



5060

# Sunlight Reception Report

SUNLIGHT RECEPTION IN AMENITY SPACES WITHIN THE PROPOSED DEVELOPMENT  
EFFECTS on SUNLIGHT RECEPTION IN EXISTING NEIGHBOURING AMENITY SPACES AS A RESULT OF THE PROPOSED DEVELOPMENT

## The Green Quarter

Proposed Strategic Housing Development

Cartronroy,  
Kilnafaddoge  
Lissywollen and  
Ardnaglug (townlands),  
Athlone  
Co. Westmeath

Avenir Homes Limited

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A 5061 One hourly overall site shadow – sunlight status illustrations	Attached

# 1 Introduction

## 1.1 Report purpose

This report gives information on the level of achieved sunlight reception in amenity spaces within the proposed new development and the effects the new proposed development has on sunlight reception in existing neighbouring amenity spaces.

## 1.2 Instruction

DKPartnership (DKP) have been commissioned by Avenir Homes Limited to carry out the analysis and report for the proposed development at Cartronroy, Kilnafaddoge, Lissywollen and Ardnaglug (townlands), Athlone, Co. Westmeath.

## 1.3 Development description

Avenir Homes Limited. intend to apply to An Bord Pleanála for permission for a strategic housing development at Cartronroy, Kilnafaddoge, Lissywollen and Ardnaglug (townlands), Athlone, Co. Westmeath. The development will consist of:

The construction of a mixed use residential development of 122 no. residential units with ancillary creche, 46 no. student apartments consisting of 283 bed spaces, and all associated site development works. The proposed development makes provision for 60 no. dwelling houses comprising 38 no. 2-storey 3-bed townhouses, 7 no. 2-storey 4-bed townhouses, 7 no. 3-storey 4-bed townhouses, 6 no. 2 storey 4-bed semi-detached and 2 no. 2 storey 4-bed detached. The proposed development includes 62 no. apartments / duplexes to be provided as follows: Block R1 containing 38 no. apartments (16 no. 1 bed units and 22 no. 2 bed units) in a 3-6 storey building, and Block R2 containing 20 no. duplex units (10 no. 2 bed units and 10 no. 3 bed units) over 4 storeys with 4 no. apartments (4 no. 2 bed units) in one 5th storey feature area. The proposed student accommodation makes provision for 283 no. bed spaces in 3 no. blocks to be provided as follows: Block S1 containing 18 apartments with 117 bed spaces over 5-6 storeys, Block S2 containing 16 apartments with 107 bed spaces over 6-7 storeys, and Block S3 containing 12 apartments with 59 bed spaces over 4-5 storeys.

The proposed development will provide for two new vehicular accesses as well as pedestrian entrances onto Lissywollen Avenue east-west access road (as permitted under An Bord Pleanála Reference ABP-309513-21). Minor modifications to ABP-309513-21 are proposed to cater for these access points, alterations to cycle/pedestrian paths, the removal of a central island to facilitate the south-eastern entrance, and provision of bus stop infrastructure. Ancillary site works include public and communal open spaces, hard and soft landscaping, pedestrian / cycleways, car parking, cycle parking, bin storage, public lighting, solar panels, ESB substation and supporting distribution kiosks, and all other ancillary works above and below ground. The proposal includes pedestrian and cycle linkages onto the Old Rail Trail Greenway to the south and Blackberry Lane (L40061) to the west.

In addition to the above specified works within the red-line boundary, Westmeath County Council are facilitating some offsite works to support the project for which the applicant has confirmed written consent. These include:

Resurfacing Blackberry lane along the western extent of the site. A special development contribution has been agreed with the applicant for such purposes.

Facilitating works to complete connections to the Old Rail Trail Greenway, including

Completion of pedestrian/cycle path between Blocks R1 and S1 to the surfaced area of the greenway to the south, and;

Replacement of existing gated access between the greenway and Blackberry Lane (southwest of the site) with a revised arrangement with dedicated cycle/pedestrian access. Final works to be agreed with Westmeath County Council.

## 1.4 Statutory requirement

There are no particular building regulations in relation day light/shadow effect standards other than recommendations outlined or referred to in the CIBSE lighting guide 10, BS EN17037/EN17037 and the BRE document "Site layout planning for daylight and sun light". The aforementioned documents do refer to a "right to a sky view" relating to existing buildings facing a new adjacent development in so far that it compares an existing sky view with the sky view when the new development is constructed. The difference, if any, must be within a certain acceptable threshold.

## 2 Executive summary

### 2.1 Analysis conducted

This report details the effects on the sunlight/shadow status of

- sunlight/shadow status of the new amenity spaces and existing spaces within the proposed development
- sunlight/shadow status of the existing neighbouring amenity spaces.

### 2.2 Guidelines and standards applied

For this report we applied the recommendations and guideline of the following;

- The Building Research Establishment (BRE) report, "Site layout planning for daylight and sunlight – a guide to good practice (referred to as the BRE Report).
- British European Standard BS EN17037/EN17037 Day lighting standards and contains guidance on the minimum recommended levels of interior day lighting.
- CIBSE guide 10 Day light and lighting for buildings.

### 2.3 Technical analysis

Calculations were conducted in accordance with the BRE guidelines to determine the extent to which the proposed development could affect the shadow/sun light reception in any existing amenity spaces and new amenity spaces proposed with the development. For new amenity spaces, in basic terms, the minimum criteria is that at least 50% of the amenity space should receive at least two hours of sunlight on the 21<sup>st</sup> March and for "existing" amenity spaces there is also the additional criteria that any loss of sunlight should not be greater than 0.8 times its former size.

### 2.4 Amenity spaces within the development shadow / sunlight assessment conclusion

Based on the BRE guidelines at least 50% of the amenity space should receive at least two hours of sunlight on the 21<sup>st</sup> March. From the calculation results we note the new amenity spaces all received more than 2 hours of sunlight on at least 50% of the area. Results are as follows (see image 5.1 for receptor locations):

Amenity area outlined in 1 (communal open area) was calculated to have 5.00 hours at 50% area.  
Amenity area outlined in 2 (public open area) was calculated to have 6.00 hours at 50% area.  
Amenity area outlined in 3 (private amenity area) was calculated to have 3.00 hours at 50% area.  
Amenity area outlined in 4 (private amenity area) was calculated to have 3.00 hours at 50% area.  
Amenity area outlined in 5 (private amenity area) was calculated to have 4.00 hours at 50% area.  
Amenity area outlined in 6 (private amenity area) was calculated to have 4.00 hours at 50% area.  
Amenity area outlined in 7 (private amenity area) was calculated to have 2.00 hours at 50% area.  
Amenity area outlined in 8 (private amenity area) was calculated to have 6.00 hours at 50% area.  
Amenity area outlined in 9 (private amenity area) was calculated to have 2.00 hours at 50% area.  
Amenity area outlined in 10 (private amenity area) was calculated to have 6.00 hours at 50% area.  
Amenity area outlined in 11 (private amenity area) was calculated to have 6.00 hours at 50% area.  
Amenity area outlined in 12 (private amenity area) was calculated to have 6.00 hours at 50% area.  
Amenity area outlined in 13 (private amenity area) was calculated to have 6.00 hours at 50% area.  
Amenity area outlined in 14 (private amenity area) was calculated to have 6.00 hours at 50% area.  
Amenity area outlined in 15 (private amenity area) was calculated to have 2.00 hours at 50% area.  
Amenity area outlined in 16 (private amenity area) was calculated to have 2.00 hours at 50% area.

