



# 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](http://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	
<b>Test Report</b>	S1607055-R1	<b>Description</b>	72W White 4000K SSL	<b>Type</b> Commercial
<b>Test Date</b>	5 July 2016	<b>Serial Number</b>	SRIS 2434	<b>Description</b> 71SSL-CY1101
<b>Report Date</b>	8 July 2016	<b>Photometric Method</b>	Absolute	<b>Manufacturer</b> Mean Well
<b>Ambient</b>	25.0 °C	<b>Lamp Lumens</b>	-1	<b>Catalog No.</b> LPF-60-24
<b>Humidity</b>	39.4 %	<b>Test Position</b>	Axial	<b>Voltage Tap</b> 120.00 V
<b>Lamp Type</b>	SSL	<b>Comments</b>	Clusters of CREE XPE2 LED's	<b>Power Factor</b> 0.9900

### Floodlight Data

General Information		Optics	Aperture (feet)	
<b>Manufacturer</b>	Lumenpulse	<b>Reflector</b>	48 Collimators Acrylic	<b>X</b> 4.0000
<b>Name</b>	LUMENFACADE	<b>Housing</b>	Extruded Aluminum	<b>Y</b> 0.1667
<b>Catalog No.</b>	LOG-HO-120-48-40K- 10x30-SI-NO	<b>Lens</b>	Glass/Polycarbonate	<b>Z</b> 0.0000

Lamp Stabilization Time: 55 minutes

**Tested By:** George Hedrei

**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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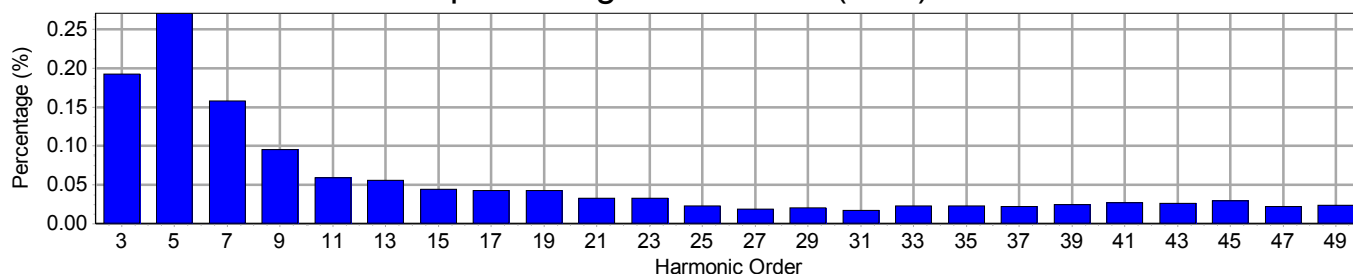
NVLAP LAB CODE: 200899-0

## Electrical Measurements

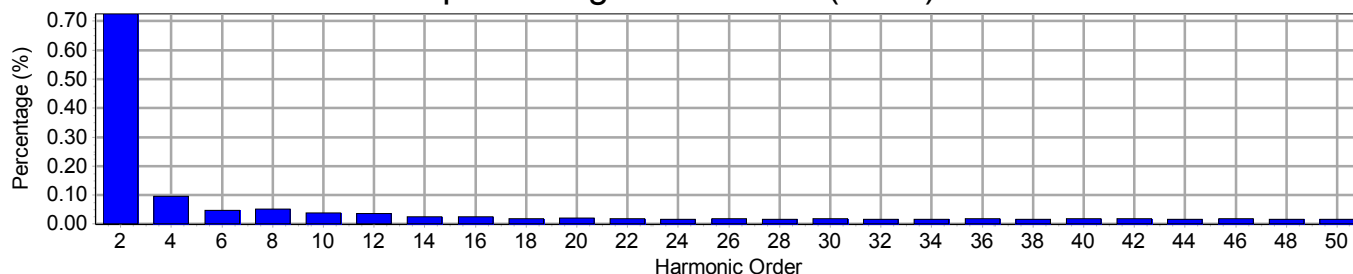
### Input

Frequency	60 Hz	Active Power	62.13 W	THDV [ANSI]	0.84 %
Voltage	120.1 V(rms)	Apparent Power	62.56 VA	THDA [ANSI]	4.55 %
Current	0.5207 A(rms)	Power Factor	0.993	Max. Harmonic At	5th order

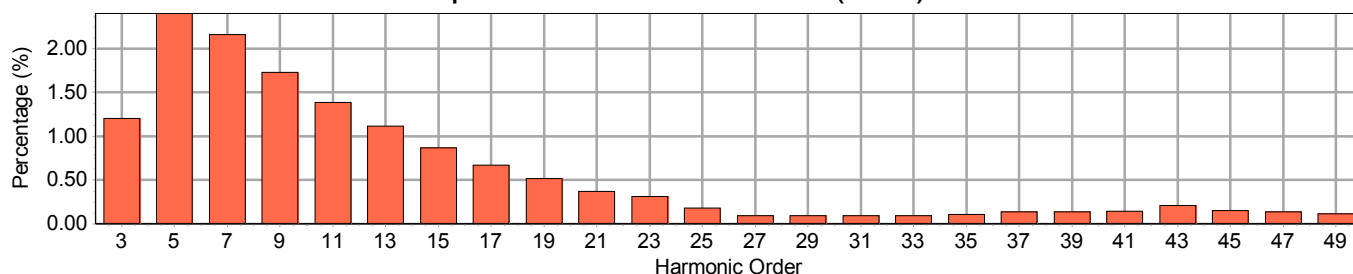
### Input Voltage Harmonics (Odd)



