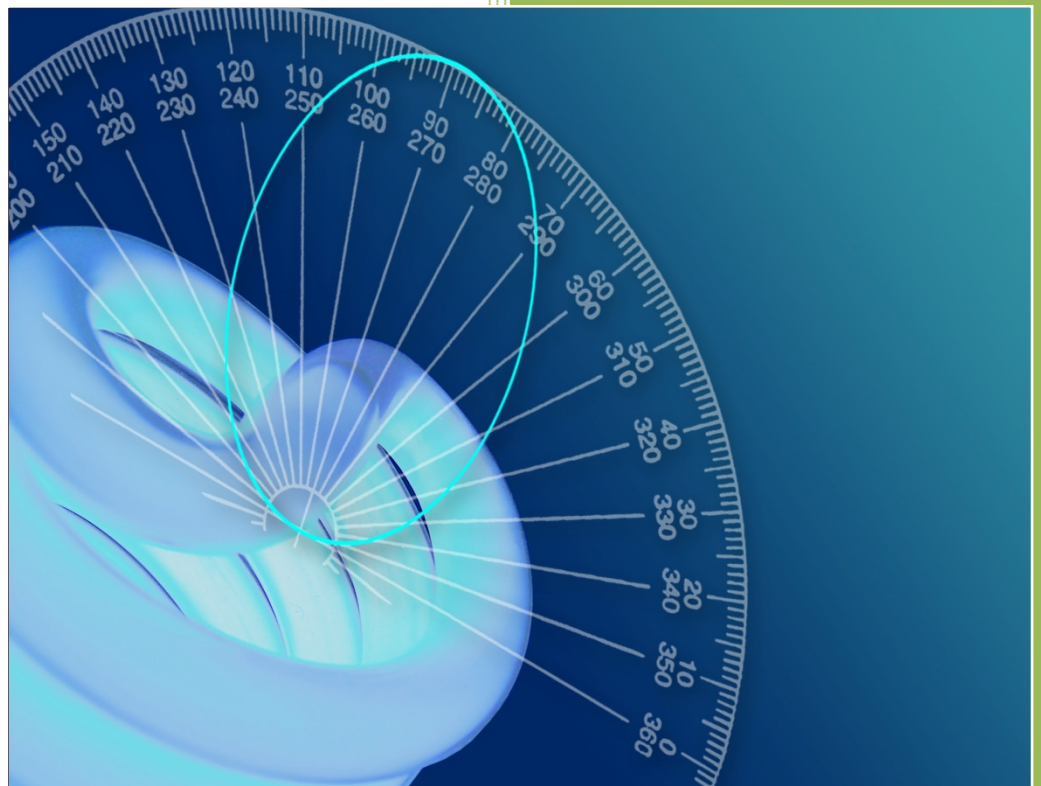


Photometric Test Report



Photometric and Optical Testing
Services
Cheltenham Film and Photographic
Studios
Hatherley Lane
Cheltenham
Gloucestershire
GL51 6PN
UK
Tel: 01242 701300

Photometric Test Report

| | | |
|--|-------------------------|-------------------------|
| Report Number: POTS/DC14072 | Report Date: 11/03/2014 | Prepared By: D CHAMBERS |
| Test Laboratory: Photometric and Optical Testing Services, Cheltenham Film and Photographic Studios, Hatherley Lane, Cheltenham, Gloucestershire, GL51 6PN | | |
| Company Registration Number: Registered in England & Wales No. OC352911 | | |
| Registered Address: Thistle Down Barn, Holcot Lane, Sywell, Northampton, NN6 0BG | | |

Client Details

| | |
|--|------------------------------------|
| Company: SH LIGHTING | Email: b.gregory@signalhouse.co.uk |
| Address: Cherrycourt Way, Stanbridge Road, Leighton Buzzard, Bedfordshire, LU7 4UH | |

Details of Product Tested

| | |
|--|---------------------------|
| Manufacturer: SH LIGHTING | Source Type: LED |
| Model: 4FT BATTEN | Luminaire Type: DOWNLIGHT |
| Power Supply Used: Uninterruptible AC power supply | |
| Voltage(AC V) = 230.0 | Current (mA)= 139 |
| Power (Watts)= 31.28 | Power factor= 0.978 |

Results

| | |
|----------------------------------|----------------------------------|
| Flux (lumens): 2436 | |
| CIE 1931 Chromaticity Cx: 0.3171 | CIE 1931 Chromaticity Cy: 0.3267 |
| CRI (%):75.88 | CCT (K): 6282 |

