ILLUMIRAIL® BAR SYSTEM

PHOTOMETRIC TEST REPORT

Test Method(s) Used	
POTS Standard Operating Procedure:	INTEGRATING SPHERE PROCEDURE POTS016
POTS Standard Operating Procedure:	NFMS OPERATION GUIDE
Standard:	LM79 08

Details of Product Tested	
Manufacturer: ADVANCED BMS	Source Type: LED
Model: HANDRAIL	Luminaire Type: ILLUMINATED HANDRAIL
Power Supply Used: Kikusui PCR1000M Voltage Stabiliser S/N SM01191	
Voltage(AC V) = 230.0	Current (mA)= 64
Power (Watts)= 5.382	Power factor= 0.364

Integrating Sphere Test	
Date of Test: 10/07/2015	Ambient Temperature:25°C
Measurement Filename: HANDRAIL	
Instrument Used: Labsphere model 2m integrating sphere spectroradiometer AS-02949-012	
Integrating Sphere Size: 2m	Measurement Geometry (2π / 4π): 4π
Sample Orientation: Horizontal	Auxiliary Correction Applied: YES
Comments:	
Date of Last Calibration (Operating Hours): 06-07-2015 (0:42)	Spectral Flux Standard Lamp Used: SCL-600
Standard Lamp Serial Number: L123	Traceable: to NIST standards
Calibration Certificate Number: SCL-600-L123	Calibration Certificate Date: 29/01/2014
Calibration Lamp Uncertainty: ± 0.67% (k=2)	
Results	
Flux (lumens): 240.7	
CIE 1931 Chromaticity Cx: 0.4500	CIE 1931 Chromaticity Cy: 0.4166
CRI (%):2888	CCT (K): 80.91

