

Lands to the Ardshanavooly, Killarney, Co. Kerry

Proposed Residential Development

EXTERNAL (PUBLIC) LIGHTING REPORT

External Lighting Installation Assessment

Lands at Ardshanavooly,
Killarney,
Co. Kerry

Wrightwood Developments Ltd

DKP document no
6600

Issue/Status
2 / P
2025-09-30

Project document no
DKP-075-6600 | 2P



Document control

DKP project no: P01
DKP document no: 6600
Project file no: DKP-P01-6600

Circular	Issue >	1#	2P
Clients	Wrightwood Developments Ltd		
Architects	R. Graham O'Sullivan Architect	☑	☑
Planning consultants	RK Consulting	☑	☑

Issue	1#	2025-04-18	Draft Planning issue
Issue	2P	2025-09-30	Draft Planning issue

Document issue status ID

Sketch/draft
P Planning
C Concept
D Design
G General information
T Tender
W Works/construction
Z As-build/constructed

Issue	Prepared	Checked	Approved
1#	212	201	201
2P	201	201	201

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	Appendix B 1:500 Illumination contours layout Masked	attached
	Appendix C 1:500 Illumination contours layout Un-masked	attached

1 Introduction

1.1 Report purpose

This report gives information on the external (public) lighting installation in connection with the new proposed project covering the site main entrance, internal circulation roads, public parking spaces, cycle & footpath.

1.2 Instruction

DKPartnership (DKP) have been commissioned by Wrightwood Developments Ltd to carry out the analysis and report for the proposed residential development at Ardshanavooly, Killarney, Co. Kerry.

1.3 Development detail

Development at a 2.23 hectare site comprising of:

Construction of a 124 no. dwellings in a mix of terraced and apartment typologies comprising:

A residential mix comprising of 5 no. studio apartments, 13 no. 1 bed apartments, 4 no. 2 bed apartments, 16 no. 1 bed duplex apartments, 16 no. 2 bed duplex maisonettes, 33 no. 2 bed duplex apartments, 33 no. 3 bed maisonettes and 4 no. 3 bed terrace houses.

215 sq.m ancillary internal communal spaces associated with the sheltered housing units.

In building heights ranging from 2 to 4 storeys.

A total of 138 no. surface car parking spaces, including 4 no. car-share parking spaces, 7 no. visitor spaces, and 5 no. assigned Part M/accessible spaces.

Bicycle parking comprising of 270 no spaces in total, comprising 118 no. spaces within the private open space of ground floor residential units and 152 no. spaces within secure sheltered structures and designated secure bicycle parking areas.

3,650 sq.m of public open space, including arrival pocket park, central pocket park and amenity landscape areas (including 126 sq.m of play), grass lawns, kickabout areas, picnic areas and seating areas;

2,045 sq.m of communal external open space, including seating areas, nature trails, and amenity grass lawns, plus 86 sq.m internal community space associated with the apartment block.

2,039 sq.m of environmental open space, including landscape buffers, protection and enhancement of existing hedgerows and trees.

A new vehicular, pedestrian and cyclist access from the existing estate road adjoining the site to the south.

Infrastructure works to serve the proposed development to include the internal road and footpath network, ESB cabinets/substations/switchrooms, site and external building lighting, site drainage works, hard and soft landscaping, boundary treatments, communal bin stores, shared bicycle store, and all ancillary site services and development works above and below ground.

1.4 Policy and building regulation requirements

The project is subject to the following statutory requirements of EN132201 External lighting calculation design.



1.5 Project location.

Image 1.1, the (google) site map below shows the approximate location of the site with proposed development approximately outlined in red.



Image 1.1: Proposed development site boundary. Imagery © Google 2025.

2 Executive summary

2.1 Analysis conducted

This report analyses the illumination calculation results of the proposed lighting design in respect of new project the site main entrance and the internal circulation roads, public parking spaces, cycle & footpath.

2.2 EN132201 External lighting calculation design targets

The table below details the main targets to be achieved for the different lighting classes.

The P class is generally for pedestrian traffic and cyclists for use on footways and cycleways, and drivers of motorised vehicles at low speed on residential roads, shoulder or parking lanes, and other road areas lying separately or along a carriageway of a traffic route or a residential road, etc.. The C lighting class is applied for use in conflict areas on traffic routes where the traffic composition is mainly motorised. Conflict areas occur wherever vehicle streams intersect each other or run into areas frequented by pedestrians, cyclists, or other road users. Areas showing a change in road geometry, such as a reduced number of lanes or a reduced lane or carriageway width, are also regarded as conflict areas. The M standard is mainly for highways and motorways.

The table below indicates the P and C/M class minimum EN13201 illumination targets.

Illumination class	E avg (lx)	E min (lx)	Uniformity	Illumination class	E avg (lx)	E min (lx)	luminance cd/m2	Uniformity
				M1/C1	30.0	12.0	2.0	0.4
				M2/C2	20.0	8.00	1.5	0.4
P1	15.0	3.00	0.2	M3/C3	15.0	6.00	1.0	0.4
P2	10.0	2.00	0.2	M4/C4	10.0	4.00	0.75	0.4
P3	7.50	1.50	0.2	M5/C5	7.50	1.50	0.50	0.3
P4	5.00	1.00	0.2					

Cop of Table 3.1 EN132201 lighting class P, C and M standards.

2.3 Design considerations

The external lighting design has been executed using the European design standard EN 1332201 category P4 for the development inner circulations roads, public parking spaces, foot & cycle path. Consideration was also extended in the lighting design by keeping the light colour of the light fittings between 2700K and 3000K in line with the bat mitigation recommendations of the National parks and Wildlife Service which is deemed to have less impact on fauna and in particular bats (see section 3.4) and by minimising the light spill outside the areas to be lit to a minimum.

2.4 Calculation data results

From the appendix A/B/C representing the illumination calculations reports and contours drawings and the 1:500 A1 overall site illumination contour layout we note that the internal development circulation roads, parking area, foot/cycle path average illuminance, minimum illuminance and uniformity comply to the P4 lighting class.

Element	Standard	E avg min (lx)	E min (lx)	Uniformity
Internal circulation, public parking, cycle & footpath	P4	6.71 (5.00)	1.32 (1.00)	0.20 (0.20)

Copy of table 4.1 Achieved illumination levels and minimum requirements (x.xx).



2.5 Light fittings applied for the purpose of illumination calculation.

The table below represent a summary of the light fitting schedule applied for the illumination calculations. See appendix lighting illumination calculation reports for further details.

Fitting	Make	Model		Light colour (K)	Flux (L)	Wattage (W)	Pole height
Luminaire A	Philips	BGP702	DM50	3000K	6.40	80	6m pole
Luminaire B	Philips	BGP702	DM50	3000K	4.20	52.5	6m pole
Luminaire C	Philips	BGP702	DM33	3000K	2.60	32.5	6m pole
Luminaire D	Philips	BGP291	DRXN0	3000K	1.40	17.5	6m pole

Copy of Table 4.2 Light fitting types applied..