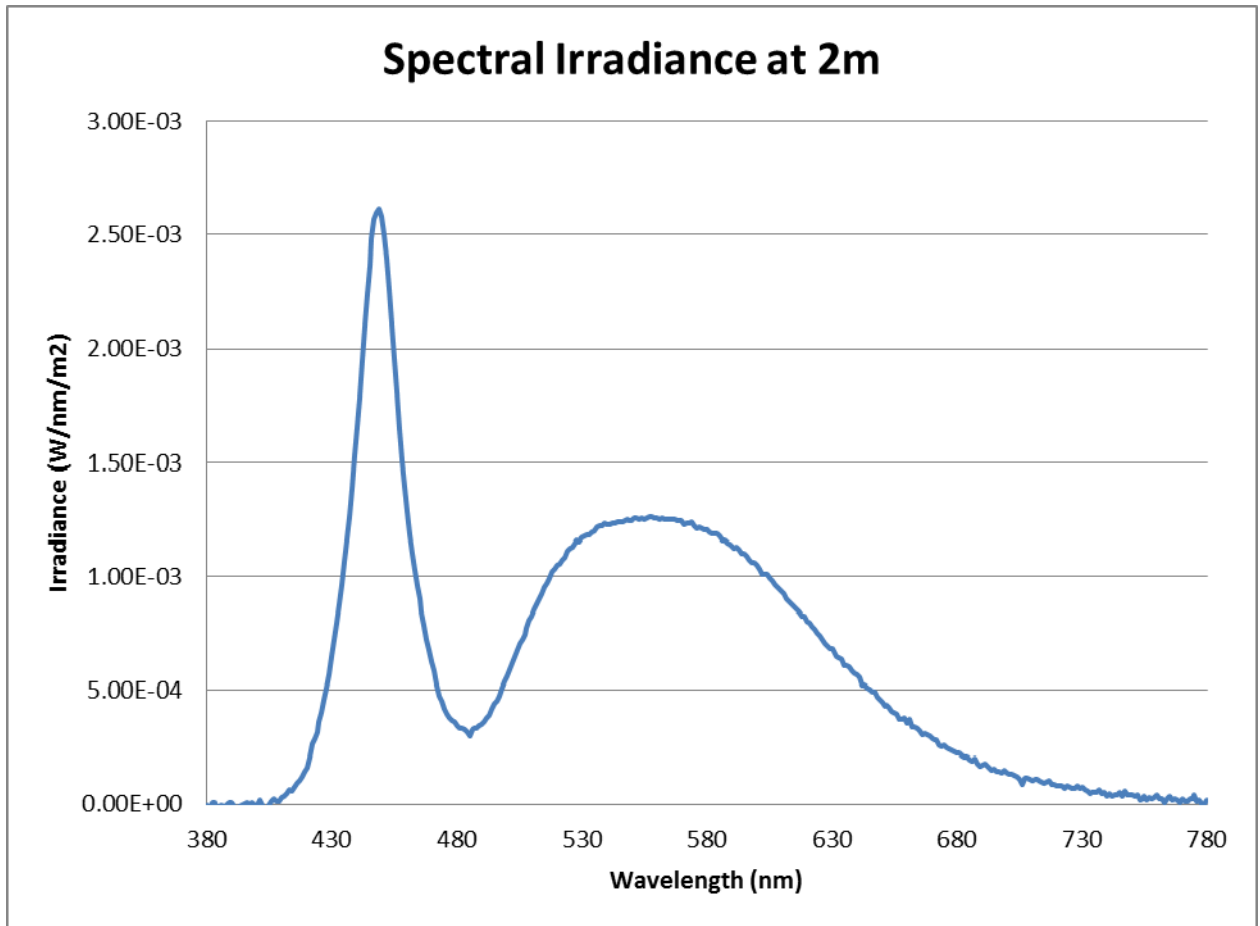


Figure 1: Spectral Irradiance

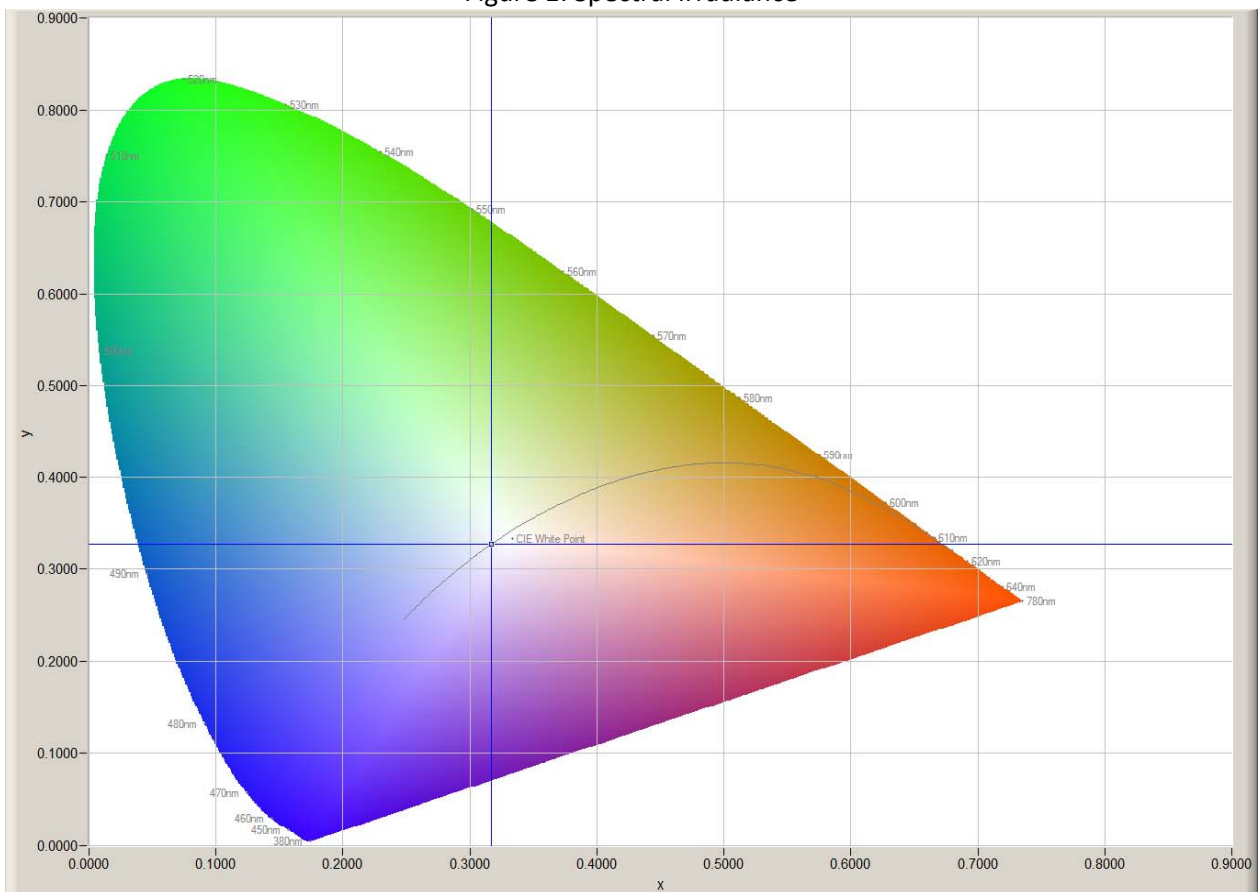


Figure 2: CIE 1931 diagram.

