

# ***Lindsey Beane***

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Lighting/Electrical  
Professor Mistrick  
Harris Theater for Music and Dance  
Chicago, IL

## **Appendix A**

***Appendix A includes supplemental information for the lighting design system. Below is a description of the order of information in this appendix.***

*Existing Conditions*

*Power Density Chart*

*Cove Detail for Type D*

*Lighting Fixture Schedule*

*Lighting Fixture Cut Sheets*

*Ballast Cut Sheets*

*Lamp Cut Sheets – Reference lighting schedule for fixture type*

*Lighting and Circuiting Layouts*

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## **Appendix A**

### *Existing Conditions*

#### *Theater Materials*

All walls, floor and ceiling were assumed to have a reflectance of 15%. All of those items are painted black or dark gray.

#### *Office Materials*

Finishes were all assumed. In the lobby area all walls are painted white and assumed to have a reflectance of 89%. The floor is sealed concrete and was assumed to have a reflectance of 45% and shows some specular qualities.

#### *Lobby and Entrance Materials*

Finishes were all assumed. In the lobby area all walls are painted white and assumed to have a reflectance of 89%. The floor is sealed concrete and was assumed to have a reflectance of 45% and shows some specular qualities.

### **Power Density ASHRAE 90.1**

#### **Space-by-Space Method**

Lobby, for performing arts theater	3.3 W/ft <sup>2</sup>
Audience/Seating Area, for performing arts theater	2.6 W/ft <sup>2</sup>
Office-Enclosed	1.1 W/ft <sup>2</sup>
Conference/Meeting/Multipurpose	1.3 W/ft <sup>2</sup>
*1.0 W/ft <sup>2</sup> may be added for accenting artwork	

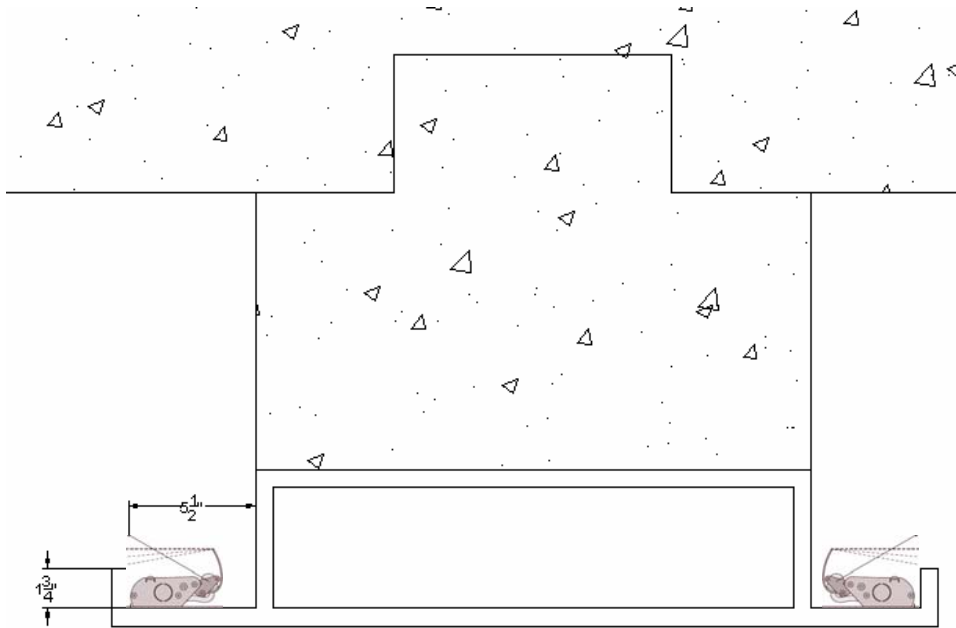
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## Appendix A

### *Cove Detail for Fixture Type D*



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## Appendix A

*The following sections of Appendix A include cut sheets for the lighting equipment used. Below is a description of the organization for the cut sheets.*

### Lighting Fixture Cut Sheets

The lighting fixtures are arranged in order of Type name. Please note the fixture type at the bottom right corner of each cut sheet page. The lamping listed here is correct and the lamps used are in the cut sheets following the ballast section.

Type	Mfr/Catalog #	Lamping			
A	 <b>Zumtobel Staff AQ-2285-4-T-SE</b> Description: Suspended fluorescent up/downlight with 2-F28T5 (48In) lamps. Optics: acrylic prismatic lens, anodized aluminum reflector 81% up/19% down.	2-F28T5 (48In) lamp	I	 <b>Lighting Services Inc M2907-**</b> Description: 6" track-mounted metal halide accent light with 1-70W PAR38 lamp. Optics: glare shield.	1-70W PAR38
			J	<b>Vari-lite</b> Description: Requires DMX controls, to be programmed with designer to pan over artwork in entrance window.	(1) 700 watt
B	 <b>Winona Lighting P1-FT139-LSS</b> Description: 20" surface-mounted compact fluorescent wallwasher with 1-FT40 lamp. Optics: anodized aluminum reflector, single.	1-FT40 lamp	K	 <b>Delray Lighting 77143-CF</b> Description: 13" suspended compact fluorescent downlight with 3-CFTR42W lamps. Optics: anodized aluminum reflector.	3-CFTR42W
C	 <b>Zumtobel Staff 1580-U</b> Description: 7" suspended compact fluorescent downlight with 2-CFQ13W lamp. Optics: painted or anodized aluminum reflector.	2-CFQ13W lamp	L	<b>Times Square Fresnel for Downlighting</b> Description: Fresnel adjustable spot, pipe mounted, black finish	100W PAR38
D	 <b>Winona Lighting P1-MC-T5-MCVU-RA</b> Description: Fluorescent cove light with 1-28T5 lamp (in cross-section).	1-28T5 lamp (in cross-section)	M	 <b>Cole Lighting LR 1P-T8</b> Description: Surface-mounted fluorescent step light with 1-T8 lamp (in cross-section). Optics: acrylic prismatic lens.	1-32T8 lamp section)
F	<b>Custom Fixture 4.5' x 4.5' x 6" Square Pendant</b> Description: 4.5' x 4.5' x 6" Pendant with acrylic glass on sides and bottom. Top is opaque and reflective on inner side of fixture.	(4) 28T5 bi-pin line	N	<b>Irwin Seating Company</b> Description: Concealed aisle fixture. Lamp is located under armrest of seat.	4W
G	 <b>Winona Lighting 5450-10-F-MB-STD</b> Description: Suspended compact fluorescent decorative pendant with 4-FT40 lamps.	4-FT40 lamps	P	<b>Times Square Lighting 702 Borderlight</b> Description: (8) compartment 8' fixture with tilt and locking rotation. Lens available to color each compartment separately.	Q2500P

# Aria™ Fluorescent Two Lamp, 28W T5 or 54W T5 HO

## Indirect/Direct Cable-Mounted

9" x 4"



**Applications:** An indirect/direct luminaire featuring new "waveguide" technology that results in a minimal profile and lightweight appearance. The patented microprism structure directs light downward in a glare free manner that is ideal for flat screen displays. The **square edges** conceal the T5 or T5 HO lamps within. The single array of lenses offers an even smaller profile at cost slightly lower than the double array.

Square edge, single panel

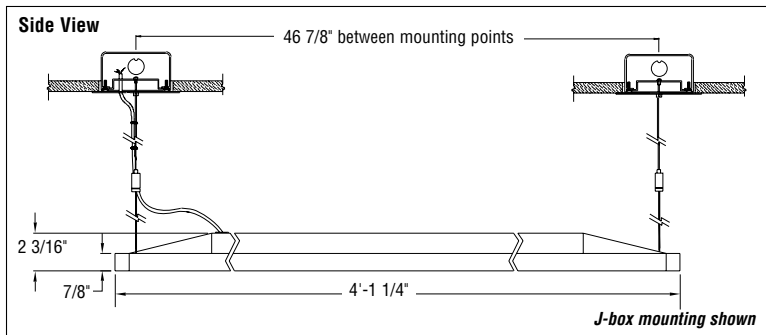
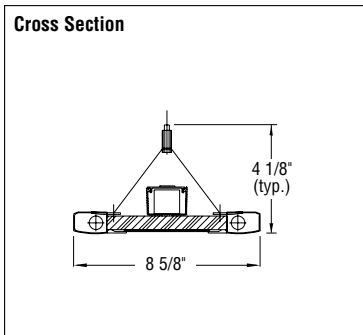
Type: \_\_\_\_\_

Project: \_\_\_\_\_

### USE THIS CHART FOR INDIVIDUAL FIXTURES ONLY (FOR CONTINUOUS RUNS SEE PAGE ARIA-4A)

ORDERING NOTE: Specify lampping, voltage, mounting and options.

▼ Fixture	▼ Lampping	▼ Length	▼ Color	▼ Optic	▼ Voltage	▼ Mounting	▼ Options
<b>AQ</b>		<b>4</b>	<b>T</b>	<b>SE</b>			
<b>AQ</b> Indirect/Direct Aria, Square Edge	<b>2285</b> (2) 28W T5 <b>2545</b> (2) 54W T5 HO	<b>4</b>	<b>T</b> Titan	<b>SE</b> Single panel wave-guide	<b>U</b> Multivoltage 120V/277V <b>2</b> 277V (NYC only) <b>3</b> 347V* <b>4</b> Dimming 120V* <b>5</b> Dimming 277V* <b>6</b> Dimming 347V* *consult factory for availability of ballast	<b>C1</b> 70" Cable <b>C2</b> 157" Cable  <i>Cable set comes factory installed with correct power feed and 5" canopy.</i>	<b>1</b> Stand-By Battery Pack, 1-lamp, (28W) <b>2</b> Stand-By Battery Pack, 1-lamp, (54W)



US Patent Des. #428,058  
IBEW Union Made

**1. Housing** - Extruded and die-cast aluminum with titan (matte silver) finish.

**2. Inner Reflector** - Specular aluminum, attached with concealed spring clips.

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**3. Lens** - Patented "waveguide" acrylic laminated lens with micro-prism structure. Single row of four panels for downward distribution. Pre-treated to be anti-static; clean with dry cloth only.

**4. Sockets** - Miniature bi-pin. Twist lock lamp installation.

**5. Lampping** - Two 28W T5 or 54W T5 HO (high output) fluorescent lamps. Supplied by others.

**6. Ballast** - Electronic multivoltage 120V/277V ballast. Ballast is mounted in center channel above

lenses, and accessible from above fixture. For availability of dimming ballasts, consult factory.

**7. Mounting** - Aircraft cable is available for junction box mounting with a 5" diameter canopy in standard lengths of 70" and 157". Cable sets and appropriate power feeds are factory installed on individual fixtures. Canopy covers are flat, 5" diameter, 16 gauge steel, white finish. Power cord is 18/3, gray. A 1/4-20 fastener (with cable and 2" diameter canopy) is provided for optional use at the non-power feed end. **Note: see page Aria-4A/4B for mounting in continuous runs.**

**8. Junction Box** - 4" octagonal junction box, supplied by others.

**9. Stand-by Battery Pack** - Integral, for one lamp operation, will operate for 90 minutes at 500 (28W) or 825 (54W) lumens. Charge indicator/test switch is factory installed.

**10. Weight** - 22.0 lbs.

In a continuing effort to offer the best product possible we reserve the right to change, without notice, specifications or materials that in our opinion will not alter the function of the product. Technical specification sheets that appear on [www.zumtobelstaffusa.com](http://www.zumtobelstaffusa.com) are the most recent version and supersede all other versions that exist in any other printed or electronic form.

ARIA-4

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# Continuous Run Fixtures

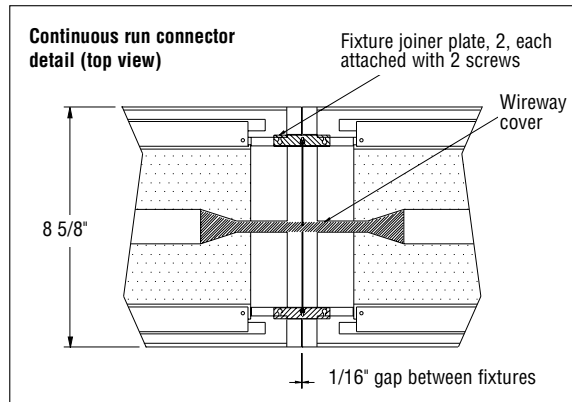
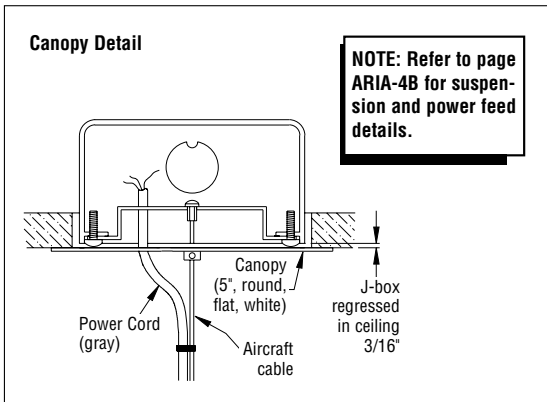
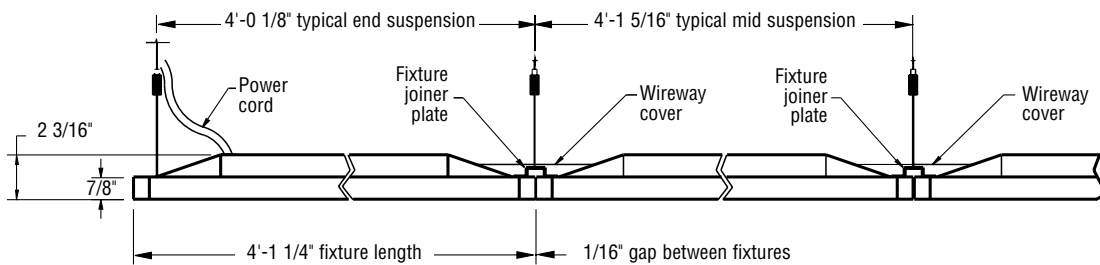
USE THESE CHARTS FOR CONTINUOUS RUNS ONLY (FOR INDIVIDUAL FIXTURES SEE PAGE ARIA-4)

**1. Select fixtures. Figure quantity of fixtures needed by using combinations of nominal 4' units, based on the overall length of the row.**

ORDERING NOTE: Specify lampping, voltage, mounting, options.

▼ Fixture	▼ Lamping	▼ Length	▼ Color	▼ Optic	▼ Voltage	▼ Mounting	▼ Options
<b>AQ</b>		<b>4</b>	<b>T</b>	<b>SE</b>		<b>00</b>	
<b>AQ</b> Indirect/Direct Aria, Square Edge	<b>2285</b> (2) 28W T5 <b>2545</b> (2) 54W T5 HO	<b>4</b>	<b>T</b> Titan	<b>SE</b> Single panel waveguide	<b>U</b> Multivoltage 120/277V <b>3</b> 347V* <b>4</b> 120V dimming* <b>5</b> 277V dimming* <b>6</b> 347V dimming* <i>*consult factory for availability of ballast</i>	<b>00</b> Fixture body only <i>(please use charts on page ARIA-4B to specify power feeds, canopies, and suspensions for continuous run fixtures)</i>	<b>1</b> Stand-By Battery Pack, 1-lamp, (28W) <b>2</b> Stand-By Battery Pack, 1-lamp, (54W)

Typical Continuous Run



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ARIA-4A

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# Continuous Run/Suspension Information

## 2. Select Power Feed Suspensions

AS	Suspension Type/Length	Power Cord Color	Canopy	Feed	Fixture Voltage
<b>AS</b> Aria Single panel waveguide	<b>CBL070</b> Aircraft Cable 70" <b>CBL157</b> Aircraft Cable 157"	<b>T</b> Gray	<b>J5</b> J-box mounting, 5" round, flat canopy, white <b>T5</b> T-bar mounting, 5" round, flat canopy, white	<b>F3</b> 3-wire power feed (standard) <b>F5</b> 5-wire power feed (use for dimming or for stand-by battery pack)	<b>U</b> Multivoltage 120/277V <b>2</b> 277V (NYC) <b>3</b> 347V  <b>NOTE:</b> If voltage is not specified, <b>U</b> (Multivoltage 120/277V) feeds will be supplied.
<b>Maximum length of fixture run per feed:</b>					
	<b>(2) 28W T5</b>	<b>(2) 54W T5 HO</b>			
<b>120V</b>	32 ft.	16 ft.			
<b>277V</b>	80 ft.	44 ft.			

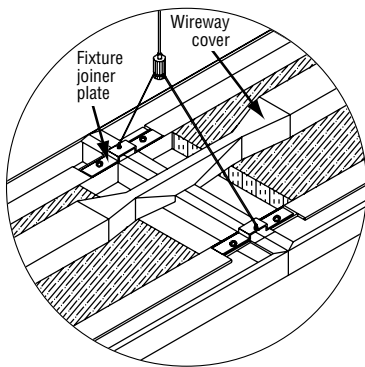
## 3. Select Non-Power Feed Suspensions

AS	Suspension Type/Length	Canopy
<b>AS</b> Aria Single panel waveguide	<b>CBL070</b> Aircraft Cable 70" <b>CBL157</b> Aircraft Cable 157"	<b>J5</b> J-box mounting, 5" round, flat canopy <b>S2</b> 1/4-20, 2" flat canopy <b>S5</b> 1/4-20, 5" flat canopy <b>Note:</b> for T-bar mounting, use <b>S2</b> or <b>S5</b> canopies.

**NOTE:** Number of non-feed suspension kits needed per row equals the number of fixtures per row.

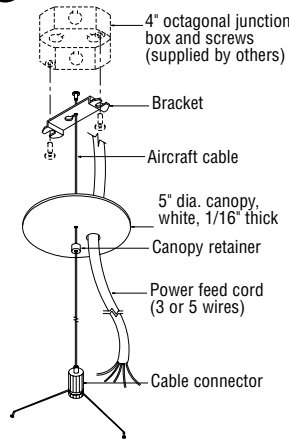
**NOTE:** Each non-power feed suspension (**J5**, **S2** or **S5**) is supplied with wireway cover, fixture joiner plate, hardware and (not shown) wire harness.

Mid-connection view (typical)

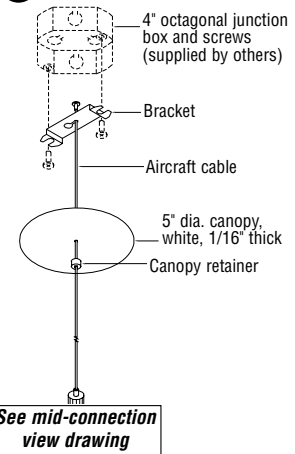


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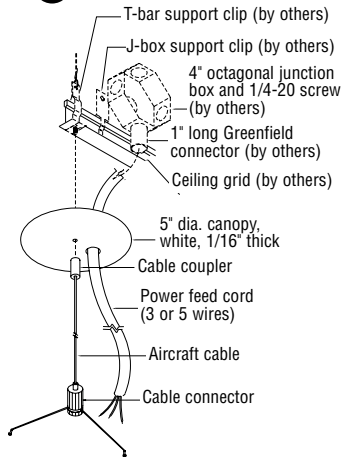
### J5 J-box Mounted with Power Feed



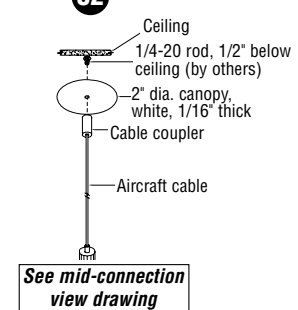
### J5 J-box Mounted Non-Power Feed



### T5 T-bar Mounted with Power Feed



### S2 1/4-20 Fastener



ARIA-4B

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# Photometric Data

## AQ 2545 4' T SE (2) 54W T5 HO

INDIRECT/DIRECT, SQUARE EDGE, SINGLE PANEL

Total Luminaire Efficiency 66%

81% Uplight      19% Downlight

Spacing Criteria

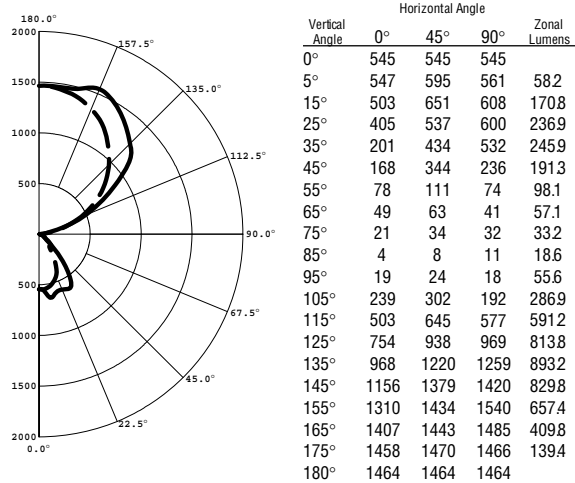
Lateral Plane      0°      90°

1.01      .4

TOTAL LAMP LUMENS = 8800

INPUT WATTS = 118

### Candela Distribution



### Luminance Data in Candela / Sq. Meter

Angle in Vertical°	Average 0°	Average 45°	Average 90°
45°	23053	47190	32337
55°	13103	18732	12494
65°	11312	14547	9293
75°	7943	12552	11877
85°	4896	8790	11683

### Coefficients of Utilization

Effective Floor Cavity Reflectance = 20%

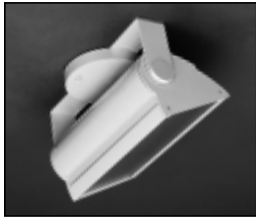
pcc	0.8				0.7				0.5				0.3			
	pw	0.7	0.5	0.3	0.1	0.7	0.5	0.3	0.1	0.5	0.3	0.1	0.5	0.3	0.1	
0	66	66	66	66	58	58	58	58	44	44	44	30	30	30		
1	60	57	55	53	53	51	49	47	38	37	36	27	26	26		
2	55	51	47	44	48	45	42	39	34	32	30	24	23	22		
3	50	45	40	37	44	40	36	33	30	28	26	22	20	19		
4	46	40	35	31	41	35	31	28	27	24	22	19	18	16		
5	42	35	30	27	37	31	27	24	24	21	19	17	16	14		
6	39	32	27	23	34	28	24	21	22	19	17	16	14	13		
7	36	28	24	20	32	25	21	18	20	17	15	14	13	11		
8	33	26	21	18	29	23	19	16	18	15	13	13	11	10		
9	31	23	19	16	27	21	17	14	16	14	12	12	10	9		

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**Profile** - P1 (basic): Anodized, extruded aluminum specular reflector with solid aluminum endcaps and stainless steel hardware.