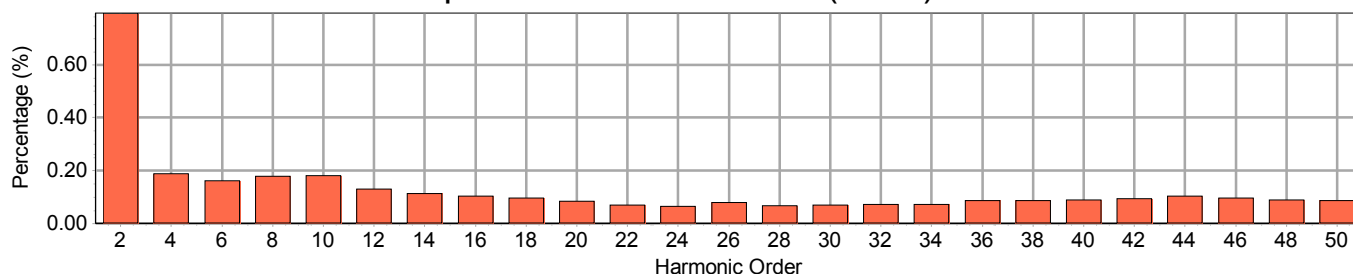
### Input Voltage Harmonics (Even)



### 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	0.726	0.796
3	180	0.192	1.204	4	240	0.096	0.188
5	300	0.271	2.404	6	360	0.047	0.161
7	420	0.158	2.163	8	480	0.053	0.178
9	540	0.095	1.729	10	600	0.039	0.180
11	660	0.059	1.385	12	720	0.037	0.129
13	780	0.055	1.114	14	840	0.026	0.112
15	900	0.044	0.866	16	960	0.026	0.102
17	1020	0.043	0.668	18	1080	0.019	0.097
19	1140	0.043	0.517	20	1200	0.021	0.084
21	1260	0.033	0.366	22	1320	0.018	0.069
23	1380	0.032	0.308	24	1440	0.018	0.064
25	1500	0.023	0.177	26	1560	0.018	0.080
27	1620	0.019	0.094	28	1680	0.017	0.066
29	1740	0.020	0.093	30	1800	0.018	0.069
31	1860	0.017	0.094	32	1920	0.017	0.072
33	1980	0.022	0.093	34	2040	0.017	0.073
35	2100	0.022	0.108	36	2160	0.020	0.086
37	2220	0.022	0.134	38	2280	0.017	0.085
39	2340	0.024	0.137	40	2400	0.019	0.089
41	2460	0.027	0.145	42	2520	0.019	0.093
43	2580	0.026	0.211	44	2640	0.017	0.103
45	2700	0.029	0.150	46	2760	0.018	0.095
47	2820	0.022	0.135	48	2880	0.017	0.088
49	2940	0.024	0.111	50	3000	0.016	0.086



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## Photometric Report: S1607055-R1

Prepared for: Lumenpulse · Test Date: 05 July 2016

Floodlight: LUMENFACADE · Lumcat: LOG-HO-120-48-40K-10x30-SI-NO

### Photometric Floodlight Characteristics

Nominal SSL Power	72.00 W	
Measured Input Voltage	120.14 V	<b>Notes</b>
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	3830	
Measured Input Power	62.13 W	
Floodlight Luminous Efficacy	61.6 lm/W	2) Field performance may differ from laboratory measurements.
Maximum Candela Value	30056	
Maximum Candela Location	0.0 H, -0.5 V	3) Results are valid for the tested material only.
Horizontal Beam Angle (50%)	35.0 °	
Vertical Beam Angle (50%)	9.5 °	4) All data published in this report are based on absolute photometry.
Horizontal Field Angle (10%)	61.0 °	
Vertical Field Angle (10%)	21.0 °	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	4Hx2V	
Beam Lumens (50%)	1621	
Beam Efficiency (50%)	N/A	
Field Lumens (10%)	3058	
Field Efficiency (10%)	N/A	
Spill Lumens	772	
Total Floodlight Lumens	3830	
Total Floodlight Efficiency	N/A	