FIGURE 1: SPECTRAL IRRADIANCE

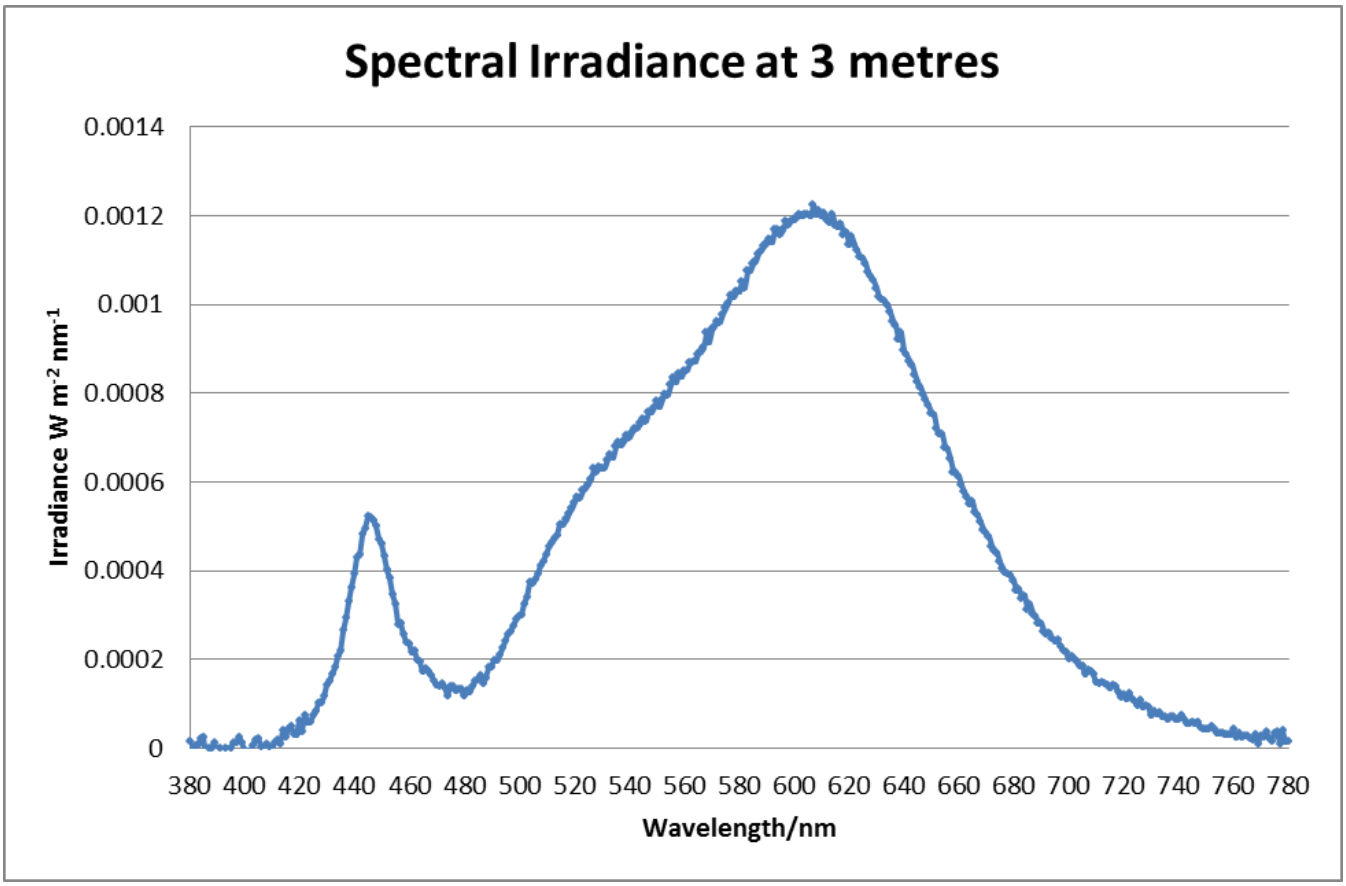

FIGURE 2: CIE 1931 DIAGRAM

ILLUMIRAIL® BAR SYSTEM

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Goniophotometer Test		
Date of Test: 14/07/2015		Ambient Temperature: 25°C
Measurement Filename: HANDRAIL		
Instrument Used: Radiant Imaging NFMS0800 Goniometer with ProMetric PM-1200N-1 Imaging Photometer		
Photometer Working Distance: 3m		Measurement Geometry: Near-Field
Comments:		
Reference Photometer Used: Specbos1211		Reference Photometer Serial Number: 2014754
Traceable: to NIST standards		Calibration Certificate Number: 2129 WK-L 2014-02
Calibration Certificate Date: 13 February 2014		Sample Stabilisation Time (minutes): 60
Reference Photometer Calibration Uncertainty: ± 2.4% (k=2, 20-200 lux, CIE illuminant A source)		
Scan Set Up		
Direction	**Range**	**Increment**
Inclination Zone 1	0-90°	3°
Aziuth	0-360°	10°
Results		
Integrated Luminous Flux (lumens):240.7	Peak Intensity (3° Spot, candelas): 681.2	Efficacy (lumens/Watt): 44.7
Beam Angle (50% of max intensity C0-180, degrees): 31.1		
Photometric Filename (IES LM-63-2002): HANDRAIL		
IES File – Absolute or Relative Format? ABSOLUTE		
Photometric Filename (EULUMDAT): HANDRAIL		
EULUMDAT File – Absolute or Relative Format? ABSOLUTE		

