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

NVLAP TESTING
NVLAP LAB CODE 200927-0

Report No: L092511814 **Issue Date: 10/6/2025**
Amendment: N/A **Revision Date: N/A**

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

Model Number: TN-60-ZDC-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: 9/29/25

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

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

Test Summary	
Total Lumens:	494.00
Efficacy:	52.64
Color Redering Index:	37.9
Correlated Color Temperature:	5692
Input Voltage (VAC/60Hz):	12.06
Input Current (Amp):	1.0523
Input Power (W):	9.38
Input Power Factor:	0.7394
Current ATHD (%):	23.5%

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

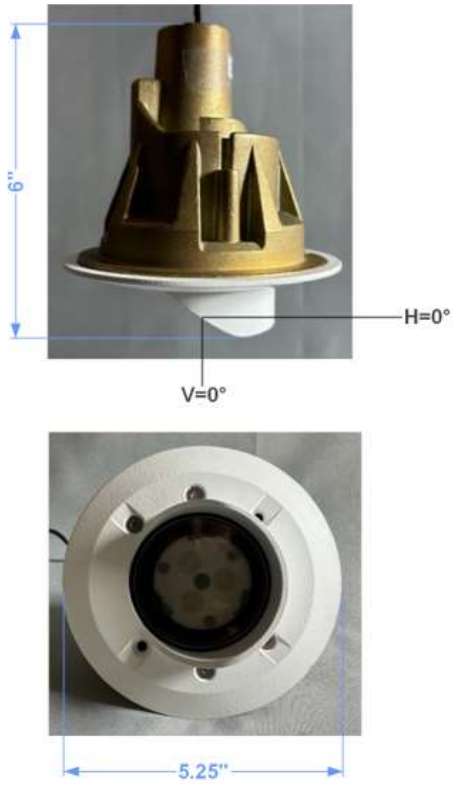


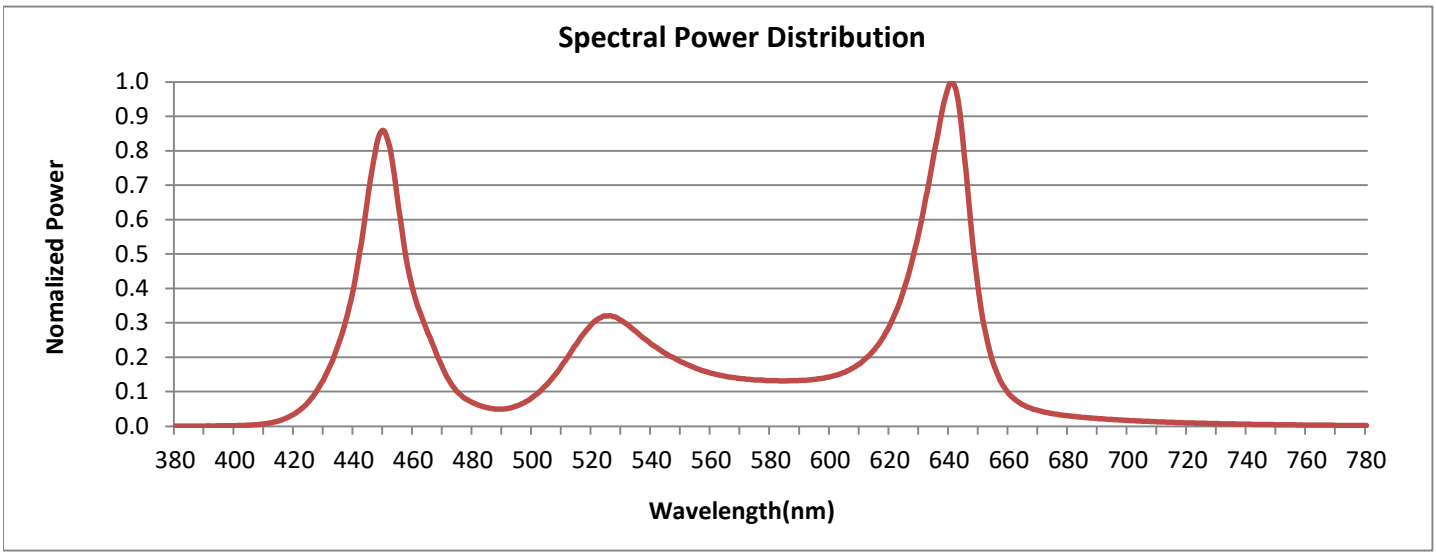
