



Les Industries Spectralux Inc. Spectralux Industries Inc.

2750 Sabourin, Saint-Laurent (Quebec) H4S 1M2 Canada
Tel.: (514) 332-0082 Fax: (514) 332-3590 www.spectralux.ca

ISO/IEC 17025



NVLAP LAB CODE: 200899-0

Moving Mirror Goniophotometer Test Report

Standard(s): , IESNA LM-35-02, IES LM-79-08, ANSI C82.77-2002

Customer Lumenpulse, 1751 Richardson, suite 1505, Montréal, Québec, Canada, H3K 1G6

General Information		SSL Details	Driver Details	
Test Report	S1607065-R1	Description	72W White 4000K SSL	Type Commercial
Test Date	6 July 2016	Serial Number	SRIS 2436	Description 71SSL-CY1101
Report Date	8 July 2016	Photometric Method	Absolute	Manufacturer Mean Well
Ambient	26.2 °C	Lamp Lumens	-1	Catalog No. LPF-60-24
Humidity	38.1 %	Test Position	Axial	Voltage Tap 120.00 V
Lamp Type	SSL	Comments	Clusters of CREE XPE2 LED's	Power Factor 0.9900

Floodlight Data

General Information		Optics	Aperture (feet)	
Manufacturer	Lumenpulse	Reflector	48 Collimators Acrylic	X 4.0000
Name	LUMENFACADE	Housing	Extruded Aluminum	Y 0.1667
Catalog No.	LOG-HO-120-48-40K- 15x25-SI-NO	Lens	Glass/Polycarbonate	Z 0.0000

Lamp Stabilization Time: 55 minutes

Tested By : Ycf[Y< YXfY].....

Approved Signatory: Chrisnel Blot

Signature:



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Luminaire Test Method

Precise installation and alignment of the luminaire to the rotation axis of the photometer is governed by a servomotor controlled via a microcontroller. A laser is used to validate the luminaire positioning. Before photometric measurements are taken, luminaire is operated long enough to reach stabilization and temperature equilibrium.

All movement commands issued to the photometer axes are mediated by the software to ensure the motion is within the limits of operation. The photometric detector used is a silicon detector corrected to closely match the spectral luminous efficiency photopic curve with a quality index less than 1.5%. Proper shielding is incorporated to the photometric test bench such that only the light from the unit under test is measured.

Luminous intensity measurements are performed at a distance great enough so that the inverse-square law applies. During each measurement the computer records the luminous intensity associated to the corresponding angles of radiation, as well as input electrical operational parameters and temperature measurements. Candela values are reported in IES format as per LM-63.

Equipment, reference standards are traceable to National Institute of Standards and Technology (NIST) and National Research Council of Canada (NRC).





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Electrical Equipment

Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
Power Supply	iRDC	CIF-3000A	974997	N.P.C.R.	N.P.C.R.
Input Power Meter	Yokogawa	WT210	91L236539	2016/05/05	2017/05/05
Output Power Meter	N/A	N/A	N/A	N.P.C.R.	N.P.C.R.

Photometric Equipment

Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
Photometer	N/A	N/A	N/A	N.P.C.R.	N.P.C.R.
Photodetector	INPHORA	IPR-PDET 19	110802	2015/10/05	2016/10/05

Environment Equipment

Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
Temperature Humidity Sensor	Omega	HH311	051202970	2014/10/24	2016/10/24



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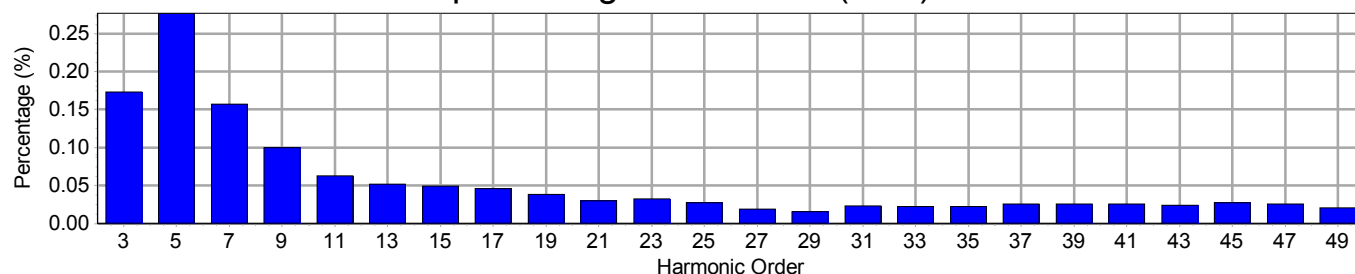
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Electrical Measurements

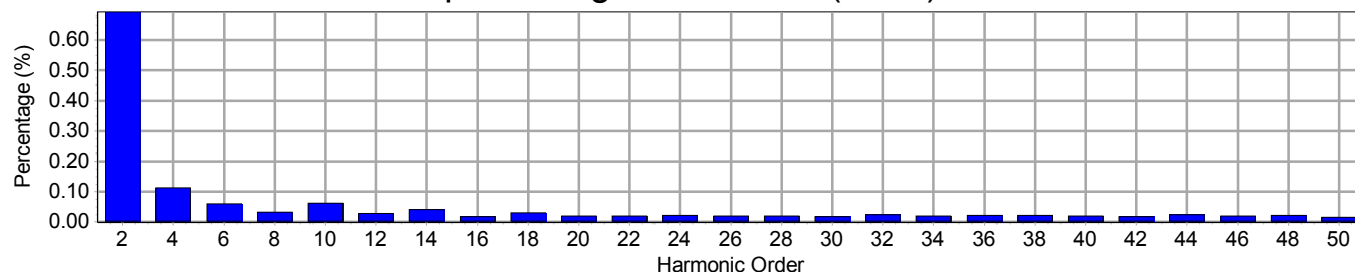
Input

Frequency	60 Hz	Active Power	61.81 W	THDV [ANSI]	0.82 %
Voltage	120.1 V(rms)	Apparent Power	62.25 VA	THDA [ANSI]	4.67 %
Current	0.5185 A(rms)	Power Factor	0.993	Max. Harmonic At	5th order

