LIGHTING SCIENCES CANADA LTD.
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Certified Test Report No. LSC F403

BEGHELLI EMERGENCY LIGHTING LUMINAIRE CAT. NO. BRAVADO
WITH SPECULAR INTERIOR AND CLEAR LENS
ONE BEGHELLI 20W MR16 INCANDESCENT LAMP. LUMEN OUTPUT = 211 LMS.

Processed by *** SPOT-LITE ***

Performance Summary:

Beam Angle	38.6 Degrees
Field Angle	51.3 Degrees
Max. Candlepower	410 CANDELA
Center Candlepower	354 CANDELA
Beam Lumens	124 LMS.
Beam Efficacy	6.3 LMS/WATT
Field Lumens	151 LMS.
Field Efficacy	7.6 LMS/WATT
Total Lumens	211 LMS.
Total Efficacy	10.7 LMS/WATT

Field Angle is defined by 10 percent of Max. Candlepower
Beam Angle is defined by 50 percent of Max. Candlepower

Laboratory results may not be representative of field performance.
ABSOLUTE PHOTOMETRY TAKEN.

Prepared for:

BEGHELLI CANADA INC.
MARKHAM, ONTARIO

Certified by:

Charles Sisson

Date: Dec 16 2011

LIGHTING SCIENCES CANADA LTD.
160 FROBISHER DRIVE, UNIT 5
WATERLOO, ONTARIO

BEGHELLI EMERGENCY LIGHTING LUMINAIRE CAT. NO. BRAVADO
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Beam center illuminance, beam and field diameters

Distance	Illuminance at Center	Beam Diameter	Field Diameter
10	3.5	7.0	9.6
15	1.6	10.5	14.4
20	.9	14.0	19.2
25	.6	17.5	24.0
30	.4	21.0	28.8
35	.3	24.5	33.6
40	.2	28.1	38.4
45	.2	31.6	43.2
50	.1	35.1	48.0
55	.1	38.6	52.8
60	.1	42.1	57.6
65	.1	45.6	62.4
70	.1	49.1	67.2
75	.1	52.6	72.0
80	.1	56.1	76.7
85	.0	59.6	81.5
90	.0	63.1	86.3
95	.0	66.6	91.1
100	.0	70.1	95.9
105	.0	73.6	100.7
110	.0	77.1	105.5
115	.0	80.7	110.3
120	.0	84.2	115.1
125	.0	87.7	119.9
130	.0	91.2	124.7
135	.0	94.7	129.5
140	.0	98.2	134.3
145	.0	101.7	139.1
150	.0	105.2	143.9

If distance is in Feet, Illuminance is in Footcandles
If distance is in Meters, Illuminance in Lux

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Tabulation of Candlepower VS. Angle
for Illuminance Calculations

Angle	Cosine of Angle	CANDELA CP	Angle	Cosine of Angle	CP	Angle	Cosine of Angle	CP
0	1.00	354	30	.87	26	60	.50	6
1	1.00	353	31	.86	25	61	.48	5
2	1.00	353	32	.85	25	62	.47	5
3	1.00	357	33	.84	26	63	.45	5
4	1.00	364	34	.83	26	64	.44	5
5	1.00	372	35	.82	26	65	.42	5
6	.99	382	36	.81	27	66	.41	4
7	.99	391	37	.80	27	67	.39	4
8	.99	401	38	.79	27	68	.37	4
9	.99	407	39	.78	27	69	.36	4
10	.98	410	40	.77	27	70	.34	4
11	.98	409	41	.75	27	71	.33	4
12	.98	407	42	.74	27	72	.31	4
13	.97	401	43	.73	28	73	.29	4
14	.97	388	44	.72	27	74	.28	3
15	.97	369	45	.71	27	75	.26	3
16	.96	340	46	.69	25	76	.24	3
17	.96	302	47	.68	22	77	.22	3
18	.95	260	48	.67	19	78	.21	3
19	.95	218	49	.66	15	79	.19	3
20	.94	178	50	.64	12	80	.17	3
21	.93	141	51	.63	10	81	.16	3
22	.93	108	52	.62	9	82	.14	3
23	.92	82	53	.60	8	83	.12	3
24	.91	61	54	.59	7	84	.10	3
25	.91	47	55	.57	7	85	.09	3
26	.90	37	56	.56	7	86	.07	3
27	.89	32	57	.54	6	87	.05	3
28	.88	29	58	.53	6	88	.03	3
29	.87	27	59	.52	6	89	.02	3

Illuminance at any point on a plane perpendicular to the luminaire axis can be calculated by either of two methods:

$$\text{Method 1: Illuminance} = \frac{\text{Candlepower} \times \text{Cosine of angle}}{\text{Distance squared from spotlight to point}}$$

$$\text{Method 2: Illuminance} = \frac{\text{Candlepower} \times \text{Cosine cubed of angle}}{\text{Distance squared from spotlight to plane}}$$

