

Signify Classified - Internal  
Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



Scaled data based on original data using  
LM-79-2019 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for

Cooper Lighting Solutions

Brand: McGRAW-EDISON

Report Number: P629396

Luminaire Tested: GWS-SA1B-750-U-SL2-W-GRSBK

Issue Date: 1/10/2023

**Test Information**

Test Method: LM-79-2019  
Report Number: P629396  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-28)  
Test Lab: COOPER LIGHTING SOLUTIONS  
Issue Date: 1/10/2023  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: McGRAW-EDISON  
Catalog Number: GWS-SA1B-750-U-SL2-W-GRSBK  
Description: GALLEON WALL SLIM LUMINAIRE. (1) LIGHTSQUARES WITH 16 LEDS EACH AND TYPE II SPILL LIGHT ELIMINATOR OPTICS W/ FACTORY INSTALLED GLARE SHIELD, BK  
Light Source: (16) 5000K CCT, 70 CRI LEDS  
Ballast/Driver: -

**Summary**

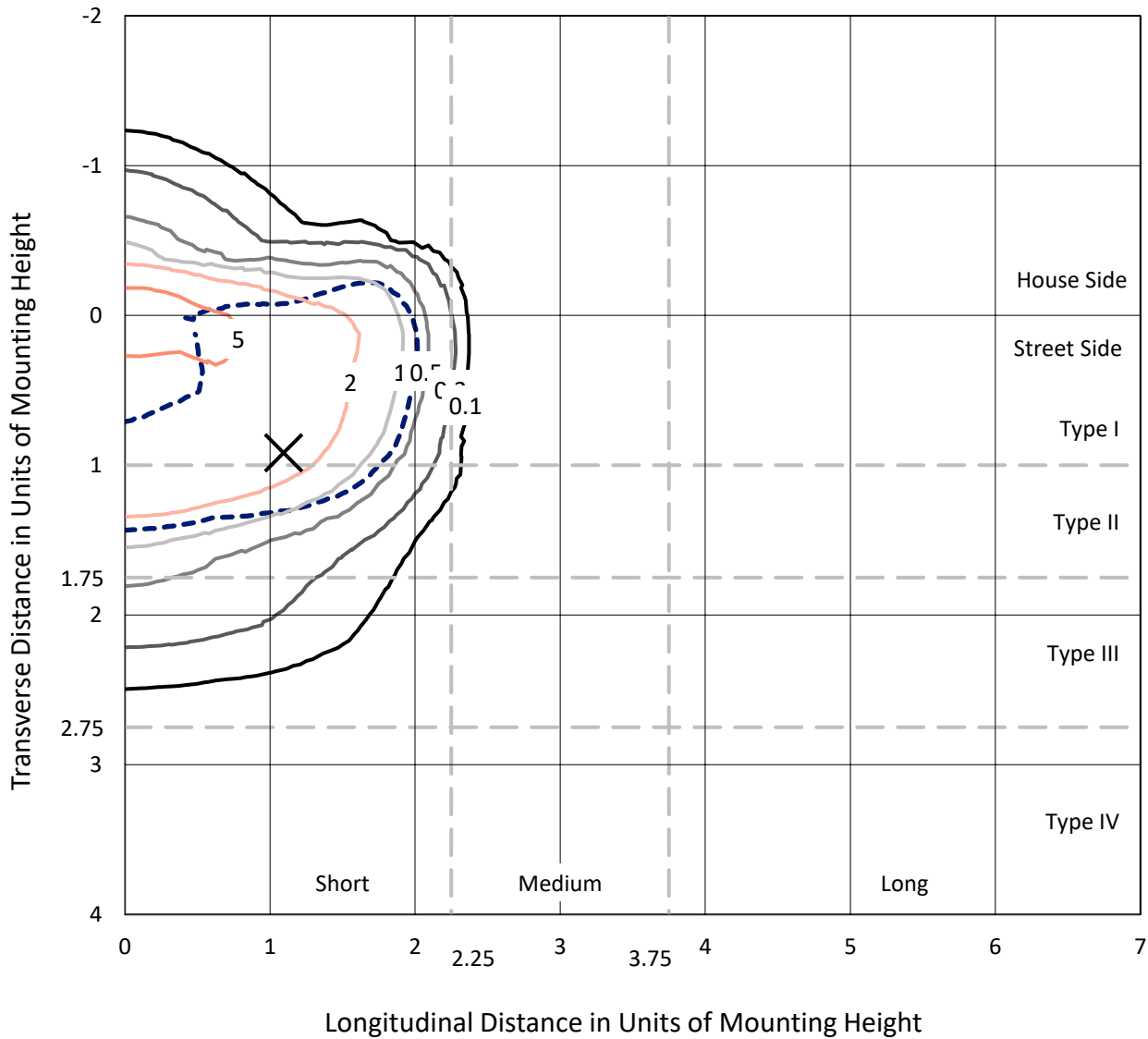
Lumens per Lamp: N/A  
Luminaire Lumens: 2152.7 lumens  
Efficiency: N/A  
Efficacy: 86.1 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B1 - U0 - G0  
  
Input Watts (W): 25  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 0  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT



