



5070

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

Phase 2 - The Farm - Bessborough

Proposed Residential Development

Bessborough,
Ballinure,
Blackrock,
Co. Cork

Estuary View Enterprises 2020 Ltd

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A 5071 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 of the proposed development on sunlight reception in existing neighbouring amenity spaces.

1.2 Instruction

DKPartnership (DKP) have been commissioned by Estuary View Enterprises 2020 Ltd, to carry out the analysis and report for the proposed development at Bessborough, Co. Cork.

1.3 Development description

Estuary View Enterprises 2020 Limited are seeking planning permission for a mixed use strategic housing development of 420 no. build to sell residential units with two creches, a café, tenant amenities, landscaping, pedestrian/cycleway infrastructure and associated site development works at Bessborough, Ballinure, Blackrock, Cork. The proposed development comprises two planning applications to An Bord Pleanála and includes two distinct phases, namely 'The Meadows' (Phase 1) and 'The Farm' (Phase 2).

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 the sunlight/shadow status of new amenity spaces within the proposed development and the effects of the proposed development on sunlight reception in 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 21st 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 21st March. From the calculation results we note the new amenity spaces all received more than the recommended sunlight. Summary of results are as follows (see image 5.1 for receptor locations):

- Amenity area outlined in 1 (Communal amenity no. 1) was calculated to have 3.00 hours at 50% area.
- Amenity area outlined in 2 (Communal amenity no. 2) was calculated to have 10.00 hours at 50% area.
- Amenity area outlined in 3 (Communal amenity no. 3) was calculated to have 6.00 hours at 50% area.
- Amenity area outlined in 4 (Public open space no.1) was calculated to have 10.00 hours at 50% area.
- Amenity area outlined in 5 (Public open space no.2) was calculated to have 7.00 hours at 50% area.
- Amenity area outlined in 6 (Public open space no.3) was calculated to have 6.00 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 sunlight/shadow assessment conclusion

Based on the BRE guidelines at least 50% of the amenity space should receive at least two hours of sunlight on the 21st 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 selected existing amenity spaces all received 2 hours of sunlight or more on at least 50% of the area before and after the introduction of the new development. Summary of results are as follows (see image 6.1 for receptor locations):

- West receptors: Receptor A, B and C are part of the Sacred heart Convent with private amenity areas. Receptor area A and B resulted in a change factor of 1.00 meaning the new proposed development has no effect on the amenity spaces shadow/sunlight. Receptor C resulted in a change factor of 0.80 meaning the new proposed development has an effect on the amenity space shadow/sunlight current status, this effect happens in the hours of 08.00-17.00. The calculation findings result in minimum BRE change factor guidelines.
- East receptors: Receptor D is a residential / hostel dwelling with back garden amenity space. This area resulted in a change factor of 0.99 meaning the new proposed development has a small effect on the amenity space shadow/sunlight current status, this effect happens in the late afternoon hours of 17.00-18.00. Receptor E and F is the Bessboro Day Care Centre with back garden amenity space / courtyard amenity space. These amenity areas resulted in a change factor of 0.99 and 0.98 meaning the new proposed development has a small effect on

the amenity spaces shadow/sunlight, this effect happens in the evening hours of 18.00-19.00. The calculation findings are comfortably within BRE guidelines. Receptor G is part of the Bessborough Centre with private amenity areas. This area resulted in a change factor of 1.00 meaning the new proposed development has no effect on existing status.

We conclude that the sunlight reception in the existing neighbouring amenity spaces after the introduction of the new development 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.

2.6 Mitigation measures / actions

No mitigation measures.

3 Geographical overview

3.1 Project overview

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



Image 3.1: approximate proposed phase 2 (Farm) development site area outlined

4 Approach and methodology

4.1 General approach

This report covers

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

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 st	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 st	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 m² or the minimum requirement = 120 (min) * 0.5a (m²) = [] min·m².