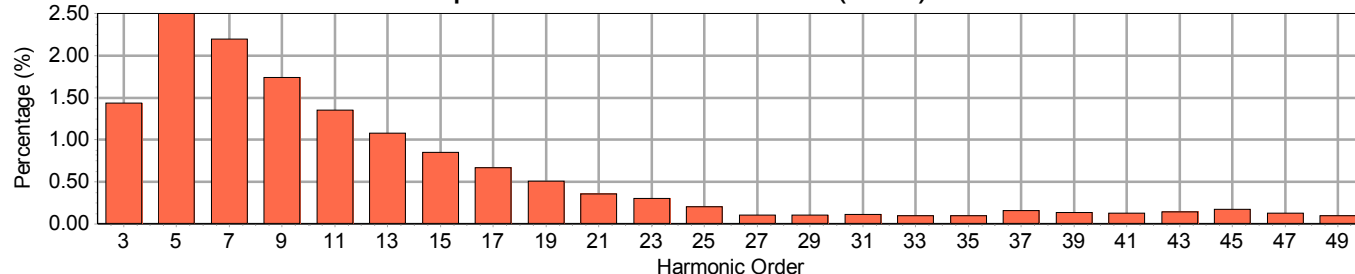
Input Voltage Harmonics (Odd)



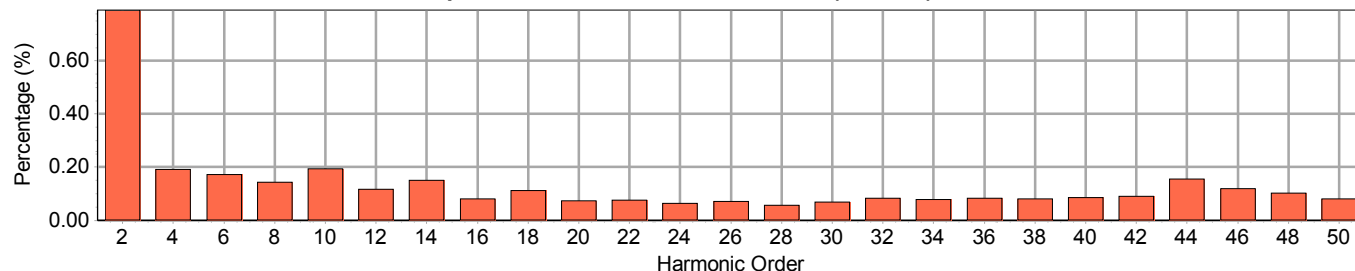
Input Voltage Harmonics (Even)



Input Current Harmonics (Odd)



Input Current Harmonics (Even)





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Harmonic Measurements

Odd Harmonics				Even Harmonics			
Harmonic Order	Frequency (HZ)	Voltage Harmonics (%)	Current Harmonics (%)	Harmonic Order	Frequency (HZ)	Voltage Harmonics (%)	Current Harmonics (%)
1	60	100.000	100.000	2	120	0.693	0.791
3	180	0.173	1.435	4	240	0.114	0.190
5	300	0.277	2.507	6	360	0.059	0.172
7	420	0.157	2.198	8	480	0.032	0.143
9	540	0.100	1.737	10	600	0.062	0.195
11	660	0.063	1.350	12	720	0.027	0.116
13	780	0.052	1.078	14	840	0.041	0.151
15	900	0.049	0.846	16	960	0.018	0.079
17	1020	0.046	0.667	18	1080	0.031	0.111
19	1140	0.039	0.509	20	1200	0.019	0.073
21	1260	0.030	0.356	22	1320	0.021	0.077
23	1380	0.032	0.302	24	1440	0.021	0.064
25	1500	0.028	0.198	26	1560	0.020	0.071
27	1620	0.019	0.101	28	1680	0.020	0.056
29	1740	0.016	0.103	30	1800	0.018	0.069
31	1860	0.023	0.113	32	1920	0.023	0.083
33	1980	0.023	0.096	34	2040	0.020	0.077
35	2100	0.022	0.097	36	2160	0.022	0.083
37	2220	0.025	0.160	38	2280	0.022	0.081
39	2340	0.026	0.134	40	2400	0.019	0.085
41	2460	0.026	0.125	42	2520	0.018	0.091
43	2580	0.024	0.139	44	2640	0.024	0.155
45	2700	0.027	0.168	46	2760	0.020	0.118
47	2820	0.025	0.128	48	2880	0.022	0.103
49	2940	0.021	0.094	50	3000	0.016	0.082



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Photometric Report: S1607065-R1

Prepared for: Lumenpulse · Test Date: 06 July 2016

Floodlight: LUMENFACADE · Lumcat: LOG-HO-120-48-40K-15x25-SI-NO

Photometric Floodlight Characteristics

Nominal SSL Power	72.00 W	
Measured Input Voltage	120.06 V	Notes
Test SSL Current	0.300 A	1) Floodlight tested in accordance to IES LM-35-1989 at a distance great enough so that the inverse-square law applies.
Floodlight Luminous Flux	3880	
Measured Input Power	61.81 W	
Floodlight Luminous Efficacy	62.8 lm/W	2) Field performance may differ from laboratory measurements.
Maximum Candela Value	24730	
Maximum Candela Location	0.0 H, -1.5 V	3) Results are valid for the tested material only.
Horizontal Beam Angle (50%)	25.0 °	
Vertical Beam Angle (50%)	16.5 °	4) All data published in this report are based on absolute photometry.
Horizontal Field Angle (10%)	47.0 °	
Vertical Field Angle (10%)	31.5 °	5) The original electronic file or paper report cannot be edited in whole or in part without written consent of Spectralux Industries Inc.
IES/NEMA Type Classification	4Hx3V	
Beam Lumens (50%)	1728	
Beam Efficiency (50%)	N/A	
Field Lumens (10%)	3213	
Field Efficiency (10%)	N/A	
Spill Lumens	667	
Total Floodlight Lumens	3880	
Total Floodlight Efficiency	N/A	



