

# itl boulder

THE LIGHT CENTER OF THE INDUSTRY SINCE 1955

INDEPENDENT TESTING LABORATORIES, INC.  
4066 CAMELOT CIRCLE, LONGMONT, CO 80504 USA

PHONE: (303) 442-1255 • FAX: (970) 535-3114 • E-MAIL: itl@itlboulder.com • WEBSITE: www.itlboulder.com

REPORT NUMBER: ITL78313

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ISSUE DATE: 09/11/13

PREPARED FOR: PRECISION ARCHITECTURAL LIGHTING

CATALOG NUMBER: MLP5-I1/D2-4-PB-120-T8

LUMINAIRE: EXTRUDED 2-PIECE METAL HOUSING WITH WHITE PAINTED GENERAL INTERIOR FINISH, FABRICATED WHITE PAINTED METAL END CAPS AND 2 DISTINCT OPTICAL COMPARTMENTS, TOP OPTICAL COMPARTMENT CONSISTS OF: FORMED MULTI-FACETED SPECULAR METAL REFLECTOR, FORMED SPECULAR METAL SOCKET MOUNTING BRACKETS. BOTTOM OPTICAL COMPARTMENT CONSISTS OF: FORMED WHITE PAINTED METAL REFLECTOR AND SOCKET MOUNTING BRACKETS, FABRICATED SEMI-DIFFUSE METAL PARABOLIC 32-CELL LOUVER. OPEN TOP.

LAMPS: THREE 32-WATT T-8 FO32/835 LINEAR FLUORESCENTS.

BALLAST: UNIVERSAL B232IUNV-C, UNIVERSAL B232IUNVHP-N

THE 0 DEGREE PLANE IS PERPENDICULAR TO THE LAMPS.

TOTAL REFLECTANCE OF PAINT = 89.2 %

MOUNTING: WALL

TOTAL INPUT WATTS = 87.6 AT 120.0 VOLTS

REPORT IS BASED ON 2950 LUMENS PER LAMP.

## CANDELA DISTRIBUTION

## FLUX

|     | 0.0  | 45.0 | 90.0 | 135.0 | 180.0 |     |
|-----|------|------|------|-------|-------|-----|
| 0   | 1380 | 1380 | 1380 | 1380  | 1380  |     |
| 5   | 1379 | 1377 | 1377 | 1379  | 1383  | 131 |
| 15  | 1390 | 1341 | 1304 | 1347  | 1400  | 381 |
| 25  | 1426 | 1288 | 1192 | 1298  | 1437  | 600 |
| 35  | 1348 | 1204 | 1050 | 1210  | 1357  | 749 |
| 45  | 1136 | 1011 | 865  | 1013  | 1140  | 772 |
| 55  | 839  | 711  | 585  | 704   | 832   | 628 |
| 65  | 414  | 282  | 168  | 273   | 400   | 286 |
| 75  | 52   | 30   | 20   | 30    | 51    | 44  |
| 85  | 5    | 4    | 2    | 4     | 5     | 5   |
| 90  | 0    | 0    | 0    | 0     | 0     |     |
| 95  | 66   | 77   | 19   | 4     | 4     | 44  |
| 105 | 351  | 338  | 124  | 14    | 6     | 177 |
| 115 | 581  | 567  | 253  | 65    | 40    | 303 |
| 125 | 822  | 805  | 378  | 130   | 100   | 397 |
| 135 | 1028 | 979  | 489  | 203   | 169   | 434 |
| 145 | 1172 | 1011 | 600  | 294   | 244   | 409 |
| 155 | 1088 | 941  | 689  | 440   | 349   | 322 |
| 165 | 960  | 903  | 745  | 587   | 518   | 209 |
| 175 | 837  | 828  | 772  | 719   | 693   | 73  |
| 180 | 773  | 773  | 773  | 773   | 773   |     |

## ZONAL LUMEN SUMMARY

| ZONE   | LUMENS | %LAMP | %FIXT |
|--------|--------|-------|-------|
| 0- 30  | 1112   | 12.6  | 18.6  |
| 0- 40  | 1861   | 21.0  | 31.2  |
| 0- 60  | 3260   | 36.8  | 54.7  |
| 0- 90  | 3596   | 40.6  | 60.3  |
| 90-120 | 524    | 5.9   | 8.8   |
| 90-130 | 921    | 10.4  | 15.4  |
| 90-150 | 1763   | 19.9  | 29.6  |
| 90-180 | 2368   | 26.8  | 39.7  |
| 0-180  | 5964   | 67.4  | 100.0 |

