

itl boulder
THE LIGHT CENTER OF THE INDUSTRY SINCE 1955

PHONE: (303) 442-1255

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NVLAP
NVLAP LAB CODE: 200925-0

INDEPENDENT TESTING LABORATORIES, INC.

4066 CAMELOT CIRCLE, LONGMONT, CO 80504 USA

ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINATION

Values based on 12 foot mounting height.



REPORT NUMBER: ITL79963

ISSUE DATE: 11/22/13

PAGE: 1 OF 7

PREPARED FOR: RAB LIGHTING, INC.

CATALOG NUMBER: GLED78Y OR GPLED78Y (W/ PRISMATIC LENS - CEILING OR PENDENT MOUNT)

LUMINAIRE: CAST 2-PIECE BROWN PAINTED FINNED METAL HOUSING, 6 CAST METAL HEAT SINKS/CIRCUIT BOARD MOUNTING BRACKETS, 6 CIRCUIT BOARDS EACH WITH 1 LED AND MOLDED PLASTIC CIRCUIT BOARD PERIMETER OVERLAY WITH SPECULAR FINISH, MOLDED PLASTIC REFLECTOR WITH SPECULAR FINISH AND 1 APERTURE PER LED, CLEAR PLASTIC DROP LENS WITH RADIALLY PRISMATIC BOTTOM AND PRISMATIC SIDES IN CAST BROWN PAINTED METAL FRAME. LENS RADIAL PRISMS IN, AND SIDE PRISMS IN AND OUT.

LAMPS: SIX WHITE MULTI-CHIP LIGHT EMITTING DIODES (LEDs), AIMED AT THE HORIZON.

TOTAL INPUT WATTS = 90.0 AT 120.0 VOLTS

LED DRIVERS: THREE RAB RD26S

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED AT RATED INPUT VOLTAGE (120VAC, 60Hz) TO THE LED DRIVERS. LED DRIVER INFORMATION PROVIDED BY CLIENT.

TEST PROCEDURE: IESNA LM-79-08

TEST DISTANCE = 20.0 FEET

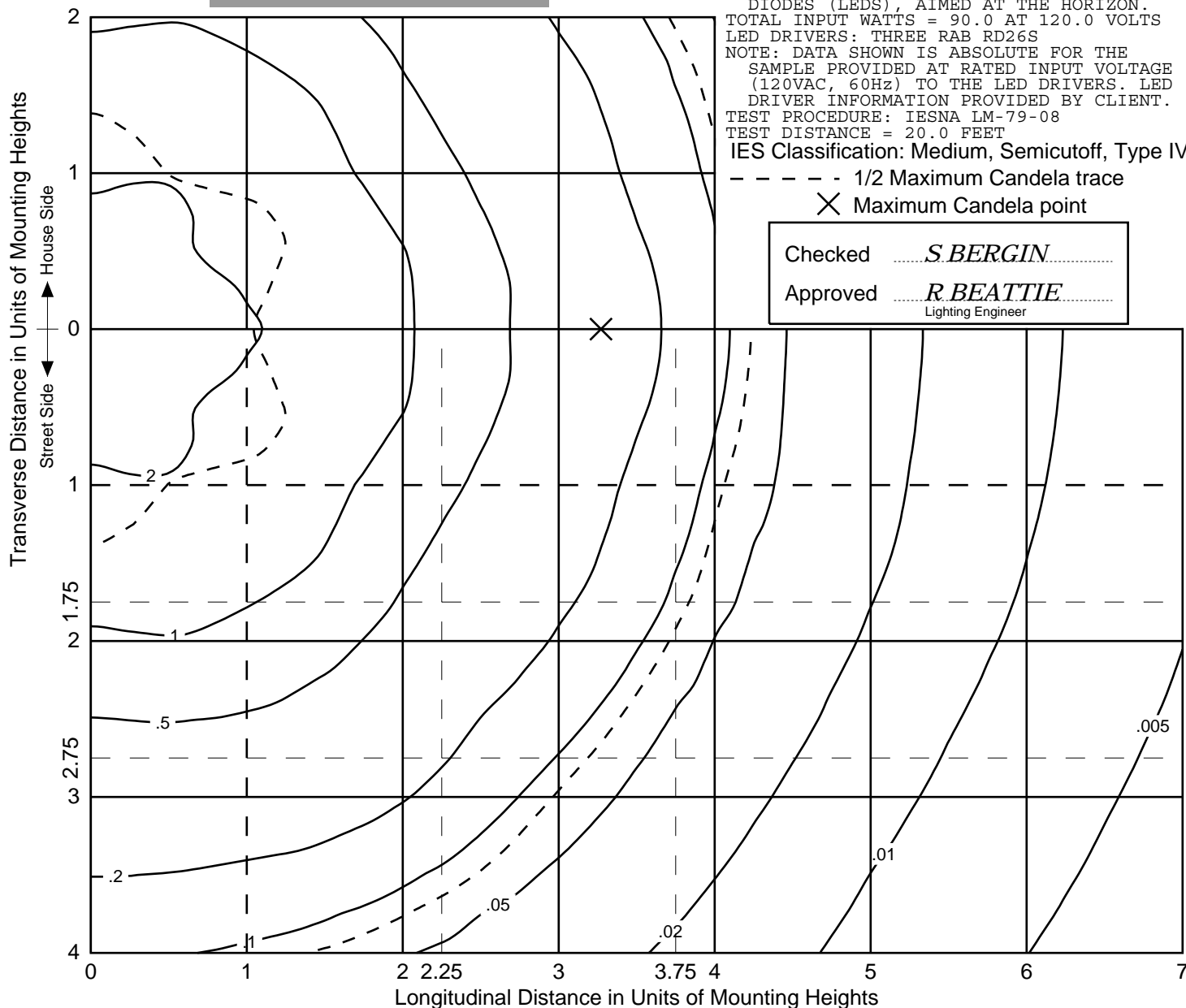
IES Classification: Medium, Semicutoff, Type IV

