



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: ITL78308

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ISSUE DATE: 09/12/13

PREPARED FOR: PRECISION ARCHITECTURAL LIGHTING

CATALOG NUMBER: MLS5-I2/D2-4-TWA-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 WHITE PAINTED METAL REFLECTOR, FORMED SPECULAR METAL SOCKET MOUNTING BRACKETS. BOTTOM OPTICAL COMPARTMENT CONSISTS OF: FORMED WHITE PAINTED METAL REFLECTOR AND SOCKET MOUNTING BRACKETS, EXTRUDED TRANSLUCENT WHITE FROSTED ACRYLIC DIFFUSER. DIFFUSER FROSTED BOTH SIDES. OPEN TOP.

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

BALLAST: UNIVERSAL B232IUNV-C, UNIVERSAL B232IUNVHP-N

THE 0 DEGREE PLANE IS PARALLEL WITH THE LAMPS.

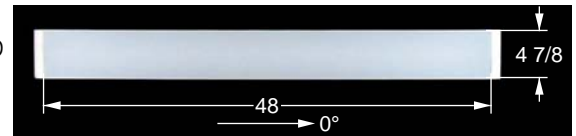
TOTAL REFLECTANCE OF PAINT = 90.1 %

MOUNTING: SUSPENDED

TOTAL INPUT WATTS = 107.0 AT 120.0 VOLTS

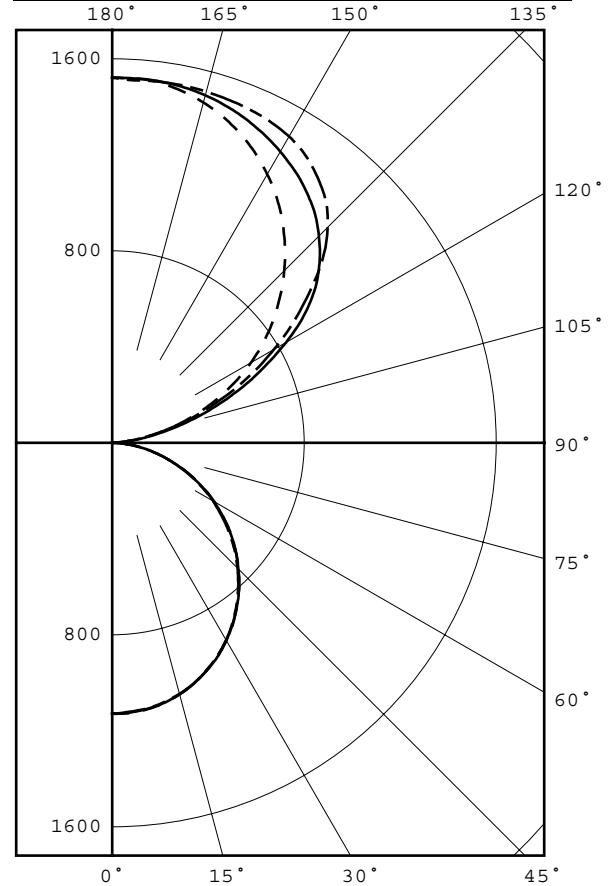
NOTE: DIFFUSER MATERIAL INFORMATION PROVIDED BY CLIENT.

REPORT IS BASED ON 2950 LUMENS PER LAMP.



CANDELA DISTRIBUTION

| | 0.0 | 22.5 | 45.0 | 67.5 | 90.0 | FLUX |
|-----|------|------|------|------|------|------|
| 0 | 1129 | 1129 | 1129 | 1129 | 1129 | 107 |
| 5 | 1126 | 1117 | 1124 | 1125 | 1121 | 306 |
| 15 | 1085 | 1079 | 1085 | 1086 | 1083 | 462 |
| 25 | 1004 | 999 | 1005 | 1006 | 1003 | 555 |
| 35 | 889 | 884 | 888 | 888 | 885 | 572 |
| 45 | 745 | 741 | 744 | 740 | 738 | 515 |
| 55 | 579 | 577 | 578 | 574 | 571 | 392 |
| 65 | 400 | 397 | 397 | 395 | 394 | 229 |
| 75 | 216 | 216 | 216 | 216 | 216 | 68 |
| 85 | 59 | 61 | 61 | 60 | 61 | 67 |
| 90 | 0 | 0 | 0 | 0 | 0 | 327 |
| 95 | 39 | 57 | 49 | 44 | 45 | 626 |
| 105 | 271 | 359 | 309 | 284 | 276 | 838 |
| 115 | 536 | 691 | 656 | 617 | 602 | 909 |
| 125 | 790 | 914 | 1001 | 970 | 954 | 836 |
| 135 | 1014 | 1095 | 1218 | 1266 | 1269 | 662 |
| 145 | 1210 | 1256 | 1354 | 1417 | 1432 | 422 |
| 155 | 1363 | 1383 | 1441 | 1482 | 1495 | 145 |
| 165 | 1468 | 1468 | 1499 | 1513 | 1515 | |
| 175 | 1520 | 1511 | 1521 | 1519 | 1515 | |
| 180 | 1521 | 1521 | 1521 | 1521 | 1521 | |



