Purpose: Measure Illumination Levels in D-667-11 Viewing Fixture.

Scope:

Bill Royall of **OEOSC** TF2 has observed that incandescent lamps in general and the 40 watt lamp in incandescent particular are becoming obsolete throughout most of the world and soon will be unavailable. OP1.002 calls for the use of 40 watt incandescent lamps in some test methods. Committee discussion suggested that it might be best to describe the test methods of 3.7.2 in terms of the photometric illuminance environment e.g. have XXX ± XX lux illuminance at the viewing location(s) rather than require use of a 40 watt incandescent or two 15 watt fluorescent lamps XX m from the viewing location.

Measurement Equipment:

- **UDT Instruments** Model 350 Linear/Log Optometer, Serial Number 0A021, Calibrated 1/29/9
- **UDT Instruments** Model 263 Photometer Head, Serial Number 18068, Calibrated 1/29/9

Equipment Measured:

- **Davidson Optronics, Inc.** Model D-667-11 Viewing Fixture, Not Serialized, Located in Calibration Department, Not Calibrated http://www.davidsonoptronics.com/D-667.htm

Reference:

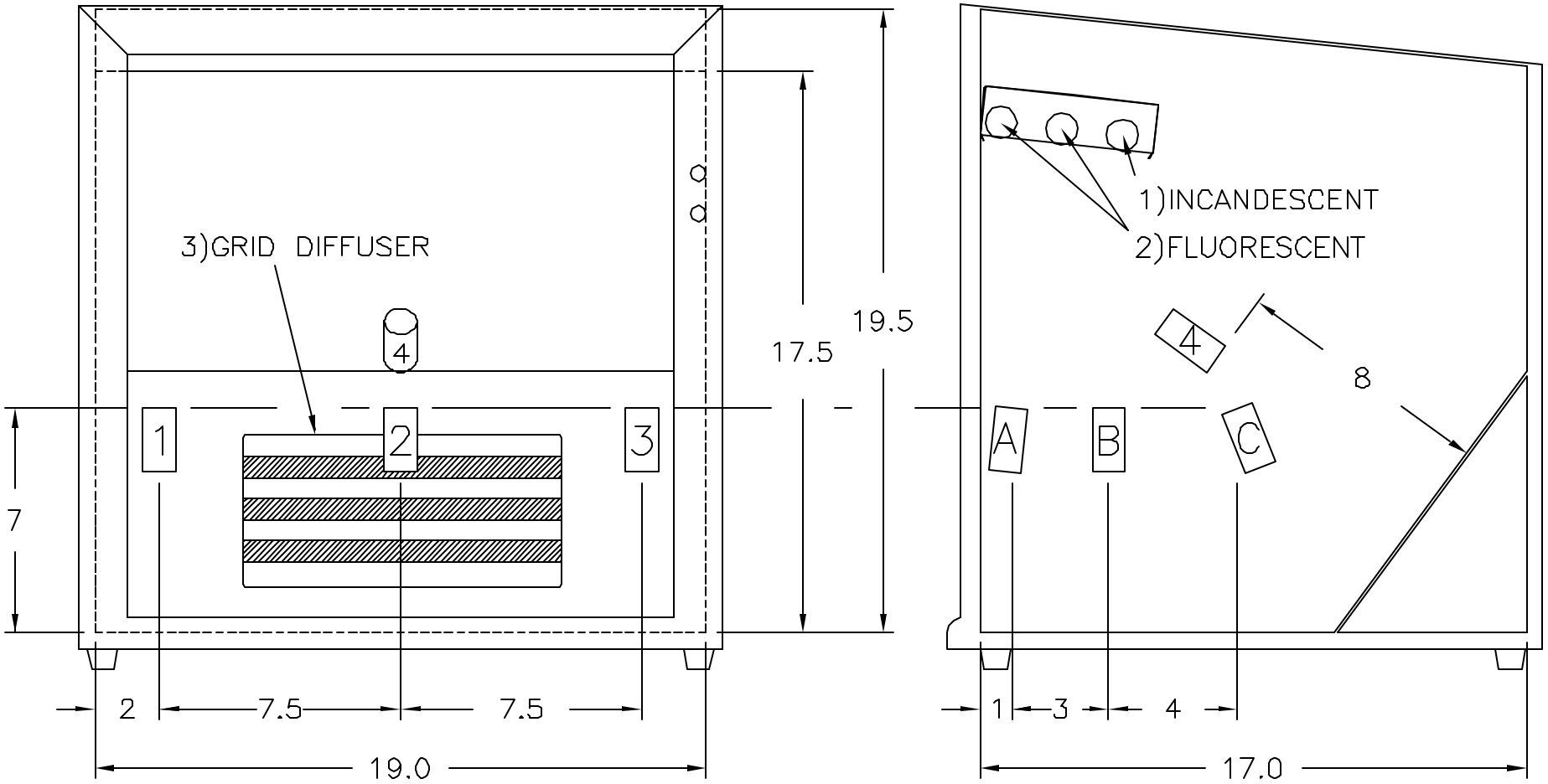
- Wikipedia definition of Illuminance: http://en.wikipedia.org/wiki/Illuminance

