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

NVLAP TESTING
NVLAP LAB CODE 200927-0

Report No: L112310204

Issue Date: 11/8/2023
Reference:N/A
Amendment:N/A

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

Model Number: RP-32-1LED-FW

Test: Photometric/Colorimetric/Electrical Test

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

IESNA LM79: 2019 Approved Methods for Electrical and Photometric Measurements of Solid-State Lighting Products

ANSI NEMA ANSLG 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: 11/6/23

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-S4	4/7/25
HP Power Supply	6032A	PS-DC05-S2	--
Fluke Digital Thermometer	52K/J	MT-TP05	5/24/25
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:	RP-32-1LED-FW
Driver Model Number:	CUSTOM

Test Summary	
Total Lumens:	56.00
Efficacy:	27.66
Color Redering Index:	87.2
Correlated Color Temperature:	2653
Input Voltage (VAC/60Hz):	12.02
Input Current (Amp):	0.2171
Input Power (W):	2.02
Input Power Factor:	0.7759
Current ATHD (%):	60.1%

Test Condition	
Ambient Temperature (°C):	25.0
Stabilization Time (Hours):	0:30
Total Operating Time (Hours):	1:20

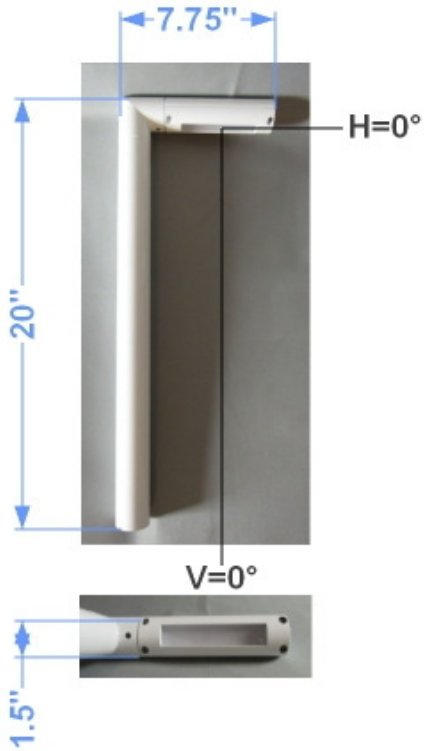

FIG. 1 LUMINAIRE

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Report No: L112310204
NVLAP TESTING
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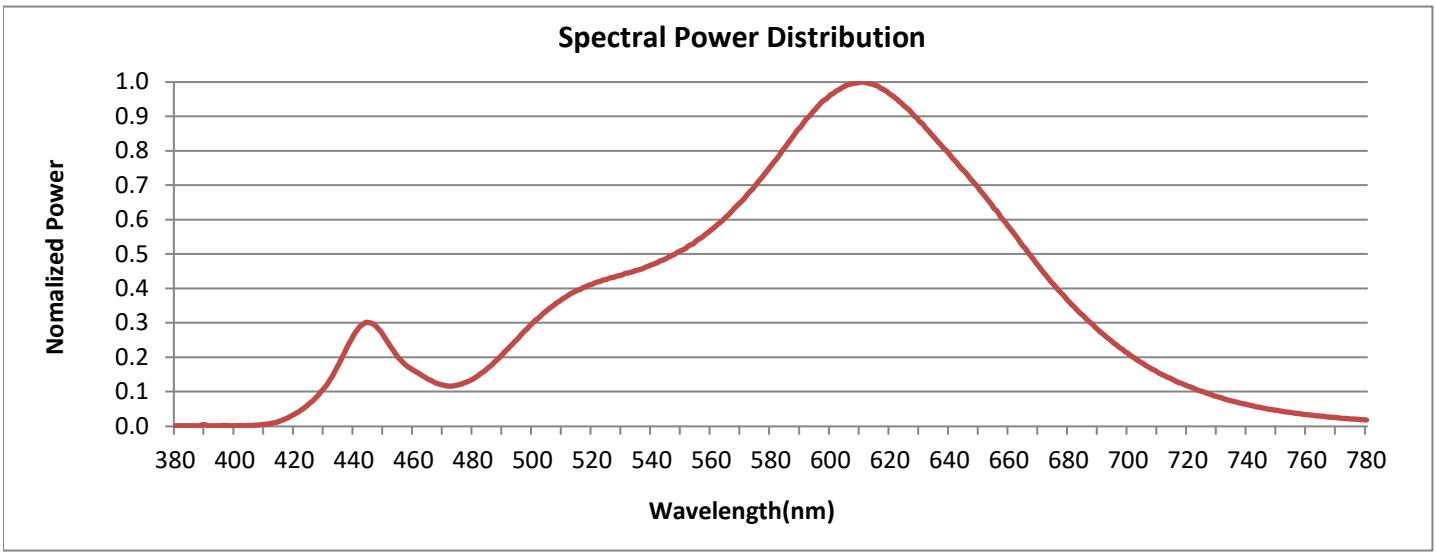
Colorimetry Test Results

