

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: P628741

Luminaire Tested: GWS-SA1A-730-U-SL3-W-GRSWH

Issue Date: 1/10/2023

**Test Information**

Test Method: LM-79-2019  
Report Number: P628741  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-2209-782-33)  
Test Lab: COOPER LIGHTING SOLUTIONS  
Issue Date: 1/10/2023  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: McGRAW-EDISON  
Catalog Number: GWS-SA1A-730-U-SL3-W-GRSWH  
Description: GALLEON WALL SLIM LUMINAIRE. (1) LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III SPILL LIGHT ELIMINATOR OPTICS W/ FACTORY INSTALLED GLARE SHIELD, WH  
Light Source: (16) 3000K CCT, 70 CRI LEDS  
Ballast/Driver: -

**Summary**

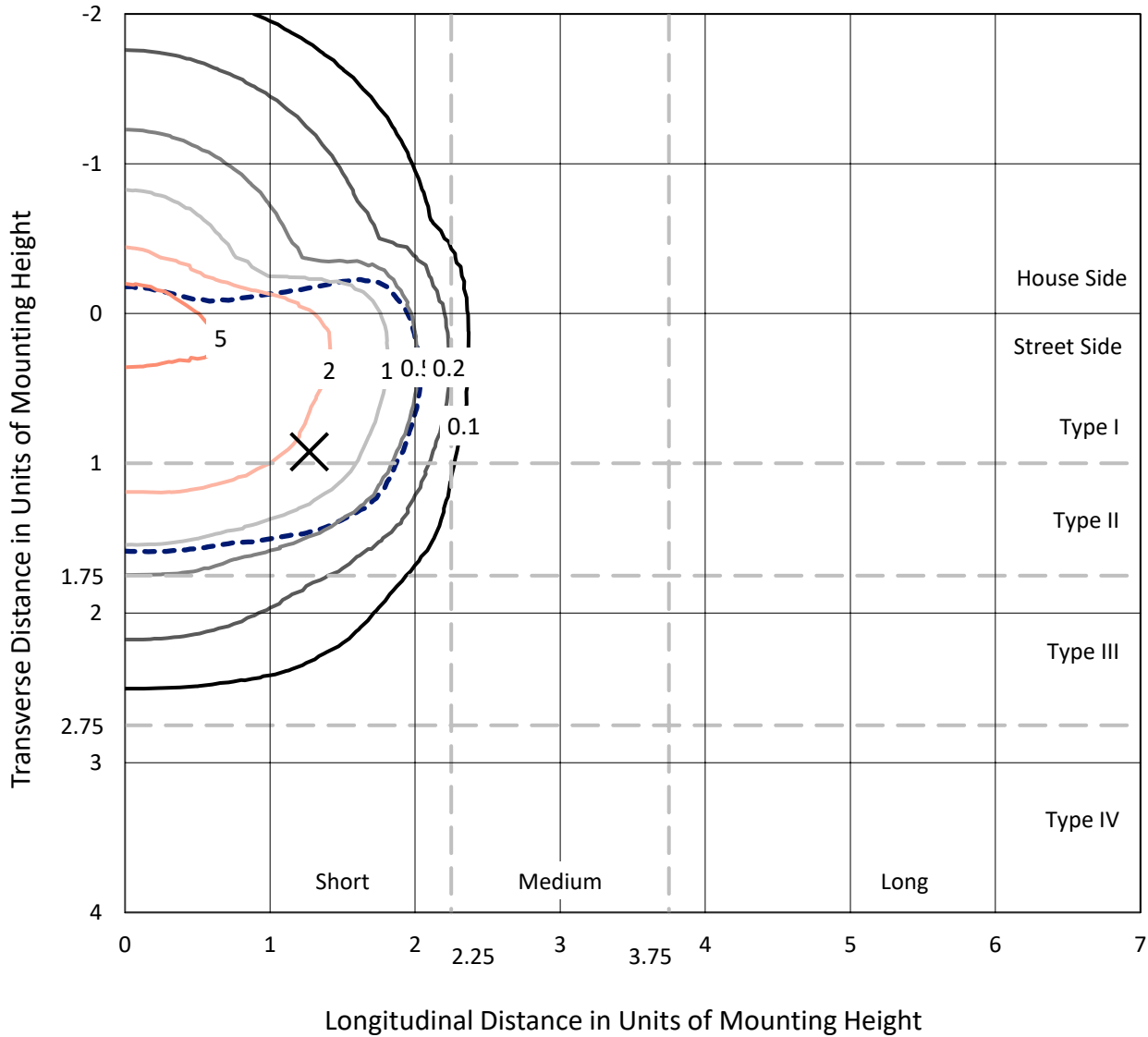
Lumens per Lamp: N/A  
Luminaire Lumens: 2168.6 lumens  
Efficiency: N/A  
Efficacy: 110.1 lumens/watt  
Luminous Opening: Rectangular (W 0.5' x L: 0.5' x H: 0')  
IES Classification: Type II - Short  
BUG Rating: B1 - U0 - G1  
  
Input Watts (W): 19.7  
Input Voltage (V): 120  
Input Current (Ain): 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: P628741  
 CATALOG NUMBER: GWS-SA1A-730-U-SL3-W-GRSWH