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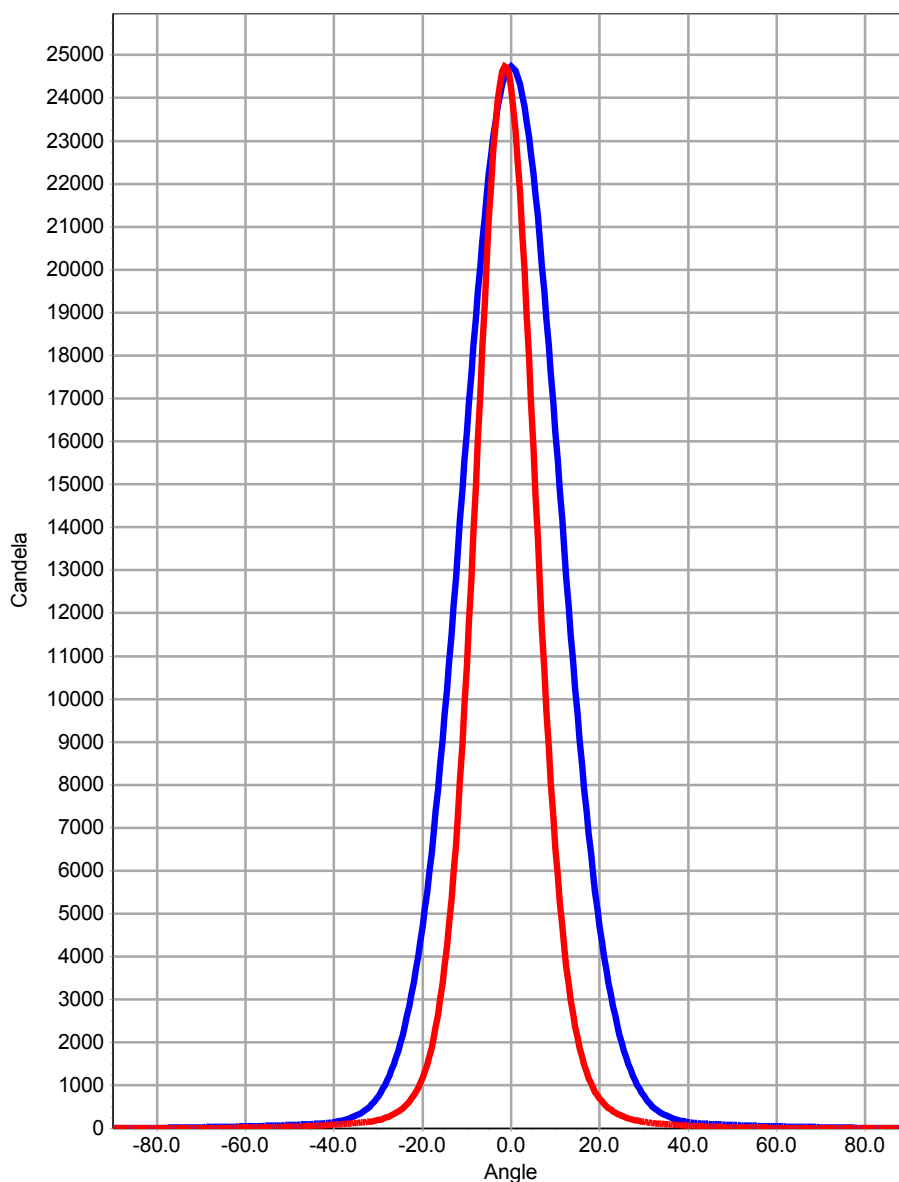
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Floodlight: LUMENFACADE · Lumcat: LOG-HO-120-48-40K-15x25-SI-NO

Maximum Candela Trace (Max. Location: 0.0 H, -1.5 V)

Horizontal Angles	Candela
-90.0	6
-85.0	7
-80.0	12
-75.0	19
-70.0	28
-65.0	38
-60.0	49
-55.0	62
-50.0	80
-45.0	103
-40.0	146
-35.0	299
-30.0	746
-25.0	1993
-20.0	4714
-15.0	9629
-10.0	16229
-5.0	22240
0.0	24730
5.0	22240
10.0	16229
15.0	9629
20.0	4714
25.0	1993
30.0	746
35.0	299
40.0	146
45.0	103
50.0	80
55.0	62
60.0	49
65.0	38
70.0	28
75.0	19
80.0	12
85.0	7
90.0	6



Vertical Angles	Candela
-90.0	3
-85.0	3
-80.0	4
-75.0	7
-70.0	10
-65.0	13
-60.0	18
-55.0	24
-50.0	34
-45.0	54
-40.0	87
-35.0	127
-30.0	194
-25.0	430
-20.0	1182
-15.0	3791
-10.0	10789
-5.0	21167
0.0	24235
5.0	15839
10.0	6542
15.0	2106
20.0	694
25.0	292
30.0	150
35.0	98
40.0	65
45.0	40
50.0	26
55.0	18
60.0	13
65.0	9
70.0	7
75.0	5
80.0	3
85.0	2
90.0	2



