



LUMINAIRE TESTING LABORATORY, INC.

SUSTAINING
MEMBER
of the
IESNA

905 Harrison Street · Allentown, PA 18103 · 610-770-1044 · Fax 610-770-8912 · www.LuminaireTesting.com

LTL NUMBER: 18456 DATE: 03-15-2010
 PREPARED FOR: RENOVA LIGHTING SYSTEMS
 CATALOG NUMBER: EFK-22-M-3LT8-V
 LUMINAIRE: FORMED WHITE ENAMEL STEEL HOUSING, FORMED SPECULAR ALUMINUM REFLECTOR, NO ENCLOSURE.
 LAMP: THREE 17 WATT T8 LINEAR FLUORESCENT LAMPS RATED AT 1325 LUMENS EACH.
 LAMP CATALOG NUMBER: GE F17T8/SP41/ECO
 BALLAST: ONE SYLVANIA "QUICKTRONIC" QHE 3X32T8/UNV-ISL-SC
 MOUNTING: RECESSED
 ELECTRICAL VALUES: 120.0VAC, 0.3171A, 37.94W

Candela Distribution

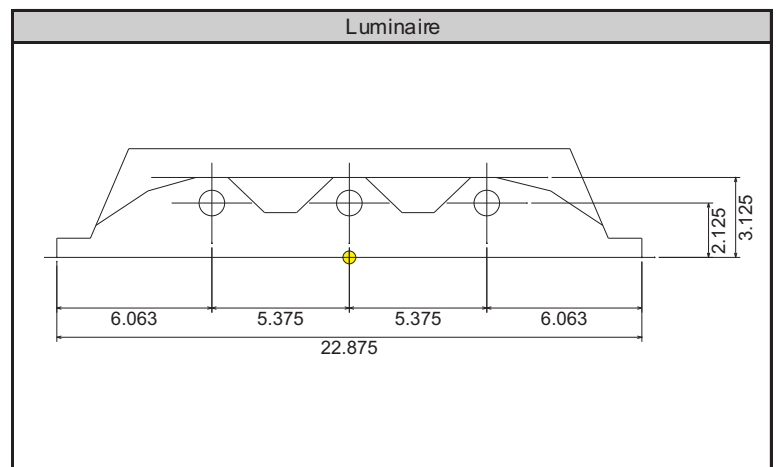
| | 0 | 22.5 | 45 | 67.5 | 90 | 112.5 | 135 | 157.5 | 180 | 202.5 | 225 | 247.5 | 270 | 292.5 | 315 | 337.5 | Flux |
|-----|------|------|------|------|------|-------|------|-------|------|-------|------|-------|------|-------|------|-------|-------|
| 0 | 1447 | 1447 | 1447 | 1447 | 1447 | 1447 | 1447 | 1447 | 1447 | 1447 | 1447 | 1447 | 1447 | 1447 | 1447 | 1447 | |
| 5 | 1439 | 1440 | 1436 | 1434 | 1432 | 1434 | 1436 | 1440 | 1439 | 1440 | 1436 | 1434 | 1432 | 1434 | 1436 | 1440 | 136.2 |
| 15 | 1385 | 1377 | 1354 | 1339 | 1331 | 1339 | 1354 | 1377 | 1385 | 1377 | 1354 | 1339 | 1331 | 1339 | 1354 | 1377 | 382.3 |
| 25 | 1280 | 1253 | 1208 | 1164 | 1153 | 1164 | 1208 | 1253 | 1280 | 1253 | 1208 | 1164 | 1153 | 1164 | 1208 | 1253 | 557.1 |
| 35 | 1119 | 1076 | 1008 | 988 | 990 | 988 | 1008 | 1076 | 1119 | 1076 | 1008 | 988 | 990 | 988 | 1008 | 1076 | 645.9 |
| 45 | 910 | 848 | 819 | 833 | 832 | 833 | 819 | 848 | 910 | 848 | 819 | 833 | 832 | 833 | 819 | 848 | 648.9 |
| 55 | 669 | 608 | 628 | 606 | 615 | 606 | 628 | 608 | 669 | 608 | 628 | 606 | 615 | 606 | 628 | 608 | 556.9 |
| 65 | 415 | 395 | 412 | 513 | 562 | 513 | 412 | 395 | 415 | 395 | 412 | 513 | 562 | 513 | 412 | 395 | 446.6 |
| 75 | 173 | 194 | 290 | 293 | 292 | 293 | 290 | 194 | 173 | 194 | 290 | 293 | 292 | 293 | 290 | 194 | 267.8 |
| 85 | 27 | 32 | 40 | 39 | 34 | 39 | 40 | 32 | 27 | 32 | 40 | 39 | 34 | 39 | 40 | 32 | 56.2 |
| 90 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | |
| 95 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 105 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 115 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 125 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 135 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 145 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 155 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 165 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 175 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 180 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |

Zonal Lumen Summary

| Zone | Lumens | % of Lamp | % of Luminaire |
|--------|--------|-----------|----------------|
| 0-30 | 1075.6 | 27.1% | 29.1% |
| 0-40 | 1721.5 | 43.3% | 46.6% |
| 0-60 | 2927.2 | 73.6% | 79.2% |
| 0-90 | 3697.9 | 93.0% | 100.0% |
| 90-180 | 0.0 | 0.0% | 0.0% |
| 0-180 | 3697.9 | 93.0% | 100.0% |

Total luminaire efficiency: 93.0%

CIE Type: Direct
 Spacing Criterion: 0 deg: 1.24 90 deg: 1.11
 180 deg: 1.24 270 deg: 1.11



Approved By: MG

THIS REPORT BASED ON LM-41 AND OTHER PERTINENT IESNA PROCEDURES.



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Candela Tabulation (5 degree Vertical Increments)

| | 0 | 22.5 | 45 | 67.5 | 90 | 112.5 | 135 | 157.5 | 180 | 202.5 | 225 | 247.5 | 270 | 292.5 | 315 | 337.5 |
|-----|------|------|------|------|------|-------|------|-------|------|-------|------|-------|------|-------|------|-------|
| 0 | 1447 | 1447 | 1447 | 1447 | 1447 | 1447 | 1447 | 1447 | 1447 | 1447 | 1447 | 1447 | 1447 | 1447 | 1447 | 1447 |
| 5 | 1439 | 1440 | 1436 | 1434 | 1432 | 1434 | 1436 | 1440 | 1439 | 1440 | 1436 | 1434 | 1432 | 1434 | 1436 | 1440 |
| 10 | 1419 | 1422 | 1406 | 1394 | 1390 | 1394 | 1406 | 1422 | 1419 | 1422 | 1406 | 1394 | 1390 | 1394 | 1406 | 1422 |
| 15 | 1385 | 1377 | 1354 | 1339 | 1331 | 1339 | 1354 | 1377 | 1385 | 1377 | 1354 | 1339 | 1331 | 1339 | 1354 | 1377 |
| 20 | 1340 | 1323 | 1290 | 1262 | 1246 | 1262 | 1290 | 1323 | 1340 | 1323 | 1290 | 1262 | 1246 | 1262 | 1290 | 1323 |
| 25 | 1280 | 1253 | 1208 | 1164 | 1153 | 1164 | 1208 | 1253 | 1280 | 1253 | 1208 | 1164 | 1153 | 1164 | 1208 | 1253 |
| 30 | 1207 | 1172 | 1108 | 1072 | 1064 | 1072 | 1108 | 1172 | 1207 | 1172 | 1108 | 1072 | 1064 | 1072 | 1108 | 1172 |
| 35 | 1119 | 1076 | 1008 | 988 | 990 | 988 | 1008 | 1076 | 1119 | 1076 | 1008 | 988 | 990 | 988 | 1008 | 1076 |
| 40 | 1020 | 969 | 907 | 916 | 920 | 916 | 907 | 969 | 1020 | 969 | 907 | 916 | 920 | 916 | 907 | 969 |
| 45 | 910 | 848 | 819 | 833 | 832 | 833 | 819 | 848 | 910 | 848 | 819 | 833 | 832 | 833 | 819 | 848 |
| 50 | 794 | 728 | 731 | 726 | 710 | 726 | 731 | 728 | 794 | 728 | 731 | 726 | 710 | 726 | 731 | 728 |
| 55 | 669 | 608 | 628 | 606 | 615 | 606 | 628 | 608 | 669 | 608 | 628 | 606 | 615 | 606 | 628 | 608 |
| 60 | 541 | 497 | 506 | 531 | 562 | 531 | 506 | 497 | 541 | 497 | 506 | 531 | 562 | 531 | 506 | 497 |
| 65 | 415 | 395 | 412 | 513 | 562 | 513 | 412 | 395 | 415 | 395 | 412 | 513 | 562 | 513 | 412 | 395 |
| 70 | 290 | 293 | 364 | 457 | 460 | 457 | 364 | 293 | 290 | 293 | 364 | 457 | 460 | 457 | 364 | 293 |
| 75 | 173 | 194 | 290 | 293 | 292 | 293 | 290 | 194 | 173 | 194 | 290 | 293 | 292 | 293 | 290 | 194 |
| 80 | 76 | 128 | 143 | 177 | 192 | 177 | 143 | 128 | 76 | 128 | 143 | 177 | 192 | 177 | 143 | 128 |
| 85 | 27 | 32 | 40 | 39 | 34 | 39 | 40 | 32 | 27 | 32 | 40 | 39 | 34 | 39 | 40 | 32 |
| 90 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 |
| 95 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 105 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 110 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 115 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 120 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 125 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 130 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 135 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 140 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 145 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 150 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 155 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 160 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 165 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 170 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 175 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 180 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Zonal Lumen Tabulation (5 degree zones)