REPORT NUMBER: P629396  
 CATALOG NUMBER: GWS-SA1B-750-U-SL2-W-GRSBK

### Iso-Footcandle Lines of Horizontal Illumination

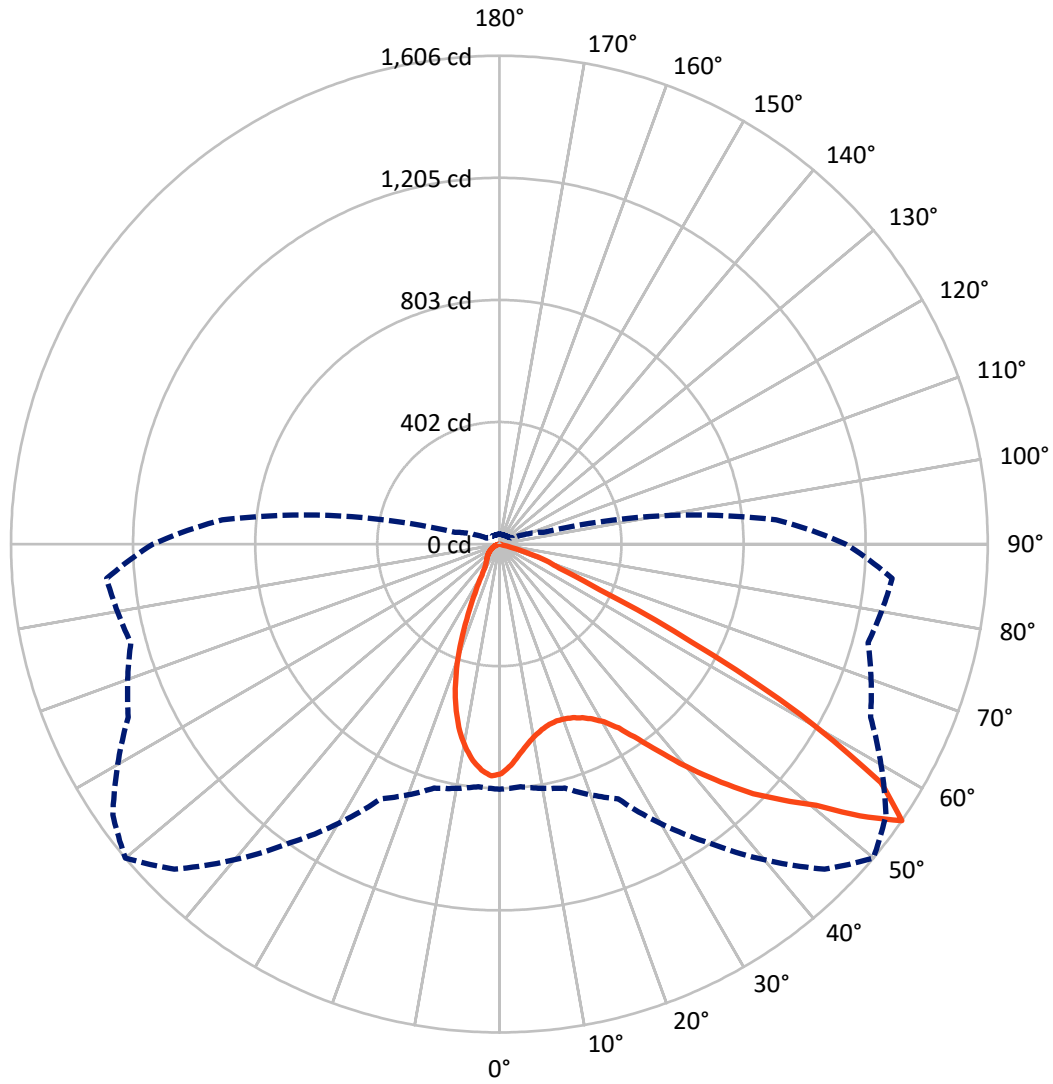
✕ Max cd  
 - - - 1/2 Max cd



Based on 10 foot mounting height. Maximum calculated value = 7.6 fc  
 Type II - Short - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 50-Deg Lateral    - - - Horizontal Cone Through 55-Deg Vertical

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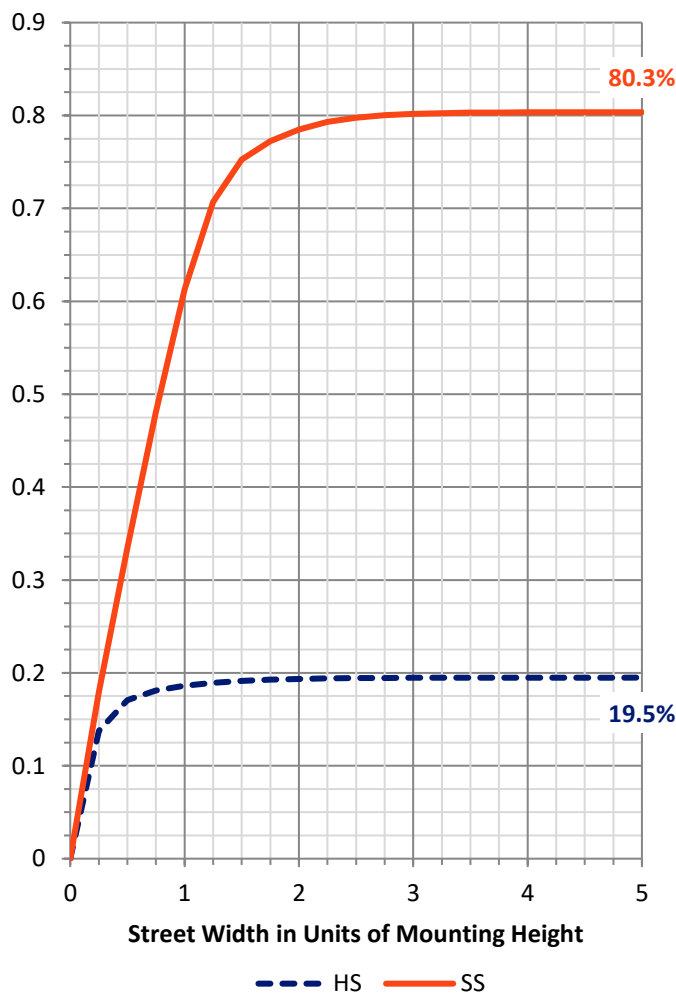
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 424.2    | 0.0    | 424.2  |
|                    | % Fixture | 19.7     | 0.0    | 19.7   |
| <b>Street Side</b> | Lumens    | 1728.5   | 0.0    | 1728.5 |
|                    | % Fixture | 80.3     | 0.0    | 80.3   |
| <b>Total</b>       | Lumens    | 2152.7   | 0.0    | 2152.7 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 66.3   | 3.1       |
| 10°-20°   | 163.2  | 7.6       |
| 20°-30°   | 230.2  | 10.7      |
| 30°-40°   | 340.7  | 15.8      |
| 40°-50°   | 491.5  | 22.8      |
| 50°-60°   | 579.8  | 26.9      |
| 60°-70°   | 258.6  | 12.0      |
| 70°-80°   | 22.2   | 1.0       |
| 80°-90°   | 0.0    | 0.0       |
| 90°-100°  | 0.0    | 0.0       |
| 100°-110° | 0.0    | 0.0       |
| 110°-120° | 0.0    | 0.0       |
| 120°-130° | 0.0    | 0.0       |
| 130°-140° | 0.0    | 0.0       |
| 140°-150° | 0.0    | 0.0       |
| 150°-160° | 0.0    | 0.0       |
| 160°-170° | 0.0    | 0.0       |
| 170°-180° | 0.0    | 0.0       |
| 0°-90°    | 2152.7 | 100.0     |
| 0°-180°   | 2152.7 | 100.0     |