2.6 Conclusion

The external (public) lighting design as per illumination reports meets the criteria set out in EN13201 for lighting class P4 covering the internal access road, foot / cycle path.. Furthermore the lighting design also applied a light colour of 3000K in line with the National parks and Wildlife Service Bat mitigation recommendations and has low light spill outside the areas to be lit to minimise the impact on any bat community and we, DKP, therefore deem the external lighting design to be in compliance with the applied standards and recommendations.

2.7 Mitigation measures / actions

No mitigation measures required for compliance to lighting standards.

3 Approach and methodology

3.1 Analysis approach

For the design of the public lighting we applied the P4 standard for the estate circulation roads, public parking areas and foot/cycle path in line with the general requirement for as outlined in EN13201 .

3.2 The extend of the overall site.

The following architects layout drawing covers the extend of the proposed development.



Image 3.1 Architects site layout.

3.3 EN132201 external lighting data and targets

The table below details the relevant P and C targeted as noted above. The P class is generally for pedestrian traffic and cyclists for use on footways and cycleways, and drivers of motorised vehicles at low speed on residential roads, shoulder or parking lanes, and other road areas lying separately or along a carriageway of a traffic route or a residential road, etc.. The C lighting class is applied for use in conflict areas on traffic routes where the traffic composition is mainly motorised. Conflict areas occur wherever vehicle streams intersect each other or run into areas frequented by pedestrians, cyclists, or other road users. Areas showing a change in road geometry, such as a reduced number of lanes or a reduced lane or carriageway width, are also regarded as conflict areas. The M standard is mainly for highways and motorways.

Illumination class	E avg (lx)	E min (lx)	Uniformity
P1	15.0	3.00	0.2
P2	10.0	2.00	0.2
P3	7.50	1.50	0.2
P4	5.00	1.00	0.2

Illumination class	E avg (lx)	E min (lx)	luminance cd/m2	Uniformity
M1/C1	30.0	12.0	2.0	0.4
M2/C2	20.0	8.00	1.5	0.4
M3/C3	15.0	6.00	1.0	0.4
M4/C4	10.0	4.00	0.75	0.4
M5/C5	7.50	1.50	0.50	0.3

Table 3.1 EN132201 lighting class P, C and M standards.

3.4 The design approach to cover any identified bat routs or roosting areas.

Consideration to the fauna was applied in the lighting design by keeping the light colour of the light fittings between 2700K and 3000K in line with the bat mitigation recommendations of the National parks and Wildlife Service which is deemed to have less impact on fauna and in particular bats and by minimising the light spill outside the areas to be lit to an average minimum of +/- 1.5Lux.

NATIONAL PARKS AND WILDLIFE SERVICE IWM134

BAT MITIGATION GUIDELINES FOR IRELAND

8.2.3 Lighting

Lighting at or near roost entrances has been shown to disturb bats and should be avoided. A useful review of information on this issue has been published by Eurobats (Voigt et al., 2018). In general, artificial light creates a barrier to commuting bats so lighting should be minimised during the active bat season from March to the end of September as it deters some bat species. Where lighting is required, directional lighting (i.e. lighting which only shines on access roads and not nearby countryside) should be used to prevent overspill. This can be achieved by the design of the luminaire, the height of the lamp and by using accessories such as hoods, cowls, louvres and shields to direct the light to the intended area only. Modern LED lighting has also been shown to deter bats but it is available in a range of colours other than white which may be used to avoid or lessen impacts. Warmer colour wavelengths between 2700 and 3000 Kelvin seem to have less impact on bats (Bat Conservation Trust & Institute of Lighting Professionals 2018). Further recent guidance on reducing obtrusive lighting, although not specific to bats, can be found in Institution of Lighting Professionals, 2021.



4 Calculation data and conclusion

4.1 Calculated achieved illumination results

From the appendix representing the illumination calculations reports and contours drawings and the 1:500 A1 overall site illumination contour layout we note that the internal development circulation roads, parking area, foot/cycle path average illuminance, minimum illuminance and uniformity comply to the P4 lighting class.

Element	Standard	E avg min (lx)	E min (lx)	Uniformity
Internal circulation, public parking, cycle & footpath	P4	6.71 (5.00)	1.32 (1.00)	0.20 (0.20)

Table 4.1 Achieved illumination levels and minimum requirements (x.xx).

4.2 Lighting column location layout (extract from 1:500 Public lighting drawing)

Below is a clip from the 1:500 A1 Public lighting drawings. See actual drawing for more accurate detail.



Illustration 4.1. Extract (clip) from 1:500 A1 Public lighting drawing Illumination contours.



4.3 EN132201 External lighting calculation data

The illuminance data was calculated using the following fittings/poles.

Fitting	Make	Model		Light colour (K)	Flux (L)	Wattage (W)	Pole height
Luminaire A	Philips	BGP702	DM50	3000K	6.40	80	6m pole
Luminaire B	Philips	BGP702	DM50	3000K	4.20	52.5	6m pole
Luminaire C	Philips	BGP702	DM33	3000K	2.60	32.5	6m pole
Luminaire D	Philips	BGP291	DRXN0	3000K	1.40	17.5	6m pole

Table 4.2 Light fitting types applied..

4.4 Light fittings applied for the purpose of illumination calculation.

The table below represent a summary of the light fitting schedule applied for the illumination calculations. See appendix A/B/C External (public) lighting illumination calculation report.

Luminaire A Data

Supplier	Philips
Type	BGP702 DM50
Lamp(s)	LED-HB 5.2S 730
Lamp Flux (klm)	6.40
File Name	Luma Gen2 Micro_BGP702_DM50_6400_20LED_5.2S_CLO_L90_730.lvs
Maintenance Factor	0.80
Imax70,80,90(cd/klm)	595.5, 51.0, 0.0
No. in Project	11

Luminaire B Data

Supplier	Philips
Type	BGP702 DM50
Lamp(s)	LED-HB 5.2S 730
Lamp Flux (klm)	4.20
File Name	Luma Gen2 Micro_BGP702_DM50_4200_20LED_5.2S_CLO_L90_730.lvs
Maintenance Factor	0.80
Imax70,80,90(cd/klm)	921.3, 65.9, 0.0
No. in Project	4

Illustration 4.2. Light fitting A and B details.



Luminaire C Data

Supplier	Philips
Type	BGP702 DN33
Lamp(s)	LED-HB 5.2S 730
Lamp Flux (klm)	2.60
File Name	Luma Gen2 Micro_BGP702_DN33_2600_20LED_5.2S_CLO_L90_730.lvs
Maintenance Factor	0.80
Imax70,80,90(cd/klm)	297.4, 17.5, 0.0
No. in Project	2



Luminaire D Data

Supplier	Philips
Type	BGP702 DRXN0
Lamp(s)	LED-HB 5.2S 730
Lamp Flux (klm)	1.40
File Name	Luma Gen2 Micro_BGP702_DRXN0_1400_6LED_5.2S_CLO_L90_730.lvs
Maintenance Factor	0.80
Imax70,80,90(cd/klm)	1419.1, 20.0, 0.0
No. in Project	5

Illustration 4.3. Light fitting C and D details.

