LIGHT LABORATORY INC.
8165 E Kaiser Blvd. Anaheim, CA 92808
www.lightlaboratory.com

NVLAP TESTING
NVLAP LAB CODE 200927-0

Report No: L092511811 **Issue Date: 10/6/2025**
Amendment: **Revision Date: N/A**

Report Prepared For: FX Luminaire / Lumascape
1940 Diamond Street, San Marcos, CA 92078

Model Number: TN-60-9LED-S-CW-FW

Test: Photometric/Colorimetric/Electrical Test

Standards Used: Appropriate part or all test guidelines were used for test performed:

IES LM79: 2008 Approved Methods for Electrical and Photometric Measurements of Solid-State Lighting Products

ANSI/IES LM79: 2019 Approved Methods for Optical and Electrical Measurements of Solid-State Lighting Products

ANSI/NEMA C78.377: 2017 Specification of the Chromaticity of Solid State Lighting Products

ANSI C82.77-10:2014: Harmonic Emission Limits-Related Quality Requirements for Lighting Equipment

Description of Sample: Client submitted the sample. Received in working and undamaged condition. No modifications were necessary.

Special Test Condition: Fixture is tested with no special conditions.

Date of Tests: 10/1/25

Seasoning of Sample: No seasoning was performed in accordance with IESNA LM-79.

Equipment List

Equipment Used	Model No	Stock No	Calibration Due Date
Chroma Programmable AC Source	61604	PS-AC02	--
Yokogawa Digital Power Meter	WT210	MT-EL06-S3	6/21/26
HP Power Supply	6032A	PS-DC05-S2	--
Fluke Digital Thermometer	52K/J	MT-TP05	6/25/26
LLI Type C Goniophotometer System	RMG-C-MKII	CD-LL04-GC	--
LLI 2M Sphere	2MR97	CD-SN03-S2	--
LLI Spectroradiometer	SPR-3000	MT-SC01-S2	Before Use

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General Information	
Manufacturer:	FX Luminaire / Lumascape
Model Number:	TN-60-9LED-S-CW-FW
Driver Model Number:	Custom

Test Summary	
Total Lumens:	881.00
Efficacy:	84.99
Color Redering Index:	83.4
Correlated Color Temperature:	2983
Input Voltage (VAC/60Hz):	12.01
Input Current (Amp):	0.9327
Input Power (W):	10.37
Input Power Factor:	0.9251
Current ATHD (%):	38.1%

Test Condition	
Ambient Temperature (°C):	25.0
Stabilization Time (Hours):	0:30
Total Operating Time (Hours):	1:10