--- 1/2 Maximum Candela trace

× Maximum Candela point

Checked *S. BERGIN*

Approved *R. BEATTIE*
Lighting Engineer



REPORT NUMBER: ITL79963
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PREPARED FOR: RAB LIGHTING, INC.
CATALOG NUMBER: GLED78Y OR GPLED78Y (W/
PRISMATIC LENS - CEILING OR PENDENT
MOUNT)

LUMINAIRE: CAST 2-PIECE BROWN PAINTED
FINNED METAL HOUSING, 6 CAST METAL
HEAT SINKS/CIRCUIT BOARD MOUNTING
BRACKETS, 6 CIRCUIT BOARDS EACH WITH 1
LED AND MOLDED PLASTIC CIRCUIT BOARD
PERIMETER OVERLAY WITH SPECULAR
FINISH, MOLDED PLASTIC REFLECTOR WITH
SPECULAR FINISH AND 1 APERTURE PER
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LAMPS: SIX WHITE MULTI-CHIP LIGHT
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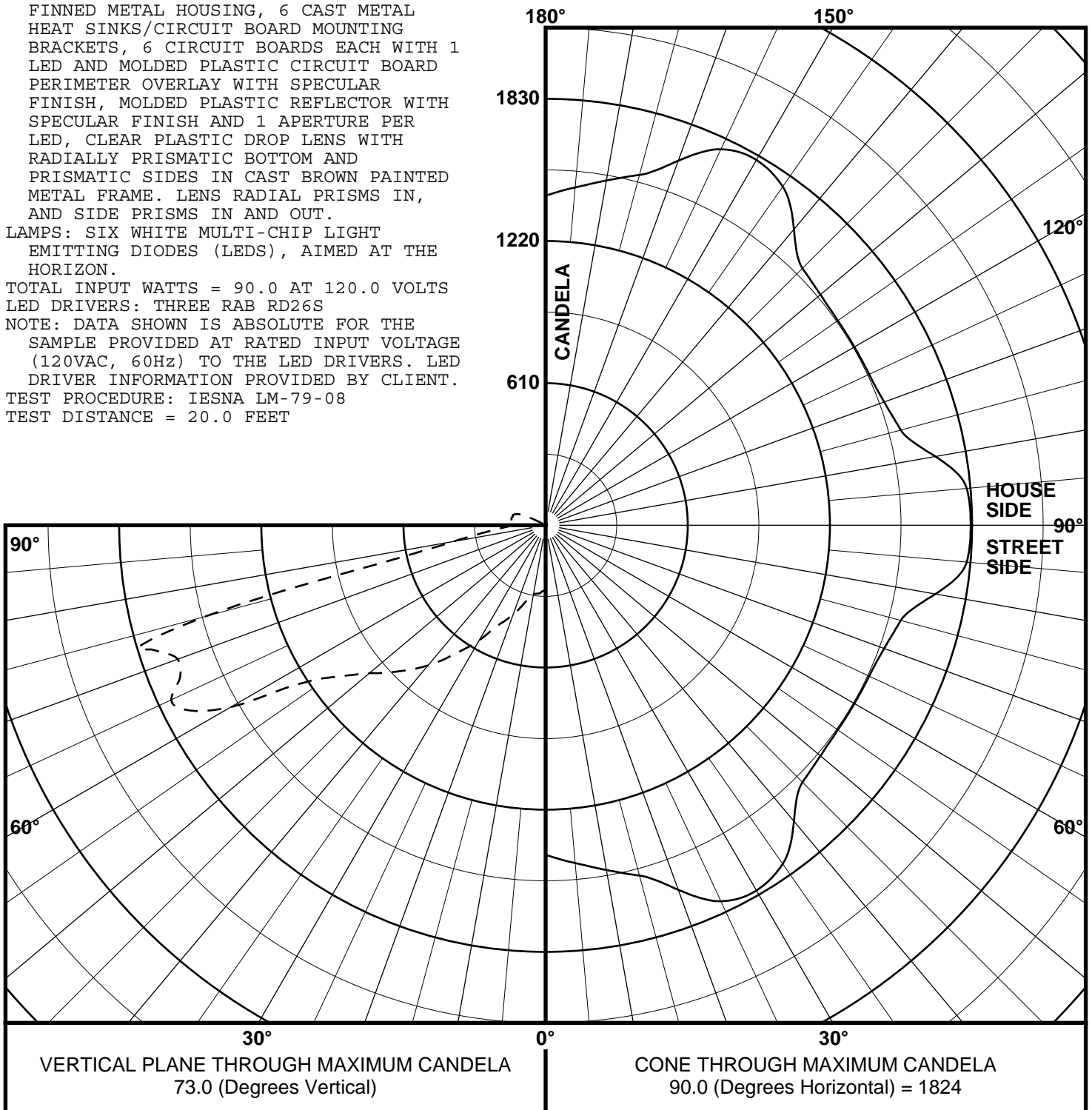
TOTAL INPUT WATTS = 90.0 AT 120.0 VOLTS
LED DRIVERS: THREE RAB RD26S