| Goniophotometer Test | | |
|--|---|------------------------------|
| Date of Test: 25/02/2014 | Ambient Temperature: 25°C | |
| Measurement Filename: 4FT BATTEN | | |
| Instrument Used: Radiant Imaging NFMS0800 Goniometer with ProMetric PM-1200N-1 Imaging Photometer | | |
| Photometer Working Distance: 3m | Measurement Geometry: Near-Field | |
| Comments: | | |
| Reference Photometer Used: Specbos1201 | Reference Photometer Serial Number: 2911670 | |
| Traceable: to NPL standards, UKAS Accredited | Calibration Certificate Number: 13201 | |
| Calibration Certificate Date: 15 th March 2013 | Sample Stabilisation Time (minutes): 45 | |
| Reference Photometer Calibration Uncertainty: $\pm 2.4\%$ ($k=2$, 20-200 lux, CIE illuminant A source) | | |
| Scan Set Up | | |
| Direction | Range | Increment |
| Inclination Zone 1 | 0-90° | 3° |
| Azimuth | 0-360° | 10° |
| Results | | |
| Integrated Luminous Flux (lumens):2436 | Peak Intensity (3° Spot, candelas):741 | Efficacy (lumens/Watt): 77.9 |
| Beam Angle (50% of max intensity C0-180, degrees): 107.2 | | |
| Photometric Filename (IES LM-63-2002): 4FT BATTEN | | |
| IES File – Absolute or Relative Format? ABSOLUTE | | |
| Photometric Filename (EULUMDAT): 4FT BATTEN | | |
| EULUMDAT File – Absolute or Relative Format? ABSOLUTE | | |

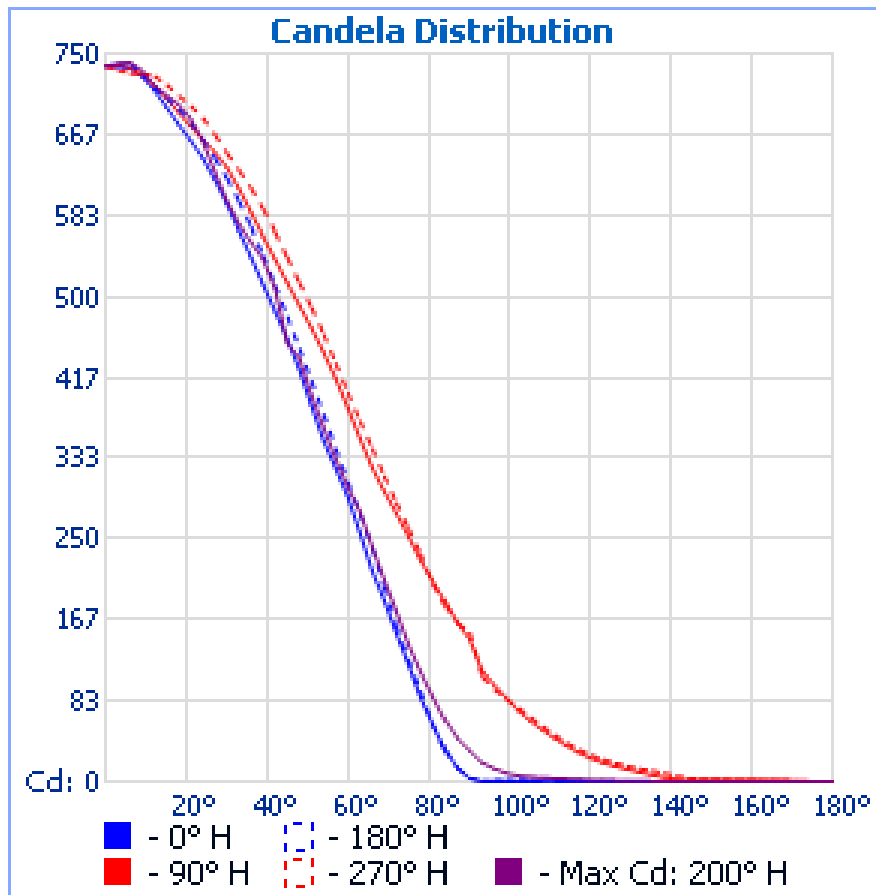


Figure 3: Far-Field Luminous Intensity (C0-180, Cartesian Coordinates)

