

PRELIMINARY PHOTOMETRIC REPORT

EPL-MJ-15W-50K

LM-63 report generated from supplied IES photometric data

Preliminary Photometric Analysis Based on Assumed Installation Conditions.

LUMINAIRE LUMENS

2,326 lm

MAXIMUM CANDELA

325.1 cd

INPUT POWER

13.98 W

PRIMARY CASE

20 ft

Required Disclaimer

This report is a preliminary photometric analysis generated from the supplied IES photometric data using assumed installation conditions. It is intended only for conceptual planning and fixture evaluation. Actual lighting performance will vary depending on mounting height, aiming, room geometry, surface reflectance, obstructions, maintenance factors and environmental conditions. Final lighting layouts should be performed using project-specific dimensions and requirements.

1. Fixture Summary

Parameter	Result	Basis / Notes
Fixture model	EPL-MJ-15W-50K	[LUMINAIRE] field
Manufacturer	LARSON	[MANUFAC] field
Lamp quantity / lamp lumens	1 / 2,325.91 lm	IES numeric header
Total luminaire lumens	2,325.91 lm	IES listed; integrated candela flux 2,325.30 lm
Luminaire efficiency	Not separately determinable	IES does not provide independent bare-lamp flux; integrated/listed ratio is not treated as optical efficiency
Input power / efficacy	13.98 W / 166.4 lm/W	Calculated from IES listed lumens and input watts
Maximum candela (CBCP)	325.14 cd	At C315.0 deg, vertical angle 49.5 deg
Beam angle (50% CBCP)	218.0 deg (estimate)	Full contiguous candela envelope around nadir on peak great-circle
Field angle (10% CBCP)	264.0 deg (estimate)	Full contiguous candela envelope around nadir on peak great-circle
Photometric type	Type C	LM-63 photometric type 1
Distribution classification	Type V-like / very broad (estimate)	Not explicitly classified in IES; inferred from full C-plane coverage and near-circular footprint
Symmetry description	Near rotational, not exact	16 unique C-planes plus 360-deg duplicate; measurable C-plane variation
Flux distribution	1,684 lm down / 641 lm up	72.4% lower hemisphere / 27.6% upper hemisphere

Beam-angle interpretation

The peak intensity is off-axis, and the 50% CBCP threshold remains above half-peak through the horizontal plane. Therefore, the reported beam and field angles are broad angular envelopes around nadir and are not conventional narrow-beam angles. Practical ground-plane footprints are separately calculated from horizontal illuminance.

. Assumptions and Calculation Method

- 1 Fixture mounted 20 ft (6.1 m) above the primary calculation plane; additional cases at 10, 15, 25 and 30 ft.
- 2 Fixture aimed straight downward at 0 deg tilt.
- 3 Flat, unobstructed 50 ft x 50 ft calculation area.
- 4 Calculation grid spacing of 2 ft; primary numeric grid uses 25 x 25 points from -24 ft to +24 ft.
- 5 Fixture centered in the calculation area.
- 6 No reflected light from walls, ceilings or ground; direct component only.
- 7 Light Loss Factor (LLF) = 0.80 applied uniformly.
- 8 Standard atmospheric conditions; no atmospheric attenuation modeled.
- 9 No obstructions, shielding, poles, equipment or site geometry.
- 10 Single fixture unless a conceptual multi-fixture example is explicitly shown.

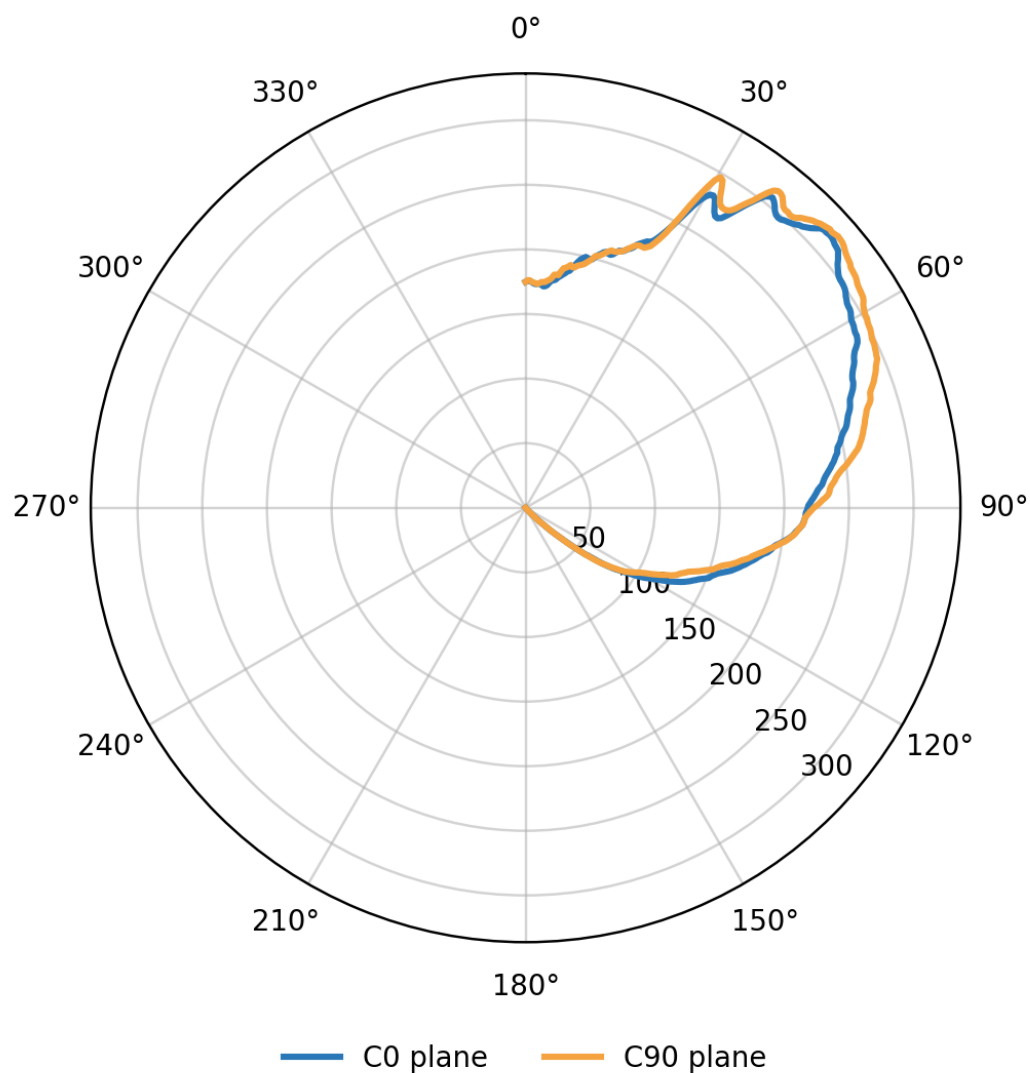
Point-by-point direct illuminance method

At each calculation point, the horizontal and vertical offsets are converted to LM-63 Type C vertical angle γ and C-plane azimuth. Candela is bilinearly interpolated from the measured IES table. Horizontal illuminance is calculated as $E = I(\gamma, C) \times \cos(\gamma) / d^2$, then multiplied by the 0.80 LLF. Distances are in feet, so the resulting values are foot-candles.