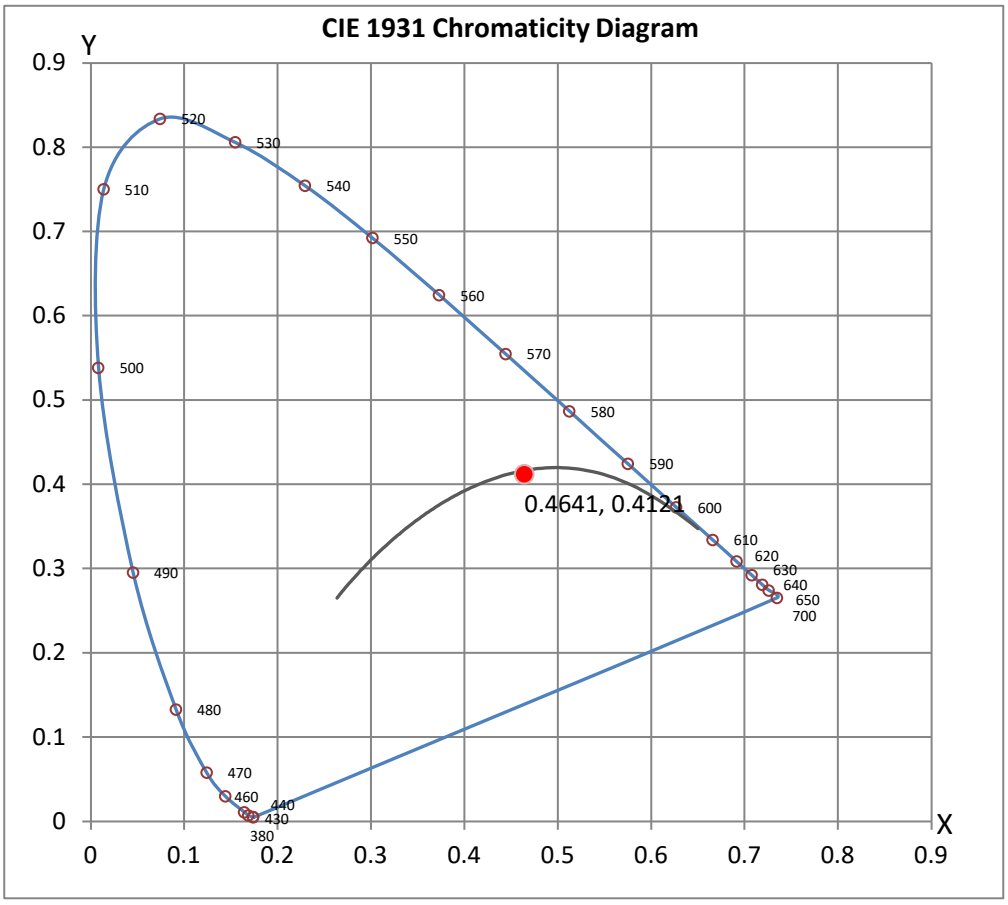


CRI & CCT

x	0.4641
y	0.4121
u'	0.2646
v'	0.5286
CRI	87.20
CCT	2653
Duv	0.00022

R Values

R1	86.14
R2	93.42
R3	97.37
R4	88.16
R5	87.65
R6	95.09
R7	84.73
R8	64.74
R9	24.24
R10	86.35
R11	90.81
R12	87.27
R13	87.89
R14	99.19
R15	77.99



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NVLAP LAB CODE 200927-0

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.*

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

Photometric Test Report

IES ROAD REPORT
PHOTOMETRIC FILENAME : L112310204.IES

DESCRIPTIVE INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] L112310204
[TESTLAB] LIGHT LABORATORY, INC. (www.lightlaboratory.com)
[ISSUEDATE] 11/8/2023
[MANUFAC] FX Luminaire / Lumascape
[LUMCAT] RP-32-1LED-FW
[LUMINAIRE] RP32, 1LED, 2700K, 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 III
Longitudinal Classification	Very Short
Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	56
Downward Total Efficiency	N.A. (absolute)
Total Luminaire Efficiency	N.A. (absolute)
Luminaire Efficacy Rating (LER)	28
Total Luminaire Watts	2.02
Ballast Factor	1.00
Upward Waste Light Ratio	0.00
Maximum Candela	24
Maximum Candela Angle	30H 10V
Maximum Candela (<90 Degrees Vertical)	24
Maximum Candela Angle (<90 Degrees Vertical)	30H 10V
Maximum Candela At 90 Degrees Vertical	0 (0.0% Luminaire Lumens)
Maximum Candela from 80 to <90 Degrees Vertical	2 (3.6% Luminaire Lumens)
Cutoff Classification (deprecated)	N.A. (absolute)

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Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES ROAD REPORT
PHOTOMETRIC FILENAME : L112310204.IES

LUMINAIRE CLASSIFICATION SYSTEM (LCS)

	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	9.5	N.A.	17.0
FM - Front-Medium (30-60)	17.6	N.A.	31.7
FH - Front-High (60-80)	5.3	N.A.	9.6
FVH - Front-Very High (80-90)	0.5	N.A.	1.0
BL - Back-Low (0-30)	7.5	N.A.	13.4
BM - Back-Medium (30-60)	11.2	N.A.	20.1
BH - Back-High (60-80)	3.5	N.A.	6.4
BVH - Back-Very High (80-90)	0.5	N.A.	0.8
UL - Uplight-Low (90-100)	0.0	N.A.	0.0
UH - Uplight-High (100-180)	0.0	N.A.	0.0
Total	55.6	N.A.	100.0
BUG Rating	B0-U0-G0		