FIG. 1 LUMINAIRE

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Colorimetry Test Results

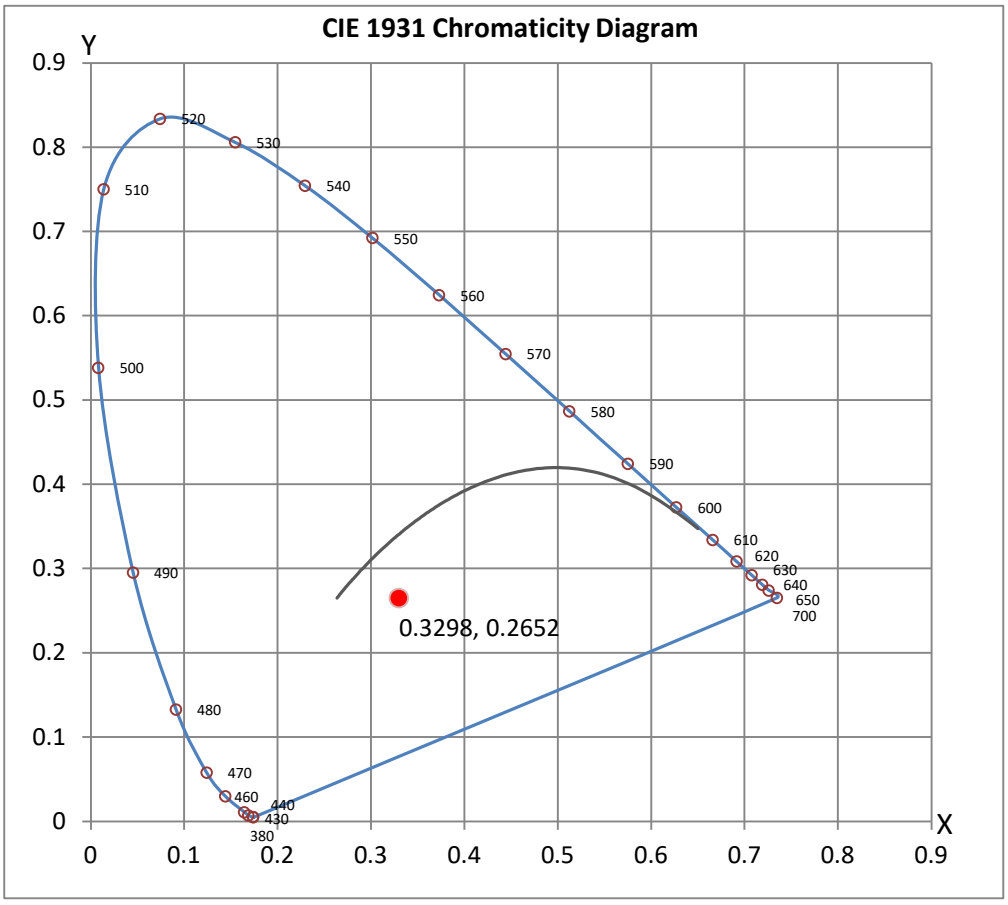


CRI & CCT

x	0.3298
y	0.2652
u'	0.2389
v'	0.4322
CRI	37.90
CCT	5692
Duv	-0.04399

R Values

R1	24.69
R2	70.35
R3	53.18
R4	17.82
R5	34.02
R6	69.65
R7	56.49
R8	-23.15
R9	-184.92
R10	53.06
R11	3.52
R12	67.66
R13	34.18
R14	67.02
R15	-3.37



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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 : L092511814.IES

DESCRIPTIVE INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] L092511814
[TESTLAB] LIGHT LABORATORY, INC. (www.lightlaboratory.com)
[ISSUEDATE] 10/3/2025
[MANUFAC] FX Luminaire / Lumascape
[LUMCAT] TN-60-ZDC-CW-FW
[LUMINAIRE] TN60, ZDC, 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