We conclude that the new amenity spaces receive sunlight on 50% of the area is in excess of the minimum recommendations of the BRE Report - Site Layout and Planning for Daylight and Sunlight - and therefore deem this to be compliant to this element.

## 2.5 Existing neighbouring amenity spaces shadow / sunlight assessment conclusion

Based on the BRE guidelines at least 50% of the amenity space should receive at least two hours of sunlight on the 21<sup>st</sup> March and that any loss of sunlight should not be greater than 0.8 (20% reduction) times its former size. From the calculation results we note that the selected existing amenity spaces all received 2 or more hours of sunlight on at least 50% of the area before and after the introduction of the new development. Results are as follows (see image 6.1 for receptor locations):

- North receptor: Receptor A is a residential dwelling with private green space. This space resulted in a change factor of 0.99 meaning the new proposed development has a small effect on the amenity space shadow/sunlight. This effect happens in the early morning hours between 08.00-09.00. The result is well within BRE guidelines.
- South receptors: Receptor B is a section of the Old Rail Trail Greenway and Receptor C is a residential dwelling with private green space. Both resulted in a change factor of 1.00 meaning the new proposed development has no effect on existing sunlight status, due to these amenity areas located south of the development site.
- East receptors: Receptor D is a residential dwelling with private green space. This space resulted in a change factor of 1.00 meaning the new proposed has no effect on existing sunlight status. Receptor E is the open green space on ESB grounds. This space resulted in a change factor of 0.91 meaning the new proposed development has a small effect on the amenity space shadow/sunlight. This effect happens in the afternoon hours between 15.00-18.00. The results are well within BRE guidelines.

We conclude that the loss of sunlight reception in the existing amenity spaces after the introduction of the new development is well in excess of the minimum recommendations of the BRE Report - Site Layout and Planning for Daylight and Sunlight - and therefore deem this to be compliant to this element.

## 2.6 Mitigation measures / actions

No mitigation measures.



### 3 Geographical overview

#### 3.1 Project overview

Image 3.1 the (google maps) site map below indicates the location of the site, approximately outlined.



Image 3.1 proposed development site area outline

## 4 Approach and methodology

### 4.1 General approach

This report covers

- the effects of the new development on the sunlight reception/shadow status of existing neighbouring amenity spaces
- the sunlight reception/shadow status of new and or existing amenity spaces within the development.

### 4.2 The nature and effects of day light and sun light

When assessing the effects of proposed building projects on the potential to cause issues relating to light, it is important to recognise the distinction between daylight and sunlight. Daylight is the combination of all direct and indirect sunlight during the daytime, whereas sunlight (for the purposes of this report) comprises only the direct elements of sunlight. For example, on a cloudy or overcast day diffused daylight still shines through windows, even when sunlight is absent. Any development within a built-up area has the potential to alter the amount of daylight and direct sun received by nearby residential properties.

Care should be taken when designing new buildings in built-up areas, especially when the proposed development is relatively tall or situated to the south of existing buildings, because in the northern hemisphere the majority of the sunlight comes from the south. In Ireland (and other northern hemisphere countries) south-facing facades will in general, receive the most sunlight, while the north facing facades will receive sunlight on only a handful of occasions, specifically early mornings and late evenings during the summer months. It is therefore important to ensure that buildings to the south of any development do not cause over shadowing to existing dwellings and therefore reduce their capacity to receive sunlight.

### 4.3 Assessment criteria

National Policy/building regulations.

The government does not have an adopted policy on daylight, sunlight and the effects of overshadowing, and does not have targets, criteria or relevant planning guidance in the way it has for other environmental impacts such as noise, landscape or air quality. However, there are a number of guidance documents which are relevant when considering daylight, sunlight and overshadowing in dwellings:

- The Building Research Establishment (BRE) report, "Site layout planning for daylight and sunlight – a guide to good practice (referred to as the BRE Report). Although not Government guidance, this report is commonly referenced as the main guide in Ireland/UK in determining the minimum standards of daylight and sunlight and for determining the impact of a development.
- British European Standard BS EN17037/EN17037 Day Lighting for buildings. BS EN17037/EN17037 contains guidance on the minimum recommended levels of interior day lighting and introduces some of the calculation procedures used in the BRE Report.
- CIBSE guide 10 Day light and lighting for buildings. CIBSE lighting guide 10 like BS EN17037/EN17037 contains guidance on the minimum recommended levels of interior day lighting and introduces recommended day light levels for general buildings.

### 4.4 The BRE Report – "Site Layout and Planning for Daylight and Sunlight – A Guide to Good Practice"

The BRE report contains guidance on how to design developments, whilst minimising the impacts on existing buildings from overshadowing and reduced levels of daylight and sunlight. The advice provided within the guide is not mandatory and should not be seen as an instrument of planning policy, its aim is to help rather than constrain the designer. Although it gives numerical guidance values, these should be interpreted with flexibility since natural lighting is one of many factors in site layout design. The guidance should be applied appropriately to developments to assist in gaining the best development possible without adverse impacts.

As well as advice, the report contains a methodology to assess levels of daylight, sunlight and over shadowing and contains criteria to determine the potential impacts of a new development on surrounding buildings. The table below summarises the criteria used to assess the overshadowing/sunlight reception in amenity spaces.



In this report we have separated the new and existing amenity spaces as they are assessed slightly differently. BRE sunlight/shadow assessment criteria. Table 4.1 Sunlight reception requirements for amenity spaces within the new proposed development.

Type	Criteria	Acceptable parameters
Overshadowing new amenity spaces	Amenity space prevented from receiving any sunlight on March 21 <sup>st</sup>	At least 50% of the amenity space should receive at least two hours of sunlight

Table 4.1

Table 4.2 Effects on Sunlight reception requirements for existing neighbouring amenity spaces.

Type	Criteria	Acceptable parameters
Overshadowing existing amenity spaces	Amenity space prevented from receiving any sunlight on March 21 <sup>st</sup>	Any loss of sunlight should not be greater than 0.8 times its former size.

Table 4.2

#### 4.5 Overshadowing effects measured

The minimum sunlight requirement in this report measured in sunlight time 2 hours (120 minutes) multiplied by 50% area m<sup>2</sup> or the minimum requirement = 120 (min) \* 0.5a (m<sup>2</sup>) = [ ] min·m<sup>2</sup>.

