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INTERNAL DAYLIGHT REPORT

North London Business Park

Brunswick Park, East Barnet N11 1GN

August 2021

Contents

1. Introduction

1.1. This practice has been instructed to provide an assessment of the internal daylighting levels to the proposed accommodation at North London Business Park, Brunswick Park, East Barnet.

1.2. These assessments are based upon the Plus Architecture proposals dated August 2021 and focus on the Phase 1 Detailed Application at Blocks 1B, 1C, 1D, 1E & 1F.

1.3. The current scheme comprises the provision of additional storeys to the existing hybrid consent which was approved at appeal (APP/N5090/W/17/3189843) in 2020.

1.4. The current proposals consist of the following:

'Hybrid planning application for the phased comprehensive redevelopment of the North London Business Park to deliver a residential-led mixed use development. The detailed element comprises up to 461 residential units in five blocks reaching 9 storeys, the provision of a 5 form entry secondary school, a gymnasium, a multi-use sports pitch and associated changing facilities and improvements to open space and transport infrastructure, including improvements to the access from Brunswick Park Road and; the outline element comprises up to 1,967 additional residential units in buildings ranging from three to twelve storeys, up to 7,148 sqm of non-residential floor space (use Class E) and 20,250sqm of open space. Associated site preparation/enabling work, transport infrastructure and junction work, landscaping and car parking.'

1.5. The methodology and criteria used for these assessments is provided by Building Research Establishment's (BRE) guidance 'Site layout planning for daylight and sunlight: A guide to good practice' (BRE 209 2nd edition, 2011).

1.6. In order to carry out an assessment, we have generated a 3D computer model (Test Environment) of the existing site, the key surrounding properties and the proposed scheme. Using this model and our specialist software, we have calculated the daylight and sunlight levels within the proposed scheme.

1.7. The numerical criteria suggested within the BRE guidelines has been applied to each of the assessments mentioned above. It is important to note that these guidelines are not a rigid set of rules, but are advisory and need to be applied flexibly according to the specific context of a site.

2. Technical Guidance

Site layout planning for daylight and sunlight: a guide to good practice, BRE 2011

2.1. As noted at 1.6 (above) the nationally recognised criteria used for quantifying daylight, sunlight and shading effects as a result of construction are provided by the Building Research Establishments guidance 'Site layout planning for daylight and sunlight: a guide to good practice' (BRE, 2011).

2.2. This document follows from previous guidance produced by Her Majesty's Stationary Office (HMSO) on daylight and sunlight in the built environment and is the accepted methodology used by local authorities for assessing daylight and sunlight in relation to new developments. It provides methods for the calculation of daylight and sunlight impacts of development upon existing surrounding properties and within proposed new dwellings.

Policy Context

2.3. It is important to note that the guidelines set out in the BRE document are to be applied flexibly and weighed in the balance against other design factors.

2.4. The opening paragraphs of the BRE guidelines state: -

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

2.5. It is important to note that the BRE guidelines for daylight and sunlight is not intended to be an absolute bar on amenity levels and the numerical values provided are purely advisory such that the guidelines should be interpreted 'sensibly and flexibly'. This flexible approach relating to daylight and sunlight is reflected in the National Planning Policy Framework (NPPF) 2019, paragraph 125 (c):

National Planning Policy Framework, 2021

2.6. The National Planning Policy Framework 2021 (NPPF) states:

"125 c) local planning authorities should refuse applications which they consider fail to make efficient use of land, taking into account the policies in this Framework. In this context, when considering applications for housing, authorities should take a flexible approach in applying policies or guidance relating to daylight and sunlight, where they would otherwise inhibit making efficient use of a site."

Internal Amenity Assessment

2.7. In respect of diffuse daylight, the Average Daylight Factor (ADF) method calculates the average illuminance within a room as a proportion of the illuminance available to an unobstructed point outdoors under a sky of known luminance and luminance distribution. This is the most detailed of the daylight calculations and considers the physical nature of the room behind the window, including; window transmittance, and surface reflectivity. The BRE guidance sets the following recommended ADF levels for habitable room uses: -

- Bedrooms – 1% ADF
- Main Living Rooms – 1.5% ADF
- Kitchens – 2% ADF

2.8. For multipurpose living / kitchen / diner arrangements the higher 2% 'kitchen' target can be difficult to achieve due to the depth of the internal space. It is therefore generally accepted that the 1.5% target for a main living room is more appropriate given this is the predominant use of the space and the kitchens are generally reliant on task lighting given their position to the rear.

3. Sources of Information

3.1. To calculate the Average Daylight Factor to the proposed units within the proposals we have used the proposed floorplans provided by Plus Architecture to determine the room surface areas, the window glazing areas and the external obstruction angles.

3.2. When considering the room surface reflectance and window transmittance, these have been assumed as follows:

<u>Reflectance Values:</u>

- Floor reflectance – 0.4 (light wood veneer)
- Wall reflectance – 0.81 (Pale Cream)
- Ceiling reflectance – 0.85 (white)

<u>Transmittance Value:</u>

- Window transmittance: 0.68 (double glazing)

3.3. Plots showing the location of each habitable room considered within the proposed blocks are attached at appendix 1.

4. The Site and Proposal

4.1. The site is located within Brunswick Park Ward in the east of the London Borough of Barnet and is bound by the East Coast Mainline railway along the entire western boundary, whilst the New Southgate Cemetery is adjacent to the eastern boundary.

4.2. The existing buildings on site provide a mix of uses including 4 buildings primarily providing office accommodation, ranging between 1 and 4-storeys in height, with the remaining buildings serving as a school and the northernmost building occupied for a variety of purposes such as function / conference rooms and a nursery.

4.3. The proposed hybrid application is for the phased comprehensive redevelopment of the site to provide a residential-led mixed use scheme ranging between 3 to 12-storeys in height comprising 2,412 residential units in total.

4.4. This is an extension to the existing planning permission granted at appeal in 2020 (APP/N5090/W/17/3189843). The image below shows the additional height being proposed in blue.

Image 1: 3D view of the consented scheme within its context with the blue areas indicating the additional accommodation proposed in the current application

4.5. We have worked with the architects providing detailed design steering advice in respect of the developing proposals in order to maximise the amenity for future occupants. This included ensuring appropriate window to room allocation within the existing consented buildings as well as optimising the internal room layouts to optimise the daylighting to the main living spaces.

5. Results

5.1. The results of our internal amenity calculations for each of the proposed buildings are attached at appendix 1.

5.2. The image below illustrates the proposed blocks we have considered as part of our assessments within the Phase 1 detailed application.

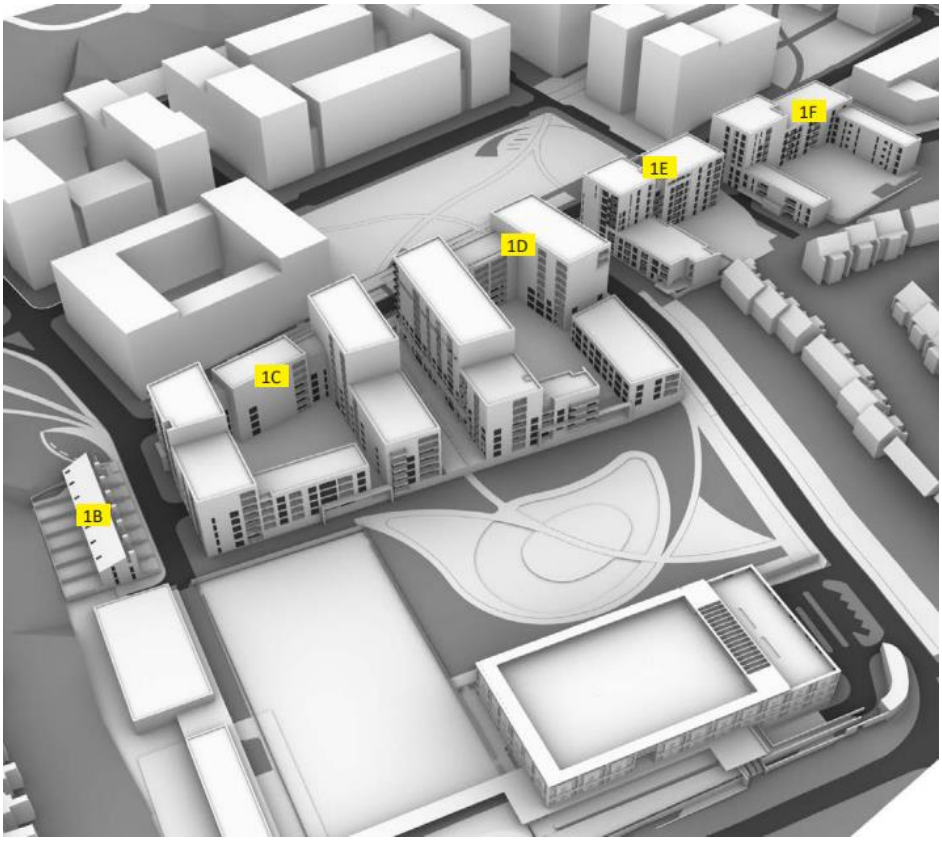

Image 2: 3D view of the detailed planning application

5.3. We have worked closely with the architects to maximise the daylight provision within the proposed residential units and this is reflected in the high level of compliance in respect of the Average Daylight Factor levels within the proposal.