NOTE: DATA SHOWN IS ABSOLUTE FOR THE
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(120VAC, 60Hz) TO THE LED DRIVERS. LED
DRIVER INFORMATION PROVIDED BY CLIENT.

TEST PROCEDURE: IESNA LM-79-08

TEST DISTANCE = 20.0 FEET

MAXIMUM PLANE AND MAXIMUM CONE PLOTS OF CANDELA





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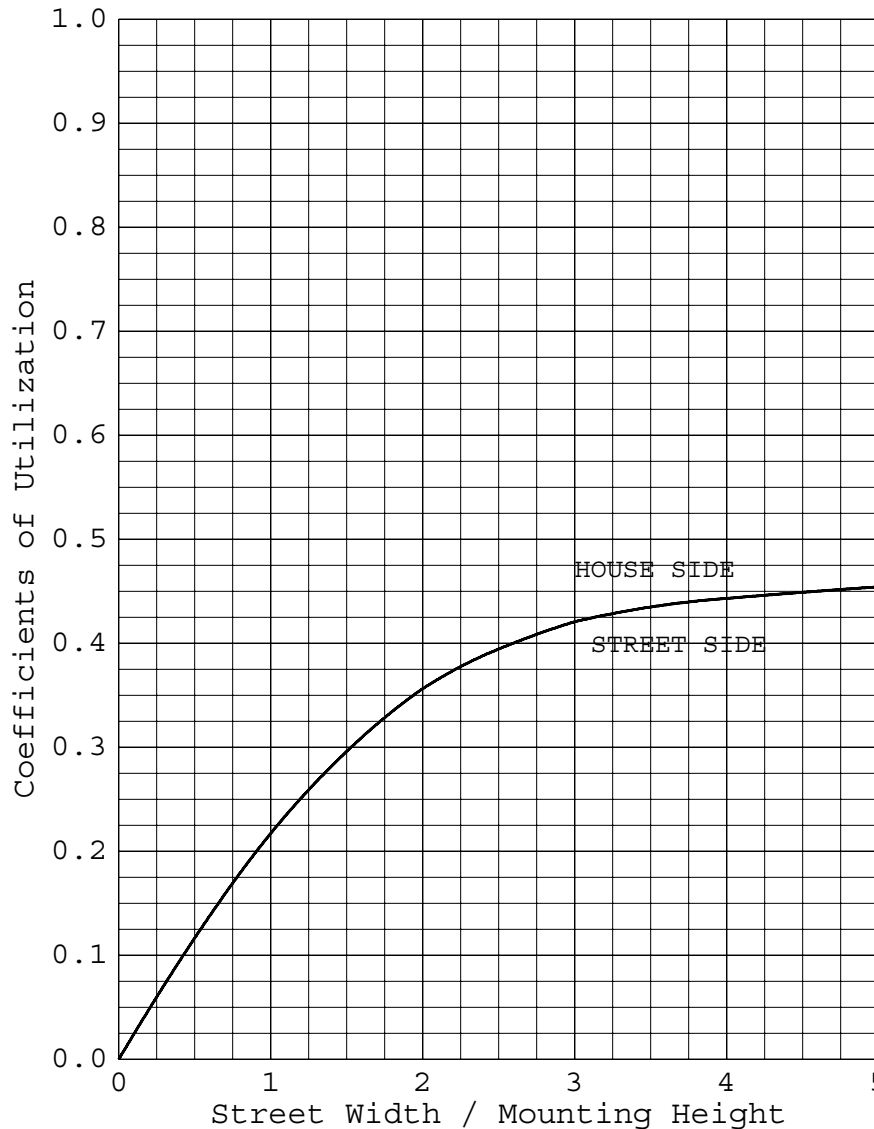
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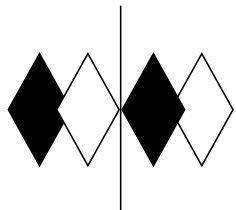
COEFFICIENTS OF UTILIZATION AND FLUX DISTRIBUTION