#### 4.6 Existing amenity spaces

The overshadowing/sun light assessment is the effects the proposed development has on existing open amenity spaces. In basic terms, based on the BRE report states that at least 50% of the amenity space should receive at least two hours of sunlight on the 21<sup>st</sup> March and any loss of sunlight should not be greater than 0.8 times its former size. The overshadowing/sun light assessment is executed in using a 3D model of the project and adjoining buildings with the results illustrated in tabular format showing the hourly status of the shadow/sunlight fraction in the relevant amenity spaces. The impacts of vegetation: It is important to note that according to the BRE Report, calculations do not normally take into account vegetation. The exception is when evergreen vegetation exists that forms a continuous barrier and would be permanent throughout the seasons.

## 5 Receptor selection and Calculation results - Amenity spaces within the proposed development

### 5.1 Amenity spaces within the proposed development

Image 5.1 below indicates the amenity areas, public and communal that have been selected and analysed on the basis that the shadow casted from the proposed development may effect the amenity areas given its geographical location in relation to the development.

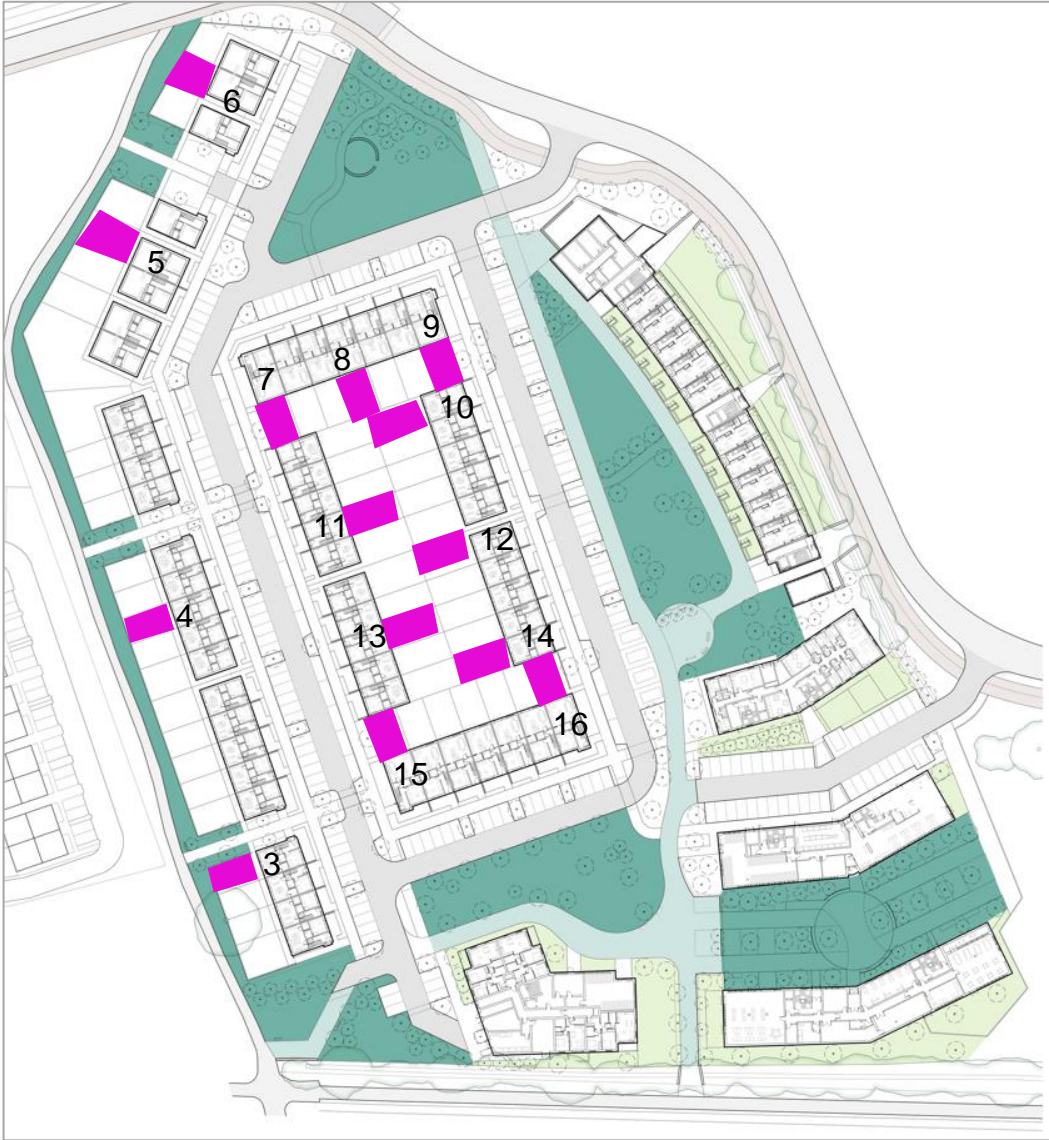


Image 5.1: amenity spaces within the development

Receptor	Description	Area m <sup>2</sup>
1	Communal open area	495
2	Public open area	7666
3 - 16	Private amenity area	~70

### 5.2 Assessment approach

The tables below represent the one hourly sunlight/shadow status of the respective new amenity spaces provided within the new development on March 21<sup>st</sup>. To compare against the BRE guidelines, the calculation results have been given the following colour code guide depending on its level of resulting compliance. See appendix A for the modelled shadow/sunlight imaging per hour.

Compliance guide

☑	0% Over /equal to
☑	5% Within
!!	10% Within
x	10% In excess of

### 5.3 Proposed development amenity space calculation results

The calculation results of the one hourly sunlight & shadow status of each amenity space:

1 Communal open area							495	m <sup>2</sup>
NEW STATUS							March 21st	
Time	Shadow	Sunlight	Sun time	Sun area	Sun time.area			
24 Hr	% / %	% / %	min	m <sup>2</sup>	min*m <sup>2</sup>			
6.00	100%	0%	60	0	0			
7.00	93%	7%	60	35	2,079			
8.00	59%	41%	60	203	12,177			
9.00	29%	71%	60	351	21,087			
10.00	23%	77%	60	381	22,869			
11.00	22%	78%	60	386	23,166			
12.00	23%	77%	60	381	22,869			
13.00	37%	63%	60	312	18,711			
14.00	54%	46%	60	228	13,662			
15.00	56%	44%	60	218	13,068			
16.00	68%	32%	60	158	9,504			
17.00	72%	28%	60	139	8,316			
18.00	85%	15%	60	74	4,455			
19.00	100%	0%	60	0	0			

Required sun hours @ 50% area: 2  
 Achieved sun hours on @ 50% area: **5.00**  
 Achieved total sun time (hrs): 5.79  
 Achieved daily sun time \* area: 171963

2 Public open area							7,666	m <sup>2</sup>
NEW STATUS							March 21st	
Time	Shadow	Sunlight	Sun time	Sun area	Sun time.area			
24 Hr	% / %	% / %	min	m <sup>2</sup>	min*m <sup>2</sup>			
6.00	100%	0%	60	0	0			
7.00	94%	6%	60	460	27,598			
8.00	68%	32%	60	2453	147,187			
9.00	59%	41%	60	3143	188,584			
10.00	43%	57%	60	4370	262,177			
11.00	41%	59%	60	4523	271,376			
12.00	49%	51%	60	3910	234,580			
13.00	52%	48%	60	3680	220,781			
14.00	46%	54%	60	4140	248,378			
15.00	46%	54%	60	4140	248,378			
16.00	47%	53%	60	4063	243,779			
17.00	68%	32%	60	2453	147,187			
18.00	81%	19%	60	1457	87,392			
19.00	100%	0%	60	0	0			