If distance is in Feet, Illuminance is in Footcandles
If distance is in Meters, Illuminance in Lux

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Cone of Light Tabulation
(Illuminances on a Plane Perpendicular to Lamp Axis)

Distance from Luminaire	Illuminance Directly on Axis	Diameter of Circle	Illuminance at Edge of Circle
1.0	354.8	.7	177.4
1.5	157.7	1.0	78.8
2.0	88.7	1.4	44.4
2.5	56.8	1.7	28.4
3.0	39.4	2.1	19.7
3.5	29.0	2.4	14.5
4.0	22.2	2.8	11.1
4.5	17.5	3.1	8.8
5.0	14.2	3.5	7.1
5.5	11.7	3.8	5.9
6.0	9.9	4.2	4.9
6.5	8.4	4.5	4.2
7.0	7.2	4.9	3.6
7.5	6.3	5.2	3.2
8.0	5.5	5.6	2.8
8.5	4.9	5.9	2.5
9.0	4.4	6.3	2.2
9.5	3.9	6.6	2.0
10.0	3.5	7.0	1.8
11.0	2.9	7.7	1.5
12.0	2.5	8.4	1.2
13.0	2.1	9.1	1.0
14.0	1.8	9.7	.9
15.0	1.6	10.4	.8
16.0	1.4	11.1	.7
17.0	1.2	11.8	.6
18.0	1.1	12.5	.5
19.0	1.0	13.2	.5
20.0	.9	13.9	.4
21.0	.8	14.6	.4
22.0	.7	15.3	.4
23.0	.7	16.0	.3
24.0	.6	16.7	.3
25.0	.6	17.4	.3
26.0	.5	18.1	.3
27.0	.5	18.8	.2
28.0	.5	19.5	.2
29.0	.4	20.2	.2
30.0	.4	20.9	.2

Total Cone Angle = 38.4 Degrees
(Based upon point where illuminance drops to 50% of center value)

Note: Distance in Feet, Illuminance in Footcandles
Distance in Meters, Illuminance in Lux

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Lighting Design Tables

Lamp Aiming Angle = .0 Degrees - See Footnote

Distance	Illuminance	Illuminated Width	Illuminated Length	Spacing
1.0	354.8	.7	.7	.7
2.0	88.7	1.4	1.4	1.4
3.0	39.4	2.1	2.1	2.1
4.0	22.2	2.8	2.8	2.8
5.0	14.2	3.5	3.5	3.5
6.0	9.9	4.2	4.2	4.2
7.0	7.2	4.9	4.9	4.9
8.0	5.5	5.6	5.6	5.6
9.0	4.4	6.3	6.3	6.3
10.0	3.5	7.0	7.0	7.0
11.0	2.9	7.7	7.7	7.7
12.0	2.5	8.4	8.4	8.4
13.0	2.1	9.1	9.1	9.1
14.0	1.8	9.7	9.7	9.7
15.0	1.6	10.4	10.4	10.4
16.0	1.4	11.1	11.1	11.1
17.0	1.2	11.8	11.8	11.8
18.0	1.1	12.5	12.5	12.5
19.0	1.0	13.2	13.2	13.2
20.0	.9	13.9	13.9	13.9
21.0	.8	14.6	14.6	14.6
22.0	.7	15.3	15.3	15.3
23.0	.7	16.0	16.0	16.0
24.0	.6	16.7	16.7	16.7
25.0	.6	17.4	17.4	17.4
26.0	.5	18.1	18.1	18.1
27.0	.5	18.8	18.8	18.8
28.0	.5	19.5	19.5	19.5
29.0	.4	20.2	20.2	20.2
30.0	.4	20.9	20.9	20.9

Illuminated width & length are based upon point at which illuminance falls to 50% of center illuminance.
Recommended spacing is based upon uniform illuminance

Aiming angle is the angle between the lamp axis and the perpendicular to the illuminated plane.

Note: Distance in Feet, Illuminance in Footcandles
Distance in Meters, Illuminance in Lux

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Lighting Design Tables Continued