### Iso-Footcandle Lines of Horizontal Illumination

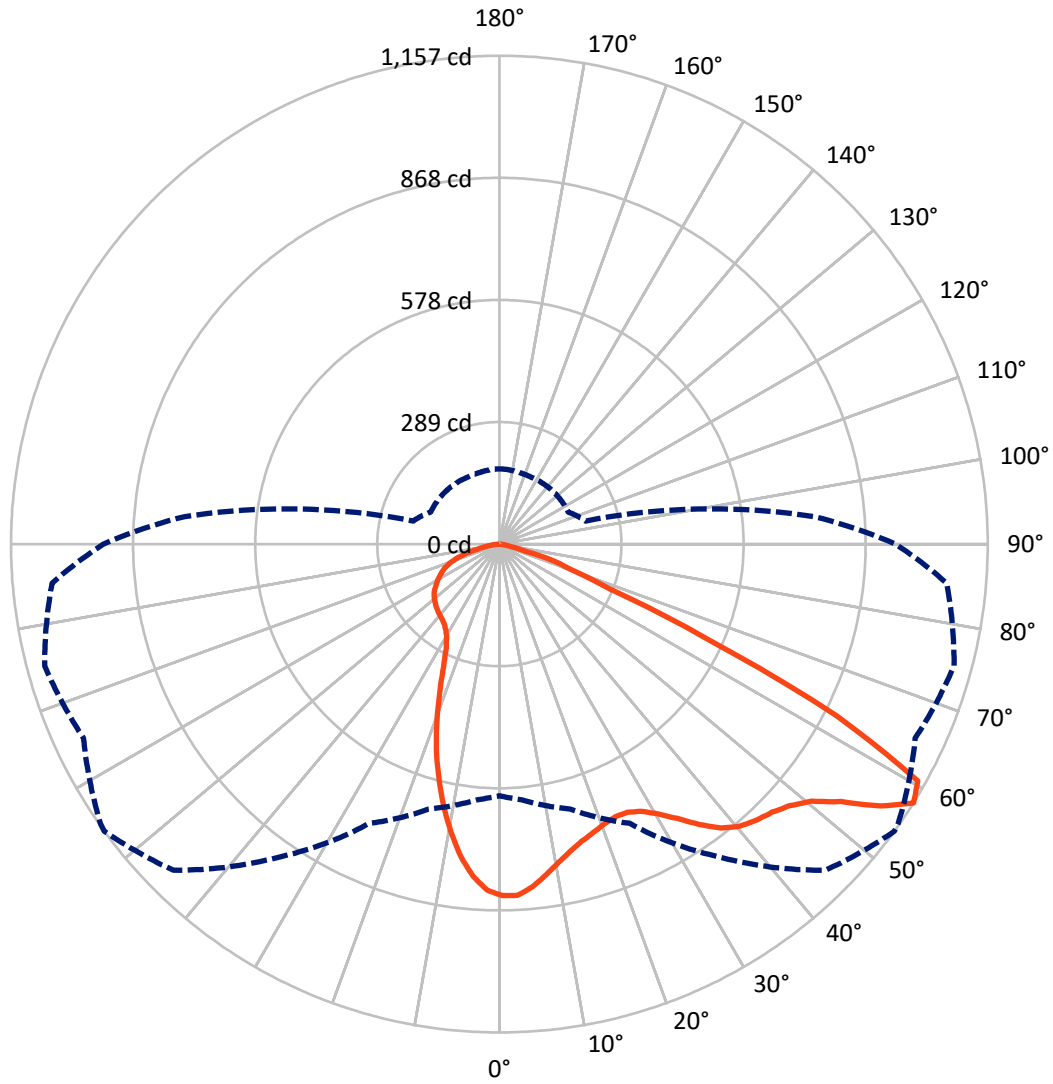
✕ Max cd  
 - - - 1/2 Max cd



Based on 10 foot mounting height. Maximum calculated value = 8.3 fc  
 Type II - Short - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 54-Deg Lateral    - - - Horizontal Cone Through 57.5-Deg Vertical

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**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 630.4    | 0.0    | 630.4  |
|                    | % Fixture | 29.1     | 0.0    | 29.1   |
| <b>Street Side</b> | Lumens    | 1538.2   | 0.0    | 1538.2 |
|                    | % Fixture | 70.9     | 0.0    | 70.9   |
| <b>Total</b>       | Lumens    | 2168.6   | 0.0    | 2168.6 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 73.2   | 3.4       |
| 10°-20°   | 174.6  | 8.1       |
| 20°-30°   | 241.7  | 11.1      |
| 30°-40°   | 335.8  | 15.5      |
| 40°-50°   | 443.5  | 20.4      |
| 50°-60°   | 527.0  | 24.3      |
| 60°-70°   | 291.9  | 13.5      |
| 70°-80°   | 72.7   | 3.4       |
| 80°-90°   | 8.3    | 0.4       |
| 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°    | 2168.6 | 100.0     |
| 0°-180°   | 2168.6 | 100.0     |