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 21st 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 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 Farm, phase 2

Receptor	Description	Area m ²
1	Communal amenity no. 1	1,063
2	Communal amenity no. 2	1,223
3	Communal amenity no. 3	227
4	Public open space no.1 (park)	24,520
5	Public open space no.2 (streets and squares)	1,072
6	Public open space no.3 (public link to greenway)	1,544

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 21st. 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 and shadow status of each amenity space:

SUNLIGHT/SHADOW CALCULATION DATA

The Farm, Phase 2

1 Communal amenity no. 1 1,063 m ²					
NEW STATUS March 21st					
Time	Shadow	Sunlight	Sun time	Sun area	Sun time.area
24 Hr	% / %		min	m ²	min*m ²
6.00	100%	0%	60	0	0
7.00	90%	10%	60	106	6,378
8.00	79%	21%	60	223	13,394
9.00	51%	49%	60	521	31,252
10.00	32%	68%	60	723	43,370
11.00	22%	78%	60	829	49,748
12.00	27%	73%	60	776	46,559
13.00	52%	48%	60	510	30,614
14.00	61%	39%	60	415	24,874
15.00	79%	21%	60	223	13,394
16.00	86%	14%	60	149	8,929
17.00	90%	10%	60	106	6,378
18.00	90%	10%	60	106	6,378
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)	4.41
Achieved daily sun time * area	281270

2 Communal amenity no. 2 1,223 m ²					
NEW STATUS March 21st					
Time	Shadow	Sunlight	Sun time	Sun area	Sun time.area
24 Hr	% / %		min	m ²	min*m ²
6.00	100%	0%	60	0	0
7.00	90%	10%	60	122	7,338
8.00	83%	17%	60	208	12,475
9.00	34%	66%	60	807	48,431
10.00	30%	70%	60	856	51,366
11.00	26%	74%	60	905	54,301
12.00	23%	77%	60	942	56,503
13.00	19%	81%	60	991	59,438
14.00	19%	81%	60	991	59,438
15.00	12%	88%	60	1076	64,574
16.00	12%	88%	60	1076	64,574
17.00	18%	82%	60	1003	60,172
18.00	35%	65%	60	795	47,697
19.00	100%	0%	60	0	0

Required sun hours @ 50% area	2
Achieved sun hours on @ 50% area	10.00
Achieved total sun time (hrs)	7.99
Achieved daily sun time * area	586306

3 Communal amenity no. 3 227 m ²					
NEW STATUS March 21st					
Time	Shadow	Sunlight	Sun time	Sun area	Sun time.area
24 Hr	% / %		min	m ²	min*m ²
6.00	100%	0%	60	0	0
7.00	90%	10%	60	23	1,362
8.00	90%	10%	60	23	1,362
9.00	90%	10%	60	23	1,362
10.00	83%	17%	60	39	2,315
11.00	67%	33%	60	75	4,495
12.00	55%	45%	60	102	6,129
13.00	47%	53%	60	120	7,219
14.00	36%	64%	60	145	8,717
15.00	18%	82%	60	186	11,168
16.00	15%	85%	60	193	11,577
17.00	20%	80%	60	182	10,896
18.00	35%	65%	60	148	8,853
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)	5.54
Achieved daily sun time * area	75455

4 Public open space no.1 24,520 m ²					
NEW STATUS March 21st					
Time	Shadow	Sunlight	Sun time	Sun area	Sun time.area
24 Hr	% / %		min	m ²	min*m ²
6.00	100%	0%	60	0	0
7.00	90%	10%	60	2452	147,120
8.00	56%	44%	60	10789	647,328
9.00	25%	75%	60	18390	1,103,400
10.00	20%	80%	60	19616	1,176,960
11.00	19%	81%	60	19861	1,191,672
12.00	19%	81%	60	19861	1,191,672
13.00	19%	81%	60	19861	1,191,672
14.00	19%	81%	60	19861	1,191,672
15.00	19%	81%	60	19861	1,191,672
16.00	19%	81%	60	19861	1,191,672
17.00	19%	81%	60	19861	1,191,672
18.00	29%	71%	60	17409	1,044,552
19.00	100%	0%	60	0	0

Required sun hours @ 50% area	2
Achieved sun hours on @ 50% area	10.00
Achieved total sun time (hrs)	8.47
Achieved daily sun time * area	12461064