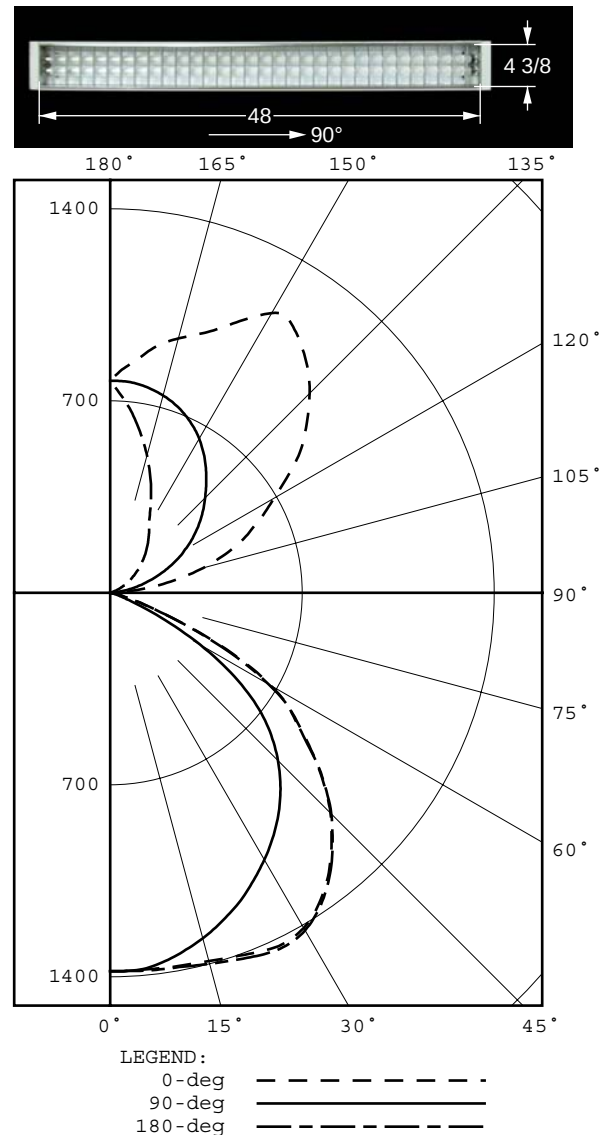
TOTAL LUMINAIRE EFFICIENCY = 67.4 %

CIE TYPE - SEMI-DIRECT

PLANE : 0-DEG 90-DEG 180-DEG

SPACING CRITERIA : 1.48 1.22 1.48

SHIELDING ANGLES : 20 27



Checked M. KLOPF

Approved R. BEATTIE  
Lighting Engineer



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PLANE : 0-DEG 90-DEG  
LUMINOUS LENGTH : 4.375 48.000

| LUMINANCE DATA IN CANDELA/SQ M |                  |                   |                    |
|--------------------------------|------------------|-------------------|--------------------|
| ANGLE<br>IN DEG                | AVERAGE<br>0-DEG | AVERAGE<br>90-DEG | AVERAGE<br>180-DEG |
| 45                             | 11858.           | 9029.             | 11900.             |
| 55                             | 10797.           | 7528.             | 10706.             |
| 65                             | 7230.            | 2934.             | 6986.              |
| 75                             | 1483.            | 570.              | 1454.              |
| 85                             | 423.             | 169.              | 423.               |



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CANDELA DISTRIBUTION  
LATERAL ANGLE

