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

NVLAP TESTING
NVLAP LAB CODE 200927-0

Report No: L092511812 **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-RG-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-RG-FW
Driver Model Number:	Custom

Test Summary	
Total Lumens:	524.00
Efficacy:	55.04
Color Redering Index:	37.4
Correlated Color Temperature:	5668
Input Voltage (VAC/60Hz):	12.06
Input Current (Amp):	1.0630
Input Power (W):	9.52
Input Power Factor:	0.7428
Current ATHD (%):	23.7%

Test Condition	
Ambient Temperature (°C):	25.0
Stabilization Time (Hours):	0:30
Total Operating Time (Hours):	0:50

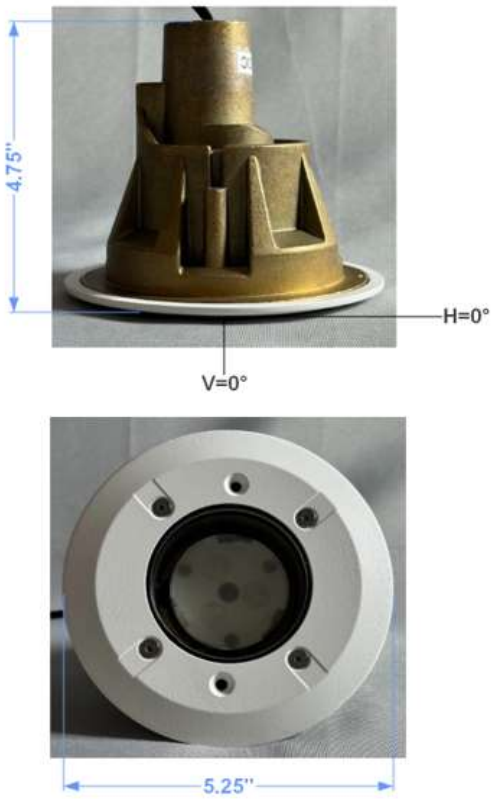


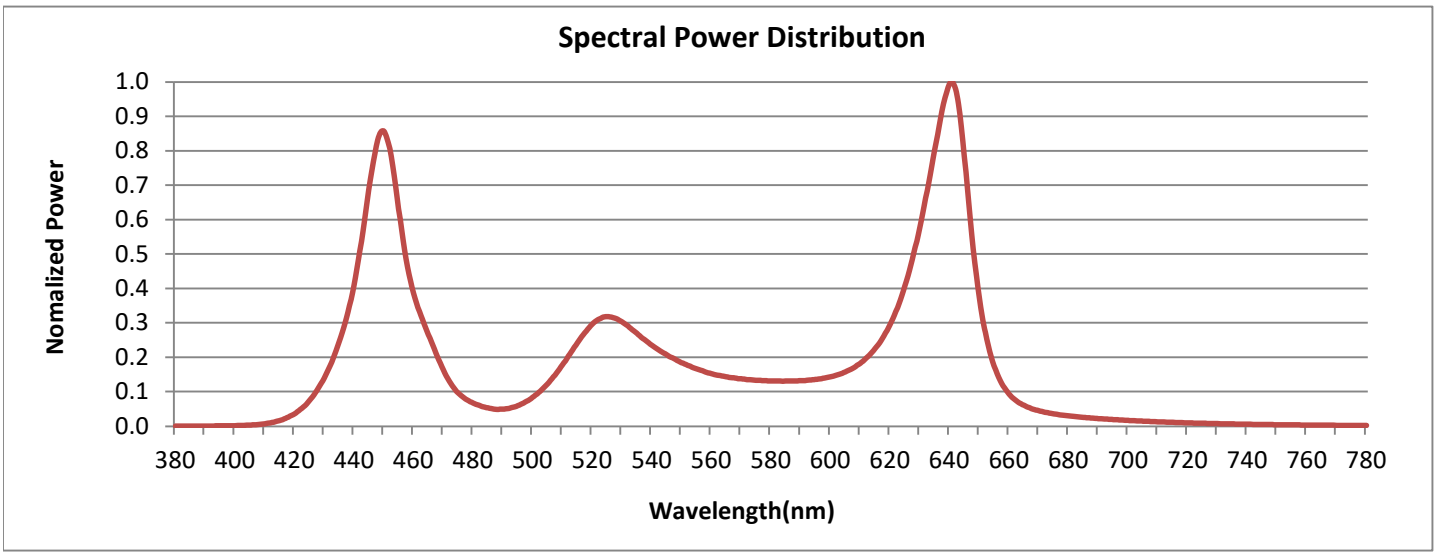
FIG. 1 LUMINAIRE

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Colorimetry Test Results

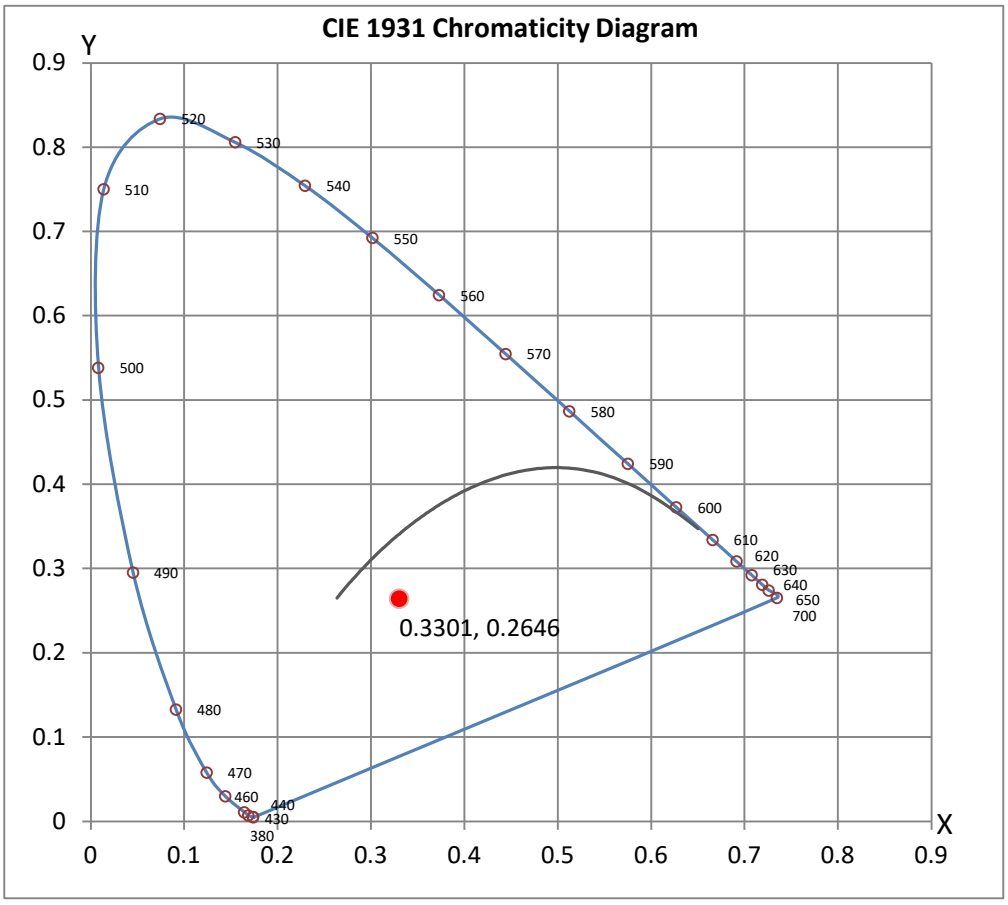


CRI & CCT

x	0.3301
y	0.2646
u'	0.2394
v'	0.4318
CRI	37.40
CCT	5668
Duv	-0.04457

R Values

R1	24.06
R2	69.88
R3	53.34
R4	17.20
R5	33.27
R6	68.98
R7	56.43
R8	-23.77
R9	-186.02
R10	52.05
R11	2.68
R12	66.80
R13	33.53
R14	67.05
R15	-4.11