5.4. The scheme has been designed to optimise the amenity to the main living spaces. Where the consented outline massing leads to closer relationships between the proposed buildings, balconies and winter gardens have been provided in front of the bedrooms to maximise the internal daylighting to the units.

5.5. For our technical assessments we have focussed on the lowest 4 levels within each block to give an indication of the levels of daylight amenity across the proposed scheme. Amenity levels will only improve to the upper-level units where outlook and sky visibility increases.

Block 1B

5.6. This 3-storey terraced block consists of 7 residential dwellings and is located to the south of the site.

5.7. The results of our ADF calculations for this building show that all 43 of the proposed habitable rooms proposed will meet the BRE recommendations of at least 1.5% for a main living space or 1% for a bedroom.

5.8. There are study rooms being proposed to the second level of each dwelling and whilst the BRE guidelines do not specify a target for a study room, all of these rooms are above the 1.5% target for a main living space such that they will be sufficiently daylit.

5.9. The proposed accommodation within Block 1B therefore demonstrates full compliance with the BRE guidelines for internal daylighting.

Block 1C

5.10. This proposed building comprises residential apartments and is located to the southern area of the site between Block 1B & 1D and ranges between 4 to 10-storeys in height.

5.11. The results of our ADF assessments show that 235 (98%) of the 238 habitable rooms assessed between ground and third level will meet / exceed the BRE recommendations of 1.5% for a main living space and 1% for a bedroom. The 3 rooms falling below the BRE targets are limited to the first level at rooms 1C-087, 1C-089 and 1C-115.

Image 3: First level plan, Block 1C

5.12. Rooms 1C-087 and 1C-115 are large open plan living / kitchen / dining rooms (LKDs) with windows recessed beneath balconies. There is a degree of trade-off

between the internal amenity provision and balcony space where the balcony provides valuable private amenity space though typically these lead to lower daylight levels as a result. Nevertheless, the ADFs to these rooms equate to just 0.1-0.2% deviations from the guidelines at ADFs of 1.3-1.4%. Such minor reductions from the targets would not be noticeable to occupants and are thus considered fully acceptable.

5.13. The remaining isolated deviation is a secondary bedroom (1C-089) to the north west corner which is similarly served by a large balcony. As such there is a degree of trade-off due to the private amenity space being provided. As bedrooms are considered 'less important' for daylight under the BRE guidelines due to their more transient occupation, this isolated transgression is unlikely to significantly affect the use / amenity of the space.

5.14. Overall, this building demonstrates an excellent level of compliance with the BRE guidelines with deviations isolated to minor effects or to less sensitive space such that they are considered in line with the intentions of the BRE guidelines.

Block 1D

5.15. This block is located to the central area of the Phase 1 detailed application between Blocks 1C & 1E and ranges from 4 to 10-storeys in height. The building is made up of residential apartments with some parking and bin storage located at the lowest level.

5.16. The ADF results for Block 1D show that of the 228 rooms assessed, 219 (96%) will meet the BRE target levels of 1.5% for a main living space and 1% for a bedroom. Of the 9 rooms below this, these are generally marginal deviations of between 0.1-0.3% ADF from the guidelines that would not significantly impact the use of the space (1D-031; 1D-047; 1D-076; 1D-095;1D-162; 1D-214; 1D-031) and are unlikely to be perceptible to the occupants.

5.17. The remaining 2 deviations are LKDs within the southern elevation (1D-030 & 1D-089) where levels are between 0.8-0.9% ADF. These are somewhat inevitable due to the proximity between Blocks 1C & 1D and the provision of balconies providing private amenity space. Such isolated transgressions are not uncommon for dense urban development's particularly where large open plan living areas are being provided with private balcony space – both of which enhance the overall quality of the units.

5.18. Overall, given the high level of compliance across the building and the deviations being generally limited to marginal shifts from the targets, the internal amenity levels are considered appropriate.

Block 1E

5.19. This 'L' shaped building is located to the northern area of the site ranging between 4 to 8-storeys in height comprising residential apartments across all

floors.

5.20. Our ADF assessments for this building show very high levels of compliance with 109 (98%) of the 111 habitable rooms meeting or exceeding the BRE target for their respective room use.

5.21. Just 2 rooms fall below the guidelines and these are a single bedroom (1-00E-17) and a main living space (1-00E-62) at ground and second level respectively. These are both exceptionally minor deviations from the BRE target levels of just 0.1% which would not be recognisable to the residents such that they are considered fully acceptable.

5.22. Overall, the scheme demonstrates excellent levels of compliance for a residential apartment block in an urban location and are fully in line with the BRE guidelines for internal amenity.

Block 1F

5.23. This 'C' shaped building is situated furthest north within the Phase 1 detailed application. The building ranges between 3 to 8-storeys in height and consists of residential apartments across all levels with some parking, storage and plant located at the ground level.

5.24. Our ADF assessments for this block again show very high levels of compliance with the BRE targets for internal amenity. 120 (98%) of the 122 rooms assessed between ground and third level meet the BRE recommendations of 1.5% for main living room and 1% for a bedroom.

5.25. The 2 isolated rooms below the targets are a living / kitchen / diner and bedroom at first level (1F-020 & 1F-126) within the western elevation facing building 3A of the outline application. The deviations to these spaces are extremely minor at just 0.1% ADF below the guidelines and would not be recognisable to the residents.

5.26. Overall, the proposals are fully consistent with the BRE guidelines for internal daylighting.

6. Conclusions

6.1. This practice has considered the internal daylight provision to the proposed residential accommodation within Phase 1 of the detailed planning application at North London Business Park, East Barnet.

6.2. Our analysis assesses the internal daylight levels against the Average Daylight Factor (ADF) criteria set out in the BRE guidelines.

6.3. The scheme has developed with our input to maximise the internal amenity levels whilst balancing other design factors. This includes the provision of private balcony amenity space and prioritising daylight to the main living spaces.

6.4. The results of our technical assessments demonstrate a high level of compliance with the BRE guidelines with the vast majority of habitable rooms either meeting or exceeding the BRE recommendations for their respective room use. In total, the scheme achieves an overall compliance rate of 98% - this is an excellent level of compliance for a residential apartment scheme in an urban location.

6.5. Where amenity levels fall below the BRE guidelines, the large majority of these deviations are limited to minor deviations of 0.1-0.3% from the BRE recommendations which are unlikely to be noticeable to the future residents. The residual deviations affect larger open plan living spaces served by balconies and a bedroom where the requirement for daylight is lower. Given the open plan living space / balconies enhance the overall quality of the units and the main living spaces nearest to the window will enjoy the good levels of daylight, these deviations are unlikely to have a significant bearing on use and enjoyment of the spaces.

6.6. Overall, the scheme is considered to be fully acceptable and in line with the intentions of the BRE guidelines and national planning policy for internal amenity.