**Coefficient of Utilization**



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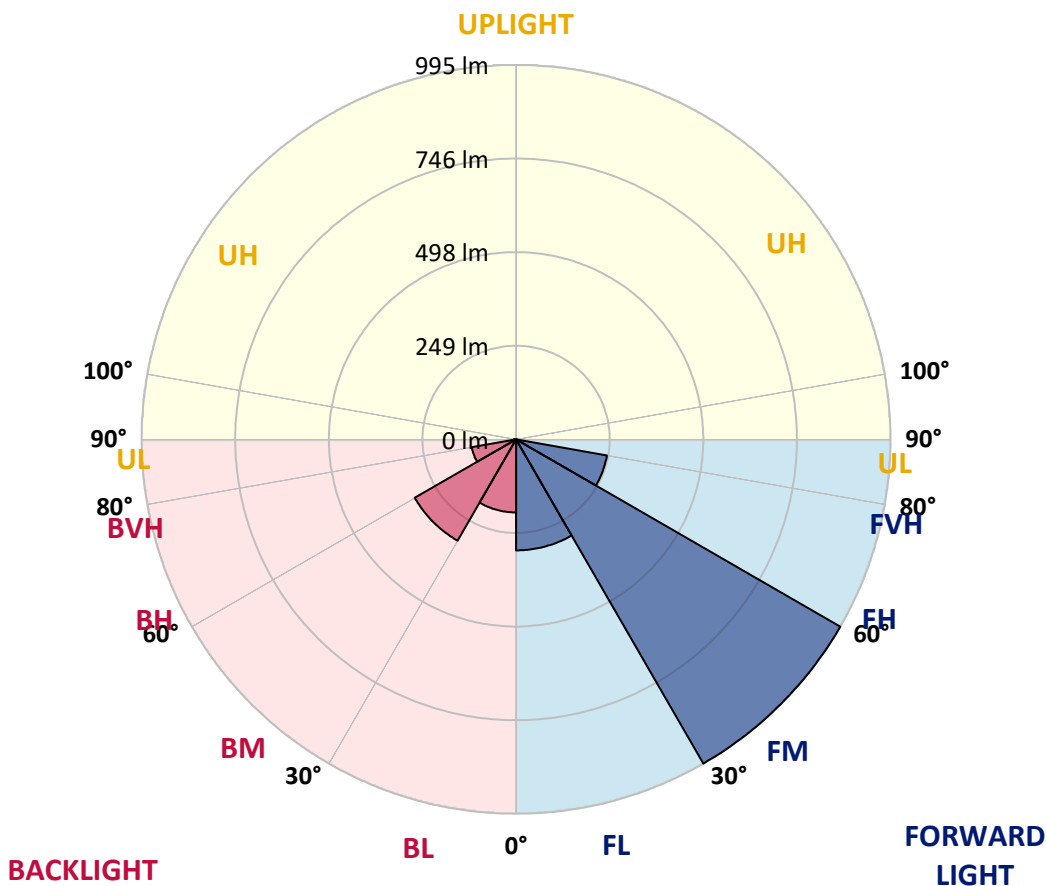
CATALOG NUMBER: GWS-SA1A-730-U-SL3-W-GRSWH

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

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |      |        |
|----------------|--------|-----------|-------------------------|------|--------|
|                |        |           | B                       | U    | G      |
| FL (0°-30°)    | 295.2  | 13.6      |                         |      |        |
| FM (30°-60°)   | 995.2  | 45.9      |                         |      |        |
| FH (60°-80°)   | 245.2  | 11.3      |                         |      | G0/660 |
| FVH (80°-90°)  | 2.6    | 0.1       |                         |      | G0/10  |
| BL (0°-30°)    | 194.3  | 9.0       | B1/500                  |      |        |
| BM (30°-60°)   | 311.0  | 14.3      | B1/1000                 |      |        |
| BH (60°-80°)   | 119.5  | 5.5       | B1/500                  |      | G1/500 |
| BVH (80°-90°)  | 5.7    | 0.3       |                         |      | G0/10  |
| UL (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |        |
| UH (100°-180°) | 0.0    | 0.0       |                         | U0/0 |        |