**Coefficient of Utilization**



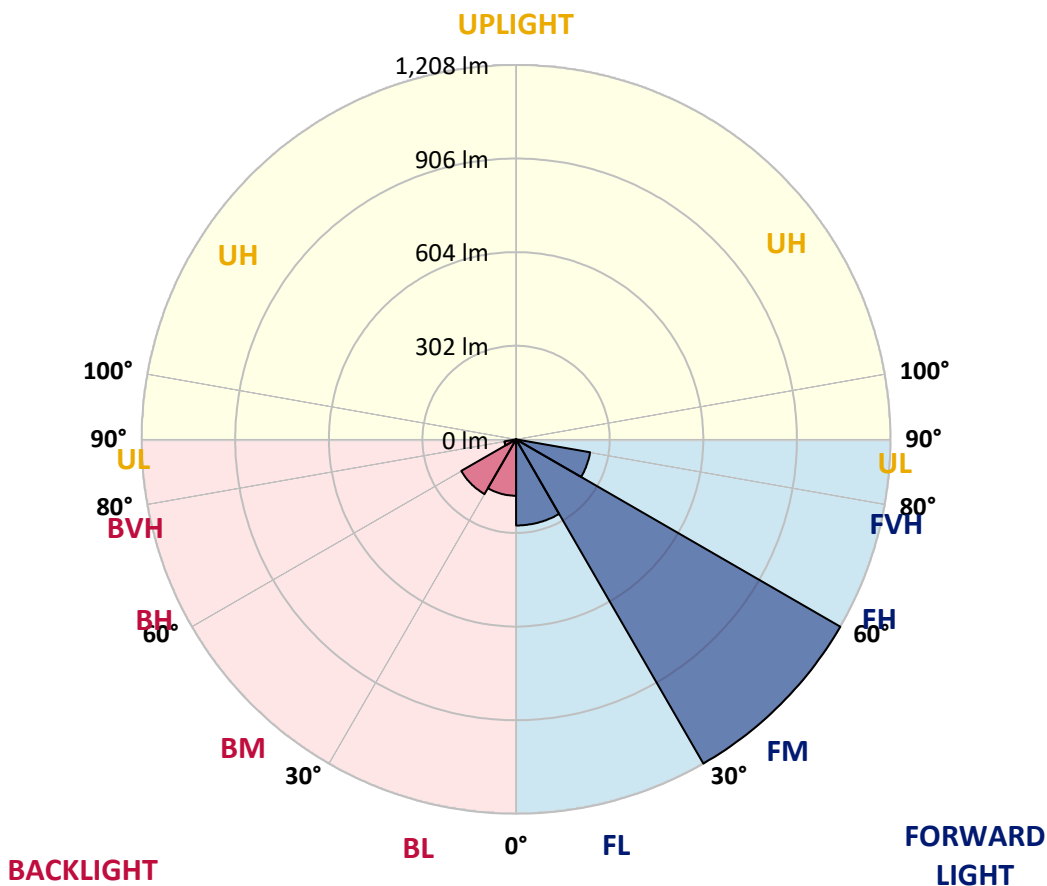
REPORT NUMBER: P629396

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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |      |        |
|----------------|--------|-----------|-------------------------|------|--------|
|                |        |           | B                       | U    | G      |
| FL (0°-30°)    | 277.9  | 12.9      |                         |      |        |
| FM (30°-60°)   | 1208.0 | 56.1      |                         |      |        |
| FH (60°-80°)   | 242.6  | 11.3      |                         |      | G0/660 |
| FVH (80°-90°)  | 0.0    | 0.0       |                         |      | G0/10  |
| BL (0°-30°)    | 181.9  | 8.4       | B1/500                  |      |        |
| BM (30°-60°)   | 204.0  | 9.5       | B0/220                  |      |        |
| BH (60°-80°)   | 38.3   | 1.8       | B0/110                  |      | G0/110 |
| BVH (80°-90°)  | 0.0    | 0.0       |                         |      | G0/10  |
| UL (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |        |
| UH (100°-180°) | 0.0    | 0.0       |                         | U0/0 |        |