**Type** - Large profile with smooth or ribbed detail.

**Indoor**; non-gasketed, captive extruded alum. hinge for lens and baffle options.

**Outdoor**; silicone gasketed lens, captive extruded alum. door with window cut-out for regressed lens.

**Aperture**; open aperture is standard for indoor fixtures. Outdoor fixtures shall be specified with clear acrylic lens option.

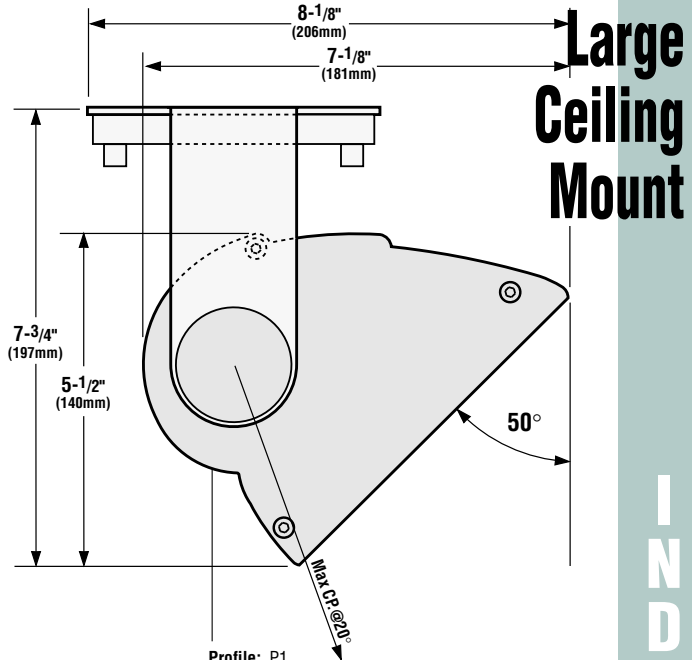
**Mounting** - Three standard mounts are fully adjustable and lockable. Designed for remote or integral ballast.

**Performance** - Asymmetric distribution provides a concentration of light on to target surface for smooth illumination. Maximum candlepower aimed 20° above nadir has less than 10% spill light within the 0-20° zone and less than 2% spill light within the 90 - 180° zone.

**Electrical** - Electronic, HPF ballast, lamp protection circuit, Class P and thermally protected. Provide 90° C supply wire. See Technical section for ballast data.

**Finishes** - An electrostatically applied wet paint system utilizes a multi-stage process to provide a durable acrylic enamel finish. Suitable for indoor and outdoor applications.

**Options** - For complete list and detailed descriptions, refer to Options Section.










**Profile:** P1  
**Type:** LS, LR, LSW, LRW  
**Mount:** LS8  
**Length:** Refer to chart below.  
**Scale:** 3/8" = 1"

**Large Ceiling Mount**

INDOOR | OUTDOOR

**HOW TO SPECIFY**

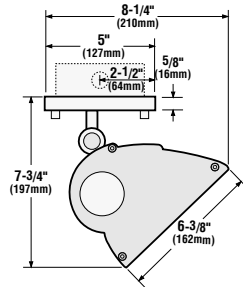
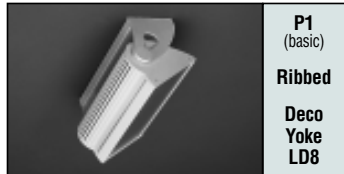
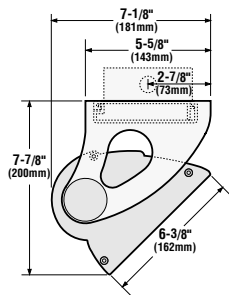
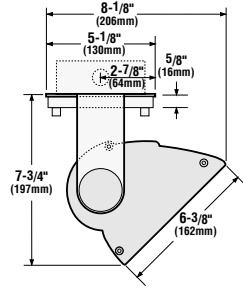
PROFILE	TYPE	LAMPING	VOLTAGE	MOUNTING	FINISH	OPTIONS	CLASS		
P1	LS	FT140	277V	LS8	SGW	X	STD		
			120V or 277V						
 <p>P1 (basic)</p>	<p><b>Indoor Locations:</b> (damp label)</p> <p><b>LS:</b> Large Smooth</p> <p><b>LR:</b> Large Ribbed</p> <p><b>Outdoor Locations:</b> (wet label)†</p> <p><b>LSW:</b> Large Smooth Wet</p> <p><b>LRW:</b> Large Ribbed Wet</p>	<p><b>Code</b>    <b>Description</b>    <b>Length</b>    <b>Weight</b></p> <p><b>Compact Fluorescent</b></p> <p>tCFM142 (1)CFM42W/GX24 12" 8 lbs.</p> <p>*tCFM157 (1)CFM57W/GX24 12" 8 lbs.</p> <p>*tCFM170 (1)CFM70W/GX24 16" 10 lbs.</p> <p>tCFM242 (2)CFM42W/GX24 20" 13 lbs.</p> <p>*tCFM257 (2)CFM57W/GX24 20" 13 lbs.</p> <p>FT139 (1)FT39W/2G11 20" 13 lbs.</p> <p>FT239 (2)FT39W/2G11 20" 13 lbs.</p> <p>FT140 (1)FT40W/2G11 25" 19 lbs.</p> <p>FT240 (2)FT40W/2G11 25" 19 lbs.</p> <p>FT150 (1)FT50W/2G11 25" 19 lbs.</p> <p>FT250 (2)FT50W/2G11 25" 19 lbs.</p> <p>FT155 (1)FT55W/2G11 25" 19 lbs.</p> <p>FT255 (2)FT55W/2G11 25" 19 lbs.</p> <p>*tCFM270 (2)CFM70W/GX24 25" 19 lbs.</p>	<p><b>Remote Ballast</b></p>  <p>LS8: Simple Yoke</p>  <p>LD8: Deco Yoke</p>  <p>LK8: Knuckle</p> <p><b>Integral Ballast</b></p>  <p>LS9: Simple Yoke</p>  <p>LS13: Simple Yoke</p>	<p><b>SGW:</b> Semi-Gloss White</p> <p><b>SGB:</b> Semi-Gloss Black</p> <p><b>ALP:</b> Aluminum Paint (matte finish)</p> <p><b>LGP:</b> Light Gold Iridescent (gloss finish)</p> <p><b>PBP:</b> Pale Bronze Paint (gloss finish)</p> <p><b>CPF:</b> (MOD) Custom Painted Finish</p>	<p><b>X:</b> No Options</p> <p><b>SV:</b> (P1 only) Short Visor</p> <p><b>SB:</b> Straight Blade Baffle (external mount CFM lamps only)</p> <p><b>PB:</b> Parabolic Blade Baffle (internal mount)</p> <p><b>EM:</b> (remote) Emergency Battery</p> <p><b>CA:</b> (CFM lamps only) Clear Acrylic Lens</p> <p><b>SO:</b> (MOD) Special Option</p>	<p><b>STD:</b> Indicate only when specifying a standard.</p> <p><b>MOD:</b> Indicate when specifying any modification.</p> <p><b>PHOTOMETRY</b></p>  <p>(1) FT40W Refer to Technical Section for detailed Photometry Reports. Report #10935</p>			
		<p><b>Linear Fluorescent</b></p> <p>- For single linear or continuous row applications see <b>Surface Linear Tab.</b></p> <p><b>Note:</b> CFM42 lamp is a "delta" pattern lamp. CFM57 and CFM70 lamps are "octa" pattern lamps.</p>							
		<p>† Wet label and CA option are available for CFM type lamps only. *Consult Factory for availability of CFM57 and CFM70 lamps.</p>							

- All fixtures U.L. listed, (USA & Canada). © Copyright 2002.  
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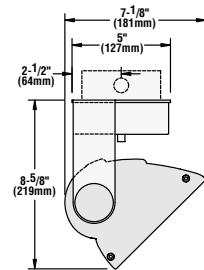
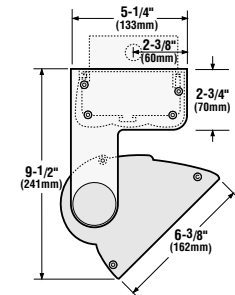
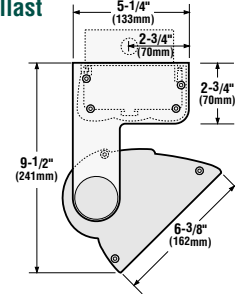
## Large Ceiling Mount

### MOUNTING STYLES\*

#### Remote Ballast



#### Integral Ballast



**NEW!**

\* P1 profile can be combined with any mounting style

PAGE:SC.8

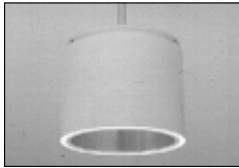
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# Pendant

**Compact Fluorescent  
(2) 13w, 18w or 26w  
Quad Tube**

**Pendant-Mounted  
Cylinder Downlight**

**10"**



**Applications:** The classic cylindrical shape, pendant mounted, to provide downlighting in high ceilings. Easy to install and maintain, this energy efficient luminaire suits a wide variety of projects.

Type: \_\_\_\_\_

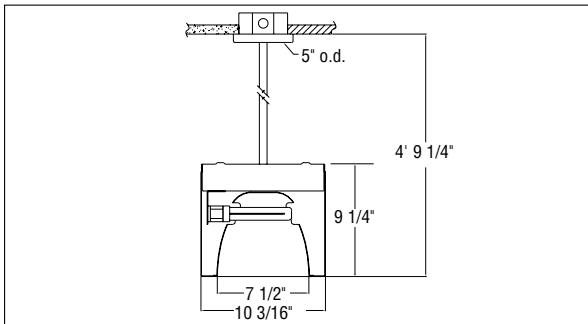
Project: \_\_\_\_\_

ORDERING NOTE: Fixture supplied as complete unit. Specify fixture, reflector finish, fixture finish and options.

▼ Fixture      ▼ Reflector Finish      ▼ Fixture Finish      ▼ Ballast/Voltage      ▼ Options

			<b>U</b>	
<b>1580</b> Pendant-Mounted Cylinder Downlight, (2) 13w Quad Tube <b>1583</b> Pendant-Mounted Cylinder Downlight, (2) 18w Quad Tube <b>1587</b> Pendant-Mounted Cylinder Downlight, (2) 26w Quad Tube	<b>CL</b> Clear Specular <b>GD</b> Gold Specular Alzak®	<b>WH</b> White <b>SP</b> Specify Color (approved color chip required)	<b>U</b> Multivoltage 120/277V	<b>FS</b> Fusing <b>HDM</b> Dimming Electronic (18w or 26w only)* <b>EEB4</b> Stand-By Battery Pack (18w or 26w only)* <b>77500</b> Stand-Off and Lens (Diffuse)* <b>77600</b> Stand-Off and Lens (Clear)*

\*consult factory



IBEW Union Made

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 3300 Route 9W  
 Highland, NY 12528-2630  
 TEL (845) 691-6262 • (800) 932-0633 • FAX (845) 691-6289  
 89 00149 9/00

**1. Socket Assembly** - 16 gauge galvanized formed steel stationary socket assembly.

**2. Ballast** - One two-lamp, thermally protected Class P electronic ballast is supplied. Micro-processor-controlled ballast operates on 120/277v, 60 Hz.

**3. Junction Box** - 4" round or octagonal, supplied by others.

**4. Mounting Pan** - 20 gauge steel base pan.

**5. Pendant Mounting Assembly** - Canopy and pendant supplied with

40° hang straight swivel. Standard pendant length is 4'. Custom lengths are available (consult factory). Pendant is field-cuttable.

**6. Lamps/sockets** - Two 13w, 18w or 26w quad tube T4 (supplied by others). Two G24q-1 sockets (for 13w), G24q-2 (for 18w) or G24q-3 (for 26w) quad tube T4 lamps. Lampholders are supplied pre-wired to ballast.

**7. Reflector** - Aluminum reflector photometrically designed for horizontally-oriented quad tube T4 fluorescent lamps. Finished with 99.98% pure clad, anti-iridescent

aluminum coating, polished and sealed. Gold Alzak® finish is also available.

**8. Fixture Housing** - .050" spun aluminum housing painted with thermosetting powdercoat (specify finish).

**9. Weight** - 7.0 lbs. without pendant.

**Note:** For EM or HDM, consult factory. Height of fixture will increase.

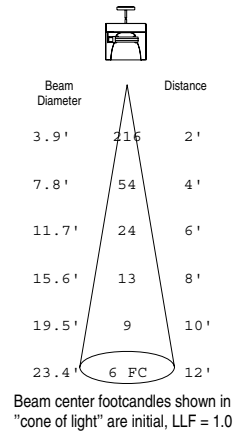
In a continuing effort to offer the best product possible, we reserve the right to change, without notice, specifications or materials that in our opinion will not alter the function of the product.

SP-2

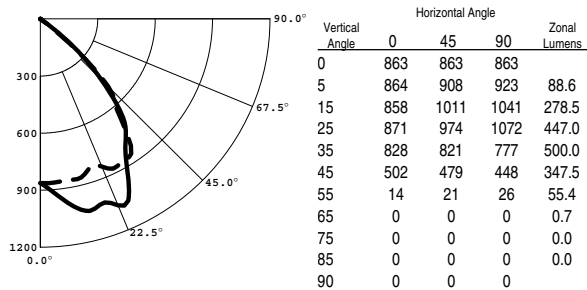
**ZUMTOBEL STAFF**  
 THE LIGHT ®

# Photometric Data

**1587 CL (2) 26W CFL**  
 10° PENDANT MOUNTED DOWNLIGHT  
 ITL 35501  
 Total Luminaire Efficiency 48%  
 0% Uplight 100% Downlight  
 Spacing Criteria  
 Lateral Plane 0 90  
 1.4 1.4  
 TOTAL LAMP LUMENS = 3600  
 INPUT WATTS = 50



## Candela Distribution



## Luminance Data in Candela / Sq. Meter

Angle in Vertical	Average 0	Average 45	Average 90
45	24908	23742	22229
55	856	1285	1590
65	0	0	0
75	0	0	0
85	0	0	0

## Coefficients of Utilization

Effective Floor Cavity Reflectance = 20%

pcc	0.8				0.7				0.5				0.3				
	0.7	0.5	0.3	0.1	0.7	0.5	0.3	0.1	0.5	0.3	0.1	0.5	0.3	0.1	0.5	0.3	0.1
0	57	57	57	57	56	56	56	56	53	53	53	51	51	51	51	51	51
1	54	53	51	50	53	52	50	49	50	49	48	48	47	46	46	46	46
2	51	48	46	44	50	47	45	44	46	44	43	44	43	42	42	42	42
3	48	44	41	39	47	44	41	39	42	40	38	41	39	38	38	38	38
4	45	41	37	35	44	40	37	35	39	36	34	38	36	34	34	34	34
5	42	37	34	32	41	37	34	31	36	33	31	35	33	31	31	31	31
6	39	34	31	28	39	34	31	28	33	30	28	32	30	28	28	28	28
7	37	32	28	26	36	31	28	26	31	28	26	30	27	25	25	25	25
8	35	29	26	24	34	29	26	23	28	25	23	28	25	23	23	23	23
9	32	27	24	21	32	27	24	21	26	23	21	26	23	21	21	21	21

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 89 00149 9/00

SP-2A

**ZUMTOBEL STAFF**  
 THE LIGHT ®

Micro Cove Mount



**Profile** - P1 (basic): Anodized, extruded aluminum specular reflector with solid aluminum endcaps and stainless steel hardware.

**Type** - Micro reflector profile for concealed applications. For indoor use only.

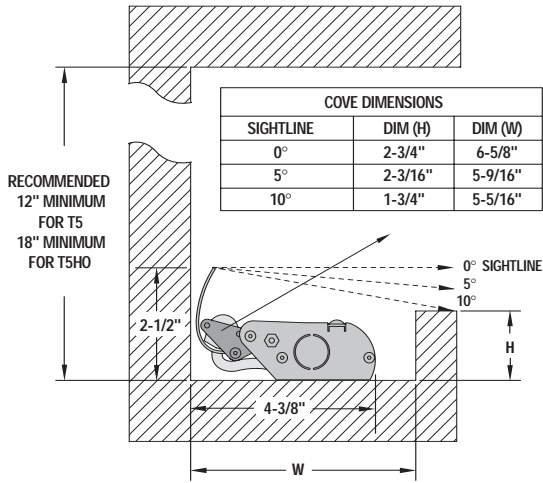
**Mounting** - Integral electronic ballast with fully adjustable and lockable aiming mechanisms. Fixtures may be mounted end to end and aimed individually without gaps between them. Mounting holes located within ballast compartment. Universal base or wall mount.

**Performance** - Asymmetric distribution provides a concentration of light on target surface for smooth illumination. Maximum candlepower aimed 115° above nadir has less than 15% spill light within the 0-115° zone and less than 3% spill light within the 180-270° zone.

**Electrical** - Electronic HPF ballast, with end of lamp life protection circuit, less than 10% THD. Class P and thermally protected. Provide 90° C supply wire. Ballast compartment includes conduit entry at each end for through-wiring when mounted end to end. Access to ballast is gained via removable cover that runs the length of the enclosure. Specify Quick Connect (QC) wiring option for fast through wiring of multiple sections.