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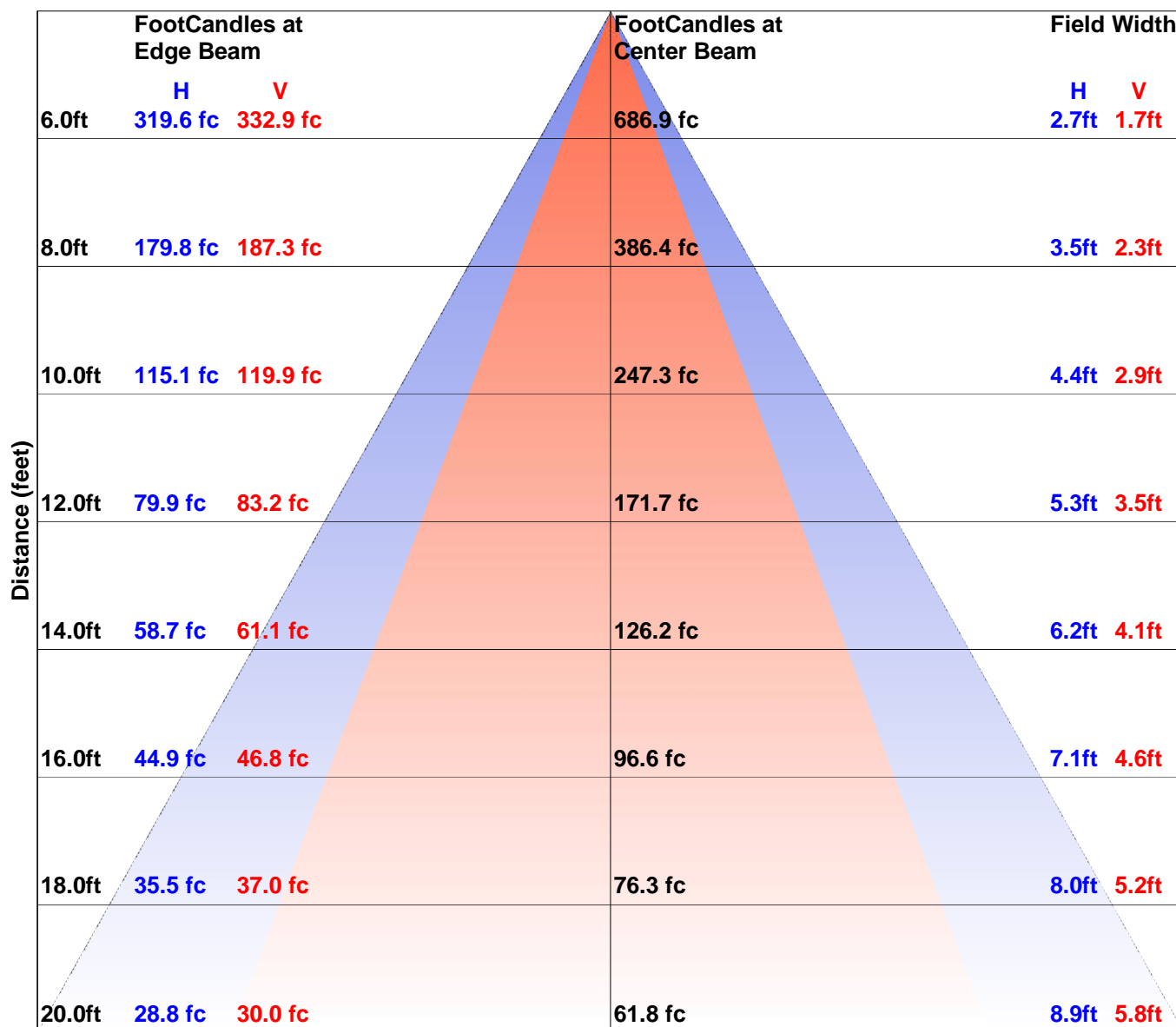
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Floodlight: LUMENFACADE · Lumcat: LOG-HO-120-48-40K-15x25-SI-NO

Downlight Beam



Horizontal (25.0 °) Vertical (16.5 °)



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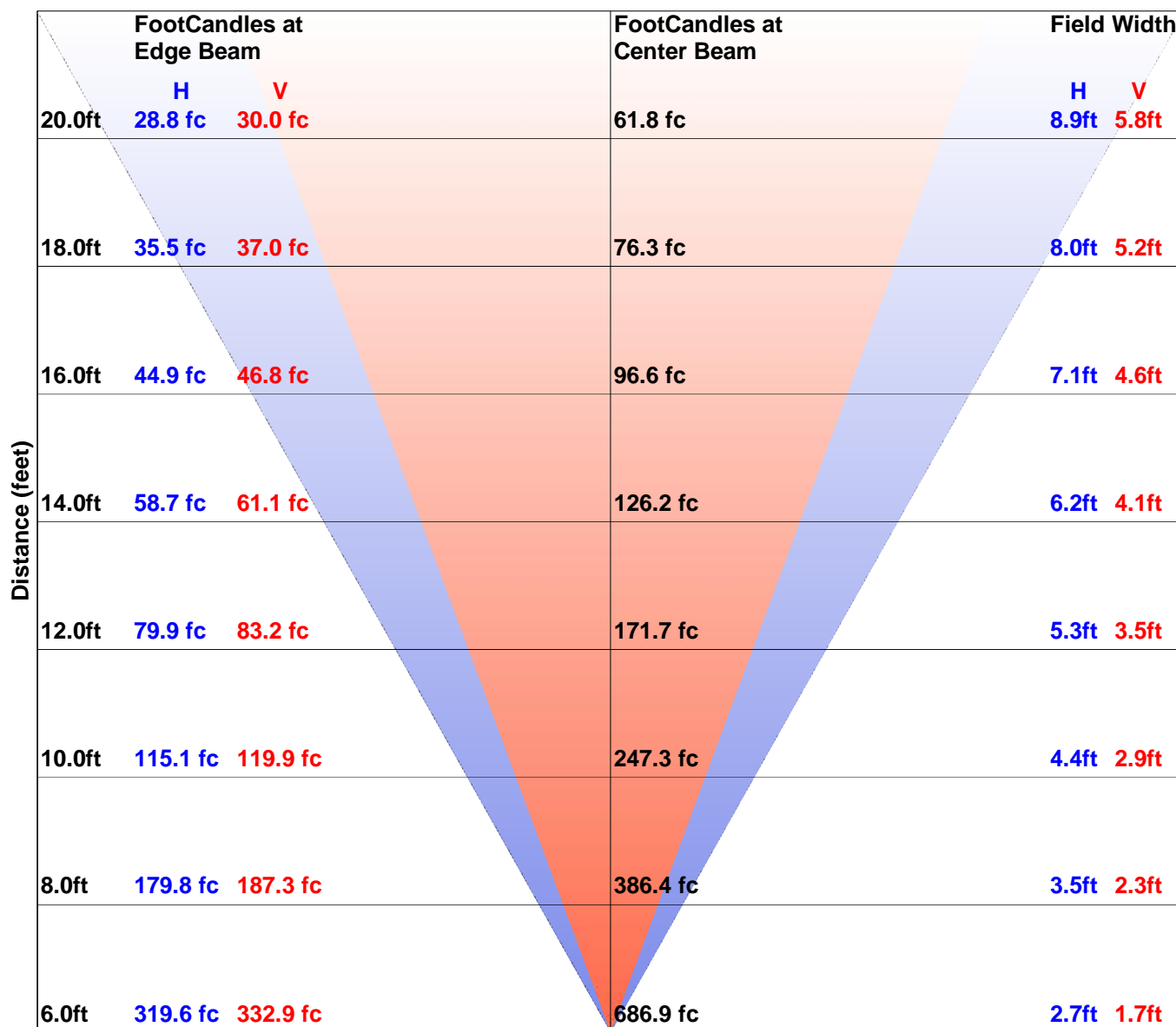
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Prepared for: Lumenpulse · Test Date: 06 July 2016