**BUG Rating: B1-U0-G0**  
 Type II Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 45°    | 50°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 755.3  | 755.3  | 755.3  | 755.3  | 755.3  | 755.3  | 755.3  | 755.3  | 755.3  | 755.3  | 755.3  |
| 2.5°  | 701.7  | 702.2  | 702.5  | 709.6  | 712.2  | 722.7  | 728.2  | 731.1  | 738.7  | 747.7  | 755.0  |
| 5°    | 654.6  | 653.8  | 655.2  | 664.1  | 669.9  | 685.4  | 693.8  | 699.6  | 716.4  | 737.4  | 755.0  |
| 7.5°  | 613.6  | 615.2  | 616.8  | 626.5  | 635.2  | 652.0  | 664.1  | 672.8  | 696.2  | 727.4  | 757.1  |
| 10°   | 584.7  | 584.7  | 587.1  | 598.1  | 608.4  | 629.1  | 641.2  | 652.3  | 680.1  | 718.5  | 759.5  |
| 12.5° | 563.4  | 563.7  | 566.6  | 579.2  | 591.0  | 612.6  | 625.2  | 636.0  | 666.7  | 709.6  | 760.0  |
| 15°   | 553.5  | 552.7  | 555.0  | 568.4  | 581.6  | 601.8  | 615.0  | 625.5  | 657.3  | 704.6  | 762.6  |
| 17.5° | 550.8  | 550.3  | 552.1  | 565.3  | 578.7  | 598.4  | 611.3  | 621.8  | 655.9  | 706.1  | 770.5  |
| 20°   | 558.4  | 557.4  | 556.6  | 567.9  | 580.5  | 600.0  | 613.4  | 625.2  | 662.3  | 714.8  | 782.6  |
| 22.5° | 576.6  | 576.6  | 574.7  | 580.3  | 588.7  | 606.3  | 620.2  | 635.7  | 678.8  | 732.2  | 800.5  |
| 25°   | 610.0  | 607.3  | 603.9  | 606.3  | 605.2  | 616.3  | 632.8  | 654.4  | 710.1  | 760.8  | 822.3  |
| 27.5° | 648.1  | 650.4  | 644.6  | 644.9  | 635.7  | 631.8  | 651.0  | 683.5  | 756.6  | 801.3  | 854.6  |
| 30°   | 699.8  | 698.0  | 698.3  | 697.5  | 676.2  | 657.5  | 678.3  | 721.6  | 815.2  | 863.0  | 896.7  |
| 32.5° | 740.3  | 742.9  | 751.6  | 756.6  | 728.7  | 698.8  | 720.9  | 773.4  | 882.0  | 933.5  | 948.2  |
| 35°   | 783.1  | 787.9  | 805.5  | 821.8  | 798.4  | 764.0  | 787.6  | 842.0  | 944.8  | 1003.1 | 1007.3 |
| 37.5° | 828.3  | 837.8  | 858.8  | 887.5  | 883.8  | 853.3  | 874.9  | 922.7  | 994.2  | 1045.2 | 1056.2 |
| 40°   | 880.1  | 889.3  | 923.7  | 965.0  | 973.7  | 966.8  | 973.9  | 1001.8 | 1026.8 | 1047.0 | 1077.2 |
| 42.5° | 936.9  | 949.5  | 993.1  | 1048.3 | 1080.9 | 1086.9 | 1070.4 | 1067.5 | 1041.0 | 1026.0 | 1072.7 |
| 45°   | 1003.9 | 1018.6 | 1068.0 | 1139.5 | 1191.3 | 1199.4 | 1170.8 | 1133.7 | 1049.9 | 1010.5 | 1059.3 |
| 47.5° | 1079.1 | 1093.0 | 1142.1 | 1228.1 | 1305.1 | 1308.2 | 1258.3 | 1198.6 | 1076.4 | 1028.3 | 1069.6 |
| 50°   | 1104.3 | 1113.0 | 1155.5 | 1256.4 | 1398.4 | 1422.5 | 1350.3 | 1271.7 | 1129.8 | 1080.9 | 1119.5 |
| 52.5° | 1017.6 | 1021.0 | 1058.0 | 1160.0 | 1379.4 | 1534.8 | 1484.6 | 1380.8 | 1224.6 | 1161.0 | 1196.5 |
| 55°   | 806.3  | 800.8  | 830.7  | 924.3  | 1198.9 | 1511.9 | 1606.2 | 1552.1 | 1346.8 | 1255.1 | 1296.7 |
| 57.5° | 564.0  | 557.4  | 550.6  | 613.9  | 894.6  | 1281.7 | 1480.1 | 1576.0 | 1463.3 | 1348.4 | 1404.7 |
| 60°   | 463.6  | 457.3  | 424.2  | 395.0  | 540.8  | 920.3  | 1136.9 | 1317.4 | 1453.8 | 1343.7 | 1401.2 |
| 62.5° | 400.5  | 396.8  | 383.4  | 343.7  | 318.3  | 525.3  | 711.9  | 884.8  | 1115.6 | 1055.1 | 1058.3 |
| 65°   | 314.6  | 313.5  | 322.7  | 326.9  | 281.5  | 290.7  | 363.2  | 459.9  | 603.1  | 568.7  | 539.3  |
| 67.5° | 215.0  | 212.6  | 229.9  | 282.8  | 270.7  | 229.4  | 212.6  | 214.4  | 261.0  | 159.5  | 126.7  |
| 70°   | 136.7  | 131.1  | 131.4  | 175.3  | 220.2  | 181.1  | 164.0  | 144.3  | 129.8  | 23.7   | 26.8   |
| 72.5° | 87.5   | 84.1   | 72.3   | 79.1   | 102.0  | 88.3   | 89.1   | 76.7   | 51.2   | 12.6   | 14.7   |
| 75°   | 36.8   | 33.9   | 26.0   | 20.8   | 20.5   | 12.9   | 11.3   | 10.5   | 7.1    | 7.1    | 7.6    |
| 77.5° | 0.3    | 0.0    | 0.0    | 0.3    | 0.5    | 0.3    | 0.3    | 0.5    | 1.1    | 1.6    | 1.8    |
| 80°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.3    |
| 82.5° | 0.0    | 0.0    | 0.0    | 0.0    | 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    | 0.0    | 0.0    | 0.0    | 0.0    |
| 87.5° | 0.0    | 0.0    | 0.0    | 0.0    | 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    | 0.0    | 0.0    | 0.0    | 0.0    |