5 Public open space no.2 **1,072** m²**NEW STATUS** March 21st

Time	Shadow	Sunlight	Sun time	Sun area	Sun time.area
24 Hr	% / %		min	m2	min*m2
6.00	100%	0%	60	0	0
7.00	88%	12%	60	129	7,718
8.00	66%	34%	60	364	21,869
9.00	53%	47%	60	504	30,230
10.00	48%	52%	60	557	33,446
11.00	46%	54%	60	579	34,733
12.00	44%	56%	60	600	36,019
13.00	39%	61%	60	654	39,235
14.00	32%	68%	60	729	43,738
15.00	29%	71%	60	761	45,667
16.00	39%	61%	60	654	39,235
17.00	90%	10%	60	107	6,432
18.00	90%	10%	60	107	6,432
19.00	100%	0%	60	0	0

Required sun hours @ 50% area	2
Achieved sun hours on @ 50% area	7.00
Achieved total sun time (hrs)	5.36
Achieved daily sun time * area	344755

6 Public open space no.3 **1,544** m²**NEW STATUS** March 21st

Time	Shadow	Sunlight	Sun time	Sun area	Sun time.area
24 Hr	% / %		min	m2	min*m2
6.00	100%	0%	60	0	0
7.00	89%	11%	60	170	10,190
8.00	71%	29%	60	448	26,866
9.00	49%	51%	60	787	47,246
10.00	48%	52%	60	803	48,173
11.00	48%	52%	60	803	48,173
12.00	52%	48%	60	741	44,467
13.00	55%	45%	60	695	41,688
14.00	56%	44%	60	679	40,762
15.00	47%	53%	60	818	49,099
16.00	47%	53%	60	818	49,099
17.00	36%	64%	60	988	59,290
18.00	57%	43%	60	664	39,835
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)	5.45
Achieved daily sun time * area	504888

5.4 Amenity spaces within proposed development at The Farm, 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 21st March. From the calculation results we note the new amenity spaces all received more than the recommended sunlight. Summary of results are as follows (see image 5.1 for receptor locations):

Amenity area outlined in 1 (Communal amenity no. 1) was calculated to have 3.00 hours at 50% area.
 Amenity area outlined in 2 (Communal amenity no. 2) was calculated to have 10.00 hours at 50% area.
 Amenity area outlined in 3 (Communal amenity no. 3) was calculated to have 6.00 hours at 50% area.
 Amenity area outlined in 4 (Public open space no.1) was calculated to have 10.00 hours at 50% area.
 Amenity area outlined in 5 (Public open space no.2) was calculated to have 7.00 hours at 50% area.
 Amenity area outlined in 6 (Public open space no.3) was calculated to have 6.00 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.