4.5 Conclusion

The external (public) lighting design as per illumination reports meets the criteria set out in EN13201 for lighting class P3 covering the internal access road, foot / cycle path, lighting class. Furthermore the lighting design also applied a light colour of 3000K in line with the National parks and Wildlife Service Bat mitigation recommendations and has low light spill outside the areas to be lit to minimise the impact on any bat community and we, DKP, therefore deem the external lighting design to be in compliance with the applied standards and recommendations.

4.6 Mitigation measures / actions

No mitigation measures required for compliance to lighting standards.



APPENDIX A

Site illuminance calculation report

DATE: 19 March 2025
DESIGNER: DKPI
PROJECT No: P01
PROJECT NAME: Ardshanavooley housing

**LIGHTING
REALITY**

Inner estate road and circulation has been designed to comply with cat P4 and shall have dimming function to U15.
Columns identified as 13A, 17D, 18D, 19D, 21D and 22D shall have hingable columns for maintainance purposes.

Ardshanavooley

**Public Lighting design for the above mentioned project:
Public lighting for estateroads and pedestian pathways for
this development has been designed to comply with
EN13201-2015 and also according to the Public Lighting
standards and current Local Authority Guidelines.
A MF of 0.8 is used for all calculations.
Photocells shall be of 7 pin and have a 35/18 lux switching
ratio.**

PREPARED BY: Ben van Deventer
DKP International
CBG House
Kenmare
Co Kerry

Layout Report

General Data

Dimensions in Metres Angles in Degrees
Grid Origin -1.2m x 39.9m
Area 206.9m x 180.6m
Sample Spacing 1.00m x 1.00m

Luminaires

Luminaire A Data



Supplier	Philips
Type	BGP702 DW50
Lamp(s)	LED-HB 5.2S 730
Lamp Flux (klm)	6.40
File Name	Luma Gen2 Micro_BGP702_DW50_6400_20LED_5.2S_CLO_L90_730.ies
Maintenance Factor	0.80
Imax70,80,90(cd/klm)	595.5, 51.0, 0.0
No. in Project	11

Luminaire B Data



Supplier	Philips
Type	BGP702 DM50
Lamp(s)	LED-HB 5.2S 730
Lamp Flux (klm)	4.20
File Name	Luma Gen2 Micro_BGP702_DM50_4200_20LED_5.2S_CLO_L90_730.ies
Maintenance Factor	0.80
Imax70,80,90(cd/klm)	921.3, 65.9, 0.0
No. in Project	4

Luminaire C Data



Supplier	Philips
Type	BGP702 DN33
Lamp(s)	LED-HB 5.2S 730
Lamp Flux (klm)	2.60
File Name	Luma Gen2 Micro_BGP702_DN33_2600_20LED_5.2S_CLO_L90_730.ies
Maintenance Factor	0.80
Imax70,80,90(cd/klm)	297.4, 17.5, 0.0
No. in Project	2

Luminaire D Data



Supplier	Philips
Type	BGP702 DRXN0
Lamp(s)	LED-HB 5.2S 730
Lamp Flux (klm)	1.40
File Name	Luma Gen2 Micro_BGP702_DRXN0_1400_6LED_5.2S_CLO_L90_730.ies
Maintenance Factor	0.80
Imax70,80,90(cd/klm)	1419.1, 20.0, 0.0
No. in Project	5

Layout

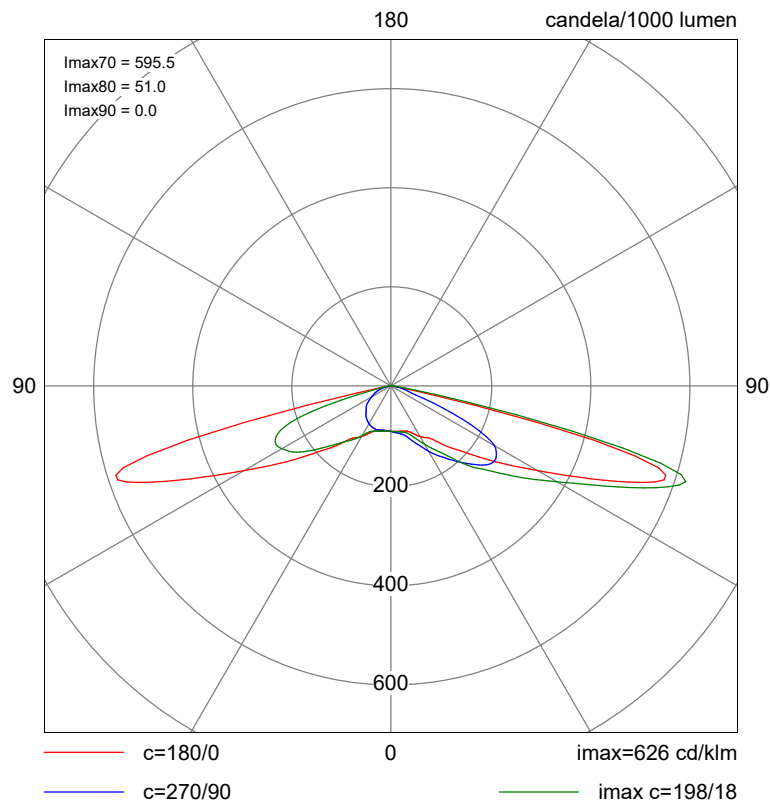
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2	B	112.29	59.61	6.00	5.00	5.00	0.00	0.40			
3	B	144.22	176.08	6.00	267.00	0.00	0.00	0.40			
4	A	187.26	167.68	6.00	92.00	5.00	0.00	0.40			
5	A	134.04	148.45	6.00	178.00	5.00	0.00	0.40			
6	B	158.25	148.25	6.00	0.00	5.00	0.00	0.40			
7	A	82.38	174.49	6.00	353.00	5.00	0.00	0.40			
8	A	82.12	138.08	6.00	358.00	5.00	0.00	0.40			
9	A	85.16	94.01	6.00	2.00	5.00	0.00	0.40			
10	A	99.06	65.85	6.00	93.00	5.00	0.00	0.40			