FIGURE 3: ILLUMINANCE 1100mm BELOW DEVICE

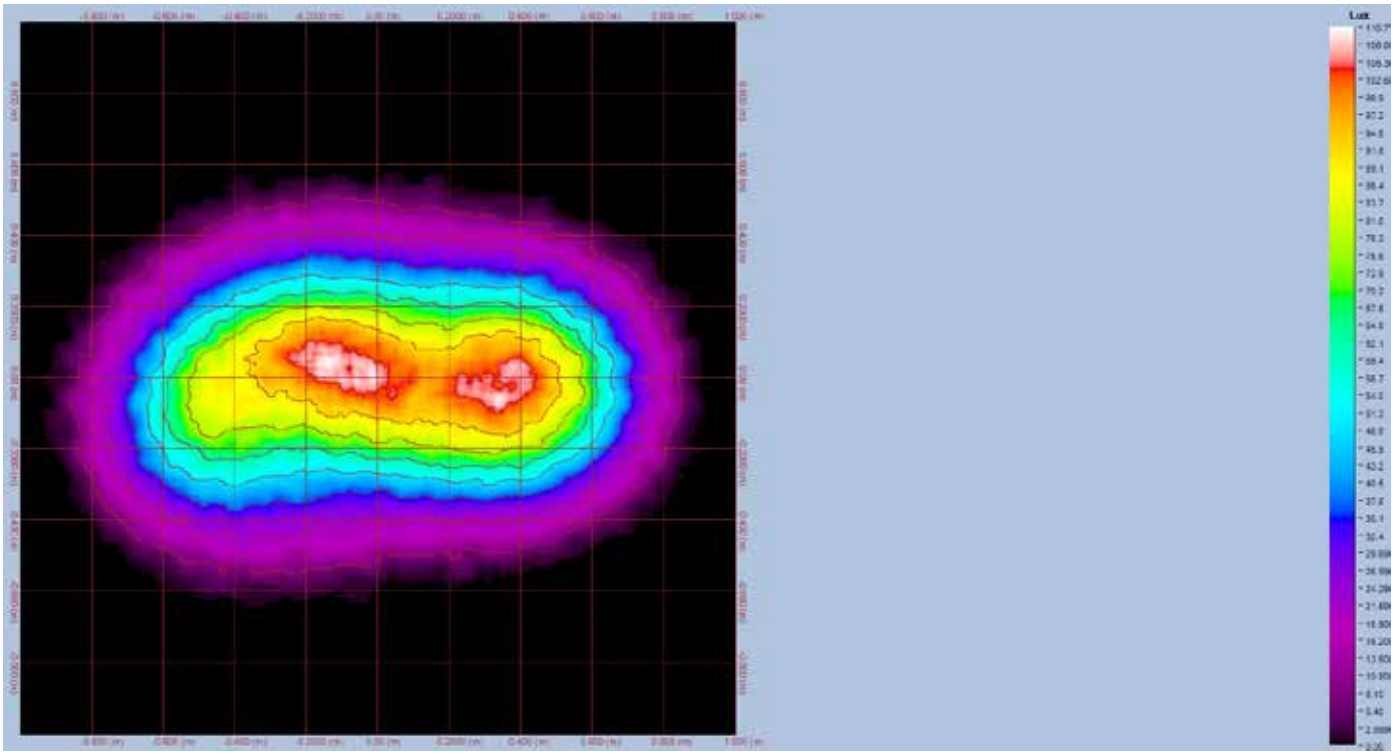


FIGURE 4: FAR-FIELD LUMINOUS INTENSITY (C0-180, CARTESIAN COORDINATES)