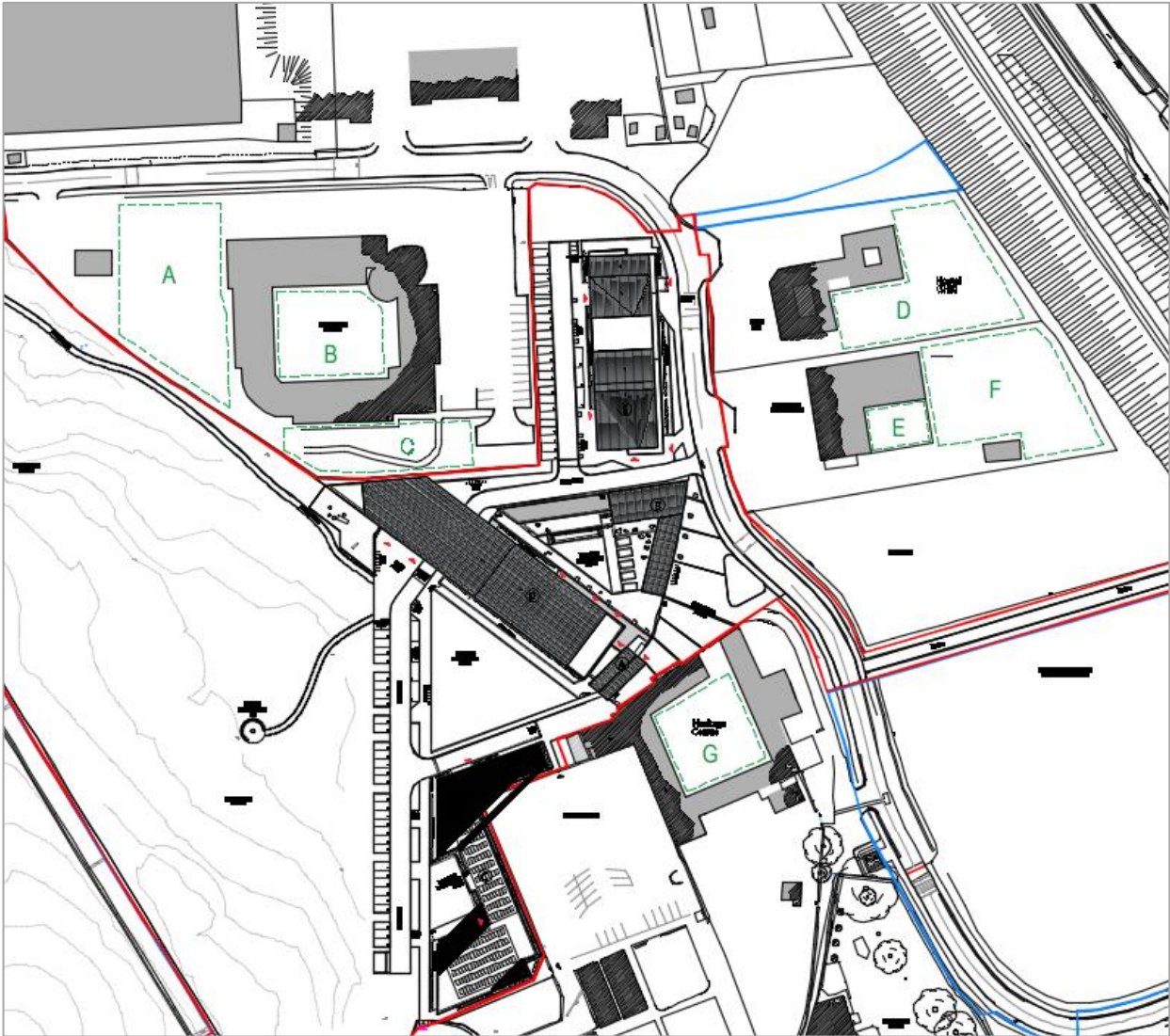


Image 6.1: existing amenity spaces

Receptor	Address	Description	~Area m ²
A	Sacred heart, convent, Mahon	Private amenity – green area	1,200
B	Sacred heart, convent, Mahon	Private amenity – court yard	800
C	Sacred heart, convent, Mahon	Private amenity – green area	650
D	Bessborough, hostel, Mahon	Private amenity – green area	900
E	Bessborough, day care centre, Mahon	Private amenity – court yard	170
F	Bessborough, day care centre, Mahon	Private amenity – green area	800
G	Bessborough Heritage centre, Mahon	Private amenity – court yard	700



6.2 Assessment approach

The left-hand side calculation tables below represent the one hourly sunlight/shadow status of the respective existing amenity space before the introduction of the new development and the right hand side tables below represent the one hourly sunlight/shadow status of the respective existing amenity space after the introduction of the new development. See appendix A for the predicted sunlight/shadow imaging per hour. Note: The calculation results have been given the following colour code guide depending on its level of resulting compliance.