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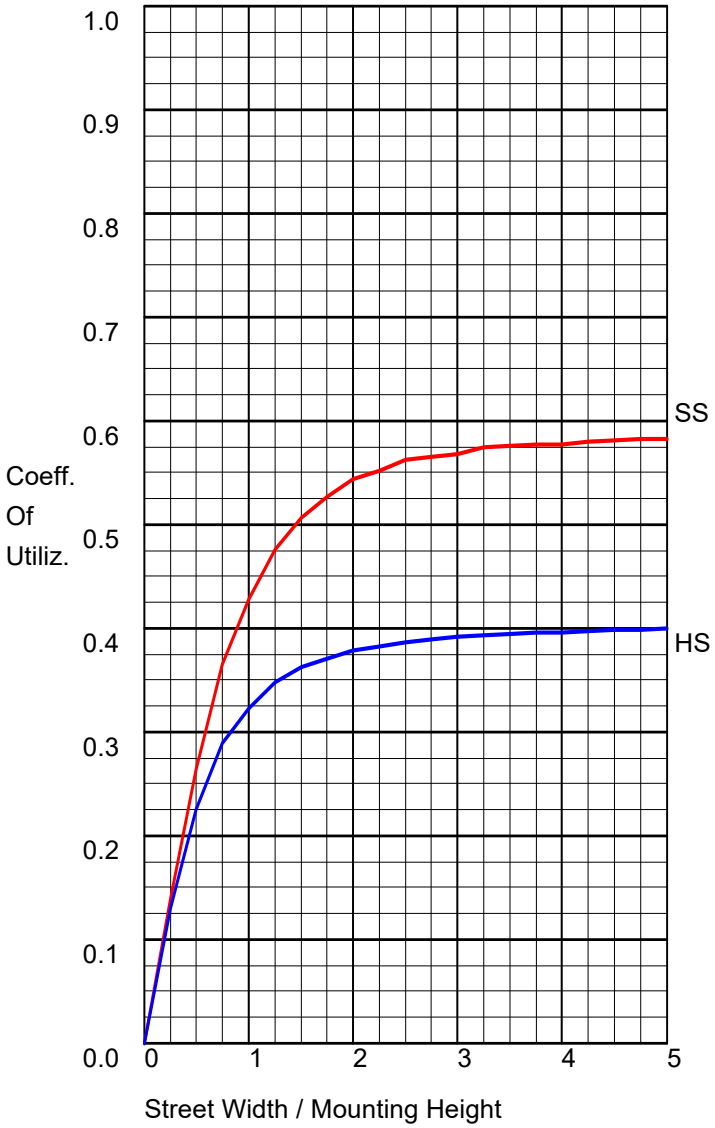
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES ROAD REPORT
PHOTOMETRIC FILENAME : L112310204.IES

COEFFICIENTS OF UTILIZATION



FLUX DISTRIBUTION

	Lumens	Percent Of Luminaire
Downward Street Side	33.0	59.3
Downward House Side	22.6	40.7
Downward Total	55.6	100.0
Upward Street Side	0.0	0.0
Upward House Side	0.0	0.0
Upward Total	0.0	0.0
Total Flux	55.6	100.0

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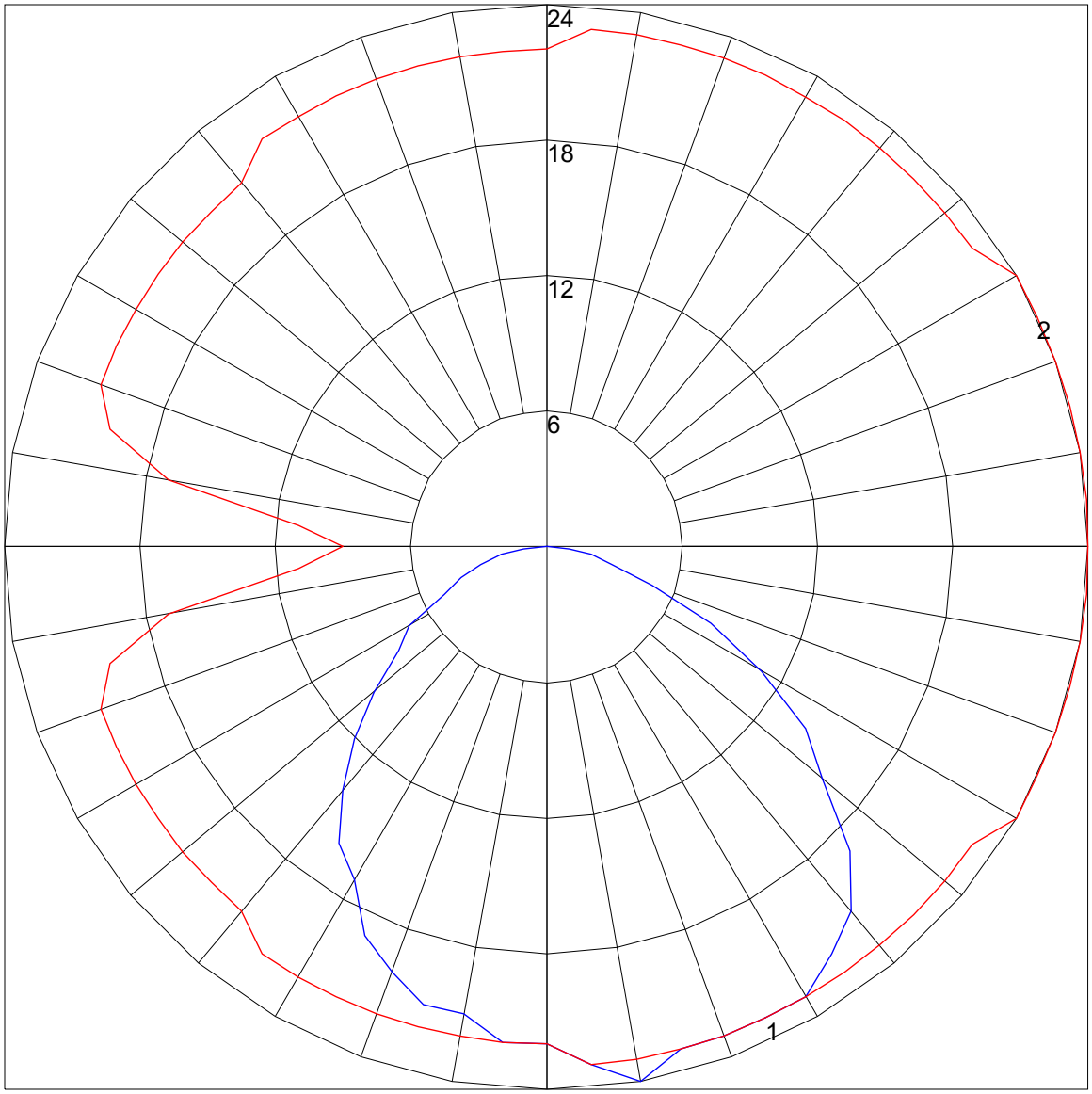
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES ROAD REPORT
PHOTOMETRIC FILENAME : L112310204.IES