REPORT NUMBER: P629396

CATALOG NUMBER: GWS-SA1B-750-U-SL2-W-GRSBK

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 755.3  | 755.3  | 755.3 | 755.3 | 755.3 | 755.3 | 755.3 | 755.3 | 755.3 | 755.3 | 755.3 |
| 2.5°  | 759.5  | 753.2  | 760.3 | 762.9 | 762.6 | 762.9 | 755.3 | 750.0 | 749.8 | 743.2 | 740.0 |
| 5°    | 762.4  | 757.4  | 762.6 | 759.2 | 751.1 | 740.8 | 727.2 | 715.3 | 710.1 | 702.5 | 698.8 |
| 7.5°  | 767.9  | 762.6  | 761.9 | 748.2 | 728.0 | 706.4 | 682.2 | 660.7 | 649.1 | 635.2 | 636.0 |
| 10°   | 771.8  | 765.8  | 755.5 | 727.7 | 694.1 | 659.6 | 623.6 | 591.6 | 571.3 | 552.7 | 549.5 |
| 12.5° | 773.4  | 764.5  | 740.6 | 698.5 | 651.2 | 606.3 | 553.5 | 507.7 | 476.2 | 451.8 | 448.3 |
| 15°   | 776.3  | 761.9  | 721.4 | 663.3 | 598.4 | 534.8 | 467.5 | 405.0 | 363.2 | 335.1 | 337.4 |
| 17.5° | 780.8  | 759.0  | 699.8 | 623.9 | 541.6 | 451.8 | 360.8 | 289.1 | 250.7 | 234.4 | 234.7 |
| 20°   | 787.1  | 755.5  | 676.2 | 580.5 | 473.6 | 357.9 | 252.3 | 198.2 | 187.4 | 186.9 | 186.1 |
| 22.5° | 795.5  | 752.1  | 651.0 | 533.0 | 392.9 | 250.7 | 167.9 | 151.1 | 155.6 | 164.2 | 165.8 |
| 25°   | 805.5  | 747.9  | 622.8 | 479.3 | 304.8 | 164.5 | 125.9 | 123.3 | 134.0 | 145.6 | 148.2 |
| 27.5° | 821.0  | 745.8  | 590.8 | 418.4 | 213.9 | 118.0 | 103.0 | 104.6 | 114.3 | 124.0 | 126.4 |
| 30°   | 847.3  | 749.8  | 555.8 | 350.0 | 137.4 | 94.1  | 89.4  | 91.7  | 97.0  | 102.0 | 104.1 |
| 32.5° | 883.0  | 761.3  | 521.9 | 275.4 | 98.0  | 81.7  | 80.7  | 82.0  | 84.1  | 87.0  | 87.8  |
| 35°   | 924.8  | 781.3  | 487.0 | 197.1 | 80.9  | 74.6  | 73.6  | 73.6  | 74.6  | 75.2  | 75.4  |
| 37.5° | 959.2  | 802.3  | 454.1 | 131.1 | 72.5  | 69.1  | 67.5  | 66.8  | 66.5  | 67.0  | 67.3  |
| 40°   | 974.2  | 811.0  | 418.4 | 95.4  | 66.5  | 64.1  | 61.8  | 59.4  | 59.4  | 61.2  | 61.5  |
| 42.5° | 963.7  | 801.3  | 377.1 | 78.8  | 62.3  | 58.9  | 55.2  | 53.1  | 54.1  | 56.0  | 56.5  |
| 45°   | 941.3  | 777.4  | 331.7 | 69.6  | 58.1  | 53.6  | 49.4  | 48.1  | 49.1  | 51.5  | 52.0  |
| 47.5° | 937.7  | 761.6  | 277.3 | 63.6  | 53.6  | 49.1  | 44.7  | 43.4  | 44.7  | 46.5  | 47.0  |
| 50°   | 974.2  | 775.3  | 216.8 | 58.3  | 49.4  | 44.4  | 40.7  | 39.4  | 40.2  | 41.3  | 41.8  |
| 52.5° | 1041.0 | 826.0  | 175.0 | 53.3  | 44.4  | 39.7  | 37.3  | 35.7  | 35.7  | 36.8  | 37.1  |
| 55°   | 1139.5 | 914.5  | 151.1 | 47.6  | 38.6  | 36.0  | 33.9  | 32.3  | 32.3  | 32.8  | 33.1  |
| 57.5° | 1253.0 | 1021.8 | 156.6 | 39.9  | 33.9  | 32.6  | 30.7  | 29.4  | 30.0  | 30.0  | 30.0  |
| 60°   | 1237.3 | 1013.9 | 167.7 | 33.6  | 30.0  | 29.4  | 27.9  | 27.3  | 28.6  | 27.6  | 27.1  |
| 62.5° | 911.4  | 700.4  | 87.8  | 27.6  | 25.8  | 25.2  | 24.2  | 25.2  | 27.1  | 24.2  | 23.1  |
| 65°   | 442.6  | 339.0  | 35.2  | 22.6  | 21.8  | 21.3  | 20.8  | 22.3  | 23.4  | 18.9  | 17.9  |
| 67.5° | 104.1  | 84.6   | 22.9  | 19.2  | 18.1  | 17.1  | 17.6  | 17.9  | 17.1  | 12.9  | 12.4  |
| 70°   | 27.1   | 26.5   | 17.9  | 16.0  | 14.5  | 13.4  | 13.4  | 13.1  | 11.3  | 8.1   | 7.6   |
| 72.5° | 14.7   | 14.5   | 12.9  | 12.1  | 10.0  | 8.9   | 9.2   | 8.1   | 6.3   | 4.7   | 4.5   |
| 75°   | 7.4    | 7.9    | 7.4   | 6.8   | 5.5   | 5.0   | 5.0   | 4.5   | 3.2   | 1.8   | 1.8   |
| 77.5° | 1.6    | 1.8    | 1.8   | 1.6   | 1.3   | 1.1   | 1.1   | 1.3   | 0.5   | 0.0   | 0.0   |
| 80°   | 0.3    | 0.3    | 0.3   | 0.3   | 0.3   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| 82.5° | 0.0    | 0.0    | 0.0   | 0.0   | 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   | 0.0   | 0.0   | 0.0   | 0.0   |
| 87.5° | 0.0    | 0.0    | 0.0   | 0.0   | 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   | 0.0   | 0.0   | 0.0   | 0.0   |



Signify Classified - Internal  
Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



LM-79-2008: Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Report Prepared for

Cooper Lighting Solutions

McGRAW-EDISON

Report Number: SP1-1908-441-4-R4

Test Date: 10/02/2019

Luminaire Tested: SA1C-750-U-5WQ

Data in this report applies to families of products SA1C-760-U-5WQ .

**Test Information**

Test Method: LM-79-2008  
 Report Number: SP1-1908-441-4-R4  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1 - 76IN SPHERE  
 Measurement Geometry: 4π  
 Issue Date: 10/28/2024  
 Manufacturer: COOPER LIGHTING SOLUTIONS  
 Product Line: McGRAW-EDISON  
 Catalog Number: **SA1C-750-U-5WQ**  
 Description: McGRAW EDISON ROADWAY AND AREA LUMINAIRE

\*\*\*THIS IS A REVISION OF SP1-1908-441-4-R3. TO UPDATE THE CATALOG INFORMATION.\*\*\*TESTED IN SITU. ROADWAY AND AREA LUMINAIRE. (1) 70 CRI, 5000K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

**Spectral Parameters**

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 4884   | CRI (Ra): | 73.5 | R9:  | -28.4 |
| CIE u':                   | 0.2101 | R1:       | 70.5 | R10: | 48.6  |
| CIE v':                   | 0.4904 | R2:       | 77.7 | R11: | 73.2  |
| Duv:                      | 0.0037 | R3:       | 84.6 | R12: | 50.7  |
| CIE x:                    | 0.3493 | R4:       | 74.7 | R13: | 71.2  |
| CIE y:                    | 0.3624 | R5:       | 71.9 | R14: | 91.4  |
| CIE z:                    | 0.2884 | R6:       | 70.7 |      |       |
| Peak Wavelength (nm):     | 444    | R7:       | 81.2 |      |       |
| Dominant Wavelength (nm): | 571    | R8:       | 56.9 |      |       |
| Purity:                   | 13.7   |           |      |      |       |
| Rf:                       | 74.9   |           |      |      |       |
| Rg:                       | 96.3   |           |      |      |       |



**Test Conditions**

Stabilization Time: 240M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.0./44%  
 Sphere Temperature (°C): 25.7

REPORT NUMBER: SP1-1908-441-4-R4

| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 6/28/2019        | 12/28/2019           |
| Power Meter                    | IN0071                | 12/5/2018        | 12/5/2019            |
| AC Power Source                | IN0063                | 12/5/2018        | 12/5/2019            |
| DC Power Source                | IN0208                | 12/5/2018        | 12/5/2019            |
| Sphere Thermometer             | IN0085                | 12/5/2018        | 12/5/2019            |
| Room Thermometer               | IN0046                | 12/5/2018        | 12/5/2019            |