Compliance guide

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

6.3 Existing amenity spaces calculation results

SUNLIGHT/SHADOW CALCULATION DATA

Phase 2

A Sacred heart, convent, Mahon 1,200 m²

EXISTING STATUS							NEW STATUS						
Time	Shadow	Sunlight	Sun time	Sun area	time * area	March 21st	Time	Shadow	Sunlight	Sun time	Sun area	time * area	March 21st
24 Hr	% / %	% / %	min	m ²	min*m ²		24 Hr	% / %	% / %	min	m ²	min*m ²	
6.00	100%	0%	60	0	0		6.00	100%	0%	60	0	0	
7.00	90%	10%	60	120	7,200		7.00	90%	10%	60	120	7,200	
8.00	76%	24%	60	288	17,280		8.00	76%	24%	60	288	17,280	
9.00	53%	47%	60	564	33,840		9.00	53%	47%	60	564	33,840	
10.00	26%	74%	60	888	53,280		10.00	26%	74%	60	888	53,280	
11.00	18%	82%	60	984	59,040		11.00	18%	82%	60	984	59,040	
12.00	15%	85%	60	1020	61,200		12.00	15%	85%	60	1020	61,200	
13.00	15%	85%	60	1020	61,200		13.00	15%	85%	60	1020	61,200	
14.00	15%	85%	60	1020	61,200		14.00	15%	85%	60	1020	61,200	
15.00	15%	85%	60	1020	61,200		15.00	15%	85%	60	1020	61,200	
16.00	15%	85%	60	1020	61,200		16.00	15%	85%	60	1020	61,200	
17.00	39%	61%	60	732	43,920		17.00	39%	61%	60	732	43,920	
18.00	49%	51%	60	612	36,720		18.00	49%	51%	60	612	36,720	
19.00	100%	0%	60	0	0		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) 7.74
 Achieved daily sun time * area 557280

Required sun hours @ 50% area (hr) 2
 Achieved sun hours on (hrs) @ 50% area 9.00
 Achieved total sun time (hrs) 7.74
 Achieved daily sun time * area 557280

B Sacred heart, convent, Mahon 800 m²

EXISTING STATUS							NEW STATUS						
Time	Shadow	Sunlight	Sun time	Sun area	time * area	March 21st	Time	Shadow	Sunlight	Sun time	Sun area	time * area	March 21st
24 Hr	% / %	% / %	min	m ²	min*m ²		24 Hr	% / %	% / %	min	m ²	min*m ²	
6.00	100%	0%	60	0	0		6.00	100%	0%	60	0	0	
7.00	89%	11%	60	88	5,280		7.00	89%	11%	60	88	5,280	
8.00	83%	17%	60	136	8,160		8.00	83%	17%	60	136	8,160	
9.00	64%	36%	60	288	17,280		9.00	64%	36%	60	288	17,280	
10.00	52%	48%	60	384	23,040		10.00	52%	48%	60	384	23,040	
11.00	42%	58%	60	464	27,840		11.00	42%	58%	60	464	27,840	
12.00	29%	71%	60	568	34,080		12.00	29%	71%	60	568	34,080	
13.00	29%	71%	60	568	34,080		13.00	29%	71%	60	568	34,080	
14.00	29%	71%	60	568	34,080		14.00	29%	71%	60	568	34,080	
15.00	30%	70%	60	560	33,600		15.00	30%	70%	60	560	33,600	
16.00	34%	66%	60	528	31,680		16.00	34%	66%	60	528	31,680	
17.00	51%	49%	60	392	23,520		17.00	51%	49%	60	392	23,520	
18.00	80%	20%	60	160	9,600		18.00	80%	20%	60	160	9,600	
19.00	100%	0%	60	0	0		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) 5.88
 Achieved daily sun time * area 282240

Required sun hours @ 50% area (hr) 2
 Achieved sun hours on (hrs) @ 50% area 6.00
 Achieved total sun time (hrs) 5.88
 Achieved daily sun time * area 282240

C Sacred heart, convent, Mahon 650 m²

EXISTING STATUS							NEW STATUS						
Time	Shadow	Sunlight	Sun time	Sun area	time * area	March 21st	Time	Shadow	Sunlight	Sun time	Sun area	time * area	March 21st
24 Hr	% / %	% / %	min	m ²	min*m ²		24 Hr	% / %	% / %	min	m ²	min*m ²	
6.00	100%	0%	60	0	0		6.00	100%	0%	60	0	0	
7.00	85%	15%	60	98	5,850		7.00	85%	15%	60	98	5,850	
8.00	62%	38%	60	247	14,820		8.00	68%	32%	60	208	12,480	-2,340
9.00	16%	84%	60	546	32,760		9.00	43%	57%	60	371	22,230	-10,530
10.00	16%	84%	60	546	32,760		10.00	40%	60%	60	390	23,400	-9,360
11.00	16%	84%	60	546	32,760		11.00	39%	61%	60	397	23,790	-8,970
12.00	16%	84%	60	546	32,760		12.00	39%	61%	60	397	23,790	-8,970
13.00	16%	84%	60	546	32,760		13.00	41%	59%	60	384	23,010	-9,750
14.00	16%	84%	60	546	32,760		14.00	42%	58%	60	377	22,620	-10,140
15.00	16%	84%	60	546	32,760		15.00	42%	58%	60	377	22,620	-10,140
16.00	16%	84%	60	546	32,760		16.00	40%	60%	60	390	23,400	-9,360
17.00	20%	80%	60	520	31,200		17.00	28%	72%	60	468	28,080	-3,120
18.00	45%	55%	60	358	21,450		18.00	49%	51%	60	332	19,980	-1,560
19.00	100%	0%	60	0	0		19.00	100%	0%	60	0	0	

