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Indoor Distribution Test Report

Relevant Standards
IES LM-79-2008, ANSI C82.77-10-2014

Prepared For
H E Williams Inc
831 W Fairview Ave
PO Box 837
Carthage, MO 64836-0837
United States

Catalog Number
2DR-L12/9DW-DIM-UNV-OW-OF-CS-x-xx
Order Number
13131414
Test Number
13131414.29

Test Date

2019-12-02

Prepared By

Josh Mitchell, Technician

Approved By

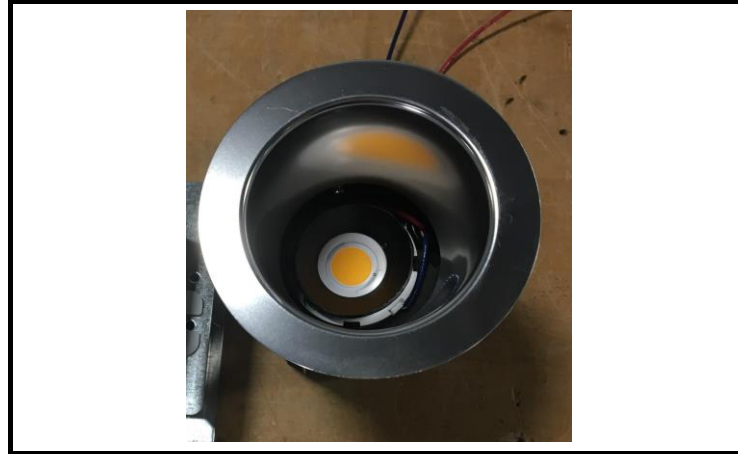
Alexa Lambert, Project Handler

The results contained in this report pertain only to the tested sample.
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Luminaire Description: Aluminum housing and reflector, no lens enclosure
Lamp: One white LED
Mounting: Recessed
Ballast/Driver: Philips Advance XI025C070V054DSM1

Luminaire



Luminaire Characteristics

Luminous Diameter: 2.50 in.

Summary of Results

| | |
|-------------------------|--------------|
| Total Luminaire Output: | 1239 Lumens |
| Luminaire Efficacy: | 53.1 lm/w |
| Maximum Candela: | 1132 Candela |

Test Conditions

| | |
|-------------------|-----------|
| Test Temperature: | 24.8 °C |
| Voltage: | 120.1 VAC |
| Current: | 0.1952 A |
| Power: | 23.34 W |
| Power Factor: | 0.996 |
| Frequency: | 60 Hz |
| Current THD: | 7.77 % |

Laboratory results may not be representative of field performance
Ballast factors have not been applied



Distribution - Goniophotometer

Distribution Test Conditions

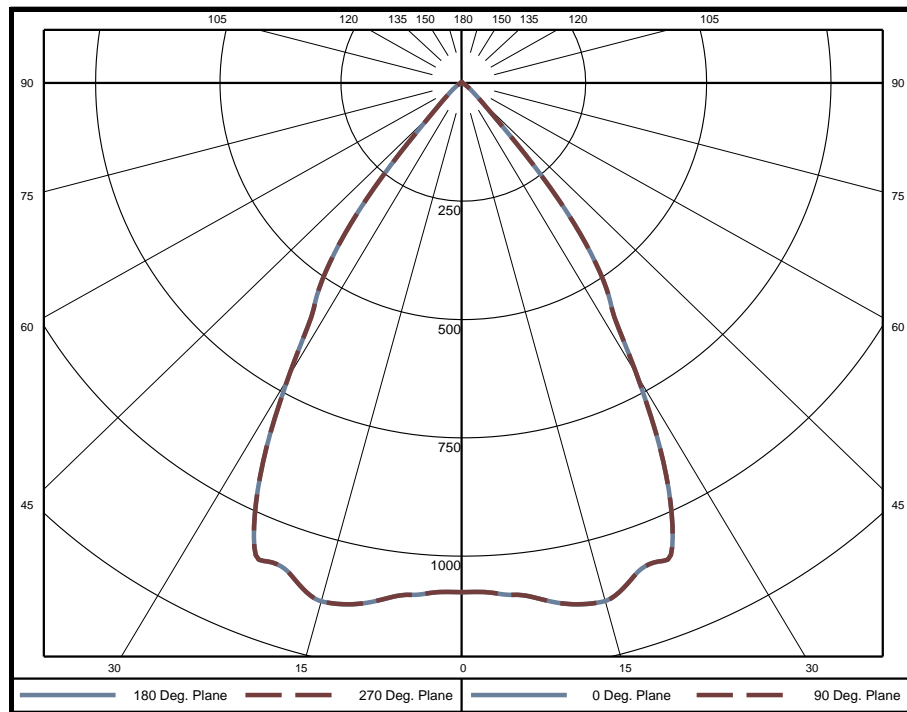
| Temperature | Voltage | Current | Power | Power Factor | Frequency | Current THD |
|-------------|-----------|----------|---------|--------------|-----------|-------------|
| 24.8 °C | 120.1 VAC | 0.1952 A | 23.34 W | 0.996 | 60 Hz | 7.77 % |