No room-cavity, radiosity, interreflection, dirt-depreciation model, glare model, emergency criterion or code-compliance assessment is included.

2. Polar Candela Distribution

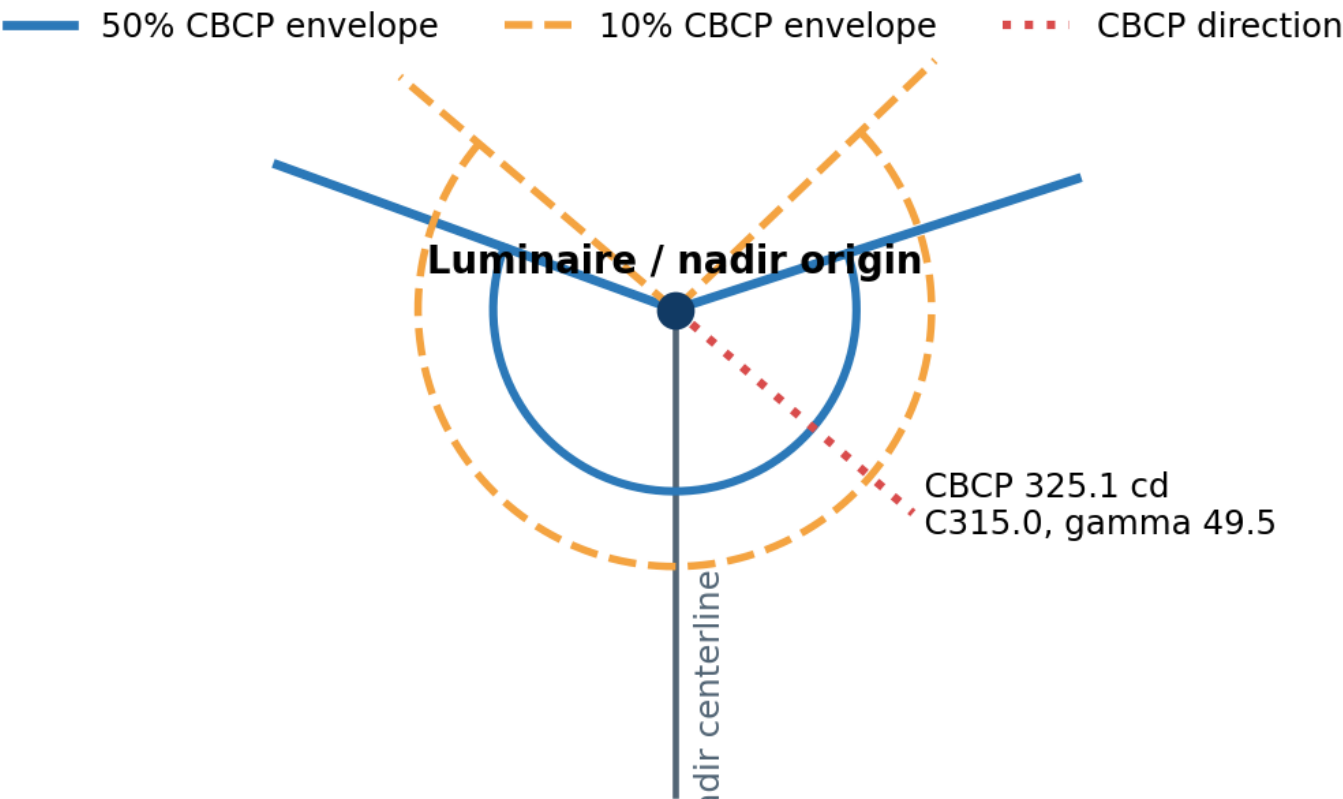
Polar Candela Distribution - Actual IES C-Plane Data



The plot uses actual candela values from the C0 and C90 planes. The broad side emission and material upper-hemisphere output are visible. Because the file contains 17 C-planes, all plan-view calculations use the complete asymmetric dataset rather than a rotational average.

3. Beam Angle Diagram

Beam Angle Diagram - Thresholds Referenced to Global CBCP



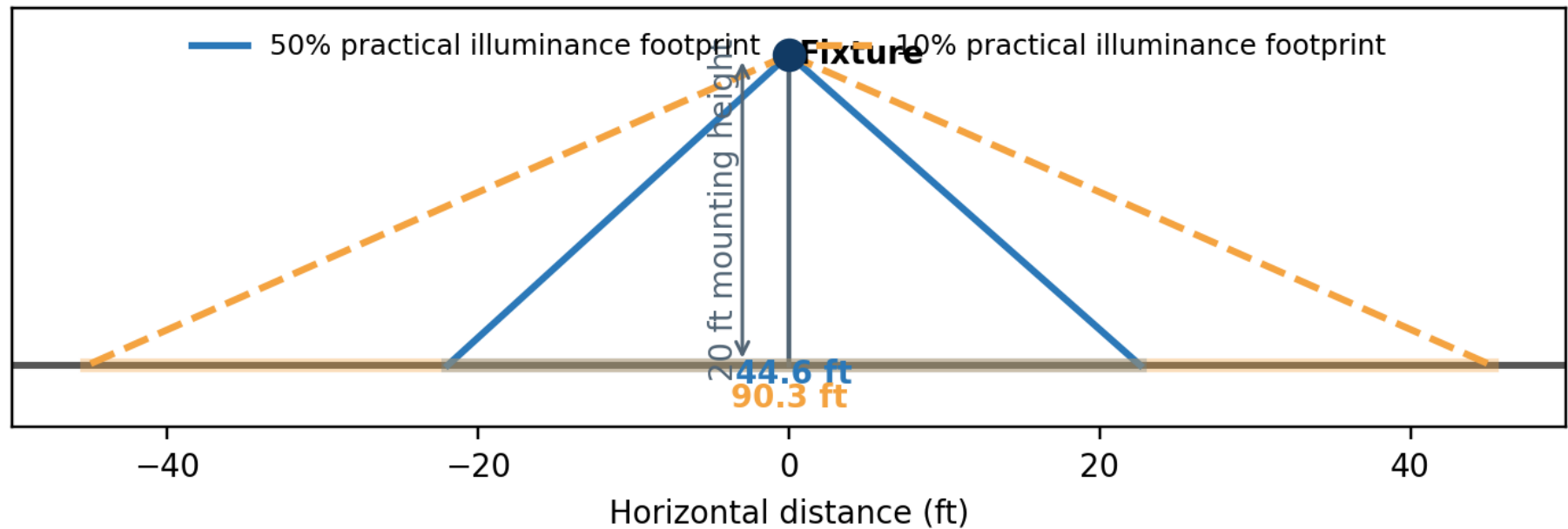
50% candela envelope: 218.0 deg | **10% field envelope: 264.0 deg**

Envelope exceeds 180 deg because significant intensity remains at and above the horizontal plane.