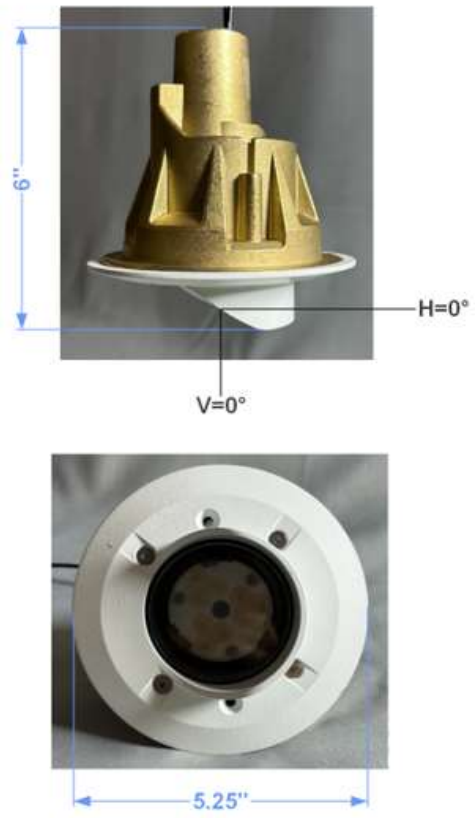
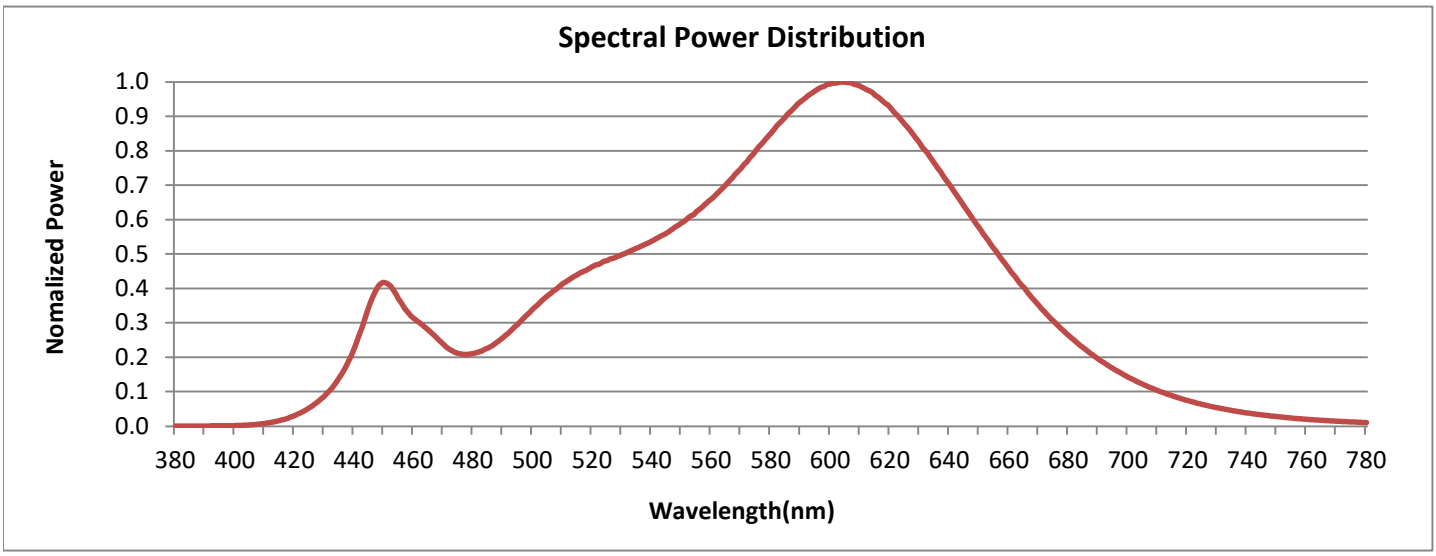