Floodlight: LUMENFACADE · Lumcat: LOG-HO-120-48-40K-15x25-SI-NO

Uplight Beam



— Horizontal (25.0 °) — Vertical (16.5 °)



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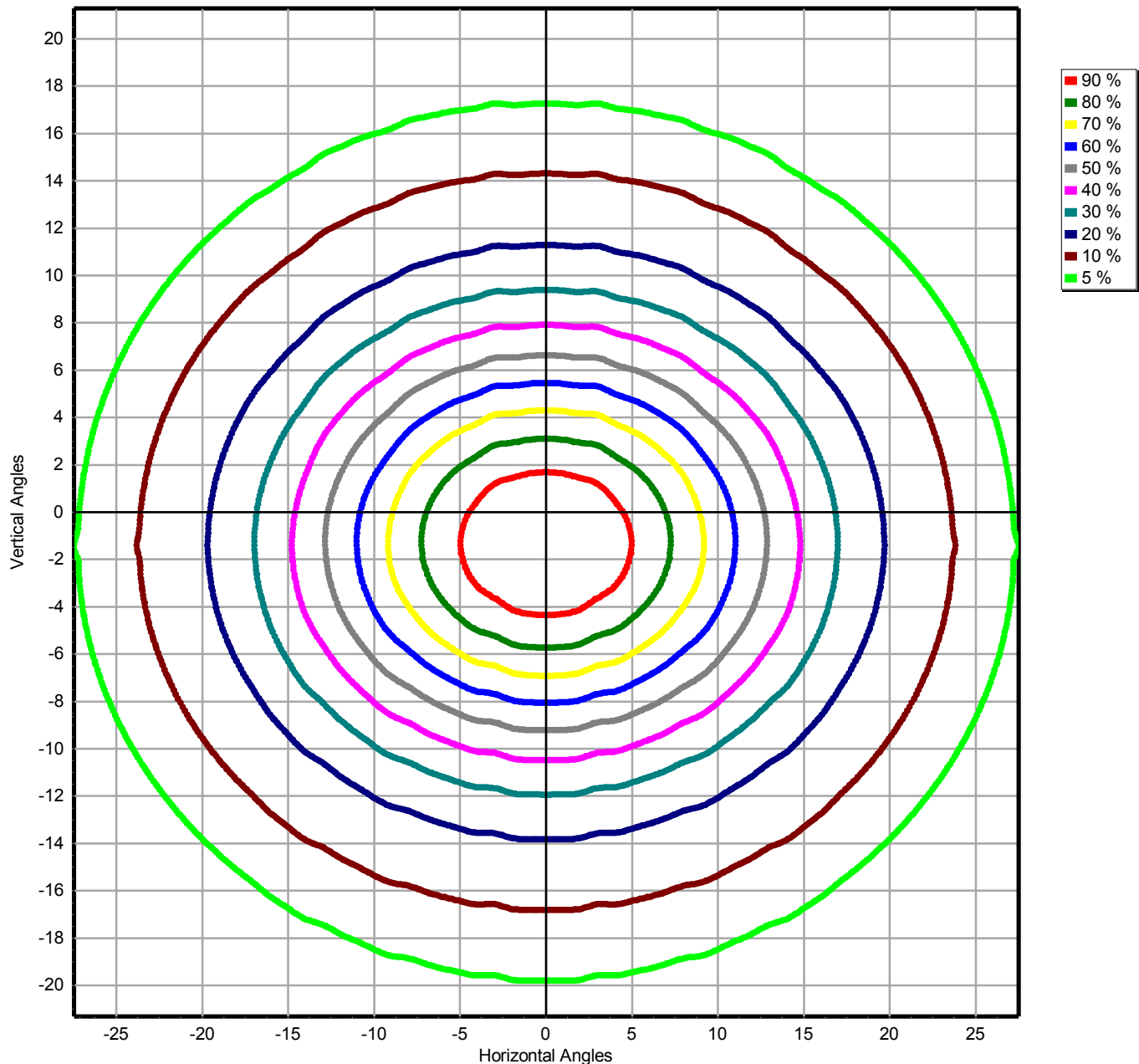
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Floodlight: LUMENFACADE · Lumcat: LOG-HO-120-48-40K-15x25-SI-NO