| | LUMENS | PERCENT OF FIXTURE |
|-------------------------|--------|-----------------------|
| DOWNWARD STREET SIDE | 2705 | 46.9 |
| DOWNWARD HOUSE SIDE | 2705 | 46.9 |
| DOWNWARD TOTAL | 5410 | 93.9 |
| UPWARD STREET SIDE | 176 | 3.1 |
| UPWARD HOUSE SIDE | 176 | 3.1 |
| UPWARD TOTAL | 352 | 6.1 |
| TOTAL FLUX | 5762 | 100.0 |

EFFICACY = 64.0 lm/W

ALL CANDELA AND LUMENS IN THIS REPORT ARE BASED ON ABSOLUTE PHOTOMETRY.
THE COEFFICIENT OF UTILIZATION VALUES ARE BASED ON THE TOTAL ABSOLUTE
LUMEN OUTPUT OF THIS LUMINAIRE SAMPLE.



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FLUX DISTRIBUTION BY SOLID ANGLE

(PER IESNA TM-15-11, LUMINAIRE CLASSIFICATION
SYSTEM FOR OUTDOOR LUMINAIRES)

| | LUMENS | PERCENT OF FIXTURE | BUG ZONE RATINGS |
|---------------|--------|--------------------------|------------------------|
| FORWARD LIGHT | 2705. | 46.9 | |
| FL (0- 30) | 173.5 | 3.0 | |
| FM (30- 60) | 992.5 | 17.2 | |
| FH (60- 80) | 1415.6 | 24.6 | G1 |
| FVH(80- 90) | 123.1 | 2.1 | G2 |
| BACK LIGHT | 2705. | 46.9 | |
| BL (0- 30) | 173.5 | 3.0 | B1 |
| BM (30- 60) | 992.5 | 17.2 | B1 |
| BH (60- 80) | 1415.6 | 24.6 | B3 G1 |
| BVH(80- 90) | 123.1 | 2.1 | G2 |
| UPLIGHT | 352. | 6.1 | |
| UL (90-100) | 136.2 | 2.4 | U3 |
| UH (100-180) | 216.0 | 3.7 | U3 |
| TRAPPED LIGHT | 0. | 0.0 | |
| TOTAL FLUX | 5762. | 100.0 | |

BACKLIGHT, UPLIGHT, AND GLARE (BUG) RATINGS
(PER ADDENDUM A FOR IESNA TM-15-11)