Lamp Aiming Angle = 30.0 Degrees - See Footnote

Distance	Illuminance	Illuminated Width	Illuminated Length	Spacing
1.0	230.5	.8	1.0	.8
2.0	57.6	1.6	1.9	1.6
3.0	25.6	2.4	2.9	2.4
4.0	14.4	3.2	3.9	3.2
5.0	9.2	4.0	4.8	4.0
6.0	6.4	4.8	5.8	4.8
7.0	4.7	5.6	6.8	5.6
8.0	3.6	6.4	7.7	6.4
9.0	2.8	7.2	8.7	7.2
10.0	2.3	8.0	9.7	8.0
11.0	1.9	8.8	10.6	8.8
12.0	1.6	9.6	11.6	9.6
13.0	1.4	10.5	12.6	10.5
14.0	1.2	11.3	13.5	11.3
15.0	1.0	12.1	14.5	12.1
16.0	.9	12.9	15.5	12.9
17.0	.8	13.7	16.4	13.7
18.0	.7	14.5	17.4	14.5
19.0	.6	15.3	18.4	15.3
20.0	.6	16.1	19.3	16.1
21.0	.5	16.9	20.3	16.9
22.0	.5	17.7	21.3	17.7
23.0	.4	18.5	22.3	18.5
24.0	.4	19.3	23.2	19.3
25.0	.4	20.1	24.2	20.1
26.0	.3	20.9	25.2	20.9
27.0	.3	21.7	26.1	21.7
28.0	.3	22.5	27.1	22.5
29.0	.3	23.3	28.1	23.3
30.0	.3	24.1	29.0	24.1

Illuminated width & length are based upon point at which illuminance falls to 50% of center illuminance.
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Note: Distance in Feet, Illuminance in Footcandles
Distance in Meters, Illuminance in Lux

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Lighting Design Tables Continued

Lamp Aiming Angle = 45.0 Degrees - See Footnote

Distance	Illuminance	Illuminated Width	Illuminated Length	Spacing
1.0	125.5	1.0	1.6	1.0
2.0	31.4	2.0	3.2	2.0
3.0	13.9	3.0	4.8	3.0
4.0	7.8	3.9	6.3	3.9
5.0	5.0	4.9	7.9	4.9
6.0	3.5	5.9	9.5	5.9
7.0	2.6	6.9	11.1	6.9
8.0	2.0	7.9	12.7	7.9
9.0	1.5	8.9	14.3	8.9
10.0	1.3	9.8	15.8	9.8
11.0	1.0	10.8	17.4	10.8
12.0	.9	11.8	19.0	11.8
13.0	.7	12.8	20.6	12.8
14.0	.6	13.8	22.2	13.8
15.0	.6	14.8	23.8	14.8
16.0	.5	15.8	25.4	15.8
17.0	.4	16.7	26.9	16.7
18.0	.4	17.7	28.5	17.7
19.0	.3	18.7	30.1	18.7
20.0	.3	19.7	31.7	19.7
21.0	.3	20.7	33.3	20.7
22.0	.3	21.7	34.9	21.7
23.0	.2	22.6	36.4	22.6
24.0	.2	23.6	38.0	23.6
25.0	.2	24.6	39.6	24.6
26.0	.2	25.6	41.2	25.6
27.0	.2	26.6	42.8	26.6
28.0	.2	27.6	44.4	27.6
29.0	.1	28.6	46.0	28.6
30.0	.1	29.5	47.5	29.5

Illuminated width & length are based upon point at which illuminance falls to 50% of center illuminance.
Recommended spacing is based upon uniform illuminance

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Note: Distance in Feet, Illuminance in Footcandles
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Lighting Design Tables Continued

Lamp Aiming Angle = 60.0 Degrees - See Footnote

Distance	Illuminance	Illuminated Width	Illuminated Length	Spacing
1.0	44.4	1.4	4.4	1.4
2.0	11.1	2.8	8.8	2.8
3.0	4.9	4.2	13.1	4.2
4.0	2.8	5.6	17.5	5.6
5.0	1.8	7.0	21.9	7.0
6.0	1.2	8.4	26.3	8.4
7.0	.9	9.7	30.6	9.7
8.0	.7	11.1	35.0	11.1
9.0	.5	12.5	39.4	12.5
10.0	.4	13.9	43.8	13.9
11.0	.4	15.3	48.1	15.3
12.0	.3	16.7	52.5	16.7
13.0	.3	18.1	56.9	18.1
14.0	.2	19.5	61.3	19.5
15.0	.2	20.9	65.6	20.9
16.0	.2	22.3	70.0	22.3
17.0	.2	23.7	74.4	23.7
18.0	.1	25.1	78.8	25.1
19.0	.1	26.5	83.1	26.5
20.0	.1	27.9	87.5	27.9
21.0	.1	29.2	91.9	29.2
22.0	.1	30.6	96.3	30.6
23.0	.1	32.0	100.6	32.0
24.0	.1	33.4	105.0	33.4
25.0	.1	34.8	109.4	34.8
26.0	.1	36.2	113.8	36.2
27.0	.1	37.6	118.1	37.6
28.0	.1	39.0	122.5	39.0
29.0	.1	40.4	126.9	40.4
30.0	.0	41.8	131.3	41.8

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SPOTLIGHT DATA

CANDLEPOWER TRACE THROUGH ORIGIN