LEGEND:
 0-deg - - - - -
 45-deg - - - - -
 90-deg - - - - -

ZONAL LUMEN SUMMARY

| ZONE | LUMENS | %LAMP | %FIXT |
|--------|--------|-------|-------|
| 0- 30 | 875 | 7.4 | 10.9 |
| 0- 40 | 1429 | 12.1 | 17.8 |
| 0- 60 | 2516 | 21.3 | 31.3 |
| 0- 90 | 3206 | 27.2 | 39.9 |
| 90-120 | 1019 | 8.6 | 12.7 |
| 90-130 | 1858 | 15.7 | 23.1 |
| 90-150 | 3603 | 30.5 | 44.8 |
| 90-180 | 4832 | 40.9 | 60.1 |
| 0-180 | 8037 | 68.1 | 100.0 |

TOTAL LUMINAIRE EFFICIENCY = 68.1 %

CIE TYPE - SEMI-INDIRECT
PLANE : 0-DEG 90-DEG
SHIELDING ANGLES : 90 90

Checked M KLOPF
 Approved R BEATTIE
 Lighting Engineer



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PLANE : 0-DEG 90-DEG
LUMINOUS LENGTH : 48.000 4.875

| LUMINANCE DATA IN CANDELA/SQ M | | | | |
|--------------------------------|---------|---------|---------|--|
| ANGLE | AVERAGE | AVERAGE | AVERAGE | |
| IN DEG | 0-DEG | 45-DEG | 90-DEG | |
| 45 | 6979. | 6970. | 6913. | |
| 55 | 6687. | 6675. | 6594. | |
| 65 | 6269. | 6222. | 6175. | |
| 75 | 5528. | 5528. | 5528. | |
| 85 | 4484. | 4636. | 4636. | |



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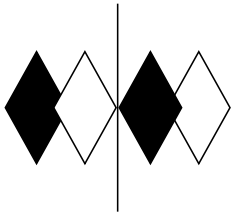
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CANDELA DISTRIBUTION LATERAL ANGLE

| | 0.0 | 22.5 | 45.0 | 67.5 | 90.0 |
|-------|------|------|------|------|------|
| 0.0 | 1129 | 1129 | 1129 | 1129 | 1129 |
| 5.0 | 1126 | 1117 | 1124 | 1125 | 1121 |
| 10.0 | 1111 | 1103 | 1110 | 1111 | 1108 |
| 15.0 | 1085 | 1079 | 1085 | 1086 | 1083 |
| 20.0 | 1049 | 1043 | 1049 | 1050 | 1048 |
| 25.0 | 1004 | 999 | 1005 | 1006 | 1003 |
| 30.0 | 950 | 946 | 951 | 951 | 949 |
| 35.0 | 889 | 884 | 888 | 888 | 885 |
| 40.0 | 820 | 816 | 820 | 817 | 815 |
| 45.0 | 745 | 741 | 744 | 740 | 738 |
| 50.0 | 664 | 661 | 664 | 659 | 657 |
| 55.0 | 579 | 577 | 578 | 574 | 571 |
| 60.0 | 491 | 488 | 488 | 485 | 485 |
| 65.0 | 400 | 397 | 397 | 395 | 394 |
| 70.0 | 307 | 305 | 305 | 304 | 304 |
| 75.0 | 216 | 216 | 216 | 216 | 216 |
| 80.0 | 132 | 134 | 134 | 133 | 134 |
| 85.0 | 59 | 61 | 61 | 60 | 61 |
| 90.0 | 0 | 0 | 0 | 0 | 0 |
| 95.0 | 39 | 57 | 49 | 44 | 45 |
| 100.0 | 145 | 190 | 161 | 150 | 146 |
| 105.0 | 271 | 359 | 309 | 284 | 276 |
| 110.0 | 403 | 542 | 477 | 446 | 431 |
| 115.0 | 536 | 691 | 656 | 617 | 602 |
| 120.0 | 667 | 813 | 836 | 796 | 779 |
| 125.0 | 790 | 914 | 1001 | 970 | 954 |
| 130.0 | 904 | 1007 | 1124 | 1140 | 1127 |
| 135.0 | 1014 | 1095 | 1218 | 1266 | 1269 |
| 140.0 | 1116 | 1178 | 1295 | 1354 | 1367 |
| 145.0 | 1210 | 1256 | 1354 | 1417 | 1432 |
| 150.0 | 1292 | 1326 | 1401 | 1456 | 1474 |
| 155.0 | 1363 | 1383 | 1441 | 1482 | 1495 |
| 160.0 | 1422 | 1431 | 1474 | 1499 | 1507 |
| 165.0 | 1468 | 1468 | 1499 | 1513 | 1515 |
| 170.0 | 1501 | 1495 | 1514 | 1519 | 1518 |
| 175.0 | 1520 | 1511 | 1521 | 1519 | 1515 |
| 180.0 | 1521 | 1521 | 1521 | 1521 | 1521 |