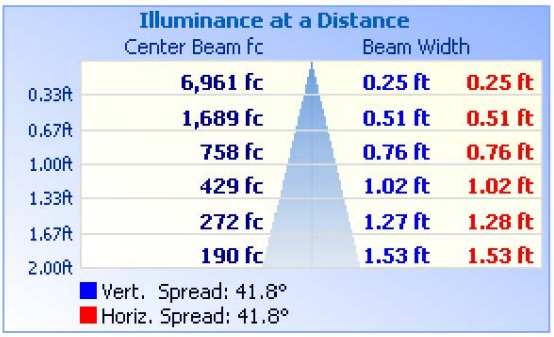
IES Classification	Type I
Longitudinal Classification	Very Short
Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	494
Downward Total Efficiency	N.A. (absolute)
Total Luminaire Efficiency	N.A. (absolute)
Luminaire Efficacy Rating (LER)	53
Total Luminaire Watts	9.38
Ballast Factor	1.00
Upward Waste Light Ratio	0.02
Maximum Candela	758
Maximum Candela Angle	180H 0V
Maximum Candela (<90 Degrees Vertical)	758
Maximum Candela Angle (<90 Degrees Vertical)	180H 0V
Maximum Candela At 90 Degrees Vertical	14 (2.8% Luminaire Lumens)
Maximum Candela from 80 to <90 Degrees Vertical	17 (3.4% Luminaire Lumens)
Cutoff Classification (deprecated)	N.A. (absolute)

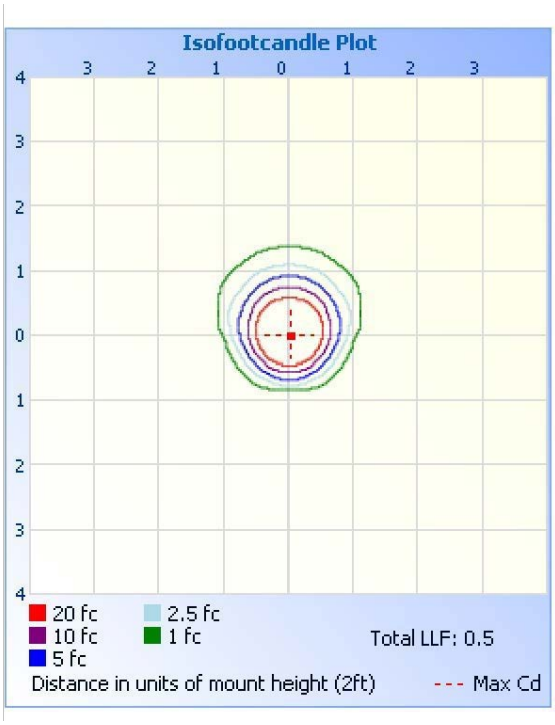
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LUMINAIRE CLASSIFICATION SYSTEM (LCS)

	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	149.0	N.A.	30.2
FM - Front-Medium (30-60)	30.7	N.A.	6.2
FH - Front-High (60-80)	3.8	N.A.	0.8
FVH - Front-Very High (80-90)	0.6	N.A.	0.1
BL - Back-Low (0-30)	187.9	N.A.	38.1
BM - Back-Medium (30-60)	89.1	N.A.	18.0
BH - Back-High (60-80)	16.5	N.A.	3.3
BVH - Back-Very High (80-90)	6.0	N.A.	1.2
UL - Uplight-Low (90-100)	3.5	N.A.	0.7
UH - Uplight-High (100-180)	6.7	N.A.	1.4
Total	493.8	N.A.	100.0
BUG Rating	B1-U1-G0		