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 : L092511812.IES

DESCRIPTIVE INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] L092511812
[TESTLAB] LIGHT LABORATORY, INC. (www.lightlaboratory.com)
[ISSUEDATE] 10/3/2025
[MANUFAC] FX Luminaire / Lumascape
[LUMCAT] TN-60-ZDC-RG-FW
[LUMINAIRE] TN60, ZDC, Ring, 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

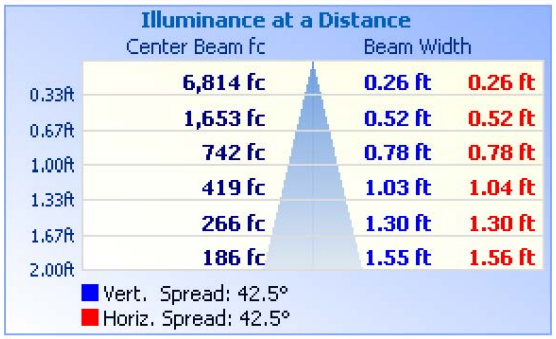
IES Classification	Type VS
Longitudinal Classification	Very Short
Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	524
Downward Total Efficiency	N.A. (absolute)
Total Luminaire Efficiency	N.A. (absolute)
Luminaire Efficacy Rating (LER)	55
Total Luminaire Watts	9.52
Ballast Factor	1.00
Upward Waste Light Ratio	0.00
Maximum Candela	742
Maximum Candela Angle	180H 0V
Maximum Candela (<90 Degrees Vertical)	742
Maximum Candela Angle (<90 Degrees Vertical)	180H 0V
Maximum Candela At 90 Degrees Vertical	0 (0.0% Luminaire Lumens)
Maximum Candela from 80 to <90 Degrees Vertical	1 (0.2% Luminaire Lumens)
Cutoff Classification (deprecated)	N.A. (absolute)

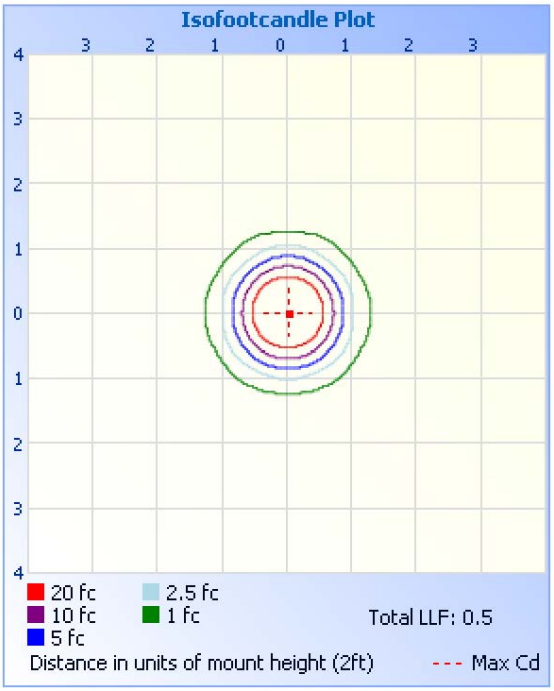
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LUMINAIRE CLASSIFICATION SYSTEM (LCS)

	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	162.2	N.A.	30.9
FM - Front-Medium (30-60)	77.6	N.A.	14.8
FH - Front-High (60-80)	4.3	N.A.	0.8
FVH - Front-Very High (80-90)	0.4	N.A.	0.1
BL - Back-Low (0-30)	183.6	N.A.	35.0
BM - Back-Medium (30-60)	91.2	N.A.	17.4
BH - Back-High (60-80)	4.5	N.A.	0.9
BVH - Back-Very High (80-90)	0.4	N.A.	0.1
UL - Uplight-Low (90-100)	0.0	N.A.	0.0
UH - Uplight-High (100-180)	0.0	N.A.	0.0
Total	524.2	N.A.	100.0
BUG Rating	B1-U0-G0		