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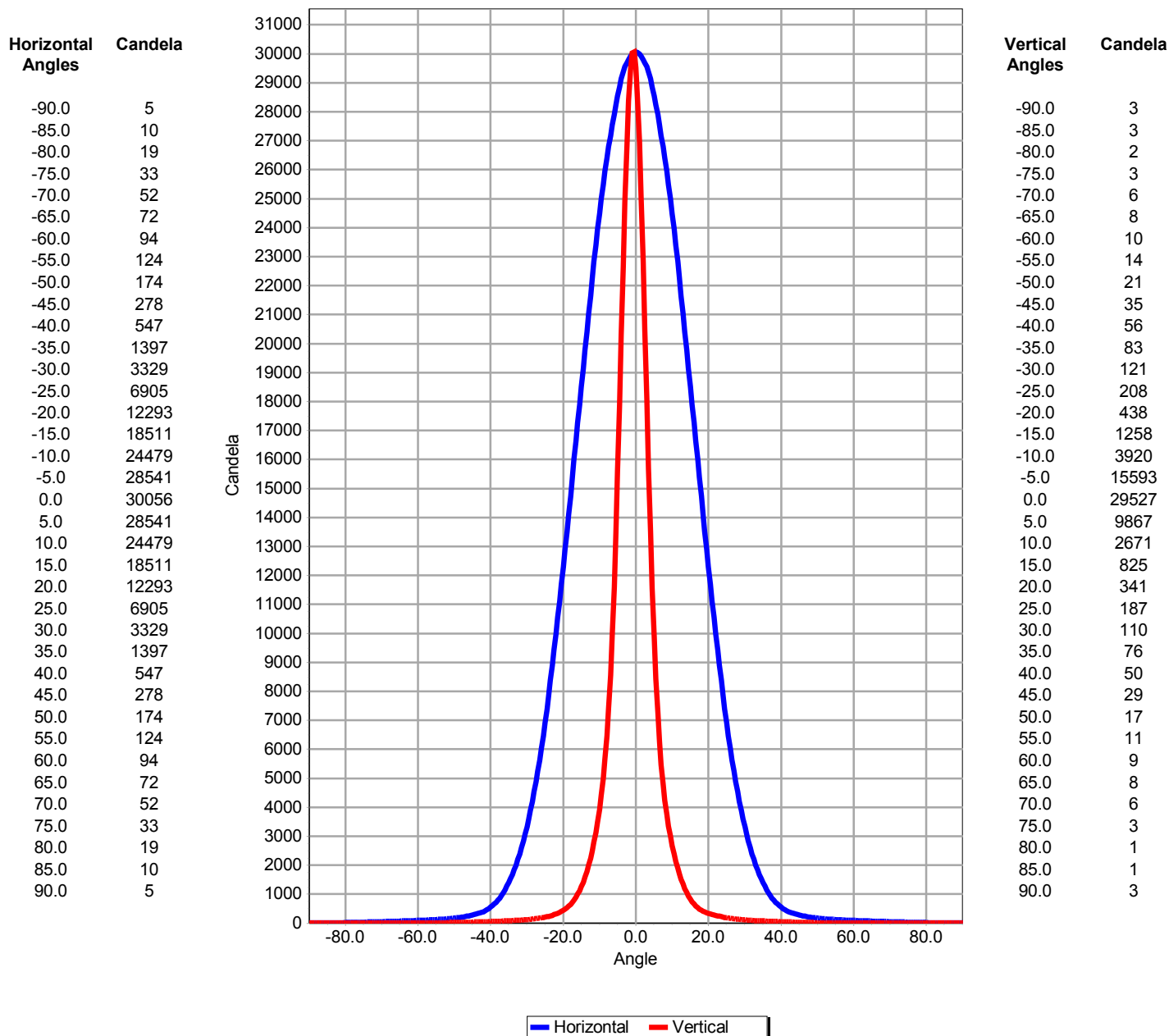
NVLAP LAB CODE: 200899-0

## Photometric Report: S1607055-R1

Prepared for: Lumenpulse · Test Date: 05 July 2016

Floodlight: LUMENFACADE · Lumcat: LOG-HO-120-48-40K-10x30-SI-NO

### Maximum Candela Trace (Max. Location: 0.0 H, -0.5 V)





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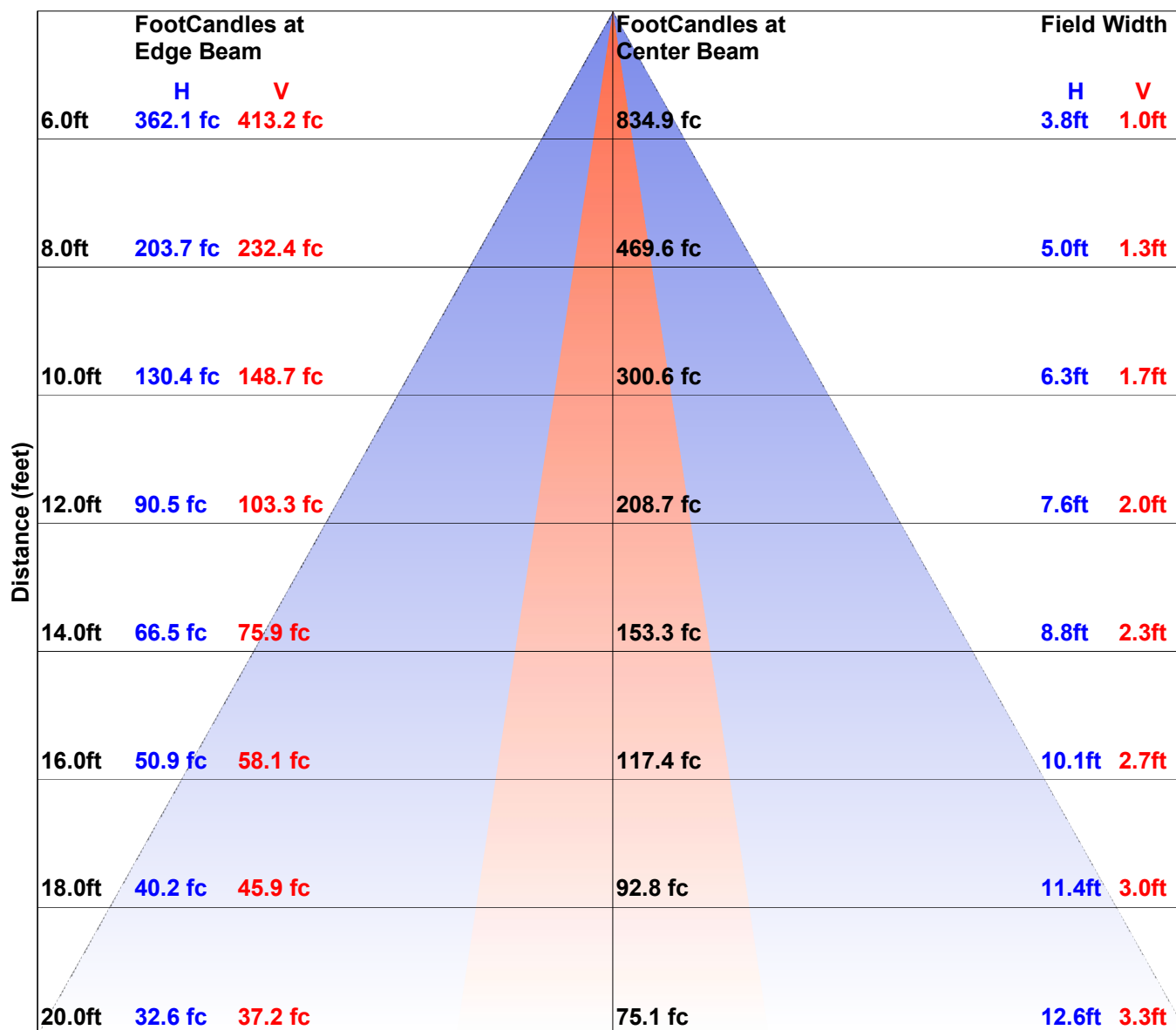
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## Photometric Report: S1607055-R1