POLAR GRAPH

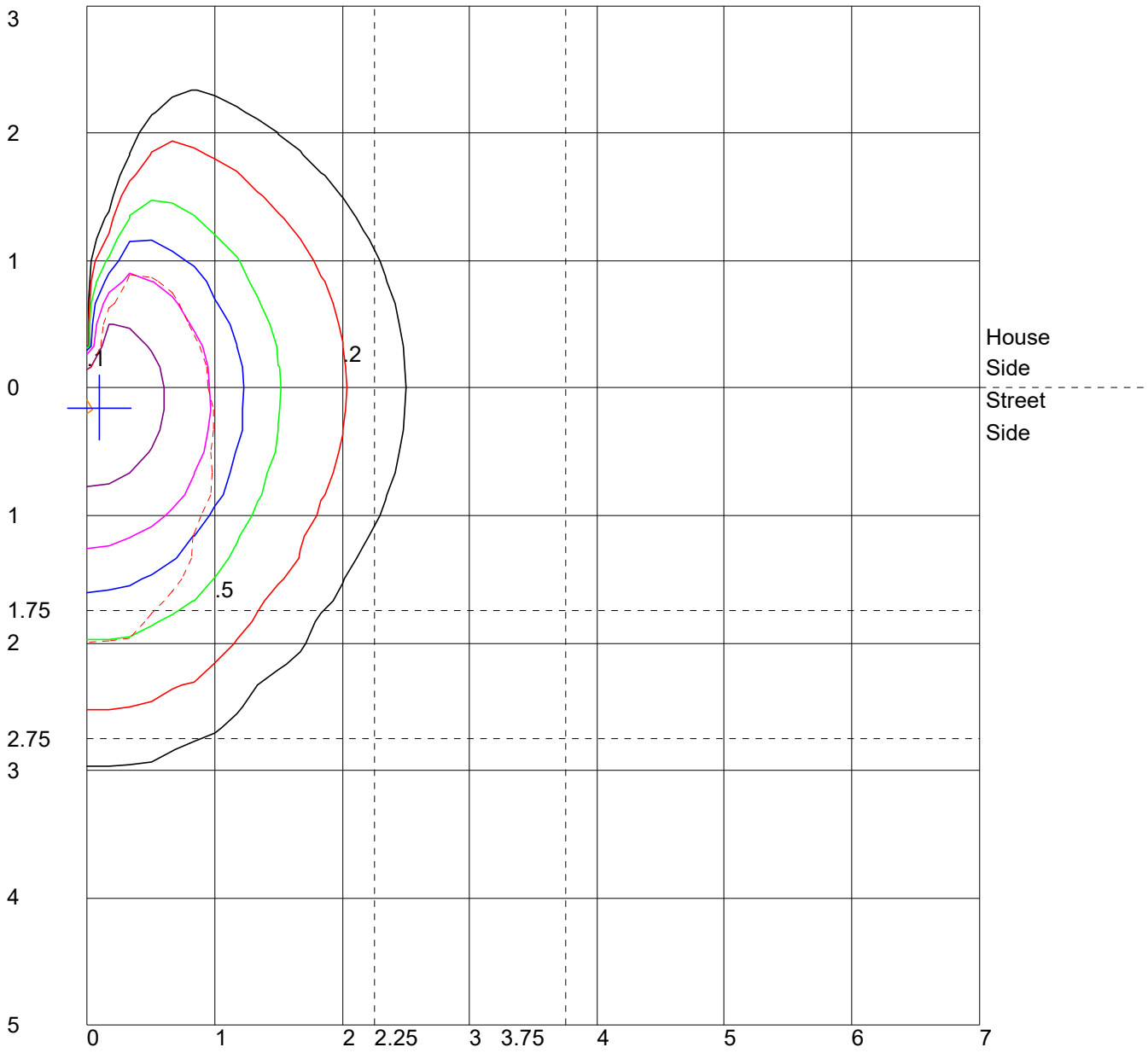


Maximum Candela = 24 Located At Horizontal Angle = 30, Vertical Angle = 10
1 - Vertical Plane Through Horizontal Angles (30 - 210) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (10) (Through Max. Cd.)

