



# 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: 17545 DATE: 01-05-2010  
 PREPARED FOR: RENOVA LIGHTING SYSTEMS  
 CATALOG NUMBER: ECS-IRK4-WN-2LT8-UNV5.8-V  
 LUMINAIRE: FORMED STEEL HOUSING, FORMED WHITE ENAMEL ALUMINUM REFLECTOR, NO ENCLOSURE.  
 LAMP: TWO 32 WATT T8 LINEAR FLUORESCENT LAMPS RATED AT 2850 LUMENS EACH.  
 LAMP CATALOG NUMBER: PHILIPS F32T8/841/ALTO  
 BALLAST: ONE SYLVANIA "QUICKTRONIC" QHE-2X32T8/UNV-ISL-SC  
 MOUNTING: PENDANT  
 ELECTRICAL VALUES: 120.0VAC, 0.4232A, 50.73W

### 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   | 1359 | 1359 | 1359 | 1359 | 1359 | 1359  | 1359 | 1359  | 1359 | 1359  | 1359 | 1359  | 1359 | 1359  | 1359 | 1359  |       |
| 5   | 1347 | 1351 | 1358 | 1354 | 1358 | 1354  | 1358 | 1351  | 1347 | 1351  | 1358 | 1354  | 1358 | 1354  | 1358 | 1351  | 128.9 |
| 15  | 1304 | 1311 | 1328 | 1330 | 1335 | 1330  | 1328 | 1311  | 1304 | 1311  | 1328 | 1330  | 1335 | 1330  | 1328 | 1311  | 373.6 |
| 25  | 1219 | 1234 | 1263 | 1293 | 1313 | 1293  | 1263 | 1234  | 1219 | 1234  | 1263 | 1293  | 1313 | 1293  | 1263 | 1234  | 583.9 |
| 35  | 1092 | 1117 | 1196 | 1261 | 1286 | 1261  | 1196 | 1117  | 1092 | 1117  | 1196 | 1261  | 1286 | 1261  | 1196 | 1117  | 745.6 |
| 45  | 932  | 974  | 1102 | 1171 | 1200 | 1171  | 1102 | 974   | 932  | 974   | 1102 | 1171  | 1200 | 1171  | 1102 | 974   | 832.7 |
| 55  | 741  | 829  | 958  | 1040 | 1072 | 1040  | 958  | 829   | 741  | 829   | 958  | 1040  | 1072 | 1040  | 958  | 829   | 834.5 |
| 65  | 526  | 650  | 780  | 886  | 936  | 886   | 780  | 650   | 526  | 650   | 780  | 886   | 936  | 886   | 780  | 650   | 753.4 |
| 75  | 288  | 434  | 592  | 650  | 677  | 650   | 592  | 434   | 288  | 434   | 592  | 650   | 677  | 650   | 592  | 434   | 571.2 |
| 85  | 56   | 201  | 324  | 403  | 432  | 403   | 324  | 201   | 56   | 201   | 324  | 403   | 432  | 403   | 324  | 201   | 321.6 |
| 90  | 1    | 96   | 192  | 261  | 287  | 261   | 192  | 96    | 1    | 96    | 192  | 261   | 287  | 261   | 192  | 96    |       |
| 95  | 0    | 35   | 114  | 178  | 202  | 178   | 114  | 35    | 0    | 35    | 114  | 178   | 202  | 178   | 114  | 35    | 118.8 |
| 105 | 0    | 6    | 2    | 23   | 41   | 23    | 2    | 6     | 0    | 6     | 2    | 23    | 41   | 23    | 2    | 6     | 18.6  |
| 115 | 0    | 2    | 1    | 1    | 1    | 1     | 1    | 2     | 0    | 2     | 1    | 1     | 1    | 1     | 1    | 2     | 1.2   |
| 125 | 0    | 0    | 0    | 0    | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     | 0.1   |
| 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     | 0.0   |