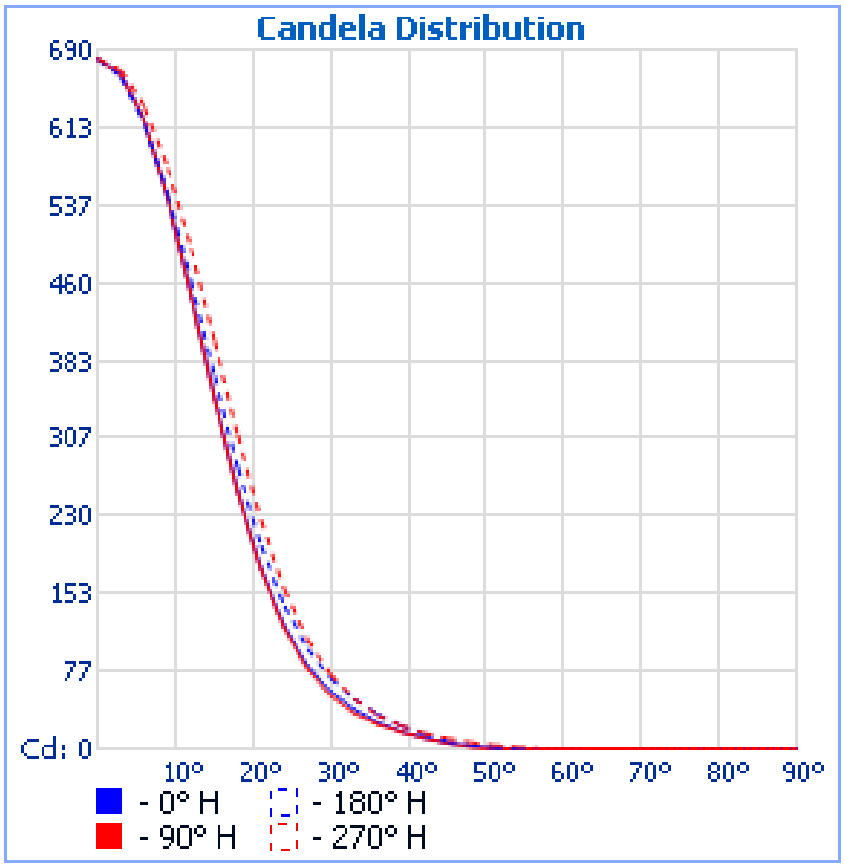
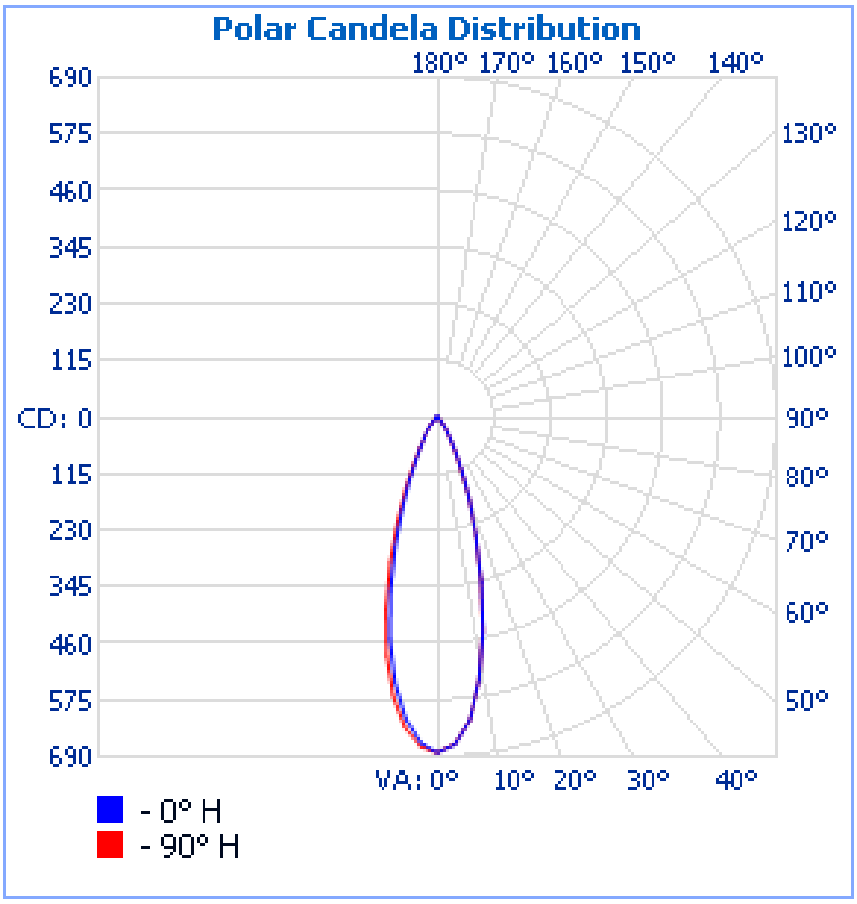


FIGURE 5: FAR-FIELD LUMINOUS INTENSITY (C0-180, C90-270, POLAR COORDINATES)