**BUG Rating: B1-U0-G1**

Type II Short





REPORT NUMBER: P628741

CATALOG NUMBER: GWS-SA1A-730-U-SL3-W-GRSWH

**CANDELA DISTRIBUTION (FULL):**

|       | 0°    | 5°    | 15°   | 25°   | 35°   | 45°    | 54°    | 55°    | 65°    | 75°    | 85°    |
|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|
| 0°    | 832.6 | 832.6 | 832.6 | 832.6 | 832.6 | 832.6  | 832.6  | 832.6  | 832.6  | 832.6  | 832.6  |
| 2.5°  | 817.0 | 818.7 | 819.8 | 823.7 | 827.0 | 830.0  | 833.1  | 833.1  | 832.9  | 832.4  | 831.3  |
| 5°    | 784.7 | 786.5 | 789.1 | 794.5 | 801.8 | 807.0  | 815.5  | 816.2  | 820.0  | 821.4  | 820.7  |
| 7.5°  | 747.2 | 747.7 | 751.1 | 758.1 | 769.6 | 778.9  | 791.2  | 792.7  | 801.6  | 806.8  | 805.8  |
| 10°   | 706.2 | 704.3 | 710.2 | 720.6 | 735.7 | 751.3  | 767.0  | 768.3  | 782.6  | 792.5  | 791.7  |
| 12.5° | 668.7 | 668.8 | 674.8 | 687.4 | 706.2 | 725.5  | 746.6  | 749.6  | 767.2  | 779.9  | 778.6  |
| 15°   | 637.3 | 638.0 | 645.3 | 659.6 | 680.9 | 703.9  | 730.3  | 733.1  | 755.4  | 772.1  | 768.3  |
| 17.5° | 612.2 | 613.0 | 619.3 | 635.6 | 658.4 | 686.3  | 718.4  | 721.2  | 748.9  | 768.7  | 761.1  |
| 20°   | 595.0 | 594.6 | 600.7 | 616.3 | 639.9 | 670.1  | 708.0  | 712.1  | 746.8  | 770.0  | 756.3  |
| 22.5° | 587.9 | 587.7 | 592.2 | 605.0 | 627.1 | 657.7  | 701.7  | 707.3  | 749.0  | 775.8  | 753.3  |
| 25°   | 591.4 | 590.7 | 594.6 | 604.1 | 621.7 | 652.9  | 703.6  | 709.5  | 758.5  | 787.7  | 753.9  |
| 27.5° | 602.4 | 601.5 | 604.8 | 613.3 | 626.7 | 657.9  | 716.6  | 723.4  | 778.6  | 809.4  | 761.3  |
| 30°   | 619.1 | 618.5 | 621.9 | 630.0 | 641.7 | 674.6  | 741.4  | 749.2  | 809.6  | 843.2  | 777.4  |
| 32.5° | 638.6 | 637.7 | 643.6 | 653.1 | 666.6 | 705.0  | 774.8  | 785.1  | 846.3  | 886.6  | 804.5  |
| 35°   | 660.5 | 659.7 | 667.9 | 681.7 | 701.1 | 747.4  | 815.3  | 826.4  | 883.8  | 935.8  | 840.6  |
| 37.5° | 681.8 | 681.8 | 697.6 | 718.0 | 742.5 | 793.4  | 853.4  | 860.4  | 909.8  | 979.4  | 879.2  |
| 40°   | 700.8 | 701.9 | 725.6 | 756.3 | 787.5 | 835.0  | 878.4  | 884.4  | 921.3  | 1009.5 | 912.8  |
| 42.5° | 721.8 | 722.7 | 750.3 | 790.4 | 827.6 | 868.6  | 893.6  | 896.6  | 923.5  | 1024.5 | 936.5  |
| 45°   | 738.5 | 739.8 | 774.1 | 817.0 | 862.5 | 893.8  | 905.7  | 908.3  | 926.7  | 1032.7 | 953.8  |
| 47.5° | 747.2 | 749.0 | 788.4 | 838.3 | 886.0 | 916.5  | 925.6  | 926.7  | 939.7  | 1047.0 | 974.6  |
| 50°   | 745.7 | 749.4 | 793.8 | 848.9 | 903.5 | 939.3  | 957.5  | 959.4  | 966.2  | 1068.0 | 998.9  |
| 52.5° | 758.9 | 760.5 | 805.3 | 861.5 | 928.4 | 981.5  | 1013.0 | 1015.6 | 1012.5 | 1083.7 | 1013.4 |
| 55°   | 737.0 | 745.0 | 791.0 | 859.7 | 966.2 | 1046.6 | 1095.2 | 1093.9 | 1054.4 | 1101.4 | 1037.5 |
| 57.5° | 596.1 | 607.8 | 649.9 | 729.7 | 903.9 | 1092.3 | 1156.7 | 1153.5 | 1086.9 | 1114.9 | 1063.7 |
| 60°   | 412.7 | 414.5 | 452.6 | 509.2 | 697.6 | 964.9  | 1138.7 | 1145.6 | 1092.8 | 1097.8 | 1015.2 |
| 62.5° | 330.1 | 329.5 | 333.0 | 334.5 | 443.7 | 678.3  | 898.8  | 923.9  | 907.9  | 855.4  | 719.5  |
| 65°   | 281.8 | 283.8 | 294.2 | 288.8 | 289.6 | 382.0  | 537.0  | 540.6  | 529.4  | 510.5  | 380.6  |
| 67.5° | 220.5 | 224.1 | 242.4 | 263.4 | 256.7 | 246.0  | 278.6  | 277.0  | 218.3  | 168.9  | 139.6  |
| 70°   | 138.1 | 140.3 | 160.0 | 206.8 | 223.5 | 202.0  | 179.1  | 178.4  | 117.0  | 96.2   | 105.4  |
| 72.5° | 80.6  | 80.9  | 86.5  | 115.3 | 148.3 | 138.1  | 131.8  | 127.0  | 75.2   | 76.7   | 84.1   |
| 75°   | 44.4  | 44.4  | 44.2  | 49.8  | 58.5  | 51.8   | 50.1   | 48.8   | 50.3   | 57.0   | 62.6   |
| 77.5° | 9.3   | 9.5   | 10.0  | 13.2  | 17.1  | 20.8   | 26.2   | 26.4   | 32.9   | 38.1   | 42.5   |
| 80°   | 4.3   | 4.5   | 5.6   | 7.1   | 9.1   | 12.1   | 16.0   | 16.2   | 19.9   | 23.9   | 26.9   |
| 82.5° | 2.2   | 2.4   | 3.0   | 3.7   | 4.8   | 6.3    | 8.9    | 8.9    | 11.9   | 14.1   | 16.0   |
| 85°   | 0.7   | 0.7   | 1.1   | 1.5   | 2.0   | 2.6    | 3.5    | 3.5    | 5.2    | 6.9    | 8.0    |
| 87.5° | 0.0   | 0.0   | 0.0   | 0.0   | 0.2   | 0.4    | 0.7    | 0.7    | 0.9    | 1.1    | 1.9    |
| 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: P628741