Prepared for: Lumenpulse · Test Date: 05 July 2016

Floodlight: LUMENFACADE · Lumcat: LOG-HO-120-48-40K-10x30-SI-NO

### Downlight Beam



— Horizontal (35.0 °) — Vertical (9.5 °)





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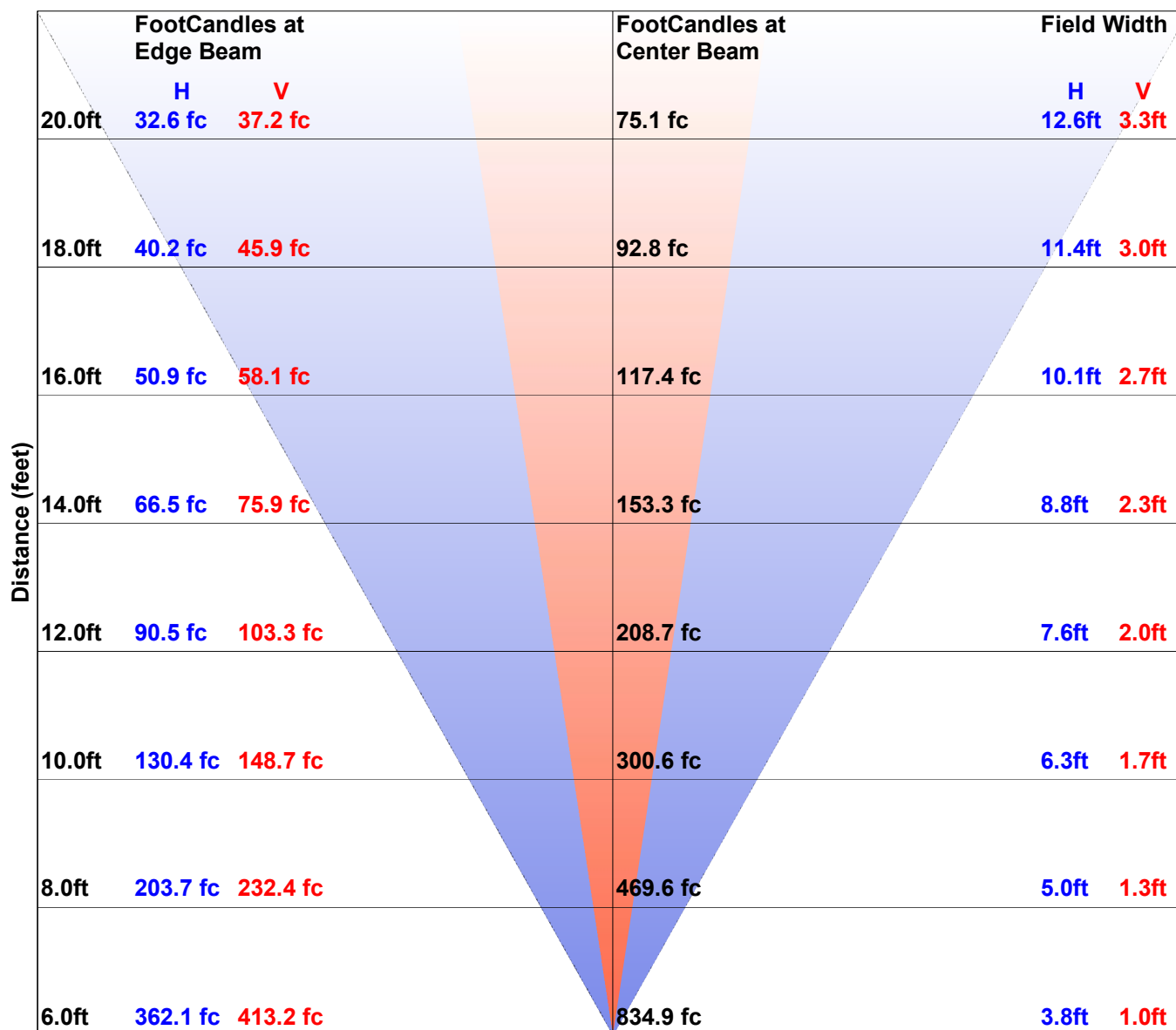
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## Photometric Report: S1607055-R1