| Zone | Lumens | Zone | Lumens | Zone | Lumens | Zone | Lumens |
|-------|--------|-------|--------|---------|--------|---------|--------|
| 0-5 | 34.5 | 45-50 | 318.8 | 90-95 | 0.0 | 135-140 | 0.0 |
| 5-10 | 101.7 | 50-55 | 293.9 | 95-100 | 0.0 | 140-145 | 0.0 |
| 10-15 | 163.9 | 55-60 | 263.0 | 100-105 | 0.0 | 145-150 | 0.0 |
| 15-20 | 218.4 | 60-65 | 235.8 | 105-110 | 0.0 | 150-155 | 0.0 |
| 20-25 | 262.2 | 65-70 | 210.8 | 110-115 | 0.0 | 155-160 | 0.0 |
| 25-30 | 294.9 | 70-75 | 164.1 | 115-120 | 0.0 | 160-165 | 0.0 |
| 30-35 | 316.9 | 75-80 | 103.7 | 120-125 | 0.0 | 165-170 | 0.0 |
| 35-40 | 329.0 | 80-85 | 49.0 | 125-130 | 0.0 | 170-175 | 0.0 |
| 40-45 | 330.1 | 85-90 | 7.2 | 130-135 | 0.0 | 175-180 | 0.0 |



| Coefficients of Utilization - Zonal Cavity Method | | | | | | | | | | | | |
|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Effective Floor Cavity Reflectance 20% | | | | | | | | | | | | |
| Ceiling Cavity Reflectance | 90 | | | | 80 | | | | 70 | | | |
| Wall Reflectance | 70 | 50 | 30 | 10 | 70 | 50 | 30 | 10 | 70 | 50 | 30 | 10 |
| Room Cavity Ratio (RCR) | | | | | | | | | | | | |
| 0 | 1.134 | 1.134 | 1.134 | 1.134 | 1.107 | 1.107 | 1.107 | 1.107 | 1.082 | 1.082 | 1.082 | 1.082 |
| 1 | 1.04 | 0.991 | 0.948 | 0.909 | 1.013 | 0.969 | 0.93 | 0.894 | 0.988 | 0.948 | 0.912 | 0.88 |
| 2 | 0.948 | 0.864 | 0.796 | 0.739 | 0.922 | 0.846 | 0.783 | 0.73 | 0.898 | 0.828 | 0.77 | 0.721 |
| 3 | 0.866 | 0.759 | 0.678 | 0.614 | 0.841 | 0.744 | 0.669 | 0.609 | 0.818 | 0.729 | 0.659 | 0.603 |
| 4 | 0.794 | 0.673 | 0.587 | 0.521 | 0.771 | 0.66 | 0.579 | 0.517 | 0.75 | 0.648 | 0.572 | 0.514 |
| 5 | 0.731 | 0.602 | 0.514 | 0.45 | 0.71 | 0.591 | 0.508 | 0.447 | 0.691 | 0.581 | 0.503 | 0.445 |
| 6 | 0.676 | 0.543 | 0.455 | 0.393 | 0.657 | 0.534 | 0.451 | 0.392 | 0.639 | 0.525 | 0.447 | 0.39 |
| 7 | 0.627 | 0.493 | 0.407 | 0.348 | 0.61 | 0.485 | 0.404 | 0.347 | 0.594 | 0.477 | 0.4 | 0.346 |
| 8 | 0.584 | 0.45 | 0.367 | 0.312 | 0.568 | 0.443 | 0.365 | 0.311 | 0.554 | 0.437 | 0.362 | 0.31 |
| 9 | 0.545 | 0.413 | 0.334 | 0.281 | 0.531 | 0.408 | 0.332 | 0.28 | 0.518 | 0.402 | 0.329 | 0.28 |
| 10 | 0.511 | 0.382 | 0.306 | 0.256 | 0.499 | 0.377 | 0.304 | 0.255 | 0.487 | 0.372 | 0.302 | 0.254 |