CATALOG NUMBER: GWS-SA1A-730-U-SL3-W-GRSWH

**CANDELA DISTRIBUTION (continued):**

|       | 90°   | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°    | 832.6 | 832.6 | 832.6 | 832.6 | 832.6 | 832.6 | 832.6 | 832.6 | 832.6 | 832.6 | 832.6 |
| 2.5°  | 828.9 | 823.1 | 823.3 | 824.4 | 820.9 | 815.5 | 812.0 | 807.5 | 804.7 | 804.2 | 806.2 |
| 5°    | 817.0 | 810.3 | 805.7 | 800.8 | 790.8 | 778.9 | 769.6 | 762.0 | 757.0 | 755.2 | 752.9 |
| 7.5°  | 800.6 | 791.9 | 780.2 | 766.7 | 748.5 | 727.3 | 712.5 | 698.5 | 688.9 | 686.1 | 684.8 |
| 10°   | 784.3 | 771.7 | 750.9 | 725.6 | 695.4 | 666.8 | 639.9 | 619.3 | 602.9 | 593.7 | 596.6 |
| 12.5° | 767.4 | 751.8 | 719.3 | 680.5 | 638.4 | 595.3 | 560.1 | 525.9 | 499.5 | 486.4 | 482.5 |
| 15°   | 752.6 | 731.4 | 686.1 | 633.6 | 577.5 | 523.3 | 472.3 | 421.0 | 387.6 | 369.4 | 364.4 |
| 17.5° | 739.9 | 712.5 | 651.0 | 585.7 | 518.7 | 441.4 | 378.7 | 331.2 | 308.3 | 298.3 | 297.6 |
| 20°   | 727.5 | 693.9 | 616.3 | 534.1 | 450.7 | 364.2 | 308.2 | 285.9 | 277.7 | 274.2 | 274.0 |
| 22.5° | 716.4 | 674.4 | 579.7 | 482.5 | 383.2 | 306.1 | 275.3 | 265.6 | 263.4 | 263.4 | 263.0 |
| 25°   | 706.9 | 654.9 | 542.2 | 427.7 | 322.1 | 272.5 | 258.2 | 254.1 | 255.1 | 256.7 | 256.9 |
| 27.5° | 703.0 | 639.7 | 506.0 | 371.5 | 279.9 | 253.0 | 246.5 | 246.0 | 248.6 | 251.2 | 251.5 |
| 30°   | 707.1 | 629.3 | 468.9 | 317.6 | 254.7 | 241.1 | 238.2 | 239.3 | 242.4 | 245.0 | 245.0 |
| 32.5° | 719.7 | 624.1 | 431.0 | 278.3 | 240.0 | 232.8 | 231.9 | 233.0 | 235.4 | 236.9 | 237.1 |
| 35°   | 741.1 | 626.1 | 391.9 | 251.7 | 230.6 | 226.7 | 226.5 | 227.2 | 228.1 | 229.1 | 229.3 |
| 37.5° | 768.0 | 635.2 | 349.9 | 236.3 | 224.4 | 222.2 | 221.8 | 221.6 | 221.8 | 221.8 | 222.0 |
| 40°   | 794.3 | 649.0 | 312.4 | 227.2 | 220.2 | 218.3 | 217.4 | 216.1 | 215.9 | 215.5 | 215.3 |
| 42.5° | 813.8 | 659.6 | 282.5 | 220.7 | 216.3 | 214.0 | 212.9 | 210.9 | 210.7 | 210.5 | 210.3 |
| 45°   | 828.5 | 668.5 | 257.7 | 214.4 | 212.2 | 210.1 | 207.7 | 205.9 | 206.2 | 206.6 | 206.6 |
| 47.5° | 845.0 | 676.3 | 239.5 | 208.5 | 207.2 | 205.1 | 202.2 | 200.9 | 202.2 | 203.5 | 203.5 |
| 50°   | 865.1 | 687.2 | 224.6 | 202.5 | 202.0 | 199.6 | 197.0 | 196.4 | 197.9 | 199.7 | 199.7 |
| 52.5° | 879.7 | 696.7 | 214.0 | 196.6 | 196.6 | 193.4 | 191.2 | 191.0 | 192.7 | 194.5 | 194.7 |
| 55°   | 907.2 | 718.8 | 210.3 | 189.7 | 189.0 | 186.6 | 184.9 | 183.6 | 185.6 | 187.3 | 187.3 |
| 57.5° | 938.2 | 748.1 | 211.3 | 179.9 | 179.0 | 178.2 | 176.9 | 175.4 | 176.0 | 177.8 | 178.0 |
| 60°   | 872.5 | 691.3 | 201.0 | 170.0 | 169.5 | 169.1 | 167.4 | 164.8 | 165.6 | 167.1 | 167.3 |
| 62.5° | 609.4 | 459.4 | 162.6 | 157.8 | 159.6 | 159.5 | 157.2 | 154.3 | 154.4 | 156.5 | 156.5 |
| 65°   | 316.3 | 248.6 | 142.8 | 146.7 | 149.4 | 148.3 | 144.6 | 142.0 | 141.6 | 144.2 | 143.7 |
| 67.5° | 136.4 | 135.7 | 129.9 | 135.0 | 137.9 | 135.5 | 131.6 | 127.3 | 127.7 | 128.6 | 127.9 |
| 70°   | 109.9 | 113.2 | 115.7 | 121.0 | 123.4 | 119.0 | 114.7 | 112.3 | 110.3 | 110.1 | 108.8 |
| 72.5° | 87.8  | 92.4  | 97.8  | 103.4 | 104.1 | 99.7  | 94.3  | 92.1  | 88.9  | 88.7  | 87.4  |
| 75°   | 66.1  | 70.0  | 74.3  | 78.7  | 78.7  | 74.4  | 70.9  | 69.8  | 66.1  | 65.0  | 63.9  |
| 77.5° | 45.1  | 47.5  | 50.9  | 52.0  | 53.1  | 51.4  | 47.9  | 46.0  | 41.8  | 40.7  | 39.2  |
| 80°   | 28.4  | 30.1  | 32.1  | 32.9  | 34.0  | 31.9  | 29.1  | 27.1  | 24.1  | 23.2  | 22.5  |
| 82.5° | 17.1  | 18.2  | 19.5  | 19.9  | 20.8  | 19.3  | 16.7  | 15.2  | 13.6  | 12.8  | 12.3  |
| 85°   | 8.7   | 9.3   | 10.0  | 10.2  | 10.0  | 8.5   | 7.6   | 6.9   | 5.8   | 5.6   | 5.2   |
| 87.5° | 2.2   | 2.6   | 2.8   | 2.6   | 2.4   | 1.9   | 1.3   | 0.9   | 0.4   | 0.4   | 0.2   |
| 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: SP1-1908-441-2-R4

Test Date: 10/03/2019

Luminaire Tested: SA1C-730-U-5WQ

Data in this report applies to families of products SA1C-730-U-5WQ .

**Test Information**

Test Method: LM-79-2008  
 Report Number: SP1-1908-441-2-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-730-U-5WQ**  
 Description: McGRAW EDISON ROADWAY AND AREA LUMINAIRE

\*\*\*THIS IS A REVISION OF SP1-1908-441-2-R3. TO UPDATE THE CATALOG INFORMATION.\*\*\*TESTED IN SITU. (1) 70 CRI, 3000K, 1050MA LIGHTSQUARE WITH 16 LEDS AND TYPE V WIDE OPTICS.