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CANDELA TABULATION

Vert. Angles	Horizontal Angles									
	0	**5**	**10**	**15**	**20**	**25**	**30**	**35**	**40**	**45**
0	758	758	758	758	758	758	758	758	758	758
5	691	690	691	694	695	701	703	705	707	708
10	585	585	585	586	589	595	596	598	605	607
15	462	461	461	463	467	471	472	477	480	484
20	318	318	318	320	324	329	332	336	341	346
25	184	184	184	183	183	186	189	194	200	207
30	94	95	98	102	104	107	108	110	110	110
35	55	55	54	53	52	51	51	53	56	59
40	15	15	17	18	20	22	24	25	27	28
45	7	7	7	8	8	8	10	10	11	11
50	6	6	6	6	6	7	7	8	8	8
55	5	5	5	5	5	6	6	6	7	7
60	3	3	3	3	4	4	5	5	6	6
65	2	2	2	2	3	3	3	4	4	5
70	0	1	1	1	1	1	1	2	2	3
75	1	0	1	1	0	0	1	1	1	1
80	1	0	1	1	1	1	0	0	1	1
85	1	1	1	1	1	1	0	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	0	1	1
120	1	1	1	1	1	1	1	0	1	1
125	1	1	1	0	1	1	1	1	0	1
130	1	1	1	1	1	1	1	1	1	1
135	1	1	1	1	1	1	1	1	1	1
140	2	2	2	2	2	1	2	1	2	2
145	2	2	2	2	2	2	2	2	2	2
150	3	3	3	3	3	3	3	3	3	3
155	3	3	3	3	3	3	3	3	3	3
160	4	4	4	4	4	4	4	4	4	4
165	4	4	4	4	4	4	4	4	4	4
170	4	4	4	4	4	4	4	4	4	4
175	4	4	4	4	4	4	4	4	4	4
180	4	4	4	4	4	4	4	4	4	4

Vert. Angles	Horizontal Angles									
	50	**55**	**60**	**65**	**70**	**75**	**80**	**85**	**90**	**95**
0	758	758	758	758	758	758	758	758	758	758
5	711	714	718	719	717	714	714	718	724	723
10	610	615	620	624	623	625	629	632	636	640
15	491	494	498	502	506	508	512	518	526	530
20	349	355	360	365	371	378	388	398	406	412
25	211	214	217	220	226	230	237	247	257	270
30	112	116	122	129	136	142	147	151	157	163
35	61	64	67	69	72	76	83	90	96	103
40	28	29	29	31	35	39	46	52	58	64
45	12	12	13	14	15	16	18	20	24	31
50	10	11	11	12	13	13	14	15	16	17
55	8	10	10	11	12	12	13	13	14	15

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CANDELA TABULATION - (Cont.)

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

Vert. Angles	**Horizontal Angles**									
	100	**105**	**110**	**115**	**120**	**125**	**130**	**135**	**140**	**145**
0	758	758	758	758	758	758	758	758	758	758
5	727	732	737	739	739	737	737	739	742	743
10	644	651	658	663	663	661	666	670	674	677
15	535	542	548	550	553	554	558	560	565	570
20	420	426	429	432	435	437	440	445	449	455
25	283	296	310	318	325	330	336	341	347	350
30	172	180	192	205	219	230	237	247	255	262
35	107	112	118	124	131	142	154	161	170	177
40	71	80	84	86	89	92	98	105	110	112
45	40	48	54	61	65	65	64	65	68	74
50	19	22	28	33	37	42	45	46	47	49
55	16	17	18	19	22	27	30	33	33	32
60	14	15	16	16	17	18	19	20	23	24
65	13	14	15	15	16	17	17	18	18	19
70	12	13	13	14	15	16	16	17	17	18
75	10	11	12	13	13	14	15	16	16	17
80	7	8	10	11	12	13	13	14	15	15
85	5	6	7	8	10	11	12	12	13	14
90	2	4	4	6	7	7	8	10	11	12
95	1	2	2	3	4	5	5	6	6	7
100	0	0	1	1	2	2	2	3	3	3
105	0	0	0	0	1	1	1	1	1	1
110	0	0	0	0	0	0	0	0	0	0
115	0	0	1	1	1	1	0	0	0	0
120	0	0	0	0	0	0	0	0	0	0
125	0	0	1	0	0	0	0	0	0	0
130	0	0	1	1	1	0	0	0	1	1

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CANDELA TABULATION - (Cont.)