Layout Continued

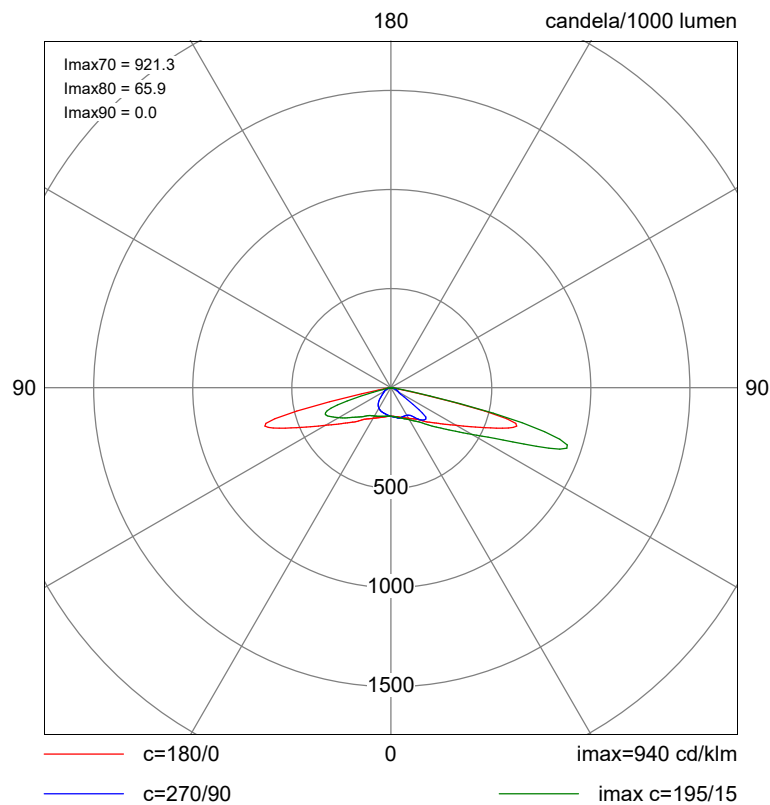
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11	A	131.34	75.13	6.00	273.00	5.00	0.00	0.40			
12	A	168.90	79.91	6.00	286.00	5.00	0.00	0.40			
13	A	54.19	94.32	6.00	359.00	0.00	0.00	0.40			
14	A	84.58	94.00	6.00	175.00	5.00	0.00	0.40			
15	C	115.76	166.96	6.00	93.00	5.00	0.00	0.40			
16	C	164.23	119.20	6.00	2.00	5.00	0.00	0.40			
17	D	121.56	115.94	6.00	359.00	5.00	0.00	0.40			
18	D	121.09	91.75	6.00	359.00	5.00	0.00	0.40			
19	D	109.06	96.80	6.00	95.00	5.00	0.00	0.40			
20	A	188.16	91.26	6.00	92.00	5.00	0.00	0.40			
21	D	146.78	134.37	6.00	271.00	5.00	0.00	0.40			
22	D	116.26	130.87	6.00	271.00	5.00	0.00	0.40			