ISO Candela Diagram





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IES File Headers

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IESNA:LM-63-2002
[ISSUEDATE]      06 July 2016
[TESTLAB]        Spectra Lux Industries Inc.
[TEST]           S1607065-R1
[MANUFAC]        Lumenpulse
[LUMCAT]          LOG-HO-120-48-40K-15x25-SI-NO
[LUMINAIRE]       LUMENFACADE
[LAMP]           Clusters of CREE XPE2 LED's - 72W SSL c/w Mean Well Driver LPF-60-24 @ 120.00V
[_BURNING]        Axial (3,880 Luminaire Lumens)
[_REFLECTOR]      48 Collimators Acrylic
[_LENS]           Glass/Polycarbonate
[_HOUSING]        Extruded Aluminum
[DISTRIBUTION]    NEMA 4Hx3V (Max. CP at 0.0H,-1.5V)
[MORE]           (Based on IES LM-35-1989)
```

Candela Table

Horizontal Angles

	0.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0
V e r t i c a l	-90.0	3	3	3	3	3	3	3	3
	-85.0	3	3	2	3	3	3	2	2
	-75.0	7	7	6	7	7	6	7	6
	-65.0	13	13	13	13	13	13	12	13
	-55.0	24	24	25	24	23	24	24	24
	-45.0	54	54	54	54	53	53	52	52
	-35.0	127	127	127	125	124	123	121	119
	-25.0	430	430	428	415	417	408	388	375
	-20.0	1182	1180	1172	1124	1127	1094	1015	966
	-15.0	3791	3787	3743	3577	3573	3444	3141	2957
	-12.5	6606	6593	6515	6235	6202	5968	5411	5081
	-12.0	7332	7319	7231	6922	6880	6619	6319	5996
	-11.5	8117	8101	8003	7666	7614	7322	6988	6628
	-11.0	8955	8938	8827	8461	8396	8071	7701	7303
	-10.5	9852	9830	9707	9311	9230	8871	8463	8022
	-10.0	10789	10766	10631	10205	10107	9712	9261	8776
	-9.5	11780	11753	11603	11146	11027	10597	10103	9573
	-9.0	12803	12774	12610	12126	11983	11513	10976	10397
A n g l e s	-8.5	13866	13833	13657	13139	12972	12464	11882	11252
	-8.0	14946	14907	14716	14176	13979	13430	12801	12120
	-7.5	16043	15999	15794	15222	14999	14409	13732	13000
	-7.0	17126	17077	16856	16268	16008	15380	14657	13875
	-6.5	18198	18144	17910	17300	17008	16340	15574	14738
	-6.0	19239	19179	18932	18312	17976	17273	16466	15581
	-5.5	20233	20170	19910	19275	18903	18163	17315	16385
	-5.0	21167	21095	20824	20190	19772	19004	18116	17143
	-4.5	22013	21938	21654	21021	20565	19766	18846	17832
	-4.0	22773	22691	22399	21773	21272	20450	19499	18451
	-3.5	23415	23330	23031	22414	21873	21034	20059	18981
	-3.0	23950	23858	23553	22953	22370	21516	20524	19420
	-2.5	24345	24252	23942	23365	22742	21879	20875	19753
	-2.0	24611	24513	24199	23645	22990	22123	21115	19979
	-1.5	24730	24628	24317	23791	23101	22240	21231	20091
	-1.0	24707	24601	24294	23800	23083	22227	21226	20088
	-0.5	24540	24435	24132	23671	22931	22090	21099	19972



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Horizontal Angles

	0.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	
V e r t i c a l	0.0	24235	24128	23830	23406	22650	21826	20855	19742	18555
	0.5	23797	23689	23398	23009	22245	21441	20496	19406	18247
	1.0	23237	23129	22847	22499	21727	20949	20031	18971	17846
	1.5	22560	22454	22184	21874	21099	20353	19472	18441	17358
	2.0	21792	21685	21427	21155	20384	19670	18827	17834	16793
	2.5	20930	20827	20580	20346	19584	18906	18103	17155	16160
	3.0	19997	19897	19663	19465	18718	18078	17316	16414	15471
	3.5	18999	18900	18681	18517	17790	17191	16472	15617	14728
	4.0	17971	17874	17669	17533	16829	16272	15599	14794	13960
	4.5	16910	16814	16622	16516	15841	15320	14694	13939	13162
	5.0	15839	15746	15570	15488	14840	14361	13781	13078	12355
	5.5	14764	14674	14510	14451	13838	13395	12861	12210	11542
	6.0	13700	13614	13466	13426	12846	12442	11951	11351	10738
	6.5	12651	12573	12436	12416	11871	11503	11054	10504	9944
	7.0	11640	11569	11445	11437	10928	10594	10186	9683	9173
	7.5	10666	10599	10485	10492	10018	9717	9348	8891	8427
	8.0	9740	9679	9575	9590	9153	8882	8546	8134	7715
	8.5	8860	8802	8708	8732	8331	8088	7786	7415	7039
	9.0	8032	7979	7897	7923	7557	7341	7068	6738	6399
	9.5	7260	7211	7137	7170	6835	6642	6400	6104	5803
A n g l e s	10.0	6542	6500	6435	6467	6165	5994	5776	5513	5245
	10.5	5882	5844	5786	5822	5546	5395	5203	4970	4732
	11.0	5276	5242	5190	5225	4980	4844	4674	4469	4258