REPORT NUMBER: SP1-1908-441-4-R4

CIE 1931 Chromaticity Diagram



CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles



Point lies inside the ANSI 5000K 4-step quadrangle

REPORT NUMBER: SP1-1908-441-4-R4

**Photopic Flux vs. Wavelength**



#####

| $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) | $\lambda$<br>(nm) | Power<br>( $\mu\text{W}/\text{nm}$ ) | Lumens<br>( $\phi/\text{nm}$ ) |
|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|-------------------|--------------------------------------|--------------------------------|
| 360               | 2945                                 | NR                             | 490               | 37941                                | NR                             | 620               | 88803                                | NR                             | 750               | 3908                                 | NR                             | 880               | 2997                                 | NR                             |
| 365               | 2596                                 | NR                             | 495               | 48525                                | NR                             | 625               | 80578                                | NR                             | 755               | 3988                                 | NR                             | 885               | 2927                                 | NR                             |
| 370               | 2732                                 | NR                             | 500               | 60609                                | NR                             | 630               | 73127                                | NR                             | 760               | 3335                                 | NR                             | 890               | 2649                                 | NR                             |
| 375               | 2894                                 | NR                             | 505               | 72036                                | NR                             | 635               | 66244                                | NR                             | 765               | 3438                                 | NR                             | 895               | 2828                                 | NR                             |
| 380               | 2822                                 | NR                             | 510               | 82168                                | NR                             | 640               | 59440                                | NR                             | 770               | 3427                                 | NR                             | 900               | 1407                                 | NR                             |
| 385               | 2394                                 | NR                             | 515               | 90898                                | NR                             | 645               | 52864                                | NR                             | 775               | 2759                                 | NR                             | 905               | 2224                                 | NR                             |
| 390               | 2370                                 | NR                             | 520               | 97142                                | NR                             | 650               | 47085                                | NR                             | 780               | 2340                                 | NR                             | 910               | 2905                                 | NR                             |
| 395               | 2267                                 | NR                             | 525               | 103255                               | NR                             | 655               | 41789                                | NR                             | 785               | 2412                                 | NR                             | 915               | 3350                                 | NR                             |
| 400               | 2262                                 | NR                             | 530               | 106697                               | NR                             | 660               | 37064                                | NR                             | 790               | 1999                                 | NR                             | 920               | 3114                                 | NR                             |
| 405               | 3000                                 | NR                             | 535               | 110081                               | NR                             | 665               | 32299                                | NR                             | 795               | 2054                                 | NR                             | 925               | 2834                                 | NR                             |
| 410               | 5324                                 | NR                             | 540               | 112494                               | NR                             | 670               | 28142                                | NR                             | 800               | 2331                                 | NR                             | 930               | 2271                                 | NR                             |
| 415               | 10725                                | NR                             | 545               | 115513                               | NR                             | 675               | 24505                                | NR                             | 805               | 2648                                 | NR                             | 935               | 2228                                 | NR                             |
| 420               | 22128                                | NR                             | 550               | 117203                               | NR                             | 680               | 21162                                | NR                             | 810               | 2485                                 | NR                             | 940               | 2833                                 | NR                             |
| 425               | 44095                                | NR                             | 555               | 119753                               | NR                             | 685               | 18400                                | NR                             | 815               | 2409                                 | NR                             | 945               | 2941                                 | NR                             |
| 430               | 77002                                | NR                             | 560               | 122602                               | NR                             | 690               | 16065                                | NR                             | 820               | 2221                                 | NR                             | 950               | 2323                                 | NR                             |
| 435               | 119881                               | NR                             | 565               | 124314                               | NR                             | 695               | 13860                                | NR                             | 825               | 1562                                 | NR                             | 955               | 1667                                 | NR                             |
| 440               | 164454                               | NR                             | 570               | 126775                               | NR                             | 700               | 12177                                | NR                             | 830               | 2249                                 | NR                             | 960               | 749                                  | NR                             |
| 445               | 179997                               | NR                             | 575               | 127511                               | NR                             | 705               | 10757                                | NR                             | 835               | 2573                                 | NR                             | 965               | 2669                                 | NR                             |
| 450               | 142822                               | NR                             | 580               | 127577                               | NR                             | 710               | 9601                                 | NR                             | 840               | 2764                                 | NR                             | 970               | 3968                                 | NR                             |
| 455               | 90008                                | NR                             | 585               | 126153                               | NR                             | 715               | 8944                                 | NR                             | 845               | 3109                                 | NR                             | 975               | 3886                                 | NR                             |
| 460               | 60557                                | NR                             | 590               | 123678                               | NR                             | 720               | 7947                                 | NR                             | 850               | 2963                                 | NR                             | 980               | 2788                                 | NR                             |
| 465               | 43305                                | NR                             | 595               | 119774                               | NR                             | 725               | 7062                                 | NR                             | 855               | 2336                                 | NR                             | 985               | 3496                                 | NR                             |
| 470               | 31089                                | NR                             | 600               | 115733                               | NR                             | 730               | 6004                                 | NR                             | 860               | 2118                                 | NR                             | 990               | 2913                                 | NR                             |
| 475               | 26278                                | NR                             | 605               | 109231                               | NR                             | 735               | 5594                                 | NR                             | 865               | 3144                                 | NR                             | 995               | 4659                                 | NR                             |
| 480               | 27060                                | NR                             | 610               | 102408                               | NR                             | 740               | 5165                                 | NR                             | 870               | 3069                                 | NR                             | 1000              | 1308                                 | NR                             |
| 485               | 30698                                | NR                             | 615               | 96015                                | NR                             | 745               | 4687                                 | NR                             | 875               | 3311                                 | NR                             |                   |                                      |                                |