BUG RATING: B3 U3 G2

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CANDELA TABULATION

| | | LATERAL ANGLE | | | | | | | | | | |
|----------------|-------|--------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | | 0.0 | 5.0 | 15.0 | 25.0 | 35.0 | 45.0 | 55.0 | 65.0 | 75.0 | 85.0 | 90.0 |
| | | | | | | | | | | | | |
| VERTICAL ANGLE | 180.0 | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| | 175.0 | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| | 165.0 | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| | 155.0 | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| | 145.0 | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| | 135.0 | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| | 125.0 | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| | 115.0 | 80. | 78. | 79. | 85. | 85. | 80. | 77. | 78. | 80. | 86. | 87. |
| | 105.0 | 124. | 124. | 132. | 144. | 141. | 132. | 126. | 126. | 134. | 145. | 146. |
| | 95.0 | 112. | 112. | 119. | 127. | 128. | 119. | 114. | 115. | 120. | 131. | 132. |
| | 92.5 | 108. | 109. | 115. | 121. | 122. | 115. | 111. | 111. | 116. | 125. | 125. |
| | 90.0 | 120. | 122. | 128. | 133. | 135. | 127. | 123. | 124. | 129. | 136. | 138. |
| | 87.5 | 152. | 153. | 159. | 164. | 167. | 158. | 155. | 155. | 160. | 168. | 171. |
| | 85.0 | 195. | 198. | 207. | 211. | 215. | 208. | 198. | 198. | 208. | 216. | 218. |
| | 82.5 | 263. | 268. | 279. | 282. | 287. | 275. | 263. | 265. | 275. | 284. | 290. |
| | 80.0 | 394. | 408. | 416. | 413. | 412. | 395. | 368. | 369. | 389. | 397. | 401. |
| | 77.5 | 739. | 721. | 714. | 694. | 710. | 698. | 659. | 645. | 668. | 626. | 631. |
| | 75.0 | 1389. | 1367. | 1313. | 1442. | 1496. | 1321. | 1386. | 1431. | 1298. | 1481. | 1515. |
| | 73.0 | 1414. | 1455. | 1556. | 1780. | 1774. | 1559. | 1531. | 1532. | 1578. | 1814. | 1824. |
| | 72.5 | 1395. | 1449. | 1567. | 1775. | 1774. | 1576. | 1514. | 1505. | 1594. | 1801. | 1773. |
| | 70.0 | 1375. | 1438. | 1551. | 1657. | 1683. | 1600. | 1517. | 1511. | 1601. | 1707. | 1680. |
| | 67.5 | 1392. | 1419. | 1556. | 1640. | 1653. | 1607. | 1495. | 1524. | 1644. | 1727. | 1697. |
| | 65.0 | 1478. | 1495. | 1720. | 1716. | 1739. | 1765. | 1582. | 1586. | 1799. | 1793. | 1773. |
| | 62.5 | 1480. | 1518. | 1661. | 1666. | 1667. | 1683. | 1566. | 1550. | 1720. | 1727. | 1721. |
| | 60.0 | 1321. | 1370. | 1413. | 1492. | 1473. | 1428. | 1361. | 1356. | 1457. | 1529. | 1560. |
| | 57.5 | 1120. | 1134. | 1229. | 1245. | 1236. | 1242. | 1120. | 1115. | 1256. | 1277. | 1275. |
| | 55.0 | 950. | 964. | 1093. | 1112. | 1100. | 1110. | 958. | 947. | 1113. | 1132. | 1140. |
| | 52.5 | 813. | 845. | 962. | 1025. | 1018. | 960. | 841. | 830. | 976. | 1045. | 1056. |
| | 50.0 | 709. | 736. | 883. | 958. | 955. | 878. | 730. | 726. | 887. | 976. | 987. |
| | 47.5 | 662. | 681. | 834. | 900. | 896. | 825. | 667. | 668. | 835. | 920. | 937. |
| | 45.0 | 659. | 678. | 787. | 851. | 842. | 775. | 658. | 660. | 797. | 874. | 885. |
| | 42.5 | 660. | 670. | 749. | 807. | 802. | 732. | 649. | 651. | 765. | 832. | 836. |
| | 40.0 | 650. | 655. | 719. | 760. | 754. | 694. | 640. | 644. | 733. | 783. | 785. |
| 37.5 | 663. | 662. | 687. | 706. | 699. | 658. | 648. | 651. | 694. | 724. | 730. | |
| 35.0 | 652. | 648. | 650. | 655. | 639. | 620. | 625. | 630. | 651. | 669. | 670. | |
| 30.0 | 574. | 568. | 551. | 545. | 545. | 537. | 554. | 562. | 562. | 567. | 570. | |
| 25.0 | 490. | 486. | 469. | 455. | 448. | 456. | 477. | 489. | 476. | 471. | 469. | |
| 20.0 | 401. | 400. | 391. | 381. | 382. | 390. | 404. | 414. | 409. | 407. | 407. | |
| 15.0 | 339. | 339. | 337. | 330. | 330. | 338. | 346. | 349. | 350. | 344. | 343. | |
| 10.0 | 297. | 297. | 295. | 295. | 294. | 296. | 299. | 300. | 301. | 301. | 301. | |
| 5.0 | 283. | 283. | 285. | 286. | 287. | 288. | 289. | 291. | 292. | 293. | 293. | |
| 0.0 | 279. | 279. | 279. | 279. | 279. | 279. | 279. | 279. | 279. | 279. | 279. | |
| | | | | | | | | | | | | |
| | | PLANE OF MAXIMUM CANDELA | | | | | | | | | | |
| | | CONE OF MAXIMUM CANDELA | | | | | | | | | | |