|       | 0.0  | 22.5 | 45.0 | 67.5 | 90.0 | 112.5 | 135.0 | 157.5 | 180.0 |
|-------|------|------|------|------|------|-------|-------|-------|-------|
| 0.0   | 1380 | 1380 | 1380 | 1380 | 1380 | 1380  | 1380  | 1380  | 1380  |
| 5.0   | 1379 | 1383 | 1377 | 1365 | 1377 | 1367  | 1379  | 1385  | 1383  |
| 10.0  | 1383 | 1381 | 1364 | 1341 | 1347 | 1344  | 1369  | 1386  | 1387  |
| 15.0  | 1390 | 1379 | 1341 | 1305 | 1304 | 1308  | 1347  | 1387  | 1400  |
| 20.0  | 1406 | 1379 | 1316 | 1260 | 1252 | 1264  | 1323  | 1390  | 1419  |
| 25.0  | 1426 | 1379 | 1288 | 1209 | 1192 | 1213  | 1298  | 1391  | 1437  |
| 30.0  | 1411 | 1356 | 1256 | 1151 | 1124 | 1159  | 1264  | 1367  | 1421  |
| 35.0  | 1348 | 1290 | 1204 | 1091 | 1050 | 1098  | 1210  | 1300  | 1357  |
| 40.0  | 1252 | 1188 | 1124 | 1018 | 965  | 1026  | 1130  | 1198  | 1259  |
| 45.0  | 1136 | 1068 | 1011 | 931  | 865  | 935   | 1013  | 1073  | 1140  |
| 50.0  | 991  | 926  | 873  | 816  | 745  | 818   | 873   | 924   | 994   |
| 55.0  | 839  | 766  | 711  | 656  | 585  | 653   | 704   | 761   | 832   |
| 60.0  | 676  | 603  | 510  | 436  | 378  | 429   | 499   | 588   | 667   |
| 65.0  | 414  | 373  | 282  | 203  | 168  | 195   | 273   | 349   | 400   |
| 70.0  | 164  | 151  | 93   | 64   | 51   | 62    | 87    | 137   | 159   |
| 75.0  | 52   | 49   | 30   | 24   | 20   | 24    | 30    | 43    | 51    |
| 80.0  | 18   | 16   | 12   | 10   | 8    | 10    | 12    | 14    | 18    |
| 85.0  | 5    | 5    | 4    | 3    | 2    | 3     | 4     | 4     | 5     |
| 90.0  | 0    | 0    | 0    | 0    | 0    | 0     | 0     | 0     | 0     |
| 95.0  | 66   | 76   | 77   | 79   | 19   | 3     | 4     | 4     | 4     |
| 100.0 | 210  | 212  | 210  | 185  | 67   | 13    | 5     | 5     | 5     |
| 105.0 | 351  | 349  | 338  | 299  | 124  | 35    | 14    | 6     | 6     |
| 110.0 | 479  | 477  | 444  | 421  | 187  | 64    | 37    | 21    | 16    |
| 115.0 | 581  | 577  | 567  | 530  | 253  | 98    | 65    | 47    | 40    |
| 120.0 | 689  | 687  | 698  | 625  | 316  | 134   | 96    | 76    | 68    |
| 125.0 | 822  | 822  | 805  | 681  | 378  | 175   | 130   | 108   | 100   |
| 130.0 | 931  | 924  | 899  | 710  | 435  | 231   | 165   | 141   | 134   |
| 135.0 | 1028 | 1021 | 979  | 740  | 489  | 295   | 203   | 178   | 169   |
| 140.0 | 1109 | 1102 | 1033 | 763  | 545  | 363   | 242   | 215   | 206   |
| 145.0 | 1172 | 1161 | 1011 | 778  | 600  | 430   | 294   | 254   | 244   |
| 150.0 | 1178 | 1124 | 972  | 796  | 649  | 494   | 366   | 298   | 284   |
| 155.0 | 1088 | 1044 | 941  | 813  | 689  | 555   | 440   | 371   | 349   |
| 160.0 | 1009 | 986  | 924  | 820  | 721  | 611   | 523   | 453   | 432   |
| 165.0 | 960  | 946  | 903  | 818  | 745  | 662   | 587   | 534   | 518   |
| 170.0 | 906  | 896  | 864  | 815  | 762  | 704   | 658   | 618   | 606   |
| 175.0 | 837  | 836  | 828  | 796  | 772  | 738   | 719   | 700   | 693   |
| 180.0 | 773  | 773  | 773  | 773  | 773  | 773   | 773   | 773   | 773   |



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5-DEGREE

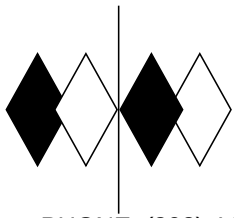
ZONAL LUMEN SUMMARY

|         |     |
|---------|-----|
| 0- 5    | 33  |
| 5- 10   | 98  |
| 10- 15  | 161 |
| 15- 20  | 220 |
| 20- 25  | 275 |
| 25- 30  | 324 |
| 30- 35  | 363 |
| 35- 40  | 386 |
| 40- 45  | 392 |
| 45- 50  | 379 |
| 50- 55  | 344 |
| 55- 60  | 284 |
| 60- 65  | 193 |
| 65- 70  | 93  |
| 70- 75  | 33  |
| 75- 80  | 12  |
| 80- 85  | 4   |
| 85- 90  | 1   |
| 90- 95  | 7   |
| 95-100  | 37  |
| 100-105 | 71  |
| 105-110 | 106 |
| 110-115 | 137 |
| 115-120 | 166 |
| 120-125 | 190 |
| 125-130 | 206 |
| 130-135 | 216 |
| 135-140 | 218 |
| 140-145 | 212 |
| 145-150 | 197 |
| 150-155 | 174 |
| 155-160 | 148 |
| 160-165 | 120 |
| 165-170 | 89  |
| 170-175 | 55  |
| 175-180 | 18  |