REPORT NUMBER: SP1-1908-441-4-R4

Scotopic Flux vs. Wavelength



Scotopic Lumens: 13493.5 S/P: 1.77

| λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) |
|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|
| 360    | 2945          | NR            | 490    | 37941         | NR            | 620    | 88803         | NR            | 750    | 3908          | NR            | 880    | 2997          | NR            |
| 365    | 2596          | NR            | 495    | 48525         | NR            | 625    | 80578         | NR            | 755    | 3988          | NR            | 885    | 2927          | NR            |
| 370    | 2732          | NR            | 500    | 60609         | NR            | 630    | 73127         | NR            | 760    | 3335          | NR            | 890    | 2649          | NR            |
| 375    | 2894          | NR            | 505    | 72036         | NR            | 635    | 66244         | NR            | 765    | 3438          | NR            | 895    | 2828          | NR            |
| 380    | 2822          | NR            | 510    | 82168         | NR            | 640    | 59440         | NR            | 770    | 3427          | NR            | 900    | 1407          | NR            |
| 385    | 2394          | NR            | 515    | 90898         | NR            | 645    | 52864         | NR            | 775    | 2759          | NR            | 905    | 2224          | NR            |
| 390    | 2370          | NR            | 520    | 97142         | NR            | 650    | 47085         | NR            | 780    | 2340          | NR            | 910    | 2905          | NR            |
| 395    | 2267          | NR            | 525    | 103255        | NR            | 655    | 41789         | NR            | 785    | 2412          | NR            | 915    | 3350          | NR            |
| 400    | 2262          | NR            | 530    | 106697        | NR            | 660    | 37064         | NR            | 790    | 1999          | NR            | 920    | 3114          | NR            |
| 405    | 3000          | NR            | 535    | 110081        | NR            | 665    | 32299         | NR            | 795    | 2054          | NR            | 925    | 2834          | NR            |
| 410    | 5324          | NR            | 540    | 112494        | NR            | 670    | 28142         | NR            | 800    | 2331          | NR            | 930    | 2271          | NR            |
| 415    | 10725         | NR            | 545    | 115513        | NR            | 675    | 24505         | NR            | 805    | 2648          | NR            | 935    | 2228          | NR            |
| 420    | 22128         | NR            | 550    | 117203        | NR            | 680    | 21162         | NR            | 810    | 2485          | NR            | 940    | 2833          | NR            |
| 425    | 44095         | NR            | 555    | 119753        | NR            | 685    | 18400         | NR            | 815    | 2409          | NR            | 945    | 2941          | NR            |
| 430    | 77002         | NR            | 560    | 122602        | NR            | 690    | 16065         | NR            | 820    | 2221          | NR            | 950    | 2323          | NR            |
| 435    | 119881        | NR            | 565    | 124314        | NR            | 695    | 13860         | NR            | 825    | 1562          | NR            | 955    | 1667          | NR            |
| 440    | 164454        | NR            | 570    | 126775        | NR            | 700    | 12177         | NR            | 830    | 2249          | NR            | 960    | 749           | NR            |
| 445    | 179997        | NR            | 575    | 127511        | NR            | 705    | 10757         | NR            | 835    | 2573          | NR            | 965    | 2669          | NR            |
| 450    | 142822        | NR            | 580    | 127577        | NR            | 710    | 9601          | NR            | 840    | 2764          | NR            | 970    | 3968          | NR            |
| 455    | 90008         | NR            | 585    | 126153        | NR            | 715    | 8944          | NR            | 845    | 3109          | NR            | 975    | 3886          | NR            |
| 460    | 60557         | NR            | 590    | 123678        | NR            | 720    | 7947          | NR            | 850    | 2963          | NR            | 980    | 2788          | NR            |
| 465    | 43305         | NR            | 595    | 119774        | NR            | 725    | 7062          | NR            | 855    | 2336          | NR            | 985    | 3496          | NR            |
| 470    | 31089         | NR            | 600    | 115733        | NR            | 730    | 6004          | NR            | 860    | 2118          | NR            | 990    | 2913          | NR            |
| 475    | 26278         | NR            | 605    | 109231        | NR            | 735    | 5594          | NR            | 865    | 3144          | NR            | 995    | 4659          | NR            |
| 480    | 27060         | NR            | 610    | 102408        | NR            | 740    | 5165          | NR            | 870    | 3069          | NR            | 1000   | 1308          | NR            |
| 485    | 30698         | NR            | 615    | 96015         | NR            | 745    | 4687          | NR            | 875    | 3311          | NR            |        |               |               |

REPORT NUMBER: SP1-1908-441-4-R4

**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 5378.9 M/P: 0.71**

| λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) | λ (nm) | Power (µW/nm) | Lumens (φ/nm) |
|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|
| 360    | 2945          | NR            | 490    | 37941         | NR            | 620    | 88803         | NR            | 750    | 3908          | NR            | 880    | 2997          | NR            |
| 365    | 2596          | NR            | 495    | 48525         | NR            | 625    | 80578         | NR            | 755    | 3988          | NR            | 885    | 2927          | NR            |
| 370    | 2732          | NR            | 500    | 60609         | NR            | 630    | 73127         | NR            | 760    | 3335          | NR            | 890    | 2649          | NR            |
| 375    | 2894          | NR            | 505    | 72036         | NR            | 635    | 66244         | NR            | 765    | 3438          | NR            | 895    | 2828          | NR            |
| 380    | 2822          | NR            | 510    | 82168         | NR            | 640    | 59440         | NR            | 770    | 3427          | NR            | 900    | 1407          | NR            |
| 385    | 2394          | NR            | 515    | 90898         | NR            | 645    | 52864         | NR            | 775    | 2759          | NR            | 905    | 2224          | NR            |
| 390    | 2370          | NR            | 520    | 97142         | NR            | 650    | 47085         | NR            | 780    | 2340          | NR            | 910    | 2905          | NR            |
| 395    | 2267          | NR            | 525    | 103255        | NR            | 655    | 41789         | NR            | 785    | 2412          | NR            | 915    | 3350          | NR            |
| 400    | 2262          | NR            | 530    | 106697        | NR            | 660    | 37064         | NR            | 790    | 1999          | NR            | 920    | 3114          | NR            |
| 405    | 3000          | NR            | 535    | 110081        | NR            | 665    | 32299         | NR            | 795    | 2054          | NR            | 925    | 2834          | NR            |
| 410    | 5324          | NR            | 540    | 112494        | NR            | 670    | 28142         | NR            | 800    | 2331          | NR            | 930    | 2271          | NR            |
| 415    | 10725         | NR            | 545    | 115513        | NR            | 675    | 24505         | NR            | 805    | 2648          | NR            | 935    | 2228          | NR            |
| 420    | 22128         | NR            | 550    | 117203        | NR            | 680    | 21162         | NR            | 810    | 2485          | NR            | 940    | 2833          | NR            |
| 425    | 44095         | NR            | 555    | 119753        | NR            | 685    | 18400         | NR            | 815    | 2409          | NR            | 945    | 2941          | NR            |
| 430    | 77002         | NR            | 560    | 122602        | NR            | 690    | 16065         | NR            | 820    | 2221          | NR            | 950    | 2323          | NR            |
| 435    | 119881        | NR            | 565    | 124314        | NR            | 695    | 13860         | NR            | 825    | 1562          | NR            | 955    | 1667          | NR            |
| 440    | 164454        | NR            | 570    | 126775        | NR            | 700    | 12177         | NR            | 830    | 2249          | NR            | 960    | 749           | NR            |
| 445    | 179997        | NR            | 575    | 127511        | NR            | 705    | 10757         | NR            | 835    | 2573          | NR            | 965    | 2669          | NR            |
| 450    | 142822        | NR            | 580    | 127577        | NR            | 710    | 9601          | NR            | 840    | 2764          | NR            | 970    | 3968          | NR            |
| 455    | 90008         | NR            | 585    | 126153        | NR            | 715    | 8944          | NR            | 845    | 3109          | NR            | 975    | 3886          | NR            |
| 460    | 60557         | NR            | 590    | 123678        | NR            | 720    | 7947          | NR            | 850    | 2963          | NR            | 980    | 2788          | NR            |
| 465    | 43305         | NR            | 595    | 119774        | NR            | 725    | 7062          | NR            | 855    | 2336          | NR            | 985    | 3496          | NR            |
| 470    | 31089         | NR            | 600    | 115733        | NR            | 730    | 6004          | NR            | 860    | 2118          | NR            | 990    | 2913          | NR            |
| 475    | 26278         | NR            | 605    | 109231        | NR            | 735    | 5594          | NR            | 865    | 3144          | NR            | 995    | 4659          | NR            |
| 480    | 27060         | NR            | 610    | 102408        | NR            | 740    | 5165          | NR            | 870    | 3069          | NR            | 1000   | 1308          | NR            |
| 485    | 30698         | NR            | 615    | 96015         | NR            | 745    | 4687          | NR            | 875    | 3311          | NR            |        |               |               |

