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

NVLAP TESTING
NVLAP LAB CODE 200927-0

Report No: L092511820 **Issue Date: 10/8/2025**
Amendment: N/A **Revision Date: N/A**

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

Model Number: TG-60-9LED-S-180-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: 9/30/25

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:	TG-60-9LED-S-180-FW
Driver Model Number:	Custom

Test Summary	
Total Lumens:	87.00
Efficacy:	9.33
Color Redering Index:	84.7
Correlated Color Temperature:	2981
Input Voltage (VAC/60Hz):	12.03
Input Current (Amp):	0.8380
Input Power (W):	9.32
Input Power Factor:	0.9244
Current ATHD (%):	38.4%

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

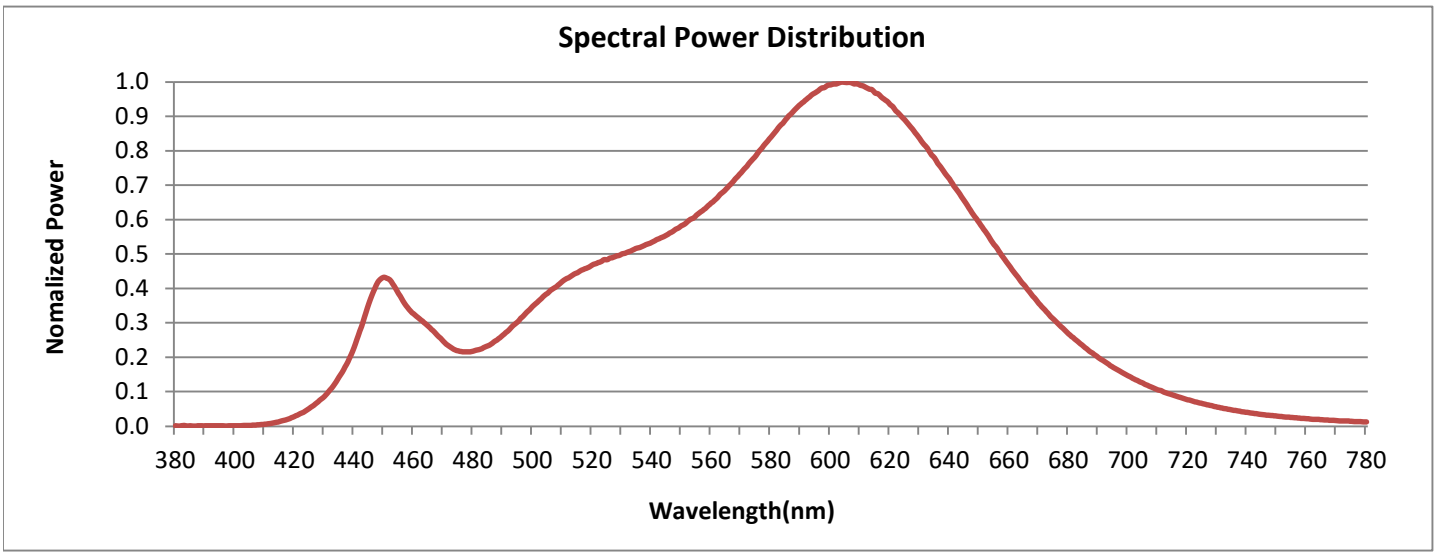


FIG. 1 LUMINAIRE

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Colorimetry Test Results

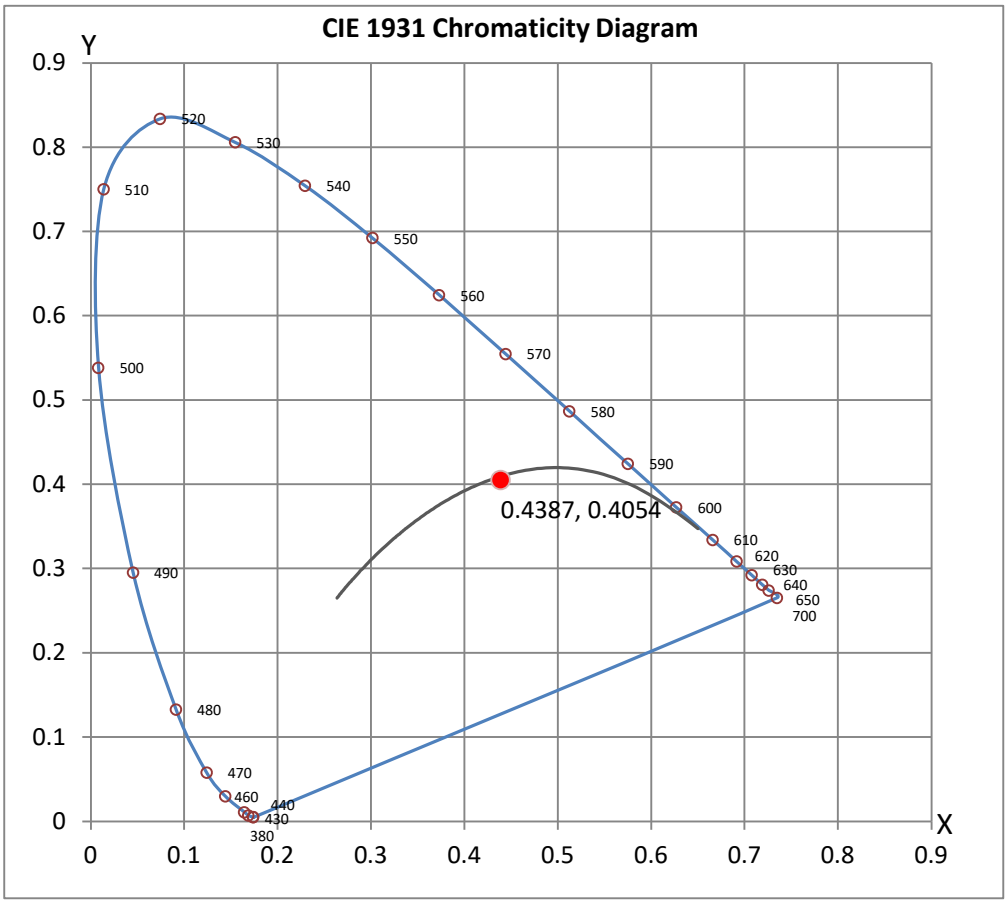


CRI & CCT

x	0.4387
y	0.4054
u'	0.2511
v'	0.5222
CRI	84.70
CCT	2981
Duv	0.00029

R Values

R1	83.51
R2	92.90
R3	95.80
R4	83.95
R5	84.76
R6	93.09
R7	82.97
R8	60.73
R9	12.84
R10	84.51
R11	84.77
R12	79.21
R13	85.87
R14	98.34
R15	75.35



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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 : L092511820.IES