Summary of Results

Spacing Criteria
 0-180: 1.09
 90-270: 1.09

Total Lumen Output: 1239 Lumens
Luminaire Efficacy: 53.1 lm/w
Maximum Candela: 1132 Candela

Polar Plot



Zonal Lumen Summary

| Zone | Lumens | % of Luminaire | Zone | Lumens | % of Luminaire | Zone | Lumens | % of Luminaire |
|-------|--------|----------------|---------|--------|----------------|---------|--------|----------------|
| 0-5 | 25.8 | 2.1% | 60-65 | 3.9 | 0.3% | 120-125 | 0 | 0.0% |
| 5-10 | 78.6 | 6.3% | 65-70 | 2.2 | 0.2% | 125-130 | 0 | 0.0% |
| 10-15 | 133.7 | 10.8% | 70-75 | 1.0 | 0.1% | 130-135 | 0 | 0.0% |
| 15-20 | 182.8 | 14.8% | 75-80 | 0.4 | 0.0% | 135-140 | 0 | 0.0% |
| 20-25 | 224.6 | 18.1% | 80-85 | 0.1 | 0.0% | 140-145 | 0 | 0.0% |
| 25-30 | 217.6 | 17.6% | 85-90 | 0.0 | 0.0% | 145-150 | 0 | 0.0% |
| 30-35 | 169.5 | 13.7% | 90-95 | 0 | 0.0% | 150-155 | 0 | 0.0% |
| 35-40 | 121.5 | 9.8% | 95-100 | 0 | 0.0% | 155-160 | 0 | 0.0% |
| 40-45 | 43.7 | 3.5% | 100-105 | 0 | 0.0% | 160-165 | 0 | 0.0% |
| 45-50 | 17.4 | 1.4% | 105-110 | 0 | 0.0% | 165-170 | 0 | 0.0% |
| 50-55 | 9.9 | 0.8% | 110-115 | 0 | 0.0% | 170-175 | 0 | 0.0% |
| 55-60 | 6.0 | 0.5% | 115-120 | 0 | 0.0% | 175-180 | 0 | 0.0% |

| Zone | Lumens | % of Luminaire |
|--------|--------|----------------|
| 0-40 | 1154 | 93.1% |
| 0-60 | 1231 | 99.4% |
| 0-90 | 1239 | 100.0% |
| 90-180 | 0 | 0.0% |



