



# 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: 18807

DATE: 04-09-2010

PREPARED FOR: RENOVA LIGHTING SYSTEMS, INC.

CATALOG NUMBER: ECS-EGF4-MN-232-UNV-12L-PRF1 (SMALL PERFORATIONS)

LUMINAIRE: FORMED WHITE ENAMEL STEEL HOUSING, FORMED WHITE ENAMEL ALUMINUM REFLECTORS WITH SPECULAR ALUMINUM REFLECTOR ABOVE LAMPS, FORMED WHITE ENAMEL PERFORATED STEEL CENTER DIFFUSER WITH TRANSLUCENT WHITE PLASTIC INSERT.

LAMP: TWO 32 WATT T8 LINEAR FLUORESCENT LAMPS RATED AT 2850 LUMENS EACH.

LAMP CATALOG NUMBER: PHILIPS F32T8/841/ALTO

BALLAST: ONE SYLVANIA "QUICKTRONIC" QHE2X32T8/UNV-ISL-SC

MOUNTING: RECESSED

ELECTRICAL VALUES: 120.0VAC, 0.4132A, 49.52W

### 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   | 1223 | 1223 | 1223 | 1223 | 1223 | 1223  | 1223 | 1223  | 1223 | 1223  | 1223 | 1223  | 1223 | 1223  | 1223 | 1223  |       |
| 5   | 1213 | 1215 | 1218 | 1220 | 1221 | 1220  | 1218 | 1215  | 1213 | 1215  | 1218 | 1220  | 1221 | 1220  | 1218 | 1215  | 115.7 |
| 15  | 1159 | 1165 | 1176 | 1186 | 1191 | 1186  | 1176 | 1165  | 1159 | 1165  | 1176 | 1186  | 1191 | 1186  | 1176 | 1165  | 332.0 |
| 25  | 1059 | 1071 | 1098 | 1123 | 1134 | 1123  | 1098 | 1071  | 1059 | 1071  | 1098 | 1123  | 1134 | 1123  | 1098 | 1071  | 505.8 |
| 35  | 917  | 940  | 987  | 1031 | 1050 | 1031  | 987  | 940   | 917  | 940   | 987  | 1031  | 1050 | 1031  | 987  | 940   | 616.6 |
| 45  | 742  | 779  | 850  | 906  | 928  | 906   | 850  | 779   | 742  | 779   | 850  | 906   | 928  | 906   | 850  | 779   | 649.7 |
| 55  | 544  | 599  | 682  | 733  | 747  | 733   | 682  | 599   | 544  | 599   | 682  | 733   | 747  | 733   | 682  | 599   | 592.1 |
| 65  | 345  | 409  | 464  | 441  | 448  | 441   | 464  | 409   | 345  | 409   | 464  | 441   | 448  | 441   | 464  | 409   | 423.6 |
| 75  | 172  | 213  | 197  | 208  | 211  | 208   | 197  | 213   | 172  | 213   | 197  | 208   | 211  | 208   | 197  | 213   | 214.9 |
| 85  | 35   | 40   | 45   | 48   | 49   | 48    | 45   | 40    | 35   | 40    | 45   | 48    | 49   | 48    | 45   | 40    | 51.6  |
| 90  | 0    | 1    | 1    | 2    | 2    | 2     | 1    | 1     | 0    | 1     | 1    | 2     | 2    | 2     | 1    | 1     |       |
| 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     | 0     |

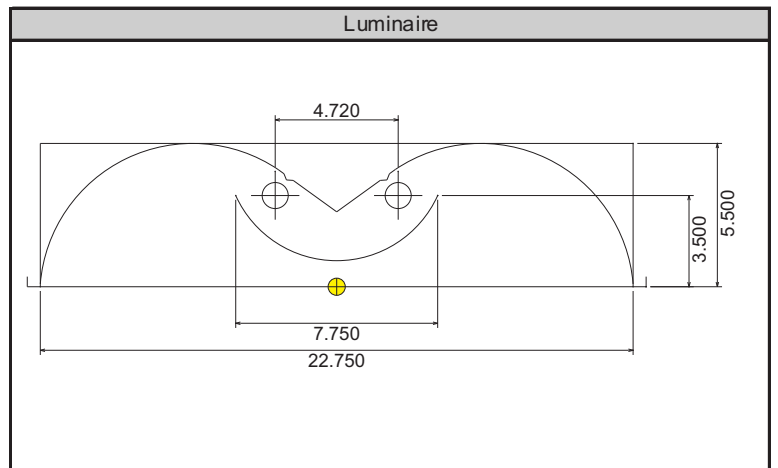
### Zonal Lumen Summary

| Zone   | Lumens | % of Lamp | % of Luminaire |
|--------|--------|-----------|----------------|
| 0-30   | 953.5  | 16.7%     | 27.2%          |
| 0-40   | 1570.1 | 27.5%     | 44.8%          |
| 0-60   | 2811.9 | 49.3%     | 80.3%          |
| 0-90   | 3502.0 | 61.4%     | 100.0%         |
| 90-180 | 0.0    | 0.0%      | 0.0%           |
| 0-180  | 3502.0 | 61.4%     | 100.0%         |