Prepared for: Lumenpulse · Test Date: 05 July 2016

Floodlight: LUMENFACADE · Lumcat: LOG-HO-120-48-40K-10x30-SI-NO

### Uplight Beam



— Horizontal (35.0 °) — Vertical (9.5 °)



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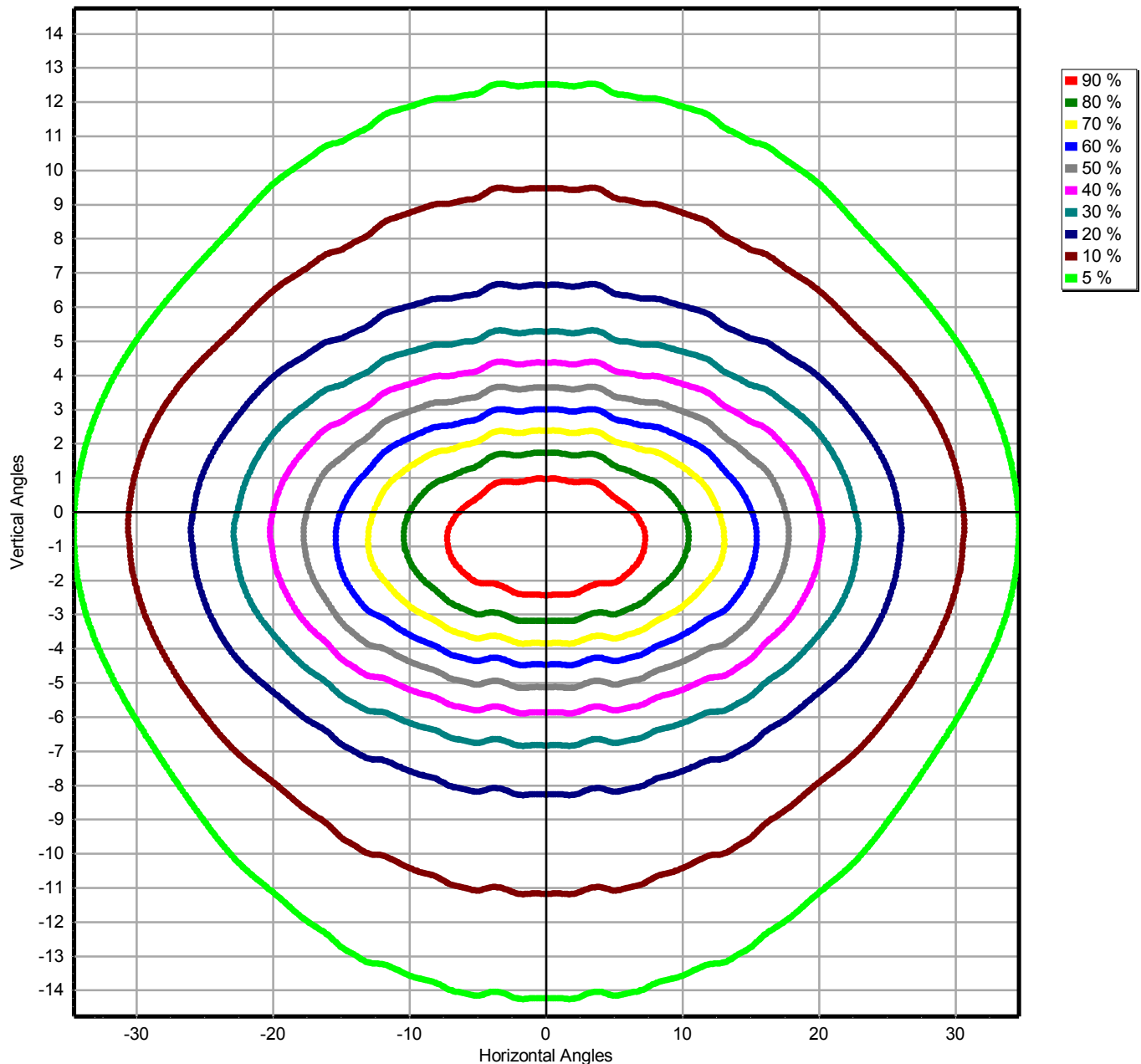
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## Photometric Report: S1607055-R1