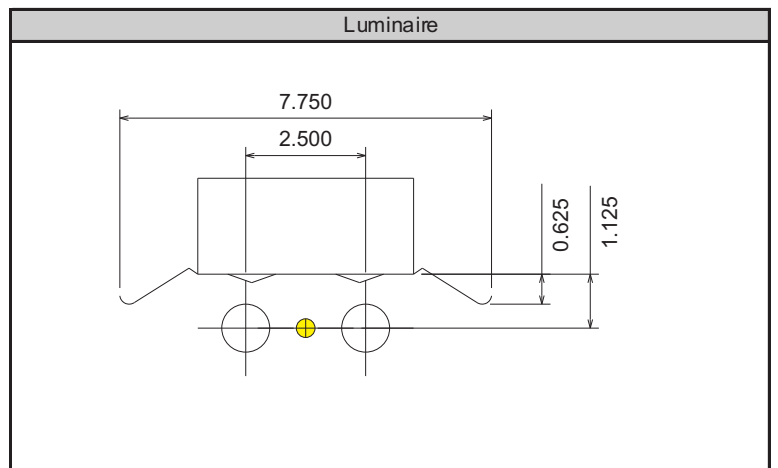
### Zonal Lumen Summary

| Zone   | Lumens | % of Lamp | % of Luminaire |
|--------|--------|-----------|----------------|
| 0-30   | 1086.4 | 19.1%     | 20.6%          |
| 0-40   | 1832.0 | 32.1%     | 34.7%          |
| 0-60   | 3499.3 | 61.4%     | 66.2%          |
| 0-90   | 5145.4 | 90.3%     | 97.4%          |
| 90-180 | 138.7  | 2.4%      | 2.6%           |
| 0-180  | 5284.1 | 92.7%     | 100.0%         |

Total luminaire efficiency: 92.7%

CIE Type: Direct  
 Spacing Criterion: 0 deg: 1.27 90 deg: 1.45  
 180 deg: 1.27 270 deg: 1.45