PHOTOMETRIC TEST REPORT

FIGURE 6. CONE DIAGRAM FOR MOUNTING HEIGHT OF 6 METRES

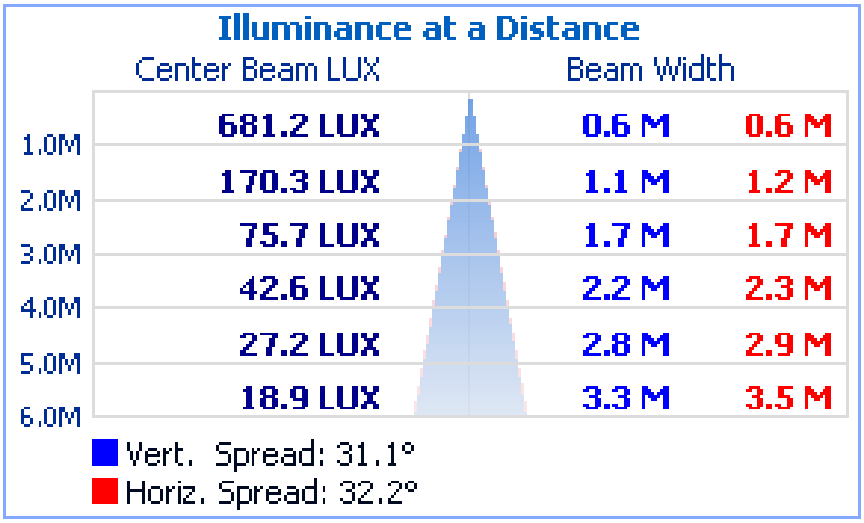


TABLE 1. UGR VALUES

Reflectance of											
Ceiling		0.7	0.7	0.5	0.5	0.3	0.7	0.7	0.5	0.5	0.3
Wall		0.5	0.3	0.5	0.3	0.3	0.5	0.3	0.5	0.3	0.3
Floor Cavity		0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Room Dimension		View Endwise (C0)					View Crosswise (C90)				
x	y										
2H	2H	22.7	24.3	23.0	24.6	25.0	22.7	24.4	23.1	24.7	25.0
	3H	24.3	25.8	24.7	26.1	26.5	24.4	25.9	24.7	26.2	26.5
	4H	25.0	26.4	25.4	26.7	27.1	25.0	26.4	25.4	26.7	27.1
	6H	25.5	26.8	25.9	27.2	27.6	25.3	26.6	25.7	27.0	27.4
	8H	25.7	26.9	26.1	27.3	27.7	25.3	26.6	25.7	26.9	27.3
	12H	25.8	27.0	26.2	27.4	27.8	25.3	26.5	25.7	26.9	27.3
4H	2H	23.5	24.9	23.8	25.2	25.6	23.5	24.9	23.9	25.2	25.6
	3H	25.2	26.4	25.6	26.8	27.2	25.3	26.5	25.7	26.9	27.3
	4H	26.1	27.1	26.5	27.5	28.0	26.1	27.1	26.5	27.5	28.0
	6H	26.7	27.6	27.1	28.0	28.5	26.4	27.4	26.9	27.8	28.2
	8H	26.9	27.8	27.4	28.2	28.7	26.5	27.4	26.9	27.8	28.3
	12H	27.1	27.9	27.5	28.3	28.8	26.5	27.3	27.0	27.7	28.2
8H	4H	26.4	27.3	26.8	27.7	28.2	26.3	27.2	26.8	27.7	28.1
	6H	27.1	27.8	27.6	28.3	28.8	26.8	27.5	27.2	28.0	28.5
	8H	27.5	28.1	28.0	28.6	29.1	26.9	27.5	27.4	28.0	28.5
	12H	27.7	28.3	28.2	28.8	29.3	26.9	27.5	27.4	28.0	28.5
12H	4H	26.4	27.2	26.9	27.7	28.2	26.4	27.2	26.8	27.6	28.1
	6H	27.2	27.9	27.7	28.4	28.8	26.9	27.5	27.4	28.0	28.5
	8H	27.5	28.1	28.1	28.6	29.1	26.9	27.5	27.5	28.0	28.5

Distance between luminaires: 0.25
Due to missing symmetry characteristics the values apply only to the indicated line of sight.