DESCRIPTIVE INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] L092511820
[TESTLAB] LIGHT LABORATORY, INC. (www.lightlaboratory.com)
[ISSUEDATE] 10/8/2025
[MANUFAC] FX Luminaire / Lumascape
[LUMCAT] TG-60-9LED-S-180-FW
[LUMINAIRE] TG60, 9LED, 3000K, 180Â°, 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	N.A.
Longitudinal Classification	N.A.
Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	87
Downward Total Efficiency	N.A. (absolute)
Total Luminaire Efficiency	N.A. (absolute)
Luminaire Efficacy Rating (LER)	9
Total Luminaire Watts	9.32
Ballast Factor	1.00
Upward Waste Light Ratio	0.76
Maximum Candela	16.56
Maximum Candela Angle	90H 90V
Maximum Candela (<90 Degrees Vertical)	13.74
Maximum Candela Angle (<90 Degrees Vertical)	90H 85V
Maximum Candela At 90 Degrees Vertical	16.56 (19.0% Luminaire Lumens)
Maximum Candela from 80 to <90 Degrees Vertical	13.74 (15.8% 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)	0.2	N.A.	0.2
FM - Front-Medium (30-60)	0.5	N.A.	0.5
FH - Front-High (60-80)	3.2	N.A.	3.7
FVH - Front-Very High (80-90)	6.7	N.A.	7.7
BL - Back-Low (0-30)	0.2	N.A.	0.2
BM - Back-Medium (30-60)	0.5	N.A.	0.5
BH - Back-High (60-80)	3.2	N.A.	3.7
BVH - Back-Very High (80-90)	6.7	N.A.	7.7
UL - Uplight-Low (90-100)	15.8	N.A.	18.2
UH - Uplight-High (100-180)	50.0	N.A.	57.5
Total	87.0	N.A.	100.0
BUG Rating	B0-U3-G0		