Total reflectance of paint: 89.9



Approved By: \_\_\_\_\_

**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   | 1359 | 1359 | 1359 | 1359 | 1359 | 1359  | 1359 | 1359  | 1359 | 1359  | 1359 | 1359  | 1359 | 1359  | 1359 | 1359  |
| 5   | 1347 | 1351 | 1358 | 1354 | 1358 | 1354  | 1358 | 1351  | 1347 | 1351  | 1358 | 1354  | 1358 | 1354  | 1358 | 1351  |
| 10  | 1331 | 1336 | 1346 | 1344 | 1350 | 1344  | 1346 | 1336  | 1331 | 1336  | 1346 | 1344  | 1350 | 1344  | 1346 | 1336  |
| 15  | 1304 | 1311 | 1328 | 1330 | 1335 | 1330  | 1328 | 1311  | 1304 | 1311  | 1328 | 1330  | 1335 | 1330  | 1328 | 1311  |
| 20  | 1266 | 1277 | 1298 | 1308 | 1319 | 1308  | 1298 | 1277  | 1266 | 1277  | 1298 | 1308  | 1319 | 1308  | 1298 | 1277  |
| 25  | 1219 | 1234 | 1263 | 1293 | 1313 | 1293  | 1263 | 1234  | 1219 | 1234  | 1263 | 1293  | 1313 | 1293  | 1263 | 1234  |
| 30  | 1160 | 1181 | 1228 | 1281 | 1307 | 1281  | 1228 | 1181  | 1160 | 1181  | 1228 | 1281  | 1307 | 1281  | 1228 | 1181  |
| 35  | 1092 | 1117 | 1196 | 1261 | 1286 | 1261  | 1196 | 1117  | 1092 | 1117  | 1196 | 1261  | 1286 | 1261  | 1196 | 1117  |
| 40  | 1016 | 1046 | 1157 | 1222 | 1249 | 1222  | 1157 | 1046  | 1016 | 1046  | 1157 | 1222  | 1249 | 1222  | 1157 | 1046  |
| 45  | 932  | 974  | 1102 | 1171 | 1200 | 1171  | 1102 | 974   | 932  | 974   | 1102 | 1171  | 1200 | 1171  | 1102 | 974   |
| 50  | 840  | 902  | 1035 | 1112 | 1142 | 1112  | 1035 | 902   | 840  | 902   | 1035 | 1112  | 1142 | 1112  | 1035 | 902   |
| 55  | 741  | 829  | 958  | 1040 | 1072 | 1040  | 958  | 829   | 741  | 829   | 958  | 1040  | 1072 | 1040  | 958  | 829   |
| 60  | 636  | 745  | 874  | 957  | 991  | 957   | 874  | 745   | 636  | 745   | 874  | 957   | 991  | 957   | 874  | 745   |
| 65  | 526  | 650  | 780  | 886  | 936  | 886   | 780  | 650   | 526  | 650   | 780  | 886   | 936  | 886   | 780  | 650   |
| 70  | 410  | 545  | 692  | 807  | 830  | 807   | 692  | 545   | 410  | 545   | 692  | 807   | 830  | 807   | 692  | 545   |
| 75  | 288  | 434  | 592  | 650  | 677  | 650   | 592  | 434   | 288  | 434   | 592  | 650   | 677  | 650   | 592  | 434   |
| 80  | 168  | 343  | 439  | 535  | 569  | 535   | 439  | 343   | 168  | 343   | 439  | 535   | 569  | 535   | 439  | 343   |
| 85  | 56   | 201  | 324  | 403  | 432  | 403   | 324  | 201   | 56   | 201   | 324  | 403   | 432  | 403   | 324  | 201   |
| 90  | 1    | 96   | 192  | 261  | 287  | 261   | 192  | 96    | 1    | 96    | 192  | 261   | 287  | 261   | 192  | 96    |
| 95  | 0    | 35   | 114  | 178  | 202  | 178   | 114  | 35    | 0    | 35    | 114  | 178   | 202  | 178   | 114  | 35    |
| 100 | 0    | 9    | 40   | 96   | 118  | 96    | 40   | 9     | 0    | 9     | 40   | 96    | 118  | 96    | 40   | 9     |
| 105 | 0    | 6    | 2    | 23   | 41   | 23    | 2    | 6     | 0    | 6     | 2    | 23    | 41   | 23    | 2    | 6     |
| 110 | 0    | 4    | 2    | 1    | 1    | 1     | 2    | 4     | 0    | 4     | 2    | 1     | 1    | 1     | 2    | 4     |
| 115 | 0    | 2    | 1    | 1    | 1    | 1     | 1    | 2     | 0    | 2     | 1    | 1     | 1    | 1     | 1    | 2     |
| 120 | 0    | 1    | 1    | 1    | 1    | 1     | 1    | 1     | 0    | 1     | 1    | 1     | 1    | 1     | 1    | 1     |
| 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   | 32.4   | 45-50 | 422.0  | 90-95   | 76.7   | 135-140 | 0.0    |
| 5-10  | 96.4   | 50-55 | 422.7  | 95-100  | 42.1   | 140-145 | 0.0    |
| 10-15 | 158.0  | 55-60 | 411.8  | 100-105 | 16.1   | 145-150 | 0.0    |
| 15-20 | 215.6  | 60-65 | 390.6  | 105-110 | 2.5    | 150-155 | 0.0    |
| 20-25 | 268.2  | 65-70 | 362.7  | 110-115 | 0.7    | 155-160 | 0.0    |
| 25-30 | 315.7  | 70-75 | 316.5  | 115-120 | 0.5    | 160-165 | 0.0    |
| 30-35 | 356.8  | 75-80 | 254.6  | 120-125 | 0.1    | 165-170 | 0.0    |
| 35-40 | 388.8  | 80-85 | 194.9  | 125-130 | 0.0    | 170-175 | 0.0    |
| 40-45 | 410.7  | 85-90 | 126.8  | 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   | 1.128 | 1.128 | 1.128 | 1.128 | 1.098 | 1.098 | 1.098 | 1.098 | 1.069 | 1.069 | 1.069 | 1.069 |
| 1   | 1.008 | 0.948 | 0.894 | 0.846 | 0.978 | 0.923 | 0.874 | 0.829 | 0.948 | 0.899 | 0.854 | 0.813 |
| 2   | 0.907 | 0.809 | 0.729 | 0.662 | 0.877 | 0.788 | 0.714 | 0.652 | 0.849 | 0.768 | 0.7   | 0.642 |
| 3   | 0.821 | 0.7   | 0.608 | 0.535 | 0.793 | 0.682 | 0.596 | 0.528 | 0.766 | 0.665 | 0.586 | 0.522 |
| 4   | 0.747 | 0.613 | 0.516 | 0.444 | 0.721 | 0.598 | 0.508 | 0.439 | 0.696 | 0.583 | 0.499 | 0.434 |
| 5   | 0.684 | 0.543 | 0.446 | 0.376 | 0.66  | 0.53  | 0.439 | 0.372 | 0.638 | 0.518 | 0.432 | 0.369 |
| 6   | 0.629 | 0.485 | 0.39  | 0.323 | 0.607 | 0.474 | 0.385 | 0.321 | 0.587 | 0.464 | 0.379 | 0.318 |
| 7   | 0.581 | 0.437 | 0.346 | 0.282 | 0.562 | 0.428 | 0.341 | 0.28  | 0.543 | 0.419 | 0.337 | 0.278 |
| 8   | 0.539 | 0.397 | 0.309 | 0.249 | 0.522 | 0.389 | 0.305 | 0.248 | 0.505 | 0.381 | 0.302 | 0.246 |
| 9   | 0.502 | 0.363 | 0.279 | 0.223 | 0.487 | 0.356 | 0.275 | 0.221 | 0.472 | 0.349 | 0.272 | 0.22  |
| 10  | 0.47  | 0.333 | 0.253 | 0.2   | 0.456 | 0.327 | 0.25  | 0.199 | 0.442 | 0.321 | 0.248 | 0.198 |