FIG. 1 LUMINAIRE

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Colorimetry Test Results

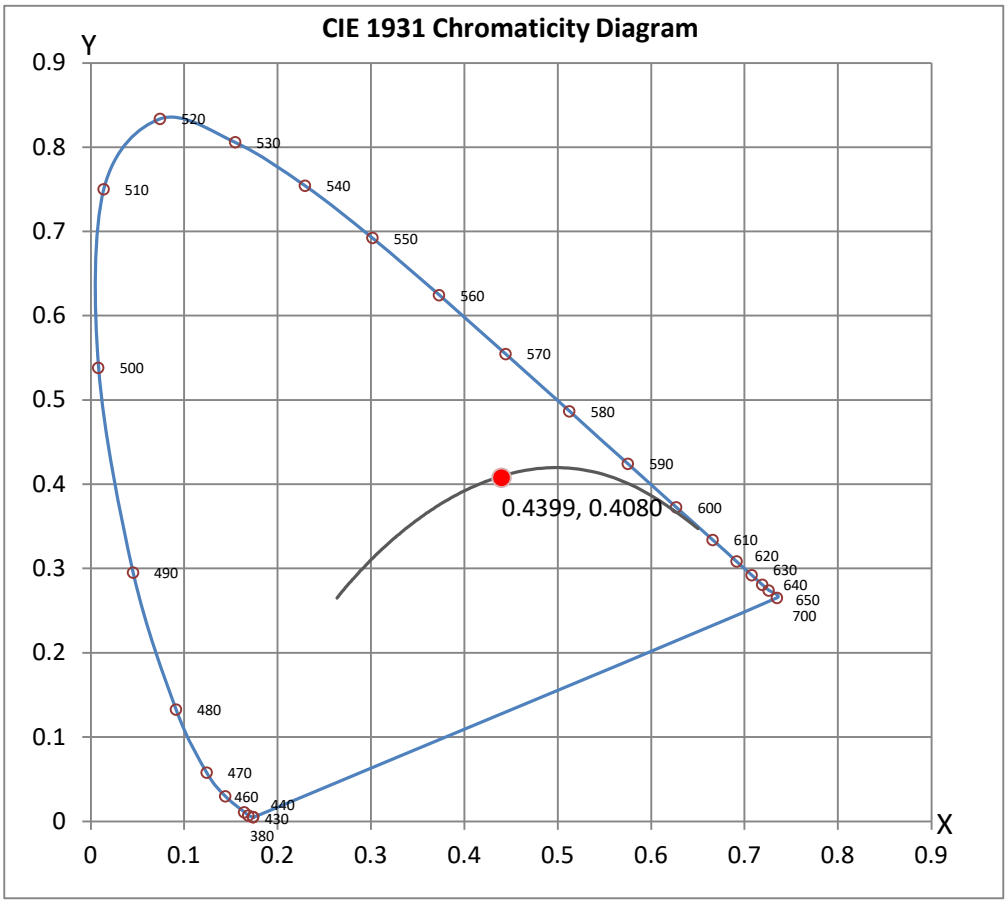


CRI & CCT

x	0.4399
y	0.4080
u'	0.2508
v'	0.5234
CRI	83.40
CCT	2983
Duv	0.00115

R Values

R1	81.74
R2	91.67
R3	96.23
R4	82.28
R5	82.78
R6	91.38
R7	82.66
R8	58.81
R9	7.65
R10	81.71
R11	82.43
R12	76.31
R13	84.09
R14	98.51
R15	73.44



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Test Methods

Photometric Measurements - Goniophotometer

A Custom Light Laboratory Type C Rotating Mirror Goniophotometer was used to measure candelas(intensity) at each angle of distribution as defined by IESNA for the appropriate fixture type.

Ambient temperature is set to 25°C and is measured from the center of the fixture, within 1ft from the outside of the fixture. Temperature is maintained at 25°C throughout the testing process and the sample is stabilized for at least 30mins and longer as necessary for the sample to achieve stabilization.

Electrical measurements are measured using the listed equipment.

Spectral Measurements - Integrating Sphere

A Sensing Spectroradiometer SPR-3000, in conjunction with Light Laboratory 2 meter integrating sphere was used to measure chromaticity coordinates, correlated color temperature(CCT) and the color rendering index(CRI) for each sample.

Ambient temperature is set to 25°C and is measured from the center of the fixture, within 1ft from the outside of the fixture. Temperature is maintained at 25°C throughout the testing process and the sample is stabilized for at least 30mins and longer as necessary for the sample to achieve stabilization.

Electrical measurements are measured using the listed equipment.

Disclaimers:

The results related only to the samples as received and tested. This report must not be used by the customer to claim product certification, approval or endorsement by NVLAP, NIST or any agency of the Federal Government.

Report Prepared by : JG

Test Report Reviewed by:

Steve Kang
Quality Assurance

**Attached are photometric data reports.*

Addendum A

Report Amendment Log

Date	Reference No.	Revision Description	Revision By

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Photometric Test Report

IES ROAD REPORT
PHOTOMETRIC FILENAME : L092511811.IES

DESCRIPTIVE INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] L092511811
[TESTLAB] LIGHT LABORATORY, INC. (www.lightlaboratory.com)
[ISSUEDATE] 10/3/2025
[MANUFAC] FX Luminaire / Lumascape
[LUMCAT] TN-60-9LED-S-CW-FW
[LUMINAIRE] TN60, 9LED, 3000K, Cowling, Flat White
[BALLASTCAT] Custom
[OTHER] INDICATING THE CANDELA VALUES ARE ABSOLUTE AND
[MORE] SHOULD NOT BE FACTORED FOR DIFFERENT LAMP RATINGS.
[INPUT] 12 VAC
[TEST PROCEDURE] IESNA:LM-79-19

CHARACTERISTICS

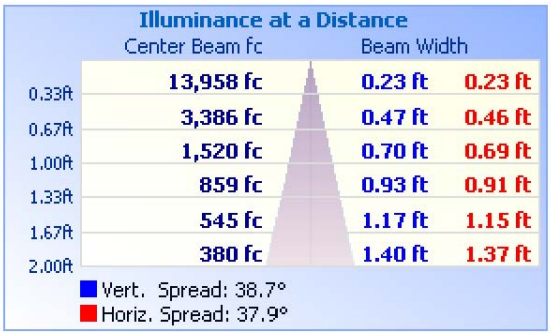
IES Classification	Type I
Longitudinal Classification	Very Short
Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	881
Downward Total Efficiency	N.A. (absolute)
Total Luminaire Efficiency	N.A. (absolute)
Luminaire Efficacy Rating (LER)	85
Total Luminaire Watts	10.37
Ballast Factor	1.00
Upward Waste Light Ratio	0.02
Maximum Candela	1520
Maximum Candela Angle	180H 0V
Maximum Candela (<90 Degrees Vertical)	1520
Maximum Candela Angle (<90 Degrees Vertical)	180H 0V
Maximum Candela At 90 Degrees Vertical	23 (2.6% Luminaire Lumens)
Maximum Candela from 80 to <90 Degrees Vertical	29 (3.3% Luminaire Lumens)
Cutoff Classification (deprecated)	N.A. (absolute)

