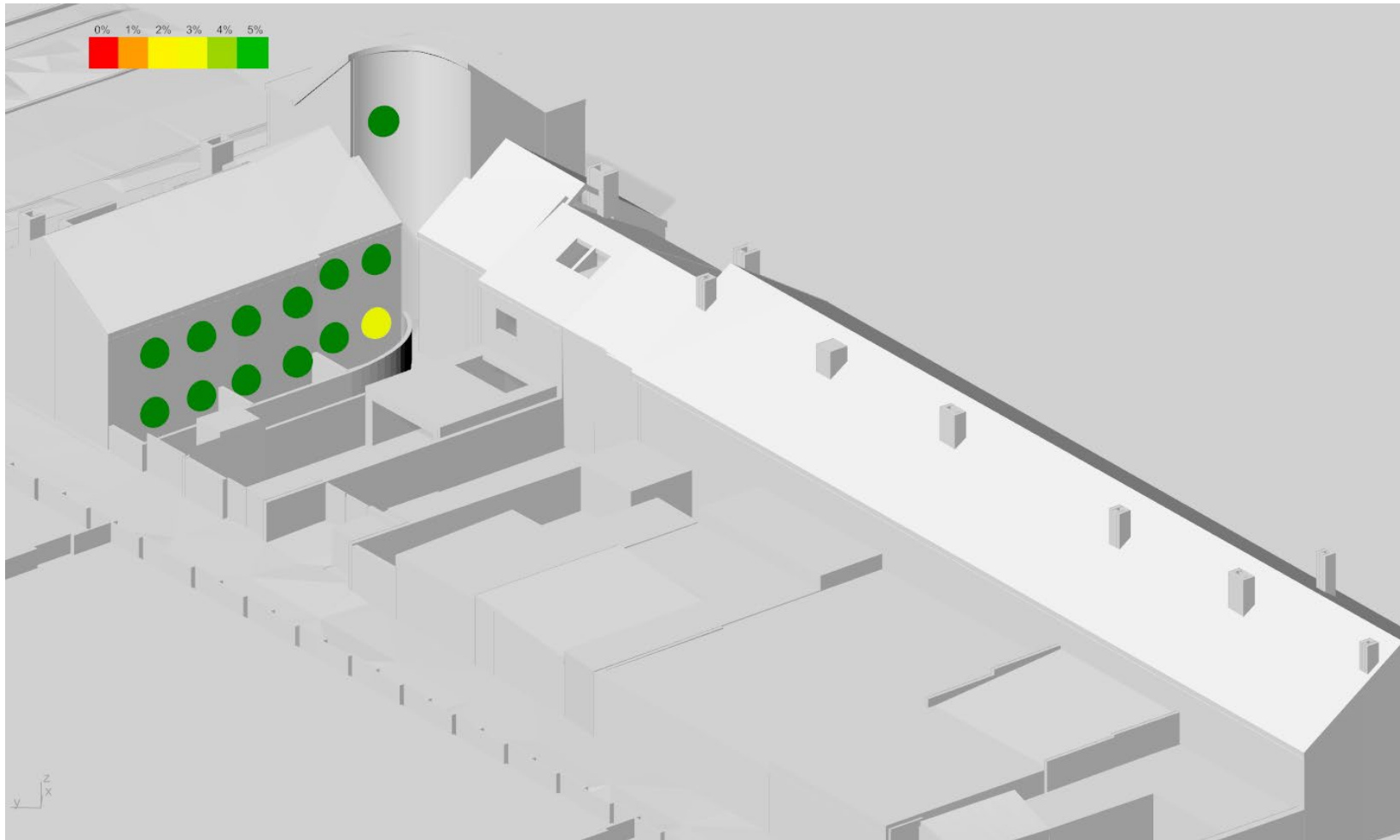


Figure 93: WPSH Baseline - Part 4

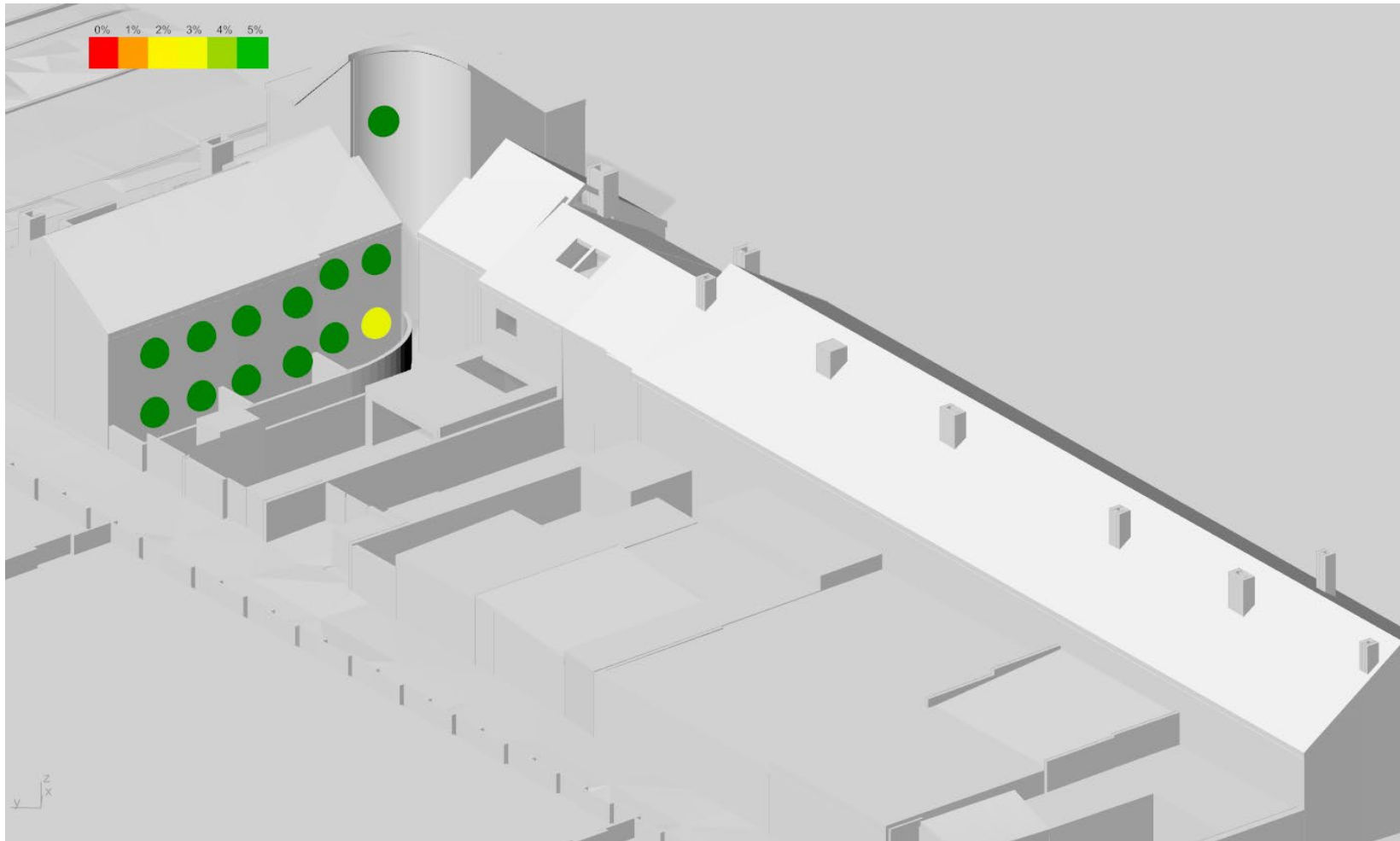


Figure 94: WPSH Proposed - Part 4

Tabulated

The following tables present the A&W PSH results for each window of the surrounding buildings for the baseline and proposed site conditions. When assessing if a point either meets or does not meet the minimum recommendation, the methods given in the methodology section of the body of the report should be applied.