Required sun hours @ 50% area: 2  
 Achieved sun hours on @ 50% area: **6.00**  
 Achieved total sun time (hrs): 5.06  
 Achieved daily sun time \* area: 2327398

3 Private amenity area							70	m <sup>2</sup>
NEW STATUS							March 21st	
Time	Shadow	Sunlight	Sun time	Sun area	Sun time.area			
24 Hr	% / %	% / %	min	m <sup>2</sup>	min*m <sup>2</sup>			
6.00	100%	0%	60	0	0			
7.00	89%	11%	60	8	462			
8.00	88%	12%	60	8	504			
9.00	88%	12%	60	8	504			
10.00	72%	28%	60	20	1,176			
11.00	51%	49%	60	34	2,058			
12.00	36%	64%	60	45	2,688			
13.00	36%	64%	60	45	2,688			
14.00	39%	61%	60	43	2,562			
15.00	53%	47%	60	33	1,974			
16.00	57%	43%	60	30	1,806			
17.00	67%	33%	60	23	1,386			
18.00	89%	11%	60	8	462			
19.00	100%	0%	60	0	0			

Required sun hours @ 50% area: 2  
 Achieved sun hours on @ 50% area: **3.00**  
 Achieved total sun time (hrs): 4.35  
 Achieved daily sun time \* area: 18270

4 Private amenity area							70	m <sup>2</sup>
NEW STATUS							March 21st	
Time	Shadow	Sunlight	Sun time	Sun area	Sun time.area			
24 Hr	% / %	% / %	min	m <sup>2</sup>	min*m <sup>2</sup>			
6.00	100%	0%	60	0	0			
7.00	89%	11%	60	8	462			
8.00	88%	12%	60	8	504			
9.00	88%	12%	60	8	504			
10.00	72%	28%	60	20	1,176			
11.00	51%	49%	60	34	2,058			
12.00	36%	64%	60	45	2,688			
13.00	36%	64%	60	45	2,688			
14.00	39%	61%	60	43	2,562			
15.00	53%	47%	60	33	1,974			
16.00	57%	43%	60	30	1,806			
17.00	67%	33%	60	23	1,386			
18.00	89%	11%	60	8	462			
19.00	100%	0%	60	0	0			

Required sun hours @ 50% area: 2  
 Achieved sun hours on @ 50% area: **3.00**  
 Achieved total sun time (hrs): 4.35  
 Achieved daily sun time \* area: 18270

5 Private amenity area							70	m <sup>2</sup>
NEW STATUS							March 21st	
Time	Shadow	Sunlight	Sun time	Sun area	Sun time.area			
24 Hr	% / %	% / %	min	m <sup>2</sup>	min*m <sup>2</sup>			
6.00	100%	0%	60	0	0			
7.00	89%	11%	60	8	462			
8.00	88%	12%	60	8	504			
9.00	88%	12%	60	8	504			
10.00	88%	12%	60	8	504			
11.00	68%	32%	60	22	1,344			
12.00	51%	49%	60	34	2,058			
13.00	37%	63%	60	44	2,646			
14.00	31%	69%	60	48	2,898			
15.00	37%	63%	60	44	2,646			
16.00	46%	54%	60	38	2,268			
17.00	78%	22%	60	15	924			
18.00	89%	11%	60	8	462			
19.00	100%	0%	60	0	0			

Required sun hours @ 50% area: 2  
 Achieved sun hours on @ 50% area: **4.00**  
 Achieved total sun time (hrs): 4.1  
 Achieved daily sun time \* area: 17220

6 Private amenity area							70	m <sup>2</sup>
NEW STATUS							March 21st	
Time	Shadow	Sunlight	Sun time	Sun area	Sun time.area			
24 Hr	% / %	% / %	min	m <sup>2</sup>	min*m <sup>2</sup>			
6.00	100%	0%	60	0	0			
7.00	89%	11%	60	8	462			
8.00	88%	12%	60	8	504			
9.00	88%	12%	60	8	504			
10.00	79%	21%	60	15	882			
11.00	85%	15%	60	11	630			
12.00	69%	31%	60	22	1,302			
13.00	49%	51%	60	36	2,142			
14.00	29%	71%	60	50	2,982			
15.00	33%	67%	60	47	2,814			
16.00	46%	54%	60	38	2,268			
17.00	78%	22%	60	15	924			
18.00	89%	11%	60	8	462			
19.00	100%	0%	60	0	0			

Required sun hours @ 50% area: 2  
 Achieved sun hours on @ 50% area: **4.00**  
 Achieved total sun time (hrs): 3.78  
 Achieved daily sun time \* area: 15876



**7 Private amenity area** 70 m<sup>2</sup>  
**NEW STATUS** March 21st

Time	Shadow % / %	Sunlight % / %	Sun time min	Sun area m <sup>2</sup>	Sun time.area min*m <sup>2</sup>
6.00	100%	0%	60	0	0
7.00	89%	11%	60	8	462
8.00	88%	12%	60	8	504
9.00	71%	29%	60	20	1,218
10.00	74%	26%	60	18	1,092
11.00	73%	27%	60	19	1,134
12.00	85%	15%	60	11	630
13.00	71%	29%	60	20	1,218
14.00	48%	52%	60	36	2,184
15.00	49%	51%	60	36	2,142
16.00	63%	37%	60	26	1,554
17.00	88%	12%	60	8	504
18.00	89%	11%	60	8	462
19.00	100%	0%	60	0	0

Required sun hours @ 50% area 2  
 Achieved sun hours on @ 50% area **2.00**  
 Achieved total sun time (hrs) 3.12  
 Achieved daily sun time \* area 13104

**8 Private amenity area** 70 m<sup>2</sup>  
**NEW STATUS** March 21st

Time	Shadow % / %	Sunlight % / %	Sun time min	Sun area m <sup>2</sup>	Sun time.area min*m <sup>2</sup>
6.00	100%	0%	60	0	0
7.00	89%	11%	60	8	462
8.00	88%	12%	60	8	504
9.00	88%	12%	60	8	504
10.00	36%	64%	60	45	2,688
11.00	21%	79%	60	55	3,318
12.00	21%	79%	60	55	3,318
13.00	21%	79%	60	55	3,318
14.00	26%	74%	60	52	3,108
15.00	30%	70%	60	49	2,940
16.00	69%	31%	60	22	1,302
17.00	85%	15%	60	11	630
18.00	89%	11%	60	8	462
19.00	100%	0%	60	0	0

Required sun hours @ 50% area 2  
 Achieved sun hours on @ 50% area **6.00**  
 Achieved total sun time (hrs) 5.37  
 Achieved daily sun time \* area 22554