**Finishes** - Bright anodized specular reflector with mill finished aluminum components and stainless steel hardware.

**Options** - See below specification worksheet for a complete list of options for this product.



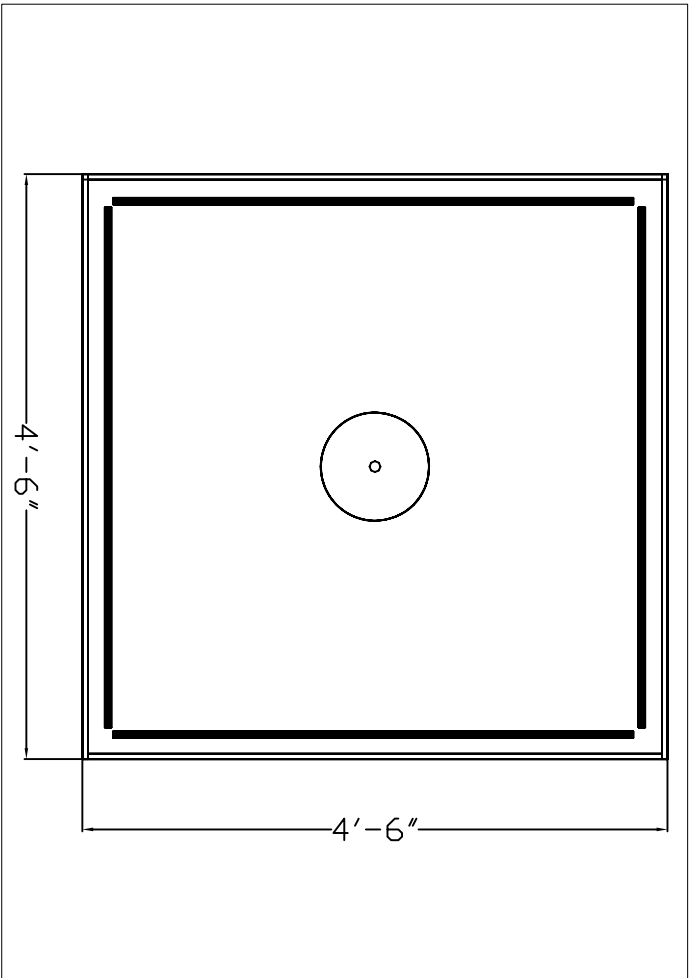
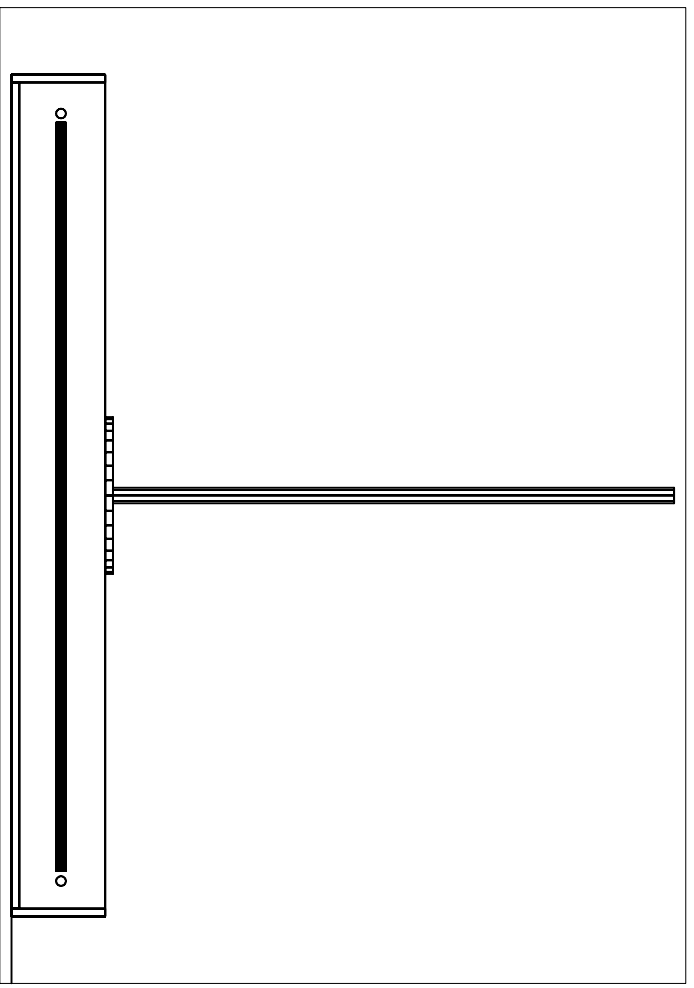
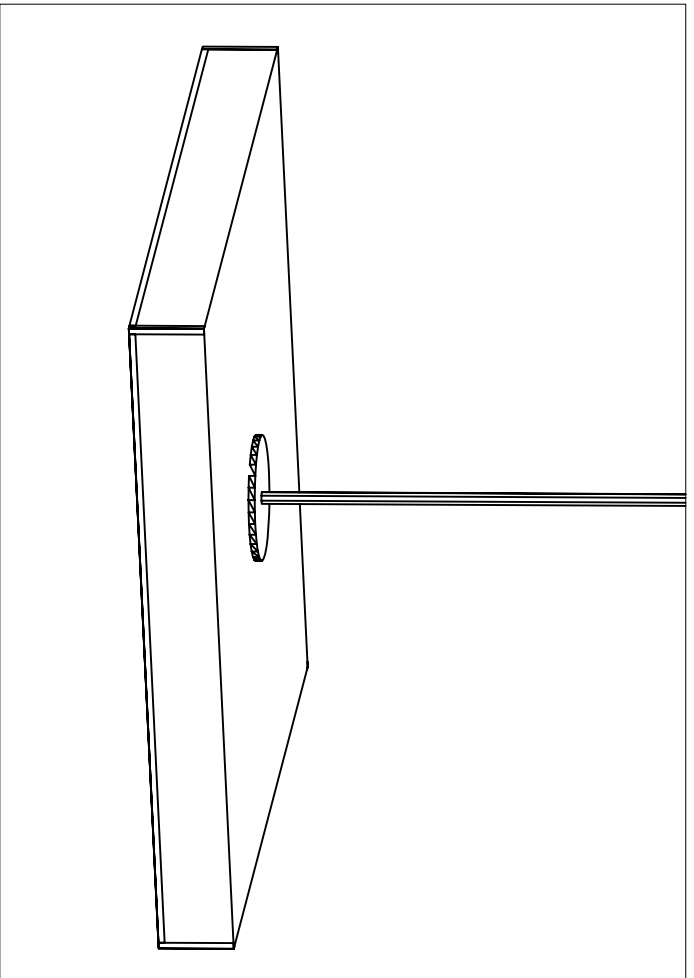
Lamp Code	Lamp Wattage	Actual Luminaire Length	Weight
124T5 or 124T5/HO	1-14w or 1-24w/HO	23"	3 lbs.
136T5 or 136T5/HO	1-21w or 1-39w/HO	34-13/16"	4 lbs.
148T5 or 148T5/HO	1-28w or 1-54w/HO	46-5/8"	5 lbs.
160T5 or 160T5/HO	1-35w or 1-80w/HO	58-7/16"	6 lbs.
272T5 or 272T5/HO	2-21w or 2-39w/HO	69-13/16"	8 lbs.
296T5 or 296T5/HO	2-28w or 2-54w/HO	93-7/16"	10 lbs.

HOW TO SPECIFY								
PROFILE	TYPE	LAMPING CODE		VOLTAGE	MOUNTING	FINISH	OPTIONS	
<p>P1 (basic)</p>	Indoor Locations:	MC: Micro Cove	Lamp Count	Nominal Length	Lamp Type	120 or 277	Integral Ballast MCVU	
			1	24"	T5(1-F14w)			
			1	36"	T5(1-F21w)			
			1	48"	T5(1-F28w)			
			1	60"	T5(1-F35w)			
			2	72"	T5(2-F21w)			
	<p>(base mount)</p> <p>OR</p> <p>(wall mount)</p>	RA: Anodized Aluminum	X: No Options EM: (remote) Emergency Battery SO: (MOD) Special Option QC: Quick Connect (see product text) DM: Dimming Ballast (10%-100% range)	STD: Indicate only when specifying a standard. MOD: Indicate when specifying any modification.	<p>PHOTOMETRY</p> <p>F54WT5/HO Refer to Technical Section for detailed Photometry Reports. Report #10900</p>			
						2	96"	T5(2-F28w)
						1	24"	T5/HO(1-F24w)
						1	36"	T5/HO(1-F39w)
						1	48"	T5/HO(1-F54w)
						1	60"	T5/HO(1-F80w)
						2	72"	T5/HO(2-F39w)
						2	96"	T5/HO(2-F54w)

INDOOR

PAGE:CC.3

- All fixtures U.L listed, (USA & Canada). © Copyright 2004.  
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## Custom Square Pendant

4'-6" Square

Frosted Acrylic Glass on sides and bottom

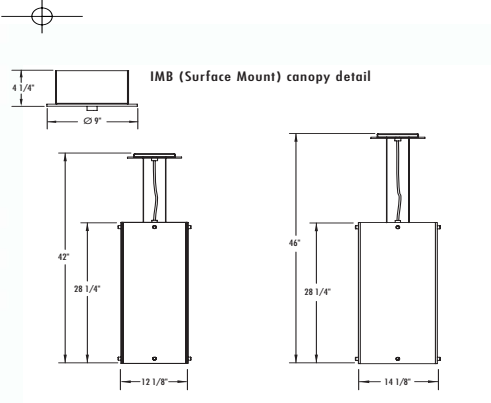
Solid top, inside painted matte white

(4) 28T5 lamps mounted as shown above

**Type F**



5450  
SHARIS



**SUBMITTAL SPECIFICATIONS:**

5450	CATALOG NUMBER	LAMPING	VOLTAGE	LENS OPTION	FINISH	BALLAST	SPECIAL
------	----------------	---------	---------	-------------	--------	---------	---------

**PRODUCT SPECIFICATIONS:**

Catalog#:		5450-10, 5450-12	
<b>Lamping:</b>	5450-10	F - F/H100- F/MH100-	(4) FT40W/2G11 (4) FT40W/2G11 and (1) 100W Par 38 Halogen Downlight (4) FT40W/2G11 and (1) 100W Par 38 Metal Halide Downlight
	5450-12	F - F/H250- F/MH100-	(4) FT50W/2G11 (4) FT50W/2G11 and (1) 250W Par 38 Halogen Downlight (4) FT50W/2G11 and (1) 100W Par 38 Metal Halide Downlight
<b>Voltage:</b>	120V or 277V <i>(when using Halogen Downlight 120V only)</i>		
<b>Lens Option:</b>	FAH is our Hand Painted Acrylic. See page 13 for an example or visit our website for more information.	QA- WLG- FAH4- FAH5- FAH6- FAH7-	Opal Acrylic - Etched White Laminated Glass (Shown) White Vein Hand Painted Foxx Alabaster Antique (Brige) Hand Painted Foxx Alabaster Grey Vein Hand Painted Foxx Alabaster Beige Vein Hand Painted Foxx Alabaster
<b>Finishes:</b>	Standard	BN- BB- CPF- CMF-	Brushed Nickel (Shown) Brushed Brass Custom Painted Finish (Consult Factory) Custom Metal Finish (Consult Factory)
<b>Ballast:</b>	Metal Halide	IMB- RMB-	Integral Electronic (See Surface Mount Canopy Detail) Remote Mount Magnetic
	Fluorescent**	DIM-	Dimming (Lutron ECO 10)
	Fluorescent/Metal Halide**	DIM/IMB- DIM/RMB-	Dimming (Lutron ECO 10) / Integral Electronic (See Surface Mount Canopy Detail) Dimming (Lutron ECO 10) / Remote Mount Electronic
<b>Special:</b>		STD- MOD-	Standard Modified Standard
<b>Weight:</b>		F- F/H- F/MH-	10- 40 lbs. 12- 55 lbs. NOTE: For fixtures over 50 lbs. additional mounting support required. 10- 45 lbs. 12- 60 lbs. 10- 55 lbs. 12- 70 lbs.

\*\* Dimming option for Fluorescent lamps only; Lutron ECO-10 ballast's offer 100% to 10% dimming. ECO-10 ballast's are fully compatible with Lutron's complete line of 3-wire fluorescent controls.

5451 / LESLEY COMPLIMENTARY WALL BRACKET - SEE PAGE 12 FOR BRACKET SPECIFICATIONS



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Job Name: \_\_\_\_\_

Type: \_\_\_\_\_

Order Number: \_\_\_\_\_

## M2907 Series 120/277V PAR38

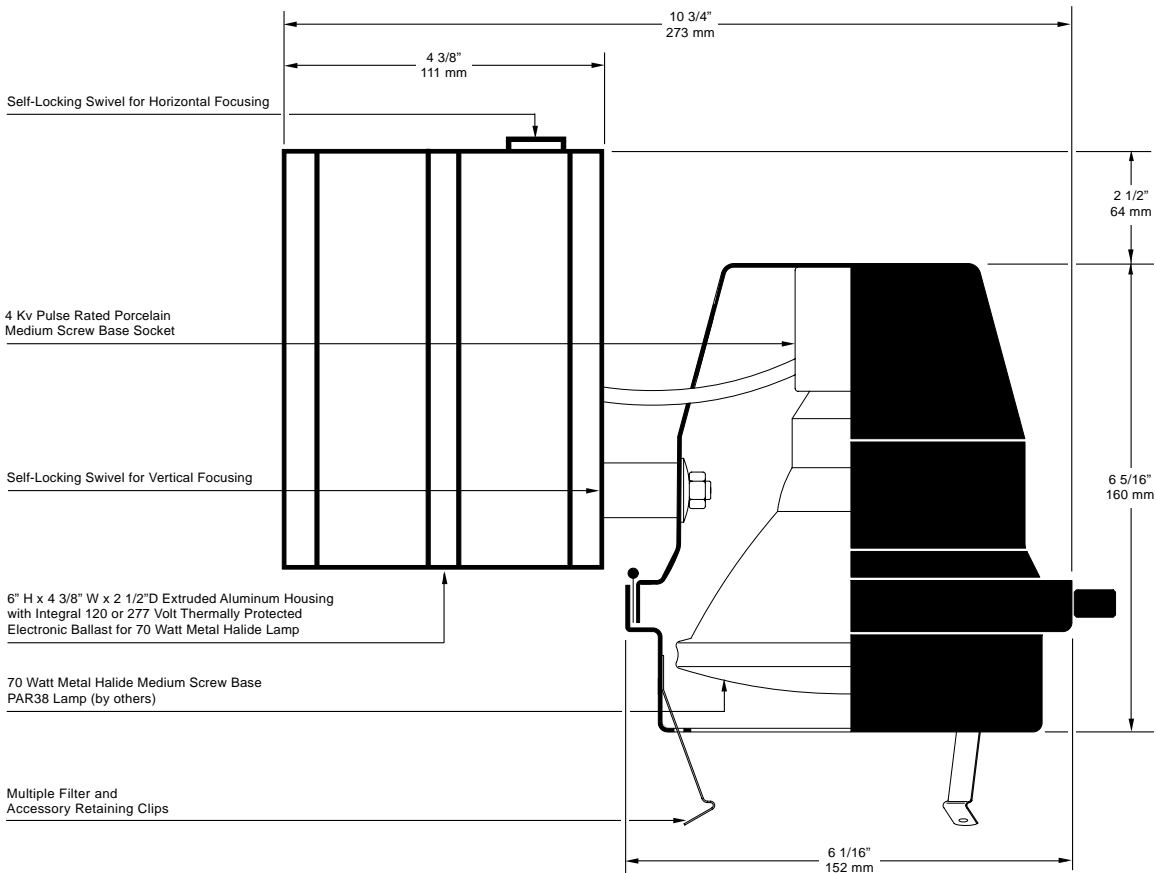


The M2907 Spotlight Series is a specification grade medium and long throw, high intensity unit specifically designed for the 70 watt PAR38 ceramic Metal Halide medium screw base lamps, which are highly efficient and long lived. Its light weight and functional styling also make it the perfect unit for all retail, display and exhibit, architectural and residential environments.

Features include rugged steel and aluminum construction, on/off switch on most mounting types, and multiple accessory clips for Size C accessories which include: Color Filters and Spread Lens, Louver, Hoods, Light Blocking Screens and UV Blocking Filter. Unit available with 120 volt or 277 volt ballast.

UL and CUL Listed  
USA Manufactured/IBEW

M2907-00 (120V)  
VM2907-00 (277V)



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Job Name: \_\_\_\_\_

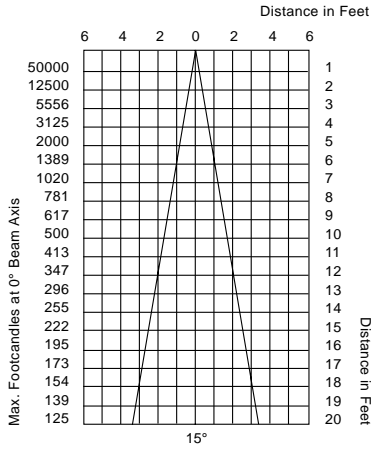
Type: \_\_\_\_\_

Order Number: \_\_\_\_\_

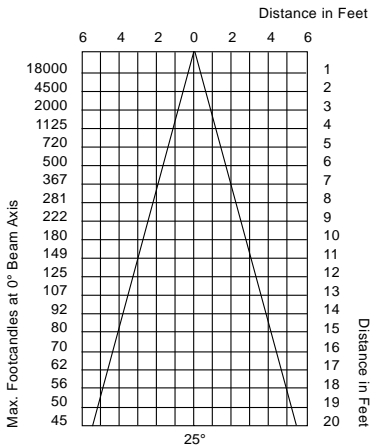
# M2907 Series 120/277V PAR38

### Photometric Data <sup>4</sup>

**CDM70/PAR38/SP/3K** 70 watt, Spot  
Beam Spread to 50% of CBCP 15°  
Center Beam Candlepower 50000



**CDM70/PAR38/FL/3K** 70watt, Flood  
Beam Spread to 50% of CBCP 25°  
Center Beam Candlepower 18000



### Lamp Types

**CDM70/PAR38/SP/3K** 70 watt, 10000 hours  
Beam Spread to 50% of CBCP 15°  
Center Beam Candlepower 50000  
Color Temperature 3000K  
Color Rendering Index 82

**CDM70/PAR38/FL/3K** 70 watt, 10000 hours  
Beam Spread to 50% of CBCP 25°  
Center Beam Candlepower 18000  
Color Temperature 3000K  
Rendering Index 82

**CDM70/PAR38/WFL/3K** 70 watt, 10000 hours  
Beam Spread to 50% of CBCP 60°  
Center Beam Candlepower 5000  
Color Temperature 3000K  
Color Rendering Index 82

**CDM70/PAR38/SP/4K** 70 watt, 10000 hours  
Beam Spread to 50% of CBCP 15°  
Center Beam Candlepower 42000  
Color Temperature 4000K  
Color Rendering Index 92

**CDM70/PAR38/FL/4K** 70 watt, 10000 hours  
Beam Spread to 50% of CBCP 25°  
Center Beam Candlepower 16000  
Color Temperature 4000K  
Color Rendering Index 92

**CDM70/PAR38/WFL/4K** 70 watt, 10000 hours  
Beam Spread to 50% of CBCP 60°  
Center Beam Candlepower 4000  
Color Temperature 4000K  
Color Rendering Index 92

**Ballast Type (Electronic)**  
ANSI Specification M98  
Maximum Input Current 120/67, 277/29  
Input Power 120/78W, 277/79W  
Power Factor >95%  
THD <10%, Nominal 6%

### Accessories

**Louver C**  
1/2" cellular metal louver, controls spill light and glare, 45° cutoff.

**Hood C**  
3" deep cylindrical hood controls spill light and glare, black interior.

**Hood Sparkle C**  
3" deep cylindrical hood controls spill and glare, with decorative sparkle effect.

**Cross Baffle C**  
2 1/8" deep cylindrical cross baffle hood, controls spill light and glare, black interior.

**Delta Baffle C**  
2 1/8" deep cylindrical delta baffle hood, controls spill light and glare, black interior.

**Barndoor C**  
4-way individually adjustable blades for control of light beam.

**Glass Color Filters, Size C**  
Selection of 95 permanent rimmed dichroic, and rimmed and slotted standard colors.

**Spread Lens C990**  
Permanent glass for spreading light beam in one axis, 5°X50°, rimmed and slotted for heat expansion.

**Spread Lens C992**  
Permanent molded glass lens for spreading light beam in one axis—nominal 5°X30°.

**Spread Lens C995**  
Permanent molded glass lens for spreading light beam in all directions—nominal 50°X50°.

**Spread Lens C996**  
Permanent molded glass lens for spreading light beam slightly more in one direction than in the other—nominal 45°X50°.

**Beam Softener C998**  
Permanent glass lens for conditioning light to create a softer beam.

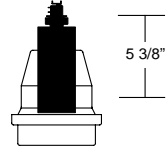
**OPTIVEX™ UV Blocking Filter C962**  
Eliminates ultra-violet wavelengths below 410±10nm. Especially useful for conservation of artworks and to help prevent fading.

**Coiled Cord**  
18/3 105°C, 18" retracted, 6 foot extended. Specify by adding suffix **CC** to model number. White fixture supplied with white cord, all other finishes supplied with black cord.

### Ordering Information

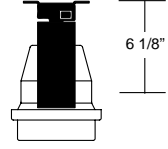
**Model Number**  
add prefix **V** for **277 Volt**  
add suffix letters for finish

**M2907-00**  
Lexan Fitting for 1 and 2 circuit LSI Track. With switch.

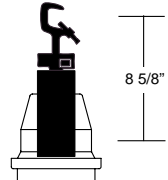


**M2907-00F**  
Same as above, with fuse.

**M2907-2G**  
Universal fitting for Unistrut Systems and any screw or bolt-up applications. With switch, 6-foot 3-wire grounding cord and plug.

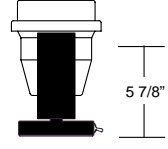


**M2907-3G**  
C-clamp for pipes from 5/8" to 1 1/4" O.D. With switch, 6-foot 3-wire grounding cord and plug.

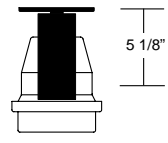


**M2907-3GA**  
Same as above for pipes from 1" to 2" O.D. Change 8 5/8" to 9 7/8"

**\*M2907-4G**  
Cushioned weighted base for floor or table use. With switch, 6-foot 3-wire grounding cord and plug.



**M2907-5A**  
Canopy for permanent mounting on standard 4" octagonal outlet box.



**Light Blocking Screens, Size C**  
C801S-20% Light Blocking, C802S-30% Light Blocking, C803S-40% Light Blocking Stainless Steel Screens. Used individually or in combination to reduce transmitted light without changing its color temperature.

**Finishes (Paint)**  
Black (suffix B)  
White (suffix W)  
Silver (suffix S)  
Graphite (suffix G)  
Platinum (suffix P)

Notes:  
1. CBCP = Center Beam Candlepower  
2. K = Color Temperature in Kelvin degrees  
3. OPTIVEX™ glass is a trademark of Bausch & Lomb Inc.  
4. Lamp manufacturers published data  
\*Non-UL and Non-CUL

Lighting Services Inc 2 Kay Fries Drive, Stony Point NY 10980-1996 / +1 845 942-2800 Fax +1 845 942-2177 / www.LightingServicesInc.com CM268 3-03

# VL2000™ Spot

l u m i n a i r e



The VARI\***LITE**® VL2000™ Spot luminaire is based on the groundbreaking technology used in some of the most popular and innovative spotlights in the history of automated lighting. The VL2000 Spot luminaire features an upper enclosure that houses the control electronics as well as a power factor corrected arc power supply for the 700 watt short arc lamp. The VL2000 Spot luminaire also features a zoom lens system and rotating gobos. The luminaire is small, fast, lightweight and virtually silent.

The VL2000 Spot luminaire accepts a wide variety of colors and gobos. Two fixed wheels are included, one factory configured for gobos and the second for color filters. A standard palette of gobos and colors is provided with the unit. Custom gobos are also available.