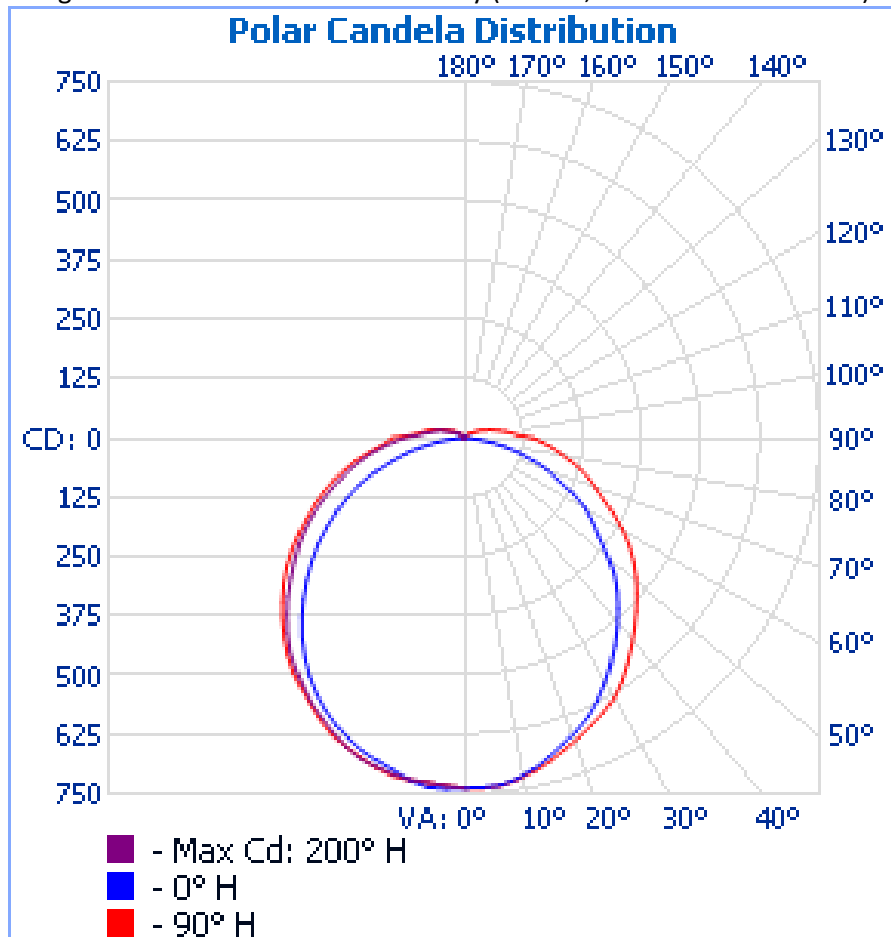


Figure 4: Far-Field Luminous Intensity (C0-180, C90-270, Polar Coordinates)

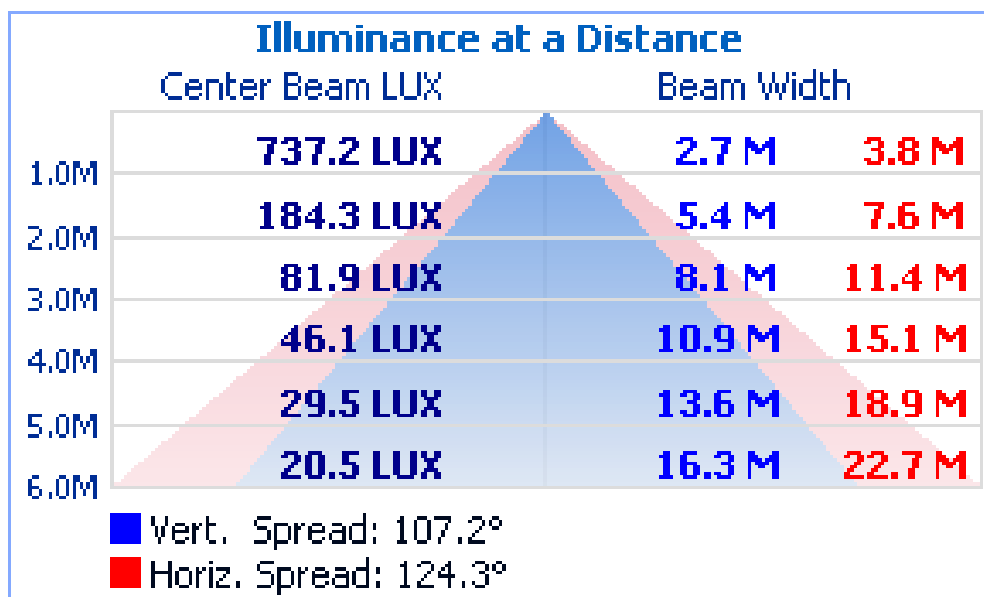


Figure 4. Cone diagram for mounting height of 6 metres.

| Room dimension | | Viewed crosswise | | | | | Viewed endwise | | | | |
|----------------|-----|------------------|------|------|------|------|----------------|------|------|------|------|
| x | y | | | | | | | | | | |
| 2H | 2H | 16.9 | 18.4 | 17.3 | 18.8 | 19.3 | 20.8 | 22.4 | 21.3 | 22.8 | 23.3 |
| | 3H | 17.7 | 19.2 | 18.2 | 19.6 | 20.1 | 22.9 | 24.4 | 23.4 | 24.8 | 25.3 |
| | 4H | 18.0 | 19.4 | 18.5 | 19.8 | 20.3 | 24.0 | 25.4 | 24.5 | 25.9 | 26.3 |
| | 6H | 18.2 | 19.5 | 18.7 | 19.9 | 20.4 | 25.2 | 26.4 | 25.6 | 26.9 | 27.4 |
| | 8H | 18.2 | 19.4 | 18.7 | 19.9 | 20.4 | 25.7 | 26.9 | 26.2 | 27.4 | 27.9 |
| | 12H | 18.1 | 19.3 | 18.6 | 19.8 | 20.3 | 26.3 | 27.5 | 26.8 | 27.9 | 28.5 |
| 4H | 2H | 17.8 | 19.2 | 18.3 | 19.6 | 20.1 | 21.1 | 22.4 | 21.5 | 22.9 | 23.4 |
| | 3H | 18.8 | 20.0 | 19.3 | 20.5 | 21.0 | 23.3 | 24.5 | 23.8 | 25.0 | 25.5 |
| | 4H | 19.3 | 20.3 | 19.8 | 20.8 | 21.4 | 24.5 | 25.6 | 25.0 | 26.1 | 26.6 |
| | 6H | 19.5 | 20.4 | 20.0 | 20.9 | 21.5 | 25.7 | 26.7 | 26.3 | 27.2 | 27.8 |
| | 8H | 19.5 | 20.4 | 20.0 | 20.9 | 21.5 | 26.4 | 27.3 | 26.9 | 27.8 | 28.4 |
| | 12H | 19.5 | 20.4 | 20.1 | 20.9 | 21.5 | 27.1 | 27.9 | 27.6 | 28.4 | 29.0 |
| 8H | 4H | 19.8 | 20.7 | 20.3 | 21.2 | 21.8 | 24.6 | 25.5 | 25.1 | 26.0 | 26.6 |
| | 6H | 20.1 | 20.9 | 20.7 | 21.5 | 22.1 | 25.9 | 26.6 | 26.4 | 27.2 | 27.8 |
| | 8H | 20.3 | 21.0 | 20.9 | 21.6 | 22.2 | 26.6 | 27.3 | 27.2 | 27.9 | 28.5 |
| | 12H | 20.3 | 20.9 | 20.9 | 21.5 | 22.1 | 27.4 | 28.0 | 28.0 | 28.6 | 29.2 |
| 12H | 4H | 20.0 | 20.8 | 20.5 | 21.3 | 21.9 | 24.6 | 25.4 | 25.1 | 25.9 | 26.5 |
| | 6H | 20.4 | 21.1 | 21.0 | 21.7 | 22.3 | 25.9 | 26.6 | 26.5 | 27.2 | 27.8 |
| | 8H | 20.6 | 21.2 | 21.2 | 21.8 | 22.4 | 26.7 | 27.2 | 27.2 | 27.8 | 28.4 |