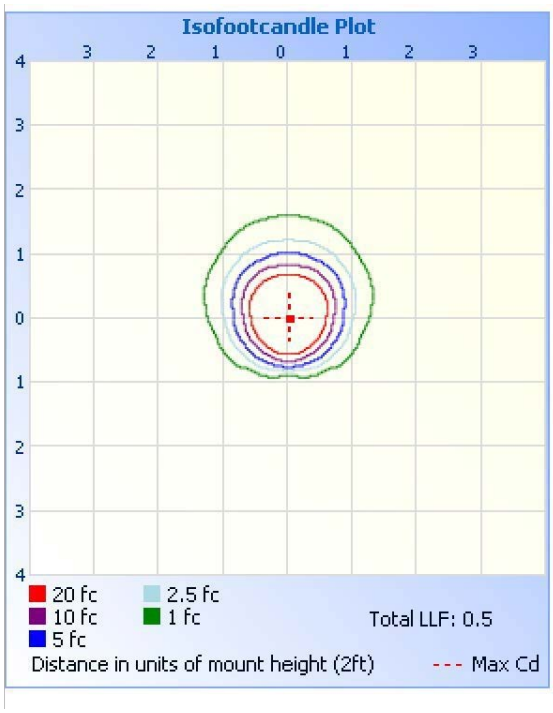
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Results derived from content of manufacturers photometric file.

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LUMINAIRE CLASSIFICATION SYSTEM (LCS)

	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	274.7	N.A.	31.2
FM - Front-Medium (30-60)	55.4	N.A.	6.3
FH - Front-High (60-80)	6.4	N.A.	0.7
FVH - Front-Very High (80-90)	0.8	N.A.	0.1
BL - Back-Low (0-30)	344.6	N.A.	39.1
BM - Back-Medium (30-60)	143.6	N.A.	16.3
BH - Back-High (60-80)	28.0	N.A.	3.2
BVH - Back-Very High (80-90)	9.7	N.A.	1.1
UL - Uplight-Low (90-100)	5.8	N.A.	0.7
UH - Uplight-High (100-180)	11.6	N.A.	1.3
Total	880.6	N.A.	100.0
BUG Rating	B1-U2-G0		





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CANDELA TABULATION

Vert. Angles	Horizontal Angles									
	0	**5**	**10**	**15**	**20**	**25**	**30**	**35**	**40**	**45**
0	1520	1520	1520	1520	1520	1520	1520	1520	1520	1520
5	1372	1375	1378	1384	1391	1392	1394	1398	1403	1406
10	1152	1153	1156	1162	1166	1169	1169	1174	1183	1188
15	844	843	845	849	856	863	869	881	891	898
20	578	578	579	581	585	590	593	602	610	616
25	346	347	347	348	348	346	339	336	335	334
30	208	207	205	197	190	183	181	180	181	181
35	103	102	100	98	98	99	101	104	107	109
40	23	23	27	32	39	46	50	52	54	56
45	10	10	11	12	13	15	17	19	22	27
50	7	8	8	8	10	11	12	14	15	17
55	6	6	6	7	8	8	10	11	13	14
60	4	4	4	5	6	6	7	8	10	11
65	2	2	3	3	4	4	5	6	7	8
70	1	1	1	1	1	2	2	3	4	5
75	1	1	1	0	1	1	1	1	2	2
80	1	1	1	1	1	1	1	1	1	1
85	1	1	1	1	1	1	1	1	1	1
90	1	1	1	1	1	1	1	1	1	1
95	1	1	1	1	1	1	1	1	1	1
100	1	1	1	1	1	1	1	1	1	1
105	1	1	1	1	1	1	1	1	1	1
110	1	1	1	1	1	1	1	1	1	1
115	1	1	1	1	1	1	1	1	1	1
120	1	1	1	1	1	1	1	1	1	1
125	1	1	1	1	1	1	1	1	1	1
130	1	1	1	1	1	1	1	1	1	1
135	2	2	2	2	2	2	2	2	2	2
140	3	3	3	3	3	3	3	3	2	3
145	4	4	4	4	4	4	4	4	4	4
150	5	5	5	5	5	5	5	5	5	5
155	6	6	6	6	6	6	6	6	6	6
160	7	7	7	7	7	7	7	7	7	7
165	7	7	7	7	7	7	7	7	7	7
170	7	7	7	7	7	7	7	7	7	7
175	7	7	7	7	7	7	7	7	7	7
180	7	7	7	7	7	7	7	7	7	7