The VL2000 Spot luminaire can be controlled from a wide variety of DMX-512 consoles.

## Programmable Functions

<b>Zoom Optics:</b>	Continuously variable field angle from 19° to 43°, programmable over a timed range of 2 seconds to 20 minutes.
<b>Beam Size Control:</b>	In addition to the zoom optics, a mechanical iris provides continuous beam size control for both rapid changes and smooth timed beam angle changes.
<b>Intensity Control:</b>	Full field dimming designed for both smooth timed fades and strobe effects.
<b>Color/Fixed Gobo Wheels:</b>	Two wheels, each providing 11 easily loaded positions for dichroic color and gobo choices.
<b>Rotating Gobo Wheel:</b>	Six-position rotating gobo wheel with five rotatable, indexable gobo positions and one open position.
<b>Edge &amp; Pattern Focus:</b>	Variable beam focus to soften edges of gobos or spots.
<b>Pan &amp; Tilt:</b>	Smooth, timed continuous motion by way of a three-phase stepper motor system.
<b>Range:</b>	Pan - 540°, Tilt - 270°.
<b>Accuracy:</b>	0.3° resolution.

## Description

<b>Source:</b>	700 Watt Short Arc Lamp	Color Temperature	5600°K
		CRI	80
<b>Output:</b>	15,500 lumens.		
<b>Power Requirements:</b>	Standard AC power distribution from 90-264 VAC, 50/60 Hz. The unit requires 4 to 12 A depending on the AC supply voltage.		
<b>Reflector:</b>	Precision glass reflector with dichroic cold mirror coating.		
<b>Operational Temperature:</b>	-20° to 122°F (-29° to 50°C). Note: Derate to 113°F (45°C for operation below 100 VAC).		
<b>Cooling:</b>	Forced air cooling.		
<b>Control:</b>	Completely compatible with a wide variety of DMX-512 consoles.		
<b>Mounting Position:</b>	The VL2000™ Spot luminaire can be mounted and operated in any orientation.		
<b>Spacing:</b>	Hangs on 19.0 in. (48.3 cm) centers.		
<b>Weight:</b>	55 lbs (25 kg) with rails.		

## Accessories

71.2528.0700	700 Watt Short Arc Lamp
22.9620.0194	Safety Cable Assembly
55.6840.0001	Truss Hook, Mega-Clamp, Round and Square
55.6841.0001	Truss Hook, Mega-Claw for 2" Round Tube

PART # : 20.9673.0001



**VARI\***LITE**®**  
Express yourself.  
a Genlyte company

# VL2000™ Spot

l u m i n a i r e

## Specifications

The unit is an integrally designed, remote-controlled, motorized spot luminaire. The head, yoke and enclosure housings are constructed of aluminum alloy, plastic and steel for lightweight strength and durability. Virtually silent fans provide forced-air cooling for internal components. The rear cap is removable, providing easy access to the lamp for replacement.

A single AC input cable along with two, five-pin DMX-512 compatible connectors (in and through) are provided. The unit can be controlled by a wide variety of DMX-512 consoles. In addition, a built-in Master/Slave function enables operation of multiple luminaires without a control console.

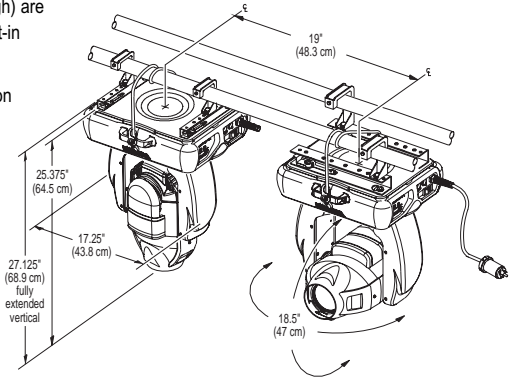
Each unit is equipped with multiple on-board processors providing diagnostic and self-calibration functions as well as internal test routines and software update capabilities.

The unit contains two independent three-phase stepper motors to provide movement of the head through 540° in the horizontal plane (pan) and 270° in the vertical plane (tilt). The pan and tilt mechanisms are belt-driven, providing positional resolution and repeatability of 0.3° on either axis.

Two continuously spinning, removable filter wheels are integral to the luminaire. Each wheel holds up to eleven interchangeable dichroic color or gobo choices to allow for custom configurations. In addition, a gobo wheel containing five individually rotating, indexable gobos is included. Its operation is achieved by two motors, which provide independent drive regardless of the direction of movement. All five rotating gobos are easily interchangeable to allow further customization of the unit. (A wide selection of color and patterned gobos is available from Vari-Lite.)

The unit contains an aluminum dimmer blade that provides full field dimming and allows for smooth timed fades and fast blackouts, as well as variable strobe effects. A mechanical iris provides continuous beam size control for both rapid changes and smooth timed beam angle changes. Variable beam focus is provided to soften the edges of gobos or spots and to provide gobo morphing. A powerful zoom lens system offers an adjustable field angle from 19° to 43°. When used in combination with the beam size iris, the unit can project a beam with a field angle of 8°.

The unit is ETL and ETLc certified and CE marked. Exterior finish is black.



## Photometric Data\*

VL2000 Spot Luminaire - 700W Metal Halide					
Zoom Lens Positions	Candela* (cd)	Beam Angle (DEGREES)	Beam Diameter TN <sup>1</sup>	Field Angle (DEGREES)	Field Diameter TN <sup>1</sup>
NFOV	297,000	15.0°	.263	18.5°	.326
MFOV	104,000	25.0°	.443	30.5°	.545
WFOV	50,000	34.5°	.621	42.5°	.777

<sup>1</sup> Multiply distance by Tn to determine coverage.

To calculate center beam illuminance (I), at a specific distance (D):  $I = \frac{cd}{D^2}$   
 — if (D) is in feet, (I) is in foot candles  
 — if (D) is in meters, (I) is in lux

\* Note:  
 All data taken with seasoned light source at 20 hours of life.  
 Fixture output = 15,500 lumens.

**VARI\*<sup>®</sup>LITE**  
 Express yourself.  
 a Genlyte company

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Vari-Lite  
 10911 Petal Street  
 Dallas, TX 75238  
 1.877.VARILITE  
 fax: 214.647.8038  
 www.vari-lite.com

**CE**  
 03/05, 5K

**ROCKET I SPECULAR ALZAK OPEN HIGHBAY**



**TYPE:** \_\_\_\_\_ **PROJECT:** \_\_\_\_\_

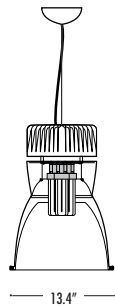
**ORDER NUMBER:**

Model#	Lamp Qty.	Wattage	Ballast	Options
<b>7714</b>	<b>1, 2, 3</b>	<b>26-42</b> CF	<b>UE, SS</b>	<b>D3, D4, D5, EM</b>
<b>7714</b>	<b>1, 2</b>	<b>57-70</b> CF		<b>CM1</b>
<b>7714</b>	<b>1</b>	<b>70,100</b> MH	<b>MH1, MH2</b>	<b>Q1, Q2</b>
<b>7714</b>	<b>1</b>	<b>INC150</b> W		
<b>7714</b>	<b>1</b>	<b>85</b> QL	<b>QL1</b>	

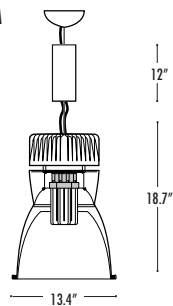
**COMPACT FLUORESCENT**

Housing is .063 spun matte anodized aluminum. Canopy mounts to standard J-boxes; suspends from aircraft cables with push button gliders; and supplied with 6 foot power cord. Order **CM1** pipe mount for outdoors. Sockets and ballasts operate 26, 32 and 42 watt triple tubes; voltage is 120 thru 277V. Separate switching **SS**, dimming ballasts **D** and emergency battery pack **EM**. Voltage must be specified. U.L. listed for damp locations.

**7714**  
fluorescent



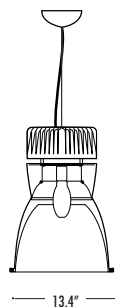
**7714/EM**  
fluorescent  
emergency  
pack



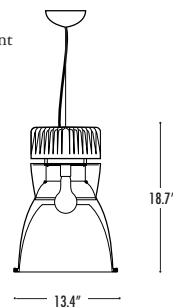
**METAL HALIDE/  
INCANDESCENT**

Housing is .063 spun matte anodized aluminum. Canopy mounts to standard J-boxes; suspends from aircraft cables with push button gliders; and supplied with 6 foot power cord. Incandescent 150W max. Metal halide ballasts are electronic, for use with medium base, ceramic arc tube lamps rated for open fixtures. For quartz restrike, order **Q1** for 120V and **Q2** for 277V. U.L. listed for damp locations.

**7714**  
metal  
halide



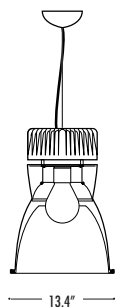
**7714**  
incandescent



**QL INDUCTION**

Housing is .063 spun matte anodized aluminum. Canopy mounts to standard J-boxes; suspends from aircraft cables with push button gliders; and supplied with 6 foot power cord. The HF generator is electronic component connected to a discharge vessel via a shielded triaxial cable. Voltage must be specified for the 85W lamp. U.L. listed for damp locations.

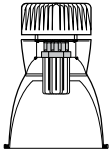
**7714**  
QL  
induction



BURBANK,  
CALIFORNIA,  
91505  
WWW.  
DELRAY  
LIGHTING.  
COM

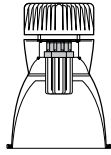
**OPEN HIGHBAY**

**7714332**



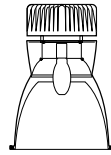
**OPEN HIGHBAY**

**7714342**



**OPEN HIGHBAY**

**7714170**



**BALLASTS**

**FLUORESCENT BALLASTS**

**UE** Universal electronic wattage: 26, 32 and 42 voltage: 120 thru 277  
All **UE** and **SS** models have sockets and ballasts that operate 26, 32 and 42 watt lamps.

**SS** Separate switching for 3 lamps

**CONE OF LIGHT**

MTG. HT.	FC/0*	DIA.
4'	222	4.3
6'	99	6.4
8'	56	8.55
10'	36	10.6
12'	25	12.8

50% FC at edge

MTG. HT.	FC/0*	DIA.
4'	296	4.3
6'	132	6.4
8'	74	8.55
10'	47	10.6
12'	33	12.8

50% FC at edge

MTG. HT.	FC/0*	DIA.
4'	121	4.3
6'	54	6.4
8'	30	8.55
10'	19	10.6
12'	13	12.8

50% FC at edge

**DIMMING NOTES:**

Due to different operating temperatures, please review number of lamps that can be used per manufacturers ballast before ordering dimming.

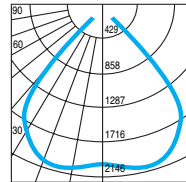
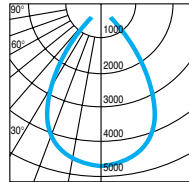
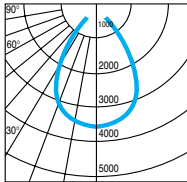
**DIMMING BALLASTS**

**D3** Advance Mark X wattage: 1,2or 3-26,32,42 or 1-57 voltage: 120 or 277  
voltage must be specified  
range: 5% - 100%  
control wires: none  
dimmers: standard incandescent recommended Advance C500A

**D4** Lutron Tu-Wire Scene control dimming wattage: 1-32, 2-32, voltage: 120 only  
range: 5% - 100%  
control wires: none  
dimmers: Lutron Grafik Eye, Nova T, Diva, Skylark

**D5** Advance Mark VII wattage: 1,2or 3-26,32,42 or 1-57 voltage: 120 or 277  
voltage must be specified  
range: 5% - 100%  
control wires: 2 low voltage  
dimmers: 1-10V analog

**CP DISTRIBUTION**



**COEFFICIENTS OF UTILIZATION**

	% CEILING 80 (20% FLOOR)		
	% WALL 70	50	30
0	70	70	70
1	68	66	65
2	65	63	61
3	63	60	58
4	60	57	54
5	58	54	52
6	56	52	49
7	54	49	47
8	52	47	44
9	49	45	42
10	46	40	37

	% CEILING 80 (20% FLOOR)		
	% WALL 70	50	30
0	69	69	69
1	66	65	64
2	64	62	60
3	62	59	56
4	59	56	53
5	57	53	50
6	55	51	48
7	53	48	46
8	53	48	46
9	48	44	41
10	45	39	36

	% CEILING 80 (20% FLOOR)		
	% WALL 70	50	30
0	76	76	76
1	73	71	70
2	70	68	66
3	68	65	62
4	65	61	58
5	63	58	55
6	60	56	53
7	58	53	50
8	56	51	47
9	53	51	47
10	49	43	40

**NOTES**

**7714332**  
3-32 watt triple tube  
G24q-3 socket  
Total lumens-7200  
Spacing criteria-1.0

**7714342**  
3-42 watt triple tube  
G24q-4 socket  
Total lumens-9600  
Spacing criteria-1.0

**7714170**  
1-70 watt ED17  
medium base socket  
Total lumens-5900  
Spacing criteria-1.0

**EXTERIOR LOCATIONS**

For suspending out side or for any windy location that could cause oscillation, you must order the pipe mount option. Pipe is 7/8" O.D. and is mounted to an earthquake canopy. Pipe replaces power cord and cable. Length of pipe must be specified.

**CM1** pipe mount

Job Name:  Fixture Type:  Qty:

# times square THEATRICAL

## FR38 PAR38 Travel Series



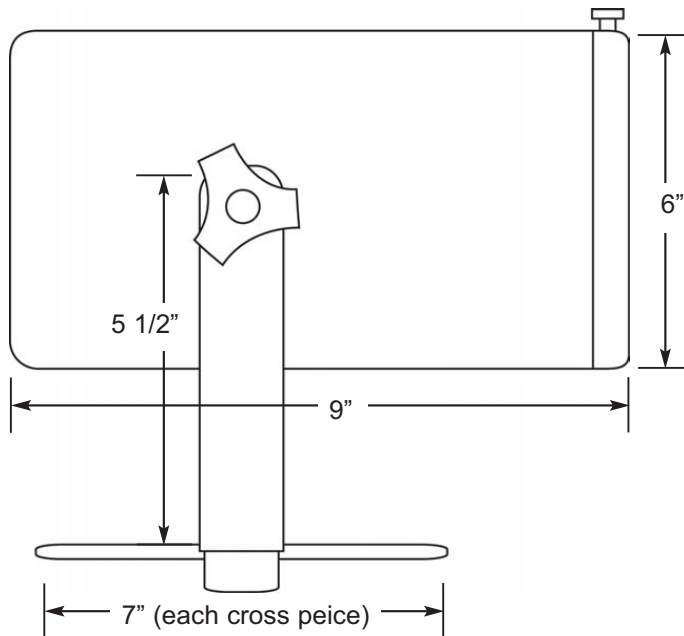
*Ideal for rental companies where the installation and break-down needs to be quick and easy. Each unit is supplied with a special X-Bar that acts as a base when opened or pipe mounted when closed. A special spun front omits the need for gel frames. A variety of lamp, accessories and mounting options available.*

Product Number: FR38  
Product Reference: 250W Parlight  
Field Angle: 24° - 124°  
Typical Throw: 15 Feet  
Lamp Base: Medium Screw  
Lamp Reference: PAR38  
Weight: 4 lbs

### FEATURES:

- Compact Theatrical Design
- Built-in Gel Holder
- Built-in X-Bar for Floor Mounting, can also be Pole Mounted
- Medium Screw Base
- 6' Line Cord with Grounded Edison Plug

Manufactured in the USA - IBEW  
UL Listed



[www.tslight.com](http://www.tslight.com)

**TIMES SQUARE LIGHTING**  
5 Kay Fries Drive  
Stony Point, NY 10980

Phone: 845-947-3034  
Fax: 845-947-3047  
Email: [info@tslight.com](mailto:info@tslight.com)

# times square THEATRICAL

## LAMP TYPES:

**90PAR/H/SP10** 90W; 2,500Hrs; 10° Beam; 16,000 Candlepower

**90PAR/H/FL25** 90W; 2,500Hrs; 25° Beam; 4,100 Candlepower

**120PAR38/SP** 120W; 2,000Hrs; 27° Beam; 11,500 Candlepower

**120PAR38/FL** 120W; 2,000Hrs; 52° Beam; 4,000 Candlepower

**Q250PAR38/SP** 250W; 6,000Hrs; 10° Beam; 52,000 Candlepower

**Q250PAR38/FL** 250W; 6,000Hrs; 30° Beam; 9,000 Candlepower

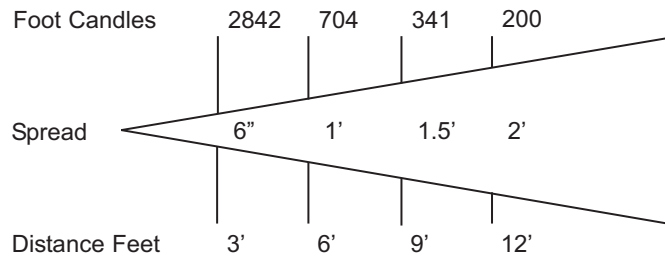
## ACCESSORIES:

- SC Safety Cable

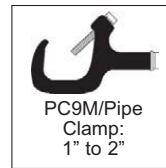
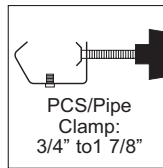
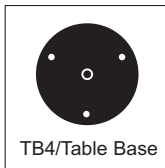
## FINISHES:

- Black
- White
- Custom Color

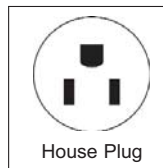
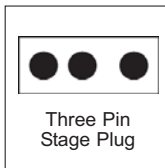
## PHOTOMETRICS: 120PAR38/FL



## MOUNTING OPTIONS:



## CONNECTORS:



**Illuminated Handrails**

**LIGHTRAIL • LR 1**

**LR 1W Wall Mounted**  
**LR 1P Post Mounted**

**Description**

LR1 Series Lightrail is a flexible system of wall or post mounted illuminated handrails. This asymmetrical design projects illumination to one side along walkways and stairways. LR 1 Series Lightrail is complementary to the LR 2 Series, which should be used when a symmetrical light pattern is required. Companion non-illuminated Lightrail is also available. Design features comply with ADA and other codes.

**Features**

An angled, high impact acrylic lens provides an asymmetrical illumination pattern that effectively reduces light to the background. To ease maintenance the lens prisms are on the lamp side. Illumination is provided by T5 or T8 fluorescent lamps. The extruded aluminum rail is welded at all intersections and features cast aluminum wall mounting brackets or extruded aluminum posts. The standard finish is a polyester coating, available in a wide range of colors. The optional grip rail with smaller dimensions meets ADA requirements.

**Applications**

LR 1 Lightrail is ideal as guardrails on pedestrian bridges and stair and ramp railings.

**Custom**

We would be pleased to discuss the production of modified standard Lightrail or custom railings to suit your specific conditions. Modifications possible include custom extrusions, alternate finishes or materials, mounting adaptations, end treatments and alternate light sources.

To learn more about our custom capabilities and standard product lines call us directly or contact your local Cole representative.



**C. W. Cole & Company, Inc.**  
**2560 N. Rosemead Boulevard**  
**South El Monte, CA 91733-1593**

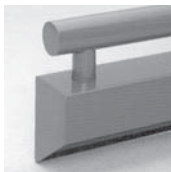
**Fax (626) 443-9253**  
**Tel. (626) 443-2473**  
**info@colelighting.com**  
**www.colelighting.com**



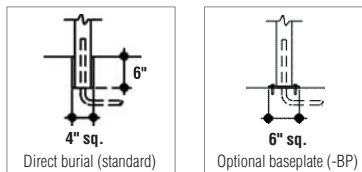
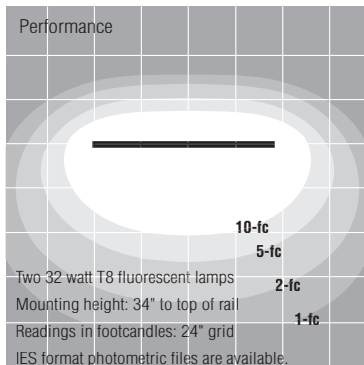
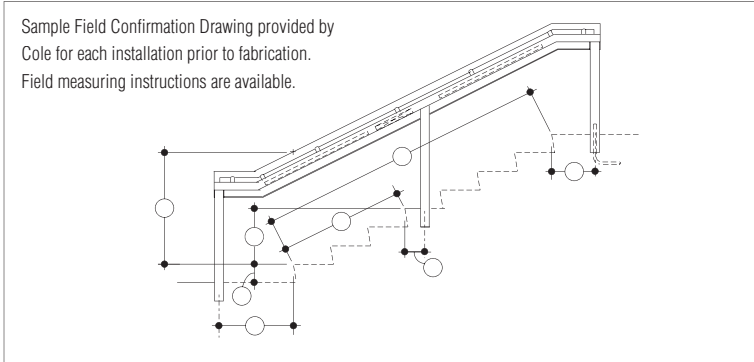
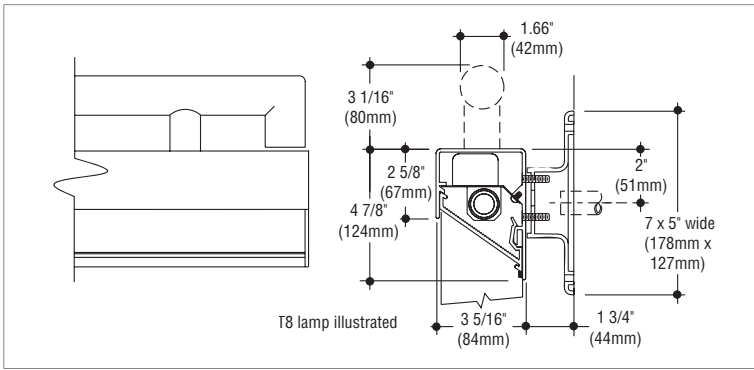
**LR 1 Lightrail produces an asymmetrical light distribution pattern that washes walkways with light while reducing illumination to the background.**



**Optional grip rail may be specified for mounting on the top of the Lightrail when required by ADA or other codes.**







**Options**

- Grip-rail:** 1.66" diameter. Add suffix **-H**.
- Baseplate:** 6" x 6" x 3/8" baseplate with four 5/8" holes. Add suffix **-BP**.
- Pickets:** 3/4" pickets, 4 3/4" on center, top rail 4" below bottom of Lightrail, bottom rail 4" above ground. Add suffix **-K**.
- Non-illuminated:** Without lighting components. Add suffix **-U**.
- Finishes:** Special finishes are available; contact factory.
- Emergency Battery:** Provides battery operation for up to 90 minutes during power outage for all or selected lamps. Add suffix **-EM**.