Required sun hours @ 50% area (hr) 2
 Achieved sun hours on (hrs) @ 50% area 10.00
 Achieved total sun time (hrs) 8.6
 Achieved daily sun time * area 335400

Required sun hours @ 50% area (hr) 2
 Achieved sun hours on (hrs) @ 50% area 10.00
 Achieved total sun time (hrs) 6.44
 Achieved daily sun time * area 251160



D Bessborough, hostel, Mahon 900 m²

EXISTING STATUS						March 21st
Time	Shadow	Sunlight	Sun time	Sun area	time * area	
24 Hr	% / %		min	m ²	min*m ²	
6.00	100%	0%	60	0	0	
7.00	90%	10%	60	90	5,400	
8.00	37%	63%	60	567	34,020	
9.00	8%	92%	60	828	49,680	
10.00	8%	92%	60	828	49,680	
11.00	8%	92%	60	828	49,680	
12.00	8%	92%	60	828	49,680	
13.00	10%	90%	60	810	48,600	
14.00	12%	88%	60	792	47,520	
15.00	15%	85%	60	765	45,900	
16.00	23%	77%	60	693	41,580	
17.00	39%	61%	60	549	32,940	
18.00	75%	25%	60	225	13,500	
19.00	100%	0%	60	0	0	

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 10.00
Achieved total sun time (hrs) 8.67
Achieved daily sun time * area 468180

NEW STATUS						March 21st	change
Time	Shadow	Sunlight	Sun time	Sun area	time * area	time * area	
24 Hr	% / %		min	m ²	min*m ²	min*m ²	
6.00	100%	0%	60	0	0	0	
7.00	90%	10%	60	90	5,400	0	
8.00	37%	63%	60	567	34,020	0	
9.00	8%	92%	60	828	49,680	0	
10.00	8%	92%	60	828	49,680	0	
11.00	8%	92%	60	828	49,680	0	
12.00	8%	92%	60	828	49,680	0	
13.00	10%	90%	60	810	48,600	0	
14.00	12%	88%	60	792	47,520	0	
15.00	15%	85%	60	765	45,900	0	
16.00	23%	77%	60	693	41,580	0	
17.00	45%	55%	60	495	29,700	-3,240	
18.00	85%	15%	60	135	8,100	-5,400	
19.00	100%	0%	60	0	0	0	

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 10.00
Achieved total sun time (hrs) 8.51 0.99
Achieved daily sun time * area 459540 0.99

E Bessborough, day care centre, Mahon 170 m²

EXISTING STATUS						March 21st
Time	Shadow	Sunlight	Sun time	Sun area	time * area	
24 Hr	% / %		min	m ²	min*m ²	
6.00	100%	0%	60	0	0	
7.00	90%	10%	60	17	1,020	
8.00	59%	41%	60	70	4,182	
9.00	39%	61%	60	104	6,222	
10.00	25%	75%	60	128	7,650	
11.00	20%	80%	60	136	8,160	
12.00	18%	82%	60	139	8,364	
13.00	18%	82%	60	139	8,364	
14.00	22%	78%	60	133	7,956	
15.00	23%	77%	60	131	7,854	
16.00	26%	74%	60	126	7,548	
17.00	58%	42%	60	71	4,284	
18.00	82%	18%	60	31	1,836	
19.00	100%	0%	60	0	0	

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 8.00
Achieved total sun time (hrs) 7.2
Achieved daily sun time * area 73440