Prepared for: Lumenpulse · Test Date: 05 July 2016

Floodlight: LUMENFACADE · Lumcat: LOG-HO-120-48-40K-10x30-SI-NO

### ISO Candela Diagram





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## IES File Headers

```
IESNA:LM-63-2002
[ISSUEDATE]      05 July 2016
[TESTLAB]        Spectra Lux Industries Inc.
[TEST]           S1607055-R1
[MANUFAC]        Lumenpulse
[LUMCAT]          LOG-HO-120-48-40K-10x30-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 (3,830 Luminaire Lumens)
[_REFLECTOR]      48 Collimators Acrylic
[_LENS]           Glass/Polycarbonate
[_HOUSING]        Extruded Aluminum
[DISTRIBUTION]    NEMA 4Hx2V (Max. CP at 0.0H,-0.5V)
[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	2	2	2	3	4	2	2
	-75.0	3	5	6	6	5	5	4	4
	-65.0	8	7	8	9	8	7	9	8
	-55.0	14	15	16	14	15	15	14	14
	-45.0	35	35	33	34	35	35	34	33
	-35.0	83	82	83	81	83	81	82	80
	-25.0	208	206	207	206	204	206	203	198
	-20.0	438	436	437	427	424	431	426	406
	-15.0	1258	1256	1261	1222	1205	1238	1218	1140
	-12.5	2232	2226	2234	2164	2136	2185	2146	2103
	-12.0	2495	2488	2497	2421	2390	2444	2400	2350
	-11.5	2792	2784	2794	2709	2674	2733	2683	2626
	-11.0	3125	3114	3126	3028	2990	3055	2999	2936
	-10.5	3496	3487	3500	3391	3345	3422	3357	3285
	-10.0	3920	3911	3925	3801	3751	3835	3762	3678
	-9.5	4414	4399	4417	4271	4215	4312	4230	4137
	-9.0	4982	4967	4987	4820	4752	4871	4774	4666
A n g l e s	-8.5	5657	5638	5663	5464	5390	5532	5422	5296
	-8.0	6458	6436	6465	6231	6143	6314	6186	6042
	-7.5	7420	7395	7432	7151	7049	7260	7110	6944
	-7.0	8568	8542	8585	8254	8133	8382	8209	8011
	-6.5	9949	9914	9969	9570	9428	9732	9528	9295
	-6.0	11580	11540	11597	11136	10968	11317	11075	10802
	-5.5	13465	13417	13484	12948	12754	13148	12864	12542
	-5.0	15593	15539	15604	15008	14780	15199	14866	14491
	-4.5	17885	17823	17884	17234	16968	17392	17011	16577
	-4.0	20285	20217	20263	19585	19285	19677	19243	18747
	-3.5	22641	22565	22592	21911	21576	21898	21415	20855
	-3.0	24877	24798	24791	24130	23765	23987	23454	22841
	-2.5	26812	26734	26693	26084	25689	25770	25198	24535
	-2.0	28372	28298	28217	27678	27264	27189	26585	25888
	-1.5	29461	29388	29264	28815	28392	28141	27518	26796
	-1.0	30031	29967	29806	29450	29030	28604	27966	27232
	-0.5	30056	30000	29799	29552	29135	28541	27905	27173



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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	29527	29482	29245	29113	28711	27958	27337	26616	25950
	0.5	28476	28438	28179	28149	27772	26880	26284	25590	25038
	1.0	26957	26929	26649	26721	26372	25366	24809	24155	23716
	1.5	25035	25013	24724	24878	24566	23479	22969	22364	22034
	2.0	22834	22822	22533	22752	22474	21351	20899	20351	20117
	2.5	20457	20450	20172	20440	20190	19070	18679	18188	18036
	3.0	18040	18042	17779	18067	17857	16777	16439	16015	15929
	3.5	15681	15683	15450	15737	15555	14557	14274	13904	13863
	4.0	13512	13515	13307	13574	13422	12527	12288	11980	11961
	4.5	11552	11561	11381	11621	11492	10713	10514	10251	10245
	5.0	9867	9873	9725	9929	9823	9152	8991	8769	8767
	5.5	8436	8442	8315	8488	8397	7835	7700	7515	7512
	6.0	7248	7253	7147	7290	7213	6742	6630	6472	6468
	6.5	6269	6273	6186	6299	6236	5842	5747	5613	5604
	7.0	5466	5469	5395	5488	5430	5104	5022	4907	4894
	7.5	4798	4801	4738	4812	4765	4487	4416	4316	4302
	8.0	4239	4240	4188	4248	4207	3971	3909	3822	3807
	8.5	3763	3764	3716	3772	3732	3530	3475	3399	3384
	9.0	3348	3352	3310	3356	3324	3147	3099	3032	3018
	9.5	2990	2992	2957	2996	2968	2811	2769	2710	2698
A n g l e s	10.0	2671	2673	2640	2678	2650	2513	2475	2425	2413
	10.5	2386	2388	2360	2391	2371	2246	2214	2168	2160
	11.0	2132	2132	2109	2137	2117	2007	1978	1938	1931
	11.5	1902	1903	1880	1909	1890	1791	1766	1732	1726
	12.0	1692	1695	1675	1699	1685	1596	1573	1544	1540
	12.5	1508	1507	1491	1512	1499	1421	1400	1374	1372
	15.0	825	826	817	828	823	781	773	760	760