Polar Diagrams

Luminaire A BGP702 DW50

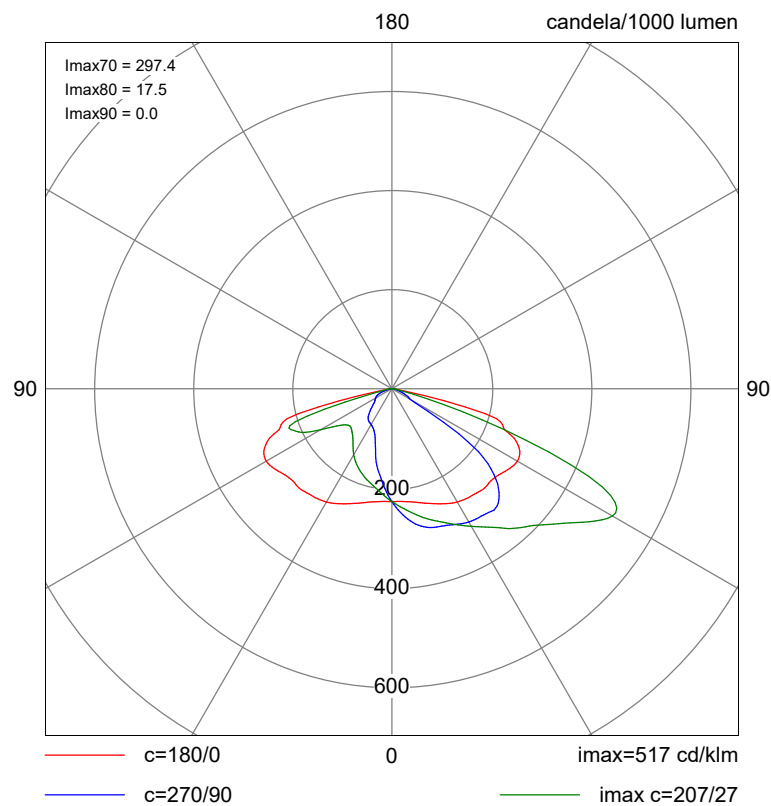


Luminaire B BGP702 DM50

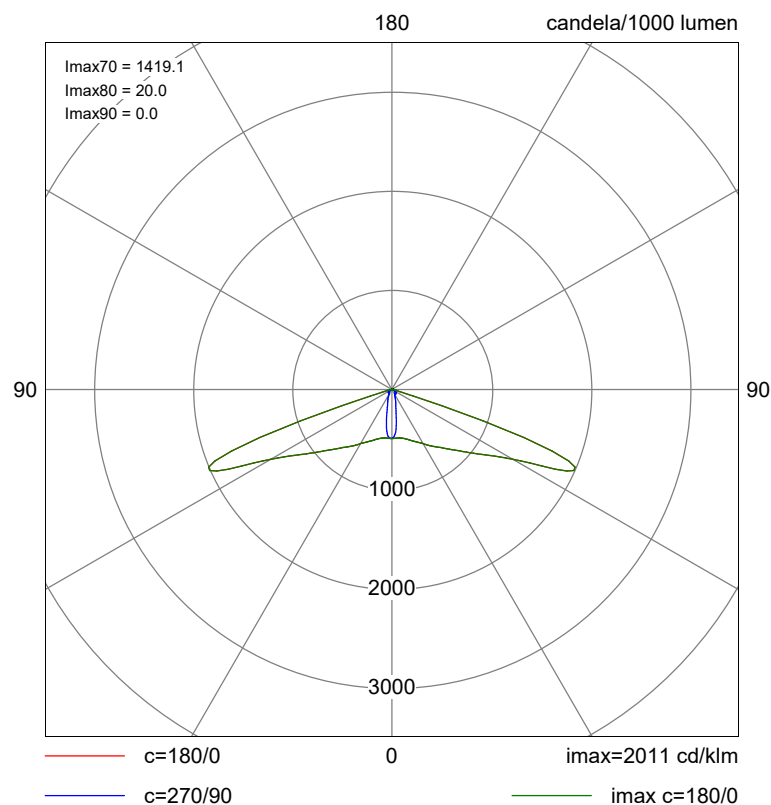


Polar Diagrams Continued

Luminaire C BGP702 DN33

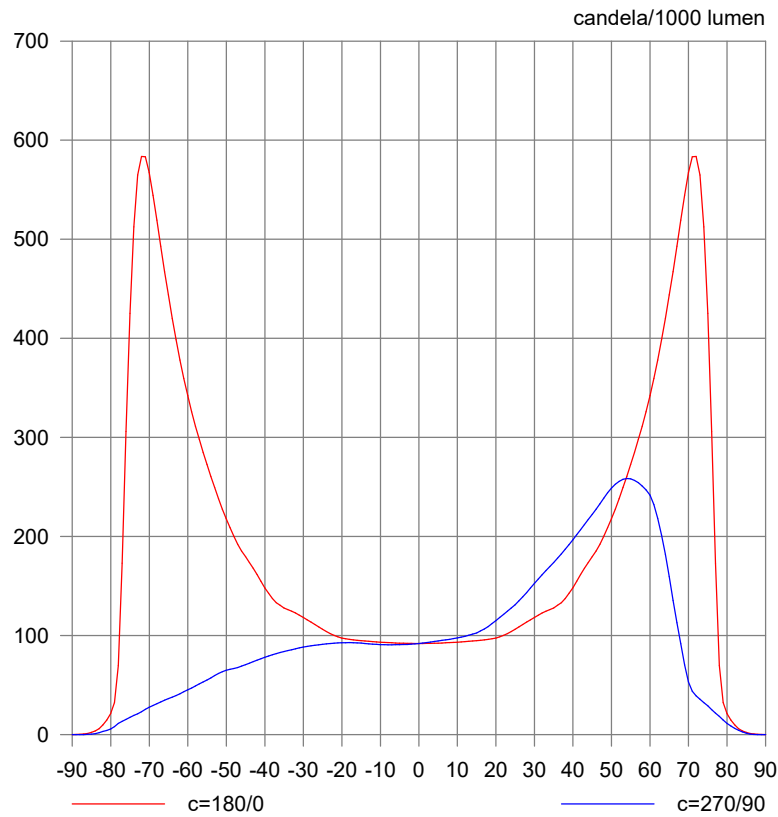


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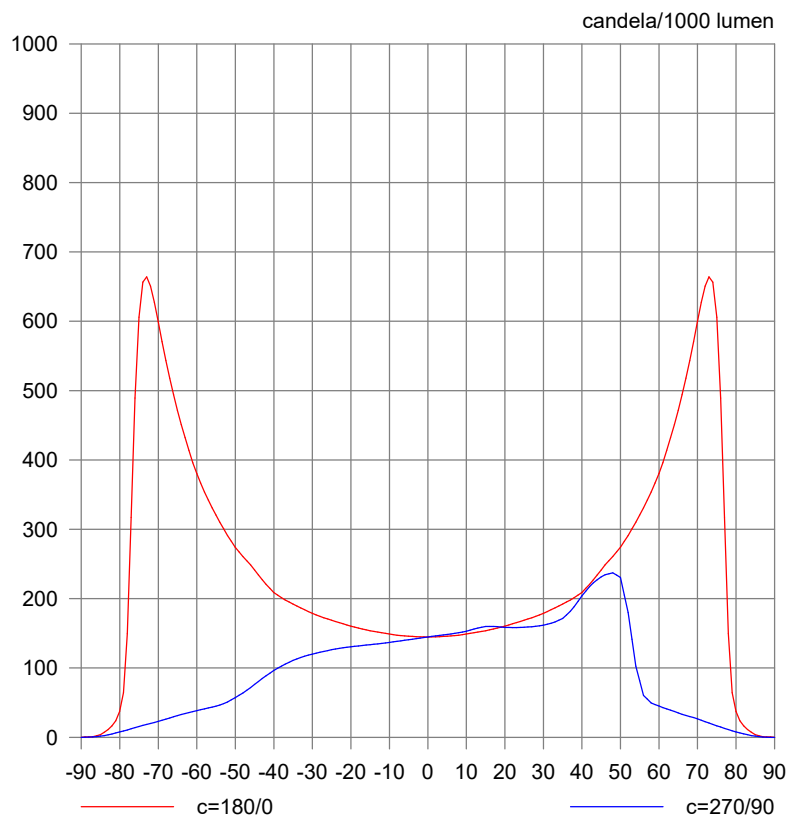


Cartesian Diagrams

Luminaire A BGP702 DW50

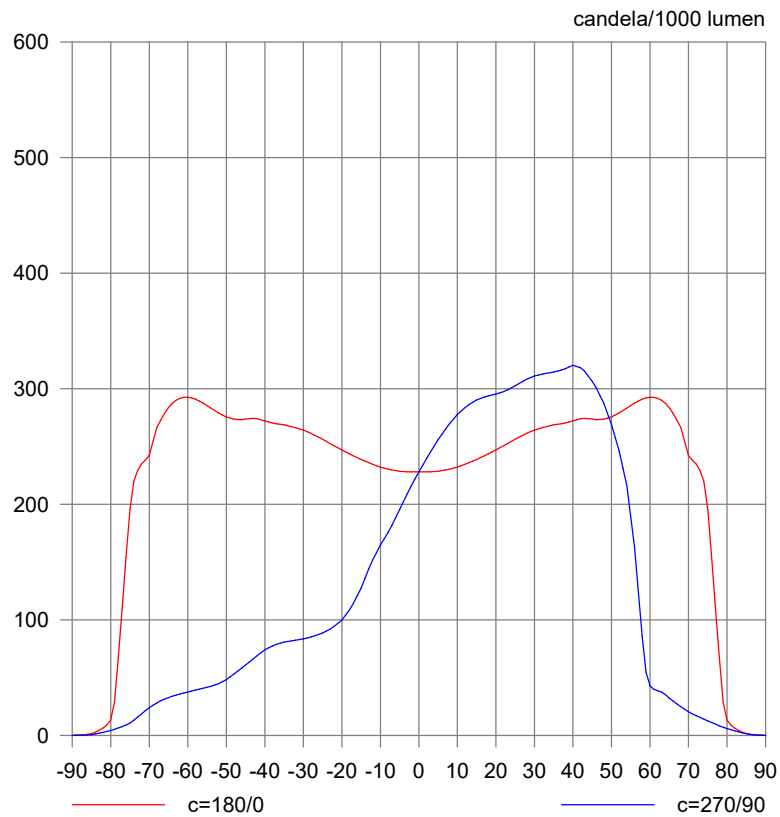


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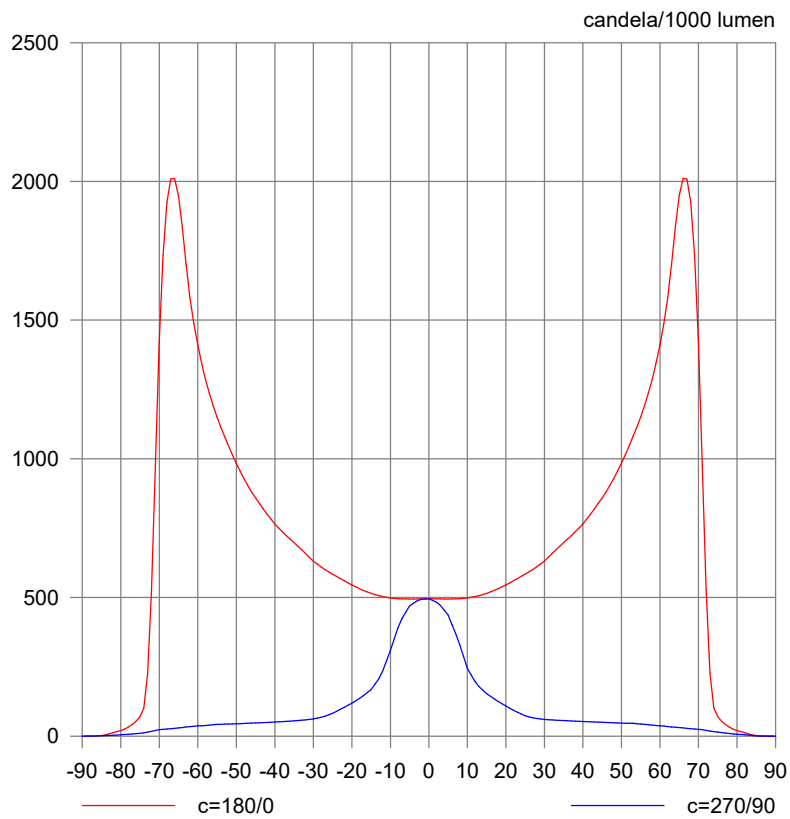