**How to Specify**

- Every Lightrail is custom designed and fabricated to your specific project conditions. Architectural drawings are required that clearly show the desired configurations and locations. A detailed drawing (similar to the sample above) will be provided by Cole prior to fabrication for your field verification.
1. Give catalog number, options, lamp size, and voltage. Example: LR 1P-H-T5-120. Lamping will be determined by the factory to maximize even illumination.
  2. Select desired options and add appropriate suffixes.

**Illuminated Handrails**

**LIGHTRAIL-LR 1**

**LR 1W Wall Mounted**  
**LR 1P Post Mounted**

**Specifications**

**Construction**

- Railing is extruded .125" wall, 6063-T5 aluminum
- Posts are 3" square, .125" wall extruded aluminum tubing
- Wall brackets are cast aluminum
- Clear, prismatic snap-in lens is extruded high-impact acrylic with prisms on the inside for better maintenance
- Ends and all railing miters are welded and ground smooth
- Optional grip-rail is 1.66" diameter x 0.19" wall aluminum pipe with cast aluminum support
- Medium bronze polyester coating is the standard finish; other colors and finishes are available.

**Electrical**

- Prewired for T5 or T8 fluorescent lamps with 120V-277V standard (347V available) electronic 0° F (-18° C) ballasts
- Lamping will be determined by the factory to ensure maximum even illumination
- Other lamping available for special applications
- Ballasts in T5 lamp models are above the lamp, allowing continuous illumination
- Ballasts in T8 lamp models are in-line with lamps in railing, and that area is non-illuminated
- UL/cUL listed suitable for wet locations.

**Mounting**

- Posts are provided to a maximum of 8' centers, wall brackets provided up to 6' centers, subject to spacing requirements of the particular installation
- Posts are provided with extra 6" length for direct burial and 4" square x 6" styrofoam forms for precasting hole; contractor to finish with quick-setting concrete
- 6" x 6" x 3/8" baseplate with four 5/8" holes is available as an option
- Wall bracket allows mounting over conduit stub.



**C. W. Cole & Company, Inc.**  
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[info@colelighting.com](mailto:info@colelighting.com)  
[www.colelighting.com](http://www.colelighting.com)



# Concealed Low Voltage Aisle Light

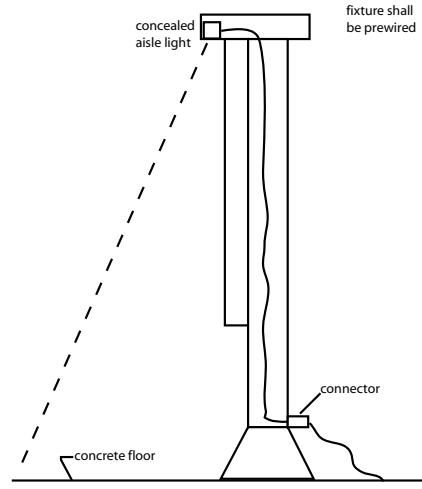
## General Description:

The Irwin Concealed Aisle Light fixture is recessed into the underside of the aisle armrest, providing a pattern of illumination on the aisle floor. The wiring to the fixture is enclosed in the tubular steel standard, with an 18" wire lead extending from the bottom of the standard. The electrical connection at site is made by the Electrical Construction Contractor. Aisle lights are wired in parallel and connected to a 24 volt, pre-wired power supply, which is engineered per project.

## Advantages:

Irwin's Concealed Low Voltage Aisle Light System offers the following unique advantages:

1. The lighting is indirect, with no visible devices.
2. Minimum Life Expectancy - 13,000 hours
3. Easy fixture replacement
4. Virtually no heat to the touch
5. Available for all style ends
6. Low voltage protects the patron
7. Suitable for outdoor installation with proper modifications
8. Aisle standards are pre-wired at the factory
9. Moderate cost



## Specification: Low Voltage Concealed Aisle Light System:

Aisle lights shall be furnished for the aisle standards located as designated on the architectural drawings. Aisle lights shall be low a voltage system (24 VAC Maximum) providing adequate illumination for floor and/or steps adjacent to aisle standards. Light assembly shall be concealed in the aisle armrest, protected from sight and damage and shall be completely pre-wired. Wiring shall extend 18" beyond the base of the standard, and shall be provided with a 3/8" flex-steel conduit connector. The seating supplier shall furnish as part of the aisle light package, suitable power supplies for powering the aisle lights.

## Method of Installation:

The seating contractor shall erect and set in place the seating end standards containing the pre-wired aisle lights. All wiring connections from the electrical distribution system to the aisle light standards and installation and connection of the transformer(s) shall be the responsibility of the electrical contractor.

-continued-

**Detailed Technical Description:**

**1. Light Source:**

Enclosed in a 1/4" x 1/4" x 6" clear plastic enclosure with two 48" wire leads.

**2. Aisle Standard Wiring:**

Three wire leads, concealed in the tubular standard, exit the standard just above the foot, and extend 18" beyond the flexible conduit fitting.

24 VAC Power Lead 16 gauge  
Common Lead 16 gauge  
Ground Lead (Green) 14 gauge

**3. Connector Fitting:**

3/8" x 90 degree flexible metal conduit fitting is supplied for each standard.

**4. Power Supply and House Wiring Specifications:**

Primary Voltage 120 Volts AC, 60 hz. (20 AMP)  
Secondary Voltage 24 Volts AC, 60 hz.  
Primary Wiring #12 Wire - Consult Electrical Engineer  
Secondary Wiring #12 Wire, except where run is longer than 400 ft., then use #10 wire

**5. Power Supply Housing for Aisle Lights:**

Equipment housed in NEMA 12 enclosure with main disconnect, transformer, primary and secondary fuses, and twelve medium/heavy duty terminal blocks.

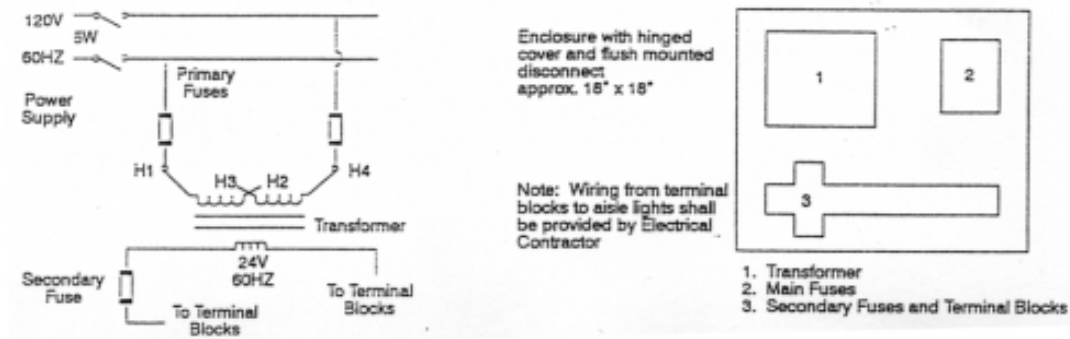
**6. Power Requirements:**

4 watts per aisle standard (.167 AMP)  
24 Volt, 60 Hz

**7. Light Intensity:**

.8 foot candles

**Wiring Diagram:**



Job Name:  Fixture Type:  Qty:

**Wall Wash** by Times Square Lighting

**Series 702 90-250W PAR38**



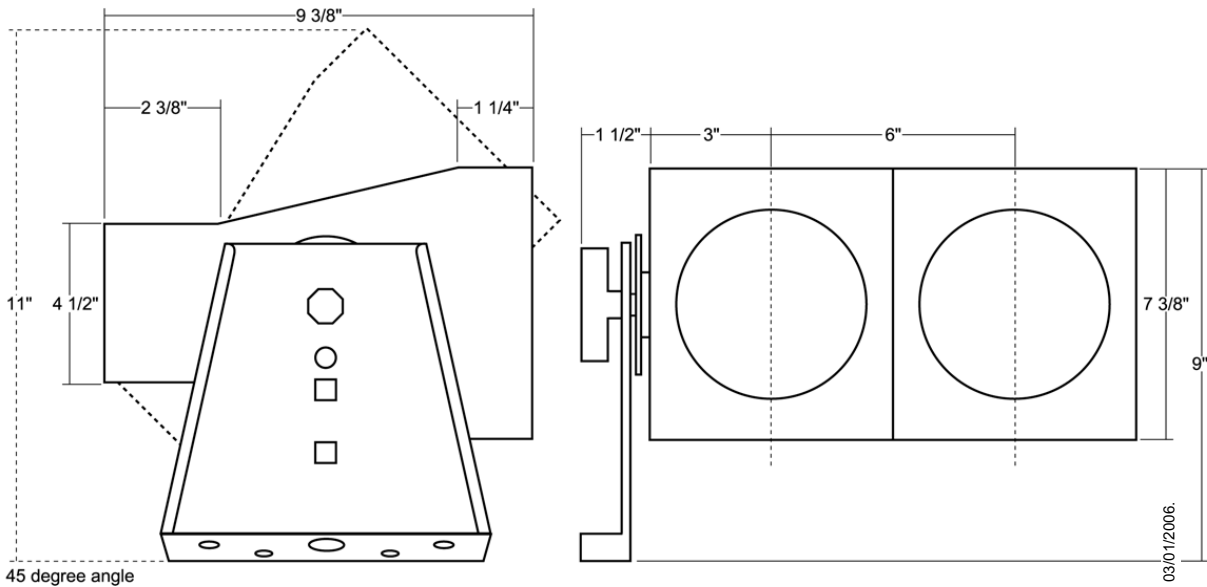
**702-6** 6', 6 compartment, 3 or 4-circuit  
**702-8** 8', 8 compartment, 4-circuit  
**702-X** custom length

The Series 702 borderlight is a multi-lamp, compartmented striplighting fixture designed for use as a general wash of light. Manufactured standard in portable lengths of 6 and 8 feet with 3 or 4-circuit operation, but custom lengths and circuitry are available. Sockets spaced on 6" centers. Ideal for use when toning, color separation or blending is required.

**Features:**

- Medium screw sockets on 6" centers
- Three 36" lead wires per circuit on portable units
- Spring-loaded color frame holder
- Compartmented for color separation
- Combination glass/gel sheet frame
- Hanging or floor mount hardware available
- Custom lengths and circuitry available

Manufactured in the USA - IBEW



Last updated 03/01/2006.



5 Kay Fries Drive • Stony Point, NY 10980  
Phone: 845-947-3034 • Fax: 845-947-3047 • www.tsilight.com  
**Specifications are subject to change without notice.**

Specify:	702-	-	-	-
	<b>MODEL NUMBER</b>	<b>FINISH</b>	<b>CONN./MOUNTING</b>	<b>ACCESSORIES (optional)</b>
Example:	702-6	-B	-E2867 -PC9M	-702CF

**Lamp Types**

**90PAR38/SP** 90W; 2500Hrs; 10° Beam;  
1600 CBCP

**90PAR38/FL** 90W; 2500Hrs; 25° Beam;  
4100 CBCP

**120PAR38/SP** 120W; 3000Hrs; 12°  
Beam; 25500 CBCP

**120PAR38/FL** 120W; 3000Hrs; 30°  
Beam; 8000 CBCP

**Q250PAR38/SP** 250W; 6000Hrs; 10°  
Beam; 52000 CBCP

**Q250PAR38/FL** 250W; 6000Hrs; 30°  
Beam; 9000 CBCP

**Connectors**

See index for details.

E2867	Edison Plug
E876	Twist Lock
600G	Stage Pin

**Mounting Options**

See index for details.

**PC9M**

Heavy duty pipe clamp for larger, heavier fixtures. For pipes 1" to 2" O.D. 6-foot, 3-wire u-ground cord and plug.

**SBB**

Set of casted trunions.

**Accessories**

See index for details.

702CF	Combo Color Frame
7074	Color Roundel - available in red, blue, green, yellow and clear. 150-watt lamp max.

**Finish**

B	Black
W	White
S	Silver
CC	Custom Color

## Specifications

### Performance

- Dimming Range: 100% to 10% measured relative light output
- Lamp Starting: programmed rapid start
- Minimum Lamp Starting Temperature: 10°C (50°F)
- Ambient Temperature Operating Range: 10°C (50°F) to 60°C (140°F)
- Relative Humidity: maximum 90% non-condensing
- Operating Voltage: 120V or 277V at 60Hz
- Lamp Current Crest Factor: less than 1.7
- Lamp Flicker: none visible
- Light Output Variation: constant  $\pm 2\%$  light output for line voltage variations of  $\pm 10\%$
- Lamp Life: average lamp life meets or exceeds rating of lamp manufacturer
- Ballast Factor: greater than .85 for T8 and T5 twin-tube lamps, equal to 1.0 for T5 lamps
- Power Factor: greater than .95
- Total Harmonic Distortion (THD): less than 20%
- Maximum Inrush Current: 7 amps per ballast at 120V, 3 amps per ballast at 277V
- Sound Rating: Inaudible in a 27dBa ambient
- Maximum Ballast Case Temperature: 75°C (167°F)

### Standards

- UL Listed (evaluated to the requirements of UL935)
- CSA certified (evaluated to the requirements of C22.2 No. 74)
- Class P thermally protected
- Meets ANSI C82.11 High Frequency Ballast Standard
- Meets FCC Part 18 Non-Consumer requirements for EMI/RFI emissions
- Meets ANSI C62.41 Category A surge protection standards up to and including 4kV
- Manufacturing facilities employ ESD reduction practices that comply with the requirements of ANSI/ESD S20.20
- Lutron Quality Systems registered to ISO 9001.2000

 **LUTRON**® SPECIFICATION SUBMITTAL




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<b>Job Name:</b>	<b>Model Numbers:</b>
<b>Job Number:</b>	

**Harris Theater for Music and Dance**

**A, D**


**Eco-10 Ballast Models**

Lamp Type				120 VOLTS		277 VOLTS	
	Lamp Watts (length)	Lamps per ballast	Case Type	Ballast Current (amps)	Eco-10 Model Number	Ballast Current (amps)	Eco-10 Model Number
 5/8" diameter <b>T5 linear</b>	14W (22")	1	C	.17	E 3 T514 C 120 1	.08	E 3 T514 C 277 1
		2	C	.32	E 3 T514 C 120 2	.14	E 3 T514 C 277 2
	21W (34")	1	C	.25	E 3 T521 C 120 1	.11	E 3 T521 C 277 1
		2	C	.43	E 3 T521 C 120 2	.19	E 3 T521 C 277 2
	28W (45.3")	1	C	.30	ECO-T528-120-1	.14	ECO-T528-277-1
		2	C	.55	ECO-T528-120-2	.25	ECO-T528-277-2
 5/8" diameter <b>T5-HO linear high output</b>	24W (21.5")	1	C	.26	ECO-T524-120-1	.13	ECO-T524-277-1
		2	C	.45	ECO-T524-120-2	.20	ECO-T524-277-2
	39W (33.4")	1	C	.38	ECO-T5H39-120-1	.17	ECO-T5H39-277-1
		2	C	.76	ECO-T5H39-120-2	.31	ECO-T5H39-277-2
	54W (45.3")	1	C	.58	ECO-T554-120-1	.25	ECO-T554-277-1
		2	C	1.1	ECO-T554-120-2	.45	ECO-T554-277-2
 5/8" diameter <b>T5 Twin-Tube</b>	36/39W (16")	1	F	.33	ECO-T539-120-1	.14	ECO-T539-277-1
		2	F	.58	ECO-T539-120-2	.25	ECO-T539-277-2
		3	F	.85	ECO-T539-120-3	.35	ECO-T539-277-3
	40W (22")	1	F	.33	ECO-T540-120-1	.14	ECO-T540-277-1
		2	F	.61	ECO-T540-120-2	.25	ECO-T540-277-2
		3	F	.88	ECO-T540-120-3	.38	ECO-T540-277-3
	50W (22")	1	F	.38	ECO-T550-120-1	.17	ECO-T550-277-1
		2	F	.69	ECO-T550-120-2	.32	ECO-T550-277-2



<b>Job Name:</b>	<b>Model Numbers:</b>
<b>Job Number:</b>	

Eco-10 Ballast Models continued ...

Lamp Type				120 VOLTS		277 VOLTS	
	Lamp Watts (length)	Lamps per ballast	Case Type	Ballast Current (amps)	Eco-10 Model Number	Ballast Current (amps)	Eco-10 Model Number
<b>T8 linear and U-bent</b>  1" diameter	17W (24")	1	F	.19	ECO-T817-120-1	.08	ECO-T817-277-1
		2	F	.31	ECO-T817-120-2	.15	ECO-T817-277-2
		3	F	.43	ECO-T817-120-3	.20	ECO-T817-277-3
	25W (36")	1	F	.24	ECO-T825-120-1	.12	ECO-T825-277-1
		2	F	.43	ECO-T825-120-2	.19	ECO-T825-277-2
	32W (48")	1	C	- -	- -	.14	E 3 T832 C 277 1
		1	D	.34	ECO-T832-120-1-L	.14	ECO-T832-277-1-L
		1	D	.34	ECO-T832-120-1-T	.14	ECO-T832-277-1-T
		1	F	- -	- -	.15	ECO-T832-277-1
		2	C	- -	- -	.23	E 3 T832 C 277 2
		2	D	.53	ECO-T832-120-2-L	.23	ECO-T832-277-2-L
		2	D	.53	ECO-T832-120-2-T	.23	ECO-T832-277-2-T
2		F	- -	- -	.22	ECO-T832-277-2	
3		F	.82	ECO-T832-120-3	.35	ECO-T832-277-3	



**LUTRON** SPECIFICATION SUBMITTAL

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<b>Job Name:</b>	<b>Model Numbers:</b>
<b>Job Number:</b>	



## Eco-10 Overview

Eco-10 lighting management electronic dimming ballasts are designed to maximize the benefits of a lighting management system. Eco-10 offers 100% to 10% dimming, and is ideal for use in any space where saving energy is the primary goal of the design.