Building Reference	Point	Annual				Winter				Meets Minimum Recommendation?
		Target	Baseline	Proposed	Ratio	Target	Baseline	Proposed	Ratio	
Cara Hall, All Saints Drive	1	25	59	59	1.00	5	15	15	1.00	Meets Minimum Recommendation
Cara Hall, All Saints Drive	2	25	60	60	1.00	5	15	15	1.00	Meets Minimum Recommendation
Cara Hall, All Saints Drive	3	25	54	54	1.00	5	16	16	1.00	Meets Minimum Recommendation
Cara Hall, All Saints Drive	4	25	82	82	1.00	5	27	27	1.00	Meets Minimum Recommendation
Athletics Club, All Saints Drive	5	25	75	66	0.88	5	27	18	0.67	Meets Minimum Recommendation
Athletics Club, All Saints Drive	6	25	71	61	0.86	5	28	18	0.64	Meets Minimum Recommendation
Athletics Club, All Saints Drive	7	25	71	62	0.87	5	28	19	0.68	Meets Minimum Recommendation
Athletics Club, All Saints Drive	8	25	67	63	0.94	5	28	24	0.86	Meets Minimum Recommendation
Athletics Club, All Saints Drive	9	25	65	60	0.92	5	28	23	0.82	Meets Minimum Recommendation
Athletics Club, All Saints Drive	10	25	69	61	0.88	5	28	20	0.71	Meets Minimum Recommendation
Athletics Club, All Saints Drive	11	25	80	72	0.90	5	29	21	0.72	Meets Minimum Recommendation
Athletics Club, All Saints Drive	12	25	67	63	0.94	5	28	24	0.86	Meets Minimum Recommendation
Naí Scoil Íde, All Saints Drive	13	25	73	66	0.90	5	21	14	0.67	Meets Minimum Recommendation
Naí Scoil Íde, All Saints Drive	14	25	74	65	0.88	5	24	15	0.63	Meets Minimum Recommendation
Naí Scoil Íde, All Saints Drive	15	25	74	67	0.91	5	25	18	0.72	Meets Minimum Recommendation
Naí Scoil Íde, All Saints Drive	16	25	74	68	0.92	5	25	19	0.76	Meets Minimum Recommendation
Naí Scoil Íde, All Saints Drive	17	25	55	51	0.93	5	16	12	0.75	Meets Minimum Recommendation
Naí Scoil Íde, All Saints Drive	18	25	65	61	0.94	5	22	18	0.82	Meets Minimum Recommendation
Naí Scoil Íde, All Saints Drive	19	25	67	64	0.96	5	22	19	0.86	Meets Minimum Recommendation

Building Reference	Point	Annual				Winter				Meets Minimum Recommendation?
		Target	Baseline	Proposed	Ratio	Target	Baseline	Proposed	Ratio	
Naí Scoil Íde, All Saints Drive	20	25	75	68	0.91	5	25	18	0.72	Meets Minimum Recommendation
Naí Scoil Íde, All Saints Drive	21	25	74	67	0.91	5	25	18	0.72	Meets Minimum Recommendation
Naí Scoil Íde, All Saints Drive	22	25	77	73	0.95	5	25	21	0.84	Meets Minimum Recommendation
Naí Scoil Íde, All Saints Drive	23	25	73	70	0.96	5	25	22	0.88	Meets Minimum Recommendation
Naí Scoil Íde, All Saints Drive	24	25	73	71	0.97	5	25	23	0.92	Meets Minimum Recommendation
Naí Scoil Íde, All Saints Drive	25	25	73	70	0.96	5	25	22	0.88	Meets Minimum Recommendation
Naí Scoil Íde, All Saints Drive	26	25	73	71	0.97	5	25	23	0.92	Meets Minimum Recommendation
Naí Scoil Íde, All Saints Drive	27	25	73	71	0.97	5	25	23	0.92	Meets Minimum Recommendation
1-15 All Saints Park	28	25	65	61	0.94	5	18	16	0.89	Meets Minimum Recommendation
1-15 All Saints Park	29	25	74	71	0.96	5	24	22	0.92	Meets Minimum Recommendation
1-15 All Saints Park	30	25	61	60	0.98	5	14	13	0.93	Meets Minimum Recommendation
1-15 All Saints Park	31	25	75	72	0.96	5	23	21	0.91	Meets Minimum Recommendation
1-15 All Saints Park	32	25	77	71	0.92	5	24	19	0.79	Meets Minimum Recommendation
1-15 All Saints Park	33	25	55	51	0.93	5	15	11	0.73	Meets Minimum Recommendation
1-15 All Saints Park	34	25	73	69	0.95	5	23	19	0.83	Meets Minimum Recommendation
1-15 All Saints Park	35	25	68	65	0.96	5	22	19	0.86	Meets Minimum Recommendation
1-15 All Saints Park	36	25	43	40	0.93	5	14	11	0.79	Meets Minimum Recommendation
1-15 All Saints Park	37	25	67	65	0.97	5	24	22	0.92	Meets Minimum Recommendation
1-15 All Saints Park	38	25	52	49	0.94	5	15	12	0.80	Meets Minimum Recommendation
1-15 All Saints Park	39	25	75	73	0.97	5	25	23	0.92	Meets Minimum Recommendation
1-15 All Saints Park	40	25	75	72	0.96	5	25	22	0.88	Meets Minimum Recommendation
1-15 All Saints Park	41	25	75	72	0.96	5	25	22	0.88	Meets Minimum Recommendation

Building Reference	Point	Annual				Winter				Meets Minimum Recommendation?
		Target	Baseline	Proposed	Ratio	Target	Baseline	Proposed	Ratio	
1-15 All Saints Park	42	25	77	76	0.99	5	25	25	1.00	Meets Minimum Recommendation
1-15 All Saints Park	43	25	75	72	0.96	5	25	22	0.88	Meets Minimum Recommendation
1-15 All Saints Park	44	25	77	75	0.97	5	25	24	0.96	Meets Minimum Recommendation
1-15 All Saints Park	45	25	74	71	0.96	5	24	21	0.88	Meets Minimum Recommendation
1-15 All Saints Park	46	25	75	72	0.96	5	25	22	0.88	Meets Minimum Recommendation
1-15 All Saints Park	47	25	75	72	0.96	5	25	22	0.88	Meets Minimum Recommendation
1-15 All Saints Park	48	25	73	70	0.96	5	25	22	0.88	Meets Minimum Recommendation
1-15 All Saints Park	49	25	70	67	0.96	5	25	22	0.88	Meets Minimum Recommendation
1-15 All Saints Park	50	25	73	70	0.96	5	25	22	0.88	Meets Minimum Recommendation
1-15 All Saints Park	51	25	68	65	0.96	5	25	22	0.88	Meets Minimum Recommendation
1-15 All Saints Park	52	25	67	64	0.96	5	17	14	0.82	Meets Minimum Recommendation
1-15 All Saints Park	53	25	75	71	0.95	5	25	21	0.84	Meets Minimum Recommendation
1-15 All Saints Park	54	25	77	73	0.95	5	25	21	0.84	Meets Minimum Recommendation
1-9 All Saints Close	58	25	36	32	0.89	5	3	3	1.00	Meets Minimum Recommendation
1-9 All Saints Close	59	25	50	47	0.94	5	5	5	1.00	Meets Minimum Recommendation
1-9 All Saints Close	60	25	57	53	0.93	5	8	8	1.00	Meets Minimum Recommendation
1-9 All Saints Close	61	25	63	57	0.90	5	14	14	1.00	Meets Minimum Recommendation
1-9 All Saints Close	62	25	67	59	0.88	5	18	18	1.00	Meets Minimum Recommendation
1-9 All Saints Close	63	25	64	55	0.86	5	15	15	1.00	Meets Minimum Recommendation
1-9 All Saints Close	71	25	71	67	0.94	5	20	20	1.00	Meets Minimum Recommendation
1-9 All Saints Close	72	25	70	66	0.94	5	22	22	1.00	Meets Minimum Recommendation
1-9 All Saints Close	73	25	73	69	0.95	5	25	25	1.00	Meets Minimum Recommendation

Building Reference	Point	Annual				Winter				Meets Minimum Recommendation?
		Target	Baseline	Proposed	Ratio	Target	Baseline	Proposed	Ratio	
1-9 All Saints Close	74	25	73	66	0.90	5	25	25	1.00	Meets Minimum Recommendation
1-9 All Saints Close	75	25	55	52	0.95	5	10	10	1.00	Meets Minimum Recommendation

A.2.2.3 No Sky Line (NSL)