Table 1. UGR values

| | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 110 | 120 | 130 | 140 | 150 | 160 | 170 | 180 |
|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0 | 737 | 737 | 737 | 737 | 737 | 737 | 737 | 737 | 737 | 737 | 737 | 737 | 737 | 737 | 737 | 737 | 737 | 737 | 737 |
| 3 | 737 | 737 | 737 | 737 | 737 | 737 | 738 | 738 | 738 | 739 | 739 | 739 | 739 | 739 | 739 | 739 | 740 | 740 | 740 |
| 6 | 735 | 734 | 733 | 732 | 732 | 732 | 733 | 734 | 735 | 736 | 736 | 735 | 734 | 734 | 734 | 735 | 736 | 738 | 739 |
| 9 | 727 | 725 | 724 | 722 | 721 | 721 | 723 | 726 | 728 | 728 | 728 | 727 | 725 | 723 | 722 | 722 | 725 | 727 | 729 |
| 12 | 713 | 713 | 713 | 711 | 709 | 709 | 713 | 716 | 717 | 717 | 718 | 718 | 717 | 714 | 712 | 711 | 712 | 714 | 716 |
| 15 | 695 | 698 | 702 | 698 | 692 | 694 | 700 | 706 | 705 | 704 | 707 | 711 | 708 | 704 | 701 | 701 | 703 | 703 | 704 |
| 18 | 677 | 683 | 686 | 683 | 676 | 679 | 689 | 695 | 692 | 690 | 696 | 701 | 696 | 690 | 688 | 690 | 691 | 693 | 693 |
| 21 | 661 | 665 | 668 | 668 | 665 | 669 | 677 | 683 | 680 | 676 | 682 | 687 | 680 | 672 | 672 | 674 | 674 | 676 | 679 |
| 24 | 643 | 643 | 645 | 646 | 651 | 656 | 660 | 666 | 665 | 662 | 665 | 667 | 660 | 655 | 653 | 648 | 650 | 652 | 662 |
| 27 | 621 | 619 | 621 | 624 | 630 | 636 | 639 | 644 | 647 | 649 | 648 | 647 | 645 | 641 | 637 | 629 | 620 | 624 | 643 |
| 30 | 595 | 595 | 602 | 604 | 606 | 611 | 618 | 623 | 627 | 633 | 631 | 632 | 628 | 623 | 619 | 615 | 601 | 594 | 622 |
| 33 | 568 | 571 | 579 | 583 | 583 | 588 | 597 | 602 | 606 | 611 | 614 | 610 | 603 | 596 | 593 | 596 | 581 | 566 | 598 |
| 36 | 541 | 545 | 549 | 557 | 556 | 562 | 574 | 580 | 585 | 587 | 593 | 583 | 578 | 569 | 560 | 570 | 558 | 537 | 572 |
| 39 | 513 | 515 | 518 | 521 | 528 | 536 | 545 | 557 | 562 | 562 | 569 | 559 | 558 | 546 | 531 | 533 | 536 | 507 | 543 |
| 42 | 485 | 482 | 485 | 491 | 506 | 514 | 521 | 532 | 537 | 539 | 542 | 537 | 536 | 522 | 513 | 500 | 507 | 478 | 512 |
| 45 | 457 | 448 | 454 | 465 | 480 | 489 | 496 | 508 | 513 | 515 | 516 | 513 | 505 | 489 | 491 | 471 | 469 | 451 | 480 |
| 48 | 425 | 417 | 429 | 441 | 448 | 458 | 469 | 482 | 489 | 491 | 489 | 486 | 472 | 456 | 459 | 448 | 426 | 424 | 447 |
| 51 | 388 | 392 | 400 | 412 | 416 | 428 | 442 | 452 | 463 | 468 | 464 | 457 | 445 | 430 | 425 | 421 | 391 | 400 | 414 |
| 54 | 352 | 363 | 369 | 372 | 382 | 402 | 414 | 423 | 433 | 443 | 438 | 427 | 416 | 406 | 395 | 382 | 360 | 372 | 379 |
| 57 | 323 | 329 | 332 | 341 | 355 | 375 | 389 | 395 | 404 | 416 | 411 | 398 | 389 | 379 | 372 | 344 | 327 | 339 | 344 |
| 60 | 294 | 293 | 295 | 310 | 326 | 347 | 364 | 368 | 377 | 386 | 382 | 372 | 361 | 354 | 341 | 312 | 299 | 302 | 309 |
| 63 | 257 | 257 | 265 | 280 | 292 | 317 | 336 | 342 | 351 | 354 | 354 | 345 | 334 | 327 | 303 | 284 | 275 | 266 | 277 |
| 66 | 218 | 219 | 231 | 251 | 262 | 287 | 304 | 313 | 324 | 324 | 326 | 316 | 307 | 298 | 271 | 249 | 228 | 230 | 242 |
| 69 | 187 | 184 | 201 | 216 | 235 | 257 | 275 | 285 | 296 | 300 | 302 | 288 | 283 | 268 | 241 | 214 | 198 | 194 | 201 |
| 72 | 153 | 154 | 171 | 186 | 211 | 230 | 247 | 260 | 270 | 277 | 280 | 265 | 257 | 239 | 215 | 184 | 165 | 160 | 161 |
| 75 | 121 | 124 | 139 | 157 | 183 | 206 | 219 | 236 | 245 | 253 | 256 | 242 | 230 | 214 | 185 | 158 | 135 | 127 | 126 |
| 78 | 87 | 92 | 111 | 132 | 156 | 181 | 197 | 213 | 221 | 228 | 229 | 218 | 207 | 188 | 159 | 134 | 107 | 96 | 95 |
| 81 | 60 | 67 | 90 | 114 | 138 | 162 | 179 | 195 | 201 | 207 | 205 | 195 | 185 | 163 | 136 | 109 | 85 | 64 | 59 |
| 84 | 33 | 45 | 64 | 92 | 113 | 139 | 158 | 172 | 184 | 185 | 182 | 171 | 165 | 142 | 113 | 88 | 62 | 42 | 32 |
| 87 | 14 | 26 | 46 | 70 | 95 | 117 | 137 | 153 | 158 | 163 | 163 | 155 | 142 | 121 | 96 | 67 | 44 | 22 | 14 |
| 90 | 4 | 13 | 33 | 57 | 80 | 98 | 119 | 133 | 140 | 146 | 146 | 135 | 122 | 99 | 78 | 51 | 31 | 11 | 4 |
| 93 | 0 | 5 | 20 | 40 | 54 | 74 | 96 | 109 | 111 | 114 | 118 | 113 | 96 | 81 | 63 | 40 | 19 | 6 | 2 |