**Spectral Parameters**

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 2993   | CRI (Ra): | 71.8 | R9:  | -38.3 |
| CIE u':                   | 0.2508 | R1:       | 67.5 | R10: | 62.5  |
| CIE v':                   | 0.5215 | R2:       | 82.9 | R11: | 63.7  |
| Duv:                      | 0.0000 | R3:       | 94.7 | R12: | 57.8  |
| CIE x:                    | 0.4374 | R4:       | 67.7 | R13: | 70.4  |
| CIE y:                    | 0.4043 | R5:       | 67.9 | R14: | 97.3  |
| CIE z:                    | 0.1583 | R6:       | 77.6 |      |       |
| Peak Wavelength (nm):     | 593    | R7:       | 76.0 |      |       |
| Dominant Wavelength (nm): | 582    | R8:       | 40.5 |      |       |
| Purity:                   | 53     |           |      |      |       |
| Rf:                       | 75.7   |           |      |      |       |
| Rg:                       | 93.9   |           |      |      |       |



**Test Conditions**

Stabilization Time: 53M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 25.0./44%  
 Sphere Temperature (°C): 25.7

REPORT NUMBER: SP1-1908-441-2-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: SP1-1908-441-2-R4

CIE 1931 Chromaticity Diagram



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



Point lies inside the ANSI 3000K 4-step quadrangle

REPORT NUMBER: SP1-1908-441-2-R4

**Photopic Flux vs. Wavelength**



#####

| 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    | 2397          | NR            | 490    | 24908         | NR            | 620    | 118784        | NR            | 750    | 5037          | NR            | 880    | 2677          | NR            |
| 365    | 2084          | NR            | 495    | 30998         | NR            | 625    | 108951        | NR            | 755    | 4413          | NR            | 885    | 2940          | NR            |
| 370    | 2143          | NR            | 500    | 37103         | NR            | 630    | 99573         | NR            | 760    | 4189          | NR            | 890    | 3116          | NR            |
| 375    | 2413          | NR            | 505    | 42987         | NR            | 635    | 90444         | NR            | 765    | 3677          | NR            | 895    | 3345          | NR            |
| 380    | 2172          | NR            | 510    | 48702         | NR            | 640    | 80749         | NR            | 770    | 3366          | NR            | 900    | 2312          | NR            |
| 385    | 1997          | NR            | 515    | 53741         | NR            | 645    | 71664         | NR            | 775    | 3211          | NR            | 905    | 2829          | NR            |
| 390    | 1830          | NR            | 520    | 57283         | NR            | 650    | 63936         | NR            | 780    | 2682          | NR            | 910    | 2783          | NR            |
| 395    | 1861          | NR            | 525    | 61876         | NR            | 655    | 56611         | NR            | 785    | 2804          | NR            | 915    | 2662          | NR            |
| 400    | 1717          | NR            | 530    | 65398         | NR            | 660    | 49763         | NR            | 790    | 2581          | NR            | 920    | 3047          | NR            |
| 405    | 1761          | NR            | 535    | 69597         | NR            | 665    | 42891         | NR            | 795    | 2711          | NR            | 925    | 2256          | NR            |
| 410    | 2680          | NR            | 540    | 74214         | NR            | 670    | 36939         | NR            | 800    | 2609          | NR            | 930    | 2976          | NR            |
| 415    | 4374          | NR            | 545    | 79911         | NR            | 675    | 31946         | NR            | 805    | 2581          | NR            | 935    | 3503          | NR            |
| 420    | 8071          | NR            | 550    | 86153         | NR            | 680    | 27385         | NR            | 810    | 2404          | NR            | 940    | 4226          | NR            |
| 425    | 15169         | NR            | 555    | 93952         | NR            | 685    | 23504         | NR            | 815    | 2556          | NR            | 945    | 2930          | NR            |
| 430    | 26038         | NR            | 560    | 102904        | NR            | 690    | 20210         | NR            | 820    | 2742          | NR            | 950    | 2115          | NR            |
| 435    | 41316         | NR            | 565    | 112009        | NR            | 695    | 17459         | NR            | 825    | 2014          | NR            | 955    | 2634          | NR            |
| 440    | 59674         | NR            | 570    | 121662        | NR            | 700    | 15207         | NR            | 830    | 2488          | NR            | 960    | 4200          | NR            |
| 445    | 72751         | NR            | 575    | 130476        | NR            | 705    | 13322         | NR            | 835    | 2625          | NR            | 965    | 1982          | NR            |
| 450    | 65091         | NR            | 580    | 137926        | NR            | 710    | 11676         | NR            | 840    | 2754          | NR            | 970    | 3613          | NR            |
| 455    | 44894         | NR            | 585    | 143406        | NR            | 715    | 10626         | NR            | 845    | 2708          | NR            | 975    | 4034          | NR            |
| 460    | 32712         | NR            | 590    | 147039        | NR            | 720    | 9416          | NR            | 850    | 2608          | NR            | 980    | 3922          | NR            |
| 465    | 25296         | NR            | 595    | 147365        | NR            | 725    | 8333          | NR            | 855    | 2605          | NR            | 985    | 1909          | NR            |
| 470    | 19318         | NR            | 600    | 145800        | NR            | 730    | 7134          | NR            | 860    | 1765          | NR            | 990    | 3617          | NR            |
| 475    | 17265         | NR            | 605    | 141363        | NR            | 735    | 6437          | NR            | 865    | 2581          | NR            | 995    | 4767          | NR            |
| 480    | 18260         | NR            | 610    | 134199        | NR            | 740    | 5834          | NR            | 870    | 3016          | NR            | 1000   | 2528          | NR            |
| 485    | 20845         | NR            | 615    | 127683        | NR            | 745    | 5500          | NR            | 875    | 3952          | NR            |        |               |               |

