

APPENDIX 4.3 LIGHTING STUDY DATE: **DESIGNER: PROJECT No: PROJECT NAME:** 18 May 2024 **Don Kinghan** DAR24011

Coolpowra Flexgen, Co. Galway R1

Exterior Lighting Design Lighting designed to the recommendations of BS5489-1:2020 and Lighting Class P4 and in conjunction with CIBSE SLL outdoor lighting guides to provide suitable lighting levels for the safe movements of vehicular and personnel movements.

DARAMACK

Lighting Class P4 Maintained average illuminance >5.0Lux Minimum point illuminance >1.0Lux

Outdoor Lighting Report

PREPARED BY:

W Don Kinghan www.daramacklighting.co.uk

DARAMACK

Exterior Lighting Design

9196878517

Layout Report



General Data

Dimensions in Metres Angles in Degrees

Calculation Grids

ID	Grid Name	Х	Y	X' Length	Y' Length	X' Spacing	Y' Spacing
1	Grid 1	582642.99	709081.71	400.00	39.00	1.60	1.50
2	Grid 2	582496.91	708967.80	198.00	90.00	1.50	1.50
3	Grid 3	582332.54	709088.85	159.00	60.00	1.50	7 .50
4	Grid 4	582239.67	709062.06	120.00	36.00	1.50	1.50
5	Carpark	582259.09	709033.71	99.00	36.00	1.50	1.50
6	Grid 6	582020.96	708915.96	258.00	180.00	1.50	1.50
7	Grid 7	581978.58	709109.85	207.00	60.00	1.50	1.50
8	Grid 8	582185.90	709045.78	21.00	42.00	1.50	1.50
9	Grid 9	582333.01	709243.54	93.00	129.00	1.50	1.50
10	Grid 10	582326.38	708947.72	150.00	90.00	1.50	1.50
11	Grid 11	582368.61	709077.91	60.00	126.00	1.50	1.50
12	Grid 12	583036.95	709013.61	171.00	42.00	1.50	1.50
13	Grid 13	583197.40	709043.20	120.00	36.00	1.50	1.50

<u>Luminaires</u>



Luminaire A Data

Supplier	Philips
Туре	BGP291 DW50 BL2
Lamp(s)	LED-HB 5.2S 730
Lamp Flux (klm)	6.00
File Name	LumiStreet Gen2 Micro_BGP291_DW50 BL 2_6000_20LED_5.2S_CLO_L90_730.ies
Maintenance Factor	0.83
Lum. Int. Class	G3
No. in Project	98

<u>Layout</u>

				-		-				1	
ID	Туре	х	Y	Height	Angle	Tilt	Cant	Out-	Target	Target	Target
/Mast								reach	х	Y	z
1	А	583257.80	709142.03	6.00	166.00	0.00	0.00	0.40			
2	А	583249.25	709116.60	6.00	144.00	0.00	0.00	0.40			
3	А	583232.05	709093.77	6.00	147.00	0.00	0.00	0.40			
4	А	583214.09	709070.42	6.00	140.00	0.00	0.00	0.40			
5	А	583194.71	709049.26	6.00	124.00	0.00	0.00	0.40			
6	А	583159.32	709042.48	6.00	299.00	0.00	0.00	0.40			
7	А	583133.07	709030.18	6.00	293.00	0.00	0.00	0.40			
8	А	583105.36	709027.99	6.00	265.00	0.00	0.00	0.40			