| | | | | | | | | | | | | | | | | | | | |
|-----|---|---|----|----|----|----|----|----|----|-----|-----|----|----|----|----|----|----|---|---|
| 96 | 0 | 2 | 12 | 28 | 44 | 60 | 79 | 93 | 96 | 100 | 101 | 96 | 81 | 67 | 50 | 29 | 13 | 3 | 2 |
| 99 | 0 | 1 | 8 | 20 | 35 | 49 | 64 | 75 | 84 | 87 | 86 | 77 | 67 | 53 | 37 | 20 | 8 | 2 | 2 |
| 102 | 1 | 1 | 5 | 15 | 28 | 42 | 53 | 64 | 71 | 73 | 72 | 64 | 55 | 44 | 29 | 15 | 5 | 1 | 3 |
| 105 | 1 | 1 | 4 | 11 | 21 | 33 | 45 | 54 | 61 | 63 | 61 | 55 | 47 | 35 | 23 | 12 | 4 | 1 | 2 |
| 108 | 1 | 1 | 3 | 9 | 17 | 27 | 37 | 45 | 51 | 54 | 52 | 46 | 38 | 28 | 17 | 8 | 3 | 1 | 2 |
| 111 | 1 | 1 | 2 | 6 | 13 | 22 | 30 | 37 | 43 | 45 | 43 | 38 | 31 | 23 | 13 | 6 | 2 | 1 | 2 |
| 114 | 1 | 1 | 2 | 5 | 10 | 17 | 24 | 30 | 35 | 37 | 35 | 30 | 25 | 18 | 10 | 5 | 1 | 1 | 1 |
| 117 | 0 | 1 | 2 | 4 | 8 | 14 | 19 | 24 | 28 | 30 | 28 | 24 | 20 | 14 | 8 | 4 | 1 | 1 | 1 |
| 120 | 0 | 1 | 1 | 3 | 6 | 11 | 15 | 20 | 23 | 24 | 23 | 20 | 16 | 11 | 6 | 3 | 1 | 1 | 1 |
| 123 | 0 | 1 | 1 | 2 | 4 | 8 | 12 | 16 | 18 | 20 | 19 | 16 | 12 | 8 | 5 | 2 | 1 | 1 | 1 |
| 126 | 0 | 1 | 1 | 1 | 3 | 6 | 10 | 13 | 15 | 16 | 15 | 13 | 10 | 7 | 3 | 2 | 1 | 1 | 0 |
| 129 | 0 | 1 | 1 | 1 | 2 | 4 | 8 | 10 | 12 | 13 | 12 | 10 | 7 | 5 | 2 | 1 | 1 | 1 | 0 |
| 132 | 0 | 0 | 1 | 1 | 1 | 3 | 5 | 8 | 9 | 10 | 9 | 8 | 5 | 3 | 2 | 1 | 1 | 1 | 0 |
| 135 | 0 | 0 | 1 | 1 | 1 | 1 | 3 | 6 | 7 | 7 | 7 | 6 | 3 | 2 | 1 | 1 | 1 | 1 | 0 |
| 138 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 3 | 5 | 5 | 4 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 0 |
| 141 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 3 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 0 |
| 144 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 0 | 0 |
| 147 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 0 | 0 |
| 150 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 0 | 0 |
| 153 | 0 | 0 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 0 | 0 |
| 156 | 0 | 0 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 0 | 0 |
| 159 | 0 | 0 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 0 | 0 |
| 162 | 0 | 0 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 0 | 0 |
| 165 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 0 | 0 | 0 |
| 168 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 0 | 0 | 0 |
| 171 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 |
| 174 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| 177 | 0 | 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 | 0 |