Item	Result	Interpretation
CBCP	325.14 cd at C315.0, gamma 49.5	Off-axis peak
50% beam envelope	-110.0 deg to 108.0 deg (218.0 deg)	Estimated around nadir
10% field envelope	-130.2 deg to 133.8 deg (264.0 deg)	Estimated around nadir

4. Side-View Beam Profile

Side-View Beam Profile - Practical Ground-Plane Footprint

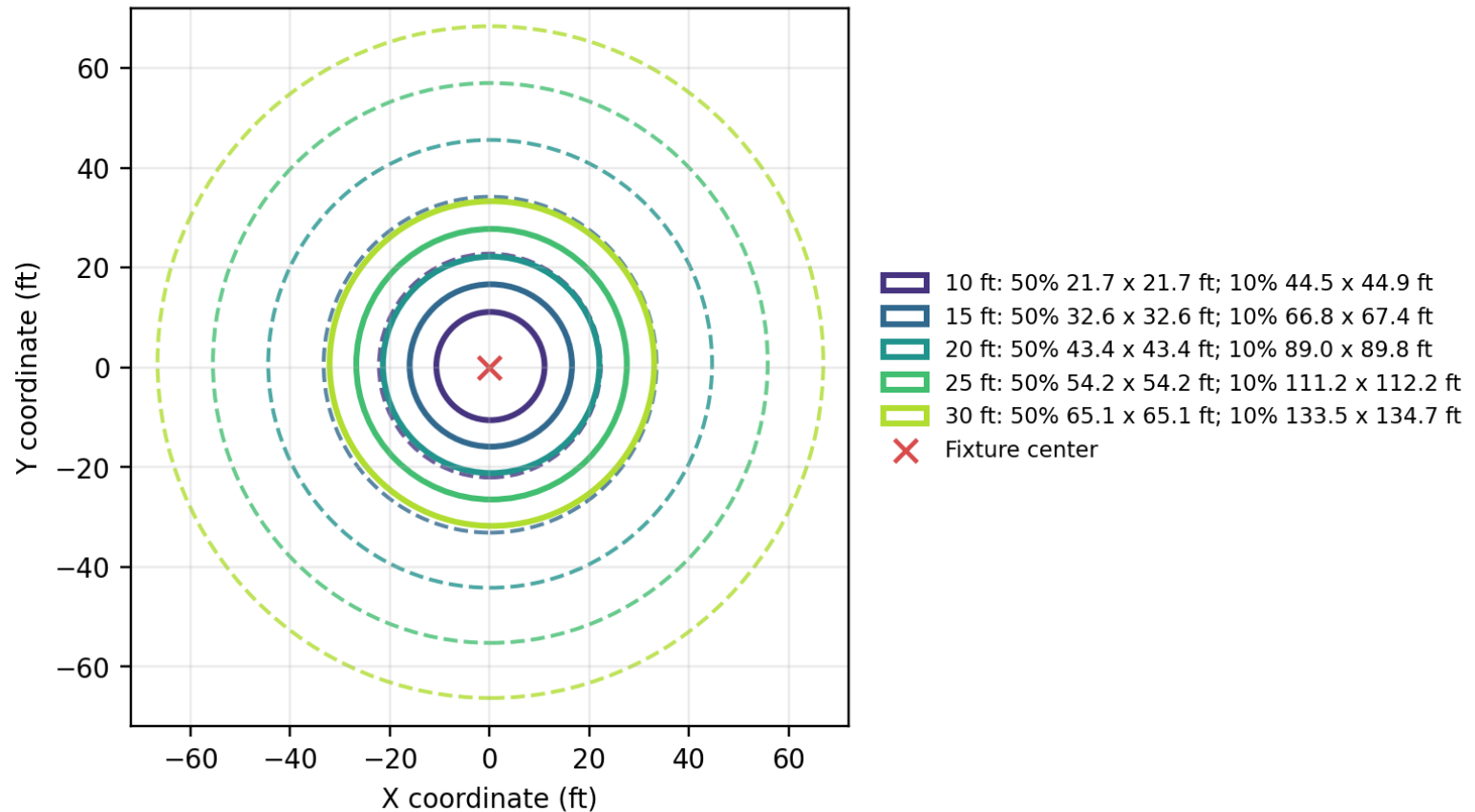


Engineering interpretation

At 20 ft, the practical 50% horizontal-illuminance footprint is approximately 43.4 x 43.4 ft and the 10% footprint is approximately 89.0 x 89.8 ft. These ground-plane footprints are used for spacing estimates because the candela beam envelope extends above the horizon and therefore does not form a conventional closed cone on the floor.