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5-DEGREE
ZONAL LUMEN SUMMARY

| | |
|---------|-----|
| 0- 5 | 7 |
| 5- 10 | 21 |
| 10- 15 | 38 |
| 15- 20 | 61 |
| 20- 25 | 91 |
| 25- 30 | 130 |
| 30- 35 | 177 |
| 35- 40 | 227 |
| 40- 45 | 274 |
| 45- 50 | 327 |
| 50- 55 | 414 |
| 55- 60 | 567 |
| 60- 65 | 778 |
| 65- 70 | 815 |
| 70- 75 | 817 |
| 75- 80 | 421 |
| 80- 85 | 157 |
| 85- 90 | 90 |
| 90- 95 | 66 |
| 95-100 | 70 |
| 100-105 | 72 |
| 105-110 | 69 |
| 110-115 | 57 |
| 115-120 | 18 |
| 120-125 | 0 |
| 125-130 | 0 |
| 130-135 | 0 |
| 135-140 | 0 |
| 140-145 | 0 |
| 145-150 | 0 |
| 150-155 | 0 |
| 155-160 | 0 |
| 160-165 | 0 |
| 165-170 | 0 |
| 170-175 | 0 |
| 175-180 | 0 |

10-DEGREE
ZONAL LUMEN SUMMARY

| | |
|-------|------|
| 0- 10 | 28 |
| 0- 20 | 126 |
| 0- 30 | 347 |
| 0- 40 | 750 |
| 0- 50 | 1351 |
| 0- 60 | 2332 |
| 0- 70 | 3925 |
| 0- 80 | 5163 |
| 0- 90 | 5410 |
| 0-100 | 5546 |
| 0-110 | 5687 |
| 0-120 | 5761 |
| 0-130 | 5762 |
| 0-140 | 5762 |
| 0-150 | 5762 |
| 0-160 | 5762 |
| 0-170 | 5762 |
| 0-180 | 5762 |



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ADDRESS: 170 LUDLOW AVE
NORTHVALE, NJ 07647

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PREPARED FOR: RAB LIGHTING, INC.
CATALOG NUMBER: GLED78Y OR GPLED78Y (W/ PRISMATIC LENS - CEILING OR PENDENT MOUNT)

ADDRESS: 170 LUDLOW AVE
NORTHVALE, NJ 07647

LUMINAIRE: CAST 2-PIECE BROWN PAINTED FINNED METAL HOUSING, 6 CAST METAL HEAT SINKS/CIRCUIT BOARD MOUNTING BRACKETS, 6 CIRCUIT BOARDS EACH WITH 1 LED AND MOLDED PLASTIC CIRCUIT BOARD PERIMETER OVERLAY WITH SPECULAR FINISH, MOLDED PLASTIC REFLECTOR WITH SPECULAR FINISH AND 1 APERTURE PER LED, CLEAR PLASTIC DROP LENS WITH RADIALY PRISMATIC BOTTOM AND PRISMATIC SIDES IN CAST BROWN PAINTED METAL FRAME. LENS RADIAL PRISMS IN, AND SIDE PRISMS IN AND OUT.

LAMP: SIX WHITE MULTI-CHIP LIGHT EMITTING DIODES (LEDs), AIMED AT THE HORIZON.

DRIVERS: THREE RAB RD26S

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED AT RATED INPUT VOLTAGE (120.0 AND 277.0 VAC, 60Hz) TO THE LED DRIVERS. LED DRIVER INFORMATION PROVIDED BY CLIENT.

| | | |
|--------------|--|----------------------|
| INSTRUMENTS: | Associated Power Technologies APT5040 AC Power Source | Calibration Due: N/A |
| | Yokogawa WT210 Digital Power Meter #9 | 02/28/14 |
| | Ocean Optics QE65000 Spectroradiometer | 10/16/14 |
| | ITL 2.0m Diameter Integrating Sphere S20-2, 4PI Geometry | 10/16/14 |

OBJECT OF TEST: Measure the Total Radiant Flux*, Spectral Power Distribution (SPD), Correlated Color Temperature (CCT), Color Rendering Indices (CRI_a, 1-14), Chromaticity Coordinates (x,y; u'v'), ANSI C78.377 Duv, and electrical data including ANSI C82.77-2002 Power Factor (PF) and Total Harmonic Distortion (THD) to the test sample. Report Off-State Power. Measure electrical data including Total Harmonic Distortion (THD) at maximum rated voltage.