Total luminaire efficiency: 61.4%

CIE Type: Direct

Spacing Criterion: 0 deg: 1.21 90 deg: 1.33  
180 deg: 1.21 270 deg: 1.33



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   | 1223 | 1223 | 1223 | 1223 | 1223 | 1223  | 1223 | 1223  | 1223 | 1223  | 1223 | 1223  | 1223 | 1223  | 1223 | 1223  |
| 5   | 1213 | 1215 | 1218 | 1220 | 1221 | 1220  | 1218 | 1215  | 1213 | 1215  | 1218 | 1220  | 1221 | 1220  | 1218 | 1215  |
| 10  | 1193 | 1196 | 1202 | 1207 | 1209 | 1207  | 1202 | 1196  | 1193 | 1196  | 1202 | 1207  | 1209 | 1207  | 1202 | 1196  |
| 15  | 1159 | 1165 | 1176 | 1186 | 1191 | 1186  | 1176 | 1165  | 1159 | 1165  | 1176 | 1186  | 1191 | 1186  | 1176 | 1165  |
| 20  | 1115 | 1124 | 1141 | 1159 | 1166 | 1159  | 1141 | 1124  | 1115 | 1124  | 1141 | 1159  | 1166 | 1159  | 1141 | 1124  |
| 25  | 1059 | 1071 | 1098 | 1123 | 1134 | 1123  | 1098 | 1071  | 1059 | 1071  | 1098 | 1123  | 1134 | 1123  | 1098 | 1071  |
| 30  | 993  | 1010 | 1046 | 1081 | 1095 | 1081  | 1046 | 1010  | 993  | 1010  | 1046 | 1081  | 1095 | 1081  | 1046 | 1010  |
| 35  | 917  | 940  | 987  | 1031 | 1050 | 1031  | 987  | 940   | 917  | 940   | 987  | 1031  | 1050 | 1031  | 987  | 940   |
| 40  | 833  | 862  | 922  | 973  | 994  | 973   | 922  | 862   | 833  | 862   | 922  | 973   | 994  | 973   | 922  | 862   |
| 45  | 742  | 779  | 850  | 906  | 928  | 906   | 850  | 779   | 742  | 779   | 850  | 906   | 928  | 906   | 850  | 779   |
| 50  | 646  | 692  | 771  | 828  | 849  | 828   | 771  | 692   | 646  | 692   | 771  | 828   | 849  | 828   | 771  | 692   |
| 55  | 544  | 599  | 682  | 733  | 747  | 733   | 682  | 599   | 544  | 599   | 682  | 733   | 747  | 733   | 682  | 599   |
| 60  | 443  | 505  | 584  | 604  | 597  | 604   | 584  | 505   | 443  | 505   | 584  | 604   | 597  | 604   | 584  | 505   |
| 65  | 345  | 409  | 464  | 441  | 448  | 441   | 464  | 409   | 345  | 409   | 464  | 441   | 448  | 441   | 464  | 409   |
| 70  | 256  | 314  | 306  | 319  | 324  | 319   | 306  | 314   | 256  | 314   | 306  | 319   | 324  | 319   | 306  | 314   |
| 75  | 172  | 213  | 197  | 208  | 211  | 208   | 197  | 213   | 172  | 213   | 197  | 208   | 211  | 208   | 197  | 213   |
| 80  | 97   | 101  | 112  | 116  | 118  | 116   | 112  | 101   | 97   | 101   | 112  | 116   | 118  | 116   | 112  | 101   |
| 85  | 35   | 40   | 45   | 48   | 49   | 48    | 45   | 40    | 35   | 40    | 45   | 48    | 49   | 48    | 45   | 40    |
| 90  | 0    | 1    | 1    | 2    | 2    | 2     | 1    | 1     | 0    | 1     | 1    | 2     | 2    | 2     | 1    | 1     |
| 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   | 29.2   | 45-50 | 323.6  | 90-95   | 0.0    | 135-140 | 0.0    |
| 5-10  | 86.5   | 50-55 | 310.0  | 95-100  | 0.0    | 140-145 | 0.0    |
| 10-15 | 141.0  | 55-60 | 282.1  | 100-105 | 0.0    | 145-150 | 0.0    |
| 15-20 | 190.9  | 60-65 | 237.9  | 105-110 | 0.0    | 150-155 | 0.0    |
| 20-25 | 234.7  | 65-70 | 185.7  | 110-115 | 0.0    | 155-160 | 0.0    |
| 25-30 | 271.1  | 70-75 | 132.4  | 115-120 | 0.0    | 160-165 | 0.0    |
| 30-35 | 299.0  | 75-80 | 82.5   | 120-125 | 0.0    | 165-170 | 0.0    |
| 35-40 | 317.6  | 80-85 | 40.3   | 125-130 | 0.0    | 170-175 | 0.0    |
| 40-45 | 326.1  | 85-90 | 11.3   | 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   | 0.749 | 0.749 | 0.749 | 0.749 | 0.731 | 0.731 | 0.731 | 0.731 | 0.714 | 0.714 | 0.714 | 0.714 |
| 1   | 0.687 | 0.655 | 0.627 | 0.602 | 0.67  | 0.641 | 0.615 | 0.592 | 0.653 | 0.627 | 0.603 | 0.582 |
| 2   | 0.626 | 0.571 | 0.526 | 0.488 | 0.609 | 0.559 | 0.518 | 0.483 | 0.593 | 0.547 | 0.509 | 0.477 |
| 3   | 0.571 | 0.501 | 0.447 | 0.405 | 0.555 | 0.491 | 0.441 | 0.401 | 0.54  | 0.481 | 0.435 | 0.397 |
| 4   | 0.523 | 0.443 | 0.385 | 0.342 | 0.508 | 0.434 | 0.381 | 0.339 | 0.494 | 0.426 | 0.376 | 0.337 |
| 5   | 0.481 | 0.395 | 0.336 | 0.293 | 0.467 | 0.388 | 0.333 | 0.292 | 0.454 | 0.381 | 0.329 | 0.29  |
| 6   | 0.443 | 0.355 | 0.297 | 0.255 | 0.431 | 0.349 | 0.294 | 0.254 | 0.419 | 0.343 | 0.291 | 0.253 |
| 7   | 0.411 | 0.321 | 0.264 | 0.225 | 0.399 | 0.316 | 0.262 | 0.224 | 0.388 | 0.311 | 0.26  | 0.223 |
| 8   | 0.382 | 0.292 | 0.237 | 0.2   | 0.371 | 0.288 | 0.236 | 0.2   | 0.362 | 0.284 | 0.234 | 0.199 |
| 9   | 0.356 | 0.268 | 0.215 | 0.18  | 0.347 | 0.264 | 0.213 | 0.179 | 0.338 | 0.26  | 0.212 | 0.179 |
| 10  | 0.333 | 0.247 | 0.196 | 0.163 | 0.325 | 0.244 | 0.195 | 0.162 | 0.317 | 0.24  | 0.193 | 0.162 |