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CANDELA TABULATION

Vert. Angles	Horizontal Angles									
	0	**5**	**10**	**15**	**20**	**25**	**30**	**35**	**40**	**45**
0	742	742	742	742	742	742	742	742	742	742
5	681	681	682	682	685	690	692	694	695	695
10	581	581	580	581	584	589	589	594	598	599
15	462	460	461	463	466	470	472	476	479	481
20	349	349	348	349	351	354	355	358	361	366
25	257	258	258	258	258	260	262	265	268	270
30	190	190	189	190	190	191	192	195	197	199
35	130	130	131	133	133	134	136	137	138	138
40	84	84	84	84	85	86	87	89	90	91
45	56	56	54	52	51	52	53	55	57	59
50	32	32	33	34	34	35	36	37	37	37
55	20	20	20	20	21	21	21	22	22	22
60	13	12	12	12	12	12	12	12	12	13
65	5	5	5	5	5	5	5	5	5	5
70	3	3	4	3	3	4	3	4	3	3
75	2	2	2	2	2	2	2	2	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	0	0	0	0	0	0	0	0	0	0
95	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0
105	0	0	0	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0	0	0	0
115	0	0	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0	0	0
125	0	0	0	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0	0	0	0
135	0	0	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0	0	0
145	0	0	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0	0	0
155	0	0	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0	0	0	0
165	0	0	0	0	0	0	0	0	0	0
170	0	0	0	0	0	0	0	0	0	0
175	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0

Vert. Angles	Horizontal Angles									
	50	**55**	**60**	**65**	**70**	**75**	**80**	**85**	**90**	**95**
0	742	742	742	742	742	742	742	742	742	742
5	700	702	703	704	702	701	701	704	708	707
10	601	605	610	612	611	614	616	618	622	626
15	485	489	493	497	498	498	502	507	511	514
20	370	373	377	381	383	385	387	391	396	400
25	273	277	279	281	283	286	289	294	297	300
30	201	204	205	207	209	211	213	215	218	222
35	139	140	141	141	143	145	146	148	151	152
40	92	92	92	93	94	95	95	95	96	98
45	61	63	64	64	63	61	60	60	59	60
50	36	36	36	37	39	40	41	41	41	42
55	22	22	22	22	23	24	24	27	27	27

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CANDELA TABULATION - (Cont.)

60	13	13	14	14	14	13	13	12	12	12
65	5	5	5	5	5	5	5	5	5	5
70	3	3	3	3	3	3	3	3	3	3
75	2	2	2	2	2	2	2	2	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	0	0	0	0	0	0	0	0	0	0
95	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0
105	0	0	0	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0	0	0	0
115	0	0	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0	0	0
125	0	0	0	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0	0	0	0
135	0	0	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0	0	0
145	0	0	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0	0	0
155	0	0	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0	0	0	0
165	0	0	0	0	0	0	0	0	0	0
170	0	0	0	0	0	0	0	0	0	0
175	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0

Vert. Angles	**Horizontal Angles**									
	100	**105**	**110**	**115**	**120**	**125**	**130**	**135**	**140**	**145**
0	742	742	742	742	742	742	742	742	742	742
5	710	716	719	722	722	720	719	722	725	726
10	630	636	642	646	647	646	647	649	654	659
15	519	527	533	536	538	542	543	545	548	553
20	405	411	417	420	421	422	425	429	435	438
25	304	308	312	314	316	318	321	324	330	332
30	223	226	229	231	232	234	237	242	244	246
35	154	155	156	158	160	161	163	167	170	173
40	99	100	100	100	101	102	103	105	106	108
45	61	64	66	67	68	68	67	66	65	65
50	42	42	41	39	39	39	40	41	42	43
55	27	25	24	24	23	24	24	24	25	27
60	13	14	14	15	14	14	14	14	13	13
65	5	5	5	5	5	5	5	5	6	6
70	3	3	3	3	3	3	3	3	3	3
75	2	2	2	2	2	2	2	2	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	0	0	0	0	0	0	0	0	0	0
95	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0
105	0	0	0	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0	0	0	0
115	0	0	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0	0	0
125	0	0	0	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0	0	0	0

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CANDELA TABULATION - (Cont.)