NEW STATUS						March 21st	change
Time	Shadow	Sunlight	Sun time	Sun area	time * area	time * area	
24 Hr	% / %		min	m ²	min*m ²	min*m ²	
6.00	100%	0%	60	0	0	0	
7.00	90%	10%	60	17	1,020	0	
8.00	59%	41%	60	70	4,182	0	
9.00	39%	61%	60	104	6,222	0	
10.00	25%	75%	60	128	7,650	0	
11.00	20%	80%	60	136	8,160	0	
12.00	18%	82%	60	139	8,364	0	
13.00	18%	82%	60	139	8,364	0	
14.00	22%	78%	60	133	7,956	0	
15.00	23%	77%	60	131	7,854	0	
16.00	26%	74%	60	126	7,548	0	
17.00	58%	42%	60	71	4,284	0	
18.00	90%	10%	60	17	1,020	-816	
19.00	100%	0%	60	0	0	0	

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 8.00
Achieved total sun time (hrs) 7.12 0.99
Achieved daily sun time * area 72624 0.99

F Bessborough, day care centre, Mahon 800 m²

EXISTING STATUS						March 21st
Time	Shadow	Sunlight	Sun time	Sun area	time * area	
24 Hr	% / %		min	m ²	min*m ²	
6.00	100%	0%	60	0	0	
7.00	90%	10%	60	80	4,800	
8.00	69%	31%	60	248	14,880	
9.00	14%	86%	60	688	41,280	
10.00	14%	86%	60	688	41,280	
11.00	14%	86%	60	688	41,280	
12.00	14%	86%	60	688	41,280	
13.00	14%	86%	60	688	41,280	
14.00	14%	86%	60	688	41,280	
15.00	18%	82%	60	656	39,360	
16.00	21%	79%	60	632	37,920	
17.00	26%	74%	60	592	35,520	
18.00	72%	28%	60	224	13,440	
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) 8.2
Achieved daily sun time * area 393600

NEW STATUS						March 21st	change
Time	Shadow	Sunlight	Sun time	Sun area	time * area	time * area	
24 Hr	% / %		min	m ²	min*m ²	min*m ²	
6.00	100%	0%	60	0	0	0	
7.00	90%	10%	60	80	4,800	0	
8.00	69%	31%	60	248	14,880	0	
9.00	14%	86%	60	688	41,280	0	
10.00	14%	86%	60	688	41,280	0	
11.00	14%	86%	60	688	41,280	0	
12.00	14%	86%	60	688	41,280	0	
13.00	14%	86%	60	688	41,280	0	
14.00	14%	86%	60	688	41,280	0	
15.00	18%	82%	60	656	39,360	0	
16.00	21%	79%	60	632	37,920	0	
17.00	26%	74%	60	592	35,520	0	
18.00	90%	10%	60	80	4,800	-8,640	
19.00	100%	0%	60	0	0	0	

Required sun hours @ 50% area (hr) 2
Achieved sun hours on (hrs) @ 50% area 9.00
Achieved total sun time (hrs) 8.02 0.98
Achieved daily sun time * area 384960 0.98

G Bessborough Heritage centre, Mahon 700 m²

EXISTING STATUS						March 21st
Time	Shadow	Sunlight	Sun time	Sun area	time * area	
24 Hr	% / %		min	m ²	min*m ²	
6.00	100%	0%	60	0	0	
7.00	90%	10%	60	70	4,200	
8.00	80%	20%	60	140	8,400	
9.00	70%	30%	60	210	12,600	
10.00	36%	64%	60	448	26,880	
11.00	24%	76%	60	532	31,920	
12.00	22%	78%	60	546	32,760	
13.00	26%	74%	60	518	31,080	
14.00	37%	63%	60	441	26,460	
15.00	44%	56%	60	392	23,520	
16.00	67%	33%	60	231	13,860	
17.00	88%	12%	60	84	5,040	
18.00	90%	10%	60	70	4,200	
19.00	100%	0%	60	0	0	