PROCEDURE: The test sample was provided by the customer and had an unknown number of operating hours. The test sample was mounted inside the integrating sphere and allowed to stabilize. After stabilization occurred, measurements were taken. In order to measure mean performance, multiple data sets were recorded and averaged. Readings were taken with the test sample operating at 120.0 VAC input. Electrical data was also recorded at maximum nominal rated input voltage (277.0 VAC). All testing performed in a 25 +/-1 degree Celsius free air ambient and in accordance with IESNA LM-79-08. All data are traceable to the National Institute of Standards and Technology. Off-State Power was reported with no voltage applied to the sample.

*NOTE: Proper calibration of integrating spheres for measuring total flux output of non-directional samples will produce reliable, repeatable results within the calibration tolerances of the equipment used. However, measurement of test samples with significant self absorption and/or directional output, even when these effects are compensated for, are likely to have a greater variation in results compared to the flux output calculated from a goniophotometric exploration since these artifacts do not affect the goniophotometric results.

RESULTS: (continued subsequent pages)

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| | |
|----------|-------------------------------------|
| Checked | <u>P O'CONNOR</u> |
| Approved | <u>L GRABA</u> Lighting Engineer |



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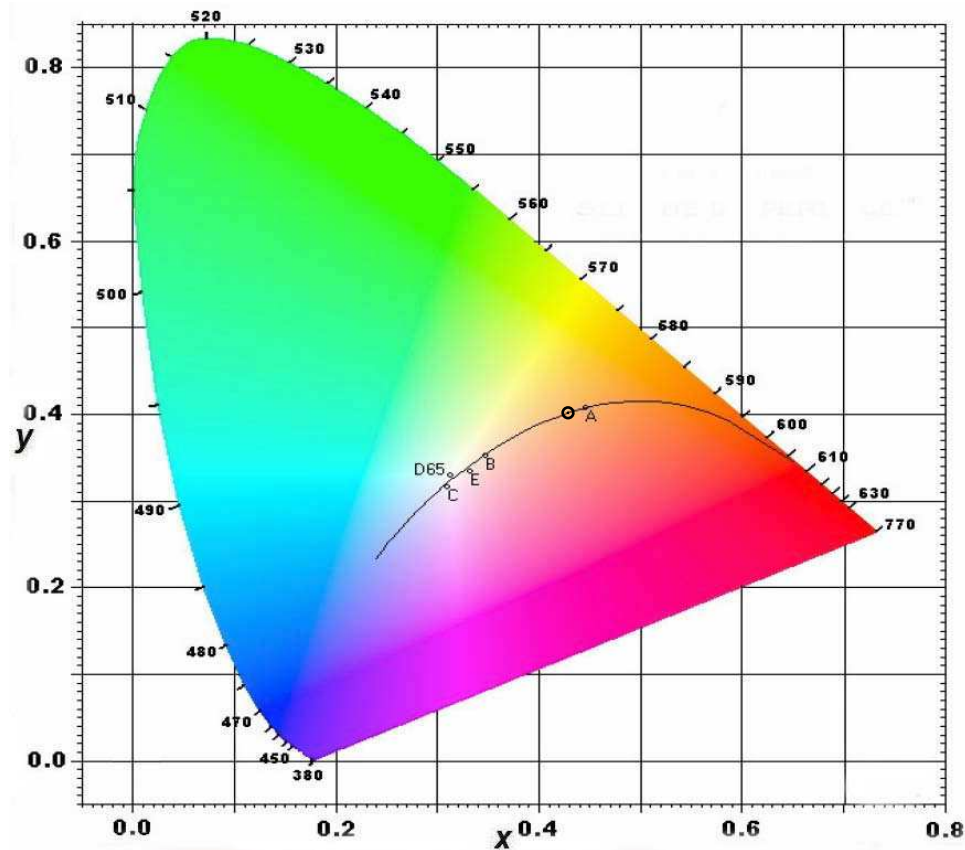
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CIE Chromaticity Diagram