Vert. Angles	Horizontal Angles									
	50	**55**	**60**	**65**	**70**	**75**	**80**	**85**	**90**	**95**
0	1520	1520	1520	1520	1520	1520	1520	1520	1520	1520
5	1406	1405	1409	1412	1417	1417	1419	1420	1424	1431
10	1189	1191	1197	1201	1205	1211	1217	1223	1230	1241
15	913	924	936	947	954	957	962	973	979	989
20	621	626	634	644	656	671	686	693	702	709
25	336	338	342	349	357	369	388	411	439	463
30	182	184	190	198	209	217	225	232	243	258
35	110	111	113	117	120	122	126	131	141	152
40	58	61	65	69	75	82	87	89	91	94
45	31	33	35	37	40	42	45	48	53	63
50	19	20	22	23	24	25	28	31	36	39
55	15	17	18	19	20	21	22	23	25	28

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CANDELA TABULATION - (Cont.)

60	12	13	15	16	17	18	19	20	21	23
65	10	11	12	13	14	15	16	18	19	20
70	5	6	8	10	11	12	13	15	16	18
75	3	3	4	5	6	7	10	11	13	14
80	1	2	2	2	3	4	5	6	8	11
85	1	1	1	1	1	1	2	2	4	6
90	1	1	1	1	1	1	1	1	1	1
95	1	1	1	1	1	1	1	1	0	1
100	1	1	1	1	1	1	1	1	1	1
105	1	1	1	1	1	1	1	1	0	1
110	1	1	1	1	1	1	1	1	1	1
115	1	1	1	1	1	1	1	1	1	1
120	1	1	1	1	1	1	1	1	1	1
125	1	1	1	1	1	1	1	1	1	1
130	1	1	1	1	1	1	1	1	1	1
135	2	2	2	2	1	1	1	1	1	1
140	2	2	2	2	2	2	2	2	2	2
145	4	4	4	4	4	3	3	3	3	3
150	5	5	5	5	5	5	5	5	5	5
155	6	6	6	6	6	6	6	6	6	6
160	7	7	7	7	7	7	6	7	7	6
165	7	7	7	7	7	7	7	7	7	7
170	7	7	7	7	7	7	7	7	7	7
175	7	7	7	7	7	7	7	7	7	7
180	7	7	7	7	7	7	7	7	7	7

Vert. Angles	**Horizontal Angles**									
	100	**105**	**110**	**115**	**120**	**125**	**130**	**135**	**140**	**145**
0	1520	1520	1520	1520	1520	1520	1520	1520	1520	1520
5	1442	1450	1461	1469	1472	1474	1478	1483	1487	1494
10	1253	1268	1277	1287	1294	1304	1310	1322	1323	1333
15	1002	1015	1029	1041	1049	1060	1070	1074	1079	1087
20	723	737	747	759	772	785	796	805	813	822
25	487	501	514	526	535	546	554	561	568	579
30	280	308	332	349	361	374	387	395	402	406
35	162	173	190	213	234	248	257	265	276	284
40	101	111	122	129	142	158	171	177	182	187
45	70	75	80	88	96	102	111	120	124	123
50	42	48	54	57	60	66	69	73	77	82
55	31	35	37	40	42	43	45	48	52	56
60	24	25	28	29	30	31	32	33	36	40
65	22	22	24	25	25	28	29	29	30	32
70	19	20	21	23	24	25	27	28	29	30
75	16	17	19	20	22	23	24	25	27	28
80	12	14	16	17	19	20	21	22	24	25
85	8	10	12	14	15	17	18	19	21	22
90	3	5	7	10	12	13	15	16	18	19
95	1	2	3	5	6	7	10	11	12	13
100	1	0	1	2	2	3	4	5	5	6
105	1	0	1	1	1	1	1	1	1	1
110	0	1	1	1	1	0	1	0	1	0
115	1	1	0	1	1	1	0	0	1	0
120	1	1	1	1	1	0	0	1	1	1
125	1	1	1	1	1	1	0	1	1	0
130	1	1	1	1	1	1	1	1	1	1

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CANDELA TABULATION - (Cont.)