10-DEGREE

ZONAL LUMEN SUMMARY

|       |      |
|-------|------|
| 0- 10 | 131  |
| 0- 20 | 512  |
| 0- 30 | 1112 |
| 0- 40 | 1861 |
| 0- 50 | 2632 |
| 0- 60 | 3260 |
| 0- 70 | 3546 |
| 0- 80 | 3591 |
| 0- 90 | 3596 |
| 0-100 | 3640 |
| 0-110 | 3817 |
| 0-120 | 4120 |
| 0-130 | 4516 |
| 0-140 | 4950 |
| 0-150 | 5359 |
| 0-160 | 5681 |
| 0-170 | 5891 |
| 0-180 | 5964 |



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COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

EFFECTIVE FLOOR CAVITY REFLECTANCE 0.20

| RC | 80 |    |    |    | 70 |    |    |    | 50 |    |    | 30 |    |    | 10 |    |    | 0  |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| RW | 70 | 50 | 30 | 10 | 70 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 0  |
| 0  | 74 | 74 | 74 | 74 | 69 | 69 | 69 | 69 | 60 | 60 | 60 | 52 | 52 | 52 | 44 | 44 | 44 | 41 |
| 1  | 68 | 66 | 63 | 61 | 64 | 61 | 59 | 57 | 54 | 52 | 51 | 47 | 46 | 45 | 40 | 39 | 39 | 36 |
| 2  | 62 | 58 | 54 | 51 | 58 | 54 | 51 | 48 | 48 | 45 | 43 | 42 | 40 | 38 | 36 | 35 | 33 | 31 |
| 3  | 57 | 51 | 46 | 43 | 53 | 48 | 44 | 41 | 42 | 39 | 37 | 37 | 35 | 33 | 32 | 30 | 29 | 26 |
| 4  | 52 | 45 | 40 | 36 | 49 | 43 | 38 | 35 | 38 | 34 | 31 | 33 | 30 | 28 | 29 | 27 | 25 | 23 |
| 5  | 48 | 41 | 35 | 31 | 45 | 38 | 33 | 30 | 34 | 30 | 27 | 30 | 27 | 24 | 26 | 24 | 22 | 20 |
| 6  | 44 | 36 | 31 | 27 | 42 | 34 | 30 | 26 | 31 | 27 | 24 | 27 | 24 | 21 | 24 | 21 | 19 | 17 |
| 7  | 41 | 33 | 28 | 24 | 38 | 31 | 26 | 23 | 28 | 24 | 21 | 25 | 21 | 19 | 22 | 19 | 17 | 15 |
| 8  | 38 | 30 | 25 | 21 | 36 | 28 | 24 | 20 | 25 | 21 | 19 | 22 | 19 | 17 | 20 | 17 | 15 | 14 |
| 9  | 36 | 27 | 22 | 19 | 33 | 26 | 21 | 18 | 23 | 19 | 17 | 21 | 17 | 15 | 18 | 16 | 14 | 12 |
| 10 | 33 | 25 | 20 | 17 | 31 | 24 | 19 | 16 | 21 | 18 | 15 | 19 | 16 | 14 | 17 | 14 | 12 | 11 |

ALL CANDELA, LUMENS, LUMINANCE, COEFFICIENT OF UTILIZATION AND VCP VALUES IN THIS REPORT ARE BASED ON RELATIVE PHOTOMETRY WHICH ASSUMES A BALLAST FACTOR OF 1.000. ANY CALCULATIONS PREPARED FROM THESE DATA SHOULD INCLUDE AN APPROPRIATE BALLAST FACTOR.

NOTE: THE ZONAL CAVITY CALCULATION TECHNIQUE IS ACCURATE WHEN LUMINAIRES WITH SYMMETRIC CANDELA DISTRIBUTIONS ARE EMPLOYED AND WHEN THE LUMINAIRES ARE LOCATED SYMMETRICALLY THROUGHOUT THE ROOM. THIS UNIT HAS SPECIAL CHARACTERISTICS AND THEREFORE THESE COEFFICIENTS SHOULD BE USED WITH CAUTION.