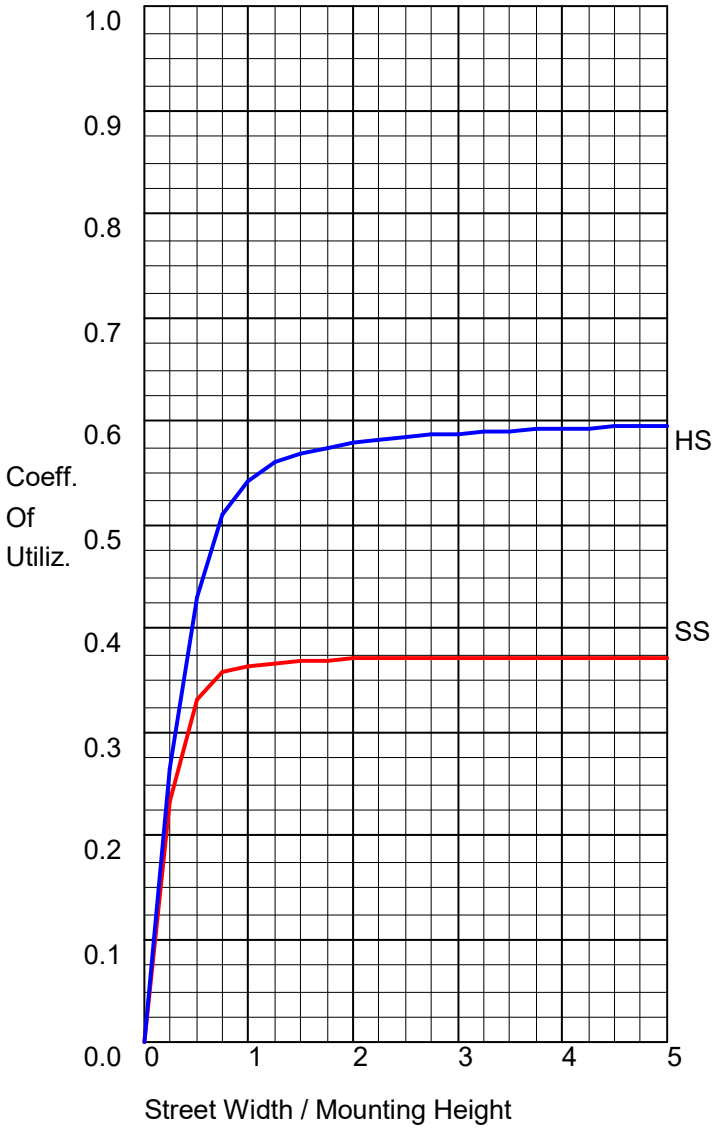
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150	3	2	2	2	2	2	2	2	2	2
155	3	3	3	3	3	3	3	3	3	3
160	3	4	3	3	3	3	3	3	3	3
165	4	4	4	4	4	4	4	4	4	4
170	4	4	4	4	4	4	4	4	4	4
175	4	4	4	4	4	4	4	4	4	4
180	4	4	4	4	4	4	4	4	4	4

Vert. Angles	**Horizontal Angles**						
	150	**155**	**160**	**165**	**170**	**175**	**180**
0	758	758	758	758	758	758	758
5	746	747	745	743	741	740	742
10	681	682	682	681	679	678	678
15	575	578	579	580	580	578	577
20	459	460	460	461	462	463	461
25	352	353	355	353	354	356	356
30	263	265	265	266	267	267	268
35	184	187	188	187	186	186	187
40	116	120	123	125	127	127	128
45	76	78	82	84	87	88	88
50	53	56	56	55	54	53	53
55	33	34	37	38	38	39	39
60	25	25	25	25	25	25	25
65	19	20	20	20	20	20	20
70	18	18	19	19	19	19	19
75	17	18	18	18	18	18	18
80	16	16	17	17	17	17	17
85	14	15	15	15	15	15	15
90	12	13	13	13	14	14	14
95	7	8	8	8	10	10	10
100	4	4	4	4	5	4	5
105	1	1	1	1	1	2	2
110	0	0	0	0	0	1	1
115	0	0	0	0	0	0	0
120	0	0	0	0	0	0	1
125	0	0	0	0	0	0	0
130	0	0	0	0	0	0	1
135	1	1	1	1	1	1	1
140	1	1	1	1	1	1	1
145	2	2	2	2	2	2	2
150	3	2	2	2	2	2	2
155	3	3	3	3	3	3	3
160	4	3	3	3	3	3	3
165	4	4	4	4	4	4	4
170	4	4	4	4	4	4	4
175	4	4	4	4	4	4	4
180	4	4	4	4	4	4	4