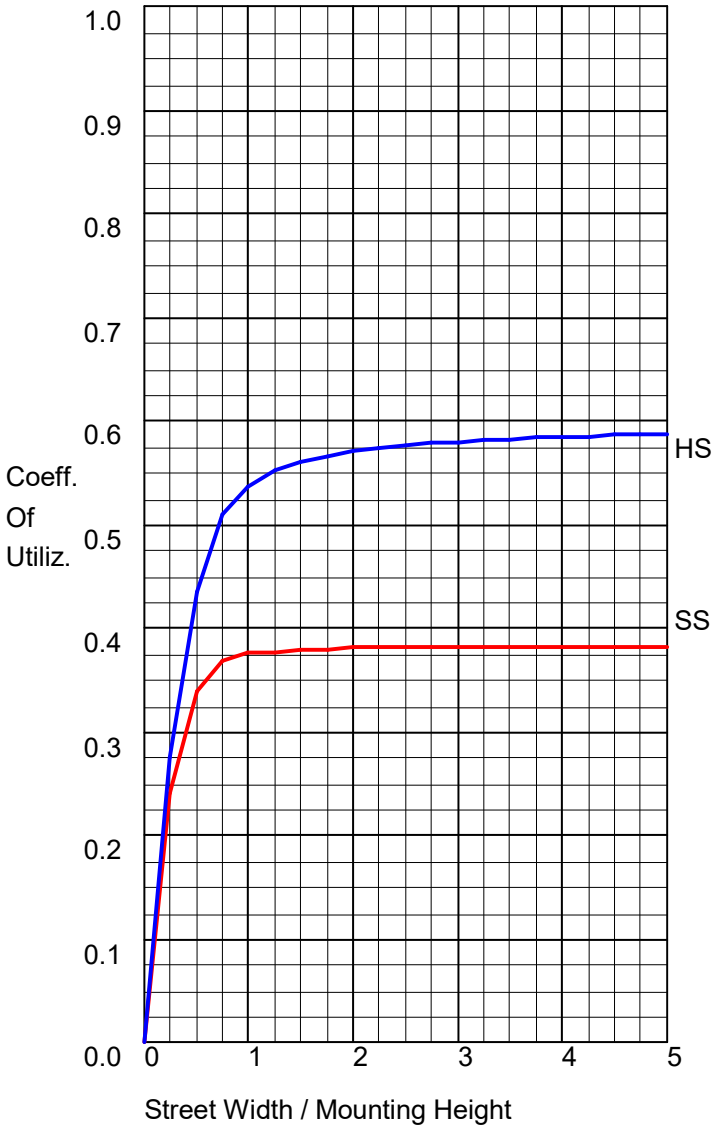
135	1	1	1	1	1	1	1	1	1	1
140	2	2	2	2	2	2	2	2	2	2
145	3	3	3	3	3	3	3	3	3	3
150	5	5	4	5	4	4	4	4	5	4
155	6	6	6	5	5	5	5	5	5	5
160	6	6	7	6	6	6	6	6	6	6
165	7	7	7	7	7	7	7	7	7	7
170	7	7	7	7	7	7	7	7	7	7
175	7	7	7	7	7	7	7	7	7	7
180	7	7	7	7	7	7	7	7	7	7

Vert. Angles	**Horizontal Angles**						
	150	**155**	**160**	**165**	**170**	**175**	**180**
0	1520	1520	1520	1520	1520	1520	1520
5	1497	1500	1503	1496	1496	1490	1485
10	1341	1344	1345	1343	1341	1338	1333
15	1096	1101	1109	1112	1113	1109	1106
20	830	837	843	849	855	856	856
25	588	599	606	614	621	625	625
30	411	419	423	427	430	434	435
35	290	294	294	293	290	287	286
40	192	194	191	188	184	183	183
45	121	120	121	123	125	127	128
50	85	86	87	86	85	84	84
55	59	61	63	63	61	63	63
60	43	46	47	48	49	50	50
65	33	35	37	38	39	39	39
70	30	32	32	33	34	34	34
75	29	29	30	31	31	31	31
80	25	27	28	28	29	29	29
85	23	23	24	24	25	25	25
90	20	21	21	22	22	22	23
95	14	15	16	16	17	17	17
100	7	8	8	10	10	10	10
105	2	2	2	2	3	3	3
110	0	0	0	0	0	1	1
115	0	1	0	0	0	0	1
120	1	0	0	0	0	0	1
125	0	0	0	0	1	1	1
130	1	1	1	1	1	1	1
135	1	1	1	1	1	1	1
140	2	2	2	2	2	2	2
145	3	3	3	3	3	3	3
150	4	4	4	4	4	4	4
155	5	5	5	5	5	5	5
160	6	6	6	6	6	6	6
165	7	7	7	7	7	7	6
170	7	7	7	7	7	7	7
175	7	7	7	7	7	7	7
180	7	7	7	7	7	7	7