REPORT NUMBER: SP1-1908-441-2-R4

Scotopic Flux vs. Wavelength



Scotopic Lumens: 8494.8

S/P: 1.23

| 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    | 2397          | NR            | 490    | 24908         | NR            | 620    | 118784        | NR            | 750    | 5037          | NR            | 880    | 2677          | NR            |
| 365    | 2084          | NR            | 495    | 30998         | NR            | 625    | 108951        | NR            | 755    | 4413          | NR            | 885    | 2940          | NR            |
| 370    | 2143          | NR            | 500    | 37103         | NR            | 630    | 99573         | NR            | 760    | 4189          | NR            | 890    | 3116          | NR            |
| 375    | 2413          | NR            | 505    | 42987         | NR            | 635    | 90444         | NR            | 765    | 3677          | NR            | 895    | 3345          | NR            |
| 380    | 2172          | NR            | 510    | 48702         | NR            | 640    | 80749         | NR            | 770    | 3366          | NR            | 900    | 2312          | NR            |
| 385    | 1997          | NR            | 515    | 53741         | NR            | 645    | 71664         | NR            | 775    | 3211          | NR            | 905    | 2829          | NR            |
| 390    | 1830          | NR            | 520    | 57283         | NR            | 650    | 63936         | NR            | 780    | 2682          | NR            | 910    | 2783          | NR            |
| 395    | 1861          | NR            | 525    | 61876         | NR            | 655    | 56611         | NR            | 785    | 2804          | NR            | 915    | 2662          | NR            |
| 400    | 1717          | NR            | 530    | 65398         | NR            | 660    | 49763         | NR            | 790    | 2581          | NR            | 920    | 3047          | NR            |
| 405    | 1761          | NR            | 535    | 69597         | NR            | 665    | 42891         | NR            | 795    | 2711          | NR            | 925    | 2256          | NR            |
| 410    | 2680          | NR            | 540    | 74214         | NR            | 670    | 36939         | NR            | 800    | 2609          | NR            | 930    | 2976          | NR            |
| 415    | 4374          | NR            | 545    | 79911         | NR            | 675    | 31946         | NR            | 805    | 2581          | NR            | 935    | 3503          | NR            |
| 420    | 8071          | NR            | 550    | 86153         | NR            | 680    | 27385         | NR            | 810    | 2404          | NR            | 940    | 4226          | NR            |
| 425    | 15169         | NR            | 555    | 93952         | NR            | 685    | 23504         | NR            | 815    | 2556          | NR            | 945    | 2930          | NR            |
| 430    | 26038         | NR            | 560    | 102904        | NR            | 690    | 20210         | NR            | 820    | 2742          | NR            | 950    | 2115          | NR            |
| 435    | 41316         | NR            | 565    | 112009        | NR            | 695    | 17459         | NR            | 825    | 2014          | NR            | 955    | 2634          | NR            |
| 440    | 59674         | NR            | 570    | 121662        | NR            | 700    | 15207         | NR            | 830    | 2488          | NR            | 960    | 4200          | NR            |
| 445    | 72751         | NR            | 575    | 130476        | NR            | 705    | 13322         | NR            | 835    | 2625          | NR            | 965    | 1982          | NR            |
| 450    | 65091         | NR            | 580    | 137926        | NR            | 710    | 11676         | NR            | 840    | 2754          | NR            | 970    | 3613          | NR            |
| 455    | 44894         | NR            | 585    | 143406        | NR            | 715    | 10626         | NR            | 845    | 2708          | NR            | 975    | 4034          | NR            |
| 460    | 32712         | NR            | 590    | 147039        | NR            | 720    | 9416          | NR            | 850    | 2608          | NR            | 980    | 3922          | NR            |
| 465    | 25296         | NR            | 595    | 147365        | NR            | 725    | 8333          | NR            | 855    | 2605          | NR            | 985    | 1909          | NR            |
| 470    | 19318         | NR            | 600    | 145800        | NR            | 730    | 7134          | NR            | 860    | 1765          | NR            | 990    | 3617          | NR            |
| 475    | 17265         | NR            | 605    | 141363        | NR            | 735    | 6437          | NR            | 865    | 2581          | NR            | 995    | 4767          | NR            |
| 480    | 18260         | NR            | 610    | 134199        | NR            | 740    | 5834          | NR            | 870    | 3016          | NR            | 1000   | 2528          | NR            |
| 485    | 20845         | NR            | 615    | 127683        | NR            | 745    | 5500          | NR            | 875    | 3952          | NR            |        |               |               |