DESIGNER: Don Kinghan PROJECT NAME: Coolpowra Flexgen, Co. Galway R1 DARAMACK

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ID	Туре	Х	Y	Height	Angle	Tilt	Cant	Out-	Target	Target	Target
/Mast								reach	х	Q .	z
9	А	583069.27	709031.33	6.00	262.00	0.00	0.00	0.40		Ö	6,
10	А	583037.48	709035.73	6.00	259.00	0.00	0.00	0.40			20-
11	А	583002.19	709040.61	6.00	261.00	0.00	0.00	0.40			5
12	А	582964.42	709045.84	6.00	261.00	0.00	0.00	0.40			
13	A	582930.07	709050.62	6.00	260.00	0.00	0.00	0.40			
14	А	582895.20	709059.90	6.00	252.00	0.00	0.00	0.40			
15	А	582863.87	709070.07	6.00	251.00	0.00	0.00	0.40			
16	А	582834.22	709079.62	6.00	250.00	0.00	0.00	0.40			
17	A	582802.11	709089.92	6.00	250.00	0.00	0.00	0.40			
18	А	582767.80	709093.52	6.00	271.00	0.00	0.00	0.40			
19	А	582733.94	709093.97	6.00	269.00	0.00	0.00	0.40			
20	A	582697.68	709094.71	6.00	271.00	0.00	0.00	0.40			
21	A	582666.04	709094.41	6.00	267.00	0.00	0.00	0.40			
22	A	582634.39	709092.57	6.00	294.00	0.00	0.00	0.40			
23	A	582601.59	709079.03	6.00	293.00	0.00	0.00	0.40			
24	A	582564.66	709063.48	6.00	294.00	0.00	0.00	0.40			
25	A	582531.18	709049.67	6.00	291.00	0.00	0.00	0.40			
26	A	582495.52	709034.83	6.00	292.00	0.00	0.00	0.40			
27	A	582474.84	709014.82	6.00	113.00	0.00	0.00	0.40			
28	A	582455.11	709037.46	6.00	238.00	0.00	0.00	0.40			
29	A	582425.40	709058.35	6.00	234.00	0.00	0.00	0.40			
30	A	582397.69	709077.86	6.00	230.00	0.00	0.00	0.40			
31	A	582372.10	709095.88	6.00	233.00	0.00	0.00	0.40			
32	A	582340.01	709107.09	6.00	279.00	0.00	0.00	0.40			
33	A	582303.53	709098.14	6.00	283.00	0.00	0.00	0.40			
34	A	582267.03	709089.41	6.00	282.00	0.00	0.00	0.40			
35	A	582238.42	709081.86	6.00	270.00	0.00	0.00	0.40			
36/ENC01	A	582272.98	709062.25	6.00	283.00	0.00	0.00	0.90			
37/ENC01	A	582272.98	709062.25	6.00	103.00	0.00	0.00	0.90			
38/ENC03	A	582329.00	709075.89	6.00	283.00	0.00	0.00	0.90			
39/ENC03	A	582329.00	709075.89	6.00	103.00	0.00	0.00	0.90			
40/ENC02	A	582300.97	709068.96	6.00	283.00	0.00	0.00	0.90			
41/ENC02	A	582300.97	709068.96	6.00	103.00	0.00	0.00	0.90			
42	A	582235.80	709054.97	6.00	192.00	0.00	0.00	0.40			
43	A	582210.67	709058.80	6.00	107.00	0.00	0.00	0.40			
11	Δ	582206 91	709092 40	6.00	238.00	0.00	0.00	0.40			

DESIGNER: Don Kinghan PROJECT NAME: Coolpowra Flexgen, Co. Galway R1 DARAMACK

Exterior Lighting Design

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ID	Туре	х	Y	Height	Angle	Tilt	Cant	Out-	Target	Target	Target
/Mast								reach	х	`? .	z
45	А	582162.93	709091.49	6.00	283.00	0.00	0.00	0.40		Ő	6,
46	A	582244.45	709020.15	6.00	193.00	0.00	0.00	0.40			20
47	А	582226.88	708989.97	6.00	104.00	0.00	0.00	0.40			X
48	А	582191.20	708981.07	6.00	104.00	0.00	0.00	0.40			
49	A	582155.98	708972.74	6.00	104.00	0.00	0.00	0.40			
50	A	582125.05	708965.18	6.00	103.00	0.00	0.00	0.40			
51	A	582097.20	708958.35	6.00	106.00	0.00	0.00	0.40			
52	A	582069.23	708952.62	6.00	88.00	0.00	0.00	0.40			
53	A	582034.22	708964.67	6.00	42.00	0.00	0.00	0.40			
54	А	582022.53	708997.41	6.00	19.00	0.00	0.00	0.40			
55	А	582013.71	709035.66	6.00	15.00	0.00	0.00	0.40			
56	А	582006.93	709063.94	6.00	13.00	0.00	0.00	0.40			
57	А	582031.76	709069.35	6.00	196.00	0.00	0.00	0.40			
58	А	582056.14	709056.39	6.00	104.00	0.00	0.00	0.40			
59	A	582090.74	709065.08	6.00	106.00	0.00	0.00	0.40			
60	A	582067.92	709079.72	6.00	193.00	0.00	0.00	0.40			
61	А	582105.74	709088.47	6.00	198.00	0.00	0.00	0.40			
62	А	582127.35	709073.76	6.00	104.00	0.00	0.00	0.40			
63	A	582143.26	709097.83	6.00	197.00	0.00	0.00	0.40			
64	A	582042.57	708997.26	6.00	200.00	0.00	0.00	0.40			
65	А	582063.93	708976.20	6.00	106.00	0.00	0.00	0.40			
66	А	582098.14	708984.31	6.00	103.00	0.00	0.00	0.40			
67	А	582132.70	708992.67	6.00	104.00	0.00	0.00	0.40			
68	А	582166.63	709000.78	6.00	107.00	0.00	0.00	0.40			
ANC01	А	582158.88	709184.99	6.00	282.00	0.00	0.00	0.40			
ANC03	A	582115.44	709186.56	6.00	280.00	0.00	0.00	0.40			
ANC02	А	582127.90	709161.74	6.00	101.00	0.00	0.00	0.40			
ANC04	А	582095.87	709154.25	6.00	105.00	0.00	0.00	0.40			
ANC05	А	582069.06	709147.67	6.00	102.00	0.00	0.00	0.40			
ANC06	А	582042.56	709141.00	6.00	106.00	0.00	0.00	0.40			
ANC07	А	582013.85	709134.10	6.00	109.00	0.00	0.00	0.40			
ANC08	А	582009.34	709152.71	6.00	279.00	0.00	0.00	0.40			
77	А	582179.13	709079.49	6.00	14.00	0.00	0.00	0.40			
78	А	582200.09	709069.26	6.00	198.00	0.00	0.00	0.40			
79	А	582186.10	709050.31	6.00	24.00	0.00	0.00	0.40			
80	A	582392.40	709265.24	6.00	0.00	0.00	0.00	0.40			