	20.0	341	342	340	342	340	329	327	323	322
	25.0	187	187	186	187	187	181	181	181	180
	35.0	76	73	74	73	73	72	73	72	71
	45.0	29	31	30	30	29	29	30	29	30
	55.0	11	11	12	12	13	13	12	12	11
	65.0	8	7	8	6	5	6	7	7	7
	75.0	3	5	5	4	4	4	5	4	3
	85.0	1	1	1	3	3	2	1	3	3
	90.0	3	3	3	3	3	3	3	3	3



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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  A n g l e s	-90.0	3	3	3	3	3	3	3	3
	-85.0	3	2	2	3	3	2	3	2
	-75.0	7	5	4	4	5	5	5	5
	-65.0	8	8	9	7	9	8	7	9
	-55.0	13	15	13	15	14	14	13	13
	-45.0	34	33	33	32	32	33	31	33
	-35.0	80	79	79	77	77	75	73	72
	-25.0	195	194	189	187	186	182	180	174
	-20.0	400	391	382	371	370	359	347	330
	-15.0	1113	1085	1042	1008	1004	962	915	853
	-12.5	1956	1901	1824	1760	1745	1663	1579	1461
	-12.0	2185	2121	2034	1960	1943	1851	1756	1624
	-11.5	2438	2367	2271	2186	2164	2059	1954	1804
	-11.0	2723	2640	2532	2437	2411	2293	2172	2004
	-10.5	3045	2950	2826	2718	2689	2556	2421	2229
	-10.0	3405	3300	3160	3037	3002	2853	2701	2482
	-9.5	3823	3700	3542	3403	3366	3193	3020	2770
	-9.0	4303	4164	3983	3822	3784	3586	3389	3102
	-8.5	4876	4713	4506	4320	4277	4050	3826	3491
	-8.0	5551	5361	5123	4908	4862	4597	4336	3947
	-7.5	6363	6139	5859	5611	5562	5256	4950	4493
	-7.0	7325	7067	6739	6446	6392	6031	5676	5140
	-6.5	8484	8176	7787	7445	7385	6963	6543	5907
	-6.0	9850	9484	9028	8623	8542	8049	7554	6813
	-5.5	11428	11000	10464	9985	9880	9304	8721	7855
	-5.0	13215	12707	12089	11529	11369	10700	10025	9034
	-4.5	15136	14551	13840	13191	12967	12197	11418	10307
	-4.0	17158	16486	15687	14942	14622	13749	12869	11646
	-3.5	19144	18394	17504	16665	16238	15265	14280	12967
	-3.0	21037	20206	19240	18310	17747	16687	15607	14229
	-2.5	22676	21783	20755	19747	19039	17901	16740	15332
	-2.0	24013	23064	21992	20920	20065	18868	17646	16234
	-1.5	24946	23960	22866	21749	20751	19515	18252	16872
	-1.0	25445	24442	23348	22199	21079	19825	18546	17224
	-0.5	25484	24479	23405	22252	21023	19779	18511	17280
	0.0	25055	24071	23034	21899	20581	19362	18122	16989
	0.5	24178	23236	22252	21153	19786	18619	17431	16418
	1.0	22913	22019	21110	20070	18675	17578	16461	15581
	1.5	21295	20473	19647	18678	17298	16285	15260	14515
	2.0	19450	18702	17970	17083	15750	14836	13908	13293
	2.5	17446	16783	16149	15359	14093	13286	12465	11965
	3.0	15411	14832	14286	13596	12430	11724	11012	10615
	3.5	13419	12926	12467	11868	10820	10215	9606	9289
	4.0	11585	11166	10780	10270	9348	8836	8318	8066
	4.5	9930	9578	9258	8828	8036	7601	7164	6962
	5.0	8503	8211	7940	7576	6904	6537	6170	6003
	5.5	7291	7041	6818	6512	5942	5635	5325	5181
	6.0	6280	6070	5879	5621	5143	4880	4619	4494
	6.5	5445	5265	5101	4880	4481	4255	4031	3924
	7.0	4759	4604	4462	4273	3933	3742	3549	3449
	7.5	4185	4050	3926	3763	3476	3307	3138	3054
	8.0	3705	3590	3480	3336	3089	2943	2795	2718
	8.5	3297	3195	3097	2974	2756	2627	2496	2428
	9.0	2940	2850	2764	2655	2466	2350	2238	2177



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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	
V e r t i c a l  A n g l e s	9.5	2629	2551	2475	2377	2210	2109	2008	1956	1844
	10.0	2353	2283	2216	2132	1982	1894	1804	1758	1662
	10.5	2108	2045	1984	1911	1778	1700	1621	1582	1494
	11.0	1884	1831	1779	1711	1595	1525	1456	1422	1346
	11.5	1685	1638	1593	1534	1428	1368	1305	1277	1211
	12.0	1503	1460	1421	1370	1279	1222	1169	1145	1085
	12.5	1340	1304	1269	1223	1142	1094	1045	1026	973
	15.0	744	725	709	688	645	621	598	590	564
	20.0	317	312	308	300	288	281	275	271	263
	25.0	178	175	173	172	166	164	161	159	157
	35.0	71	71	72	70	67	68	67	66	66
	45.0	30	28	29	29	28	28	27	28	27
	55.0	13	12	11	11	13	11	12	12	10
	65.0	7	6	7	7	6	7	7	7	7
	75.0	3	4	4	4	5	4	4	2	5
	85.0	1	4	1	3	1	2	2	2	2
	90.0	3	3	3	3	3	3	3	3	3



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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	4	3	3	3	2	4	6	6
	-75.0	4	5	5	6	5	7	7	7