### Features

- Continuous, flicker-free dimming from 100% to 10%
- Standard 3-wire line-voltage phase-control technology for consistent fixture-to-fixture dimming performance
- Models available for T5 and T5-HO linear, T8 linear and U-bent, and T5 twin-tube lamps
- Programmed rapid start design preheats lamp cathodes before applying full arc voltage
- Lamps turn on to any dimmed level without flashing to full brightness
- Low harmonic distortion throughout the entire dimming range maintains power quality
- Frequency of operation ensures that ballast does not interfere with infrared devices operating between 38 and 42 kHz
- Inrush current limiting circuitry eliminates circuit breaker tripping, switch arcing, and relay failure
- End-of-lamp-life protection circuitry (for T5 and T5-HO linear models) ensures safe operation throughout entire lamp life cycle
- For linear lamps, ballasts maintain consistent light output for different lamp lengths, ensuring uniformity
- Ultra-quiet operation
- Protected from miswires of any input power to control lead
- 100% compatible with all Lutron 3-wire fluorescent controls
- 100% performance tested at factory
- Designed and assembled in the USA
- 5-year limited warranty with Lutron field service commissioning (3-year standard warranty) from date of purchase



**Eco-10, case type C**

1.18”w (30mm) x 1.00”h (25mm) x 18.00”l (457mm)



**Eco-10, case type D**

1.58”w (40mm) x 1.00”h (25mm) x 9.50”l (241mm)



**Eco-10, case type F**

2.38”w (60mm) x 1.50”h (38mm) x 9.50”l (241mm)

<b>Job Name:</b>	<b>Model Numbers:</b>
<b>Job Number:</b>	

## Specifications

### Performance

- Dimming Range: 100% to 10% measured relative light output
- Lamp Starting: programmed rapid start
- Minimum Lamp Starting Temperature: 10°C (50°F)
- Ambient Temperature Operating Range: 10°C (50°F) to 60°C (140°F)
- Relative Humidity: maximum 90% non-condensing
- Operating Voltage: 120V or 277V at 60Hz
- Lamp Current Crest Factor: less than 1.7
- Lamp Flicker: none visible
- Light Output Variation: constant  $\pm 2\%$  light output for line voltage variations of  $\pm 10\%$
- Lamp Life: average lamp life meets or exceeds rating of lamp manufacturer
- Ballast Factor: greater than .85 for T8 and T5 twin-tube lamps, equal to 1.0 for T5 lamps
- Power Factor: greater than .95
- Total Harmonic Distortion (THD): less than 20%
- Maximum Inrush Current: 7 amps per ballast at 120V, 3 amps per ballast at 277V
- Sound Rating: Inaudible in a 27dBa ambient
- Maximum Ballast Case Temperature: 75°C (167°F)

### Standards




- UL Listed (evaluated to the requirements of UL935)
- CSA certified (evaluated to the requirements of C22.2 No. 74)
- Class P thermally protected
- Meets ANSI C82.11 High Frequency Ballast Standard
- Meets FCC Part 18 Non-Consumer requirements for EMI/RFI emissions
- Meets ANSI C62.41 Category A surge protection standards up to and including 4kV
- Manufacturing facilities employ ESD reduction practices that comply with the requirements of ANSI/ESD S20.20
- Lutron Quality Systems registered to ISO 9001.2000

 **LUTRON®** SPECIFICATION SUBMITTAL

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<b>Job Name:</b>	<b>Model Numbers:</b>
<b>Job Number:</b>	

**Eco-10 Ballast Models**

Lamp Type				120 VOLTS		277 VOLTS	
	Lamp Watts (length)	Lamps per ballast	Case Type	Ballast Current (amps)	Eco-10 Model Number	Ballast Current (amps)	Eco-10 Model Number
 5/8" diameter <b>T5 linear</b>	14W (22")	1	C	.17	E 3 T514 C 120 1	.08	E 3 T514 C 277 1
		2	C	.32	E 3 T514 C 120 2	.14	E 3 T514 C 277 2
	21W (34")	1	C	.25	E 3 T521 C 120 1	.11	E 3 T521 C 277 1
		2	C	.43	E 3 T521 C 120 2	.19	E 3 T521 C 277 2
	28W (45.3")	1	C	.30	ECO-T528-120-1	.14	ECO-T528-277-1
		2	C	.55	ECO-T528-120-2	.25	ECO-T528-277-2
 5/8" diameter <b>T5-HO linear high output</b>	24W (21.5")	1	C	.26	ECO-T524-120-1	.13	ECO-T524-277-1
		2	C	.45	ECO-T524-120-2	.20	ECO-T524-277-2
	39W (33.4")	1	C	.38	ECO-T5H39-120-1	.17	ECO-T5H39-277-1
		2	C	.76	ECO-T5H39-120-2	.31	ECO-T5H39-277-2
	54W (45.3")	1	C	.58	ECO-T554-120-1	.25	ECO-T554-277-1
		2	C	1.1	ECO-T554-120-2	.45	ECO-T554-277-2
 5/8" diameter <b>T5 Twin-Tube</b>	36/39W (16")	1	F	.33	ECO-T539-120-1	.14	ECO-T539-277-1
		2	F	.58	ECO-T539-120-2	.25	ECO-T539-277-2
		3	F	.85	ECO-T539-120-3	.35	ECO-T539-277-3
	40W (22")	1	F	.33	ECO-T540-120-1	.14	ECO-T540-277-1
		2	F	.61	ECO-T540-120-2	.25	ECO-T540-277-2
		3	F	.88	ECO-T540-120-3	.38	ECO-T540-277-3
	50W (22")	1	F	.38	ECO-T550-120-1	.17	ECO-T550-277-1
		2	F	.69	ECO-T550-120-2	.32	ECO-T550-277-2




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<b>Job Name:</b>	<b>Model Numbers:</b>
<b>Job Number:</b>	

Eco-10 Ballast Models continued ...

Lamp Type				120 VOLTS		277 VOLTS	
	Lamp Watts (length)	Lamps per ballast	Case Type	Ballast Current (amps)	Eco-10 Model Number	Ballast Current (amps)	Eco-10 Model Number
<b>T8 linear and U-bent</b>  1" diameter	17W (24")	1	F	.19	ECO-T817-120-1	.08	ECO-T817-277-1
		2	F	.31	ECO-T817-120-2	.15	ECO-T817-277-2
		3	F	.43	ECO-T817-120-3	.20	ECO-T817-277-3
	25W (36")	1	F	.24	ECO-T825-120-1	.12	ECO-T825-277-1
		2	F	.43	ECO-T825-120-2	.19	ECO-T825-277-2
	32W (48")	1	C	- -	- -	.14	E 3 T832 C 277 1
		1	D	.34	ECO-T832-120-1-L	.14	ECO-T832-277-1-L
		1	D	.34	ECO-T832-120-1-T	.14	ECO-T832-277-1-T
		1	F	- -	- -	.15	ECO-T832-277-1
		2	C	- -	- -	.23	E 3 T832 C 277 2
		2	D	.53	ECO-T832-120-2-L	.23	ECO-T832-277-2-L
		2	D	.53	ECO-T832-120-2-T	.23	ECO-T832-277-2-T
2		F	- -	- -	.22	ECO-T832-277-2	
3		F	.82	ECO-T832-120-3	.35	ECO-T832-277-3	



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Job Name:	Model Numbers:
Job Number:	



<b>IDL-2S26-M5-BS@120</b>	
Brand Name	ROVR
Ballast Type	Electronic Dimming
Starting Method	Programmed Start
Lamp Connection	Series
Input Voltage	120-277
Input Frequency	50/60 HZ
Status	Active

**Electrical Specifications**

Lamp Type	Num. of Lamps	Rated Lamp Watts	Min. Start Temp (°F/C)	Input Current (Amps)	Input Power (Watts) (min/max)	Ballast Factor (min/max)	MAX THD %	Power Factor	Lamp Current Crest Factor	B.E.F.
CFQ13W/G24Q	1	13	50/10	0.14	04/16	0.30/1.00	10	0.99	1.6	6.25
* CFQ13W/G24Q	2	13	50/10	0.26	06/31	0.03/1.00	10	0.99	1.6	3.23

**Wiring Diagram**

**Diag. 165**

The wiring diagram that appears above is for the lamp type denoted by the asterisk (\*)

**Standard Lead Length (inches)**

	in.	cm.
Black	0	0
White	0	0
Blue	0	0
Red	0	0
Yellow	0	0
Gray		0
Violet		0

	in.	cm.
Yellow/Blue		0
Blue/White		0
Brown		0
Orange		0
Orange/Black		0
Black/White		0
Red/White		0

**Enclosure**

**Enclosure Dimensions**

OverAll (L)	Width (W)	Height (H)	Mounting (M)
4.98 "	3.00 "	1.18 "	2.00 "
4 49/50	3	1 9/50	2
12.6 cm	7.6 cm	3 cm	5.1 cm

Revised 12/03/2003



Data is based upon tests performed by Advance Transformer in a controlled environment and representative of relative performance. Actual performance can vary depending on operating conditions. Specifications are subject to change without notice. All specifications are nominal unless otherwise noted.

**ADVANCE TRANSFORMER CO.**  
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 Corporate Offices: Phone: 800-322-2086



e-Vision® Electronic Ballast for Metal Halide Lamps

Catalog Number IMH-70-D  
 For (1) 70W Metal Halide Lamp  
 ANSI M98, M139, M143  
 120-277V 50/60Hz Electronic  
 Status: Active

DIMENSIONS AND DATA

Lamp Data		Input Volts	Catalog Number*	Line Current (Amps)	Input Power (W)	Ballast Factor	Max THD (%)	Min Power Factor	Wiring Dia	Figure	Weight (lb)	Max Distance to Lamp (ft)
Number	Watts											
70 Watt Lamp, ANSI Code M98, M139 or M143 Minimum Starting Temp -30°C/-20°F												
1	70	120	IMH-70-D-xxx	0.67	80	1.0	15	0.9	3	D	1.6	5
		277		0.29	79							

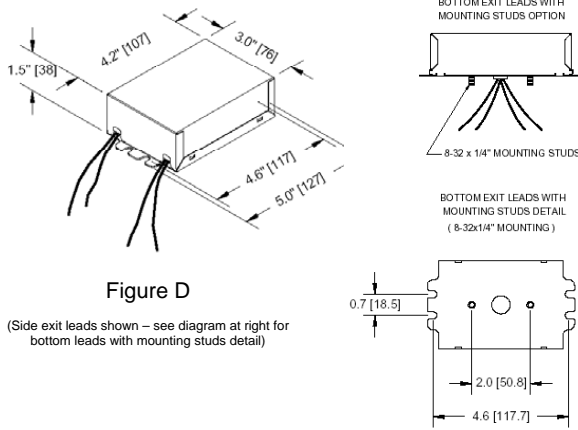
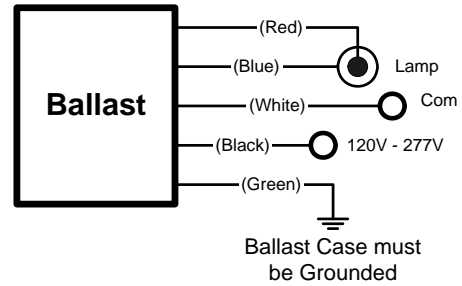
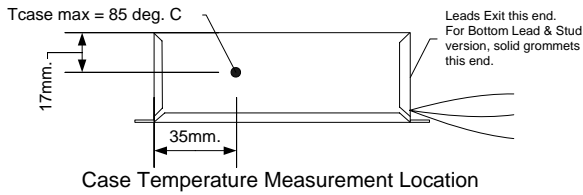


Figure D

(Side exit leads shown – see diagram at right for bottom leads with mounting studs detail)



Wiring Diagram 3



Case Temperature Measurement Location



INSTALLATION & APPLICATION NOTES:

1. Maximum allowable case temperature is 85°C. See figure above for measurement location
2. Ignition pulse is 4 kV max
3. All leads are 12 inches long
4. Ballast output will shutdown after 20 minutes if lamp fails to ignite
5. Power must be cycled off – then on, after replacing lamp

\*Ordering Information

Order Suffix	Description
-LF	Ballast with side exit leads and mounting feet
-BLS	Ballast with bottom exit leads and mounting studs

Data is based on tests performed by Advance transformer in a controlled environment and representative of relative performance. Actual performance can vary depending on operating conditions. Specifications are subject to change without notice. All specifications are nominal unless otherwise noted.

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A DIVISION OF PHILIPS ELECTRONICS NORTH AMERICA CORPORATION

Revised 1/13/06

## Specifications

### Performance

- Dimming Range: 100% to 5% measured relative light output (RLO)
- Lamp Starting: programmed rapid start
- Minimum Lamp Starting Temperature: 10°C (50°F)
- Ambient Temperature Operating Range: 10°C (50°F) to 60°C (140°F)
- Relative Humidity: maximum 90% non-condensing
- Operating Voltage: 120V or 277V at 60Hz
- Lamp Current Crest Factor: less than 1.7
- Lamp Flicker: none visible
- Light Output: constant  $\pm 2\%$  light output for line voltage variations of  $\pm 10\%$
- Lamp Life: average lamp life meets or exceeds rating of lamp manufacturer
- Ballast Factor: greater than .95 for T4 quad or triple tube lamps, and greater than .85 for T5 twin-tube lamps
- Power Factor: greater than .95
- Total Harmonic Distortion (THD): less than 10%
- Maximum Inrush Current: 7 amps per ballast at 120V, 3 amps per ballast at 277V
- Sound Rating: Inaudible in a 27dBa ambient
- Maximum Ballast Case Temperature: 75°C (167°F)

### Standards



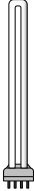
- UL Listed (evaluated to the requirements of UL935)
- CSA certified (evaluated to the requirements of C22.2 No. 74)
- Class P thermally protected
- Meets ANSI C82.11 High Frequency Ballast Standard
- Meets FCC Part 18 Non-Consumer for EMI/RFI emissions requirements
- T4 compact fluorescent ballasts are MIL Std. 461E compliant (meets the requirements of CE101, RE101 and RE102)
- Meets ANSI C62.41 Category A surge protection standards to 6kV
- Manufacturing facilities employ ESD reduction practices that comply with the requirements of ANSI/ESD S20.20
- Lutron Quality Systems registered to ISO 9001

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<b>Job Name:</b>	<b>Model Numbers:</b>
<b>Job Number:</b>	

## Compact SE Ballast Models

Lamp Type	Lamp Watts	Lamps per ballast	Case Type	Ballast Current (amps)	120 VOLTS		277 VOLTS	
					Ballast Model Number <sup>1</sup>	Ballast Current (amps)	Ballast Model Number <sup>1</sup>	Ballast Current (amps)
<b>T4 4-Pin Quad-Tube</b>  1/2" diameter	18W	1	A	.20	FDB-T418-120-1-S	.08	FDB-T418-277-1-S	
		2	B	.42	FDB-T418-120-2-S	.17	FDB-T418-277-2-S	
	26W	1	A	.26	FDB-T426-120-1-S	.12	FDB-T426-277-1-S	
		2	B	.50	FDB-T426-120-2-S	.21	FDB-T426-277-2-S	
<b>T4 4-Pin Triple-Tube</b>  1/2" diameter	18W	1	A	.20	FDB-T418-120-1-S	.08	FDB-T418-277-1-S	
		2	B	.42	FDB-T418-120-2-S	.17	FDB-T418-277-2-S	
	26W	1	A	.26	FDB-T426-120-1-S	.12	FDB-T426-277-1-S	
		2	B	.50	FDB-T426-120-2-S	.21	FDB-T426-277-2-S	
	32W	1	A	.31	FDB-T432-120-1-S	.13	FDB-T432-277-1-S	
		2	B	.59	FDB-T432-120-2-S	.24	FDB-T432-277-2-S	
	42W	1	B	.36	FDB-T442-120-1-S	.16	FDB-T442-277-1-S	
2		B	.67	FDB-T442-120-2-S	.29	FDB-T442-277-2-S		
<b>T5 Twin-Tube</b>  5/8" diameter	36/39W (16")	1	F	.33	FDB-1643-120-1	.14	FDB-1643-277-1	
		2	F	.58	FDB-1643-120-2	.25	FDB-1643-277-2	
		3	F	.85	FDB-1643-120-3	.35	FDB-1643-277-3	
	40W (22")	1	F	.33	FDB-2227-120-1	.14	FDB-2227-277-1	
		2	F	.61	FDB-2227-120-2	.25	FDB-2227-277-2	
		3	F	.88	FDB-2227-120-3	.38	FDB-2227-277-3	
	50W (22")	1	F	.38	FDB-2243-120-1	.17	FDB-2243-277-1	
		2	F	.69	FDB-2243-120-2	.32	FDB-2243-277-2	



<sup>1</sup> Mounting studs standard for T4 ballasts. Delete suffix -S in the model number if mounting studs not needed.

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<b>Job Name:</b>	<b>Model Numbers:</b>
<b>Job Number:</b>	



## Specifications

### Performance

- Dimming Range: 100% to 10% measured relative light output
- Lamp Starting: programmed rapid start
- Minimum Lamp Starting Temperature: 10°C (50°F)
- Ambient Temperature Operating Range: 10°C (50°F) to 60°C (140°F)
- Relative Humidity: maximum 90% non-condensing
- Operating Voltage: 120V or 277V at 60Hz
- Lamp Current Crest Factor: less than 1.7
- Lamp Flicker: none visible
- Light Output Variation: constant  $\pm 2\%$  light output for line voltage variations of  $\pm 10\%$
- Lamp Life: average lamp life meets or exceeds rating of lamp manufacturer
- Ballast Factor: greater than .85 for T8 and T5 twin-tube lamps, equal to 1.0 for T5 lamps
- Power Factor: greater than .95
- Total Harmonic Distortion (THD): less than 20%
- Maximum Inrush Current: 7 amps per ballast at 120V, 3 amps per ballast at 277V
- Sound Rating: Inaudible in a 27dBa ambient
- Maximum Ballast Case Temperature: 75°C (167°F)

### Standards




- UL Listed (evaluated to the requirements of UL935)
- CSA certified (evaluated to the requirements of C22.2 No. 74)
- Class P thermally protected
- Meets ANSI C82.11 High Frequency Ballast Standard
- Meets FCC Part 18 Non-Consumer requirements for EMI/RFI emissions
- Meets ANSI C62.41 Category A surge protection standards up to and including 4kV
- Manufacturing facilities employ ESD reduction practices that comply with the requirements of ANSI/ESD S20.20
- Lutron Quality Systems registered to ISO 9001.2000

 **LUTRON**® SPECIFICATION SUBMITTAL

Page

<b>Job Name:</b>	<b>Model Numbers:</b>
<b>Job Number:</b>	


**Eco-10 Ballast Models**

Lamp Type				120 VOLTS		277 VOLTS	
	Lamp Watts (length)	Lamps per ballast	Case Type	Ballast Current (amps)	Eco-10 Model Number	Ballast Current (amps)	Eco-10 Model Number
 5/8" diameter <b>T5 linear</b>	14W (22")	1	C	.17	E 3 T514 C 120 1	.08	E 3 T514 C 277 1
		2	C	.32	E 3 T514 C 120 2	.14	E 3 T514 C 277 2
	21W (34")	1	C	.25	E 3 T521 C 120 1	.11	E 3 T521 C 277 1
		2	C	.43	E 3 T521 C 120 2	.19	E 3 T521 C 277 2
	28W (45.3")	1	C	.30	ECO-T528-120-1	.14	ECO-T528-277-1
		2	C	.55	ECO-T528-120-2	.25	ECO-T528-277-2
 5/8" diameter <b>T5-HO linear high output</b>	24W (21.5")	1	C	.26	ECO-T524-120-1	.13	ECO-T524-277-1
		2	C	.45	ECO-T524-120-2	.20	ECO-T524-277-2
	39W (33.4")	1	C	.38	ECO-T5H39-120-1	.17	ECO-T5H39-277-1
		2	C	.76	ECO-T5H39-120-2	.31	ECO-T5H39-277-2
	54W (45.3")	1	C	.58	ECO-T554-120-1	.25	ECO-T554-277-1
		2	C	1.1	ECO-T554-120-2	.45	ECO-T554-277-2
 5/8" diameter <b>T5 Twin-Tube</b>	36/39W (16")	1	F	.33	ECO-T539-120-1	.14	ECO-T539-277-1
		2	F	.58	ECO-T539-120-2	.25	ECO-T539-277-2
		3	F	.85	ECO-T539-120-3	.35	ECO-T539-277-3
	40W (22")	1	F	.33	ECO-T540-120-1	.14	ECO-T540-277-1
		2	F	.61	ECO-T540-120-2	.25	ECO-T540-277-2
		3	F	.88	ECO-T540-120-3	.38	ECO-T540-277-3
	50W (22")	1	F	.38	ECO-T550-120-1	.17	ECO-T550-277-1
		2	F	.69	ECO-T550-120-2	.32	ECO-T550-277-2



<b>Job Name:</b>	<b>Model Numbers:</b>
<b>Job Number:</b>	

Eco-10 Ballast Models continued ...