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Layout Continued

Layout Contin	ued								PEC	N.	
ID	Туре	х	Y	Height	Angle	Tilt	Cant	Out-	Target	Target	Target
/Mast								reach	Х	` Q.	z
81	А	582378.90	709268.22	6.00	102.00	0.00	0.00	0.40		Q	02
82	А	582387.02	709303.75	6.00	8.00	0.00	0.00	0.40			20
83	А	582388.27	709342.48	6.00	188.00	0.00	0.00	0.40			R.
84	А	582363.11	709342.22	6.00	97.00	0.00	0.00	0.40			
CNC01	А	582440.24	709011.55	6.00	140.00	0.00	0.00	0.40			
CNC02	А	582419.75	708995.92	6.00	104.00	0.00	0.00	0.40			
CNC03	А	582398.62	708981.03	6.00	108.00	0.00	0.00	0.40			
CNC04	А	582366.72	708973.34	6.00	104.00	0.00	0.00	0.40			
CNC05	А	582395.69	709011.68	6.00	332.00	0.00	0.00	0.40			
CNC06	А	582409.18	709031.50	6.00	201.00	0.00	0.00	0.40			
CNC07	А	582372.66	709033.36	6.00	282.00	0.00	0.00	0.40			
CNC08	А	582332.04	709023.69	6.00	283.00	0.00	0.00	0.40			
DNC01	А	582400.84	709100.44	6.00	149.00	0.00	0.00	0.40			
DNC04	А	582396.70	709152.30	6.00	189.00	0.00	0.00	0.40			
DNC03	Α	582370.33	709154.98	6.00	16.00	0.00	0.00	0.40			
DNC06	А	582389.49	709189.60	6.00	195.00	0.00	0.00	0.40			
DNC05	А	582360.47	709184.39	6.00	9.00	0.00	0.00	0.40			
DNC02	А	582388.93	709126.28	6.00	59.00	0.00	0.00	0.40			





Eav	5.62
Emin	1.14
Emax	10.38
Emin/Emax	0.11
Emin/Eav	0.20



Eav	5.57
Emin	1.12
Emax	10.91
Emin/Emax	0.10
Emin/Eav	0.20



Eav	5.69
Emin	1.15
Emax	10.30
Emin/Emax	0.11
Emin/Eav	0.20



Eav	5.32
Emin	1.07
Emax	10.25
Emin/Emax	0.10
Emin/Eav	0.20



Eav	6.97
Emin	2.78
Emax	11.16
Emin/Emax	0.25
Emin/Eav	0.40



Eav	6.59
Emin	1.29
Emax	11.56
Emin/Emax	0.11
Emin/Eav	0.20



Eav	6.37
Emin	1.33
Emax	11.27
Emin/Emax	0.12
Emin/Eav	0.21





Eav	6.10
Emin	1.19
Emax	10.82
Emin/Emax	0.11
Emin/Eav	0.20



Results

Eav	6.33
Emin	1.24
Emax	11.91
Emin/Emax	0.10
Emin/Eav	0.20





Eav	5.88
Emin	1.22
Emax	10.44
Emin/Emax	0.12
Emin/Eav	0.21



Eav	6.83
Emin	1.38
Emax	11.22
Emin/Emax	0.12
Emin/Eav	0.20





	Lighting class		
	E1 to E2 ^{A)}	E3 to E4 ^{A)}	
cyclists	Speed limit $v \leq 30$ mph	Speed limit v ≤ 30 mph	
	P4	P3	
	P5	P4	
	55	74	