	-65.0	8	8	8	7	9	8	11	9
	-55.0	14	13	14	15	13	12	13	8
	-45.0	29	30	29	28	28	24	20	12
	-35.0	70	69	68	65	63	52	37	16
	-25.0	165	162	157	149	136	98	67	28
	-20.0	309	295	284	258	229	141	87	36
	-15.0	771	724	682	596	498	233	120	46
	-12.5	1308	1219	1141	973	791	317	143	51
	-12.0	1450	1352	1263	1075	868	338	148	53
	-11.5	1607	1496	1397	1185	951	359	153	53
	-11.0	1782	1656	1543	1303	1042	384	157	56
	-10.5	1976	1837	1709	1438	1145	409	164	57
	-10.0	2196	2037	1893	1586	1256	433	169	58
	-9.5	2446	2263	2100	1753	1380	464	175	58
	-9.0	2732	2525	2338	1945	1521	495	180	60
	-8.5	3066	2828	2615	2166	1684	528	187	61
	-8.0	3458	3183	2938	2423	1871	567	192	62
	-7.5	3923	3605	3320	2726	2091	610	199	64
	-7.0	4473	4101	3769	3080	2342	657	204	64
	-6.5	5127	4688	4299	3496	2640	710	210	65
	-6.0	5894	5381	4925	3980	2983	770	220	66
	-5.5	6775	6175	5641	4535	3376	834	226	68
	-5.0	7767	7070	6446	5151	3811	905	231	68
	-4.5	8840	8040	7318	5812	4276	980	240	69
	-4.0	9964	9059	8236	6503	4767	1055	248	71
	-3.5	11075	10068	9147	7178	5249	1133	254	70
	-3.0	12138	11040	10021	7823	5710	1205	262	72
	-2.5	13063	11889	10792	8380	6112	1269	268	72
	-2.0	13821	12587	11426	8833	6443	1324	271	72
	-1.5	14355	13091	11885	9147	6677	1365	277	73
	-1.0	14650	13374	12146	9346	6815	1389	279	72
	-0.5	14732	13499	12293	9436	6905	1397	278	72
	0.0	14446	13231	12037	9152	6720	1387	280	73
	0.5	13962	12805	11648	8840	6511	1356	276	72
	1.0	13259	12178	11086	8393	6202	1314	272	72
	1.5	12358	11377	10365	7832	5812	1255	269	72
	2.0	11329	10447	9531	7194	5367	1187	262	72
	2.5	10215	9439	8625	6509	4883	1113	255	70
	3.0	9079	8412	7696	5815	4389	1036	249	71
	3.5	7965	7396	6784	5135	3903	955	241	68
	4.0	6939	6456	5933	4506	3450	879	232	68
	4.5	6006	5602	5158	3937	3037	806	224	68
	5.0	5196	4855	4482	3440	2671	740	217	66
	5.5	4500	4211	3896	3010	2354	680	208	64
	6.0	3915	3671	3403	2647	2083	627	202	64
	6.5	3428	3219	2988	2340	1853	577	195	62
	7.0	3023	2841	2640	2084	1657	536	188	61
	7.5	2682	2524	2349	1863	1491	498	183	61
	8.0	2391	2254	2102	1677	1349	464	176	59
	8.5	2142	2021	1887	1513	1221	434	169	58
	9.0	1924	1818	1698	1370	1110	406	165	57



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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	1731	1638	1534	1240	1012	380	159	91	56
	10.0	1561	1477	1385	1124	920	357	153	89	54
	10.5	1406	1334	1250	1018	837	335	149	87	53
	11.0	1266	1202	1130	924	764	313	143	85	52
	11.5	1139	1083	1018	836	694	295	139	84	50
	12.0	1022	974	917	756	632	277	134	80	50
	12.5	917	877	826	684	577	259	130	79	49
	15.0	538	518	493	420	366	195	110	68	44
	20.0	255	249	240	217	197	127	81	54	35
	25.0	153	151	147	136	128	93	65	45	26
	35.0	65	65	64	60	58	46	34	24	14
	45.0	27	25	25	25	23	21	17	13	12
	55.0	13	11	10	11	11	11	13	10	9
	65.0	7	7	7	6	6	7	7	9	7
	75.0	4	2	4	5	4	6	7	8	7
	85.0	2	4	3	2	3	6	7	6	6
	90.0	3	3	3	3	3	3	3	3	3

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## Horizontal Angles

	75.0	85.0	90.0
V e r t i c a l  A n g l e s	-90.0	3	3
	-85.0	7	5
	-75.0	6	7
	-65.0	6	6
	-55.0	8	6
	-45.0	8	6
	-35.0	9	6
	-25.0	14	7
	-20.0	16	5
	-15.0	21	5
	-12.5	24	6
	-12.0	25	5
	-11.5	27	5
	-11.0	26	5
	-10.5	26	4
	-10.0	28	5
	-9.5	28	4
	-9.0	28	5
	-8.5	30	6
	-8.0	29	4
	-7.5	30	5
	-7.0	31	7
	-6.5	31	4
	-6.0	32	5
	-5.5	32	5
	-5.0	32	5
	-4.5	33	4
	-4.0	34	5
	-3.5	32	5
	-3.0	33	4
	-2.5	34	5
	-2.0	34	5
	-1.5	34	5
	-1.0	34	5
	-0.5	33	5
	0.0	34	6
	0.5	35	5
	1.0	34	7
	1.5	33	5
	2.0	34	4
	2.5	33	6
	3.0	33	5
	3.5	33	6
	4.0	32	6
	4.5	32	6
	5.0	31	5
	5.5	31	5
	6.0	30	5
	6.5	31	6
	7.0	29	6
	7.5	28	6
	8.0	29	6
	8.5	28	6
	9.0	27	7



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## Horizontal Angles

	75.0	85.0	90.0
V e r t i c a l  A n g l e s	9.5	28	7
	10.0	26	8
	10.5	25	7
	11.0	27	8
	11.5	24	7
	12.0	24	5
	12.5	25	7
	15.0	22	6
	20.0	17	7
	25.0	12	7
	35.0	11	7
	45.0	9	7
	55.0	7	5
	65.0	7	7
	75.0	7	6
	85.0	4	5
	90.0	3	3