	11.5	4725	4693	4649	4683	4464	4344	4193	4012	3827
	12.0	4219	4192	4152	4185	3990	3885	3752	3593	3431
	12.5	3766	3742	3708	3740	3564	3473	3355	3216	3073
	15.0	2106	2092	2075	2097	2003	1957	1898	1826	1753
	20.0	694	689	685	694	668	657	642	624	607
	25.0	292	291	290	293	284	282	279	273	269
	35.0	98	98	98	99	97	96	96	95	95
	45.0	40	40	40	40	40	39	39	39	40
	55.0	18	18	17	18	18	17	17	17	17
	65.0	9	9	9	9	8	9	9	9	9
	75.0	5	4	5	4	4	5	4	5	5
	85.0	2	2	2	2	1	2	1	2	1
	90.0	2	2	2	2	2	2	2	2	2



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Horizontal Angles

	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
V e r t i c a l	-90.0	3	3	3	3	3	3	3	3
	-85.0	2	3	2	3	3	3	3	3
	-75.0	7	6	5	7	6	6	6	7
	-65.0	13	12	12	13	13	12	11	12
	-55.0	24	24	23	23	23	22	22	22
	-45.0	52	52	51	50	51	49	48	47
	-35.0	119	117	115	113	111	110	108	103
	-25.0	371	357	341	328	313	306	290	260
	-20.0	946	895	838	788	734	705	650	549
	-15.0	2862	2671	2458	2274	2076	1956	1765	1411
	-12.5	4885	4537	4155	3820	3464	3232	2892	2268
	-12.0	5405	5015	4589	4216	3818	3556	3178	2484
	-11.5	5963	5530	5059	4642	4199	3901	3483	2714
	-11.0	6558	6077	5557	5095	4603	4269	3808	2959
	-10.5	7192	6661	6088	5577	5034	4659	4152	3217
	-10.0	7854	7272	6643	6082	5487	5067	4509	3488
	-9.5	8553	7914	7227	6613	5960	5494	4886	3771
	-9.0	9275	8578	7832	7163	6450	5934	5272	4062
	-8.5	10020	9266	8459	7731	6958	6388	5673	4363
	-8.0	10777	9962	9094	8306	7474	6846	6075	4667
A n g l e s	-7.5	11545	10668	9737	8887	7994	7307	6484	4974
	-7.0	12301	11364	10373	9462	8510	7763	6884	5276
	-6.5	13049	12053	11003	10031	9018	8212	7280	5574
	-6.0	13774	12719	11615	10584	9513	8645	7660	5864
	-5.5	14465	13356	12197	11111	9985	9056	8023	6139
	-5.0	15114	13955	12746	11604	10429	9440	8362	6396
	-4.5	15698	14496	13243	12053	10834	9786	8669	6629
	-4.0	16224	14980	13692	12455	11197	10093	8942	6836
	-3.5	16669	15391	14074	12798	11506	10353	9172	7015
	-3.0	17034	15730	14389	13080	11762	10566	9360	7161
	-2.5	17307	15985	14629	13292	11957	10721	9500	7271
	-2.0	17487	16152	14789	13435	12091	10822	9590	7346
	-1.5	17567	16229	14867	13503	12157	10862	9629	7384
	-1.0	17549	16215	14861	13496	12158	10843	9616	7379
	-0.5	17433	16110	14774	13415	12092	10768	9552	7336
	0.0	17218	15916	14605	13262	11959	10634	9437	7256
	0.5	16912	15638	14357	13039	11764	10447	9274	7142
	1.0	16523	15284	14040	12753	11513	10210	9068	6992
	1.5	16054	14855	13654	12406	11206	9925	8821	6811
	2.0	15517	14365	13212	12007	10854	9601	8538	6603
	2.5	14919	13816	12715	11559	10456	9240	8222	6370
	3.0	14270	13221	12178	11074	10025	8848	7880	6116
	3.5	13574	12584	11599	10553	9560	8430	7513	5843
	4.0	12855	11925	11002	10012	9077	7998	7133	5559
	4.5	12113	11242	10379	9452	8577	7551	6741	5264
	5.0	11365	10553	9751	8886	8068	7100	6344	4965
	5.5	10611	9860	9118	8314	7557	6646	5945	4664
	6.0	9866	9174	8492	7748	7048	6196	5548	4365
	6.5	9131	8497	7874	7189	6546	5753	5157	4068
	7.0	8423	7844	7275	6646	6057	5324	4777	3779
	7.5	7736	7208	6694	6121	5584	4906	4409	3499
	8.0	7083	6605	6139	5619	5130	4510	4058	3231
	8.5	6460	6029	5611	5140	4700	4130	3720	2972
	9.0	5874	5487	5111	4687	4289	3773	3404	2728



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ISO/IEC 17025



NVLAP LAB CODE: 200899-0

Horizontal Angles

	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
9.5	5324	4979	4645	4265	3908	3437	3105	2772	2498
10.0	4816	4507	4210	3868	3548	3124	2827	2528	2282
10.5	4346	4070	3807	3502	3217	2833	2568	2301	2082
11.0	3913	3668	3435	3164	2909	2566	2330	2091	1897
11.5	3518	3302	3096	2854	2629	2321	2111	1899	1726
12.0	3155	2964	2784	2570	2371	2095	1909	1721	1567
12.5	2829	2661	2502	2312	2136	1891	1727	1559	1424
15.0	1622	1536	1454	1355	1263	1129	1041	952	881
20.0	572	550	529	503	478	441	416	392	372
25.0	259	252	247	239	231	219	212	204	198
35.0	93	92	91	89	88	85	85	83	82
45.0	38	38	38	38	38	37	36	36	36
55.0	17	17	17	16	17	16	17	17	16
65.0	9	9	9	9	9	8	8	8	9
75.0	4	5	5	4	4	4	4	4	4
85.0	1	2	2	2	2	1	1	2	2
90.0	2	2	2	2	2	2	2	2	2