Table 2a. Luminous intensity values, azimuth 0-180°

| | 190 | 200 | 210 | 220 | 230 | 240 | 250 | 260 | 270 | 280 | 290 | 300 | 310 | 320 | 330 | 340 | 350 |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0 | 737 | 737 | 737 | 737 | 737 | 737 | 737 | 737 | 737 | 737 | 737 | 737 | 737 | 737 | 737 | 737 | 737 |
| 3 | 740 | 740 | 739 | 738 | 737 | 736 | 735 | 734 | 733 | 733 | 733 | 734 | 734 | 735 | 736 | 736 | 737 |
| 6 | 740 | 741 | 741 | 739 | 738 | 735 | 733 | 731 | 730 | 730 | 730 | 732 | 733 | 735 | 736 | 736 | 736 |
| 9 | 731 | 733 | 733 | 734 | 734 | 732 | 731 | 730 | 730 | 729 | 729 | 729 | 729 | 730 | 730 | 730 | 728 |
| 12 | 716 | 718 | 721 | 725 | 725 | 724 | 724 | 726 | 727 | 727 | 724 | 721 | 720 | 720 | 719 | 716 | 714 |
| 15 | 706 | 708 | 710 | 715 | 718 | 717 | 716 | 717 | 719 | 719 | 717 | 711 | 707 | 705 | 704 | 701 | 696 |
| 18 | 697 | 698 | 699 | 703 | 709 | 710 | 708 | 707 | 707 | 710 | 710 | 701 | 694 | 692 | 690 | 684 | 679 |
| 21 | 685 | 684 | 680 | 683 | 692 | 697 | 697 | 696 | 697 | 698 | 697 | 688 | 681 | 680 | 677 | 668 | 663 |
| 24 | 666 | 660 | 652 | 659 | 670 | 677 | 679 | 682 | 684 | 681 | 678 | 672 | 668 | 665 | 656 | 649 | 645 |
| 27 | 640 | 629 | 630 | 643 | 651 | 658 | 662 | 666 | 667 | 665 | 661 | 656 | 651 | 644 | 633 | 625 | 623 |
| 30 | 610 | 599 | 615 | 629 | 634 | 641 | 648 | 650 | 648 | 649 | 644 | 635 | 626 | 618 | 610 | 601 | 598 |
| 33 | 577 | 575 | 602 | 611 | 614 | 621 | 630 | 633 | 630 | 631 | 624 | 610 | 603 | 595 | 588 | 578 | 573 |
| 36 | 544 | 557 | 584 | 580 | 587 | 598 | 607 | 613 | 612 | 608 | 603 | 588 | 580 | 572 | 563 | 552 | 548 |
| 39 | 517 | 539 | 550 | 546 | 560 | 574 | 583 | 591 | 590 | 584 | 581 | 567 | 556 | 545 | 530 | 526 | 521 |
| 42 | 490 | 509 | 515 | 525 | 537 | 554 | 559 | 565 | 566 | 558 | 555 | 543 | 527 | 521 | 501 | 495 | 488 |
| 45 | 457 | 452 | 484 | 505 | 507 | 530 | 535 | 535 | 541 | 536 | 527 | 516 | 498 | 495 | 473 | 466 | 453 |
| 48 | 426 | 437 | 459 | 477 | 474 | 501 | 510 | 505 | 515 | 514 | 499 | 486 | 469 | 466 | 442 | 438 | 420 |
| 51 | 400 | 398 | 430 | 444 | 447 | 471 | 484 | 480 | 489 | 486 | 469 | 458 | 441 | 434 | 409 | 402 | 393 |
| 54 | 373 | 365 | 388 | 412 | 424 | 437 | 455 | 456 | 462 | 454 | 441 | 429 | 412 | 400 | 374 | 372 | 363 |
| 57 | 344 | 333 | 349 | 384 | 395 | 409 | 424 | 430 | 432 | 426 | 415 | 403 | 382 | 371 | 344 | 337 | 329 |
| 60 | 313 | 304 | 314 | 350 | 366 | 383 | 393 | 400 | 401 | 399 | 388 | 371 | 354 | 339 | 311 | 301 | 297 |
| 63 | 278 | 279 | 284 | 312 | 337 | 355 | 362 | 369 | 372 | 370 | 358 | 340 | 326 | 304 | 280 | 269 | 262 |
| 66 | 240 | 243 | 257 | 279 | 307 | 323 | 333 | 338 | 344 | 338 | 327 | 313 | 296 | 273 | 253 | 233 | 220 |
| 69 | 203 | 208 | 222 | 246 | 274 | 293 | 308 | 309 | 316 | 310 | 297 | 288 | 265 | 243 | 222 | 200 | 185 |
| 72 | 168 | 176 | 191 | 218 | 241 | 266 | 281 | 284 | 288 | 284 | 271 | 259 | 236 | 216 | 193 | 170 | 157 |
| 75 | 133 | 142 | 163 | 191 | 212 | 237 | 250 | 257 | 262 | 256 | 245 | 227 | 211 | 184 | 164 | 141 | 127 |
| 78 | 99 | 113 | 137 | 165 | 187 | 212 | 222 | 230 | 235 | 229 | 219 | 201 | 184 | 156 | 138 | 113 | 94 |
| 81 | 66 | 88 | 110 | 136 | 162 | 181 | 195 | 202 | 204 | 202 | 195 | 174 | 158 | 135 | 118 | 93 | 68 |
| 84 | 46 | 64 | 88 | 112 | 140 | 159 | 174 | 180 | 181 | 183 | 171 | 153 | 135 | 111 | 95 | 69 | 47 |
| 87 | 26 | 45 | 66 | 94 | 120 | 137 | 155 | 161 | 163 | 162 | 147 | 131 | 111 | 94 | 73 | 49 | 27 |
| 90 | 15 | 32 | 52 | 76 | 97 | 118 | 138 | 136 | 154 | 139 | 128 | 109 | 90 | 75 | 56 | 34 | 14 |
| 93 | 6 | 20 | 38 | 57 | 75 | 91 | 102 | 107 | 109 | 106 | 101 | 86 | 70 | 52 | 35 | 18 | 5 |