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Appendix 1

Internal Amenity Results

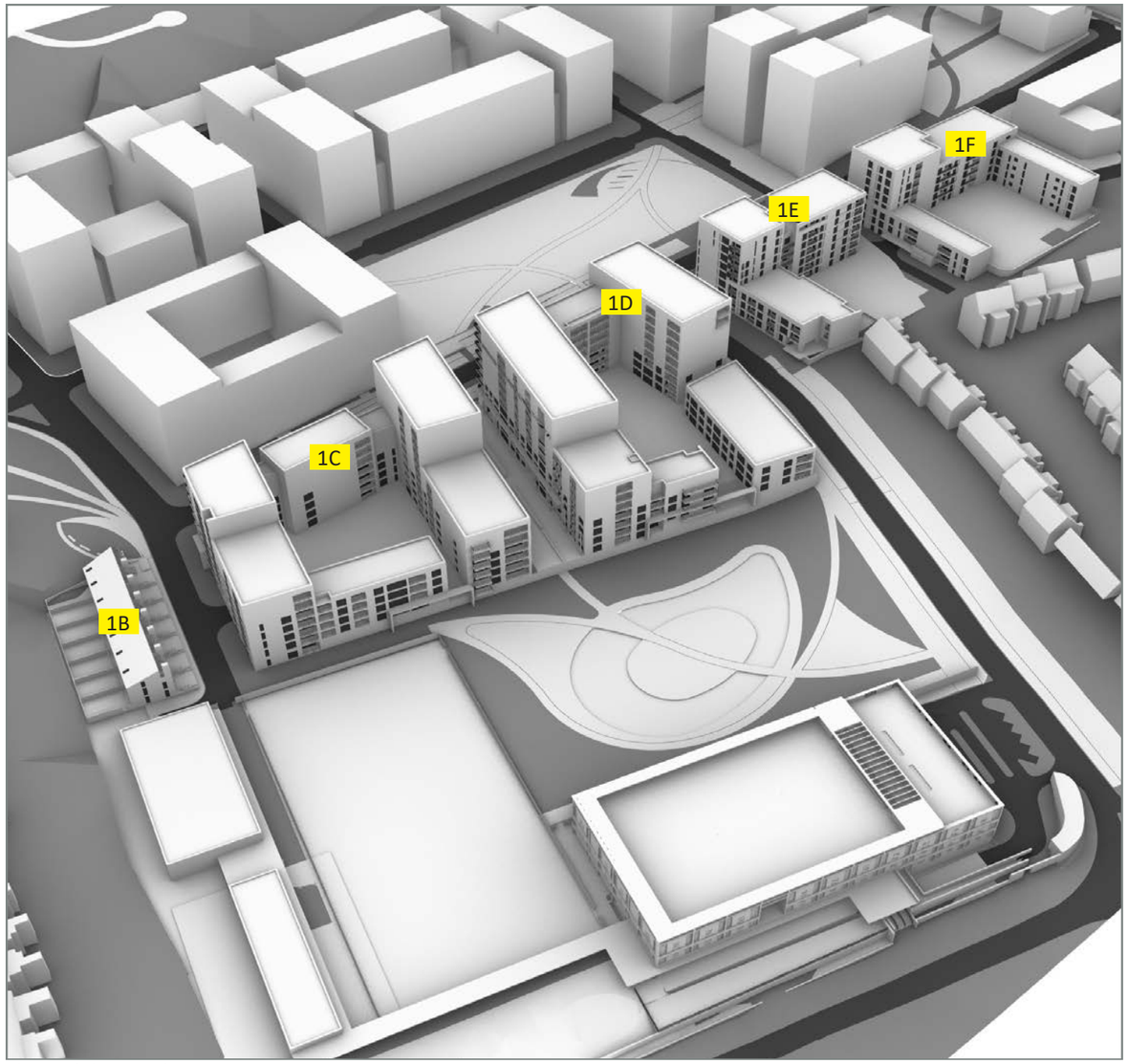

Fig. 1: Bird's Eye View

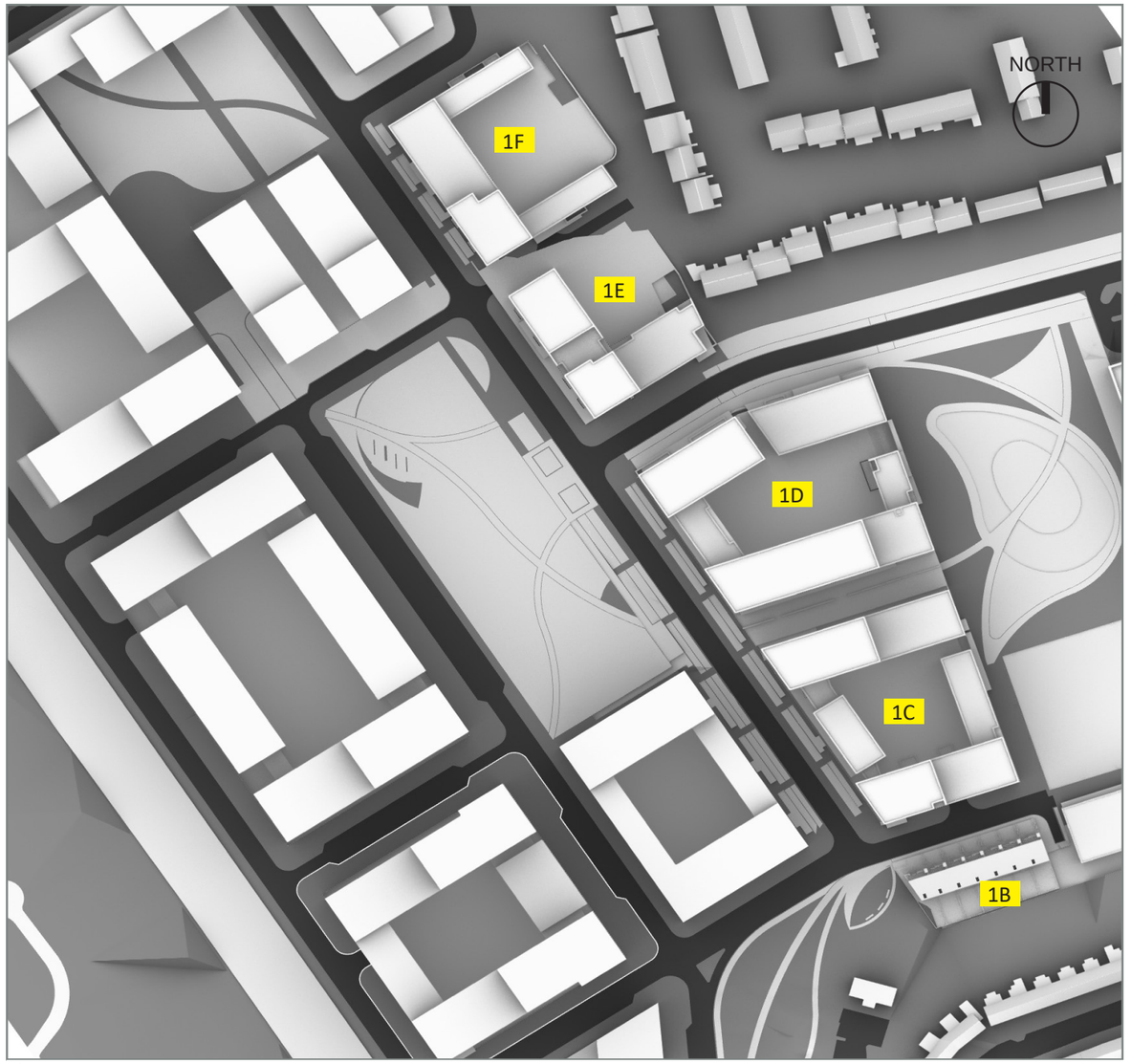

Fig. 2: Top View

Fig. 3: Ground Floor Plan

Room ID	Room use	Daylight Quantum ADF
1B - Floor GF		
1B-001	LKD	6.0
1B-002	LKD	3.9
1B-003	LKD	3.7
1B-004	LKD	3.6
1B-005	LKD	3.5
1B-006	LKD	3.6
1B-007	Living room	3.5
1B-008	Kitchen	5.9