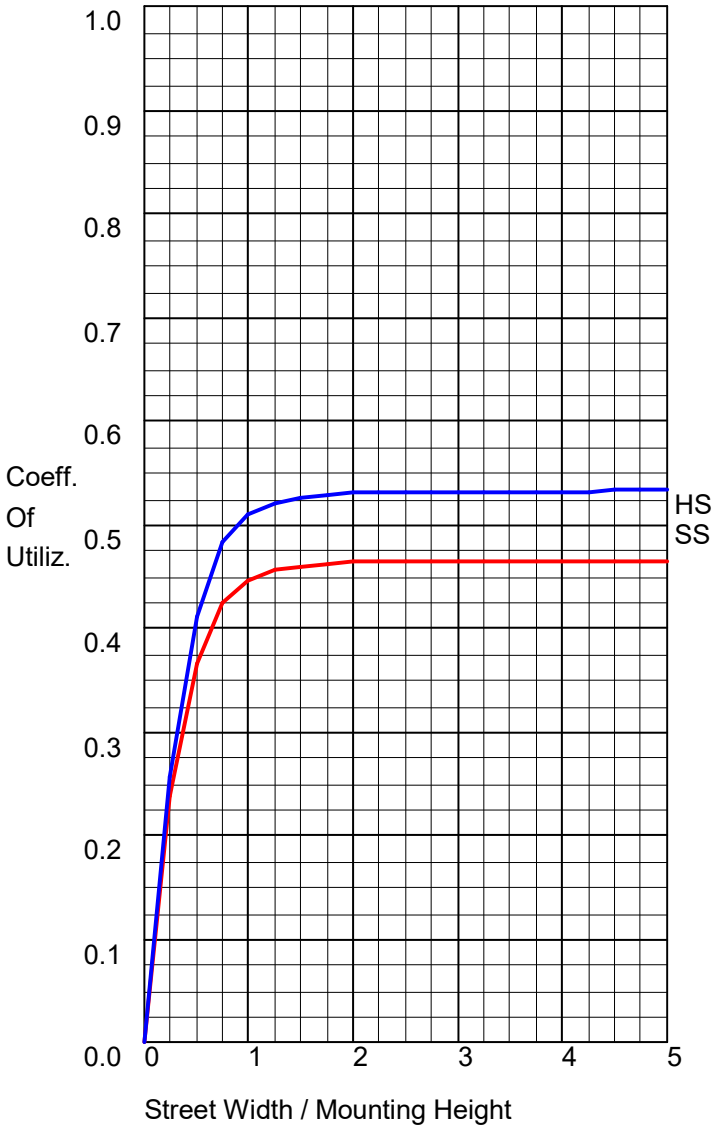
135	0	0	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0	0	0
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150	0	0	0	0	0	0	0	0	0	0
155	0	0	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0	0	0	0
165	0	0	0	0	0	0	0	0	0	0
170	0	0	0	0	0	0	0	0	0	0
175	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0

Vert. Angles	**Horizontal Angles**						
	150	**155**	**160**	**165**	**170**	**175**	**180**
0	742	742	742	742	742	742	742
5	729	729	728	727	726	724	726
10	664	665	664	663	663	659	658
15	557	560	561	560	560	560	559
20	441	444	444	443	443	443	445
25	335	336	335	336	337	337	337
30	248	248	249	249	250	251	252
35	175	175	175	175	175	175	175
40	110	111	112	113	113	113	113
45	65	67	68	71	73	75	76
50	43	45	45	43	42	42	42
55	28	27	27	25	25	25	25
60	13	14	14	15	16	16	17
65	6	6	6	5	6	5	6
70	3	3	3	3	3	3	3
75	2	2	2	2	2	2	2
80	1	1	1	1	1	1	1
85	1	1	1	1	1	1	1
90	0	0	0	0	0	0	0
95	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0
105	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0
115	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0
125	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0
135	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0
145	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0
155	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0
165	0	0	0	0	0	0	0
170	0	0	0	0	0	0	0
175	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0