**9 Private amenity area** 70 m<sup>2</sup>  
**NEW STATUS** March 21st

Time	Shadow % / %	Sunlight % / %	Sun time min	Sun area m <sup>2</sup>	Sun time.area min*m <sup>2</sup>
6.00	100%	0%	60	0	0
7.00	89%	11%	60	8	462
8.00	88%	12%	60	8	504
9.00	66%	34%	60	24	1,428
10.00	48%	52%	60	36	2,184
11.00	49%	51%	60	36	2,142
12.00	70%	30%	60	21	1,260
13.00	85%	15%	60	11	630
14.00	80%	20%	60	14	840
15.00	74%	26%	60	18	1,092
16.00	74%	26%	60	18	1,092
17.00	88%	12%	60	8	504
18.00	89%	11%	60	8	462
19.00	100%	0%	60	0	0

Required sun hours @ 50% area 2  
 Achieved sun hours on @ 50% area **2.00**  
 Achieved total sun time (hrs) 3  
 Achieved daily sun time \* area 12600

**10 Private amenity area** 70 m<sup>2</sup>  
**NEW STATUS** March 21st

Time	Shadow % / %	Sunlight % / %	Sun time min	Sun area m <sup>2</sup>	Sun time.area min*m <sup>2</sup>
6.00	100%	0%	60	0	0
7.00	89%	11%	60	8	462
8.00	88%	12%	60	8	504
9.00	88%	12%	60	8	504
10.00	68%	32%	60	22	1,344
11.00	41%	59%	60	41	2,478
12.00	36%	64%	60	45	2,688
13.00	36%	64%	60	45	2,688
14.00	36%	62%	60	43	2,604
15.00	41%	59%	60	41	2,478
16.00	47%	53%	60	37	2,226
17.00	85%	15%	60	11	630
18.00	89%	11%	60	8	462
19.00	100%	0%	60	0	0

Required sun hours @ 50% area 2  
 Achieved sun hours on @ 50% area **6.00**  
 Achieved total sun time (hrs) 4.54  
 Achieved daily sun time \* area 19068

**11 Private amenity area** 70 m<sup>2</sup>  
**NEW STATUS** March 21st

Time	Shadow % / %	Sunlight % / %	Sun time min	Sun area m <sup>2</sup>	Sun time.area min*m <sup>2</sup>
6.00	100%	0%	60	0	0
7.00	89%	11%	60	8	462
8.00	88%	12%	60	8	504
9.00	47%	53%	60	37	2,226
10.00	41%	59%	60	41	2,478
11.00	38%	62%	60	43	2,604
12.00	36%	64%	60	45	2,688
13.00	36%	64%	60	45	2,688
14.00	42%	58%	60	41	2,436
15.00	68%	32%	60	22	1,344
16.00	85%	15%	60	11	630
17.00	88%	12%	60	8	504
18.00	89%	11%	60	8	462
19.00	100%	0%	60	0	0

Required sun hours @ 50% area 2  
 Achieved sun hours on @ 50% area **6.00**  
 Achieved total sun time (hrs) 4.53  
 Achieved daily sun time \* area 19026

**12 Private amenity area** 70 m<sup>2</sup>  
**NEW STATUS** March 21st

Time	Shadow % / %	Sunlight % / %	Sun time min	Sun area m <sup>2</sup>	Sun time.area min*m <sup>2</sup>
6.00	100%	0%	60	0	0
7.00	89%	11%	60	8	462
8.00	88%	12%	60	8	504
9.00	88%	12%	60	8	504
10.00	68%	32%	60	22	1,344
11.00	41%	59%	60	41	2,478
12.00	36%	64%	60	45	2,688
13.00	36%	64%	60	45	2,688
14.00	38%	62%	60	43	2,604
15.00	41%	59%	60	41	2,478
16.00	47%	53%	60	37	2,226
17.00	88%	12%	60	8	504
18.00	89%	11%	60	8	462
19.00	100%	0%	60	0	0

Required sun hours @ 50% area 2  
 Achieved sun hours on @ 50% area **6.00**  
 Achieved total sun time (hrs) 4.51  
 Achieved daily sun time \* area 18942

**13 Private amenity area** 70 m<sup>2</sup>  
**NEW STATUS** March 21st

Time	Shadow % / %	Sunlight % / %	Sun time min	Sun area m <sup>2</sup>	Sun time.area min*m <sup>2</sup>
6.00	100%	0%	60	0	0
7.00	89%	11%	60	8	462
8.00	88%	12%	60	8	504
9.00	47%	53%	60	37	2,226
10.00	41%	59%	60	41	2,478
11.00	38%	62%	60	43	2,604
12.00	36%	64%	60	45	2,688
13.00	36%	64%	60	45	2,688
14.00	42%	58%	60	41	2,436
15.00	68%	32%	60	22	1,344
16.00	85%	15%	60	11	630
17.00	88%	12%	60	8	504
18.00	89%	11%	60	8	462
19.00	100%	0%	60	0	0

Required sun hours @ 50% area 2  
 Achieved sun hours on @ 50% area **6.00**  
 Achieved total sun time (hrs) 4.53  
 Achieved daily sun time \* area 19026

**14 Private amenity area** 70 m<sup>2</sup>  
**NEW STATUS** March 21st

Time	Shadow % / %	Sunlight % / %	Sun time min	Sun area m <sup>2</sup>	Sun time.area min*m <sup>2</sup>
6.00	100%	0%	60	0	0
7.00	89%	11%	60	8	462
8.00	88%	12%	60	8	504
9.00	80%	20%	60	14	840
10.00	58%	42%	60	29	1,764
11.00	38%	62%	60	43	2,604
12.00	36%	64%	60	45	2,688
13.00	36%	64%	60	45	2,688
14.00	36%	62%	60	43	2,604
15.00	41%	59%	60	41	2,478
16.00	47%	53%	60	37	2,226
17.00	88%	12%	60	8	504
18.00	89%	11%	60	8	462
19.00	100%	0%	60	0	0

Required sun hours @ 50% area 2  
 Achieved sun hours on @ 50% area **6.00**  
 Achieved total sun time (hrs) 4.72  
 Achieved daily sun time \* area 19824



15 Private amenity area						70 m <sup>2</sup>
NEW STATUS						March 21st
Time	Shadow % / %	Sunlight % / %	Sun time min	Sun area m <sup>2</sup>	Sun time.area min*m <sup>2</sup>	
6.00	100%	0%	60	0	0	
7.00	89%	11%	60	8	462	
8.00	88%	12%	60	8	504	
9.00	88%	12%	60	8	504	
10.00	83%	17%	60	12	714	
11.00	79%	21%	60	15	882	
12.00	79%	21%	60	15	882	
13.00	69%	31%	60	22	1,302	
14.00	38%	62%	60	43	2,604	
15.00	42%	58%	60	41	2,436	
16.00	75%	25%	60	18	1,050	
17.00	88%	12%	60	8	504	
18.00	88%	11%	60	8	462	
19.00	100%	0%	60	0	0	

Required sun hours @ 50% area	2
Achieved sun hours on @ 50% area	2.00
Achieved total sun time (hrs)	2.93
Achieved daily sun time * area	12306