Photometric Toolbox (R) Copyright 2002-2019 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES ROAD REPORT
PHOTOMETRIC FILENAME : L112310204.IES

ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINANCE



Distance In Units Of Mounting Height
Values Based On 1.5 Foot Mounting Height
1/2 Maximum Candela Trace Shown As Dashed Curve
(+) = Maximum Candela Point

Photometric Toolbox (R) Copyright 2002-2019 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

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NVLAP TESTING
NVLAP LAB CODE 200927-0

Report No: L112310205

Issue Date: 11/8/2023
Reference:N/A
Amendment:N/A

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

Model Number: RP-32-ZDC-FW

Test: Photometric/Colorimetric/Electrical Test

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

IESNA LM79: 2019 Approved Methods for Electrical and Photometric Measurements of Solid-State Lighting Products

ANSI NEMA ANSLG 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: 11/6/23

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-S4	4/7/25
HP Power Supply	6032A	PS-DC05-S2	--
Fluke Digital Thermometer	52K/J	MT-TP05	5/24/25
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:	RP-32-ZDC-FW
Driver Model Number:	CUSTOM

Test Summary	
Total Lumens:	59.00
Efficacy:	13.18
Color Redering Index:	19.5
Correlated Color Temperature:	12940
Input Voltage (VAC/60Hz):	12.00
Input Current (Amp):	0.4446
Input Power (W):	4.48
Input Power Factor:	0.8387
Current ATHD (%):	47.9%

Test Condition	
Ambient Temperature (°C):	25.0
Stabilization Time (Hours):	0:35
Total Operating Time (Hours):	1:25

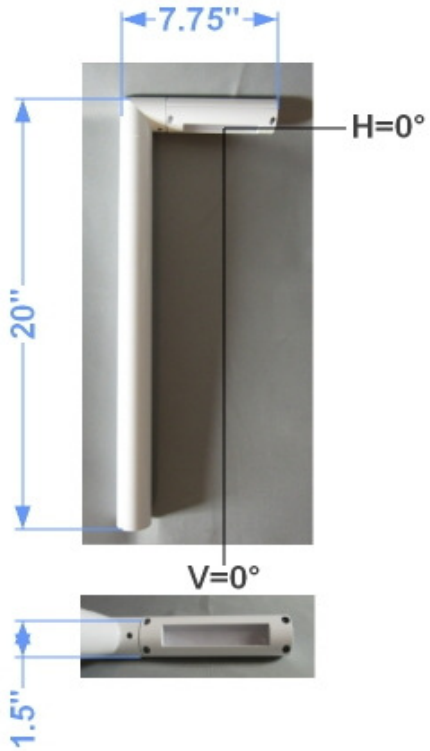

FIG. 1 LUMINAIRE

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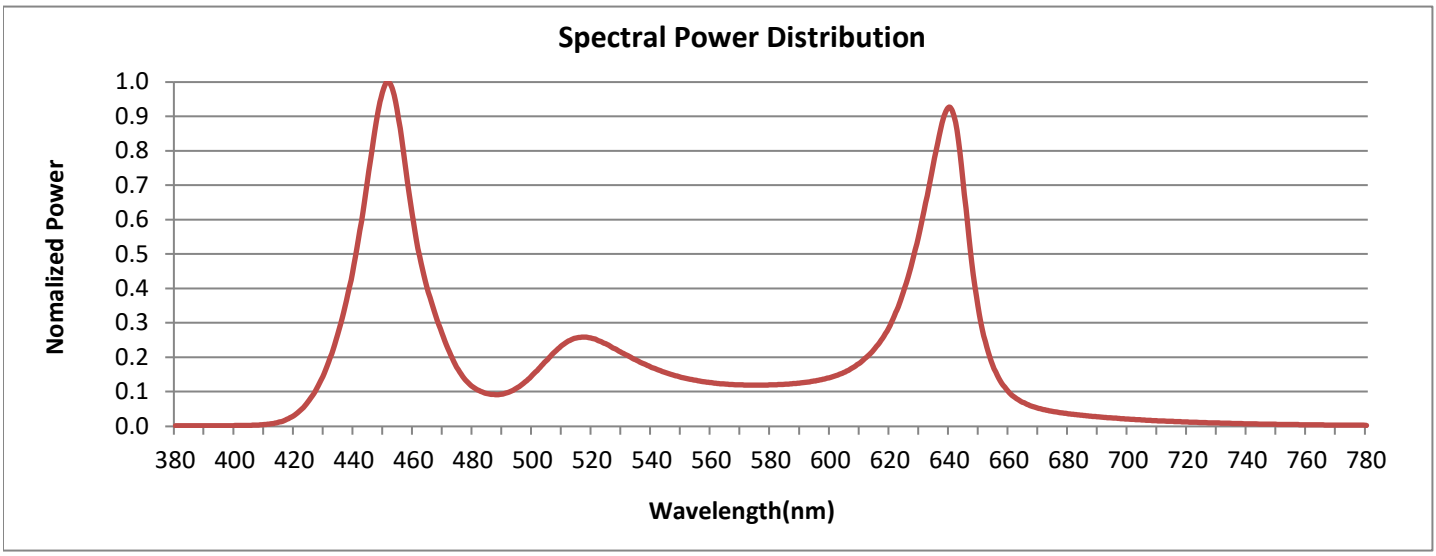
Report No: L112310205
NVLAP TESTING
NVLAP LAB CODE 200927-0