Imagery



Figure 95: Athletics Club - Baseline



Figure 96: Athletics Club - Proposed

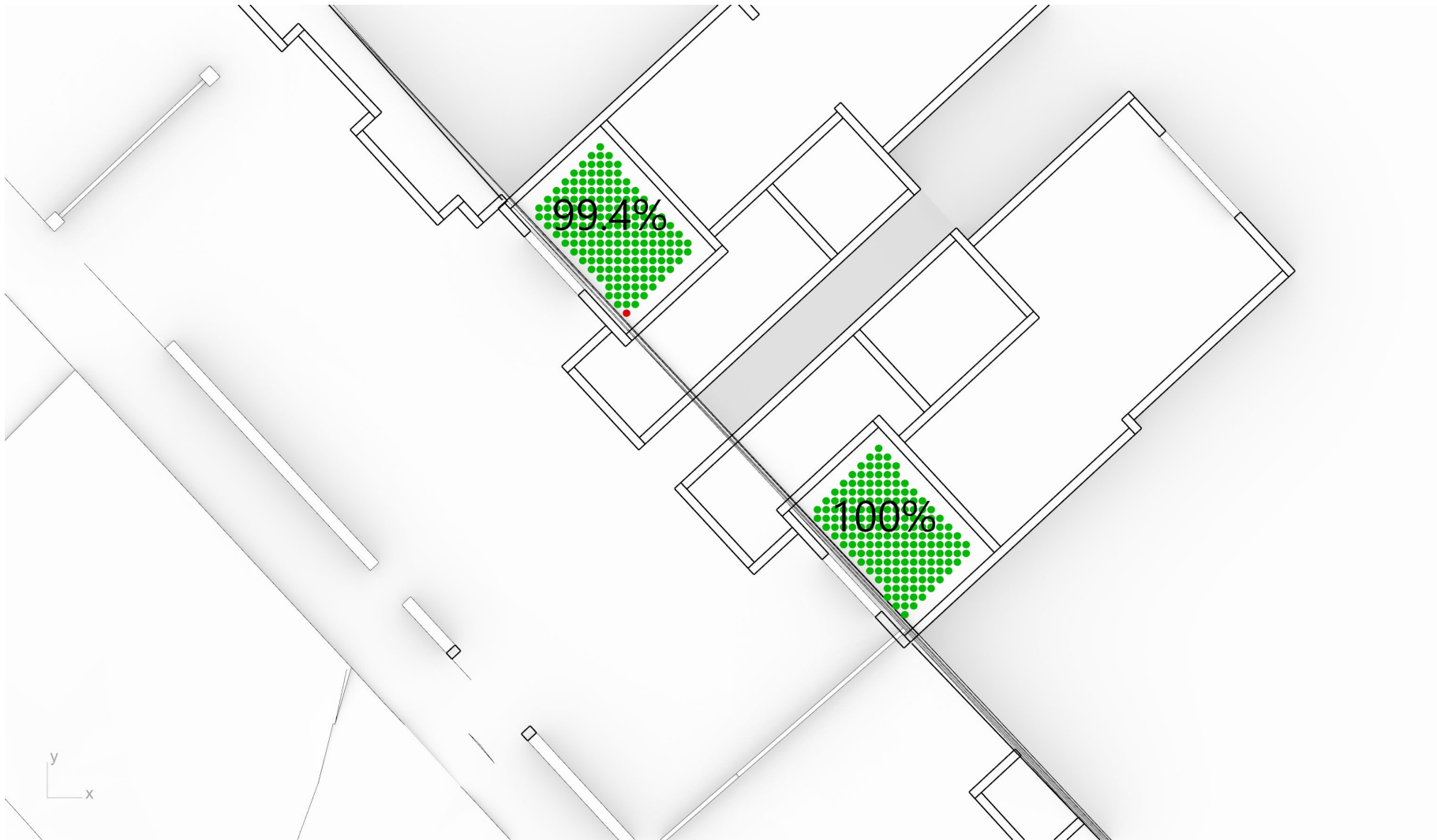


Figure 97: 7&9 All Saints Park 1 - Baseline

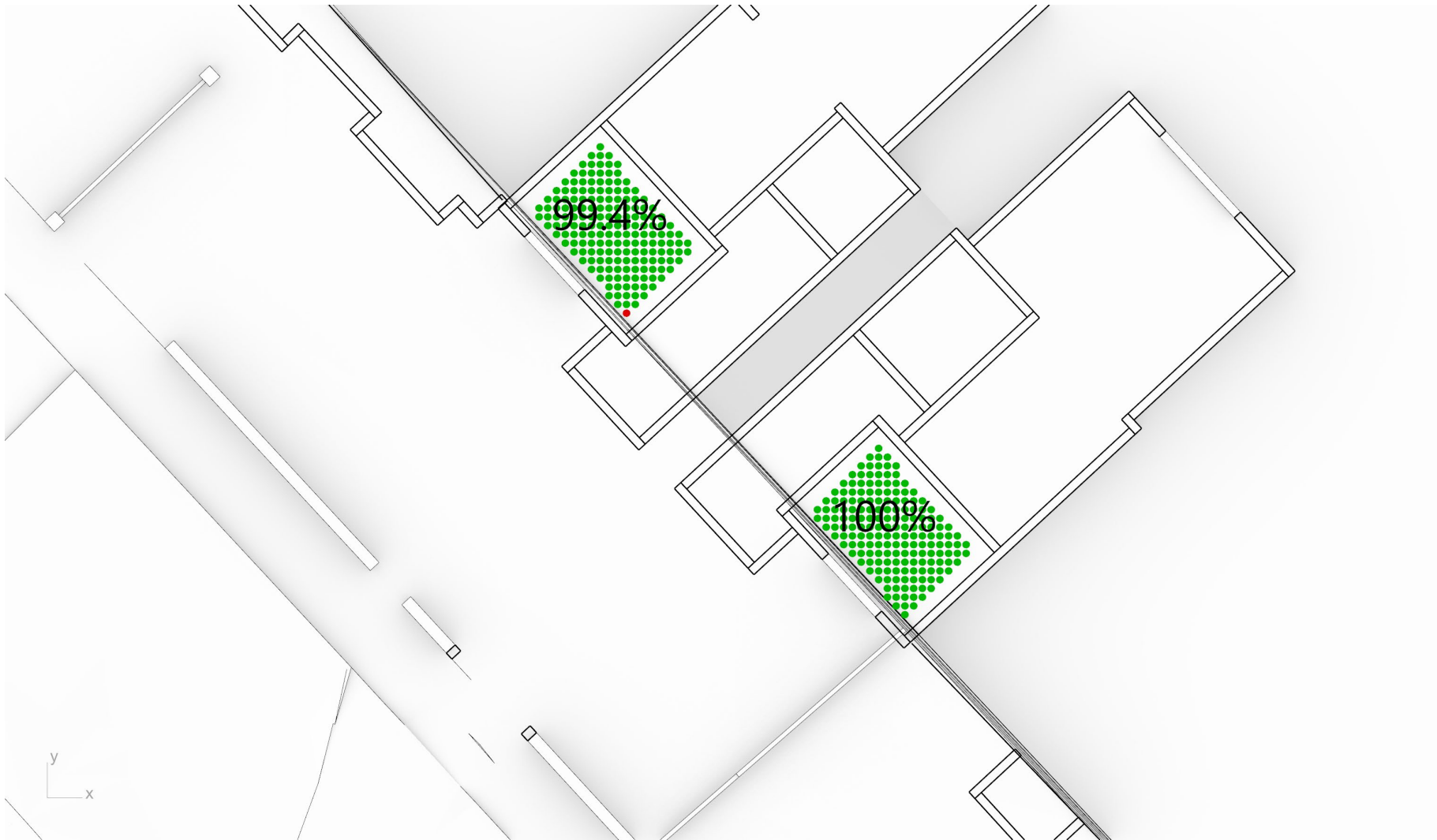


Figure 98: 7&9 All Saints Park 1 - Proposed

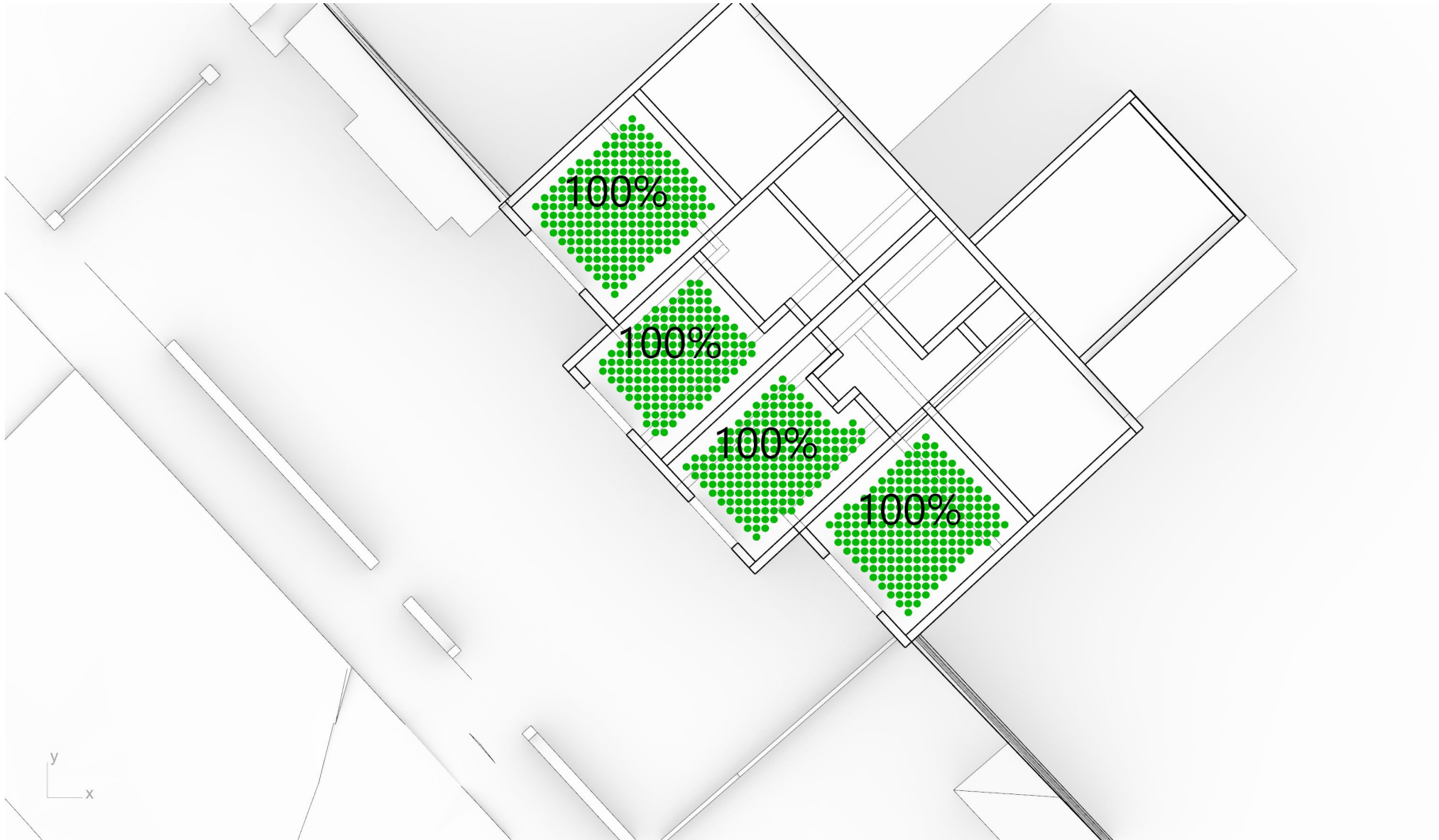


Figure 99: 7&9 All Saints Park 2 - Baseline

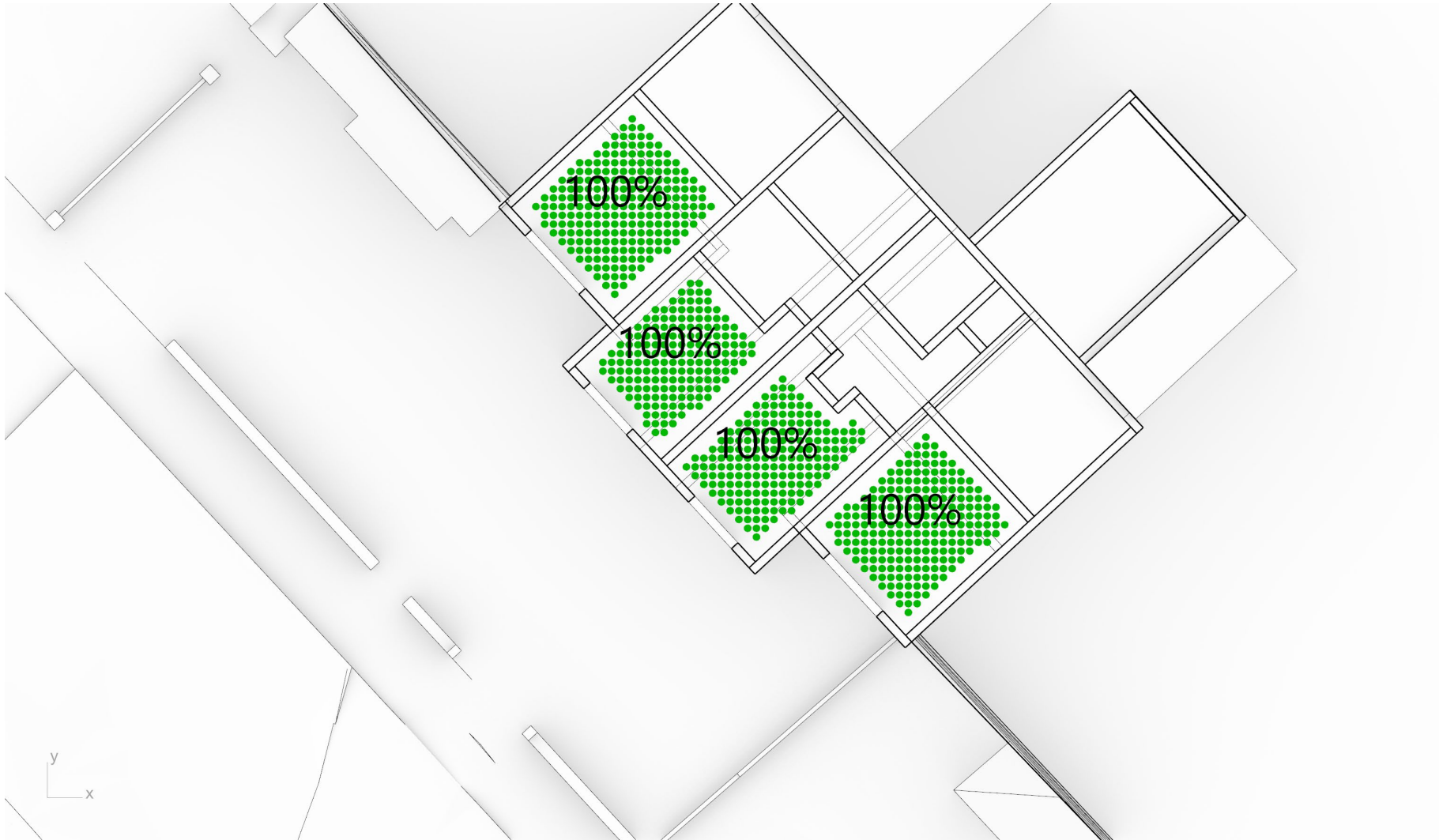