Table 1: Results

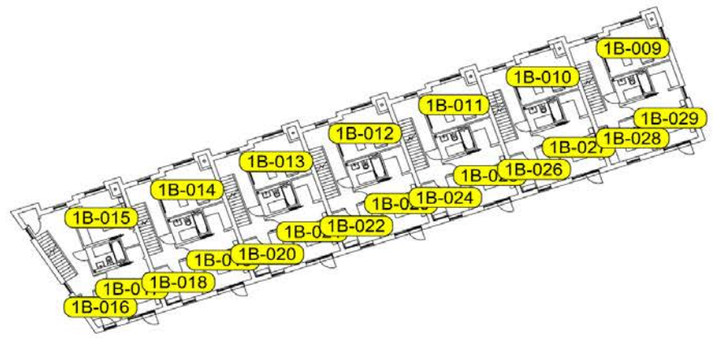

Fig. 4: First Floor Plan

Room ID	Room use	Daylight Quantum ADF
1B - Floor 1F		
1B-016	Study	5.0
1B-017	Bedroom	5.7
1B-018	Bedroom	3.7
1B-019	Bedroom	6.2
1B-020	Bedroom	3.7
1B-021	Bedroom	6.2
1B-022	Bedroom	3.7
1B-023	Bedroom	6.3
1B-024	Bedroom	3.7
1B-025	Bedroom	6.3
1B-026	Bedroom	3.7
1B-027	Bedroom	6.3
1B-028	Bedroom	3.5
1B-029	Bedroom	9.2

Table 2: Results

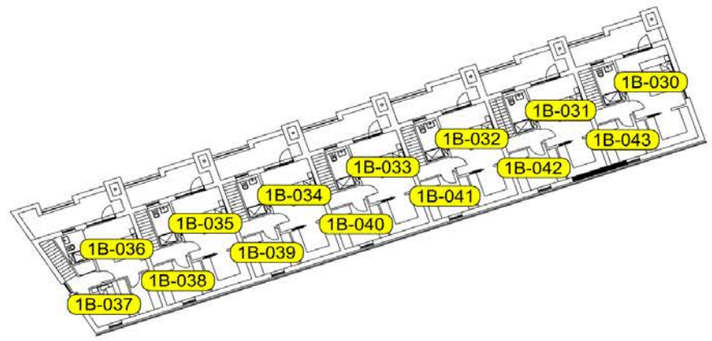

Fig. 5: Second Floor Plan

Room ID	Room use	Daylight Quantum ADF
1B - Floor 2F		
1B-030	Bedroom	4.2
1B-031	Bedroom	2.4
1B-032	Bedroom	2.3
1B-033	Bedroom	2.3
1B-034	Bedroom	2.2
1B-035	Bedroom	2.2
1B-036	Bedroom	2.7
1B-037	Bedroom	1.6
1B-038	Study	1.6
1B-039	Study	1.6
1B-040	Study	1.6
1B-041	Study	1.6
1B-042	Study	1.6
1B-043	Study	1.6

Table 3: Results

Fig. 6: Basement Floor Plan

Room ID	Room use	Daylight Quantum ADF
1C - Floor -1F		
1C-001	LKD	3.1
1C-002	Bedroom	7.9
1C-003	LKD	6.1
1C-004	Bedroom	3.8
1C-005	Bedroom	2.4
1C-006	LKD	5.0
1C-007	Bedroom	6.5
1C-008	LKD	3.0
1C-009	Bedroom	3.1
1C-010	LKD	3.5

Table 4: Results

Fig. 7: Ground Floor Plan

Room ID	Room use	Daylight Quantum ADF
1C - Floor GF		
1C-011	Bedroom	3.5
1C-012	Bedroom	2.7
1C-013	LKD	2.2
1C-014	Bedroom	6.3
1C-015	LKD	2.4
1C-016	Bedroom	8.0
1C-017	LKD	2.7
1C-018	Bedroom	8.1
1C-019	LKD	6.6
1C-020	Bedroom	3.5
1C-021	Bedroom	2.1
1C-022	Bedroom	4.2
1C-023	Bedroom	6.1
1C-024	Bedroom	7.1
1C-025	Bedroom	6.8
1C-026	Bedroom	1.6
1C-027	LKD	1.7
1C-028	Bedroom	3.5
1C-029	Bedroom	4.6
1C-030	Bedroom	5.2
1C-031	Bedroom	2.9
1C-032	Bedroom	3.8
1C-033	LKD	1.5
1C-034	Bedroom	4.5
1C-035	Bedroom	1.4
1C-036	Bedroom	2.5
1C-037	LKD	2.2
1C-038	Bedroom	2.3
1C-039	Bedroom	2.4
1C-040	Bedroom	2.2
1C-041	Bedroom	2.0
1C-042	Living room	2.7
1C-043	Bedroom	5.4
1C-044	LKD	5.5
1C-045	Bedroom	7.6
1C-046	LKD	3.3
1C-047	Bedroom	3.1
1C-048	LKD	4.0
1C-049	Bedroom	1.0
1C-050	Bedroom	4.3
1C-051	Living room	3.5
1C-052	LKD	3.5
1C-053	Bedroom	3.7
1C-054	LKD	2.9
1C-055	Bedroom	3.0
1C-056	LKD	1.6
1C-057	LKD	2.3
1C-058	Living room	3.3
1C-059	LKD	2.8
1C-060	LKD	3.0

Table 5: Results

Fig. 8: First Floor Plan

Room ID	Room use	Daylight Quantum ADF
1C - Floor 1F		
1C-061	Bedroom	3.8
1C-062	Bedroom	7.5
1C-063	LKD	2.9
1C-064	Bedroom	7.1
1C-065	LKD	2.4
1C-066	Bedroom	8.1
1C-067	LKD	2.7
1C-068	Bedroom	8.3
1C-069	LKD	7.4
1C-070	Bedroom	4.6
1C-071	Bedroom	8.6
1C-072	Bedroom	2.8
1C-073	LKD	7.9
1C-074	Bedroom	7.8
1C-075	LKD	1.7
1C-076	Bedroom	7.2
1C-077	LKD	3.2
1C-078	Bedroom	7.9
1C-079	LKD	5.5
1C-080	Bedroom	3.9
1C-081	Bedroom	2.2
1C-082	Bedroom	3.8
1C-083	Bedroom	3.3
1C-084	Bedroom	3.8
1C-085	Bedroom	2.1
1C-086	Bedroom	4.1
1C-087	LKD	1.4
1C-088	Bedroom	1.4
1C-089	Bedroom	0.5
1C-090	Bedroom	2.7
1C-091	LKD	2.4
1C-092	Bedroom	2.6
1C-093	Bedroom	2.7
1C-094	Bedroom	2.4
1C-095	Bedroom	2.2
1C-096	Living room	2.9
1C-097	Bedroom	5.8
1C-098	LKD	5.7
1C-099	Bedroom	7.8
1C-100	LKD	3.6
1C-101	Bedroom	3.6
1C-102	LKD	4.5
1C-103	Bedroom	1.5
1C-104	Bedroom	4.8
1C-105	Living room	3.9
1C-106	LKD	3.8
1C-107	Bedroom	4.0
1C-108	LKD	3.1
1C-109	Bedroom	3.2
1C-110	LKD	1.9
1C-111	LKD	2.5
1C-112	Bedroom	6.2
1C-113	Bedroom	1.4
1C-114	Bedroom	4.6
1C-115	LKD	1.3
1C-116	LKD	3.2

Table 6: Results

Fig. 9: Second Floor Plan

Room ID	Room use	Daylight Quantum ADF
1C - Floor 2F		
1C-117	Bedroom	4.2
1C-118	Bedroom	7.6
1C-119	LKD	3.1
1C-120	Bedroom	7.2
1C-121	LKD	2.5
1C-122	Bedroom	8.2
1C-123	LKD	2.7
1C-124	Bedroom	8.4
1C-125	LKD	7.7
1C-126	Bedroom	5.0
1C-127	Bedroom	9.0
1C-128	Bedroom	3.1
1C-129	LKD	8.4
1C-130	Bedroom	8.3
1C-131	LKD	1.9
1C-132	Bedroom	7.6
1C-133	LKD	3.5
1C-134	Bedroom	8.3
1C-135	LKD	6.9
1C-136	Bedroom	5.2
1C-137	Bedroom	2.3
1C-138	Bedroom	4.1
1C-139	Bedroom	5.2
1C-140	Bedroom	6.0
1C-141	Bedroom	3.4
1C-142	Bedroom	4.5
1C-143	Bedroom	4.6
1C-144	LKD	4.5
1C-145	LKD	2.4
1C-146	Bedroom	3.7
1C-147	Bedroom	3.1
1C-148	Bedroom	2.9
1C-149	LKD	2.1
1C-150	Bedroom	3.5
1C-151	Bedroom	2.9
1C-152	Bedroom	3.0
1C-153	Bedroom	2.6
1C-154	Bedroom	2.4
1C-155	Living room	3.3
1C-156	Bedroom	3.7
1C-157	Bedroom	3.9
1C-158	Bedroom	4.6
1C-159	LKD	6.0
1C-160	Bedroom	7.9
1C-161	LKD	3.7
1C-162	Bedroom	4.4
1C-163	LKD	5.2
1C-164	Bedroom	2.2
1C-165	Bedroom	5.3
1C-166	Living room	4.3
1C-167	LKD	4.2
1C-168	Bedroom	4.4
1C-169	LKD	3.4
1C-170	Bedroom	3.3
1C-171	LKD	2.2
1C-172	LKD	2.7
1C-173	Bedroom	6.7
1C-174	Bedroom	1.7
1C-175	Bedroom	5.1
1C-176	LKD	1.6
1C-177	LKD	3.4