TABLE 2A. LUMINOUS INTENSITY VALUES, AZIMUTH 0-180°

	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
0	681	681	681	681	681	681	681	681	681	681	681	681	681	681	681	681	681	681	681
3	667	666	665	667	666	666	666	666	666	665	664	664	663	662	661	663	660	662	663
6	619	617	623	624	622	621	622	621	620	619	618	617	616	613	615	617	617	614	617
9	542	539	544	539	542	543	543	544	544	542	542	540	538	537	537	537	544	542	548
12	447	444	443	446	455	452	450	446	446	446	446	445	449	451	456	451	453	457	463
15	347	342	349	348	348	351	347	348	344	346	344	349	350	355	355	359	363	361	369
18	254	258	253	258	252	255	253	254	256	253	257	256	257	261	261	270	268	278	278
21	178	181	181	183	180	178	179	181	179	177	180	183	183	184	190	195	195	199	201
24	121	122	123	119	121	123	119	122	120	119	121	124	124	127	130	129	136	139	142
27	82	83	81	81	82	81	80	79	79	79	80	82	85	87	90	90	91	97	99
30	57	56	55	56	54	53	53	53	53	53	54	56	58	58	61	62	63	67	70
33	40	38	37	39	37	36	36	35	35	36	37	38	40	41	43	44	44	46	50
36	27	27	25	26	25	25	25	24	24	25	26	27	28	29	30	31	31	32	35
39	18	17	18	18	17	17	17	17	17	17	18	19	20	20	20	20	22	21	23
42	11	11	11	11	11	11	11	11	11	11	12	13	13	13	13	13	13	13	15
45	6	5	6	7	6	7	7	6	6	6	7	8	8	8	7	7	6	7	8
48	3	3	3	3	3	3	3	3	3	2	3	4	4	3	3	3	3	3	4
51	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	2
54	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
69	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
72	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
87	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PHOTOMETRIC TEST REPORT

TABLE 2B. LUMINOUS INTENSITY VALUES, AZIMUTH 190-350°

	190	200	210	220	230	240	250	260	270	280	290	300	310	320	330	340	350
0	681	681	681	681	681	681	681	681	681	681	681	681	681	681	681	681	681
3	663	663	666	665	667	668	669	670	670	670	670	669	668	667	668	665	666
6	616	623	625	626	626	630	632	633	634	633	632	630	626	626	626	624	618
9	546	553	550	555	560	565	570	573	574	572	569	563	556	550	544	547	540
12	462	464	469	481	484	487	490	493	494	491	486	481	475	470	456	449	446
15	368	377	381	386	394	396	402	401	403	398	396	387	382	369	361	356	345
18	287	285	294	294	302	305	310	314	310	309	303	295	287	275	272	260	261
21	208	211	217	219	220	225	232	230	226	226	225	217	208	201	196	187	183
24	146	149	148	155	157	157	162	160	158	158	157	150	145	138	130	130	126
27	102	102	105	110	112	111	110	109	108	107	105	102	99	95	89	87	86
30	71	72	75	77	77	77	76	75	74	72	71	68	65	64	61	59	59
33	50	51	54	56	55	53	52	50	50	49	46	46	44	44	43	41	40
36	35	37	40	39	39	37	36	35	34	33	32	32	31	30	29	28	27
39	23	26	27	27	28	26	26	24	23	23	23	22	21	20	19	19	18
42	15	17	18	19	20	19	18	17	16	15	15	15	15	14	12	12	11
45	8	9	11	12	13	13	12	12	11	10	10	8	9	8	8	6	6
48	4	4	5	7	8	8	8	8	7	6	6	5	5	5	4	4	4
51	2	1	2	3	4	5	5	5	4	3	3	3	3	2	2	2	2
54	1	1	1	1	1	1	2	2	2	2	1	1	1	1	1	1	0
57	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
69	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
72	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
87	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