| 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                          | 1.017 | 1.017 | 1.017 | 1.017 | 0.968 | 0.968 | 0.968 | 0.924 | 0.924 | 0.924 | 0.903 |
| 1                          | 0.894 | 0.854 | 0.817 | 0.783 | 0.812 | 0.782 | 0.754 | 0.774 | 0.75  | 0.727 | 0.704 |
| 2                          | 0.797 | 0.73  | 0.672 | 0.623 | 0.695 | 0.647 | 0.605 | 0.662 | 0.622 | 0.587 | 0.564 |
| 3                          | 0.717 | 0.633 | 0.565 | 0.509 | 0.603 | 0.545 | 0.496 | 0.575 | 0.526 | 0.484 | 0.461 |
| 4                          | 0.651 | 0.556 | 0.483 | 0.425 | 0.531 | 0.467 | 0.416 | 0.507 | 0.453 | 0.408 | 0.385 |
| 5                          | 0.596 | 0.494 | 0.419 | 0.362 | 0.473 | 0.407 | 0.355 | 0.453 | 0.395 | 0.349 | 0.327 |
| 6                          | 0.55  | 0.444 | 0.369 | 0.313 | 0.425 | 0.359 | 0.308 | 0.408 | 0.349 | 0.303 | 0.282 |
| 7                          | 0.509 | 0.402 | 0.328 | 0.274 | 0.386 | 0.32  | 0.27  | 0.371 | 0.312 | 0.266 | 0.246 |
| 8                          | 0.474 | 0.366 | 0.294 | 0.243 | 0.352 | 0.287 | 0.24  | 0.339 | 0.281 | 0.237 | 0.218 |
| 9                          | 0.444 | 0.336 | 0.266 | 0.217 | 0.324 | 0.26  | 0.215 | 0.313 | 0.255 | 0.212 | 0.194 |
| 10                         | 0.417 | 0.31  | 0.243 | 0.196 | 0.3   | 0.238 | 0.194 | 0.29  | 0.233 | 0.192 | 0.175 |

Average Luminance Table (cd/m<sup>2</sup>)

|    | 0    | 45   | 90   |
|----|------|------|------|
| 0  | 8779 | 7116 | 7105 |
| 45 | 8166 | 7145 | 7633 |
| 55 | 7857 | 7277 | 7930 |
| 65 | 7340 | 7411 | 8589 |
| 75 | 6162 | 7845 | 8516 |
| 85 | 2743 | 7470 | 9088 |

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.