Table 7: Results

Fig. 10: Third Floor Plan

Room ID	Room use	Daylight Quantum ADF
1C - Floor 3F		
1C-178	Bedroom	4.7
1C-179	Bedroom	7.7
1C-180	LKD	3.2
1C-181	Bedroom	7.3
1C-182	LKD	2.5
1C-183	Bedroom	8.3
1C-184	LKD	2.7
1C-185	Bedroom	8.5
1C-186	LKD	7.9
1C-187	Bedroom	5.2
1C-188	Bedroom	9.2
1C-189	Bedroom	3.2
1C-190	LKD	8.5
1C-191	Bedroom	8.5
1C-192	LKD	1.9
1C-193	Bedroom	7.7
1C-194	LKD	3.6
1C-195	Bedroom	8.5
1C-196	LKD	7.1
1C-197	Bedroom	5.5
1C-198	Bedroom	2.5
1C-199	Bedroom	4.4
1C-200	Bedroom	5.6
1C-201	Bedroom	6.5
1C-202	Bedroom	3.7
1C-203	Bedroom	4.8
1C-204	Bedroom	4.9
1C-205	LKD	4.8
1C-206	LKD	2.6
1C-207	Bedroom	4.0
1C-208	Bedroom	3.4
1C-209	Bedroom	3.2
1C-210	LKD	2.4
1C-211	Bedroom	4.0
1C-212	Bedroom	3.3
1C-213	Bedroom	3.4
1C-214	Bedroom	2.9
1C-215	Bedroom	2.7
1C-216	Living room	3.7
1C-217	Bedroom	4.2
1C-218	Bedroom	4.4
1C-219	Bedroom	5.1
1C-220	LKD	6.2
1C-221	Bedroom	8.0
1C-222	LKD	3.7
1C-223	Bedroom	5.9
1C-224	LKD	5.9
1C-225	Bedroom	2.8
1C-226	Bedroom	5.9
1C-227	Living room	4.7
1C-228	LKD	4.7
1C-229	Bedroom	4.8
1C-230	LKD	3.6
1C-231	Bedroom	3.5
1C-232	LKD	2.5
1C-233	LKD	3.0
1C-234	Bedroom	7.4
1C-235	Bedroom	2.0
1C-236	Bedroom	5.7
1C-237	LKD	2.1
1C-238	LKD	3.6

Table 8: Results

Fig. 11: Ground Floor Plan

Room ID	Room use	Daylight Quantum ADF
1D - Floor GF		
1D-001	Bedroom	6.8
1D-002	LKD	2.4
1D-003	Living room	9.5
1D-004	Bedroom	1.9
1D-005	Bedroom	4.7
1D-006	LKD	2.1
1D-007	Bedroom	2.5
1D-008	Bedroom	3.0
1D-009	LKD	2.1
1D-010	LKD	1.8
1D-011	Bedroom	1.6
1D-012	Living room	2.0
1D-013	Bedroom	2.5
1D-014	LKD	3.0
1D-015	LKD	4.5
1D-016	Bedroom	2.0