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Horizontal Angles

	18.0	19.0	20.0	22.5	25.0	35.0	45.0	55.0	65.0
V e r t i c a l A n g l e s	-90.0	3	3	3	3	3	3	3	3
	-85.0	3	3	2	3	3	4	8	6
	-75.0	6	6	6	6	7	7	10	8
	-65.0	12	12	12	12	11	11	13	9
	-55.0	21	22	22	21	20	19	18	12
	-45.0	47	46	46	44	42	35	28	15
	-35.0	99	98	96	90	84	63	46	33
	-25.0	247	234	222	194	170	101	67	47
	-20.0	506	467	428	344	277	129	77	52
	-15.0	1265	1127	1001	735	535	173	87	57
	-12.5	2008	1770	1551	1094	762	201	93	58
	-12.0	2195	1930	1686	1182	816	207	93	58
	-11.5	2394	2102	1831	1276	873	212	95	60
	-11.0	2605	2282	1985	1374	932	218	96	59
	-10.5	2829	2473	2147	1476	995	225	96	60
	-10.0	3062	2672	2315	1583	1059	231	97	59
	-9.5	3305	2880	2490	1694	1126	238	97	60
	-9.0	3555	3094	2671	1807	1194	243	98	61
	-8.5	3813	3312	2856	1923	1264	249	100	61
	-8.0	4074	3535	3043	2041	1333	255	99	60
	-7.5	4337	3759	3232	2159	1403	261	101	61
	-7.0	4596	3979	3417	2274	1471	266	100	61
	-6.5	4852	4195	3599	2388	1538	271	101	61
	-6.0	5098	4404	3775	2497	1602	276	101	61
	-5.5	5333	4603	3942	2600	1662	281	102	61
	-5.0	5554	4788	4099	2698	1719	285	103	62
	-4.5	5752	4957	4240	2786	1769	289	102	62
	-4.0	5930	5106	4366	2863	1814	292	102	62
	-3.5	6081	5233	4473	2929	1851	294	103	62
	-3.0	6206	5339	4561	2983	1883	296	103	63
	-2.5	6299	5417	4628	3024	1906	298	103	62
	-2.0	6361	5470	4672	3050	1921	299	103	62
	-1.5	6398	5506	4714	3112	1993	299	103	62
	-1.0	6388	5493	4696	3082	1953	299	102	62
	-0.5	6352	5460	4664	3046	1916	297	102	62
	0.0	6283	5401	4615	3015	1898	296	102	62
	0.5	6184	5316	4545	2972	1872	294	103	62
	1.0	6056	5208	4453	2915	1839	292	102	62
	1.5	5902	5078	4344	2847	1799	289	101	61
	2.0	5725	4927	4218	2770	1753	284	102	61
	2.5	5526	4758	4076	2683	1702	281	101	62
	3.0	5310	4574	3923	2586	1646	277	100	61
	3.5	5076	4377	3756	2484	1586	272	100	61
	4.0	4834	4171	3584	2377	1523	267	99	60
	4.5	4582	3957	3404	2264	1457	262	99	60
	5.0	4327	3740	3222	2151	1389	256	98	60
	5.5	4068	3521	3037	2035	1321	250	98	61
	6.0	3811	3303	2853	1919	1252	246	97	60
	6.5	3558	3086	2671	1805	1184	239	97	59
	7.0	3309	2874	2492	1692	1117	233	96	59
	7.5	3068	2670	2319	1583	1051	227	95	58
	8.0	2837	2472	2151	1477	987	221	95	58
	8.5	2615	2283	1991	1375	926	215	93	58
	9.0	2405	2103	1838	1277	867	209	92	58



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Horizontal Angles

	18.0	19.0	20.0	22.5	25.0	35.0	45.0	55.0	65.0	
V e r t i c a l	9.5	2206	1933	1694	1185	810	203	92	58	36
	10.0	2019	1774	1558	1097	757	197	91	57	36
	10.5	1846	1626	1431	1015	705	192	90	57	35
	11.0	1685	1488	1313	938	658	187	89	57	36
	11.5	1537	1361	1204	866	613	181	88	56	35
	12.0	1400	1242	1102	800	571	176	88	56	35
	12.5	1276	1134	1009	739	534	171	86	56	35
	15.0	799	721	652	498	379	148	82	54	34
	20.0	349	325	304	255	213	114	71	49	30
	25.0	190	182	174	156	139	91	62	42	26
	35.0	80	78	77	72	68	53	39	28	17
	45.0	35	34	34	33	32	27	23	18	12
	55.0	16	16	15	15	16	15	14	12	9
	65.0	9	8	8	8	9	8	9	9	7
	75.0	4	3	4	3	4	5	6	8	7
	85.0	2	2	1	2	2	4	6	7	5
	90.0	2	2	2	2	2	2	2	2	2

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Horizontal Angles

	75.0	85.0	90.0
V e r t i c a l	-90.0	3	3
	-85.0	5	5
	-75.0	5	5
	-65.0	6	5
	-55.0	7	5
	-45.0	8	4
	-35.0	11	5
	-25.0	14	5
	-20.0	16	5
	-15.0	18	5
	-12.5	19	5
	-12.0	19	5
	-11.5	19	5
	-11.0	20	5
	-10.5	19	5
	-10.0	19	5
	-9.5	19	5
	-9.0	19	5
	-8.5	20	5
	-8.0	19	5
A n g l e s	-7.5	19	6
	-7.0	19	5
	-6.5	19	6
	-6.0	19	5
	-5.5	19	5
	-5.0	19	5
	-4.5	19	5
	-4.0	19	5
	-3.5	19	5
	-3.0	20	5
	-2.5	20	5
	-2.0	20	6
	-1.5	19	6
	-1.0	19	6
	-0.5	19	5
	0.0	19	5
	0.5	20	5
	1.0	19	5
	1.5	19	5
	2.0	19	4
	2.5	19	5
	3.0	19	5
	3.5	19	5
	4.0	19	5
	4.5	19	5
	5.0	19	5
	5.5	19	6
	6.0	18	5
	6.5	19	5
	7.0	18	5
	7.5	19	5
	8.0	18	6
	8.5	18	5
	9.0	18	5



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Horizontal Angles

	75.0	85.0	90.0
V e r t i c a l	9.5	18	7
	10.0	18	6
	10.5	18	7
	11.0	17	6
	11.5	18	6
	12.0	18	7
	12.5	17	6
	15.0	17	6
	20.0	15	6
	25.0	12	6
	35.0	9	5
	45.0	7	6
	55.0	7	5
	65.0	5	5
	75.0	5	5
A n g l e s	85.0	4	4
	90.0	2	2