16 Private amenity area						70
NEW STATUS						March 21st
Time	Shadow % / %	Sunlight % / %	Sun time min	Sun area m <sup>2</sup>	Sun time.area min*m <sup>2</sup>	
6.00	100%	0%	60	0	0	
7.00	89%	11%	60	8	462	
8.00	88%	12%	60	8	504	
9.00	88%	12%	60	8	504	
10.00	38%	62%	60	43	2,604	
11.00	42%	58%	60	41	2,436	
12.00	69%	31%	60	22	1,302	
13.00	70%	30%	60	21	1,260	
14.00	70%	30%	60	21	1,260	
15.00	70%	30%	60	21	1,260	
16.00	84%	16%	60	11	672	
17.00	88%	12%	60	8	504	
18.00	89%	11%	60	8	462	
19.00	100%	0%	60	0	0	

Required sun hours @ 50% area	2
Achieved sun hours on @ 50% area	2.00
Achieved total sun time (hrs)	3.15
Achieved daily sun time * area	13230

**5.4 Amenity spaces within proposed development at Lissywollen sunlight / shadow results conclusion**

Based on the BRE guidelines at least 50% of the amenity space should receive at least two hours of sunlight on the 21<sup>st</sup> March. From the calculation results we note the new amenity spaces all received more than 2 hours of sunlight on at least 50% of the area. Results are as follows (see image 5.1 for receptor locations):

- Amenity area outlined in 1 (communal open area) was calculated to have 5.00 hours at 50% area.
- Amenity area outlined in 2 (public open area) was calculated to have 6.00 hours at 50% area.
- Amenity area outlined in 3 (private amenity area) was calculated to have 3.00 hours at 50% area.
- Amenity area outlined in 4 (private amenity area) was calculated to have 3.00 hours at 50% area.
- Amenity area outlined in 5 (private amenity area) was calculated to have 4.00 hours at 50% area.
- Amenity area outlined in 6 (private amenity area) was calculated to have 4.00 hours at 50% area.
- Amenity area outlined in 7 (private amenity area) was calculated to have 2.00 hours at 50% area.
- Amenity area outlined in 8 (private amenity area) was calculated to have 6.00 hours at 50% area.
- Amenity area outlined in 9 (private amenity area) was calculated to have 2.00 hours at 50% area.
- Amenity area outlined in 10 (private amenity area) was calculated to have 6.00 hours at 50% area.
- Amenity area outlined in 11 (private amenity area) was calculated to have 6.00 hours at 50% area.
- Amenity area outlined in 12 (private amenity area) was calculated to have 6.00 hours at 50% area.
- Amenity area outlined in 13 (private amenity area) was calculated to have 6.00 hours at 50% area.
- Amenity area outlined in 14 (private amenity area) was calculated to have 6.00 hours at 50% area.
- Amenity area outlined in 15 (private amenity area) was calculated to have 2.00 hours at 50% area.
- Amenity area outlined in 16 (private amenity area) was calculated to have 2.00 hours at 50% area.

We conclude that the new amenity spaces receive sunlight on 50% of the area is in excess of the minimum recommendations of the BRE Report - Site Layout and Planning for Daylight and Sunlight - and therefore deem this to be compliant to this element.





## 6 Receptor selection and Calculation results – Existing neighbouring amenity spaces

### 6.1 Selected existing amenity spaces

Image 6.1 below indicates the neighbouring amenity areas that have been selected and analysed on the basis that the shadow casted from the new development may effect these amenity areas given its geographical location in relation to the proposed development.

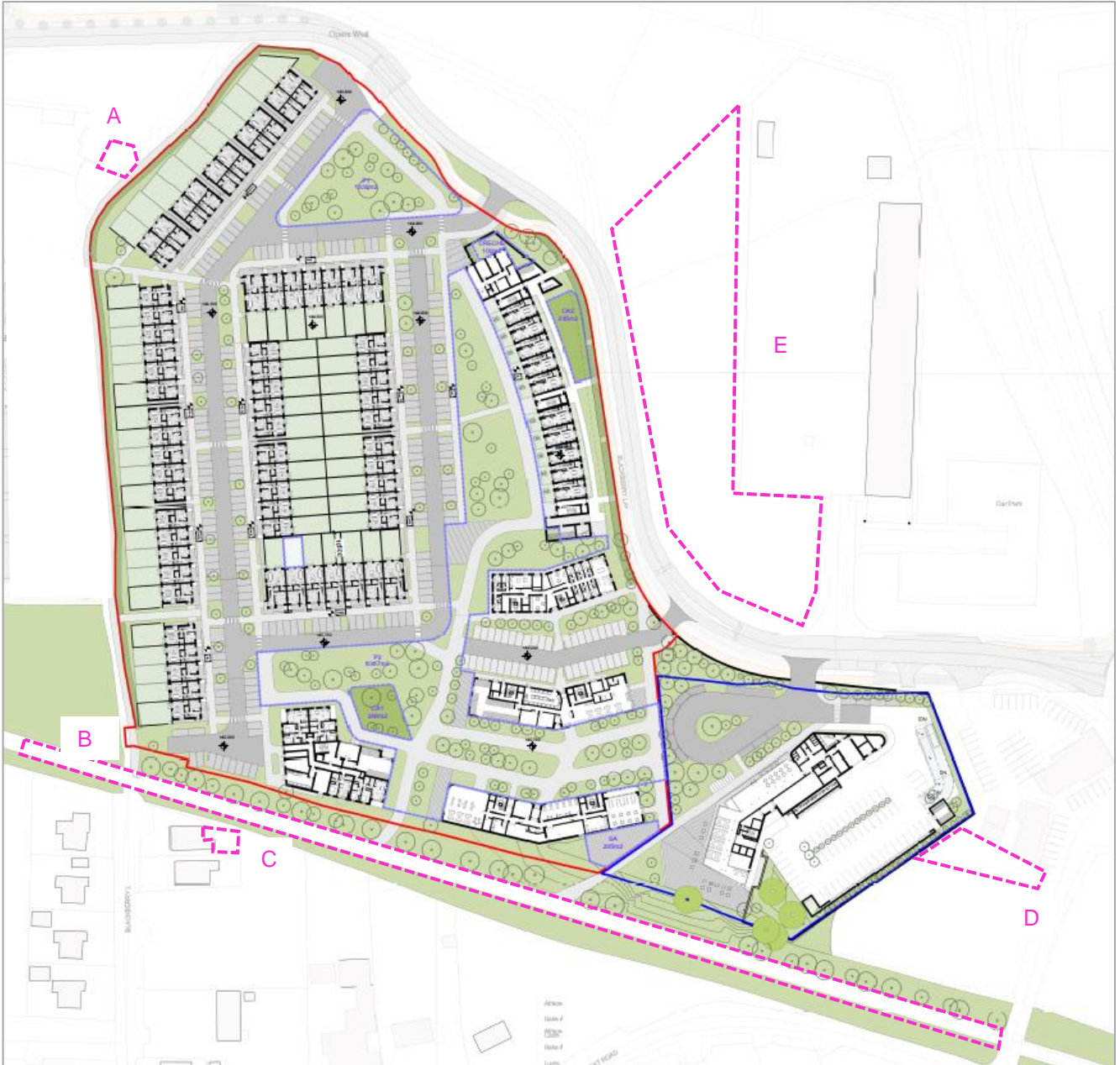


Image 6.1: selected existing amenity spaces

Receptor	Address	Description
A	Kilnafaddoge, Athlone	Front garden / amenity space
B	Part of the Old Rail Trail Greenway	Public amenity space
C	1 Ashgrove, Kilnafaddoge, Athlone	Back garden / amenity space
D	Garrycastle, Athlone	Green area / amenity space
E	ESB Networks	ESB green area



### 6.2 Assessment approach

The calculation results of the one hourly sunlight & shadow status of each amenity space before and after the introduction of the new development are all detailed in the tables below. Note: The calculation results have been given the following colour code guide depending on its level of resulting compliance for March 21<sup>st</sup>. See appendix A for the predicted sunlight/shadow imaging per hour.