| Ceiling Cavity Reflectance | 50 | | | | 30 | | | 10 | | | 0 |
|----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Wall Reflectance | 70 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 0 |
| Room Cavity Ratio (RCR) | | | | | | | | | | | |
| 0 | 1.034 | 1.034 | 1.034 | 1.034 | 0.99 | 0.99 | 0.99 | 0.949 | 0.949 | 0.949 | 0.93 |
| 1 | 0.941 | 0.909 | 0.879 | 0.852 | 0.872 | 0.848 | 0.826 | 0.839 | 0.819 | 0.801 | 0.782 |
| 2 | 0.852 | 0.795 | 0.746 | 0.704 | 0.765 | 0.724 | 0.688 | 0.737 | 0.703 | 0.673 | 0.653 |
| 3 | 0.776 | 0.702 | 0.642 | 0.592 | 0.676 | 0.625 | 0.582 | 0.652 | 0.609 | 0.572 | 0.552 |
| 4 | 0.711 | 0.625 | 0.559 | 0.507 | 0.603 | 0.546 | 0.5 | 0.583 | 0.534 | 0.493 | 0.473 |
| 5 | 0.655 | 0.561 | 0.492 | 0.44 | 0.543 | 0.482 | 0.435 | 0.526 | 0.473 | 0.43 | 0.41 |
| 6 | 0.606 | 0.508 | 0.438 | 0.386 | 0.492 | 0.43 | 0.383 | 0.478 | 0.423 | 0.38 | 0.36 |
| 7 | 0.564 | 0.463 | 0.394 | 0.343 | 0.449 | 0.387 | 0.341 | 0.437 | 0.381 | 0.338 | 0.32 |
| 8 | 0.527 | 0.424 | 0.356 | 0.308 | 0.413 | 0.351 | 0.306 | 0.402 | 0.346 | 0.304 | 0.286 |
| 9 | 0.494 | 0.391 | 0.325 | 0.278 | 0.381 | 0.32 | 0.277 | 0.372 | 0.316 | 0.275 | 0.258 |
| 10 | 0.465 | 0.363 | 0.298 | 0.253 | 0.354 | 0.294 | 0.252 | 0.346 | 0.291 | 0.251 | 0.235 |

Average Luminance Table (cd/m²)

| | 0 | 45 | 90 |
|----|------|------|------|
| 0 | 4287 | 4287 | 4287 |
| 45 | 3813 | 3429 | 3486 |
| 55 | 3456 | 3246 | 3176 |
| 65 | 2912 | 2885 | 3938 |
| 75 | 1986 | 3319 | 3346 |
| 85 | 903 | 1376 | 1170 |

THIS TEST WAS CONDUCTED USING RELATIVE PHOTOMETRY TECHNIQUES ACCORDING TO STANDARD IESNA PROCEDURES. THE USER MUST THEREFORE USE CAUTION IN THE FOLLOWING SITUATIONS: 1) THIS TEST WAS PERFORMED USING A SPECIFIC BALLAST/LAMP COMBINATION. EXTRAPOLATION OF THESE DATA FOR OTHER BALLAST/LAMP COMBINATIONS MAY PRODUCE ERRONEOUS RESULTS. 2) ACCORDING TO IESNA PROCEDURES, THE BALLAST(S) AND LAMP(S) ARE PRESUMED TO PRODUCE 100% OF RATED OUTPUT. AN APPROPRIATE BALLAST FACTOR MUST BE APPLIED TO THE LUMEN OUTPUT RATINGS AND LUMINOUS INTENSITY VALUES GIVEN. 3) THIS TEST WAS CONDUCTED IN A CONTROLLED LABORATORY ENVIRONMENT WHERE THE AMBIENT TEMPERATURE WAS HELD AT 25 °C ±1°C. FIELD PERFORMANCE MAY DIFFER PARTICULARLY IN REGARDS TO CHANGE IN LUMINOUS OUTPUT AS A RESULT OF DIFFERENCE IN AMBIENT TEMPERATURE AND METHOD OF MOUNTING THE LUMINAIRE.