Lamp Type				120 VOLTS		277 VOLTS	
	Lamp Watts (length)	Lamps per ballast	Case Type	Ballast Current (amps)	Eco-10 Model Number	Ballast Current (amps)	Eco-10 Model Number
<b>T8 linear and U-bent</b>  1" diameter	17W (24")	1	F	.19	ECO-T817-120-1	.08	ECO-T817-277-1
		2	F	.31	ECO-T817-120-2	.15	ECO-T817-277-2
		3	F	.43	ECO-T817-120-3	.20	ECO-T817-277-3
	25W (36")	1	F	.24	ECO-T825-120-1	.12	ECO-T825-277-1
		2	F	.43	ECO-T825-120-2	.19	ECO-T825-277-2
	32W (48")	1	C	- -	- -	.14	E 3 T832 C 277 1
		1	D	.34	ECO-T832-120-1-L	.14	ECO-T832-277-1-L
		1	D	.34	ECO-T832-120-1-T	.14	ECO-T832-277-1-T
		1	F	- -	- -	.15	ECO-T832-277-1
		2	C	- -	- -	.23	E 3 T832 C 277 2
2		D	.53	ECO-T832-120-2-L	.23	ECO-T832-277-2-L	
2		D	.53	ECO-T832-120-2-T	.23	ECO-T832-277-2-T	
2		F	- -	- -	.22	ECO-T832-277-2	
3		F	.82	ECO-T832-120-3	.35	ECO-T832-277-3	



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Job Number:	



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## T5 Starcoat High Efficiency Item Detail

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T5 Starcoat High Efficiency

T5 Starcoat High Output

T5 Preheat

T8 Ecolux - TCLP Compliant (2', 3', and 4') w/ Starcoat

T8 Ecolux XL and SXL (4') Extra Life w/ Starcoat

T8 ULTRA Watt-Miser (4', 8', XL) w/ Starcoat

T8 ULTRA F28T8 UltraMax System w/ Starcoat

T8 ULTRA High Lumen w/ Starcoat

T8 Mod-U-line®

F25T12 for T8 Ballasts

8' T8

8' T8 XL Extra Life

8' T8 Watt-Miser XL Extra-Life

8' T8 High Output

8' T8 Instant Start

T8 Other Lengths

T8 Preheat

3' T12 (F30T12 and F25T12) - Rapid Start

F40 Standard Rapid Start

F40 XL Extra Life Rapid

### Subcategory

### T5 Starcoat High Efficiency

<a href="#">Product Code</a>	46706
<a href="#">Description</a>	F28W/T5/841/ECO
<a href="#">Watts</a>	28
<a href="#">Lumens (Initial)</a>	2900
<a href="#">Lumens (Mean)</a>	2726
<a href="#">Average Rated Life</a>	20000
<a href="#">Color Temperature (K)</a>	4100
<a href="#">Color Rendering Index (Ra) CRI</a>	85
<a href="#">Bulb Type</a>	T5
<a href="#">Base Type</a>	Miniature BiPin (G5)
<a href="#">Nominal Length (In.)</a>	45.2
<a href="#">Nominal Length (mm)</a>	1150
<a href="#">Sales Unit UPC</a>	043168467063
<a href="#">Case UPC</a>	043168467063
<a href="#">SCC</a>	10043168467060
<a href="#">Case Quantity</a>	40
<a href="#">Additional Information</a>	S/P Ratio: 1.3 Lumen Ratings at 35C. At 25C, Initial Lumens

Set the current view to the default view

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[Return to: Dulux S \(single, 2-Pin\)](#)

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**Product Number:** 20306  
**Order Abbreviation:** CF13DS/841  
**General Description:** DULUX 13W single compact fluorescent lamp with 2-pin base, 4100K color temperature, 82 CRI, ECOLOGIC

Product Information	
Abbrev. With Packaging Info.	CF13DS841 50/CS 1/SKU
Average Rated Life (hr)	10000
Base	GX23
Bulb	T4
Color Rendering Index (CRI)	82
Color Temperature/CCT (K)	4100
Family Brand Name	Dulux® S
Industry Standards	ANSI C78.901 - 2001, IEC 60901- 0013
Initial Lumens at 25C	800
Mean Lumens at 25C	688
Maximum Overall Length - MOL (in)	7.1
Maximum Overall Length - MOL (mm)	180
NEMA Generic Designation (current)	CFT13DS/GX23/841
Nominal Wattage (W)	13.00

**Additional Product Information**

**[Product Documents, Graphs, and Images](#)**

**[Packaging Information](#)**



- Footnotes**
- Approximate initial lumens after 100 hours operation.
  - The life ratings of fluorescent lamps are based on 3 hr. burning cycles under specified conditions and with ballast meeting ANSI specifications. If burning cycle is increased, there will be a corresponding increase in the average hours life.
  - Rule of Thumb for Compact Fluorescent Lamps: Divide wattage of incandescent lamp by 4 to determine approximate wattage of compact fluorescent lamp that will provide similar



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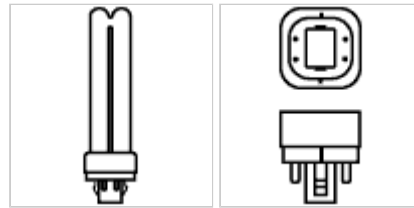
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Subcategory	Plug-in 4-Pin Double Biax®
<a href="#">Product Code</a>	30038  
<a href="#">Description</a>	F13DBX/SPX41/4P
<a href="#">Watts</a>	13
<a href="#">Average Rated Life</a>	12000
<a href="#">Lumens (Initial)</a>	900
<a href="#">Lumens (Mean)</a>	755
<a href="#">Color Temperature (K)</a>	4100
<a href="#">Color Rendering Index (Ra) CRI</a>	82
<a href="#">Bulb Type</a>	BiaxD (T4)
<a href="#">Base Type</a>	G24q-1
<a href="#">Nominal Length (In.)</a>	5
<a href="#">Nominal Length (mm)</a>	127
<a href="#">Max Overall Length (In.)</a>	4.9
<a href="#">Max Overall Length (mm)</a>	125
<a href="#">Sales Unit UPC</a>	043168982733
<a href="#">Case UPC</a>	043168300384
<a href="#">SCC</a>	00043168300384
<a href="#">Case Quantity</a>	50
<a href="#">Additional Information</a>	NEMA Generic Designation: CFQ13W/G24q/841
<a href="#">Footnotes</a>	Fluorescent lamp lumens decline during life. Based on 60Hz reference circuit lamp minimum starting temperature is a function of the ballast. Most ballasts with a minimum starting temperature of 50° F (10° C). Ballasts are also available provide reliable starting to 0° F (-18° C) and -20° F (-29° C).

 Reduced Wattage  LSB Data Available



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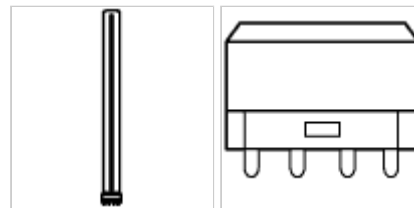
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Subcategory	Plug-in 4-Pin High Lumen Biax®
<a href="#">Product Code</a>	16954
<a href="#">Description</a>	F40/30BX/SPX41
<a href="#">Watts</a>	40
<a href="#">Average Rated Life</a>	20000
<a href="#">Lumens (Initial)</a>	3150
<a href="#">Lumens (Mean)</a>	2840
<a href="#">Color Temperature (K)</a>	4100
<a href="#">Color Rendering Index (Ra) CRI</a>	82
<a href="#">Bulb Type</a>	BiaxL (T5)
<a href="#">Base Type</a>	2G11
<a href="#">Nominal Length (In.)</a>	22.5
<a href="#">Nominal Length (mm)</a>	572
<a href="#">Sales Unit UPC</a>	043168169547
<a href="#">Case UPC</a>	043168169547
<a href="#">SCC</a>	10043168169544
<a href="#">Govt. Nat'l Stock Number</a>	6240013537705
<a href="#">Case Quantity</a>	40
<a href="#">Additional Information</a>	NEMA Generic Designation: FT40W/2G11/RS/841
<a href="#">Footnotes</a>	Fluorescent lamp lumens decline during life. Based on 60Hz reference circuit. lamp minimum starting temperature is a function of the ballast. Most ballasts with a minimum starting temperature of 50° F (10° C). Ballasts are also available provide reliable starting to 0° F (-18° C) and -20° F (-29° C). Life ratings based on instant start operation. On instant start ballast, life rating is 25% lower.

Reduced Wattage

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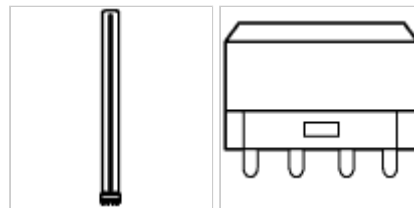
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Subcategory	Plug-in 4-Pin High Lumen Biax®
<a href="#">Product Code</a>	16954
<a href="#">Description</a>	F40/30BX/SPX41
<a href="#">Watts</a>	40
<a href="#">Average Rated Life</a>	20000
<a href="#">Lumens (Initial)</a>	3150
<a href="#">Lumens (Mean)</a>	2840
<a href="#">Color Temperature (K)</a>	4100
<a href="#">Color Rendering Index (Ra) CRI</a>	82
<a href="#">Bulb Type</a>	BiaxL (T5)
<a href="#">Base Type</a>	2G11
<a href="#">Nominal Length (In.)</a>	22.5
<a href="#">Nominal Length (mm)</a>	572
<a href="#">Sales Unit UPC</a>	043168169547
<a href="#">Case UPC</a>	043168169547
<a href="#">SCC</a>	10043168169544
<a href="#">Govt. Nat'l Stock Number</a>	6240013537705
<a href="#">Case Quantity</a>	40
<a href="#">Additional Information</a>	NEMA Generic Designation: FT40W/2G11/RS/841
<a href="#">Footnotes</a>	Fluorescent lamp lumens decline during life. Based on 60Hz reference circuit. lamp minimum starting temperature is a function of the ballast. Most ballasts with a minimum starting temperature of 50° F (10° C). Ballasts are also available provide reliable starting to 0° F (-18° C) and -20° F (-29° C). Life ratings based on instant start operation. On instant start ballast, life rating is 25% lower.

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Neck](#)

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[Compact PAR20](#)

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PAR16](#)

[Diamond Precise™  
Electronic MR16](#)

[PAR36](#)

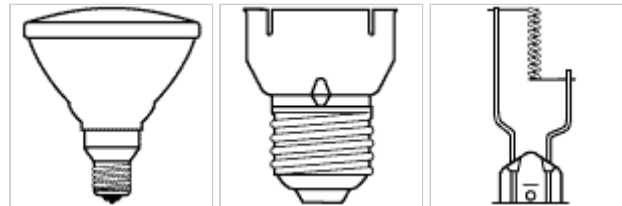
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[Precise Cover Glass IR  
MR16](#)

[Turn & Lock  
ConstantColor® MR16](#)

[ConstantColor®  
Precise™ Cover Glass  
MR16](#)

[ConstantColor®](#)



Subcategory	HIR™ PAR38
<a href="#">Product Code</a>	18631
<a href="#">Description</a>	100PAR/HIR/FL25
<a href="#">Volts</a>	120
<a href="#">Watts</a>	100
<a href="#">Average Life in Hours</a>	3000
<a href="#">Lumens</a>	2030
<a href="#">CBCP</a>	7000
<a href="#">Color Temperature (K)</a>	2900
<a href="#">Bulb Type</a>	PAR38
<a href="#">Base Type</a>	Med Skirt
<a href="#">Max Overall Length (In.)</a>	5.313
<a href="#">Max Overall Length (mm)</a>	135
<a href="#">Filament Type</a>	CC-8
<a href="#">Sales Unit UPC</a>	043168906364
<a href="#">Case UPC</a>	043168186315
<a href="#">SCC</a>	00043168186315
<a href="#">Govt. Nat'l Stock Number</a>	6240013445132
<a href="#">Case Quantity</a>	12
<a href="#">Additional Information</a>	Floodlight
<a href="#">Footnotes</a>	<p><b>WARNING</b></p> <ul style="list-style-type: none"> <li>- Turn power off before inspection, installation or removal</li> <li>- Keep combustible materials away from lamp</li> <li>- Do not use lamp if outer glass is scratched or broken</li> </ul> <p><b>CAUTION</b></p> <ul style="list-style-type: none"> <li>- Allow lamp to cool before handling</li> <li>- Do not use lamp if outer glass is scratched or broken</li> </ul>

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T8 Ecolux XL and SXL (4') Extra Life w/ Starcoat

T8 ULTRA Watt-Miser (4', 8', XL) w/ Starcoat

T8 ULTRA F28T8 UltraMax System w/ Starcoat

T8 ULTRA High Lumen w/ Starcoat

T8 Mod-U-line®

F25T12 for T8 Ballasts

8' T8

8' T8 XL Extra Life

8' T8 Watt-Miser XL Extra-Life

8' T8 High Output

8' T8 Instant Start

T8 Other Lengths

T8 Preheat

3' T12 (F30T12 and F25T12) - Rapid Start

F40 Standard Rapid Start

F40 XL Extra Life Rapid

### Subcategory

### T5 Starcoat High Efficiency

<a href="#">Product Code</a>	46706
<a href="#">Description</a>	F28W/T5/841/ECO
<a href="#">Watts</a>	28
<a href="#">Lumens (Initial)</a>	2900
<a href="#">Lumens (Mean)</a>	2726
<a href="#">Average Rated Life</a>	20000
<a href="#">Color Temperature (K)</a>	4100
<a href="#">Color Rendering Index (Ra) CRI</a>	85
<a href="#">Bulb Type</a>	T5
<a href="#">Base Type</a>	Miniature BiPin (G5)
<a href="#">Nominal Length (In.)</a>	45.2
<a href="#">Nominal Length (mm)</a>	1150
<a href="#">Sales Unit UPC</a>	043168467063
<a href="#">Case UPC</a>	043168467063
<a href="#">SCC</a>	10043168467060
<a href="#">Case Quantity</a>	40
<a href="#">Additional Information</a>	S/P Ratio: 1.3 Lumen Ratings at 35C. At 25C, Initial Lumens

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APPLICATION: EVENT LIGHTING

# Philips MSR SA / Single Ended

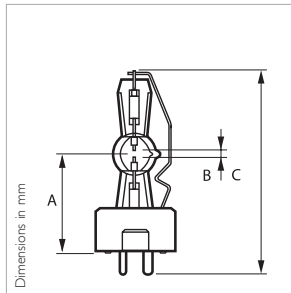
Features	Benefits
Philips Pinch Protection	Enables use at higher temperatures in any burning position. Longer lifetime, fewer early failures, consistent performance over time
Very short arc	High beam intensity
Compact lamp design	Compact design luminaries
MSR filling	Excellent color characteristics, optimal colors on stage



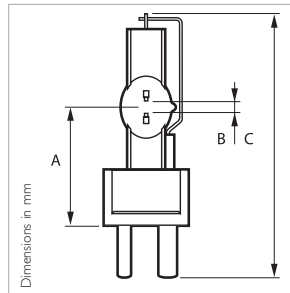
MSR 400 SA / MSR 700 SA



MSR 1200 SA / MSR 2000 SA



MSR 400 SA / MSR 700 SA



MSR 1200 SA / MSR 2000 SA

Dimensions			
Type	A	B	C max.
MSR 400 SA	36.5±0.5	3.0	80
MSR 700 SA	39.0±0.5	4.0	85
MSR 1200 SA	59.0±0.5	7.0	135
MSR 2000 SA	59.0±1.0	7.0	135

Ballast specifications			
Type of lamp	Impedance Ω	Current A	Ballast losses W
MSR 400 SA	Electronic Ballast only		
MSR 700 SA	"	"	"
MSR 1200 SA	"	"	"
MSR 2000 SA	"	"	"

Ignitor Specifications			
Type	Vp (kV) min.	Min. Ignation time max. (sec)	
MSR 400 SA	2	4.5	20
MSR 700 SA	2	4.5	20
MSR 1200 SA	2	5	20
MSR 2000 SA	2.5	5	20

Maximum permissible temperatures (°C)		
Type	Pinch	Bulb
MSR 400 SA	500	1000
MSR 700 SA	500	1000
MSR 1200 SA	500	1000
MSR 2000 SA	500	1000

Type	Lamp wattage	Cap/ base	Lumen output	Efficacy source	Chromaticity coordinates		Color rendering index	Color temp.	Burning position <sup>1)</sup>	Average lamp life	Replacement before hrs	Minimum ignition supply voltage	Lamp current	Ordering number
	W		lm	lm/W	x	y	R <sub>a</sub>	K	h		V	A		
MSR 400 SA	400	GY9.5	30000	75	.330	.342	75	5600	ANY	750	1000	207	8.4	9281 702 05100
MSR 700 SA	700	GY9.5	55000	80	.330	.342	80	5600	ANY	750	1000	207	11.0	9281 703 05100
MSR 1200 SA	1200	GY22	96000	80	.330	.342	80	5600	ANY	750	1000	207	13.8	9281 709 05100
MSR 2000 SA	2000**	GY22	155000	86	.320	.330	> 80	6000	ANY	750	1000	207	20.0	9281 732 05100

<sup>1)</sup> Tip at side

\*\*Lamp can be operated at 2000 W for max 50% of specified average lifetime



## Philips pinch protection technology

- **Reliability**, through longer lifetime and fewer early failures.
- **Quality**, through excellent storage characteristics and consistent performance over time.
- **Compactness**, allowing more compact design of fixtures and burning positions.
- **Philips P3 technology**, Max 500° C pinch temperature
- **No pinch protection**, Max 350° C pinch temperature

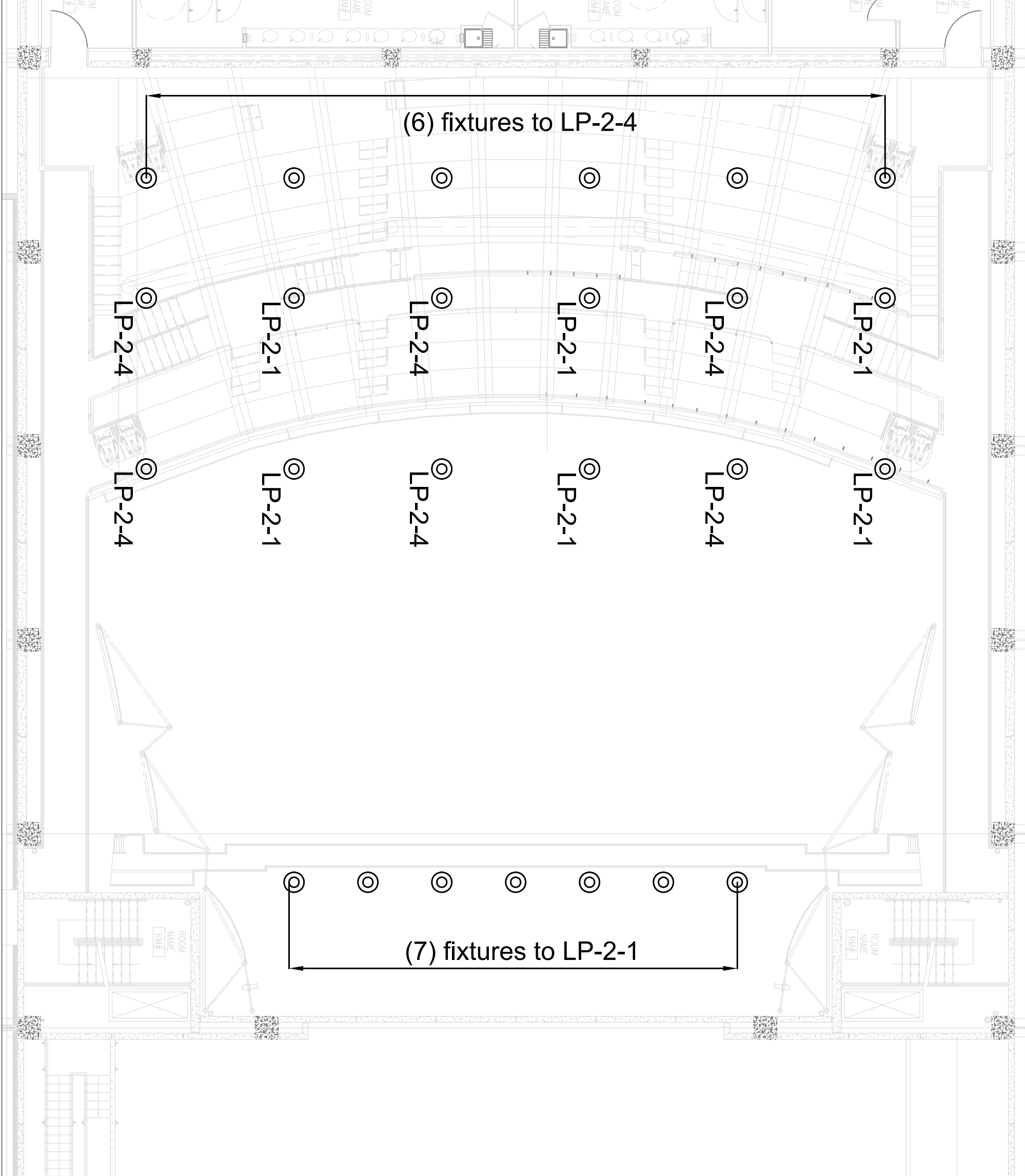


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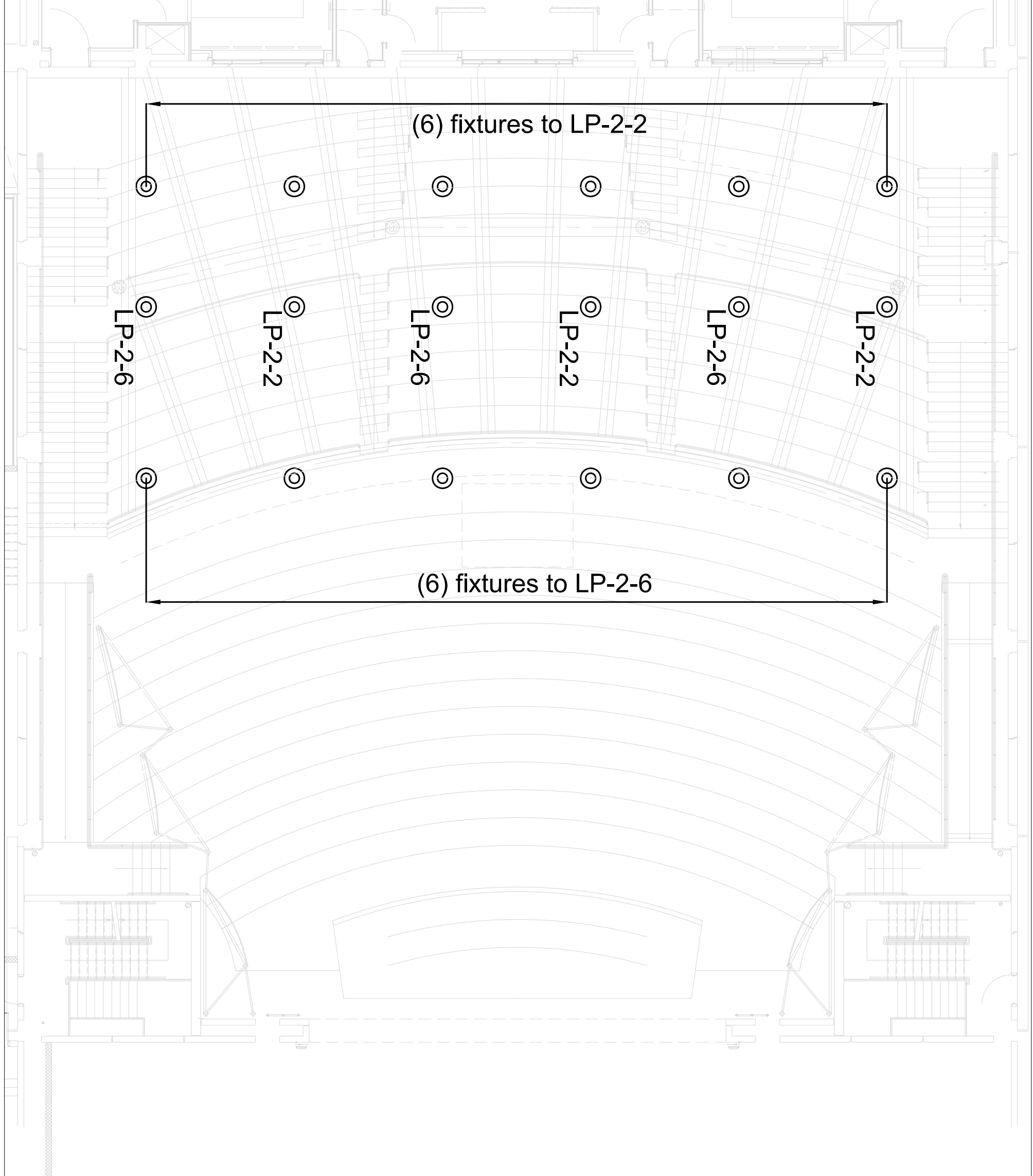
[www.philips.com/broadway](http://www.philips.com/broadway)