Figure 100: 7&9 All Saints Park 2 - Proposed

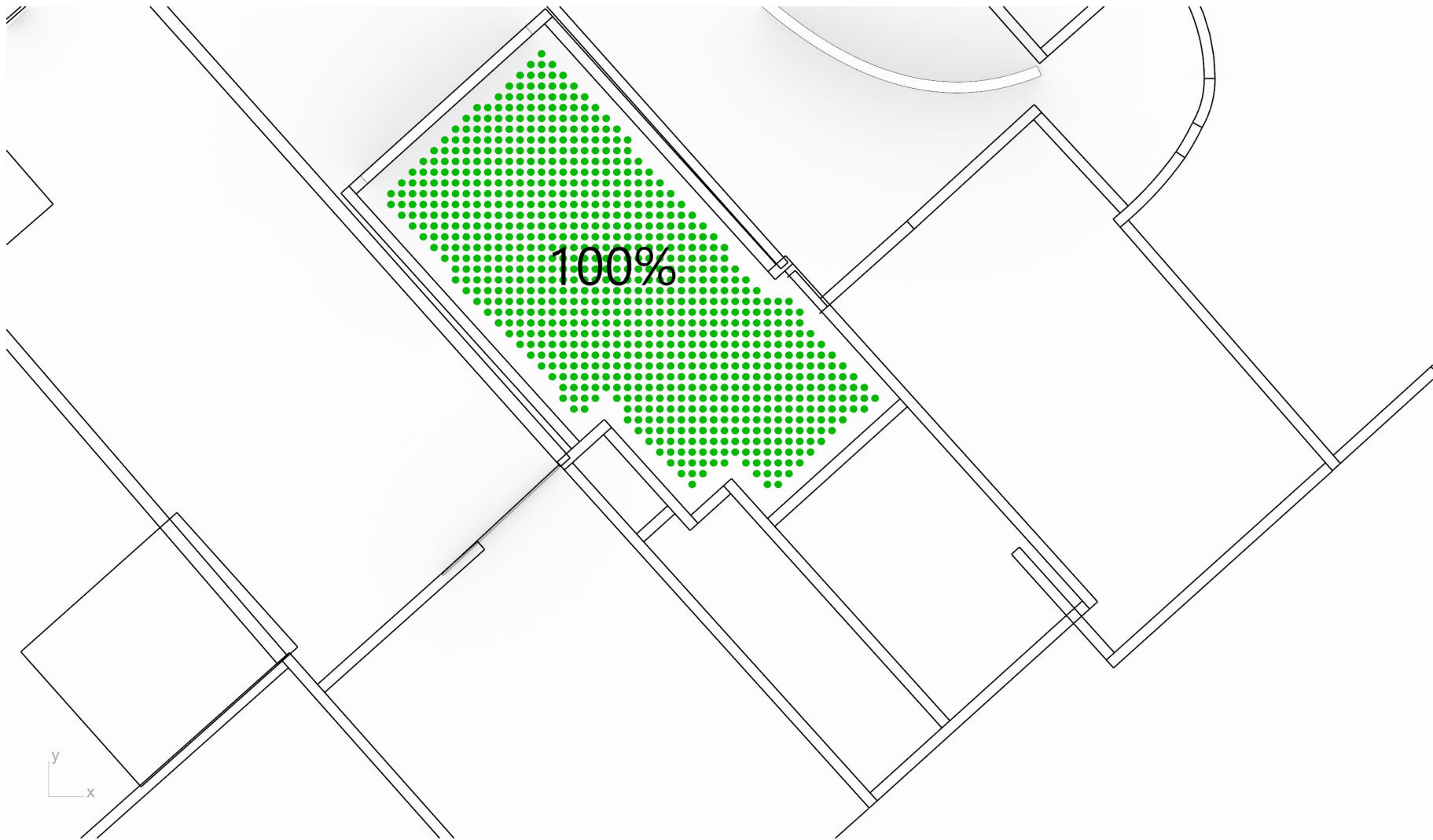


Figure 101: 8 All Saints Close 1 - Baseline

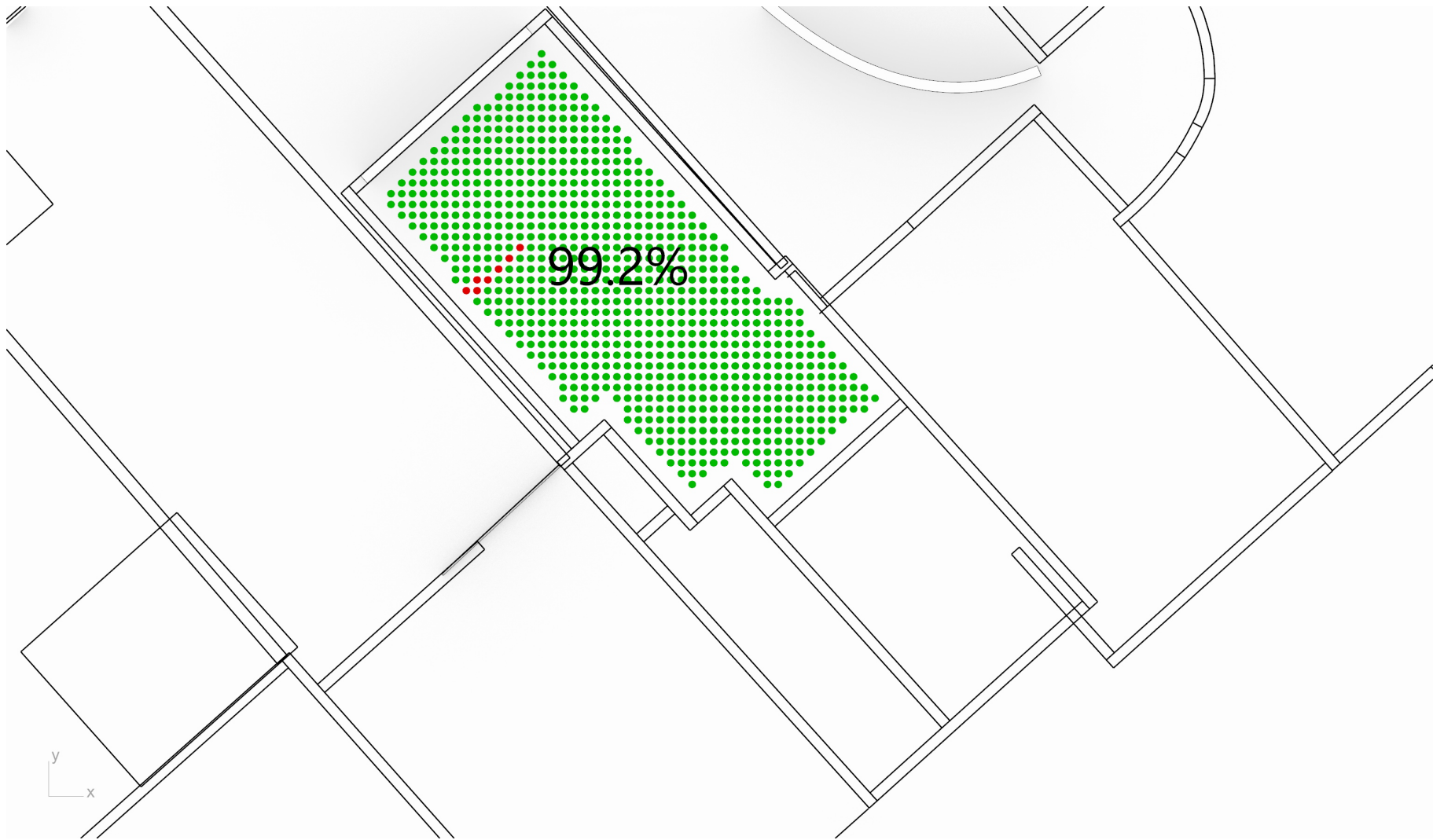


Figure 102: 8 All Saints Close 1 - Proposed

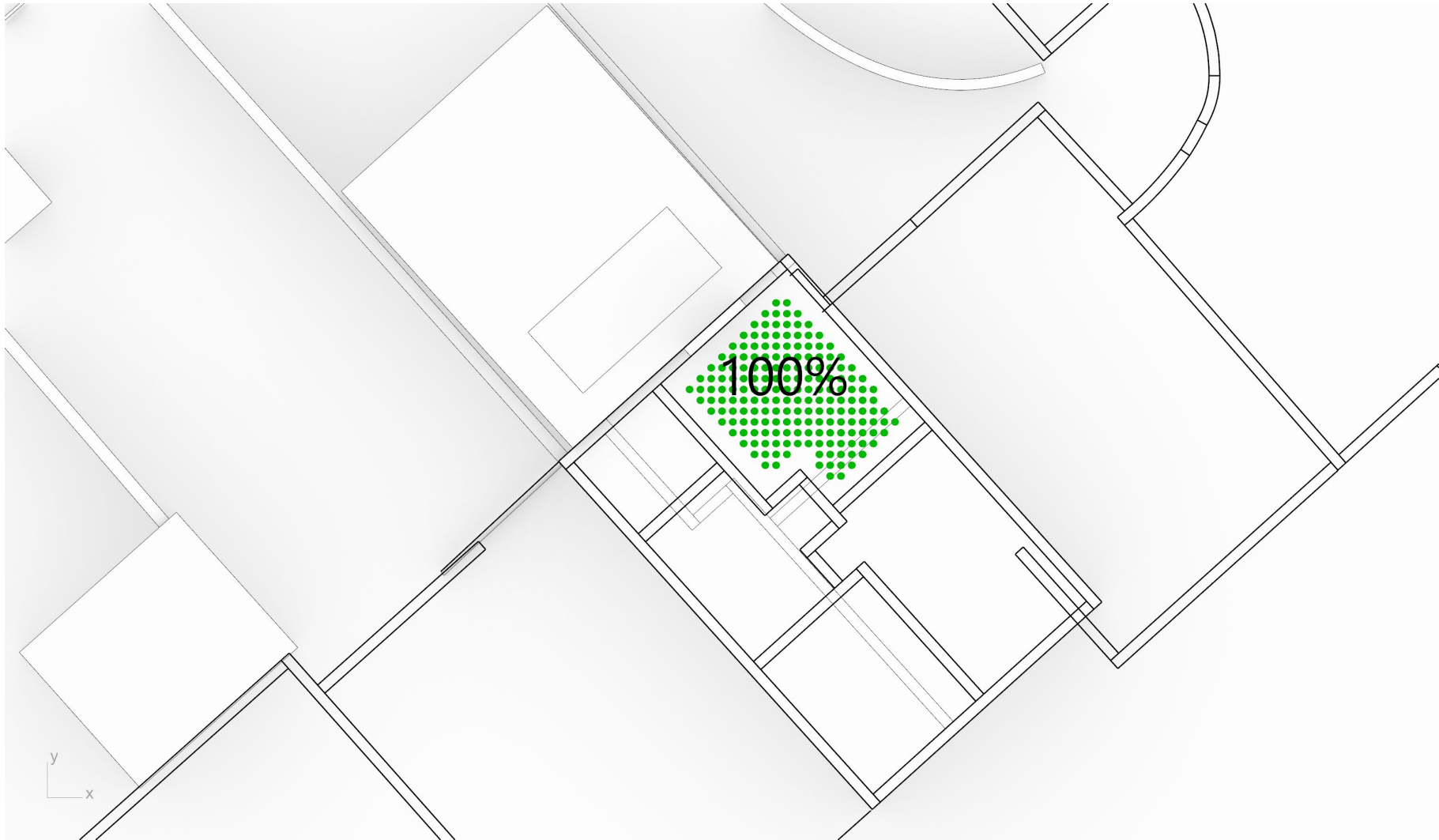


Figure 103: 8 All Saints Close 2 - Baseline

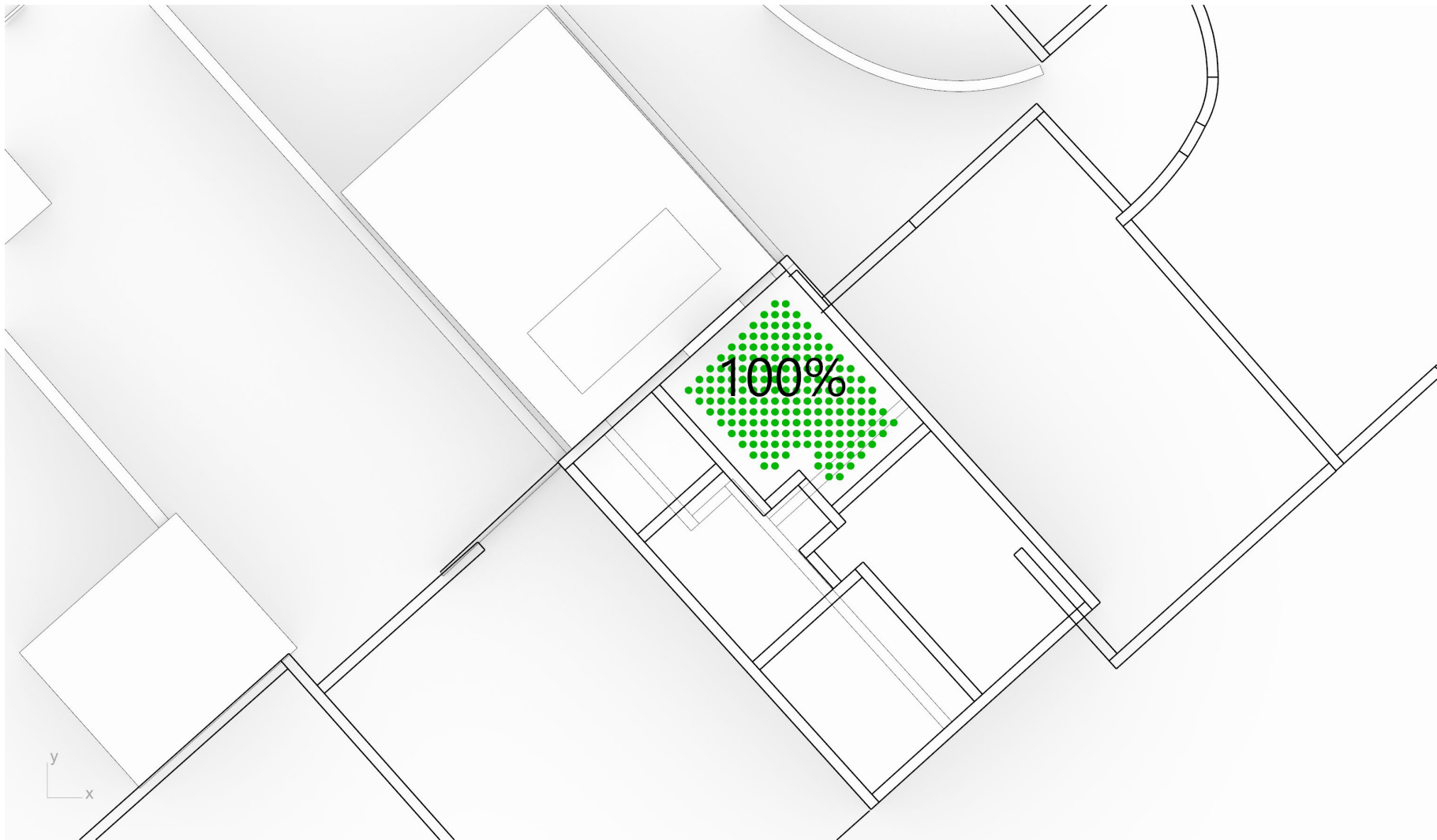


Figure 104: 8 All Saints Close 2 - Proposed