Candela Tabulation

Horizontal Angle (Degrees)

| Vertical Angle (Degrees) | 0 | 22.5 | 45 | 67.5 | 90 | 112.5 | 135 | 157.5 | 180 | 202.5 | 225 | 247.5 | 270 | 292.5 | 315 | 337.5 |
|--------------------------|-----|------|------|------|------|-------|------|-------|------|-------|------|-------|------|-------|------|-------|
| | 0 | 1076 | 1076 | 1076 | 1076 | 1076 | 1076 | 1076 | 1076 | 1076 | 1076 | 1076 | 1076 | 1076 | 1076 | 1076 |
| | 5 | 1086 | 1086 | 1086 | 1086 | 1086 | 1086 | 1086 | 1086 | 1086 | 1086 | 1086 | 1086 | 1086 | 1086 | 1086 |
| | 10 | 1115 | 1115 | 1115 | 1115 | 1115 | 1115 | 1115 | 1115 | 1115 | 1115 | 1115 | 1115 | 1115 | 1115 | 1115 |
| | 15 | 1132 | 1132 | 1132 | 1132 | 1132 | 1132 | 1132 | 1132 | 1132 | 1132 | 1132 | 1132 | 1132 | 1132 | 1132 |
| | 20 | 1086 | 1086 | 1086 | 1086 | 1086 | 1086 | 1086 | 1086 | 1086 | 1086 | 1086 | 1086 | 1086 | 1086 | 1086 |
| | 25 | 1006 | 1006 | 1006 | 1006 | 1006 | 1006 | 1006 | 1006 | 1006 | 1006 | 1006 | 1006 | 1006 | 1006 | 1006 |
| | 30 | 704 | 704 | 704 | 704 | 704 | 704 | 704 | 704 | 704 | 704 | 704 | 704 | 704 | 704 | 704 |
| | 35 | 487 | 487 | 487 | 487 | 487 | 487 | 487 | 487 | 487 | 487 | 487 | 487 | 487 | 487 | 487 |
| | 40 | 225 | 225 | 225 | 225 | 225 | 225 | 225 | 225 | 225 | 225 | 225 | 225 | 225 | 225 | 225 |
| | 45 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 |
| | 50 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 |
| | 55 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 |
| | 60 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | 65 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| | 70 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| | 75 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | 80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 85 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 90 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 105 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 110 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 115 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 120 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 125 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 130 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 135 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 140 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 145 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 150 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 155 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 160 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 165 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 170 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 175 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 180 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Average Luminance (cd/m²)

Horizontal Angle (Degrees)

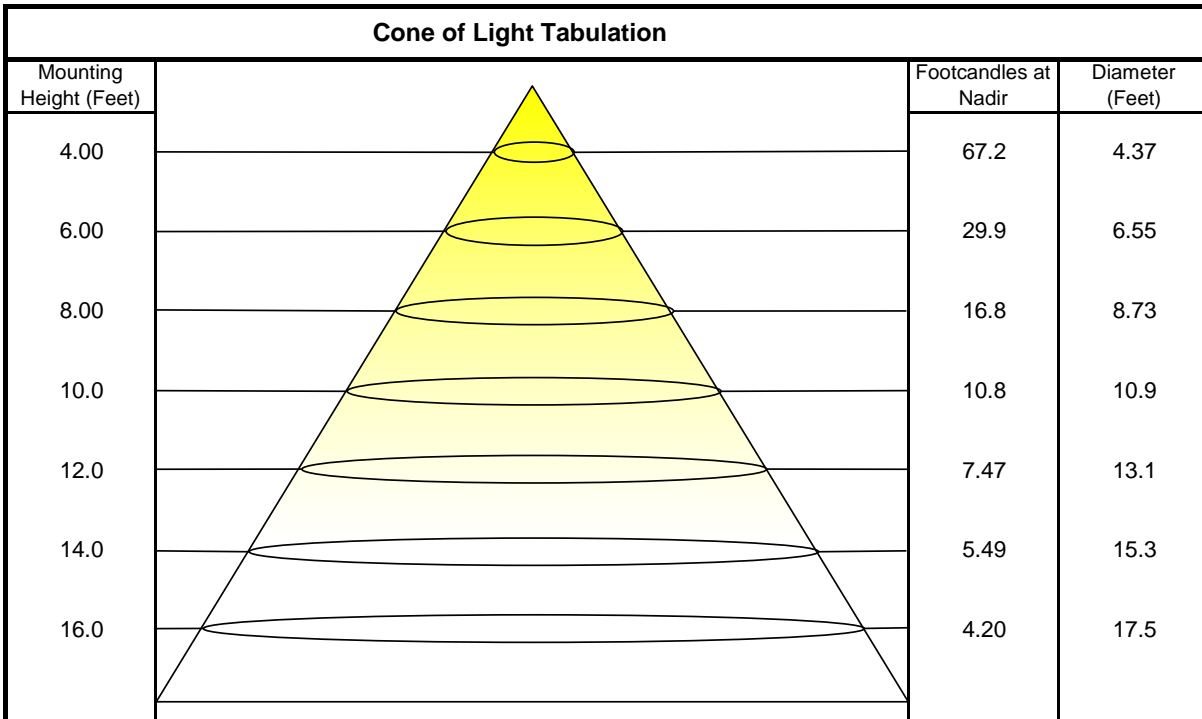
| Vertical Angle (Degrees) | 0 | 45 | 90 |
|--------------------------|----|--------|--------|
| | 0 | 339700 | 339700 |
| | 45 | 28150 | 28150 |
| | 55 | 9213 | 9213 |
| | 65 | 4527 | 4527 |
| | 75 | 1351 | 1351 |
| | 85 | 390 | 390 |