Colorimetry Test Results

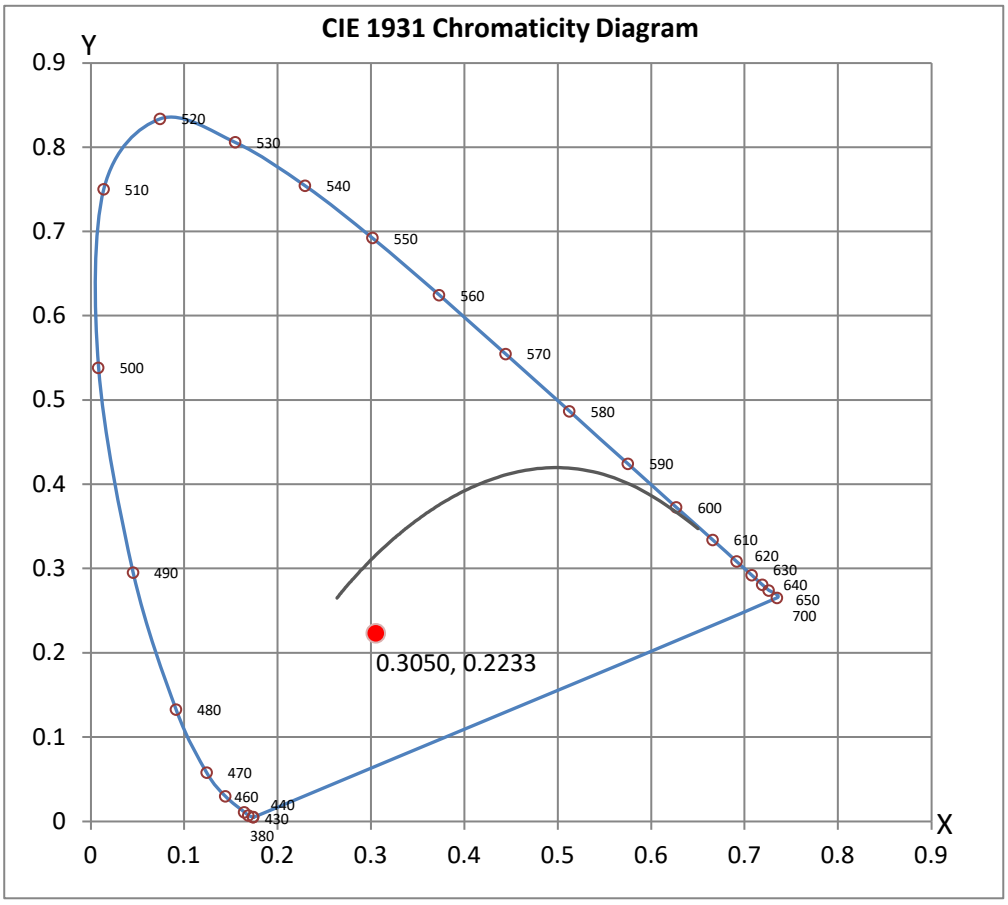


CRI & CCT

x	0.3050
y	0.2233
u'	0.2407
v'	0.3964
CRI	19.50
CCT	12940
Duv	-0.05782

R Values

R1	-5.84
R2	49.08
R3	55.81
R4	-7.15
R5	9.31
R6	48.82
R7	54.65
R8	-49.00
R9	-302.53
R10	4.58
R11	-30.41
R12	46.38
R13	4.73
R14	66.87
R15	-40.17



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NVLAP LAB CODE 200927-0

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.*

LIGHT LABORATORY INC.
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Photometric Test Report

IES ROAD REPORT
PHOTOMETRIC FILENAME : L112310205.IES

DESCRIPTIVE INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] L112310205
[TESTLAB] LIGHT LABORATORY, INC. (www.lightlaboratory.com)
[ISSUEDATE] 11/8/2023
[MANUFAC] FX Luminaire / Lumascape
[LUMCAT] RP-32-ZDC-FW
[LUMINAIRE] RP32, ZDC, 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 III
Longitudinal Classification	Very Short
Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	59
Downward Total Efficiency	N.A. (absolute)
Total Luminaire Efficiency	N.A. (absolute)
Luminaire Efficacy Rating (LER)	13
Total Luminaire Watts	4.48
Ballast Factor	1.00
Upward Waste Light Ratio	0.00
Maximum Candela	25
Maximum Candela Angle	55H 10V
Maximum Candela (<90 Degrees Vertical)	25
Maximum Candela Angle (<90 Degrees Vertical)	55H 10V
Maximum Candela At 90 Degrees Vertical	0 (0.0% Luminaire Lumens)
Maximum Candela from 80 to <90 Degrees Vertical	2 (3.4% Luminaire Lumens)
Cutoff Classification (deprecated)	N.A. (absolute)

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Results derived from content of manufacturers photometric file.

IES ROAD REPORT
PHOTOMETRIC FILENAME : L112310205.IES

LUMINAIRE CLASSIFICATION SYSTEM (LCS)

	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	10.0	N.A.	17.0
FM - Front-Medium (30-60)	18.7	N.A.	31.8
FH - Front-High (60-80)	5.6	N.A.	9.6
FVH - Front-Very High (80-90)	0.5	N.A.	0.9
BL - Back-Low (0-30)	7.8	N.A.	13.4
BM - Back-Medium (30-60)	11.9	N.A.	20.4
BH - Back-High (60-80)	3.6	N.A.	6.1
BVH - Back-Very High (80-90)	0.5	N.A.	0.8
UL - Uplight-Low (90-100)	0.0	N.A.	0.0
UH - Uplight-High (100-180)	0.0	N.A.	0.0
Total	58.6	N.A.	100.0
BUG Rating	B0-U0-G0		