5. Top-View Beam Footprint

Top-View Practical Beam Footprints at Requested Mounting Heights

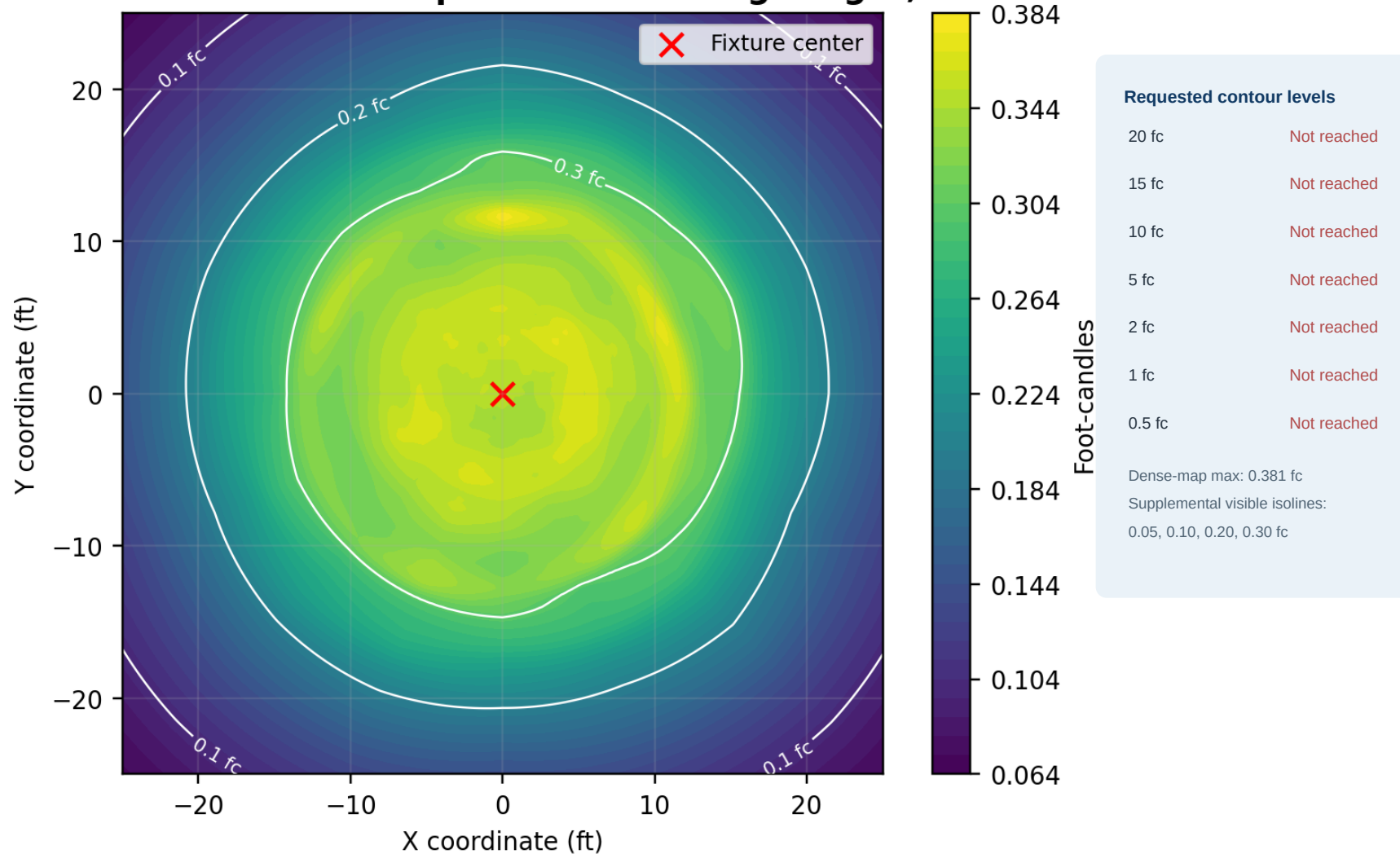


Height	50% footprint (ft)	10% footprint (ft)	Max FC (LLF 0.80)
10 ft	21.7 x 21.7	44.5 x 44.9	1.522
15 ft	32.6 x 32.6	66.8 x 67.4	0.676
20 ft	43.4 x 43.4	89.0 x 89.8	0.381
25 ft	54.2 x 54.2	111.2 x 112.2	0.244
30 ft	65.1 x 65.1	133.5 x 134.7	0.169

Footprints are practical horizontal-illuminance contours at 50% and 10% of the maximum value calculated at each mounting height. They are not the conventional 50% and 10% candela cone intersections.

6. Iso-Foot-Candle Contour Map - Primary 20 ft Case

Iso-Foot-Candle Contour Map - 20 ft Mounting Height, LLF 0.80



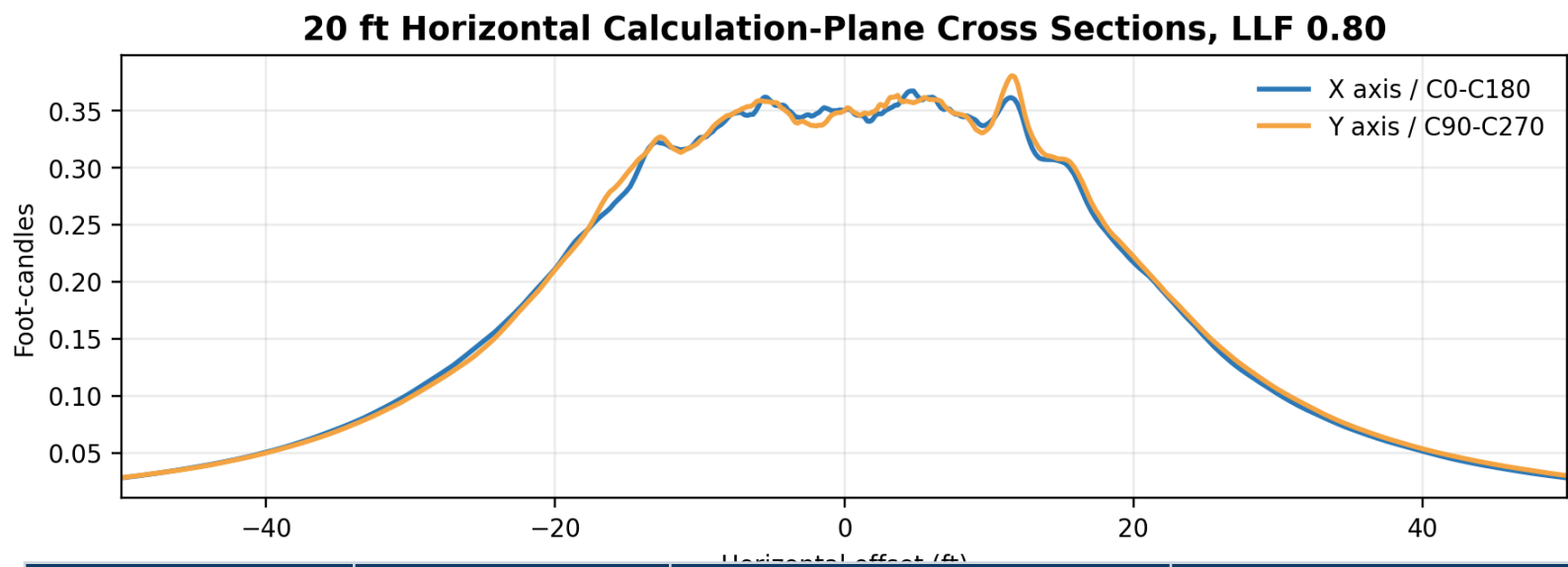
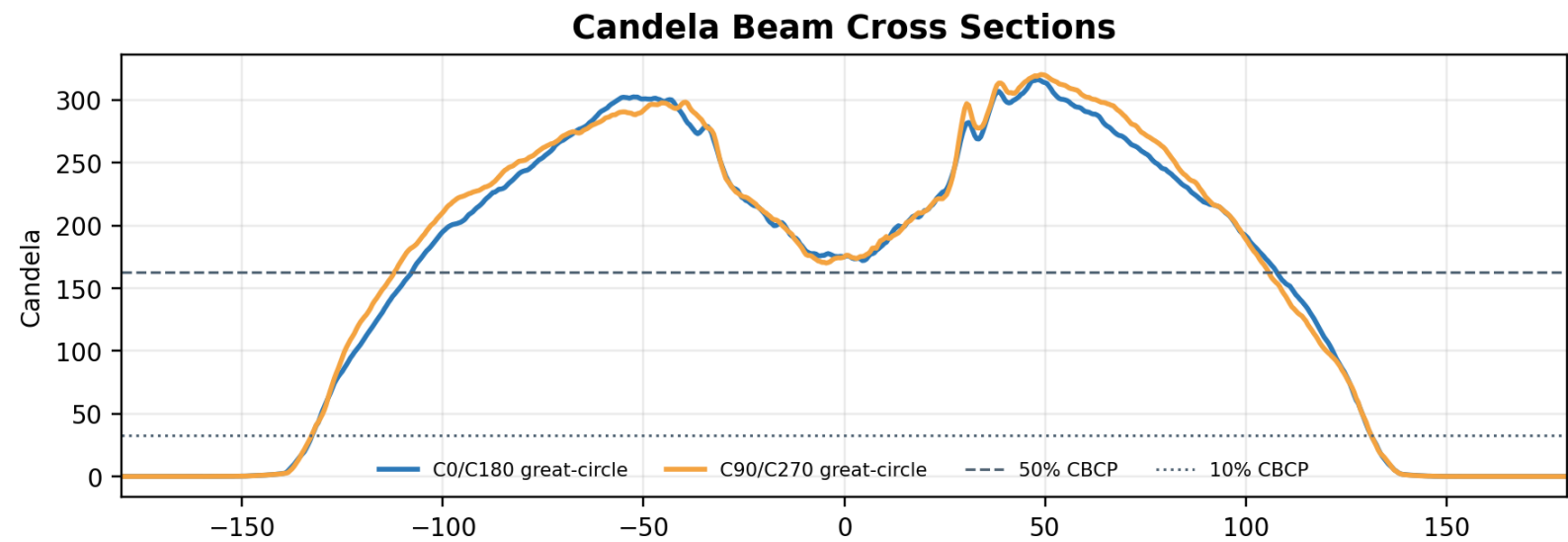
The requested 0.5, 1, 2, 5, 10, 15 and 20 fc contour levels are not reached in the assumed 20 ft single-fixture case. Lower supplemental contour values are plotted so the actual distribution remains visible.