Coefficients of Utilization - Zonal Cavity Method

| Effective Floor Cavity Reflectance 20% | | | | | | | | | | | | | | | | | | |
|--|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ceiling Cavity Reflectance | 80 | | | | 70 | | | | 50 | | | 30 | | | 10 | | | 0 |
| Wall Reflectance | 70 | 50 | 30 | 10 | 70 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 0 |
| Room Cavity Ratio (RCR) | ** Values are expressed as percent of total lumen output delivered to the task surface ** | | | | | | | | | | | | | | | | | |
| 0 | 119 | 119 | 119 | 119 | 116 | 116 | 116 | 116 | 111 | 111 | 111 | 106 | 106 | 106 | 102 | 102 | 102 | 100 |
| 1 | 113 | 111 | 108 | 106 | 111 | 108 | 106 | 104 | 104 | 103 | 101 | 101 | 99 | 98 | 97 | 96 | 95 | 93 |
| 2 | 108 | 103 | 99 | 95 | 105 | 101 | 97 | 94 | 98 | 95 | 92 | 95 | 92 | 90 | 92 | 90 | 88 | 86 |
| 3 | 102 | 96 | 90 | 86 | 100 | 94 | 89 | 86 | 91 | 88 | 84 | 89 | 86 | 83 | 87 | 84 | 82 | 80 |
| 4 | 97 | 89 | 83 | 79 | 95 | 88 | 83 | 79 | 86 | 81 | 78 | 84 | 80 | 77 | 82 | 79 | 76 | 74 |
| 5 | 92 | 83 | 77 | 73 | 90 | 82 | 77 | 72 | 80 | 76 | 72 | 79 | 74 | 71 | 77 | 73 | 71 | 69 |
| 6 | 87 | 78 | 72 | 67 | 85 | 77 | 71 | 67 | 75 | 70 | 67 | 74 | 70 | 66 | 73 | 69 | 66 | 64 |
| 7 | 82 | 73 | 67 | 62 | 81 | 72 | 66 | 62 | 71 | 66 | 62 | 70 | 65 | 62 | 69 | 64 | 61 | 60 |
| 8 | 78 | 68 | 62 | 58 | 77 | 68 | 62 | 58 | 67 | 62 | 58 | 66 | 61 | 58 | 65 | 60 | 57 | 56 |
| 9 | 74 | 64 | 58 | 54 | 73 | 64 | 58 | 54 | 63 | 58 | 54 | 62 | 57 | 54 | 61 | 57 | 54 | 52 |
| 10 | 71 | 61 | 55 | 51 | 70 | 60 | 55 | 51 | 59 | 54 | 51 | 59 | 54 | 50 | 58 | 54 | 50 | 49 |