Notes: Readings taken in foot-candles (English illuminance units)
1 foot-candle = 10.76 (meter^2 / foot^2) lux.

Readings taken approximately 8 inches (20 cm) from light sources. This reading location is what is typically used in the D-667-11:

1) Overhead 40 watt clear 10 inch long incandescent lamp
2) Two (2) Overhead 15 watt cool white 17 inch long fluorescent lamps (General Electric P/N F15T8/CW)
3) Rear 40 watt frosted 10 inch long incandescent lamp, through white barred grid diffuser

Photometer head's sensor was directed at light source for all readings.
For 1) & 2) readings were obtained over an array with the photosensor about 4 inches above D-667-11 floor and about 12 inches from light source with photosensor directed towards light source.
Array coordinates have numeric designation for width locations and alpha designations for depth (e.g. 1-A is front left, 2-B is center)
Illumination reading 3) for rear diffuser grid taken at location 4-B, about 8 inches away from and normal to grid, near center of Viewing Fixture
Location 2-B is the most common location D-667-11 operators use for evaluation of reflective surfaces.



DIMENSIONS: INCHES
SCALE: APPROXIMATELY 1:5

Illuminance Readings:

1) 40 watt overhead incandescent:

At four inches (10 cm) above the base:

WIDTH \ DEPTH	A	B	C
1	549 lux (51 ft-cndl)	441 lux (41 ft-cndl)	463 lux (43 ft-cndl)
2	495 lux (46 ft-cndl)	603 lux (56 ft-cndl)	560 lux (52 ft-cndl)
3	484 lux (45 ft-cndl)	463 lux (43 ft-cndl)	452 lux (42 ft-cndl)

2) Two (2) 15 watt overhead fluorescent:

At four inches (10 cm) above the base:

WIDTH \ DEPTH	A	B	C
2	1625 lux (151 ft-cndl)	1969 lux (183 ft-cndl)	1356 lux (126 ft-cndl)

And at a two inch (5 cm) distance from the lamps: (similar to OP1.002 figure 5)

DEPTH \ WIDTH	1	2	3
B	4132 lux (384 ft-cndl)	7726 lux (718 ft-cndl)	4024 lux (374 ft-cndl)

3) Rear 40 watt incandescent through white barred grid diffuser: (similar to OP1.002 figure 4)

One reading at location 4-B: 172 lux (16 foot-candles).

Summary:

Illumination in Davidson Optronics D-667-11 Viewing Fixture varies, especially depending on which light source is used.
Four inches above the base, the overhead 40 watt incandescent lamp provides an average 500 lux with a standard deviation of 53 lux.
Four inches above the base, the overhead fluorescent lamps provide an average 1650 lux with a standard deviation of 250 lux.

The white barred diffuser illuminated from the rear by a 40 watt incandescent lamp gave 172 lux at eight inches normal to the diffuser.