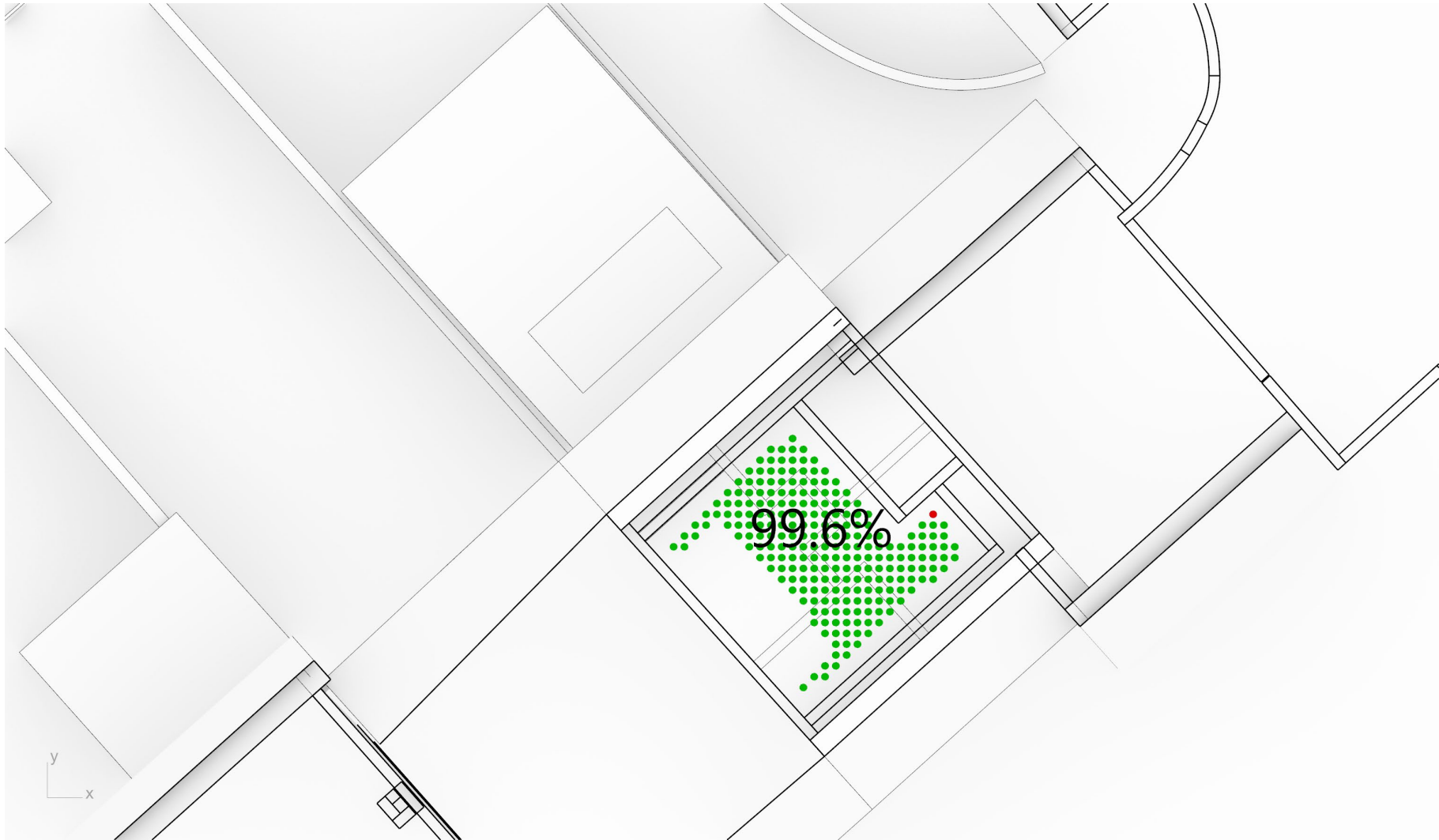


Figure 105: 8 All Saints Close 3 - Baseline

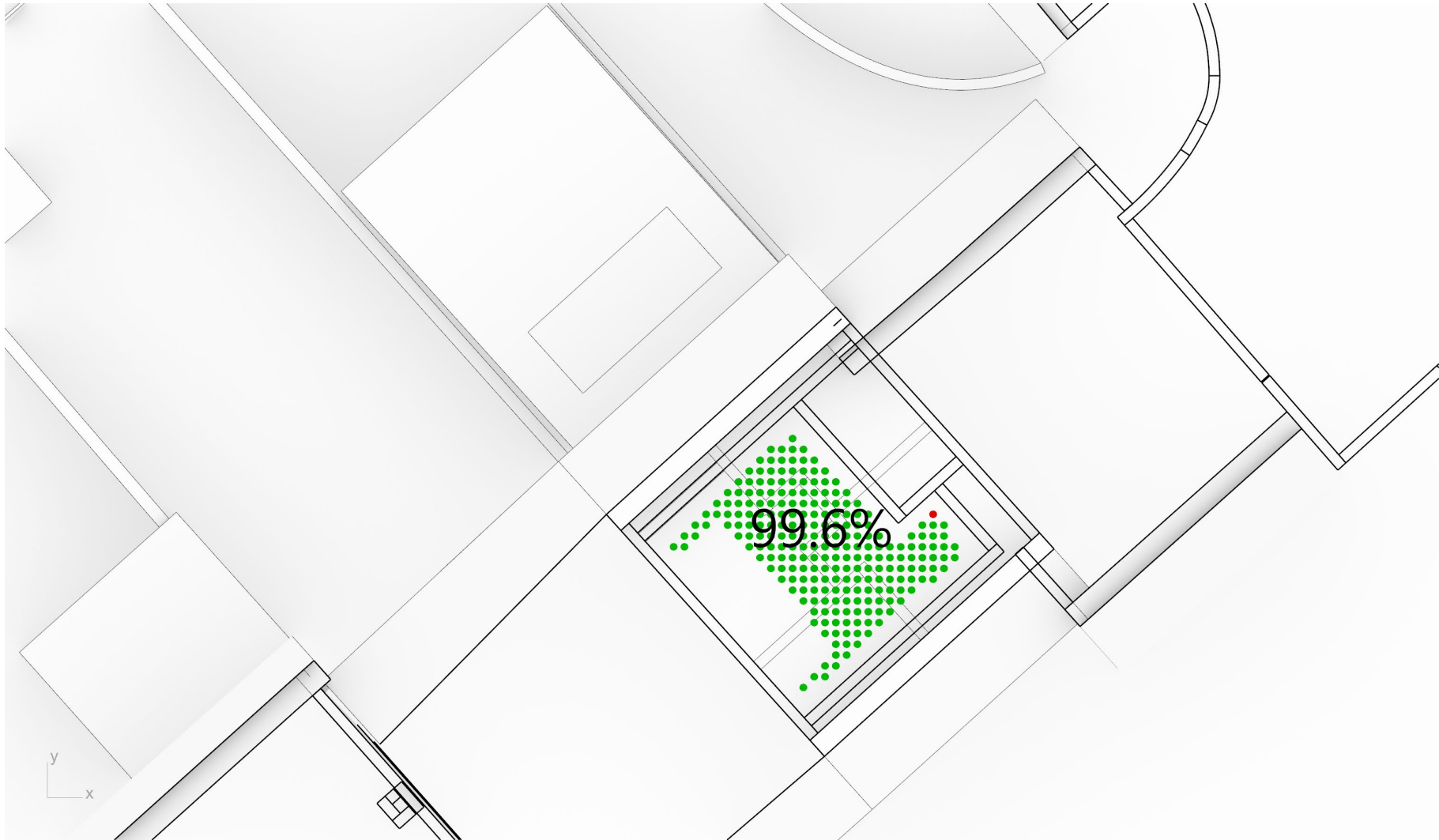


Figure 106: 8 All Saints Close 3 - Proposed

Tabulated

The following table presents the results for NSL in the baseline and proposed conditions. In assessing whether or not various spaces meet the minimum recommendations, the methods described in the body of the report have been applied. The points listed on the table can be cross referenced with the graphic underneath in order to determine the impact at specific locations.

Building Reference	Grid Reference	Baseline	Proposed	Ratio
Athletics Club, All Saints Drive	0	100	100	1.00
Athletics Club, All Saints Drive	1	100	100	1.00
Athletics Club, All Saints Drive	2	100	74	0.74
Athletics Club, All Saints Drive	3	100	100	1.00
8 All Saints Park	4	100	99	0.99
9 All Saints Park	5	100	100	1.00
10 All Saints Park	6	100	100	1.00
7&9 All Saints Park	7	99	99	1.00
7&9 All Saints Park	8	100	100	1.00
7&9 All Saints Park	9	100	100	1.00
7&9 All Saints Park	10	100	100	1.00
7&9 All Saints Park	11	100	100	1.00
7&9 All Saints Park	12	100	100	1.00

A.2.2.4 Sunlight in Amenity Areas

Imagery



Figure 107: Existing, Part 1 – Sunlight in Amenity Areas (21st March)