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COEFFICIENTS OF UTILIZATION



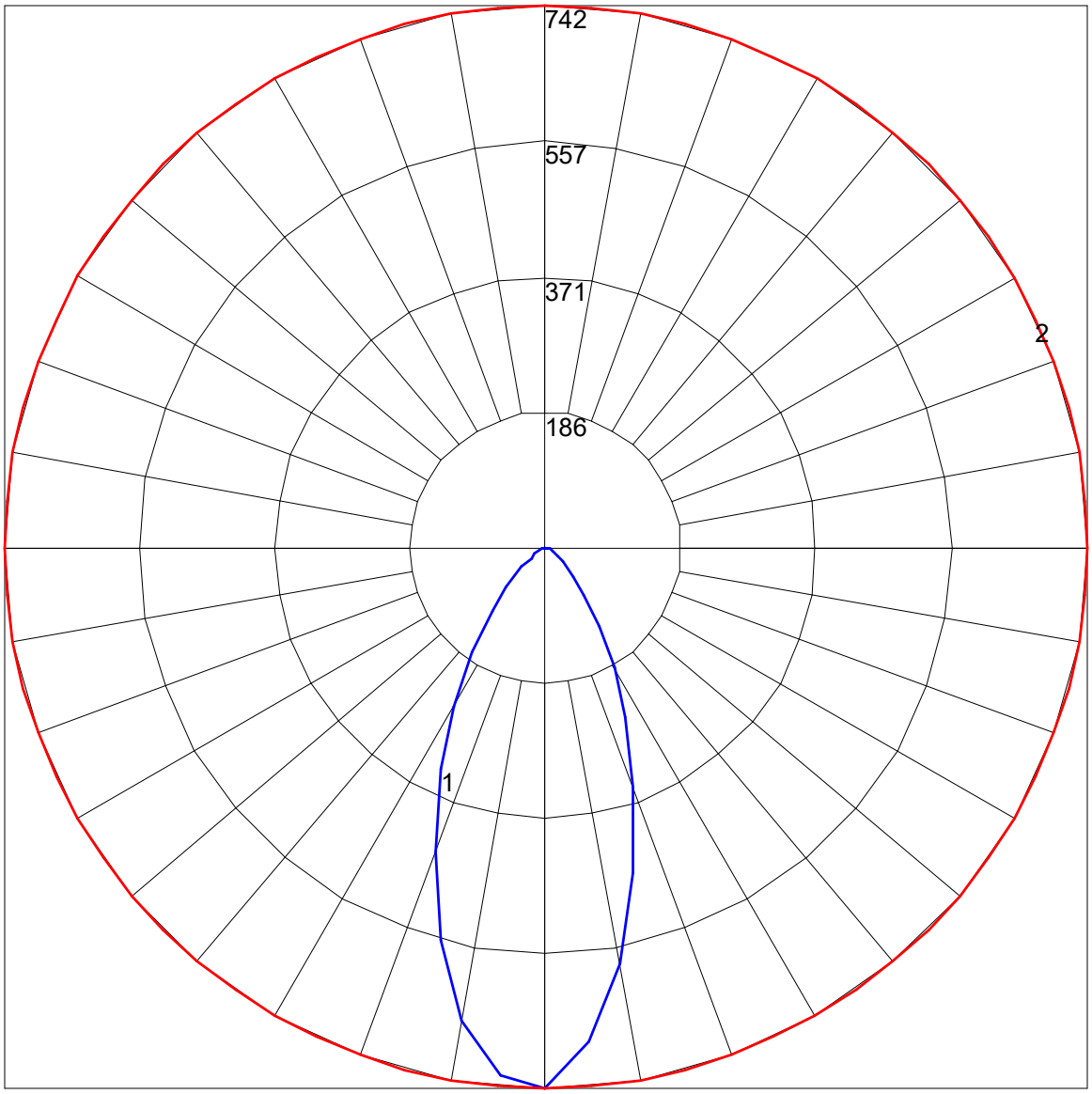
FLUX DISTRIBUTION

	Lumens	Percent Of Luminaire
Downward Street Side	244.5	46.6
Downward House Side	279.7	53.4
Downward Total	524.2	100.0
Upward Street Side	0.0	0.0
Upward House Side	0.0	0.0
Upward Total	0.0	0.0
Total Flux	524.2	100.0