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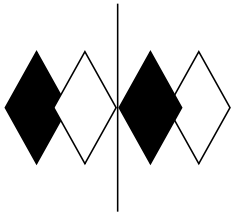
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5-DEGREE
 ZONAL LUMEN SUMMARY

| | |
|---------|-----|
| 0- 5 | 27 |
| 5- 10 | 80 |
| 10- 15 | 130 |
| 15- 20 | 176 |
| 20- 25 | 215 |
| 25- 30 | 247 |
| 30- 35 | 270 |
| 35- 40 | 284 |
| 40- 45 | 289 |
| 45- 50 | 283 |
| 50- 55 | 269 |
| 55- 60 | 246 |
| 60- 65 | 215 |
| 65- 70 | 177 |
| 70- 75 | 136 |
| 75- 80 | 93 |
| 80- 85 | 52 |
| 85- 90 | 16 |
| 90- 95 | 11 |
| 95-100 | 56 |
| 100-105 | 124 |
| 105-110 | 202 |
| 110-115 | 280 |
| 115-120 | 346 |
| 120-125 | 401 |
| 125-130 | 438 |
| 130-135 | 455 |
| 135-140 | 454 |
| 140-145 | 435 |
| 145-150 | 402 |
| 150-155 | 358 |
| 155-160 | 304 |
| 160-165 | 244 |
| 165-170 | 178 |
| 170-175 | 108 |
| 175-180 | 36 |

10-DEGREE
 ZONAL LUMEN SUMMARY

| | |
|-------|------|
| 0- 10 | 107 |
| 0- 20 | 412 |
| 0- 30 | 875 |
| 0- 40 | 1429 |
| 0- 50 | 2001 |
| 0- 60 | 2516 |
| 0- 70 | 2909 |
| 0- 80 | 3138 |
| 0- 90 | 3206 |
| 0-100 | 3273 |
| 0-110 | 3599 |
| 0-120 | 4225 |
| 0-130 | 5063 |
| 0-140 | 5972 |
| 0-150 | 6809 |
| 0-160 | 7471 |
| 0-170 | 7893 |
| 0-180 | 8037 |



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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 | 71 | 71 | 71 | 71 | 65 | 65 | 65 | 65 | 53 | 53 | 53 | 42 | 42 | 42 | 32 | 32 | 32 | 27 | |
| 1 | 65 | 62 | 59 | 57 | 59 | 57 | 54 | 52 | 46 | 45 | 43 | 37 | 36 | 35 | 28 | 27 | 27 | 23 | |
| 2 | 59 | 54 | 50 | 46 | 54 | 49 | 46 | 43 | 40 | 38 | 36 | 32 | 30 | 29 | 25 | 23 | 22 | 19 | |
| 3 | 54 | 47 | 42 | 38 | 49 | 43 | 39 | 36 | 35 | 32 | 30 | 28 | 26 | 24 | 22 | 20 | 19 | 16 | |
| 4 | 49 | 42 | 36 | 32 | 44 | 38 | 34 | 30 | 31 | 28 | 25 | 25 | 23 | 21 | 19 | 18 | 16 | 14 | |
| 5 | 45 | 37 | 32 | 28 | 41 | 34 | 29 | 26 | 28 | 24 | 22 | 22 | 20 | 18 | 17 | 15 | 14 | 12 | |
| 6 | 41 | 33 | 28 | 24 | 38 | 30 | 26 | 22 | 25 | 22 | 19 | 20 | 18 | 16 | 16 | 14 | 12 | 10 | |
| 7 | 38 | 30 | 25 | 21 | 35 | 27 | 23 | 19 | 23 | 19 | 16 | 18 | 16 | 14 | 14 | 12 | 11 | 9 | |
| 8 | 35 | 27 | 22 | 18 | 32 | 25 | 20 | 17 | 21 | 17 | 15 | 17 | 14 | 12 | 13 | 11 | 10 | 8 | |
| 9 | 33 | 25 | 20 | 16 | 30 | 23 | 18 | 15 | 19 | 15 | 13 | 15 | 13 | 11 | 12 | 10 | 9 | 7 | |
| 10 | 31 | 23 | 18 | 14 | 28 | 21 | 16 | 14 | 17 | 14 | 12 | 14 | 12 | 10 | 11 | 9 | 8 | 7 | |

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.