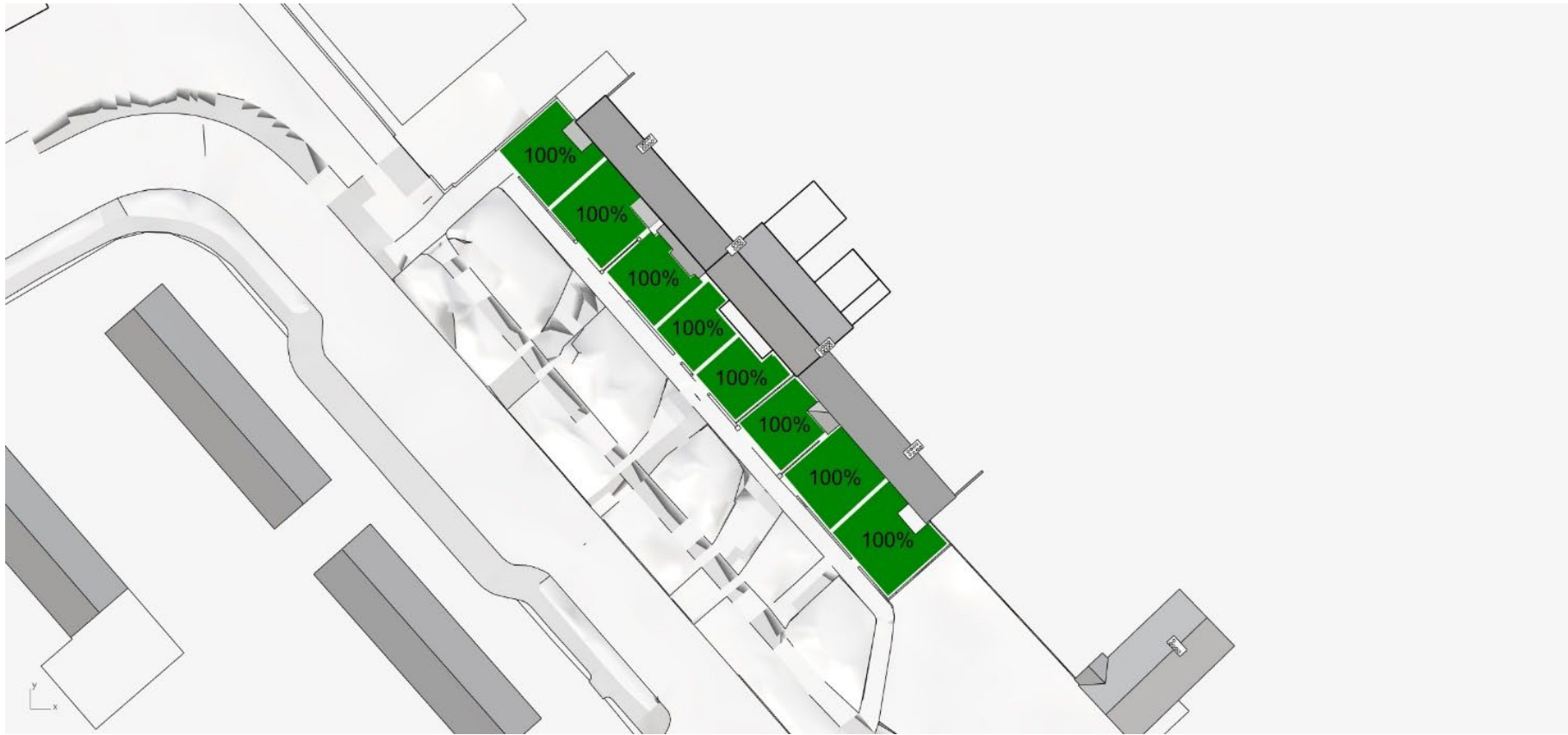


Figure 108: Proposed, Part 1 – Sunlight in Amenity Areas (21st March)

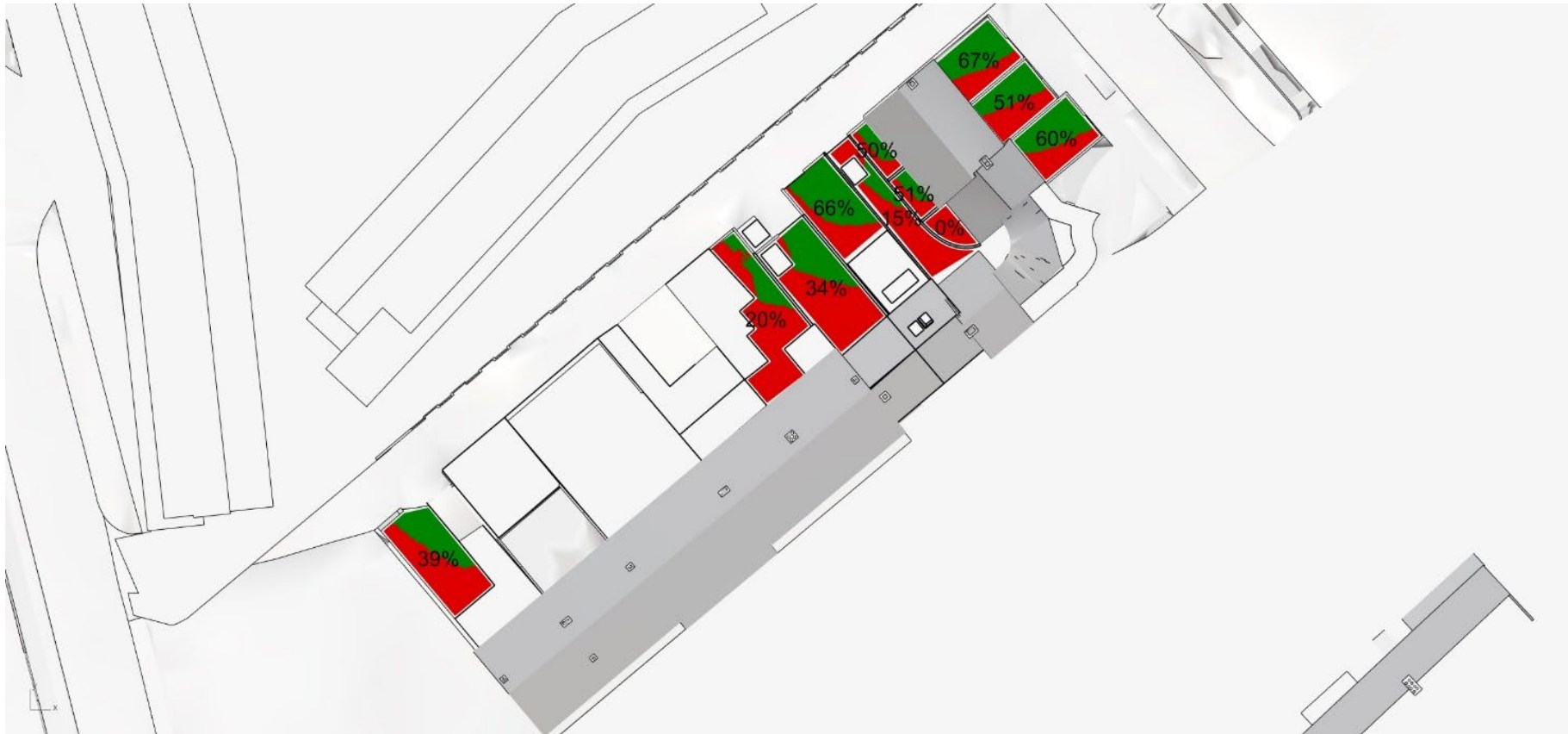


Figure 109: Existing, Part 2 – Sunlight in Amenity Areas (21st March)



Figure 110: Proposed, Part 2 – Sunlight in Amenity Areas (21st March)

Tabulated

The following tables present the SiAA results for each amenity space in the surrounding context for the baseline and proposed site conditions, with the assessment date set to 21st March. When assessing if a space either meets or does not meet the minimum recommendation, the methods given in the methodology section of the body of the report should be applied.

Grid Reference	Baseline	Proposed	Ratio
0	50%	50%	1.00
1	51%	51%	1.00
2	100%	100%	1.00
3	100%	100%	1.00
4	100%	100%	1.00
5	39%	39%	1.00
6	20%	20%	1.00
7	34%	34%	1.00
8	66%	66%	1.00
9	15%	15%	1.00
10	0%	0%	1.00
11	67%	67%	1.00
12	51%	51%	1.00
13	60%	60%	1.00
14	100%	100%	1.00
15	100%	100%	1.00
16	100%	100%	1.00
17	100%	100%	1.00
18	100%	100%	1.00