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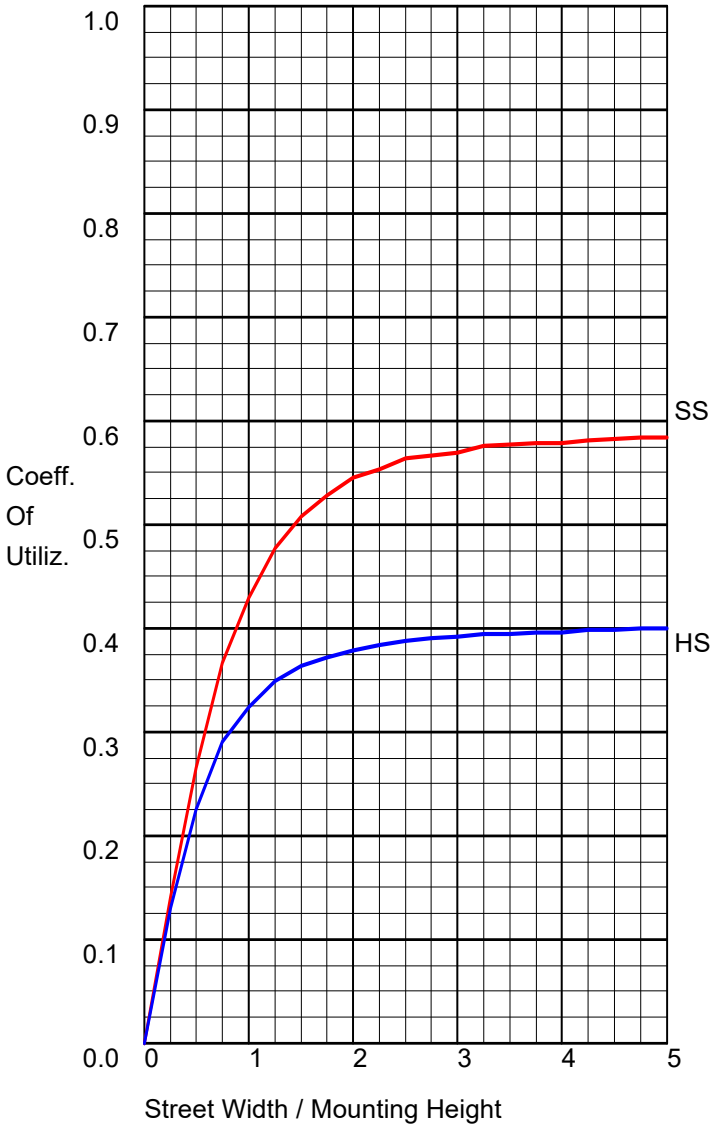
Results derived from content of manufacturers photometric file.

IES ROAD REPORT
PHOTOMETRIC FILENAME : L112310205.IES

COEFFICIENTS OF UTILIZATION



FLUX DISTRIBUTION

	Lumens	Percent Of Luminaire
Downward Street Side	34.8	59.4
Downward House Side	23.8	40.6
Downward Total	58.6	99.9
Upward Street Side	0.0	0.0
Upward House Side	0.0	0.0
Upward Total	0.0	0.0
Total Flux	58.6	99.9

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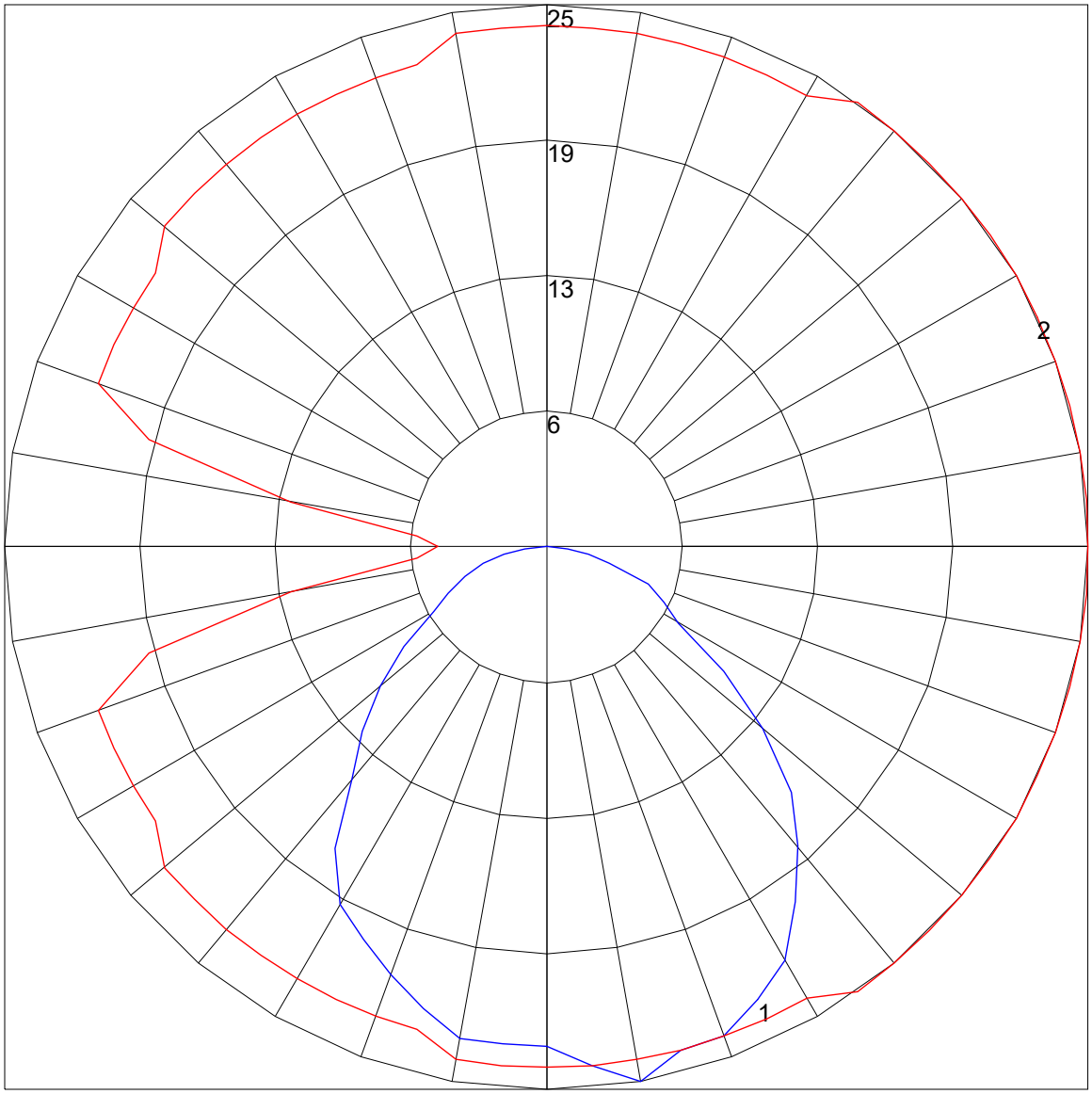
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES ROAD REPORT
PHOTOMETRIC FILENAME : L112310205.IES