Cartesian Diagrams Continued

Luminaire C BGP702 DN33

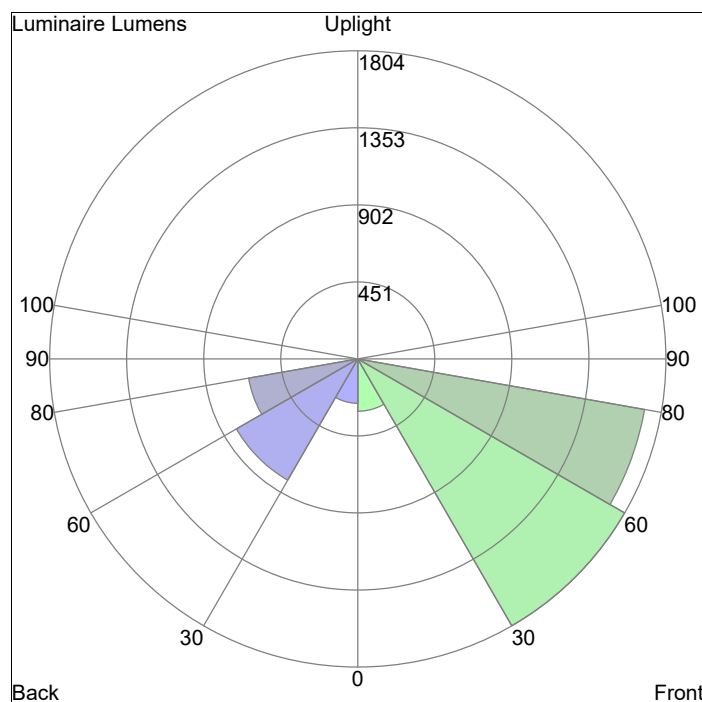


Luminaire D BGP702 DRXN0



Luminaire Classification System (LCS) Graphs

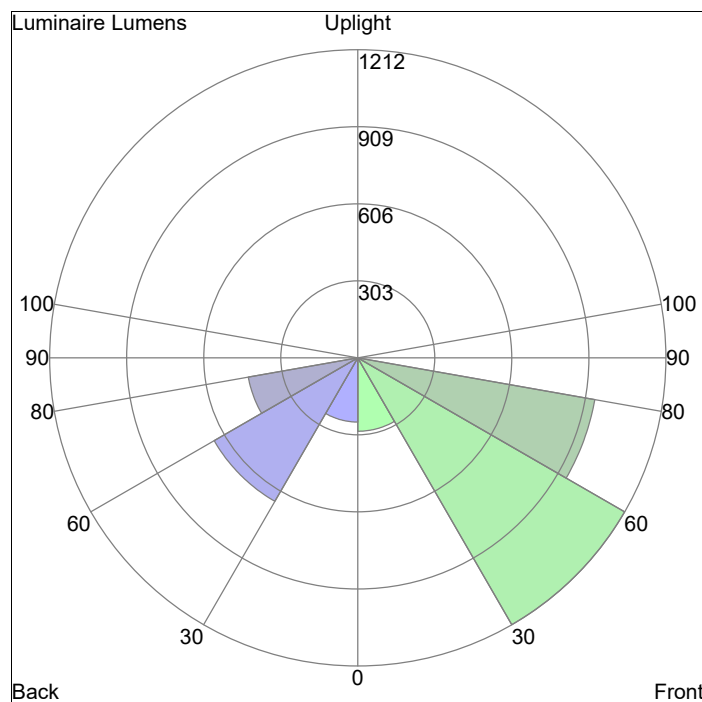
Luminaire A BGP702 DW50



LCS	Lumens	%Lamp	%Lum
FL	306.9	4.8	5.5
FM	1804.5	28.2	32.4
FH	1705.7	26.7	30.6
FVH	17.7	0.3	0.3
BL	260.6	4.1	4.7
BM	820.1	12.8	14.7
BH	649.0	10.1	11.6
BVH	9.8	0.2	0.2
UL	0.0	0.0	0.0
UH	0.0	0.0	0.0
Total	5574.6	87.1	100.0

BUG rating=B2-U0-G2

Luminaire B BGP702 DM50

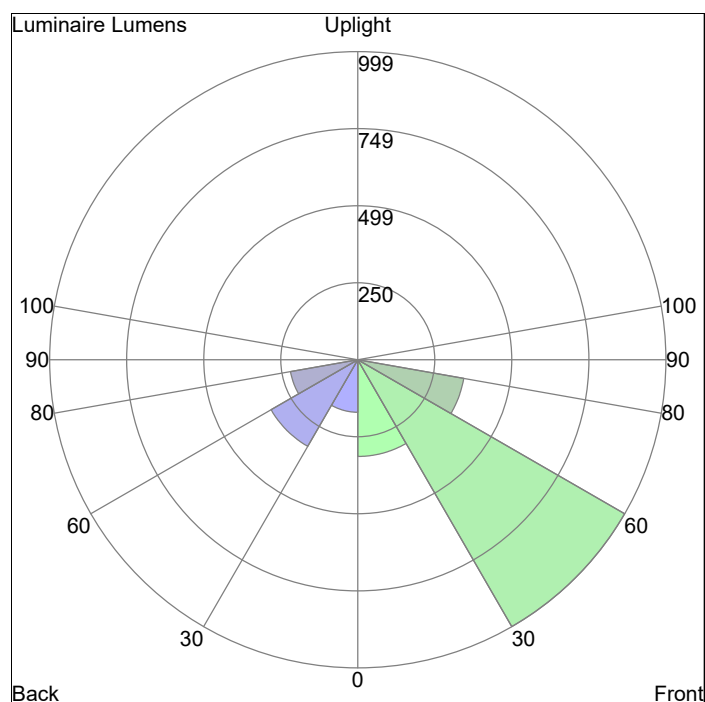


LCS	Lumens	%Lamp	%Lum
FL	289.1	6.9	7.6
FM	1212.4	28.9	31.8
FH	947.0	22.5	24.9
FVH	12.1	0.3	0.3
BL	252.9	6.0	6.6
BM	652.1	15.5	17.1
BH	436.9	10.4	11.5
BVH	7.8	0.2	0.2
UL	0.0	0.0	0.0
UH	0.0	0.0	0.0
Total	3810.5	90.7	100.0