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COEFFICIENTS OF UTILIZATION



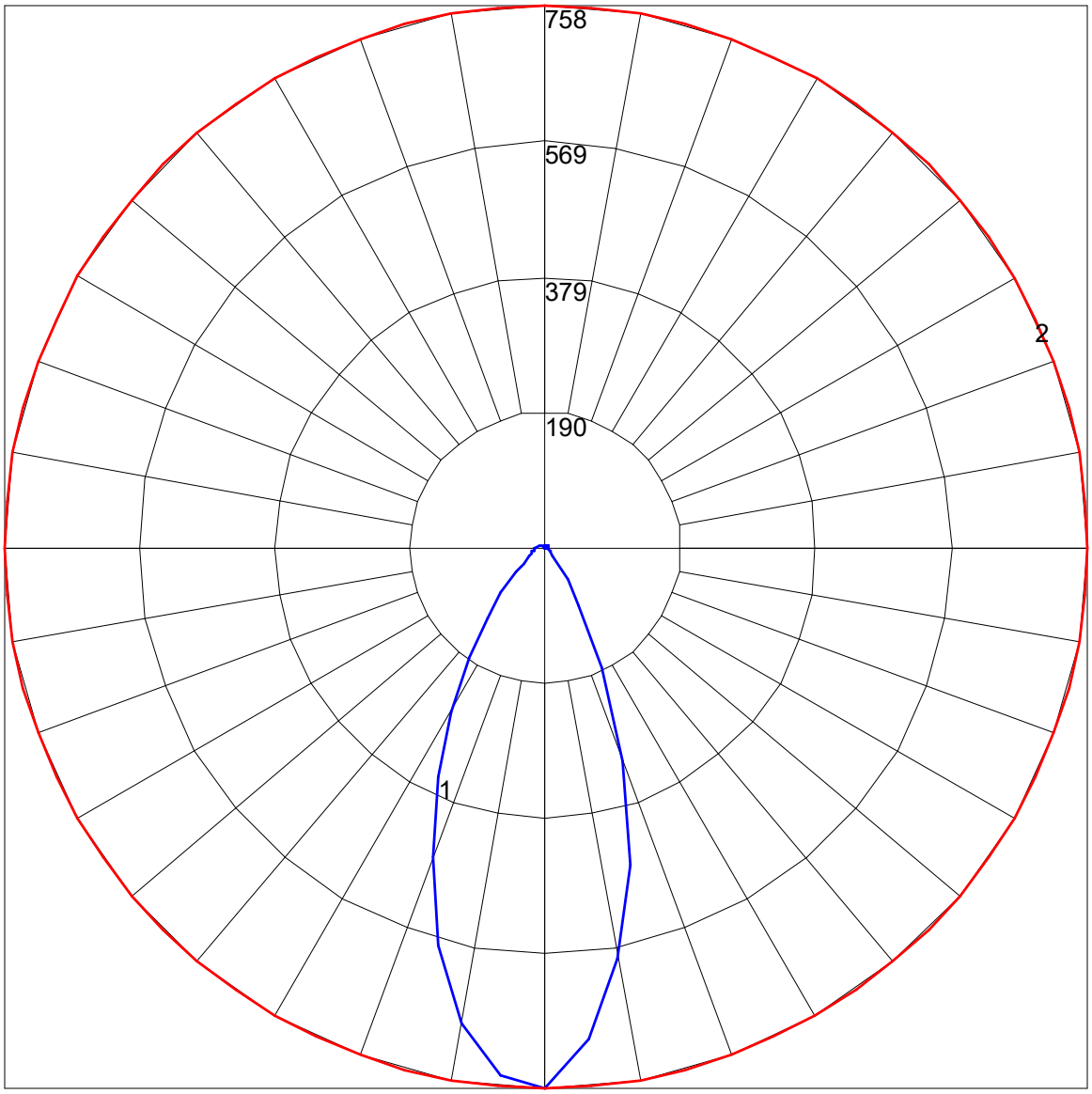
FLUX DISTRIBUTION

	Lumens	Percent Of Luminaire
Downward Street Side	184.1	37.3
Downward House Side	299.4	60.7
Downward Total	483.5	97.9
Upward Street Side	4.2	0.8
Upward House Side	6.0	1.2
Upward Total	10.2	2.1
Total Flux	493.7	100.0