Table 9: Results

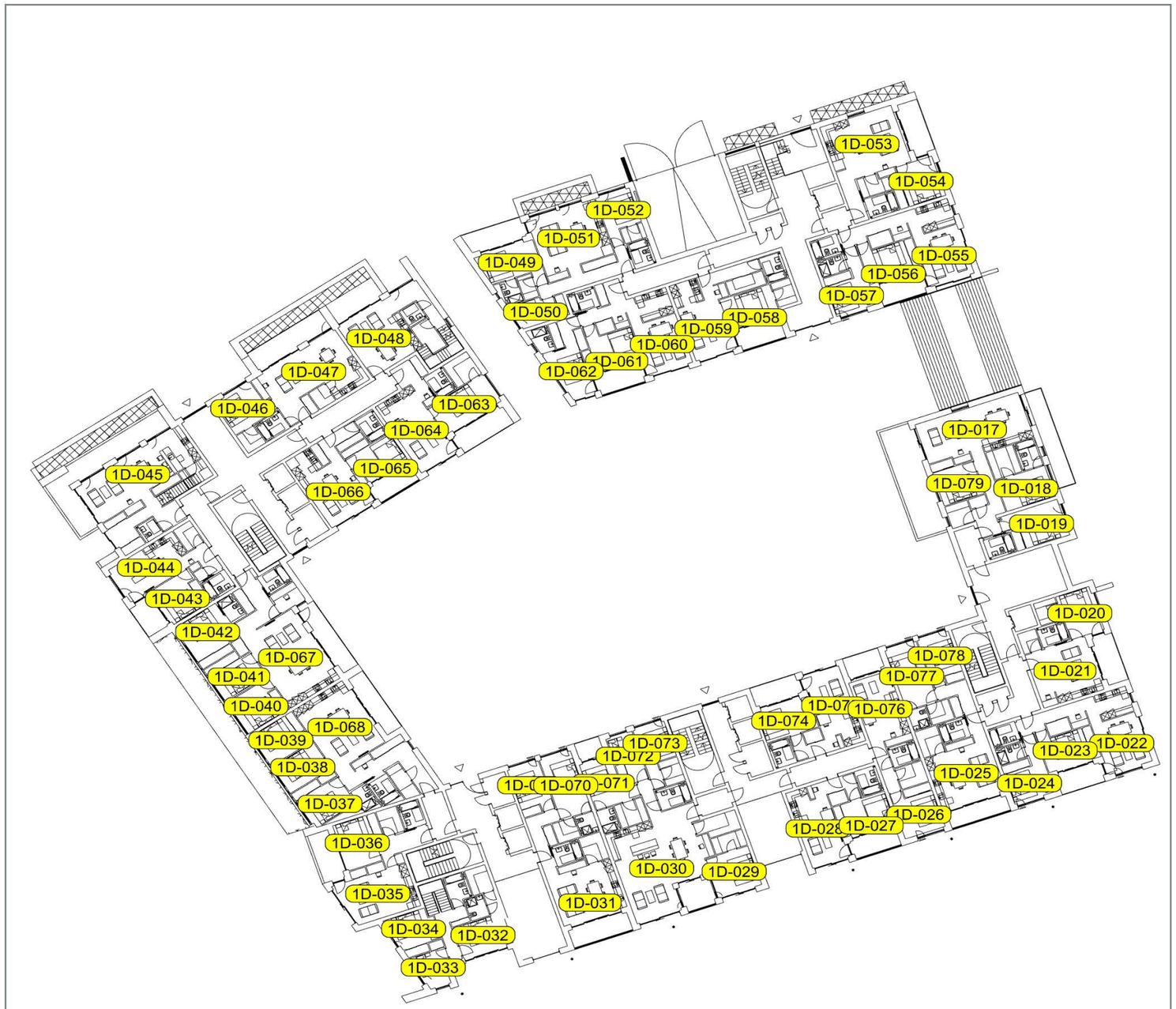

Fig. 12: First Floor Plan

Room ID	Room use	Daylight Quantum ADF
1D - Floor 1F		
1D-017	LKD	4.9
1D-018	Bedroom	3.7
1D-019	Bedroom	3.7
1D-020	Bedroom	7.2
1D-021	LKD	2.5
1D-022	Living room	8.6
1D-023	Bedroom	2.0
1D-024	Bedroom	5.0
1D-025	LKD	2.3
1D-026	Bedroom	1.9
1D-027	Bedroom	2.4
1D-028	LKD	1.5
1D-029	Bedroom	1.5
1D-030	LKD	0.8
1D-031	LKD	1.3
1D-032	Bedroom	1.0
1D-033	Bedroom	4.1
1D-034	Bedroom	1.3
1D-035	LKD	4.9
1D-036	Bedroom	3.4
1D-037	Bedroom	3.8
1D-038	Bedroom	4.6
1D-039	Bedroom	4.4
1D-040	Bedroom	4.7
1D-041	Bedroom	4.8
1D-042	Bedroom	3.6
1D-043	Bedroom	2.0
1D-044	LKD	3.8
1D-045	LKD	7.5
1D-046	Bedroom	3.9
1D-047	LKD	1.4
1D-048	LKD	4.4
1D-049	Bedroom	3.5
1D-050	Bedroom	1.1
1D-051	LKD	5.3
1D-052	Bedroom	6.8
1D-053	LKD	3.9
1D-054	Bedroom	7.9
1D-055	Living room	9.3
1D-056	Bedroom	4.5
1D-057	Bedroom	5.4
1D-058	Bedroom	4.3
1D-059	Living room	4.0
1D-060	Living room	3.8
1D-061	Bedroom	4.3
1D-062	Bedroom	5.4
1D-063	Bedroom	2.4
1D-064	LKD	2.9
1D-065	Bedroom	4.0
1D-066	Living room	3.3
1D-067	LKD	1.9
1D-068	LKD	1.8
1D-069	Bedroom	4.3
1D-070	Bedroom	3.2
1D-071	Bedroom	1.2
1D-072	Bedroom	3.3
1D-073	Bedroom	5.7
1D-074	Bedroom	3.0
1D-075	LKD	3.7
1D-076	LKD	1.3
1D-077	Bedroom	3.6
1D-078	Bedroom	4.7
1D-079	Bedroom	4.1

Table 10: Results

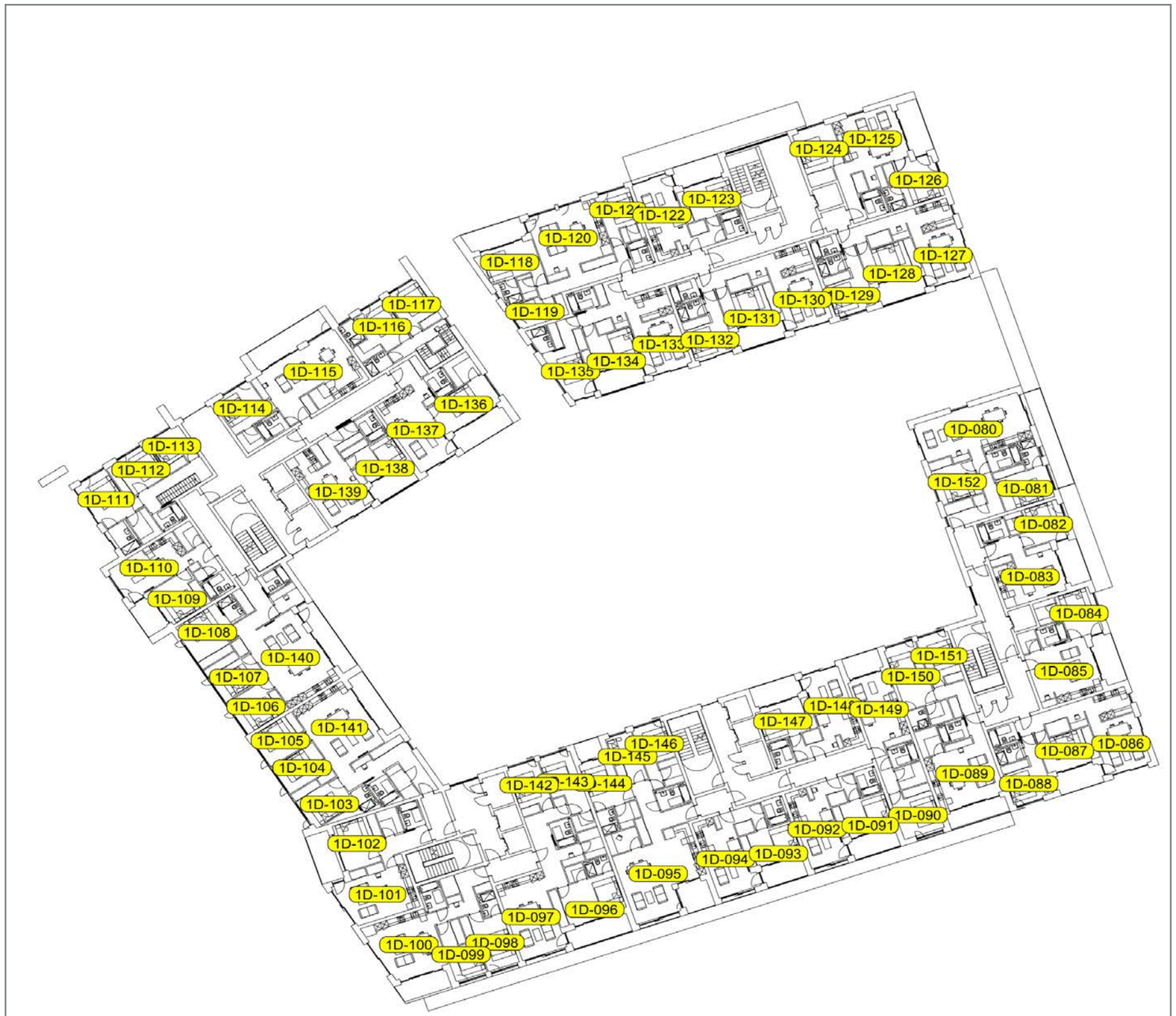

Fig. 13: Second Floor Plan

Room ID	Room use	Daylight Quantum ADF
1D - Floor 2F		
1D-080	LKD	5.6
1D-081	Bedroom	4.4
1D-082	Bedroom	8.0
1D-083	LKD	2.6
1D-084	Bedroom	8.3
1D-085	LKD	2.5
1D-086	Living room	10.4
1D-087	Bedroom	2.0
1D-088	Bedroom	5.8
1D-089	LKD	0.9
1D-090	Bedroom	2.8
1D-091	Bedroom	3.4
1D-092	LKD	2.2
1D-093	Bedroom	2.8
1D-094	LKD	1.8
1D-095	LKD	1.2
1D-096	Bedroom	2.6
1D-097	LKD	1.8
1D-098	Bedroom	2.4
1D-099	Bedroom	2.7
1D-100	LKD	5.8
1D-101	LKD	5.1
1D-102	Bedroom	3.6
1D-103	Bedroom	3.9
1D-104	Bedroom	4.7
1D-105	Bedroom	4.6
1D-106	Bedroom	4.9
1D-107	Bedroom	5.0
1D-108	Bedroom	3.7
1D-109	Bedroom	2.2
1D-110	LKD	4.0
1D-111	Bedroom	4.1
1D-112	Bedroom	1.7
1D-113	Bedroom	1.8
1D-114	Bedroom	1.6
1D-115	LKD	2.0
1D-116	Bedroom	2.8
1D-117	Bedroom	2.2
1D-118	Bedroom	4.0
1D-119	Bedroom	1.2
1D-120	LKD	5.7
1D-121	Bedroom	7.7
1D-122	LKD	5.5
1D-123	Bedroom	4.4
1D-124	Bedroom	6.4
1D-125	LKD	5.3
1D-126	Bedroom	7.5
1D-127	Living room	10.2
1D-128	Bedroom	5.1
1D-129	Bedroom	6.0
1D-130	Living room	4.3
1D-131	Bedroom	5.0
1D-132	Bedroom	6.9
1D-133	Living room	4.2
1D-134	Bedroom	4.7
1D-135	Bedroom	6.0
1D-136	Bedroom	3.6
1D-137	LKD	3.2
1D-138	Bedroom	4.4
1D-139	Living room	3.7
1D-140	LKD	2.1
1D-141	LKD	2.3
1D-142	Bedroom	4.8
1D-143	Bedroom	3.9
1D-144	Bedroom	1.3
1D-145	Bedroom	3.5
1D-146	Bedroom	6.2
1D-147	Bedroom	3.6
1D-148	LKD	4.2
1D-149	LKD	1.5
1D-150	Bedroom	4.0
1D-151	Bedroom	5.2
1D-152	Bedroom	4.5