BUG rating=B2-U0-G1

Luminaire Classification System (LCS) Graphs Continued

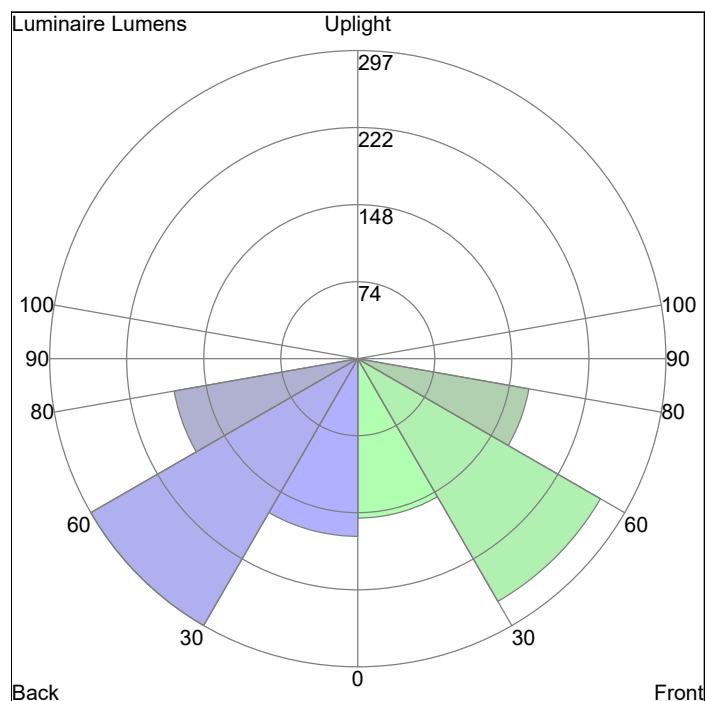
Luminaire C BGP702 DN33



LCS	Lumens	%Lamp	%Lum
FL	313.6	12.1	13.2
FM	998.7	38.4	41.9
FH	348.9	13.4	14.6
FVH	3.9	0.2	0.2
BL	170.5	6.6	7.2
BM	324.2	12.5	13.6
BH	221.2	8.5	9.3
BVH	2.9	0.1	0.1
UL	0.0	0.0	0.0
UH	0.0	0.0	0.0
Total	2384.2	91.7	100.0

BUG rating=B1-U0-G1

Luminaire D BGP702 DRXN0

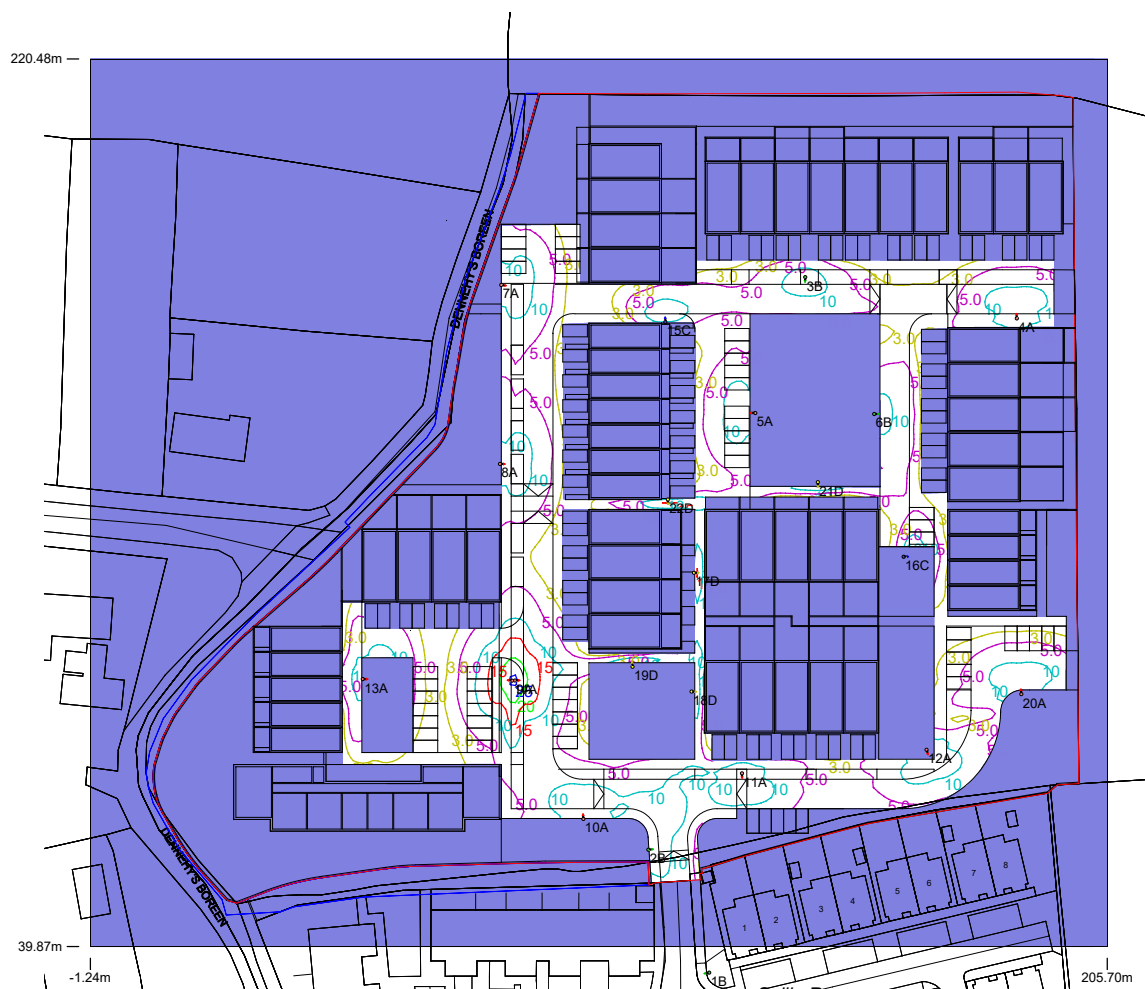


LCS	Lumens	%Lamp	%Lum
FL	153.5	11.0	12.4
FM	269.8	19.3	21.7
FH	167.3	11.9	13.5
FVH	2.0	0.1	0.2
BL	171.1	12.2	13.8
BM	296.7	21.2	23.9
BH	179.4	12.8	14.5
BVH	2.0	0.1	0.2
UL	0.0	0.0	0.0
UH	0.0	0.0	0.0
Total	1241.5	88.7	100.0

BUG rating=B1-U0-G1

Horizontal Illuminance (lux)