| | | | | | | | | | | | | | | | | | |
|------------|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|---|
| 96 | 3 | 14 | 30 | 47 | 63 | 77 | 88 | 94 | 96 | 94 | 86 | 74 | 58 | 42 | 27 | 13 | 2 |
| 99 | 2 | 9 | 23 | 38 | 53 | 66 | 76 | 83 | 86 | 82 | 73 | 63 | 50 | 35 | 21 | 8 | 2 |
| 102 | 2 | 7 | 17 | 32 | 46 | 58 | 68 | 74 | 77 | 73 | 66 | 55 | 44 | 30 | 17 | 7 | 1 |
| 105 | 2 | 5 | 13 | 25 | 38 | 50 | 59 | 64 | 67 | 63 | 57 | 47 | 35 | 23 | 12 | 5 | 1 |
| 108 | 3 | 4 | 10 | 19 | 30 | 41 | 49 | 55 | 58 | 54 | 47 | 39 | 29 | 18 | 9 | 4 | 1 |
| 111 | 3 | 4 | 8 | 15 | 24 | 34 | 41 | 46 | 49 | 46 | 39 | 32 | 24 | 15 | 8 | 3 | 1 |
| 114 | 3 | 3 | 7 | 12 | 20 | 27 | 33 | 38 | 40 | 38 | 33 | 26 | 19 | 12 | 6 | 2 | 1 |
| 117 | 2 | 3 | 6 | 10 | 16 | 22 | 27 | 32 | 33 | 32 | 27 | 22 | 16 | 10 | 5 | 2 | 1 |
| 120 | 2 | 2 | 5 | 9 | 13 | 18 | 22 | 26 | 28 | 26 | 22 | 18 | 13 | 9 | 4 | 1 | 1 |
| 123 | 2 | 2 | 4 | 8 | 11 | 15 | 18 | 22 | 23 | 22 | 18 | 15 | 11 | 7 | 3 | 1 | 1 |
| 126 | 1 | 2 | 3 | 6 | 9 | 13 | 15 | 18 | 19 | 18 | 15 | 13 | 9 | 5 | 2 | 1 | 1 |
| 129 | 1 | 1 | 2 | 4 | 7 | 11 | 13 | 15 | 16 | 15 | 13 | 11 | 7 | 4 | 2 | 1 | 1 |
| 132 | 1 | 1 | 2 | 3 | 5 | 9 | 11 | 13 | 14 | 13 | 11 | 9 | 5 | 3 | 2 | 1 | 0 |
| 135 | 0 | 1 | 2 | 2 | 3 | 6 | 9 | 11 | 12 | 11 | 9 | 6 | 3 | 2 | 1 | 1 | 0 |
| 138 | 0 | 1 | 2 | 2 | 2 | 4 | 6 | 8 | 9 | 8 | 6 | 3 | 3 | 2 | 1 | 1 | 0 |
| 141 | 0 | 1 | 1 | 2 | 2 | 3 | 3 | 5 | 6 | 5 | 3 | 3 | 2 | 2 | 1 | 1 | 0 |
| 144 | 0 | 1 | 1 | 2 | 2 | 3 | 3 | 3 | 4 | 3 | 3 | 2 | 2 | 1 | 1 | 1 | 0 |
| 147 | 0 | 0 | 1 | 1 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 1 | 1 | 0 | 0 |
| 150 | 0 | 0 | 1 | 1 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 1 | 1 | 1 | 0 | 0 |
| 153 | 0 | 0 | 1 | 1 | 1 | 2 | 2 | 3 | 3 | 3 | 2 | 2 | 1 | 1 | 0 | 0 | 0 |
| 156 | 0 | 0 | 0 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 0 | 0 | 0 |
| 159 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 0 | 0 | 0 |
| 162 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 0 | 0 | 0 |
| 165 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| 168 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 171 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 174 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 177 | 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 |

Table 2b. Luminous intensity values, azimuth 190-350°

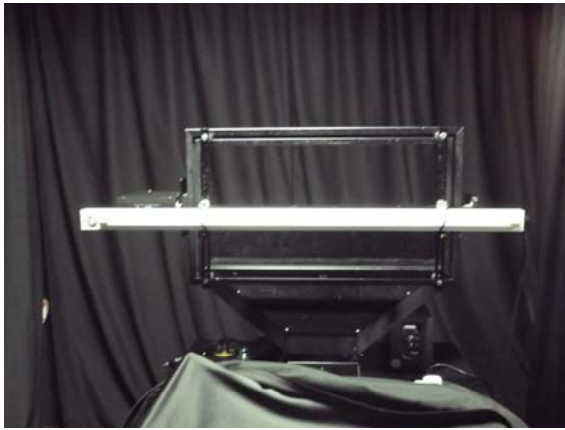


Photo 1: Luminaire on goniometer mount

Signature:

A handwritten signature in black ink on a light blue background. The signature is cursive and appears to read "D Chambers".

Print Name:

D CHAMBERS

Date:

12/03/2014

Test Engineer

Duly authorised to sign on behalf of:

Photometric and Optical Testing Services LLP