7. Foot-Candle Grid - 20 ft Mounting Height

MAXIMUM FC					MINIMUM FC					AVERAGE FC					AVG/MIN					MAX/MIN					
0.373					0.074					0.227					3.05					5.01					
	X coordinate (ft)																								
	-24	-22	-20	-18	-16	-14	-12	-10	-8	-6	-4	-2	0	2	4	6	8	10	12	14	16	18	20	22	24
24	0.074	0.083	0.091	0.100	0.110	0.119	0.129	0.138	0.147	0.154	0.160	0.165	0.168	0.165	0.161	0.154	0.146	0.137	0.129	0.120	0.110	0.101	0.092	0.084	0.077
22	0.083	0.092	0.102	0.113	0.124	0.136	0.147	0.158	0.168	0.178	0.185	0.191	0.194	0.191	0.186	0.179	0.170	0.160	0.148	0.137	0.125	0.114	0.103	0.093	0.085
20	0.092	0.102	0.113	0.126	0.139	0.154	0.167	0.180	0.190	0.201	0.210	0.217	0.222	0.219	0.214	0.205	0.194	0.182	0.171	0.157	0.142	0.128	0.115	0.104	0.094
18	0.101	0.113	0.126	0.140	0.157	0.173	0.188	0.202	0.214	0.227	0.239	0.247	0.251	0.250	0.246	0.237	0.223	0.208	0.193	0.177	0.161	0.144	0.129	0.115	0.103
16	0.111	0.125	0.140	0.157	0.175	0.193	0.212	0.229	0.247	0.265	0.280	0.291	0.298	0.294	0.287	0.278	0.259	0.236	0.217	0.199	0.180	0.162	0.144	0.128	0.113
14	0.121	0.137	0.155	0.173	0.194	0.217	0.238	0.261	0.279	0.288	0.300	0.308	0.310	0.311	0.307	0.300	0.291	0.271	0.241	0.219	0.200	0.179	0.159	0.141	0.124
12	0.131	0.149	0.168	0.189	0.215	0.240	0.265	0.286	0.305	0.323	0.332	0.350	0.373	0.359	0.346	0.329	0.310	0.299	0.273	0.240	0.218	0.197	0.174	0.153	0.135
10	0.141	0.160	0.181	0.206	0.235	0.261	0.285	0.316	0.338	0.331	0.320	0.329	0.335	0.335	0.335	0.350	0.338	0.314	0.304	0.269	0.233	0.212	0.188	0.164	0.144
8	0.147	0.168	0.192	0.222	0.252	0.276	0.306	0.343	0.337	0.329	0.332	0.342	0.347	0.347	0.342	0.334	0.356	0.331	0.313	0.300	0.253	0.223	0.201	0.174	0.151
6	0.152	0.175	0.202	0.234	0.261	0.289	0.330	0.337	0.332	0.345	0.351	0.356	0.360	0.353	0.348	0.339	0.339	0.361	0.313	0.319	0.272	0.233	0.209	0.182	0.157
4	0.156	0.180	0.208	0.241	0.267	0.296	0.344	0.324	0.340	0.351	0.359	0.355	0.358	0.361	0.368	0.352	0.341	0.365	0.324	0.313	0.287	0.241	0.214	0.188	0.161
2	0.158	0.182	0.211	0.244	0.269	0.303	0.330	0.325	0.344	0.356	0.353	0.354	0.349	0.356	0.360	0.359	0.349	0.346	0.346	0.309	0.293	0.245	0.217	0.191	0.164
0	0.158	0.183	0.211	0.243	0.267	0.305	0.318	0.326	0.344	0.352	0.352	0.347	0.350	0.343	0.360	0.362	0.346	0.339	0.356	0.307	0.292	0.246	0.217	0.192	0.164
-2	0.156	0.181	0.209	0.240	0.269	0.304	0.319	0.319	0.345	0.361	0.360	0.343	0.337	0.338	0.360	0.361	0.341	0.339	0.347	0.309	0.285	0.243	0.213	0.188	0.161
-4	0.152	0.176	0.203	0.233	0.266	0.297	0.322	0.313	0.338	0.355	0.352	0.358	0.349	0.355	0.363	0.350	0.332	0.347	0.332	0.308	0.273	0.237	0.207	0.182	0.157
-6	0.147	0.169	0.195	0.223	0.256	0.290	0.321	0.314	0.323	0.341	0.350	0.359	0.358	0.353	0.347	0.340	0.334	0.351	0.318	0.298	0.258	0.227	0.198	0.173	0.150
-8	0.140	0.161	0.184	0.212	0.240	0.273	0.301	0.319	0.316	0.328	0.344	0.350	0.346	0.336	0.329	0.330	0.351	0.336	0.306	0.283	0.247	0.214	0.186	0.163	0.143
-10	0.131	0.153	0.175	0.201	0.229	0.254	0.277	0.307	0.324	0.327	0.327	0.325	0.323	0.321	0.324	0.341	0.334	0.303	0.294	0.264	0.232	0.202	0.178	0.154	0.135
-12	0.124	0.144	0.165	0.187	0.213	0.239	0.257	0.277	0.301	0.335	0.339	0.329	0.319	0.327	0.328	0.305	0.296	0.292	0.276	0.244	0.215	0.191	0.169	0.147	0.128
-14	0.117	0.134	0.153	0.173	0.195	0.221	0.243	0.260	0.274	0.286	0.300	0.310	0.309	0.302	0.294	0.286	0.282	0.267	0.244	0.222	0.200	0.180	0.158	0.138	0.120
-16	0.109	0.124	0.141	0.159	0.178	0.197	0.216	0.237	0.255	0.268	0.274	0.279	0.281	0.279	0.275	0.265	0.248	0.231	0.215	0.201	0.187	0.166	0.146	0.127	0.111
-18	0.101	0.114	0.128	0.145	0.161	0.176	0.192	0.207	0.221	0.233	0.241	0.243	0.241	0.239	0.234	0.224	0.214	0.204	0.193	0.182	0.167	0.150	0.132	0.117	0.103
-20	0.093	0.104	0.116	0.129	0.143	0.157	0.170	0.183	0.194	0.201	0.207	0.210	0.210	0.209	0.204	0.198	0.190	0.182	0.173	0.160	0.146	0.133	0.119	0.106	0.094
-22	0.085	0.095	0.105	0.115	0.127	0.138	0.150	0.160	0.169	0.175	0.179	0.181	0.180	0.180	0.178	0.173	0.167	0.160	0.150	0.140	0.128	0.117	0.106	0.096	0.086
-24	0.077	0.085	0.094	0.103	0.112	0.121	0.130	0.139	0.145	0.150	0.153	0.154	0.153	0.153	0.152	0.149	0.144	0.138	0.130	0.121	0.112	0.103	0.094	0.086	0.079