POLAR GRAPH



Maximum Candela = 25 Located At Horizontal Angle = 55, Vertical Angle = 10
1 - Vertical Plane Through Horizontal Angles (55 - 235) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (10) (Through Max. Cd.)

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Results derived from content of manufacturers photometric file.

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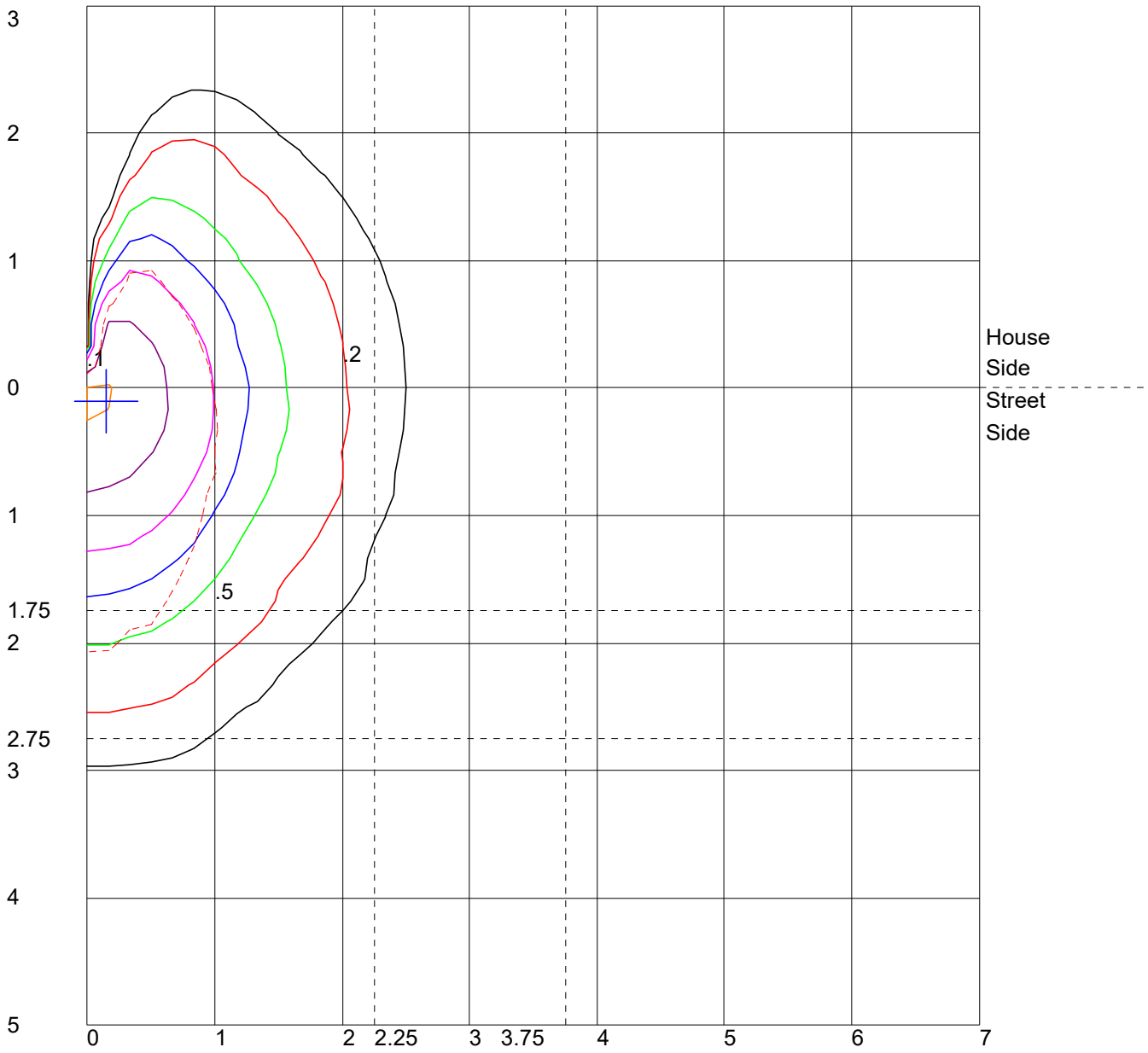
ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINANCE



Distance In Units Of Mounting Height
Values Based On 1.5 Foot Mounting Height
1/2 Maximum Candela Trace Shown As Dashed Curve
(+) = Maximum Candela Point

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