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CANDELA TABULATION

Vert. Angles	Horizontal Angles									
	0	**5**	**10**	**15**	**20**	**25**	**30**	**35**	**40**	**45**
0	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39
5	0.43	0.43	0.47	0.43	0.43	0.43	0.40	0.40	0.36	0.33
10	0.36	0.51	0.36	0.33	0.36	0.29	0.36	0.36	0.43	0.43
15	0.29	0.40	0.40	0.43	0.29	0.43	0.40	0.40	0.40	0.36
20	0.43	0.33	0.43	0.36	0.36	0.40	0.40	0.43	0.40	0.40
25	0.43	0.29	0.29	0.40	0.36	0.33	0.33	0.40	0.36	0.40
30	0.58	0.33	0.33	0.33	0.36	0.36	0.33	0.40	0.33	0.43
35	0.29	0.33	0.33	0.40	0.36	0.43	0.25	0.33	0.33	0.40
40	0.43	0.51	0.36	0.40	0.40	0.36	0.43	0.29	0.36	0.29
45	0.43	0.40	0.33	0.29	0.40	0.33	0.36	0.29	0.40	0.43
50	0.51	0.47	0.36	0.40	0.47	0.33	0.43	0.47	0.33	0.40
55	0.51	0.40	0.43	0.43	0.47	0.43	0.43	0.47	0.43	0.36
60	0.51	0.43	0.47	0.51	0.40	0.51	0.43	0.51	0.51	0.43
65	1.23	1.16	1.16	1.08	1.05	1.05	1.01	0.98	0.72	0.90
70	2.75	2.60	2.49	2.42	2.39	2.39	2.35	2.28	2.10	1.99
75	4.70	4.77	4.84	4.77	4.66	4.70	4.77	4.70	4.66	4.59
80	8.53	8.53	8.39	8.46	8.71	8.68	8.60	8.46	8.46	8.42
85	13.52	13.41	13.34	13.41	13.12	13.20	12.83	12.36	12.33	12.33
90	16.05	16.09	16.05	15.94	15.83	15.51	14.93	14.32	13.59	13.59
95	15.47	15.54	15.65	15.69	15.65	15.29	14.39	13.59	12.62	12.58
100	13.38	13.34	13.56	13.52	13.59	13.30	12.83	12.00	11.46	11.35
105	11.21	11.03	11.14	11.14	11.21	11.14	10.99	10.66	10.48	10.41
110	10.34	10.30	10.45	10.41	10.45	10.45	10.30	10.30	10.12	10.27
115	10.99	11.03	11.10	11.03	10.92	10.66	10.56	10.48	10.56	10.63
120	11.64	11.64	11.68	11.53	11.35	11.14	10.88	10.70	10.66	10.66
125	10.92	10.88	10.70	10.74	10.52	10.23	10.12	9.76	9.65	9.51
130	8.39	8.46	8.39	8.57	8.50	8.53	8.68	8.71	8.71	8.68
135	8.24	8.24	8.31	8.31	8.24	8.42	8.28	8.35	8.39	8.39
140	7.81	8.13	8.13	8.10	8.17	8.17	8.17	8.28	8.17	8.13
145	7.81	8.06	8.06	7.99	7.99	7.95	8.13	8.03	8.17	8.10
150	7.95	7.88	7.95	7.92	7.95	7.88	7.95	7.95	7.95	7.99
155	7.88	7.88	7.85	7.99	7.95	7.95	7.92	7.95	7.88	7.99
160	7.95	7.85	7.85	7.99	7.92	7.95	7.81	7.88	7.92	7.95
165	7.81	7.81	7.88	7.99	7.85	7.88	7.92	7.85	7.92	7.88
170	8.10	7.88	7.99	7.81	7.95	7.85	7.92	7.92	7.85	7.99
175	7.81	7.92	7.74	7.81	7.81	7.92	7.92	7.88	7.95	7.85
180	7.89	7.89	7.89	7.89	7.89	7.89	7.89	7.89	7.89	7.89