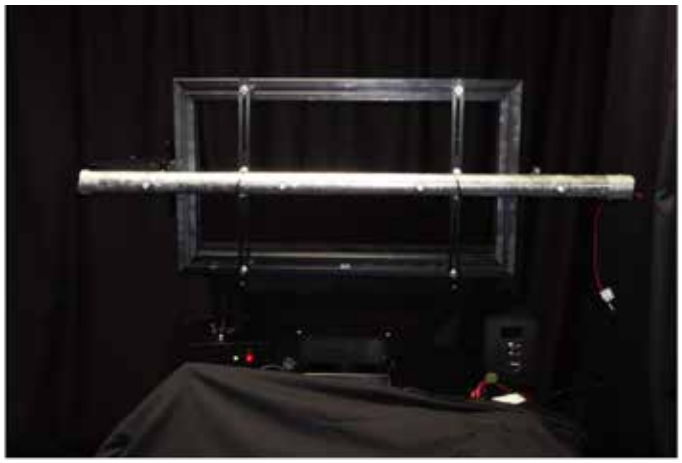
TABLE 3. ZONAL FLUX TABLE

Zone	Lumens	% Total
0-5	15.8	6.5%
5-10	41.3	16.9%
10-15	51.9	21.3%
15-20	48.0	19.7%
20-25	34.6	14.2%
25-30	22.2	9.1%
30-35	14.1	5.8%
35-40	8.5	3.5%
40-45	4.7	1.9%
45-50	2.1	0.9%
50-55	0.5	0.2%
55-60	0.1	0.0%
60-65	0.0	0.0%
65-70	0.0	0.0%
70-75	0.0	0.0%
75-80	0.0	0.0%
80-85	0.0	0.0%
85-90	0.0	0.0%

TABLE 4. UTILISATION FACTOR TABLE

Effective Floor Cavity Reflectance: 20%																		
RCC %:	**80**				**70**				**50**			**30**			**10**			**0**
RW %:	**70**	**50**	**30**	**0**	**70**	**50**	**30**	**0**	**50**	**30**	**20**	**50**	**30**	**20**	**50**	**30**	**20**	**0**
RCR: 0	1.19	1.19	1.19	1.19	1.16	1.16	1.16	1.00	1.11	1.11	1.11	1.06	1.06	1.06	1.02	1.02	1.02	1.00
1	1.14	1.12	1.10	1.08	1.12	1.10	1.08	0.96	1.06	1.04	1.03	1.02	1.01	1.00	0.99	0.98	0.97	0.95
2	1.10	1.06	1.03	1.00	1.08	1.04	1.01	0.92	1.01	0.99	0.97	0.98	0.96	0.94	0.96	0.94	0.93	0.91
3	1.06	1.00	0.96	0.93	1.04	0.99	0.95	0.88	0.97	0.93	0.91	0.94	0.92	0.90	0.92	0.90	0.88	0.87
4	1.02	0.96	0.91	0.88	1.00	0.94	0.90	0.84	0.92	0.89	0.86	0.91	0.88	0.85	0.89	0.86	0.84	0.83
5	0.98	0.91	0.86	0.83	0.96	0.90	0.86	0.80	0.89	0.85	0.82	0.87	0.84	0.81	0.86	0.83	0.80	0.79
6	0.94	0.87	0.82	0.79	0.93	0.86	0.82	0.77	0.85	0.81	0.78	0.84	0.80	0.77	0.82	0.79	0.77	0.76
7	0.91	0.83	0.79	0.75	0.90	0.83	0.78	0.74	0.82	0.78	0.75	0.81	0.77	0.74	0.79	0.76	0.74	0.73
8	0.88	0.80	0.75	0.72	0.87	0.79	0.75	0.71	0.78	0.74	0.71	0.78	0.74	0.71	0.77	0.73	0.71	0.70
9	0.85	0.77	0.72	0.69	0.84	0.76	0.72	0.68	0.76	0.71	0.69	0.75	0.71	0.68	0.74	0.71	0.68	0.67
10	0.82	0.74	0.69	0.66	0.81	0.74	0.69	0.66	0.73	0.69	0.66	0.72	0.68	0.66	0.72	0.68	0.66	0.65

PHOTO 1: LUMINAIRE ON GONIOMETER MOUNT



Signature:

Print Name:

D CHAMBERS

Date:

16/07/2015

Test Engineer

Duly authorised to sign on behalf of:
Photometric and Optical Testing Services LLP

Checked By:

Signature:

Print Name:

G John

Date:

28/07/2015

Technical Director

Duly authorised to sign on behalf of:
Photometric and Optical Testing Services LLP