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POLAR GRAPH

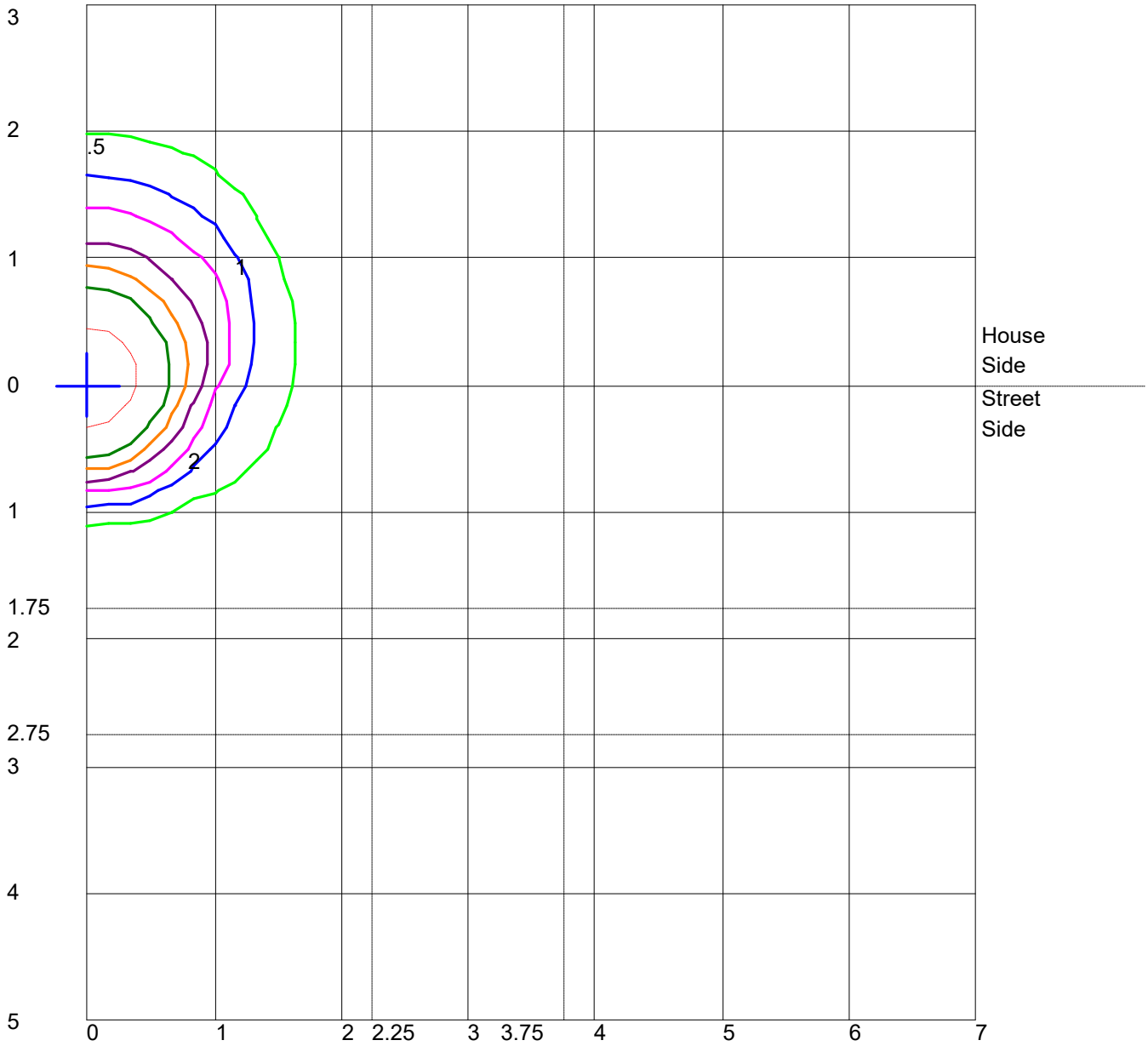


Maximum Candela = 758 Located At Horizontal Angle = 180, Vertical Angle = 0
1 - Vertical Plane Through Horizontal Angles (180 - 0) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (0) (Through Max. Cd.)

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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

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