Vert. Angles	Horizontal Angles								
	50	**55**	**60**	**65**	**70**	**75**	**80**	**85**	**90**
0	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39
5	0.47	0.40	0.36	0.29	0.43	0.33	0.40	0.43	0.36
10	0.33	0.36	0.40	0.47	0.36	0.40	0.47	0.36	0.29
15	0.43	0.29	0.43	0.33	0.40	0.47	0.36	0.36	0.36
20	0.36	0.33	0.47	0.40	0.40	0.33	0.43	0.40	0.36
25	0.43	0.29	0.36	0.29	0.29	0.36	0.36	0.43	0.43
30	0.43	0.33	0.29	0.40	0.36	0.33	0.40	0.43	0.51
35	0.40	0.36	0.40	0.36	0.33	0.36	0.25	0.36	0.51
40	0.47	0.43	0.36	0.40	0.36	0.33	0.43	0.40	0.36
45	0.40	0.36	0.40	0.33	0.43	0.36	0.43	0.36	0.29
50	0.36	0.36	0.40	0.36	0.40	0.40	0.47	0.33	0.36
55	0.40	0.43	0.47	0.47	0.29	0.43	0.47	0.43	0.36

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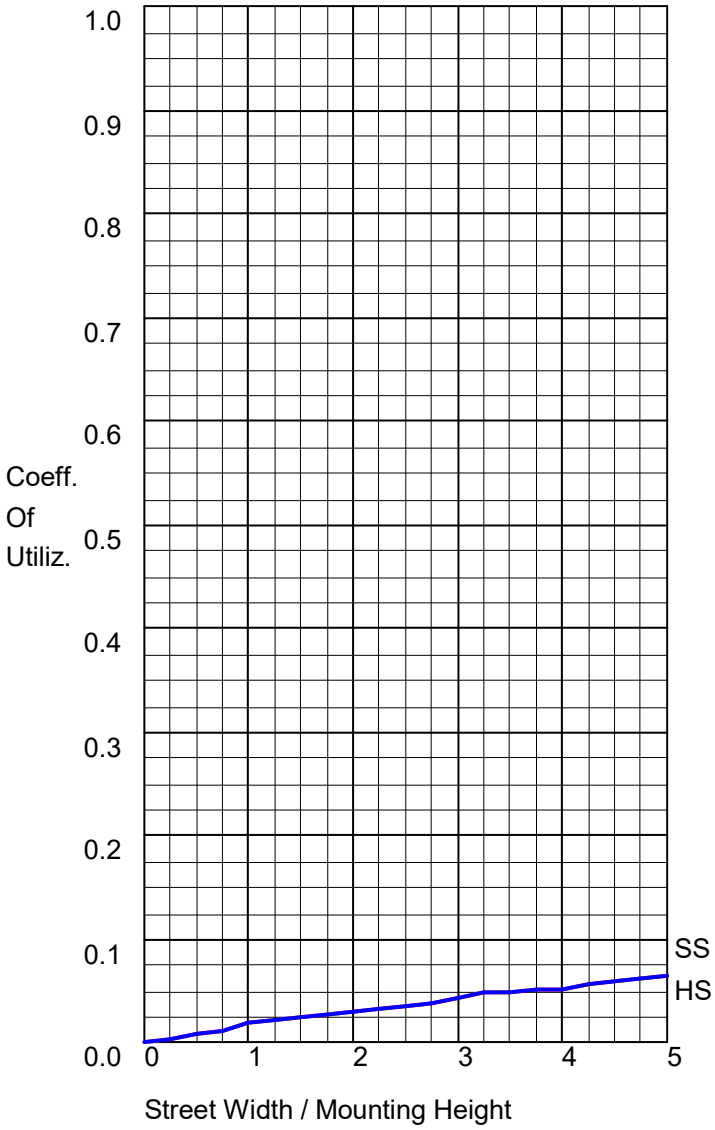
CANDELA TABULATION - (Cont.)