#### Compliance guide

☑	0% Over /equal to
☑	5% Within
!!	10% Within
x	10% In excess of

### 6.3 Existing neighbouring amenity spaces calculation results

The calculation results of the one hourly sunlight & shadow status of each amenity space before and after the introduction of the new development:

#### SUNLIGHT/SHADOW CALCULATION DATA

A Kilnafaddoge, Athlone 105 m <sup>2</sup>							NEW STATUS							
EXISTING STATUS						March 21st	NEW STATUS						change	
Time	Shadow	Sunlight	Sun time	Sun area	time * area	Time	Shadow	Sunlight	Sun time	Sun area	time * area	time * area		
24 Hr	% / %	% / %	min	m <sup>2</sup>	min*m <sup>2</sup>	24 Hr	% / %	% / %	min	m <sup>2</sup>	min*m <sup>2</sup>	min*m <sup>2</sup>		
6.00	100%	0%	60	0	0	6.00	100%	0%	60	0	0	0		
7.00	75%	25%	60	26	1,575	7.00	75%	25%	60	26	1,575	0		
8.00	58%	42%	60	44	2,646	8.00	75%	25%	60	26	1,575	-1,071		
9.00	14%	86%	60	90	5,418	9.00	14%	86%	60	90	5,418	0		
10.00	5%	95%	60	100	5,985	10.00	5%	95%	60	100	5,985	0		
11.00	0%	100%	60	105	6,300	11.00	0%	100%	60	105	6,300	0		
12.00	0%	100%	60	105	6,300	12.00	0%	100%	60	105	6,300	0		
13.00	0%	100%	60	105	6,300	13.00	0%	100%	60	105	6,300	0		
14.00	0%	100%	60	105	6,300	14.00	0%	100%	60	105	6,300	0		
15.00	0%	100%	60	105	6,300	15.00	0%	100%	60	105	6,300	0		
16.00	0%	100%	60	105	6,300	16.00	0%	100%	60	105	6,300	0		
17.00	16%	84%	60	88	5,292	17.00	16%	84%	60	88	5,292	0		
18.00	39%	61%	60	64	3,843	18.00	39%	61%	60	64	3,843	0		
19.00	100%	0%	60	0	0	19.00	100%	0%	60	0	0	0		
Required sun hours @ 50% area (hr)						2	Required sun hours @ 50% area (hr)						2	
Achieved sun hours on (hrs) @ 50% area						10.00	Achieved sun hours on (hrs) @ 50% area						10.00	
Achieved total sun time (hrs)						9.93	Achieved total sun time (hrs)						9.76	0.99
Achieved daily sun time * area						62559	Achieved daily sun time * area						61488	0.99

B Part of the Old Rail Trail Greenv 1,400 m <sup>2</sup>							NEW STATUS							
EXISTING STATUS						March 21st	NEW STATUS						change	
Time	Shadow	Sunlight	Sun time	Sun area	time * area	Time	Shadow	Sunlight	Sun time	Sun area	time * area	time * area		
24 Hr	% / %	% / %	min	m <sup>2</sup>	min*m <sup>2</sup>	24 Hr	% / %	% / %	min	m <sup>2</sup>	min*m <sup>2</sup>	min*m <sup>2</sup>		
6.00	100%	0%	60	0	0	6.00	100%	0%	60	0	0	0		
7.00	78%	22%	60	308	18,480	7.00	78%	22%	60	308	18,480	0		
8.00	74%	26%	60	364	21,840	8.00	74%	26%	60	364	21,840	0		
9.00	24%	76%	60	1064	63,840	9.00	24%	76%	60	1064	63,840	0		
10.00	34%	66%	60	924	55,440	10.00	34%	66%	60	924	55,440	0		
11.00	34%	66%	60	924	55,440	11.00	34%	66%	60	924	55,440	0		
12.00	34%	66%	60	924	55,440	12.00	34%	66%	60	924	55,440	0		
13.00	34%	66%	60	924	55,440	13.00	34%	66%	60	924	55,440	0		
14.00	34%	66%	60	924	55,440	14.00	34%	66%	60	924	55,440	0		
15.00	34%	66%	60	924	55,440	15.00	34%	66%	60	924	55,440	0		
16.00	34%	66%	60	924	55,440	16.00	34%	66%	60	924	55,440	0		
17.00	40%	60%	60	840	50,400	17.00	40%	60%	60	840	50,400	0		
18.00	48%	52%	60	728	43,680	18.00	48%	52%	60	728	43,680	0		
19.00	100%	0%	60	0	0	19.00	100%	0%	60	0	0	0		
Required sun hours @ 50% area (hr)						2	Required sun hours @ 50% area (hr)						2	
Achieved sun hours on (hrs) @ 50% area						10.00	Achieved sun hours on (hrs) @ 50% area						10.00	
Achieved total sun time (hrs)						6.98	Achieved total sun time (hrs)						6.98	1.00
Achieved daily sun time * area						586320	Achieved daily sun time * area						586320	1.00



**C** 1 Ashgrove, Kinafaddoge, Athlone 90 m2

EXISTING STATUS						March 21st	change
Time	Shadow	Sunlight	Sun time	Sun area	time * area		
24 Hr	% / %		min	m2	min*m2		
6.00	100%	0%	60	0	0		
7.00	70%	30%	60	27	1,620		
8.00	0%	100%	60	90	5,400		
9.00	0%	100%	60	90	5,400		
10.00	0%	100%	60	90	5,400		
11.00	0%	100%	60	90	5,400		
12.00	8%	92%	60	83	4,968		
13.00	11%	89%	60	80	4,806		
14.00	58%	42%	60	38	2,268		
15.00	69%	31%	60	28	1,674		
16.00	85%	15%	60	14	810		
17.00	85%	15%	60	14	810		
18.00	85%	15%	60	14	810		
19.00	100%	0%	60	0	0		