Grid values are direct horizontal illuminance in foot-candles with LLF 0.80. The grid uses 2 ft spacing and excludes the exact +/-25 ft boundary so that equal spacing is maintained about the fixture center.

8. Beam Cross Sections



Mounting height	Maximum FC	50% footprint	10% footprint
10 ft	1.522	21.7 x 21.7 ft	44.5 x 44.9 ft
15 ft	0.676	32.6 x 32.6 ft	66.8 x 67.4 ft
20 ft	0.381	43.4 x 43.4 ft	89.0 x 89.8 ft
25 ft	0.244	54.2 x 54.2 ft	111.2 x 112.2 ft
30 ft	0.169	65.1 x 65.1 ft	133.5 x 134.7 ft

9. Spacing Recommendations - Engineering Estimates

Spacing basis	C0/C180 axis	C90/C270 axis	Basis
Maximum spacing for 50% footprint overlap	43.4 ft	43.4 ft	Approximately the full 50% practical footprint
Recommended conceptual uniform spacing	30 ft	30 ft	About 70% of the 50% footprint dimension
Approximate spacing criterion (SC)	1.50	1.50	Recommended spacing / 20 ft mounting height

Conceptual spacing range at 20 ft: 30 ft recommended; approximately 43 ft maximum for 50% overlap

The recommended spacing is intentionally conservative because this is a direct-only single-fixture calculation with no interreflection. At the maximum spacing, adjacent 50% footprints only meet or overlap slightly; local uniformity may be poor between fixtures if aiming, mounting height, obstructions or output vary. Closer spacing generally improves uniformity.

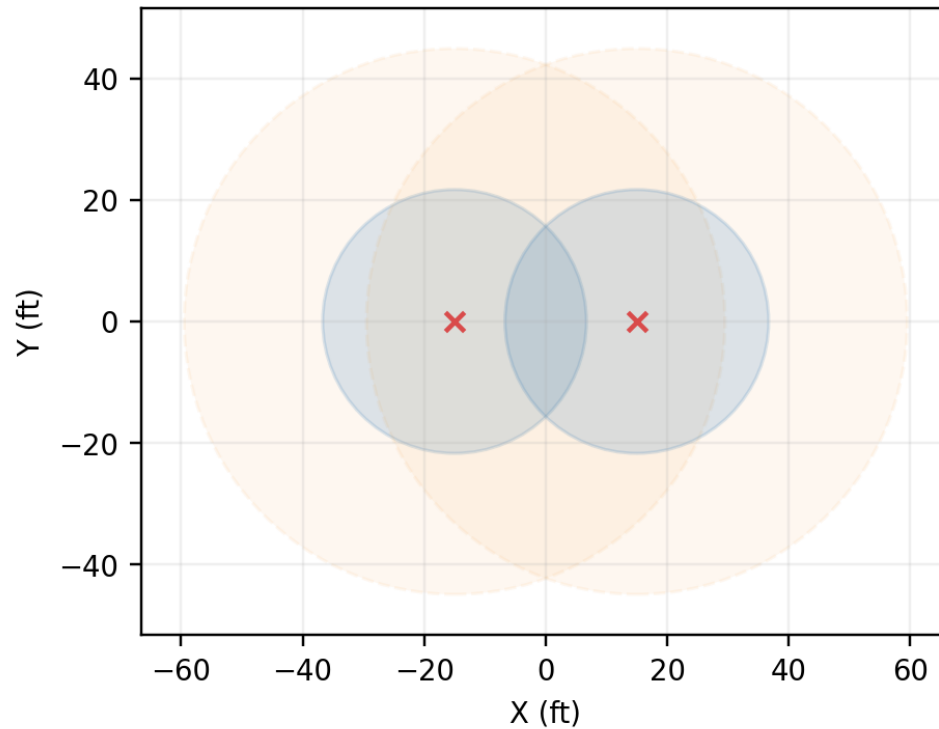
Spacing limitations and required project checks

Final spacing must be evaluated against required maintained illuminance, task category, emergency-lighting criteria, glare limits, hazardous-location restrictions, structural mounting positions, obstructions, surface reflectance and the number of fixtures. The SC value above is an engineering ratio derived from the calculated practical footprint; it is not a manufacturer-published spacing criterion.