Grid 1

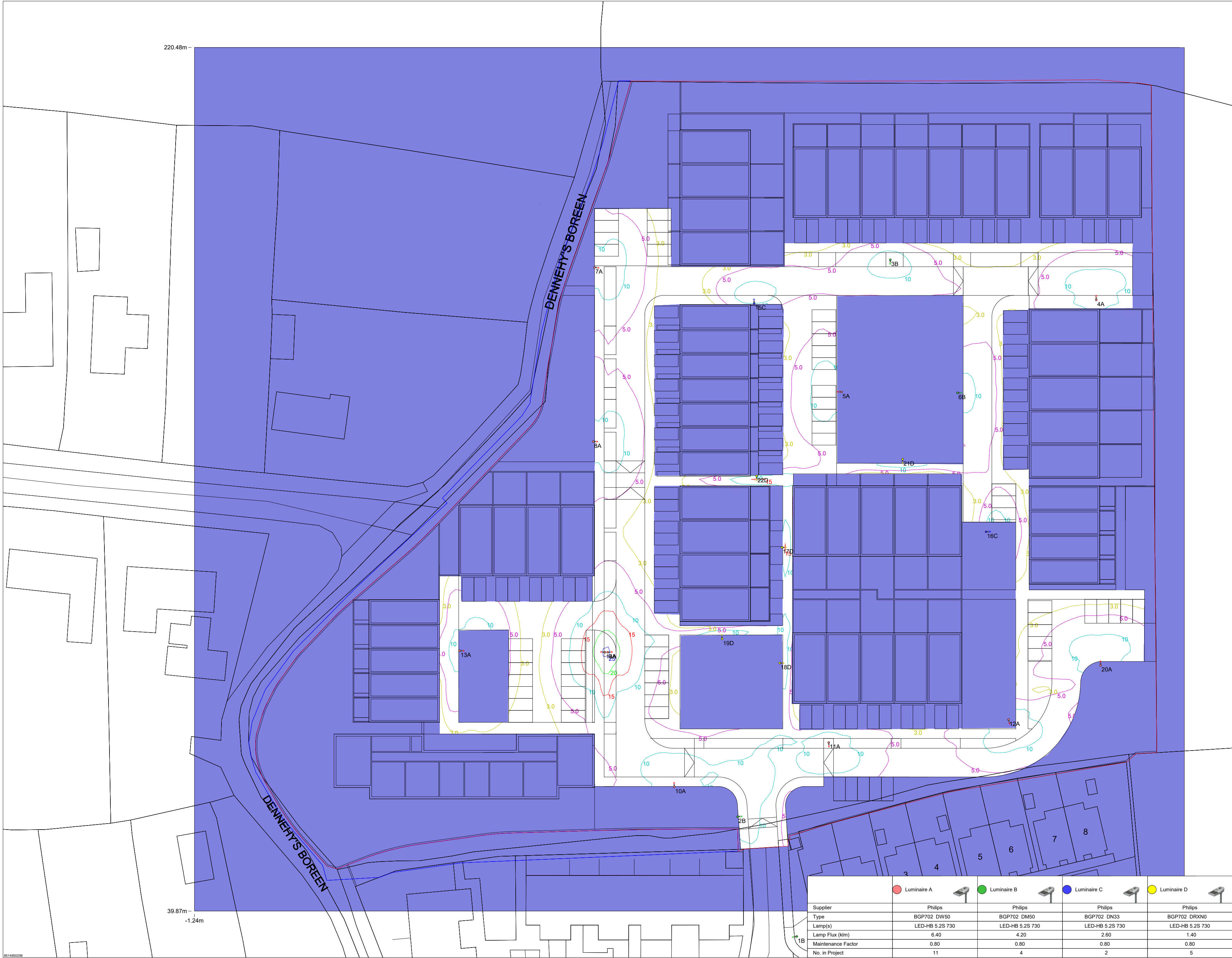


Results

Eav	6.71
Emin	1.32
E _{max}	25.49
Emin/E _{max}	0.05
Emin/Eav	0.20

APPENDIX B

Site illuminance contours Masked
1:500 A2



PROJECT NAME:
Ardshanavooley housing

PROJECT No:
P01

SCALE:
1:500

DATE:
19 March 2025

CALCULATION:
Horizontal Illuminance (lux)

DESIGNER:
DKPI

Inner estate road and circulation has been designed to comply with cat P4 and shall have dimming function to U15.
Columns identified as 13A, 17D, 18D, 19D, 21D and 22D shall have hinged columns for maintenance purposes.

PRINT SIZE:
A2

Public Lighting design for the above mentioned project:
Public lighting for estate roads and pedestrian pathways for this development has been designed to comply with EN13201:2015 and also according to the Public Lighting standards and current Local Authority Guidelines.
A MF of 0.8 is used for all calculations.
Photocells shall be of 7 pin and have a 35/18 lux switching ratio.

PREPARED BY:

Ben van Deventer
DKP International
CBG House
Kenmare
Co Kerry

Results Grid 1

Eav	6.71
Emin	1.32
Emax	25.49
Emin/Emax	0.05
Emin/Eav	0.20

LIGHTING
REALITY

	Luminaire A	Luminaire B	Luminaire C	Luminaire D	
Supplier	Philips	Philips	Philips	Philips	
Type	BGP702 DW50	BGP702 DM50	BGP702 DN33	BGP702 DRXN0	
Lamp(s)	LED-HB 5.2S 730	LED-HB 5.2S 730	LED-HB 5.2S 730	LED-HB 5.2S 730	
Lamp Flux (lm)	6.40	4.20	2.60	1.40	
Maintenance Factor	0.80	0.80	0.80	0.80	
No. in Project	11	4	2	5	

APPENDIX C

Site illuminance contours Un-masked
1:500 A2

220.48m

39.87m
-1.24m

DENNEHY'S BOREEN

DENNEHY'S BOREEN

PROJECT NAME:
Ardshanavooley housing

PROJECT No:
P01

SCALE:
1:500

DATE:
19 March 2025

CALCULATION:
Horizontal Illuminance (lux)

DESIGNER:
DKPI

Inner estate road and circulation has been designed to comply with cat P4 and shall have dimming function to U15.
Columns identified as 15A, 17D, 18D, 19D, 21D and 22D shall have hingable columns for maintenance purposes.

PRINT SIZE:
A2

Public Lighting design for the above mentioned project:
Public lighting for estateroads and pedestrian pathways for this development has been designed to comply with EN13201-2015 and also according to the Public Lighting standards and current Local Authority Guidelines.
A MF of 0.8 is used for all calculations.
Photocells shall be of 7 pin and have a 35/18 lux switching ratio.

PREPARED BY:

Ben van Deventer
DKP International
CBG House
Kenmare
Co Kerry

Results Grid 1

Eav	6.71
Emin	1.32
Emax	25.49
Emin/Emax	0.05
Emin/Eav	0.20

LIGHTING
REALITY

	Luminaire A	Luminaire B	Luminaire C	Luminaire D	
Supplier	Philips	Philips	Philips	Philips	
Type	BGP702 DW50	BGP702 DM50	BGP702 DN33	BGP702 DRXN0	
Lamp(s)	LED-HB 5.2S 730	LED-HB 5.2S 730	LED-HB 5.2S 730	LED-HB 5.2S 730	
Lamp Flux (lm)	6.40	4.20	2.60	1.40	
Maintenance Factor	0.80	0.80	0.80	0.80	
No. in Project	11	4	2	5	