Symbol	Type
⊙	K
⊕	L
—	M
-	N
⏏	P

# *Balcony Ceiling Level*

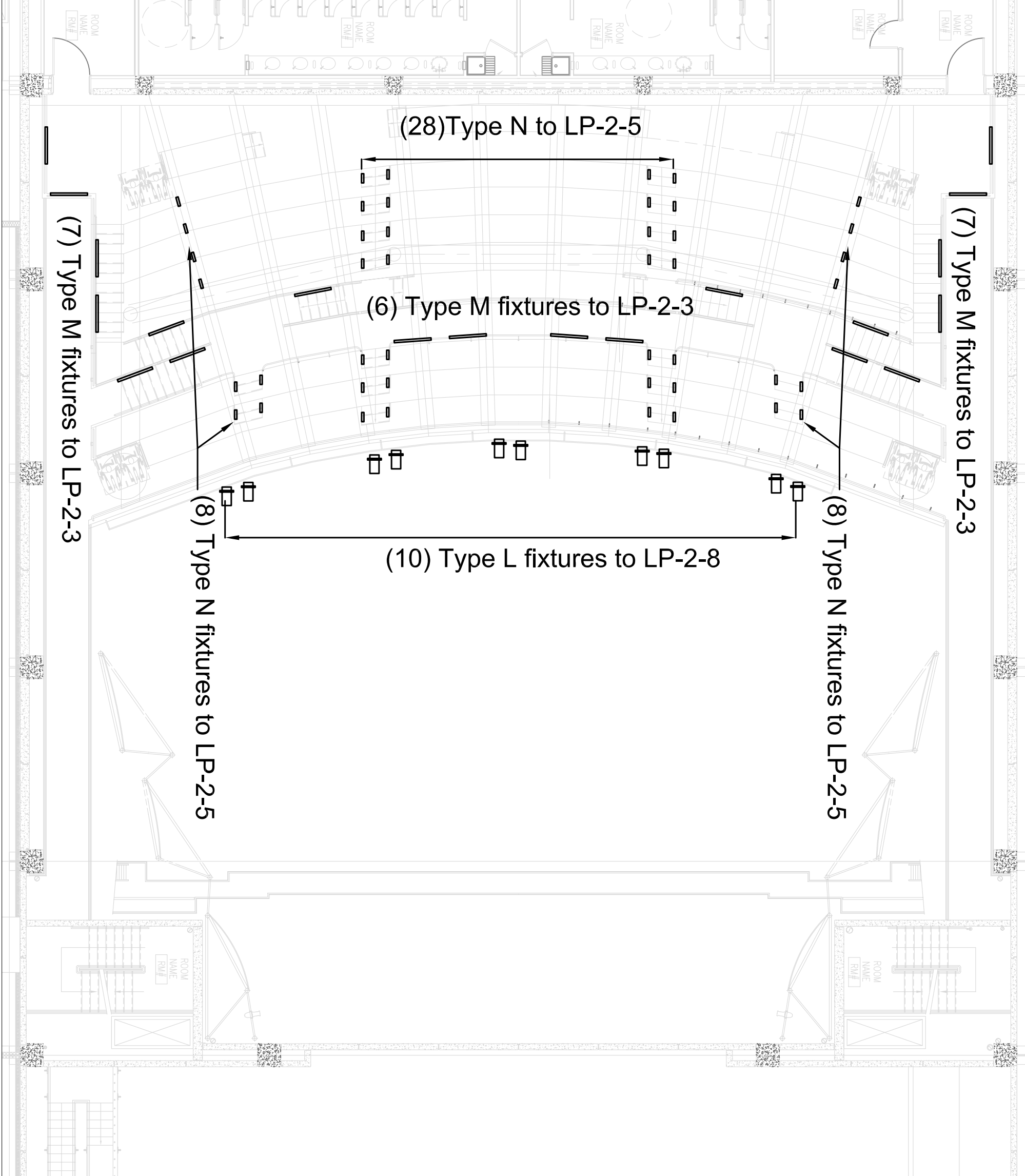
## Lighting and Circuiting Plan



Symbol	Type
⊙	K
⌘	L
—	M
-	N
▬	P

# *Parterre Ceiling Level*

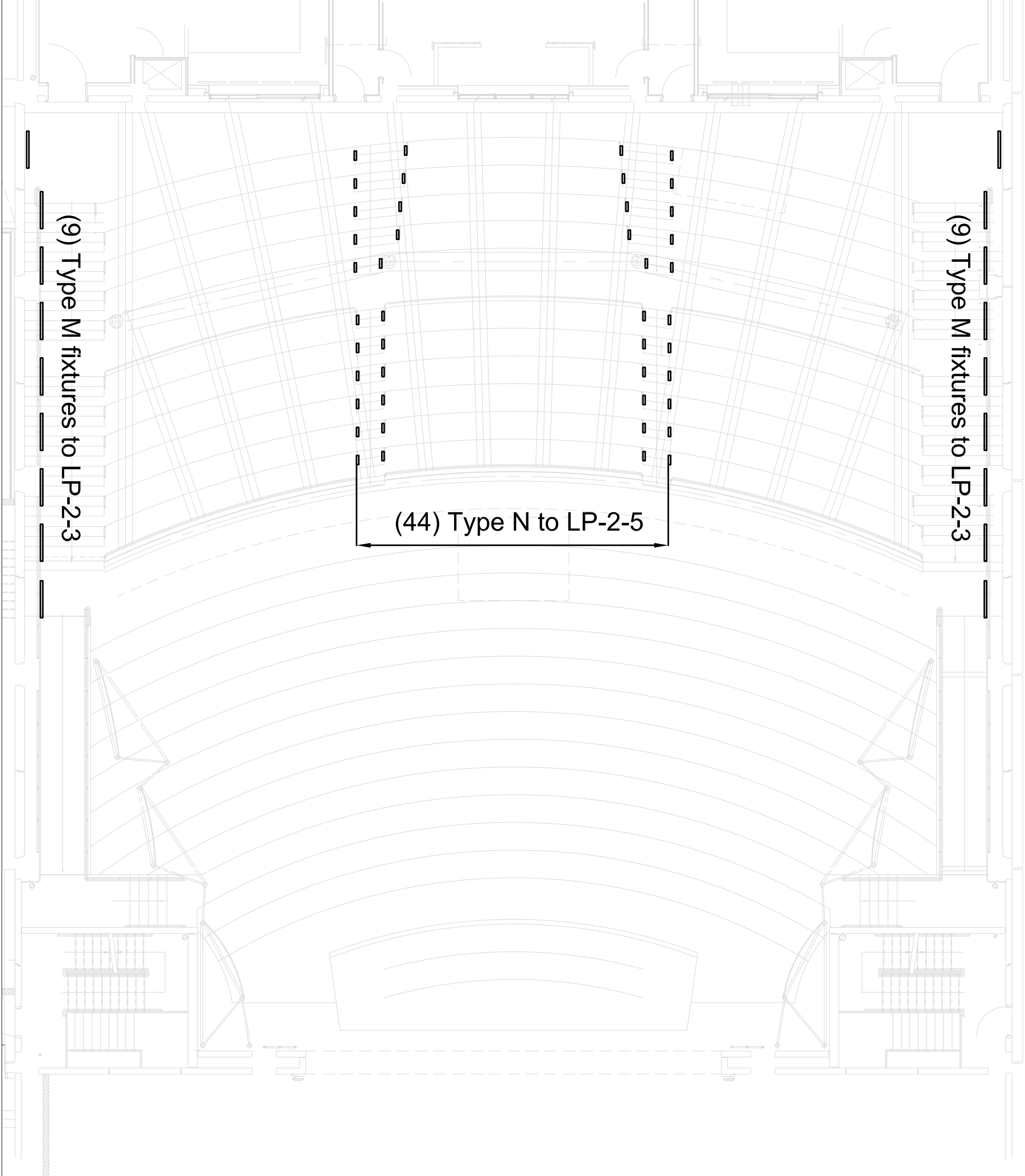
## Lighting and Circuiting Plan



Symbol	Type
⊙	K
⊞	L
—	M
-	N
⌌	P

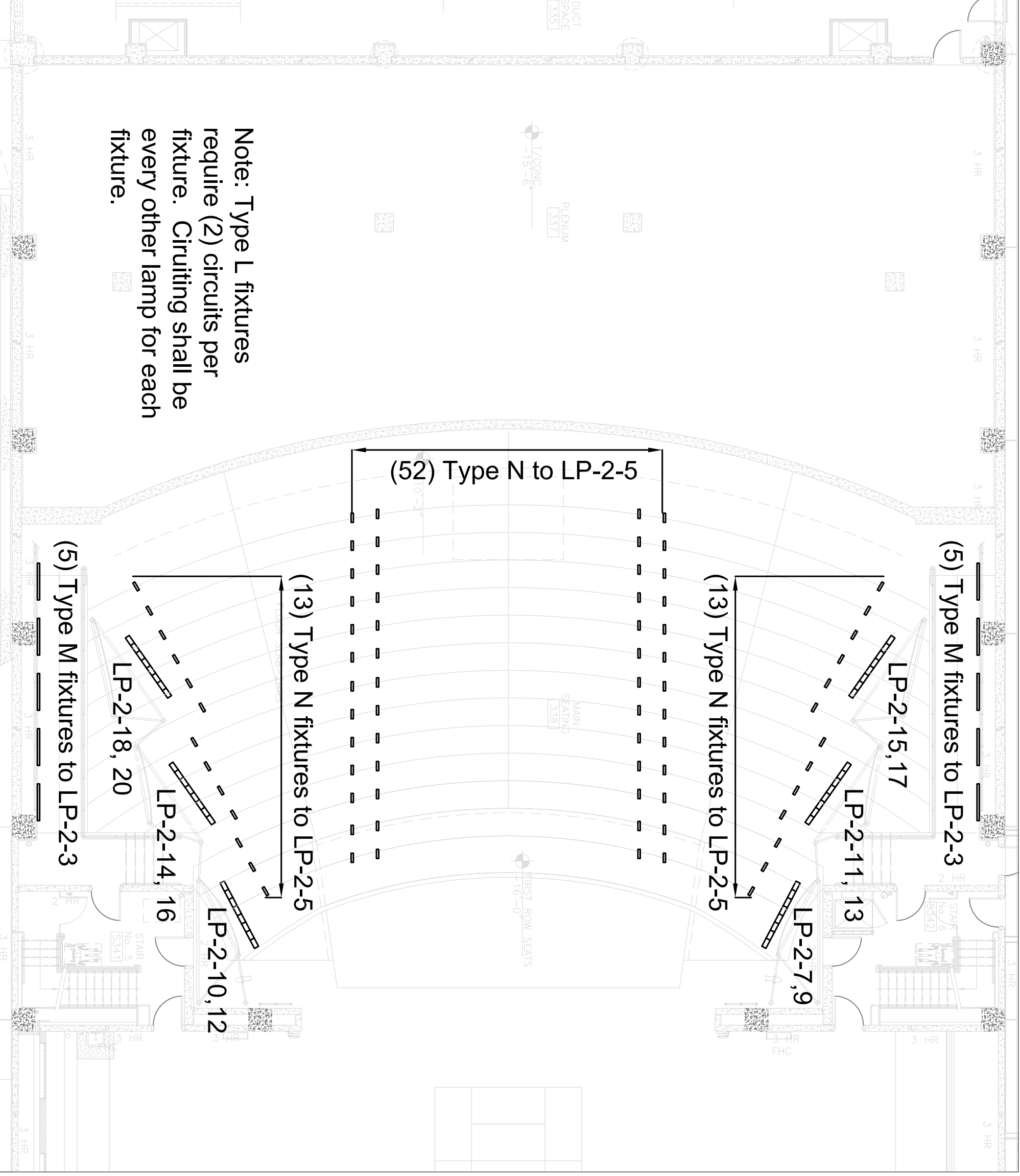
# Balcony Floor Level

## Lighting and Circuiting Plan



Symbol	Type
⊙	K
⊞	L
—	M
-	N
⌌	P

***Parterre Floor Level***  
 Lighting and Circuiting Plan



Note: Type L fixtures require (2) circuits per fixture. Circuiting shall be every other lamp for each fixture.

(52) Type N to LP-2-5

(5) Type M fixtures to LP-2-3

(13) Type N fixtures to LP-2-5

(13) Type N fixtures to LP-2-5

(5) Type M fixtures to LP-2-3

LP-2-18, 20

LP-2-14, 16

LP-2-10, 12

LP-2-15, 17

LP-2-11, 13

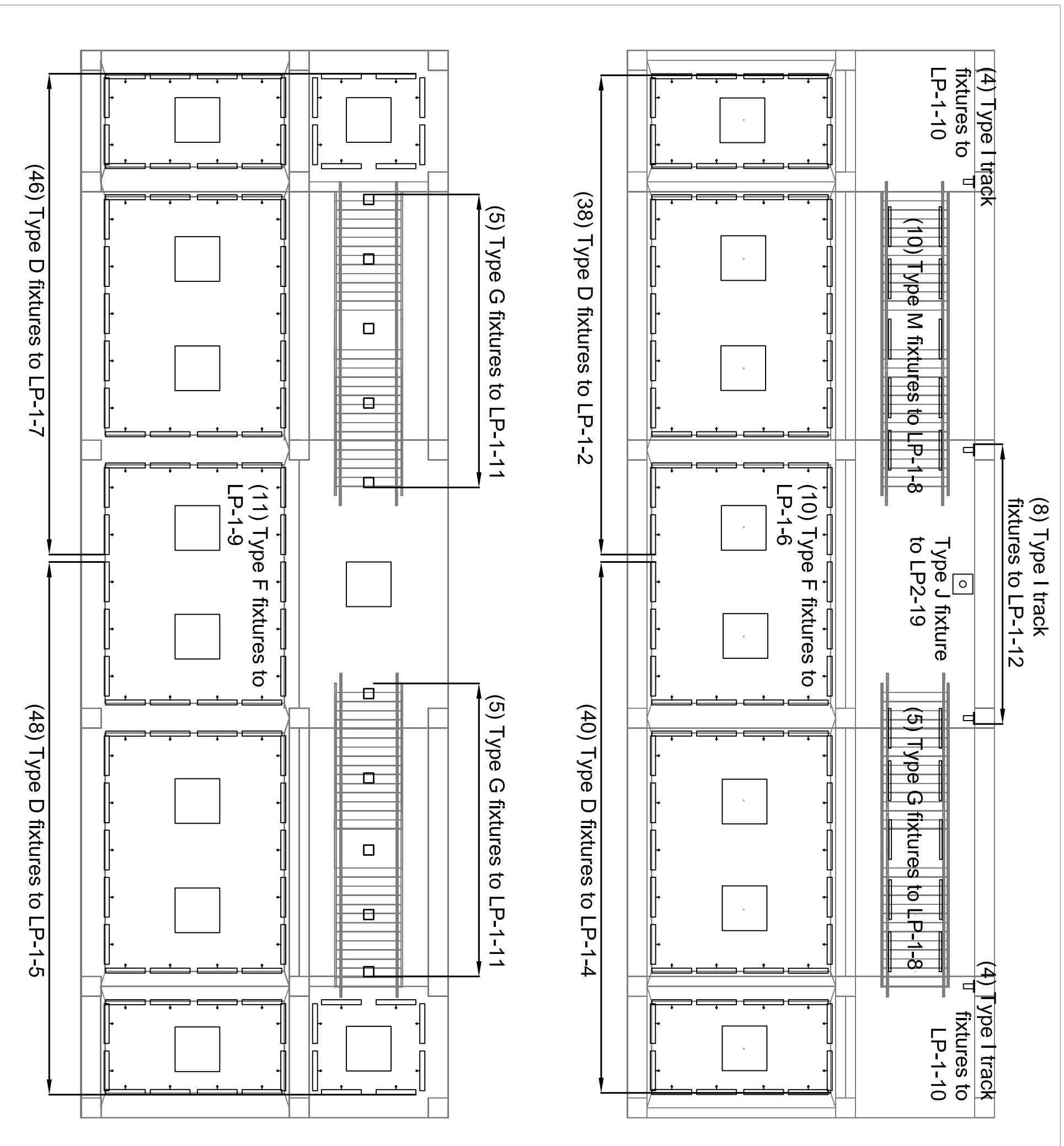
LP-2-7, 9

Symbol	Type
⊙	K
⊠	L
—	M
-	N
▬	P

# Main Seating Floor Level

Lighting and Circuiting Plan

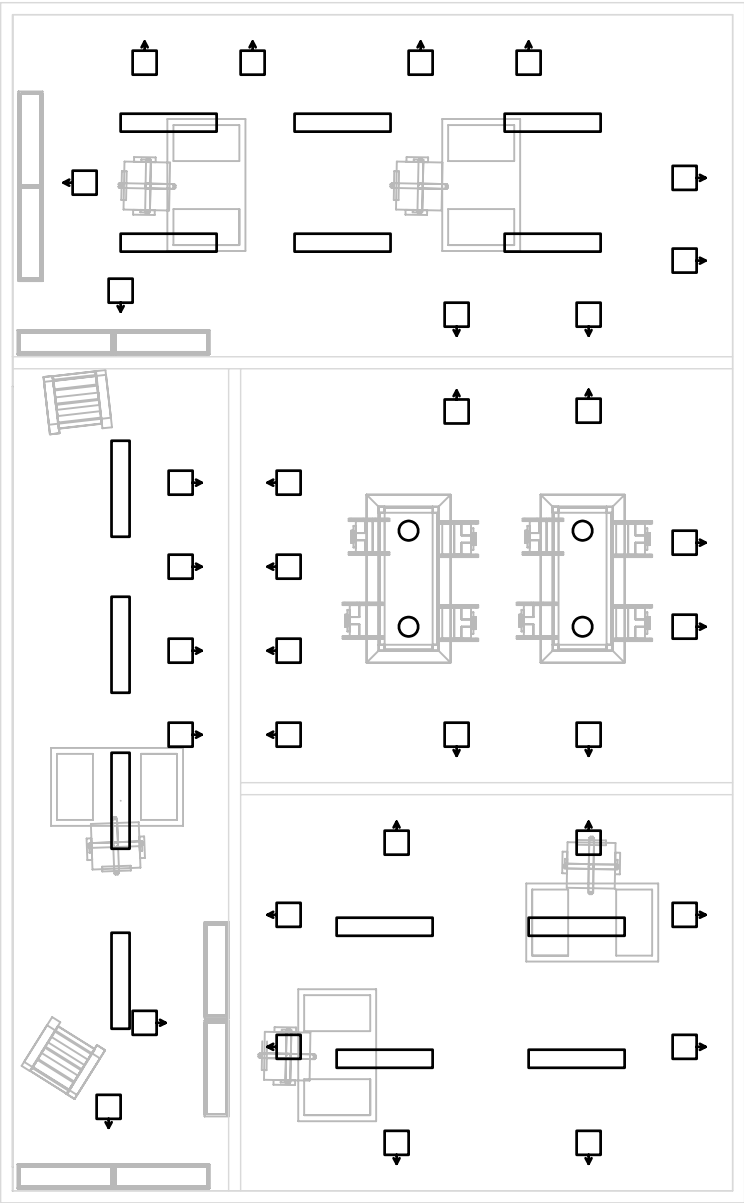




Symbol	Type
	D
	F
	G
	I
	J
	M




# *Entrance and Lobby Spaces*

## Lighting and Circuiting Plan



**Notes:**

1. Types A and C are both fluorescent pendants controlled by LP-1-1
2. Type B wall washers are controlled by LP-1-3

Symbol	Type
	A
	B
	C

# *Office Ceiling Level*

## Lighting and Circuiting Plan