| 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                          | 0.683 | 0.683 | 0.683 | 0.683 | 0.654 | 0.654 | 0.654 | 0.627 | 0.627 | 0.627 | 0.614 |
| 1                          | 0.622 | 0.601 | 0.581 | 0.564 | 0.577 | 0.561 | 0.546 | 0.555 | 0.542 | 0.53  | 0.517 |
| 2                          | 0.563 | 0.526 | 0.493 | 0.466 | 0.505 | 0.479 | 0.455 | 0.487 | 0.465 | 0.445 | 0.432 |
| 3                          | 0.512 | 0.463 | 0.423 | 0.39  | 0.446 | 0.412 | 0.384 | 0.43  | 0.401 | 0.377 | 0.363 |
| 4                          | 0.468 | 0.411 | 0.367 | 0.332 | 0.396 | 0.358 | 0.328 | 0.383 | 0.35  | 0.323 | 0.31  |
| 5                          | 0.43  | 0.368 | 0.322 | 0.287 | 0.356 | 0.315 | 0.284 | 0.344 | 0.309 | 0.281 | 0.268 |
| 6                          | 0.397 | 0.332 | 0.285 | 0.251 | 0.321 | 0.28  | 0.248 | 0.312 | 0.275 | 0.246 | 0.234 |
| 7                          | 0.369 | 0.301 | 0.255 | 0.222 | 0.292 | 0.251 | 0.22  | 0.284 | 0.247 | 0.218 | 0.206 |
| 8                          | 0.344 | 0.276 | 0.23  | 0.198 | 0.268 | 0.227 | 0.196 | 0.261 | 0.223 | 0.195 | 0.183 |
| 9                          | 0.322 | 0.253 | 0.209 | 0.178 | 0.247 | 0.206 | 0.177 | 0.24  | 0.203 | 0.176 | 0.165 |
| 10                         | 0.302 | 0.234 | 0.191 | 0.161 | 0.228 | 0.189 | 0.16  | 0.223 | 0.186 | 0.16  | 0.149 |

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

|    | 0    | 45   | 90   |
|----|------|------|------|
| 0  | 1774 | 1774 | 1774 |
| 45 | 1522 | 1742 | 1903 |
| 55 | 1376 | 1723 | 1888 |
| 65 | 1182 | 1593 | 1537 |
| 75 | 965  | 1106 | 1183 |
| 85 | 588  | 755  | 809  |

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.