60	0.54	0.33	0.36	0.51	0.43	0.51	0.54	0.43	0.58
65	0.94	0.90	0.83	0.90	0.98	1.01	1.01	1.16	1.08
70	1.99	1.92	1.99	2.10	2.06	2.28	2.31	2.46	2.39
75	4.48	4.27	4.30	4.05	4.30	4.27	4.30	4.52	4.63
80	8.17	7.85	7.81	7.85	7.88	7.92	8.06	8.17	8.24
85	12.29	12.29	12.40	12.44	12.47	12.69	13.27	13.52	13.74
90	13.67	14.28	15.11	15.69	16.12	16.20	16.20	16.45	16.56
95	12.80	13.67	14.64	15.54	15.87	15.91	15.87	15.80	15.98
100	11.57	12.22	12.87	13.48	13.74	13.81	13.67	13.59	13.52
105	10.38	10.74	10.95	11.21	11.24	11.24	11.14	11.17	11.14
110	10.30	10.30	10.34	10.41	10.41	10.41	10.30	10.38	10.27
115	10.41	10.59	10.59	10.88	10.95	11.03	11.06	11.10	11.06
120	10.70	10.85	10.99	11.17	11.53	11.79	12.00	12.00	12.07
125	9.72	9.98	10.20	10.63	10.77	11.10	11.10	11.24	11.21
130	8.60	8.75	8.68	8.53	8.64	8.53	8.60	8.68	8.68
135	8.46	8.28	8.28	8.24	8.31	8.28	8.39	8.24	8.24
140	8.21	8.21	8.24	8.13	8.06	8.06	8.10	8.06	8.10
145	8.06	8.03	7.99	8.03	8.03	7.95	7.95	7.92	8.03
150	7.95	8.03	7.88	7.95	7.95	7.92	7.88	7.88	7.95
155	7.99	7.88	7.92	7.92	7.92	7.95	7.85	7.88	7.81
160	7.92	7.88	7.95	7.92	7.92	7.85	7.99	7.77	8.03
165	7.95	7.81	7.92	7.95	7.85	7.81	7.81	7.92	7.81
170	7.88	7.81	7.88	7.92	7.81	7.88	7.88	7.77	7.81
175	7.88	7.81	7.88	7.81	7.77	7.92	7.81	7.92	7.81
180	7.89	7.89	7.89	7.89	7.89	7.89	7.89	7.89	7.89