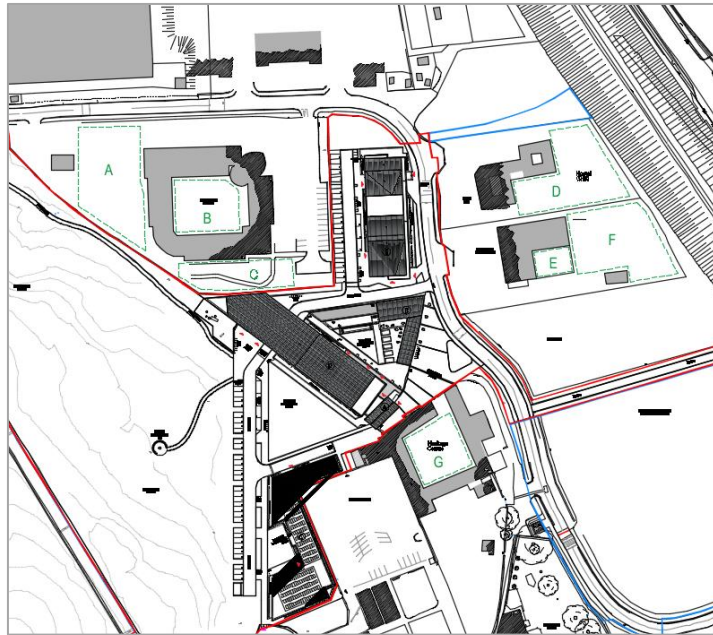
Required sun hours @ 50% area 2
Achieved sun hours on @ 50% area 6.00
Achieved total sun time (hrs) 5.26
Achieved daily sun time * area 220920

NEW STATUS						March 21st	change
Time	Shadow	Sunlight	Sun time	Sun area	time * area	time * area	
24 Hr	% / %		min	m ²	min*m ²	min*m ²	
6.00	100%	0%	60	0	0	0	
7.00	90%	10%	60	70	4,200	0	
8.00	80%	20%	60	140	8,400	0	
9.00	70%	30%	60	210	12,600	0	
10.00	36%	64%	60	448	26,880	0	
11.00	24%	76%	60	532	31,920	0	
12.00	22%	78%	60	546	32,760	0	
13.00	26%	74%	60	518	31,080	0	
14.00	37%	63%	60	441	26,460	0	
15.00	44%	56%	60	392	23,520	0	
16.00	67%	33%	60	231	13,860	0	
17.00	88%	12%	60	84	5,040	0	
18.00	90%	10%	60	70	4,200	0	
19.00	100%	0%	60	0	0	0	

Required sun hours @ 50% area 2
Achieved sun hours on @ 50% area 6.00
Achieved total sun time (hrs) 5.26 1.00
Achieved daily sun time * area 220920 1.00

6.4 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 21st 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 selected existing amenity spaces all received 2 hours of sunlight or more on at least 50% of the area before and after the introduction of the new development. Summary of results are as follows (see image 6.1 for receptor locations):



(For reference) Image 6.1: existing amenity spaces

- West receptors: Receptor A, B and C are part of the Sacred heart Convent with private amenity areas. Receptor area A and B resulted in a change factor of 1.00 meaning the new proposed development has no effect on the amenity spaces shadow/sunlight. Receptor C resulted in a change factor of 0.80 meaning the new proposed development has an effect on the amenity space shadow/sunlight current status, this effect happens in the hours of 08.00-17.00. The calculation findings result in minimum BRE guidelines.
- East receptors: Receptor D is a residential / hostel dwelling with back garden amenity space. This area resulted in a change factor of 0.99 meaning the new proposed development has a small effect on the amenity space shadow/sunlight current status, this effect happens in the late afternoon hours of 17.00-18.00. Receptor E and F is the Bessboro Day Care Centre with back garden amenity space / courtyard amenity space. These amenity areas resulted in a change factor of 0.99 and 0.98 meaning the new proposed development has a small effect on the amenity spaces shadow/sunlight, this effect happens in the evening hours of 18.00-19.00. The calculation findings are comfortably within BRE guidelines. Receptor G is part of the Bessborough Centre with private amenity areas. This area resulted in a change factor of 1.00 meaning the new proposed development has no effect on existing status.

We conclude that the sunlight reception in the existing neighbouring amenity spaces after the introduction of the new development 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.