lluminance	Additional requirement if facial recognition is necessary		
E _{min} [maintained] lx	E _{v.min} [maintained] lx	E _{sc,min} [maintained] lx	
3,00	5,0	5,0	
2,00	3,0	2,0	
1,50	2,5	1,5	
1,00	1,5	1,0	
0,60	1,0	0,6	
0,40	0,6	0,2	
860	· · · · · · · · · · · · · · · · · · ·		

CDM RESIDUAL DESIGN RISKS AND RESIDUAL ENVIRONMENTAL RI In accordance with the Construction Design Management Regulations 2015, Daramack Lighting Consultancy has undertaken a design risk assessment for the elements of work shown on this drawing. The above are some but not all the residual risks identified in the risk assessment. For a comprehensiv list refer to the design risk assessment. 1. Do not scale from this drawing. 2. Site verify all dimensions prior to construction 3. Report all discrepancies to the Drawing Originator immediately 4. This drawing is to be read in conjunction with all relevant documents and drawings Notes 92 🔶 Luminaire as Philips LumiStreet Gen2 Micro BGP291, 6.0klm 20LED 39W DW50 BL2 3000K Warm White CLO post top mounted luminaire complete with factory-fitted integral rear shields at 0° tilt on 6m standard galvanized steel planted lighting columns. 2x Luminaire as Philips LumiStreet Gen2 Micro BGP291, 6.0klm 20LED 39W DW50 BL2 3000K Warm White CLO twin 0.5m outreach bracket mounted luminaire complete with factory-fitted integral rear shields at 0° tilt on 6m standard galvanized steel planted lighting columns. 5.0 5.0Lux Contour Line - Target average illuminance 1.0Lux Contour Line - Target minimum illuminance 0.1 0.1Lux Contour Line - equivalent to full moon on clear night DRAWING TO BE READ IN CONJUNCTION WITH DAR24011/001 AND DAR24011/003 LUX RATING CHART Light Level (LUX) Foot Candles (FC) Condition 107,527 10.000 Sunliah 10,752.70 1,000 Daylight Overcast Day 1,075.30 100 107.53 Very Dark Day 10.75 Twilight Deep Twilight 1.08 0.1 Full Moon 0.108 0.01 0.0108 0.001 **Ouarter Moon** 0.0011 0.0001 Starlight Overcast Night 0.0001 0 0000

.				
Rev	Date	Description	Dm	Chk'd
R0	14/05/24	FIRST ISSUE	WDK	WDK
R1	20/05/24	ENTRANCE ROAD - ROUTE ALTERED	WDK	WDK

Drawing Originator

THIS DRAWING IS THE PROPERTY OF DARAMACK LIGHTING CONSULTANCY AND SHALL NOT BE REPRODUCED WITHOUT PRIOR WRITTEN PERMISSION - LISBURN - TEL:07590 986 007

Drawing Status
PRELIMINARY
Project Name

		,	
Drawn by WDK	Drawn Date 10/05/24	Checked by WDK	Checked Date 14/05/24
Approved by	Approved Date	Scale 1:500	
Title			Original drawing sheet is A1

EXTERNAL LIGHTING LAYOUT WITH LUX LEVEL CONTOURS SHEET 2 OF 3

DAR24011/002

Drawing Number

		Overca	ast Night	0.0001		0.00001		
R1	20/0	5/24	ENTRAN	NCE ROAD	- ROUTE	E ALTERED	WDK	WDK
R0	14/0	5/24	FIRST IS	SUE			WDK	WDK
Rev	Da	ite		Desci	iption		Dm	Chk'd
Revisio	Revisions							

Drawn by WDK	Drawn Date 10/05/24	Checked by WDK	Checked Date 14/05/24
Approved by	Approved Date	Scale 1:500	
ïtle		Oric	ninal drawing sheet is A1