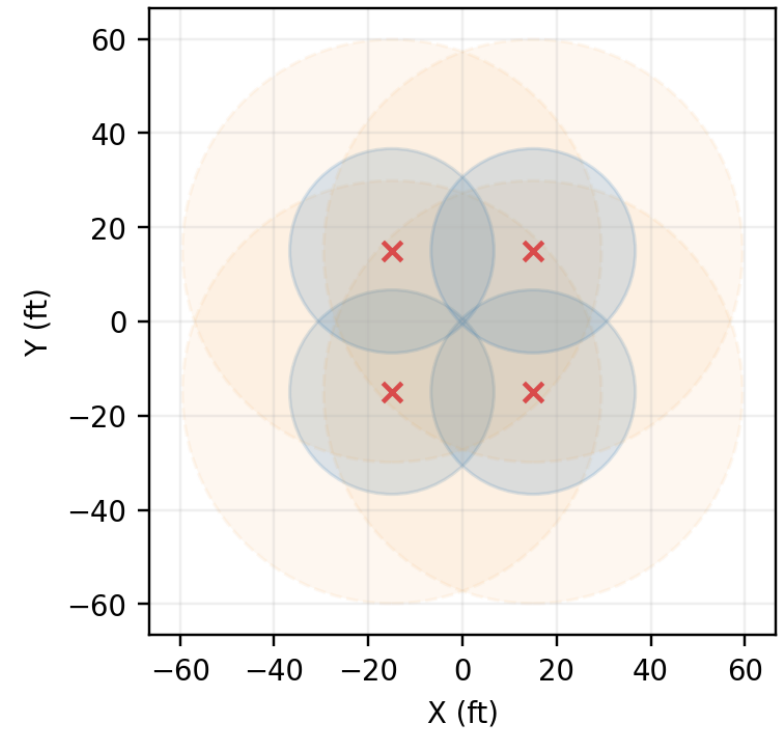
10. Multiple Fixture Layout Examples - Two and Four Fixtures

Conceptual Multiple-Fixture Layouts - 30 ft Spacing at 20 ft Mounting Height

2 fixtures - 2 x 1 conceptual grid
Approx. 10% footprint area: 119 x 90 ft



4 fixtures - 2 x 2 conceptual grid
Approx. 10% footprint area: 119 x 120 ft

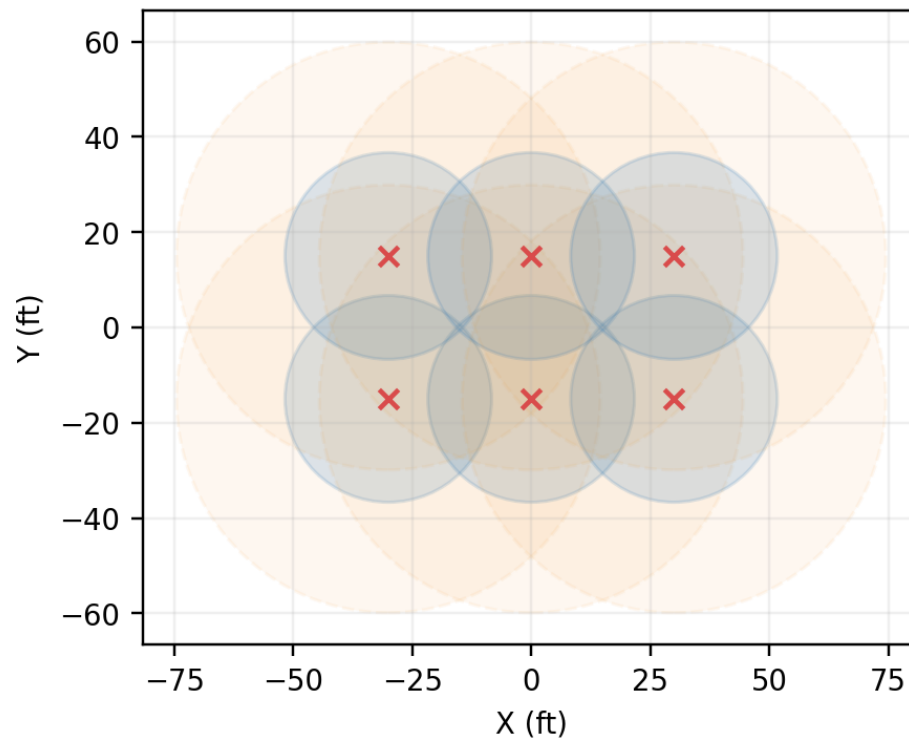


Red X marks show fixture centers. Blue areas represent approximate 50% practical footprints and dashed orange areas represent 10% practical footprints. These examples use the estimated 30 ft spacing at 20 ft mounting height and do not imply a site-specific lighting design.

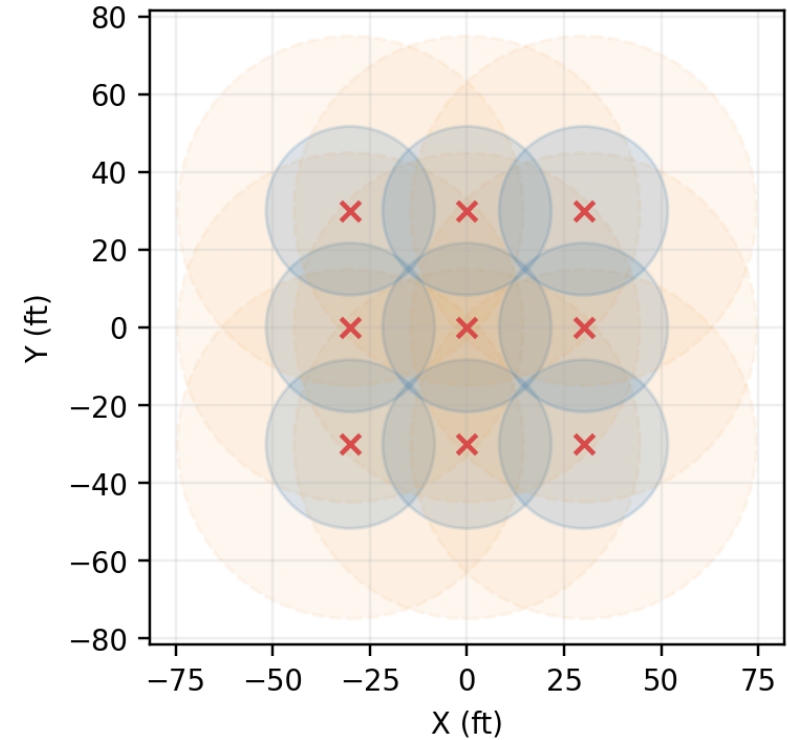
10. Multiple Fixture Layout Examples - Six and Nine Fixtures

Conceptual Multiple-Fixture Layouts - 30 ft Spacing at 20 ft Mounting Height

6 fixtures - 3 x 2 conceptual grid
Approx. 10% footprint area: 149 x 120 ft



9 fixtures - 3 x 3 conceptual grid
Approx. 10% footprint area: 149 x 150 ft



Approximate illuminated-area dimensions are bounding dimensions of the 10% practical footprints, not guaranteed maintained-lighting limits. Actual multi-fixture foot-candle levels require a project-specific calculation using the exact site geometry and fixture coordinates.