REPORT NUMBER: SP1-1908-441-4-R4

TM-30-18

**Summary**

$R_f = 74.9$   
 $R_g = 96.3$   
 CIE  $R_a = 73.5$   
 $R_g = -28.4$



**Color Vector Graphics**





REPORT NUMBER: SP1-1908-441-4-R4

TM-30-18

**Individual Sample Fidelity Index ( $R_{f,i}$ )**

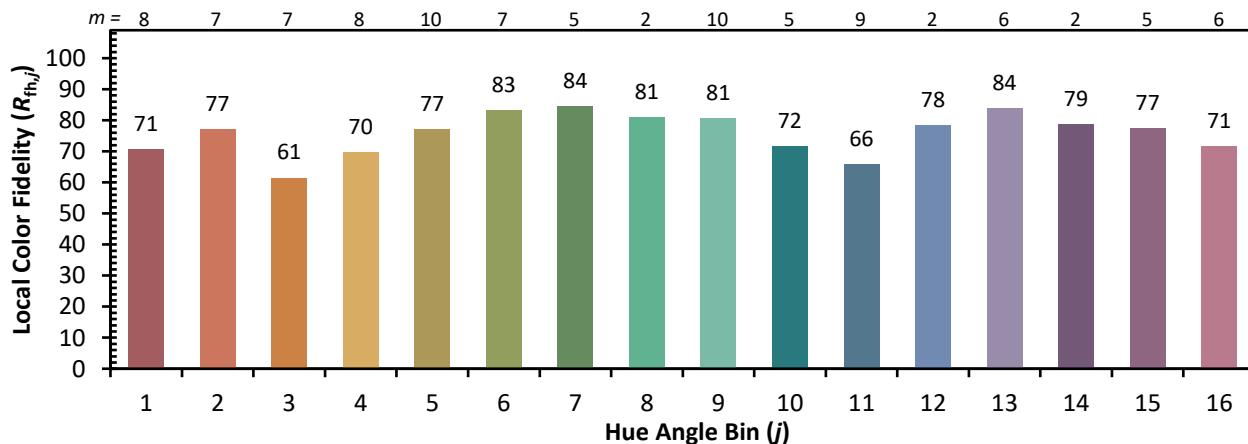
|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 61 | CES51 = 90 | CES76 = 52 |
| CES02 = 60 | CES27 = 84 | CES52 = 91 | CES77 = 71 |
| CES03 = 30 | CES28 = 81 | CES53 = 79 | CES78 = 54 |
| CES04 = 69 | CES29 = 58 | CES54 = 83 | CES79 = 80 |
| CES05 = 46 | CES30 = 67 | CES55 = 83 | CES80 = 77 |
| CES06 = 50 | CES31 = 63 | CES56 = 73 | CES81 = 77 |
| CES07 = 39 | CES32 = 59 | CES57 = 72 | CES82 = 90 |
| CES08 = 38 | CES33 = 69 | CES58 = 73 | CES83 = 86 |
| CES09 = 29 | CES34 = 69 | CES59 = 88 | CES84 = 88 |
| CES10 = 73 | CES35 = 83 | CES60 = 93 | CES85 = 84 |
| CES11 = 56 | CES36 = 95 | CES61 = 88 | CES86 = 75 |
| CES12 = 61 | CES37 = 78 | CES62 = 85 | CES87 = 78 |
| CES13 = 41 | CES38 = 76 | CES63 = 77 | CES88 = 79 |
| CES14 = 74 | CES39 = 93 | CES64 = 74 | CES89 = 75 |
| CES15 = 70 | CES40 = 86 | CES65 = 67 | CES90 = 77 |
| CES16 = 46 | CES41 = 87 | CES66 = 69 | CES91 = 89 |
| CES17 = 49 | CES42 = 78 | CES67 = 67 | CES92 = 66 |
| CES18 = 55 | CES43 = 75 | CES68 = 73 | CES93 = 80 |
| CES19 = 71 | CES44 = 99 | CES69 = 81 | CES94 = 57 |
| CES20 = 64 | CES45 = 83 | CES70 = 63 | CES95 = 71 |
| CES21 = 85 | CES46 = 81 | CES71 = 60 | CES96 = 78 |
| CES22 = 77 | CES47 = 80 | CES72 = 86 | CES97 = 85 |
| CES23 = 91 | CES48 = 72 | CES73 = 53 | CES98 = 75 |
| CES24 = 90 | CES49 = 81 | CES74 = 96 | CES99 = 62 |
| CES25 = 71 | CES50 = 89 | CES75 = 58 |            |



REPORT NUMBER: SP1-1908-441-4-R4

TM-30-18

Color Rendition by Hue-Angle Bin



REPORT NUMBER: SP1-1908-441-4-R4

TM-30-18

Measure Comparisons



(END OF REPORT)