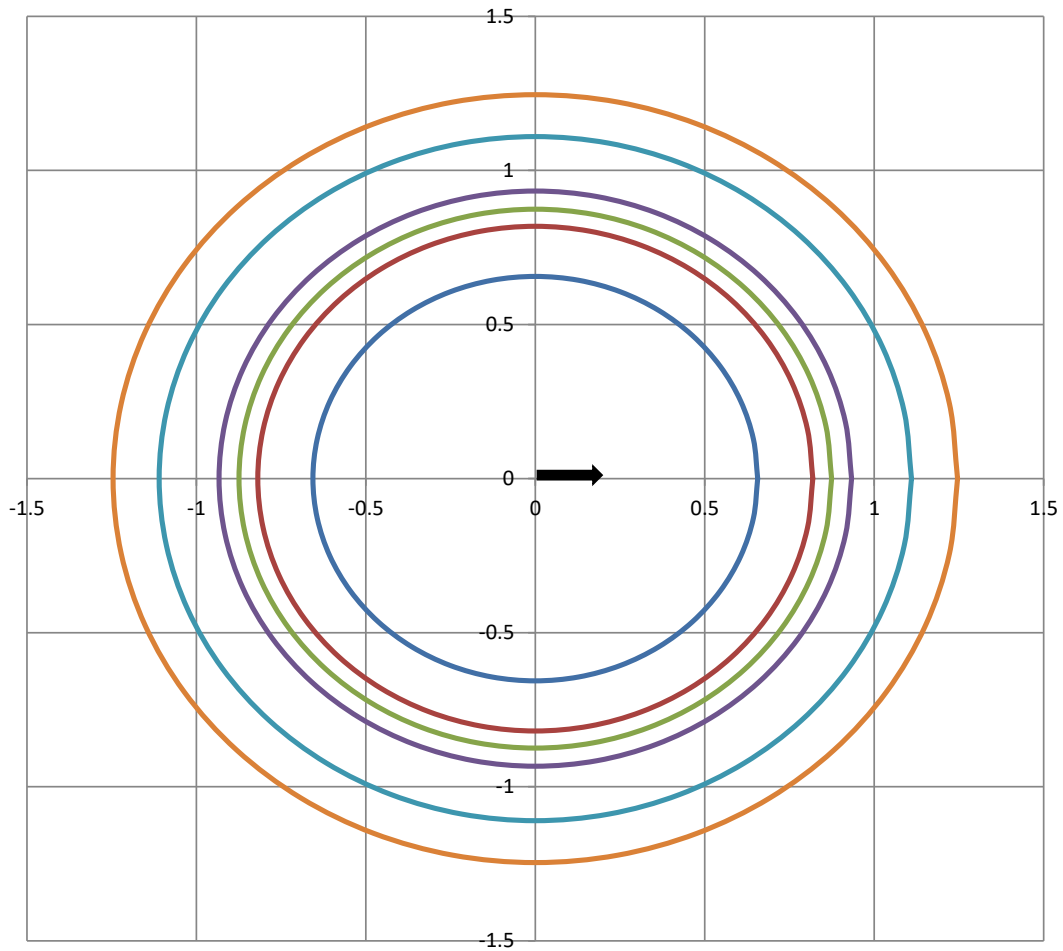
| Beam and Field Information | |
|----------------------------|--------------|
| CIE Type: | Direct |
| Center Beam Intensity: | 1076 Candela |
| Central Cone Intensity: | 1079 Candela |
| Beam Flux: | 986.5 Lumens |
| Beam Angle (0-180): | 67.1 Degrees |
| Beam Angle (90-270): | 67.1 Degrees |
| Field Angle (0-180): | 84.9 Degrees |
| Field Angle (90-270): | 84.9 Degrees |





ISOFootcandle Plot

Mounting Height - 8 Feet



Grid Lines in Units of Mounting Height

5 fc 2 fc 1 fc 0.5 fc 0.2 fc 0.1 fc