REPORT NUMBER: SP1-1908-441-2-R4

**Melanopic Flux vs. Wavelength**



**Melanopic Lumens: 3101.5 M/P: 0.45**

| 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    | 2397          | NR            | 490    | 24908         | NR            | 620    | 118784        | NR            | 750    | 5037          | NR            | 880    | 2677          | NR            |
| 365    | 2084          | NR            | 495    | 30998         | NR            | 625    | 108951        | NR            | 755    | 4413          | NR            | 885    | 2940          | NR            |
| 370    | 2143          | NR            | 500    | 37103         | NR            | 630    | 99573         | NR            | 760    | 4189          | NR            | 890    | 3116          | NR            |
| 375    | 2413          | NR            | 505    | 42987         | NR            | 635    | 90444         | NR            | 765    | 3677          | NR            | 895    | 3345          | NR            |
| 380    | 2172          | NR            | 510    | 48702         | NR            | 640    | 80749         | NR            | 770    | 3366          | NR            | 900    | 2312          | NR            |
| 385    | 1997          | NR            | 515    | 53741         | NR            | 645    | 71664         | NR            | 775    | 3211          | NR            | 905    | 2829          | NR            |
| 390    | 1830          | NR            | 520    | 57283         | NR            | 650    | 63936         | NR            | 780    | 2682          | NR            | 910    | 2783          | NR            |
| 395    | 1861          | NR            | 525    | 61876         | NR            | 655    | 56611         | NR            | 785    | 2804          | NR            | 915    | 2662          | NR            |
| 400    | 1717          | NR            | 530    | 65398         | NR            | 660    | 49763         | NR            | 790    | 2581          | NR            | 920    | 3047          | NR            |
| 405    | 1761          | NR            | 535    | 69597         | NR            | 665    | 42891         | NR            | 795    | 2711          | NR            | 925    | 2256          | NR            |
| 410    | 2680          | NR            | 540    | 74214         | NR            | 670    | 36939         | NR            | 800    | 2609          | NR            | 930    | 2976          | NR            |
| 415    | 4374          | NR            | 545    | 79911         | NR            | 675    | 31946         | NR            | 805    | 2581          | NR            | 935    | 3503          | NR            |
| 420    | 8071          | NR            | 550    | 86153         | NR            | 680    | 27385         | NR            | 810    | 2404          | NR            | 940    | 4226          | NR            |
| 425    | 15169         | NR            | 555    | 93952         | NR            | 685    | 23504         | NR            | 815    | 2556          | NR            | 945    | 2930          | NR            |
| 430    | 26038         | NR            | 560    | 102904        | NR            | 690    | 20210         | NR            | 820    | 2742          | NR            | 950    | 2115          | NR            |
| 435    | 41316         | NR            | 565    | 112009        | NR            | 695    | 17459         | NR            | 825    | 2014          | NR            | 955    | 2634          | NR            |
| 440    | 59674         | NR            | 570    | 121662        | NR            | 700    | 15207         | NR            | 830    | 2488          | NR            | 960    | 4200          | NR            |
| 445    | 72751         | NR            | 575    | 130476        | NR            | 705    | 13322         | NR            | 835    | 2625          | NR            | 965    | 1982          | NR            |
| 450    | 65091         | NR            | 580    | 137926        | NR            | 710    | 11676         | NR            | 840    | 2754          | NR            | 970    | 3613          | NR            |
| 455    | 44894         | NR            | 585    | 143406        | NR            | 715    | 10626         | NR            | 845    | 2708          | NR            | 975    | 4034          | NR            |
| 460    | 32712         | NR            | 590    | 147039        | NR            | 720    | 9416          | NR            | 850    | 2608          | NR            | 980    | 3922          | NR            |
| 465    | 25296         | NR            | 595    | 147365        | NR            | 725    | 8333          | NR            | 855    | 2605          | NR            | 985    | 1909          | NR            |
| 470    | 19318         | NR            | 600    | 145800        | NR            | 730    | 7134          | NR            | 860    | 1765          | NR            | 990    | 3617          | NR            |
| 475    | 17265         | NR            | 605    | 141363        | NR            | 735    | 6437          | NR            | 865    | 2581          | NR            | 995    | 4767          | NR            |
| 480    | 18260         | NR            | 610    | 134199        | NR            | 740    | 5834          | NR            | 870    | 3016          | NR            | 1000   | 2528          | NR            |
| 485    | 20845         | NR            | 615    | 127683        | NR            | 745    | 5500          | NR            | 875    | 3952          | NR            |        |               |               |

REPORT NUMBER: SP1-1908-441-2-R4

TM-30-18

**Summary**

$R_f = 75.7$   
 $R_g = 93.9$   
 $CIE R_a = 71.8$   
 $R_g = -38.3$



**Color Vector Graphics**





REPORT NUMBER: SP1-1908-441-2-R4

TM-30-18

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

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 86 | CES26 = 67 | CES51 = 87 | CES76 = 63 |
| CES02 = 63 | CES27 = 88 | CES52 = 86 | CES77 = 80 |
| CES03 = 31 | CES28 = 87 | CES53 = 78 | CES78 = 67 |
| CES04 = 71 | CES29 = 66 | CES54 = 84 | CES79 = 87 |
| CES05 = 49 | CES30 = 73 | CES55 = 84 | CES80 = 86 |
| CES06 = 51 | CES31 = 70 | CES56 = 75 | CES81 = 71 |
| CES07 = 41 | CES32 = 65 | CES57 = 74 | CES82 = 94 |
| CES08 = 40 | CES33 = 73 | CES58 = 76 | CES83 = 90 |
| CES09 = 29 | CES34 = 79 | CES59 = 85 | CES84 = 89 |
| CES10 = 76 | CES35 = 89 | CES60 = 93 | CES85 = 77 |
| CES11 = 59 | CES36 = 97 | CES61 = 84 | CES86 = 61 |
| CES12 = 65 | CES37 = 87 | CES62 = 91 | CES87 = 78 |
| CES13 = 43 | CES38 = 81 | CES63 = 77 | CES88 = 77 |
| CES14 = 74 | CES39 = 95 | CES64 = 72 | CES89 = 67 |
| CES15 = 71 | CES40 = 92 | CES65 = 68 | CES90 = 76 |
| CES16 = 47 | CES41 = 88 | CES66 = 69 | CES91 = 89 |
| CES17 = 50 | CES42 = 89 | CES67 = 67 | CES92 = 58 |
| CES18 = 56 | CES43 = 79 | CES68 = 72 | CES93 = 74 |
| CES19 = 73 | CES44 = 99 | CES69 = 81 | CES94 = 49 |
| CES20 = 66 | CES45 = 85 | CES70 = 66 | CES95 = 68 |
| CES21 = 87 | CES46 = 80 | CES71 = 67 | CES96 = 76 |
| CES22 = 79 | CES47 = 82 | CES72 = 88 | CES97 = 82 |
| CES23 = 92 | CES48 = 69 | CES73 = 59 | CES98 = 75 |
| CES24 = 91 | CES49 = 80 | CES74 = 95 | CES99 = 62 |
| CES25 = 73 | CES50 = 87 | CES75 = 69 |            |



REPORT NUMBER: SP1-1908-441-2-R4

TM-30-18

Color Rendition by Hue-Angle Bin



REPORT NUMBER: SP1-1908-441-2-R4

TM-30-18

Measure Comparisons



(END OF REPORT)