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RESULTS:

| SPECTRORADIOMETRIC | |
|---------------------------------|-------------------|
| Observer | CIE 1931 2 degree |
| Chromaticity Ordinate x | 0.4285 |
| Chromaticity Ordinate y | 0.4013 |
| Observer | CIE 1976 2 degree |
| Chromaticity Ordinate u' | 0.2463 |
| Chromaticity Ordinate v' | 0.5190 |
| Correlated Color Temp CCT (K) | 3123 |
| ANSI C78.377-2008 Duv | 0.000 |
| Total Radiant Flux (milliWatts) | 17424 * |
| ELECTRICAL | |
| Input Voltage (Volts AC) | 120.0 |
| Input Current (Amps AC) | 0.755 |
| Input Power (Watts) | 90.2 |
| Input Power Factor (%) | 99.6 |
| Input Current THD (%) | 8.0 |
| Input Voltage THD (%) | 0.1 |
| Off-State Power (Watts) | |
| | 0.0 |
| ELECTRICAL AT MAX NONIMAL INPUT | |
| Input Voltage (Volts AC) | 277.0 |
| Input Current (Amps AC) | 0.356 |
| Input Power (Watts) | 89.7 |
| Input Power Factor (%) | 91.0 |
| Input Current THD (%) | 11.0 |
| Input Voltage THD (%) | 0.1 |

| COLOR RENDERING INDICES | CRI |
|---------------------------------|-----|
| Ra (Average 1-8) | 83 |
| R1 Light greyish red | 81 |
| R2 Dark greyish yellow | 89 |
| R3 Strong yellowish green | 96 |
| R4 Moderate yellowish green | 83 |
| R5 Light bluish green | 82 |
| R6 Light blue | 87 |
| R7 Light violet | 84 |
| R8 Light reddish purple | 60 |
| R9 Strong red | 6 |
| R10 Strong yellow | 76 |
| R11 Strong green | 83 |
| R12 Strong blue | 69 |
| R13 Light yellowish pink (skin) | 83 |
| R14 Moderate olive green (leaf) | 98 |

*NOTE:

Proper calibration of integrating spheres for measuring total flux output of non-directional samples will produce reliable, repeatable results within the calibration tolerances of the equipment used. However, measurement of test samples with significant self absorption and/or directional output, even when these effects are compensated for, are likely to have a greater variation in results compared to the flux output calculated from a goniophotometric exploration since these artifacts do not affect the goniophotometric results.



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CATALOG NUMBER:

GLE78Y OR GPLED78Y (W/ PRISMATIC LENS - CEILING OR PENDENT MOUNT)

RESULTS:

| Wavelength | mW per nm | Wavelength | mW per nm | Wavelength | mW per nm |
|------------|-----------|------------|-----------|------------|-----------|
| 380 | 0.338 | 515 | 55.058 | 650 | 65.462 |
| 385 | 0.328 | 520 | 59.351 | 655 | 58.904 |
| 390 | 0.341 | 525 | 62.521 | 660 | 52.486 |
| 395 | 0.388 | 530 | 64.883 | 665 | 46.470 |
| 400 | 0.468 | 535 | 66.590 | 670 | 40.910 |
| 405 | 0.660 | 540 | 68.226 | 675 | 35.791 |
| 410 | 1.078 | 545 | 70.079 | 680 | 31.185 |
| 415 | 1.921 | 550 | 72.474 | 685 | 27.054 |
| 420 | 3.700 | 555 | 75.561 | 690 | 23.467 |
| 425 | 7.101 | 560 | 79.425 | 695 | 20.325 |
| 430 | 13.142 | 565 | 84.094 | 700 | 17.395 |
| 435 | 22.463 | 570 | 89.424 | 705 | 14.926 |
| 440 | 36.394 | 575 | 94.948 | 710 | 12.816 |
| 445 | 55.853 | 580 | 100.539 | 715 | 11.024 |
| 450 | 67.625 | 585 | 105.719 | 720 | 9.445 |
| 455 | 57.793 | 590 | 110.112 | 725 | 8.073 |
| 460 | 41.207 | 595 | 113.419 | 730 | 6.897 |
| 465 | 30.843 | 600 | 115.324 | 735 | 5.909 |
| 470 | 23.965 | 605 | 115.419 | 740 | 5.046 |
| 475 | 19.412 | 610 | 113.806 | 745 | 4.341 |
| 480 | 18.207 | 615 | 110.445 | 750 | 3.736 |
| 485 | 19.863 | 620 | 105.573 | 755 | 3.219 |
| 490 | 23.641 | 625 | 99.746 | 760 | 2.754 |
| 495 | 29.287 | 630 | 92.976 | 765 | 2.368 |
| 500 | 36.233 | 635 | 86.150 | 770 | 2.047 |
| 505 | 43.295 | 640 | 79.182 | 775 | 1.767 |
| 510 | 49.720 | 645 | 72.320 | 780 | 1.524 |