Table 11: Results

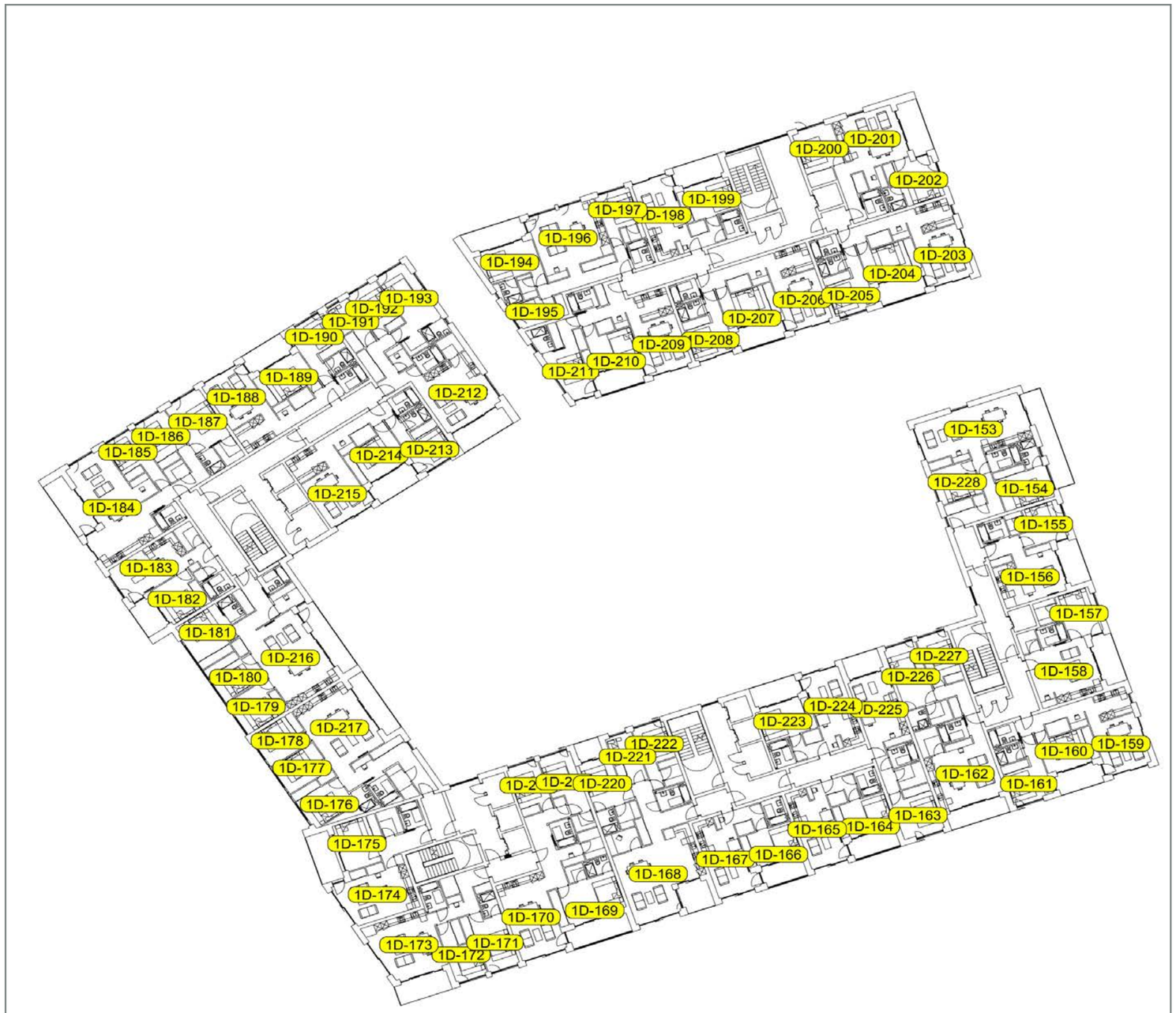

Fig. 14: Third Floor Plan

Room ID	Room use	Daylight Quantum ADF
1D - Floor 3F		
1D-153	LKD	6.1
1D-154	Bedroom	4.5
1D-155	Bedroom	8.2
1D-156	LKD	2.7
1D-157	Bedroom	8.4
1D-158	LKD	2.5
1D-159	Living room	11.0
1D-160	Bedroom	2.1
1D-161	Bedroom	6.6
1D-162	LKD	1.2
1D-163	Bedroom	4.1
1D-164	Bedroom	4.6
1D-165	LKD	3.2
1D-166	Bedroom	3.8
1D-167	LKD	2.7
1D-168	LKD	1.8
1D-169	Bedroom	3.5
1D-170	LKD	2.6
1D-171	Bedroom	3.4
1D-172	Bedroom	3.7
1D-173	LKD	6.1
1D-174	LKD	5.3
1D-175	Bedroom	3.8
1D-176	Bedroom	4.1
1D-177	Bedroom	4.9
1D-178	Bedroom	4.7
1D-179	Bedroom	5.0
1D-180	Bedroom	5.1
1D-181	Bedroom	3.8
1D-182	Bedroom	2.3
1D-183	LKD	4.1
1D-184	LKD	4.9
1D-185	Bedroom	7.1
1D-186	Bedroom	5.8
1D-187	Bedroom	4.4
1D-188	Living room	6.2
1D-189	Bedroom	2.9
1D-190	Bedroom	7.5
1D-191	Bedroom	3.6
1D-192	Bedroom	5.2
1D-193	Bedroom	9.0
1D-194	Bedroom	4.1
1D-195	Bedroom	1.3
1D-196	LKD	5.9
1D-197	Bedroom	8.1
1D-198	LKD	5.7
1D-199	Bedroom	4.5
1D-200	Bedroom	6.6
1D-201	LKD	5.5
1D-202	Bedroom	7.7
1D-203	Living room	11.0
1D-204	Bedroom	6.0
1D-205	Bedroom	6.8
1D-206	Living room	5.1
1D-207	Bedroom	5.7
1D-208	Bedroom	7.8
1D-209	Living room	4.8
1D-210	Bedroom	5.4
1D-211	Bedroom	6.7
1D-212	LKD	3.4
1D-213	Bedroom	5.1
1D-214	Bedroom	0.7
1D-215	Living room	4.4
1D-216	LKD	2.2
1D-217	LKD	2.4
1D-218	Bedroom	5.2
1D-219	Bedroom	4.2
1D-220	Bedroom	1.5
1D-221	Bedroom	3.8
1D-222	Bedroom	6.7
1D-223	Bedroom	4.0
1D-224	LKD	4.7
1D-225	LKD	1.8
1D-226	Bedroom	4.5
1D-227	Bedroom	5.9
1D-228	Bedroom	4.9

Table 12: Results

Fig. 15: Ground Floor Plan

Room ID	Room use	Daylight Quantum ADF
1E - Floor GF		
1.00E-01	LKD	3.8
1.00E-02	Bedroom	1.9
1.00E-03	LKD	3.3
1.00E-04	Bedroom	2.2
1.00E-05	Bedroom	3.9
1.00E-06	Bedroom	2.4
1.00E-07	LKD	2.1
1.00E-08	Bedroom	5.9
1.00E-09	Bedroom	3.0
1.00E-10	LKD	3.7
1.00E-11	Bedroom	4.3
1.00E-12	Living room	1.5
1.00E-13	Bedroom	5.2
1.00E-14	LKD	3.3
1.00E-15	Bedroom	1.4
1.00E-16	LKD	2.7
1.00E-17	Bedroom	0.9
1.00E-18	LKD	2.9
1.00E-19	Bedroom	1.7
1.00E-20	LKD	1.7
1.00E-21	Bedroom	1.6
1.00E-22	Bedroom	1.4
1.00E-23	Bedroom	2.6
1.00E-24	Bedroom	4.0
1.00E-25	Living room	2.0
1.00E-26	Bedroom	4.7