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COEFFICIENTS OF UTILIZATION



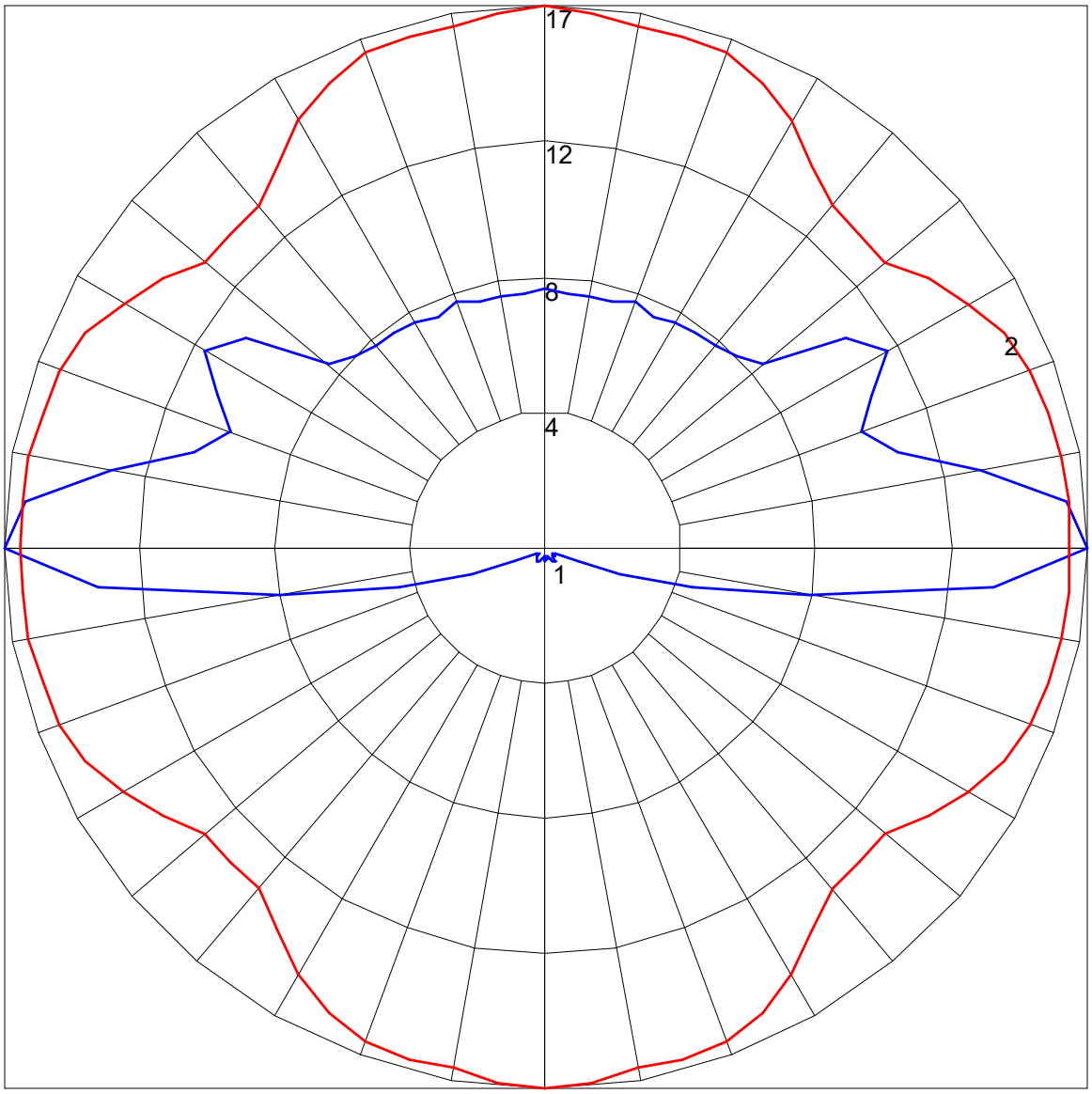
FLUX DISTRIBUTION

	Lumens	Percent Of Luminaire
Downward Street Side	10.5	12.1
Downward House Side	10.5	12.1
Downward Total	21.0	24.2
Upward Street Side	32.9	37.9
Upward House Side	32.9	37.9
Upward Total	65.8	75.7
Total Flux	86.8	99.9