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COEFFICIENTS OF UTILIZATION



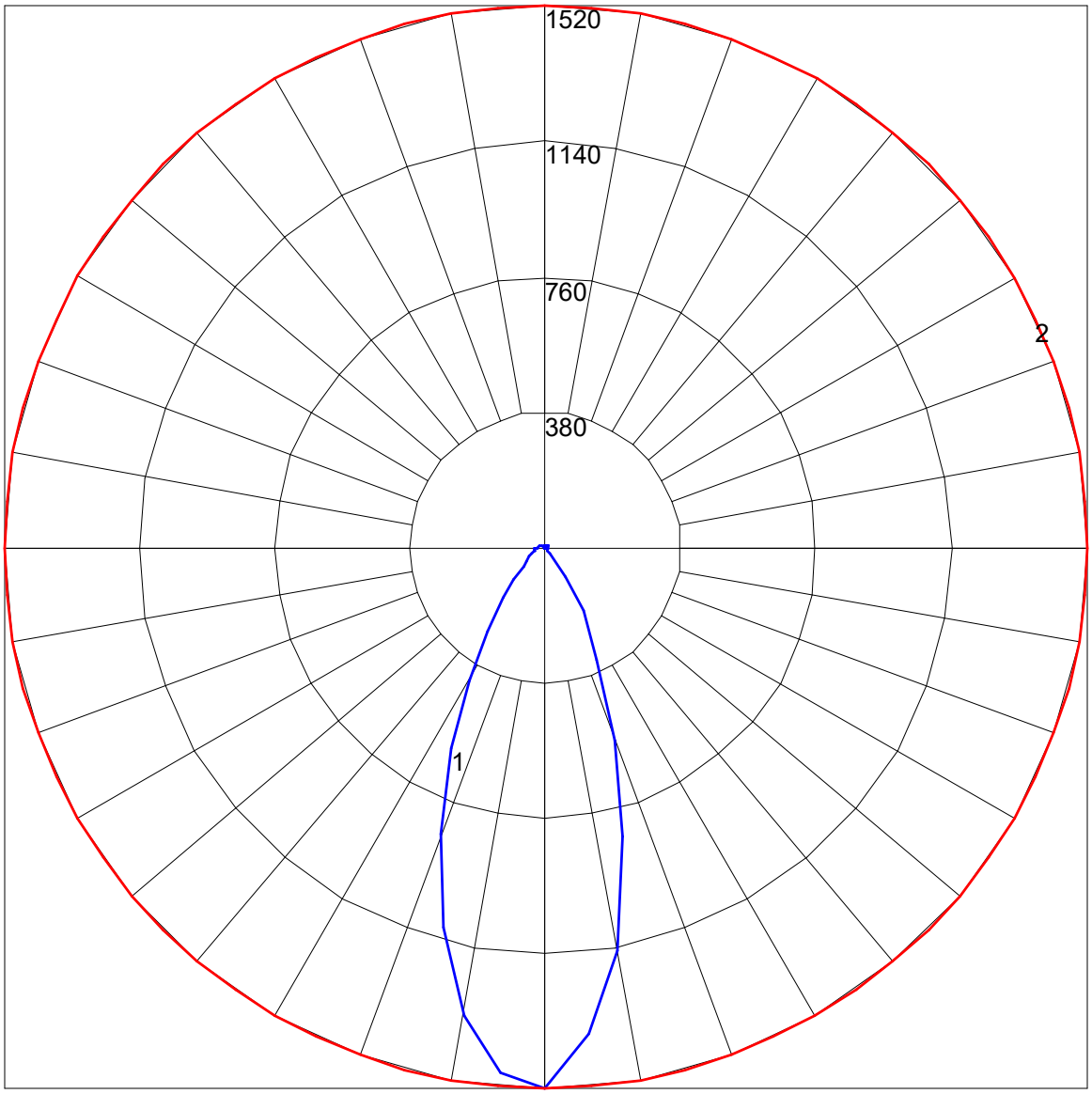
FLUX DISTRIBUTION

	Lumens	Percent Of Luminaire
Downward Street Side	337.2	38.3
Downward House Side	525.9	59.7
Downward Total	863.1	98.0
Upward Street Side	6.5	0.7
Upward House Side	10.9	1.2
Upward Total	17.4	2.0
Total Flux	880.5	100.0