11. Performance Summary

BEAM TYPE	Very broad, batwing-like / near-Type-V distribution with off-axis peak intensity.
WIDE VS. NARROW	Wide. The 50% CBCP envelope extends beyond the horizontal plane, and the practical footprint is broad relative to mounting height.
BEST MOUNTING HEIGHT RANGE	Estimated 10-15 ft for useful low-level area illumination. At 20 ft, the maximum is approximately 0.38 fc with LLF 0.80. Heights of 25-30 ft are suited only to very low ambient targets unless multiple fixtures are used.
TYPICAL APPLICATIONS	Conceptual low-level area, equipment perimeter, platform, walkway, marker or general ambient illumination where broad coverage is more important than high center intensity. Application examples are engineering interpretations, not IES metadata.
STRENGTHS	Broad coverage; near-circular practical footprint; 166.4 lm/W based on IES listed lumens and watts; complete 360-deg C-plane data.
LIMITATIONS	Low candela and low foot-candle levels at higher mounting heights; approximately 27.6% of integrated flux is in the upper hemisphere; no reflected-light benefit is included; broad emission can increase glare or spill light depending on installation.

Interpretation boundary

Applications and performance interpretations are based only on the photometric shape and assumed calculation conditions. They are not product certification, hazardous-location suitability, code compliance or a recommendation for a specific site.

Appendix A. C-Plane Beam and Field Edge Data

C-plane	50% left	50% right	50% width	10% left	10% right	10% width
0.0	-107.8	107.5	215.2	-132.5	131.2	263.8
22.5	-112.2	106.5	218.8	-131.8	133.0	264.8
45.0	-109.0	109.5	218.5	-132.8	130.2	263.0
67.5	-108.0	109.8	217.8	-131.8	131.5	263.2
90.0	-112.0	105.5	217.5	-132.5	131.2	263.8
112.5	-102.0	109.2	211.2	-131.0	131.0	262.0
135.0	-108.0	110.0	218.0	-133.8	130.2	264.0
157.5	-111.2	106.2	217.5	-131.2	133.0	264.2
180.0	-107.5	107.8	215.2	-131.2	132.5	263.8
202.5	-106.5	112.2	218.8	-133.0	131.8	264.8
225.0	-109.5	109.0	218.5	-130.2	132.8	263.0
247.5	-109.8	108.0	217.8	-131.5	131.8	263.2
270.0	-105.5	112.0	217.5	-131.2	132.5	263.8
292.5	-109.2	102.0	211.2	-131.0	131.0	262.0
315.0	-110.0	108.0	218.0	-130.2	133.8	264.0
337.5	-106.2	111.2	217.5	-133.0	131.2	264.2

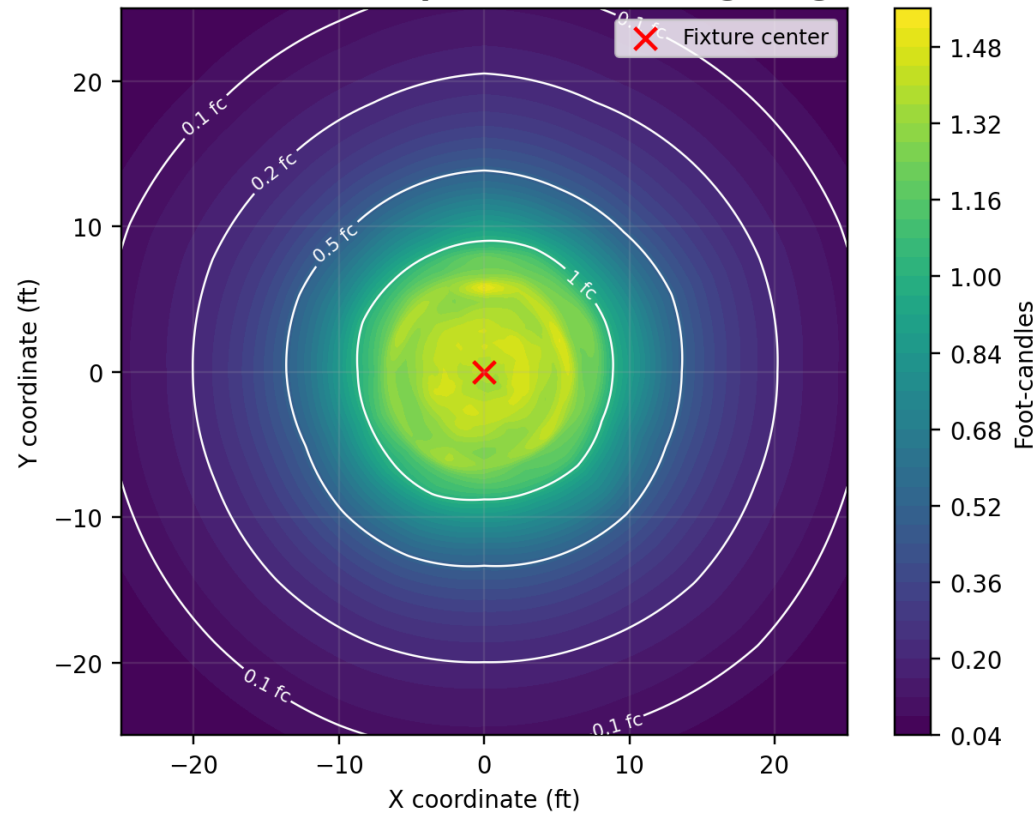
Angular-edge method

For each C-plane, the measured plane is paired with its opposite C-plane to form a full vertical great-circle. The table reports the contiguous 50% and 10% global-CBCP threshold envelope around nadir. Values are interpolated at 0.25 deg resolution and are estimates derived from the actual IES candela table.

Vertical zone	Lumens	Percent
0-30 deg	180.1	7.7%
30-60 deg	683.5	29.4%
60-90 deg	820.6	35.3%
90-120 deg	552.3	23.8%
120-150 deg	88.7	3.8%
150-180 deg	0.0	0.0%

Appendix B. Supplemental 10 ft Contours and Final Disclaimer

Iso-Foot-Candle Contour Map - 10 ft Mounting Height, LLF 0.80



10 ft supplemental case

Dense-map maximum	1.522 fc
50% footprint	21.7 x 21.7 ft
10% footprint	44.5 x 44.9 ft
LLF	0.80
Fixture count	1

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This report is a preliminary photometric analysis generated from the supplied IES photometric data using assumed installation conditions. It is intended only for conceptual planning and fixture evaluation. Actual lighting performance will vary depending on mounting height, aiming, room geometry, surface reflectance, obstructions, maintenance factors and environmental conditions. Final lighting layouts should be performed using project-specific dimensions and requirements.