NEW STATUS						March 21st	change
Time	Shadow	Sunlight	Sun time	Sun area	time * area		
24 Hr	% / %		min	m2	min*m2		
6.00	100%	0%	60	0	0		
7.00	70%	30%	60	27	1,620		
8.00	0%	100%	60	90	5,400		
9.00	0%	100%	60	90	5,400		
10.00	0%	100%	60	90	5,400		
11.00	0%	100%	60	90	5,400		
12.00	8%	92%	60	83	4,968		
13.00	11%	89%	60	80	4,806		
14.00	58%	42%	60	38	2,268		
15.00	69%	31%	60	28	1,674		
16.00	85%	15%	60	14	810		
17.00	85%	15%	60	14	810		
18.00	85%	15%	60	14	810		
19.00	100%	0%	60	0	0		

Required sun hours @ 50% area (hr) 2  
 Achieved sun hours on (hrs) @ 50% area 6.00  
 Achieved total sun time (hrs) 7.29  
 Achieved daily sun time \* area 39366

Required sun hours @ 50% area (hr) 2  
 Achieved sun hours on (hrs) @ 50% area 6.00  
 Achieved total sun time (hrs) 7.29  
 Achieved daily sun time \* area 39366

**D** Garrycastle, Athlone 310 m2

EXISTING STATUS						March 21st	change
Time	Shadow	Sunlight	Sun time	Sun area	time * area		
24 Hr	% / %		min	m2	min*m2		
6.00	100%	0%	60	0	0		
7.00	70%	30%	60	93	5,580		
8.00	85%	15%	60	47	2,790		
9.00	42%	58%	60	180	10,788		
10.00	19%	81%	60	251	15,066		
11.00	0%	100%	60	310	18,600		
12.00	0%	100%	60	310	18,600		
13.00	0%	100%	60	310	18,600		
14.00	0%	100%	60	310	18,600		
15.00	0%	100%	60	310	18,600		
16.00	16%	84%	60	260	15,624		
17.00	30%	70%	60	217	13,020		
18.00	85%	15%	60	47	2,790		
19.00	100%	0%	60	0	0		

NEW STATUS						March 21st	change
Time	Shadow	Sunlight	Sun time	Sun area	time * area		
24 Hr	% / %		min	m2	min*m2		
6.00	100%	0%	60	0	0		
7.00	70%	30%	60	93	5,580		
8.00	85%	15%	60	47	2,790		
9.00	42%	58%	60	180	10,788		
10.00	19%	81%	60	251	15,066		
11.00	0%	100%	60	310	18,600		
12.00	0%	100%	60	310	18,600		
13.00	0%	100%	60	310	18,600		
14.00	0%	100%	60	310	18,600		
15.00	0%	100%	60	310	18,600		
16.00	16%	84%	60	260	15,624		
17.00	30%	70%	60	217	13,020		
18.00	85%	15%	60	47	2,790		
19.00	100%	0%	60	0	0		

Required sun hours @ 50% area (hr) 2  
 Achieved sun hours on (hrs) @ 50% area 9.00  
 Achieved total sun time (hrs) 8.53  
 Achieved daily sun time \* area 158658

Required sun hours @ 50% area (hr) 2  
 Achieved sun hours on (hrs) @ 50% area 9.00  
 Achieved total sun time (hrs) 8.53  
 Achieved daily sun time \* area 158658

**E** ESB Networks 5,500 m2

EXISTING STATUS						March 21st	change
Time	Shadow	Sunlight	Sun time	Sun area	time * area		
24 Hr	% / %		min	m2	min*m2		
6.00	100%	0%	60	0	0		
7.00	70%	30%	60	1650	99,000		
8.00	68%	32%	60	1760	105,600		
9.00	16%	84%	60	4620	277,200		
10.00	0%	100%	60	5500	330,000		
11.00	0%	100%	60	5500	330,000		
12.00	0%	100%	60	5500	330,000		
13.00	0%	100%	60	5500	330,000		
14.00	0%	100%	60	5500	330,000		
15.00	0%	100%	60	5500	330,000		
16.00	0%	100%	60	5500	330,000		
17.00	0%	100%	60	5500	330,000		
18.00	60%	40%	60	2200	132,000		
19.00	100%	0%	60	0	0		

NEW STATUS						March 21st	change
Time	Shadow	Sunlight	Sun time	Sun area	time * area		
24 Hr	% / %		min	m2	min*m2		
6.00	100%	0%	60	0	0		
7.00	70%	30%	60	1650	99,000		
8.00	68%	32%	60	1760	105,600		
9.00	16%	84%	60	4620	277,200		
10.00	0%	100%	60	5500	330,000		
11.00	0%	100%	60	5500	330,000		
12.00	0%	100%	60	5500	330,000		
13.00	0%	100%	60	5500	330,000		
14.00	0%	100%	60	5500	330,000		
15.00	6%	94%	60	5170	310,200		-19,800
16.00	11%	89%	60	4895	293,700		-36,300
17.00	57%	43%	60	2365	141,900		-188,100
18.00	75%	25%	60	1375	82,500		-49,500
19.00	100%	0%	60	0	0		

Required sun hours @ 50% area (hr) 2  
 Achieved sun hours on (hrs) @ 50% area 9.00  
 Achieved total sun time (hrs) 9.86  
 Achieved daily sun time \* area 3253800

Required sun hours @ 50% area (hr) 2  
 Achieved sun hours on (hrs) @ 50% area 8.00  
 Achieved total sun time (hrs) 8.97  
 Achieved daily sun time \* area 2960100



#### 6.4 Existing amenity spaces shadow / sunlight assessment conclusion

Based on the BRE guidelines at least 50% of the amenity space should receive at least two hours of sunlight on the 21<sup>st</sup> March and that any loss of sunlight should not be greater than 0.8 (20% reduction) times its former size. From the calculation results we note that the selected existing amenity spaces all received 2 or more hours of sunlight on at least 50% of the area before and after the introduction of the new development. Results are as follows (see image 6.1 for receptor locations):



(For reference) Image 6.1: selected existing amenity spaces

- North receptor: Receptor A is a residential dwelling with private green space. This space resulted in a change factor of 0.99 meaning the new proposed development has a small effect on the amenity space shadow/sunlight. This effect happens in the early morning hours between 08.00-09.00. The result is well within BRE guidelines.
- South receptors: Receptor B is a section of the Old Rail Trail Greenway and Receptor C is a residential dwelling with private green space. Both resulted in a change factor of 1.00 meaning the new proposed development has no effect on existing sunlight status, due to these amenity areas located south of the development site.
- East receptors: Receptor D is a residential dwelling with private green space. This space resulted in a change factor of 1.00 meaning the new proposed has no effect on existing sunlight status. Receptor E is the open green space on ESB grounds. This space resulted in a change factor of 0.91 meaning the new proposed development has a small effect on the amenity space shadow/sunlight. This effect happens in the afternoon hours between 15.00-18.00. The results are well within BRE guidelines.

We conclude that some existing amenity spaces have a marginal loss of sunlight reception however this loss in the existing amenity spaces as a result of the introduction of the new development is within the maximum allowable change factor (0.8 or maximum 20% loss) as per the BRE Report - Site Layout and Planning for Daylight and Sunlight - and we, DKP, therefore deem this to be compliant .