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POLAR GRAPH

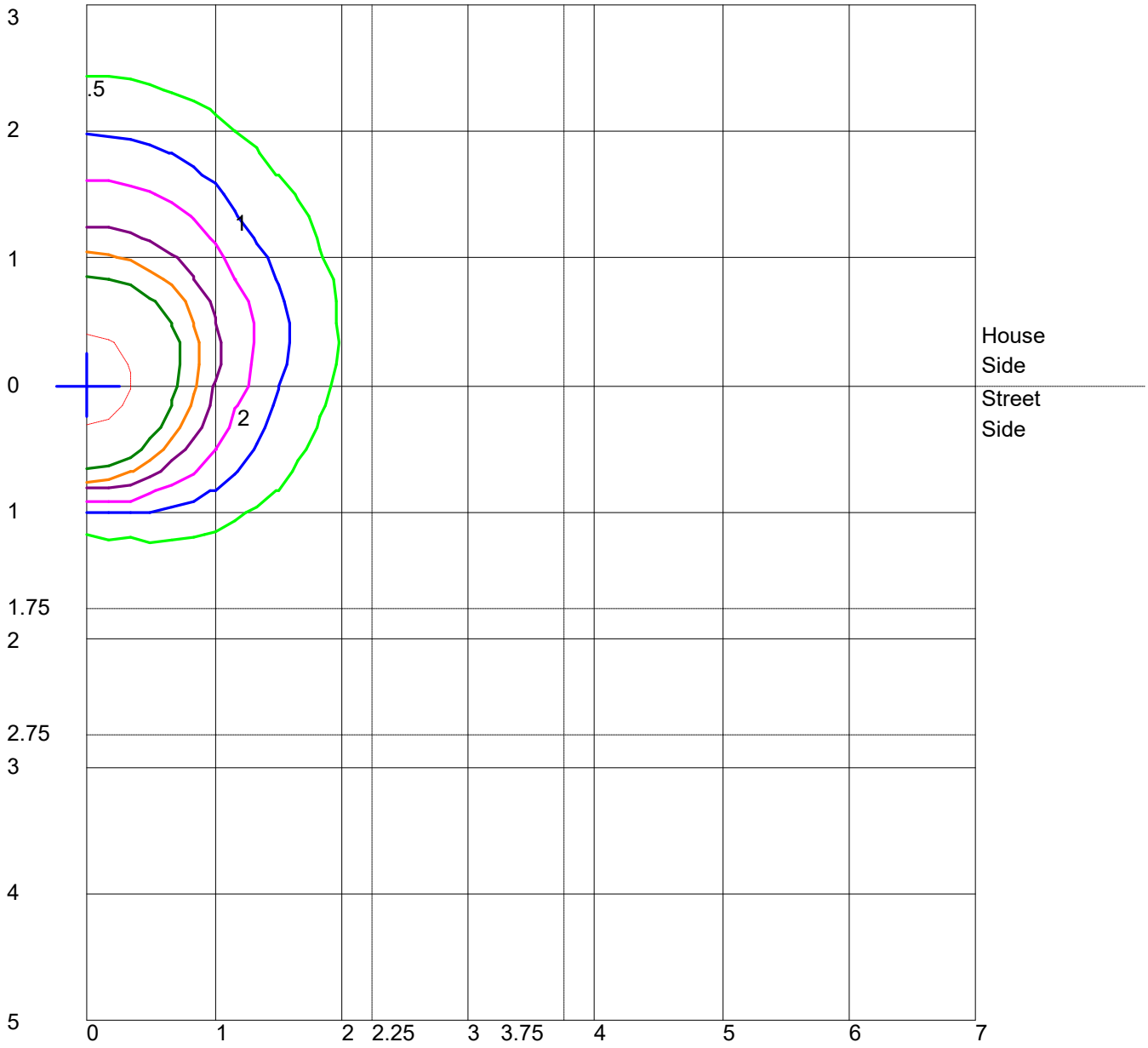


Maximum Candela = 1520 Located At Horizontal Angle = 180, Vertical Angle = 0
1 - Vertical Plane Through Horizontal Angles (180 - 0) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (0) (Through Max. Cd.)

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ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINANCE



Distance In Units Of Mounting Height

Values Based On 2 Foot Mounting Height

1/2 Maximum Candela Trace Shown As Dashed Curve

(+) = Maximum Candela Point