Table 13: Results

Fig. 16: First Floor Plan

Room ID	Room use	Daylight Quantum ADF
1E - Floor 1F		
1.00E-27	LKD	4.2
1.00E-28	Bedroom	2.1
1.00E-29	LKD	3.5
1.00E-30	Bedroom	2.4
1.00E-31	Bedroom	4.9
1.00E-32	Bedroom	2.6
1.00E-33	LKD	2.6
1.00E-34	Bedroom	6.2
1.00E-35	Bedroom	3.2
1.00E-36	LKD	3.8
1.00E-37	Bedroom	4.4
1.00E-38	Living room	1.7
1.00E-39	Bedroom	5.3
1.00E-40	LKD	3.5
1.00E-41	Bedroom	1.5
1.00E-42	LKD	2.9
1.00E-43	Bedroom	1.1
1.00E-44	LKD	3.0
1.00E-45	Bedroom	1.7
1.00E-46	LKD	3.9
1.00E-47	Bedroom	2.4
1.00E-48	LKD	2.4
1.00E-49	Bedroom	3.9
1.00E-50	Bedroom	2.3
1.00E-51	Bedroom	3.0
1.00E-52	LKD	1.8
1.00E-53	Bedroom	1.7
1.00E-54	Bedroom	1.4
1.00E-55	Bedroom	2.9
1.00E-56	Bedroom	4.4
1.00E-57	Living room	2.3
1.00E-58	Bedroom	5.2

Table 14: Results

Fig. 17: Second Floor Plan

Room ID	Room use	Daylight Quantum ADF
1E - Floor 2F		
1.00E-59	LKD	4.6
1.00E-60	Bedroom	2.4
1.00E-61	Bedroom	6.5
1.00E-62	Living room	1.4
1.00E-63	Bedroom	3.6
1.00E-64	Bedroom	6.1
1.00E-65	Bedroom	2.9
1.00E-66	LKD	3.4
1.00E-67	Bedroom	6.4
1.00E-68	Bedroom	3.5
1.00E-69	LKD	4.0
1.00E-70	Bedroom	4.6
1.00E-71	Living room	1.9
1.00E-72	Bedroom	5.5
1.00E-73	LKD	3.6
1.00E-74	Bedroom	1.5
1.00E-75	LKD	3.1
1.00E-76	Bedroom	1.3
1.00E-77	LKD	3.2
1.00E-78	Bedroom	1.9
1.00E-79	LKD	4.1
1.00E-80	Bedroom	2.6
1.00E-81	LKD	4.6
1.00E-82	Bedroom	4.1
1.00E-83	Bedroom	2.4
1.00E-84	Bedroom	3.2
1.00E-85	LKD	4.7
1.00E-86	Bedroom	2.1
1.00E-87	Bedroom	3.1
1.00E-88	Bedroom	4.8
1.00E-89	Living room	2.6
1.00E-90	Bedroom	5.7

Table 15: Results

Fig. 18: Third Floor Plan

Room ID	Room use	Daylight Quantum ADF
1E - Floor 3F		
1.00E-91	LKD	4.9
1.00E-92	Bedroom	2.6
1.00E-93	Bedroom	6.7
1.00E-94	Living room	1.5
1.00E-95	Bedroom	4.1
1.00E-96	Bedroom	6.3
1.00E-97	Bedroom	3.1
1.00E-98	LKD	3.5
1.00E-99	Bedroom	6.6
1.00E-100	Bedroom	3.7
1.00E-101	LKD	4.1
1.00E-102	Bedroom	4.7
1.00E-103	Living room	2.1
1.00E-104	Bedroom	5.7
1.00E-105	LKD	3.8
1.00E-106	Bedroom	6.8
1.00E-107	Bedroom	5.7
1.00E-108	Living room	3.1
1.00E-109	Bedroom	5.1
1.00E-110	Living room	2.8
1.00E-111	Bedroom	6.0

Table 16: Results

Fig. 19: Ground Floor Plan

Room ID	Room use	Daylight Quantum ADF
1F - Floor GF		
1F-002	Bedroom	3.9
1F-003	Bedroom	2.5
1F-004	LKD	2.0
1F-005	Bedroom	3.1
1F-006	LKD	1.6
1F-007	Bedroom	2.8
1F-008	LKD	2.5
1F-009	Bedroom	2.1

Table 17: Results

Fig. 20: First Floor Plan

Room ID	Room use	Daylight Quantum ADF
1F - Floor 1F		
1F-010	Bedroom	3.7
1F-011	Bedroom	4.4
1F-012	Bedroom	2.8
1F-013	Bedroom	2.4
1F-014	Bedroom	3.7
1F-015	LKD	2.2
1F-016	Bedroom	3.4
1F-017	Bedroom	2.9
1F-018	LKD	2.6
1F-019	Bedroom	2.2
1F-020	LKD	1.4
1F-021	Bedroom	1.2
1F-022	Bedroom	3.7
1F-023	Bedroom	0.9
1F-024	LKD	1.6
1F-025	Bedroom	1.5
1F-026	Bedroom	0.9
1F-027	Bedroom	2.1
1F-028	Bedroom	2.6
1F-029	LKD	3.9
1F-030	LKD	3.4
1F-031	Bedroom	1.0
1F-032	Bedroom	3.6
1F-033	Bedroom	2.0
1F-034	Bedroom	2.4
1F-035	Bedroom	4.1
1F-036	Bedroom	4.1
1F-037	LKD	2.6
1F-038	LKD	2.4
1F-039	Bedroom	3.0
1F-040	Bedroom	3.8
1F-041	LKD	1.5
1F-042	Bedroom	4.7
1F-043	LKD	2.9
1F-044	Bedroom	3.2
1F-045	Bedroom	6.5
1F-046	Bedroom	1.9
1F-047	Bedroom	2.9
1F-048	LKD	3.6
1F-049	LKD	4.3

Table 18: Results

Fig. 21: Second Floor Plan

Room ID	Room use	Daylight Quantum ADF
1F - Floor 2F		
1F-050	Bedroom	3.9
1F-051	Bedroom	4.7
1F-052	Bedroom	3.0
1F-053	Bedroom	2.6
1F-054	Bedroom	3.9
1F-055	LKD	2.4
1F-056	Bedroom	3.6
1F-057	Bedroom	3.1
1F-058	LKD	2.7
1F-059	Bedroom	2.4
1F-060	LKD	1.9
1F-061	Bedroom	1.3
1F-062	Bedroom	3.8
1F-063	Bedroom	1.0
1F-064	LKD	2.2
1F-065	Bedroom	2.4
1F-066	Bedroom	1.6
1F-067	Bedroom	2.5
1F-068	Bedroom	2.9
1F-069	LKD	5.8
1F-070	LKD	4.0
1F-071	Bedroom	1.4
1F-072	Bedroom	4.2
1F-073	Bedroom	2.7
1F-074	Bedroom	2.9
1F-075	Bedroom	4.7
1F-076	Bedroom	4.3
1F-077	LKD	4.2
1F-078	LKD	3.6
1F-079	Bedroom	3.1
1F-080	Bedroom	4.0
1F-081	LKD	1.7
1F-082	Bedroom	5.1
1F-083	LKD	3.1
1F-084	Bedroom	3.6
1F-085	Bedroom	6.9
1F-086	Bedroom	2.3
1F-087	Bedroom	3.0
1F-088	LKD	3.8
1F-089	LKD	4.7

Table 19: Results

Fig. 22: Third Floor Plan

Room ID	Room use	Daylight Quantum ADF
1F - Floor 3F		
1F-090	LKD	5.7
1F-091	Bedroom	3.1
1F-092	Bedroom	2.7
1F-093	LKD	2.8
1F-094	Bedroom	2.5
1F-095	LKD	2.0
1F-096	Bedroom	1.4
1F-097	Bedroom	4.0
1F-098	Bedroom	1.0
1F-099	LKD	2.9
1F-100	Bedroom	3.3
1F-101	Bedroom	2.2
1F-102	Bedroom	3.1
1F-103	Bedroom	2.9
1F-104	Bedroom	3.0
1F-105	LKD	5.4
1F-106	LKD	4.5
1F-107	Bedroom	2.1
1F-108	Bedroom	4.6
1F-109	Bedroom	2.9
1F-110	Bedroom	3.1
1F-111	Bedroom	5.0
1F-112	Bedroom	4.4
1F-113	LKD	4.7
1F-114	LKD	4.2
1F-115	Bedroom	3.3
1F-116	Bedroom	4.2
1F-117	LKD	1.9
1F-118	Bedroom	5.6
1F-119	LKD	3.3
1F-120	Bedroom	3.9
1F-121	Bedroom	7.4
1F-122	Bedroom	3.0

Table 20: Results