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POLAR GRAPH

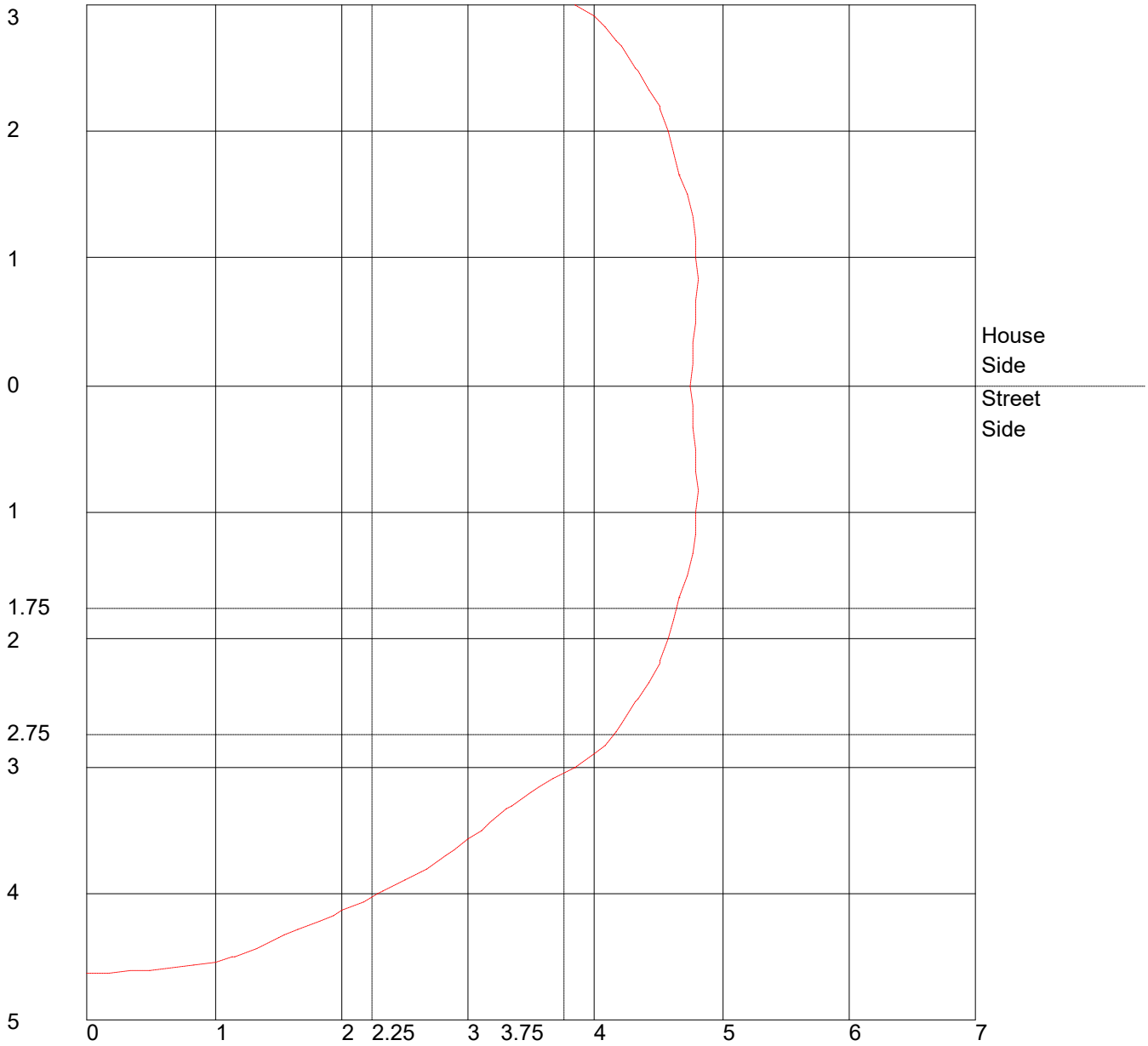


Maximum Candela = 16.56 Located At Horizontal Angle = 90, Vertical Angle = 90
1 - Vertical Plane Through Horizontal Angles (90 - 270) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (90) (Through Max. Cd.)

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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

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