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POLAR GRAPH

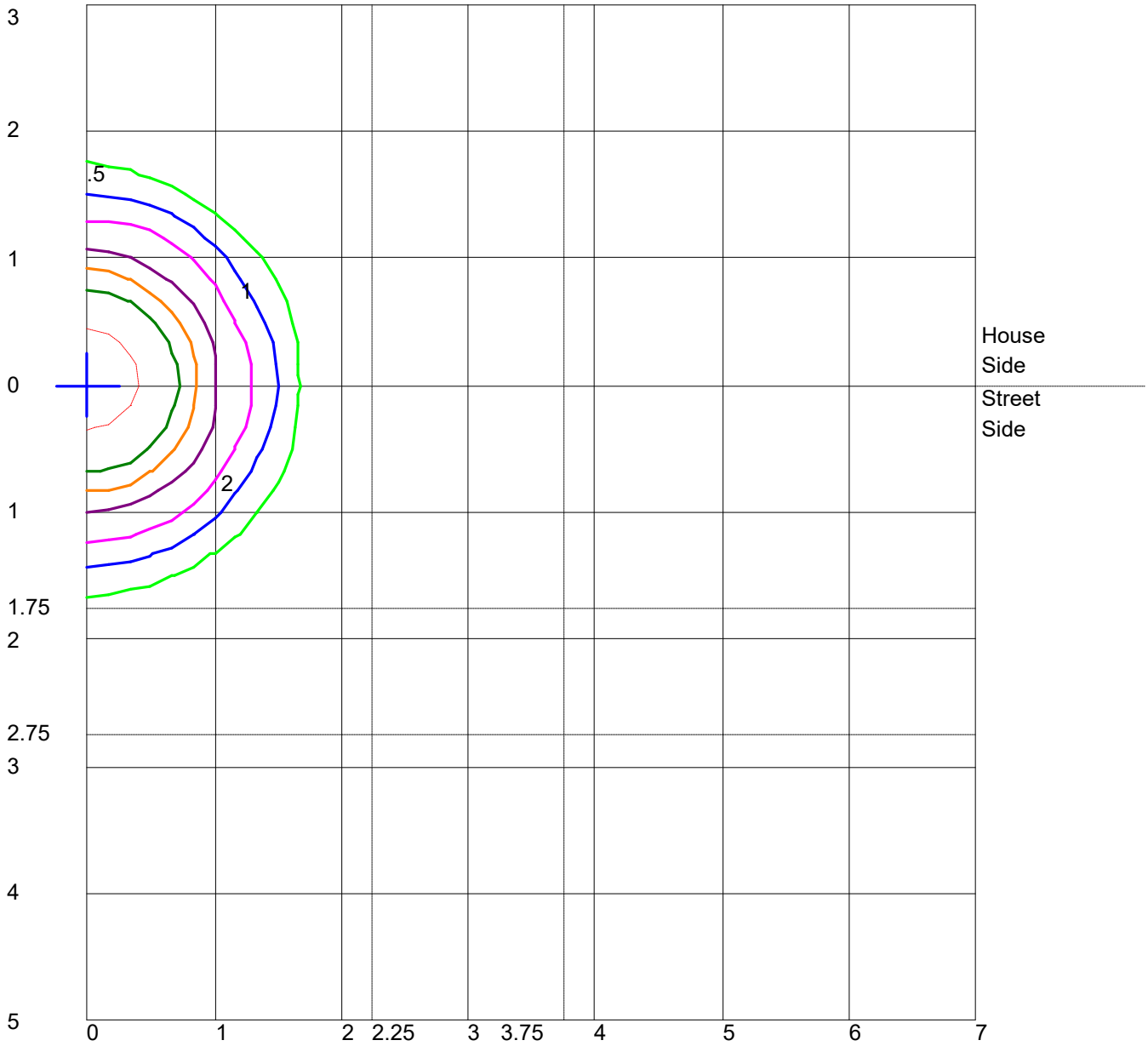


Maximum Candela = 742 Located At Horizontal Angle = 180, Vertical Angle = 0
1 - Vertical Plane Through Horizontal Angles (180 - 0) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (0) (Through Max. Cd.)

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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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