

*The University of Toledo- Carlson Library*

- c) If you checked the box indicating that your project involves equipment for new construction or facility expansion, then calculate the annual savings [(kWh used by less efficient new equipment) – (kWh used by higher efficiency new equipment) = (kWh per year saved)]. Please attach your calculations and record the results below:

Annual savings: 121,000kWh

Please describe the less efficient new equipment that you rejected in favor of the more efficient new equipment. **See Exhibit 1**

#### **Section 4: Demand Reduction/Demand Response Programs**

- A) Our program involves (choose which applies):

- ☒ Coincident peak-demand savings from our energy efficiency program.
- ☐ Actual peak-demand reduction. (Attach a description and documentation of the peak-demand reduction).
- ☐ Potential peak-demand reduction (choose which applies):

➤ Choose one or more of the following that applies:

- ☐ Our peak-demand reduction program meets the requirements to be counted as a capacity resource under a tariff of a regional transmission organization (RTO) approved by the Federal Energy Regulatory Commission.
- ☐ Our peak-demand reduction program meets the requirements to be counted as a capacity resource under a program that is equivalent to an RTO program, which has been approved by the Public Utilities Commission of Ohio.

- B) What is the date your peak demand reduction program was initiated? **See Exhibit 2**
- C) What is the peak demand reduction achieved or capable of being achieved (show calculations through which this was determined):

16.00 kW **See Exhibit 2**



## **Section 5: Request for Cash Rebate Reasonable Arrangement (Option 1) or Exemption from Rider (Option 2)**

Under this section, check the box that applies and fill in all blanks relating to that choice.

Note: If Option 2 is selected, the application will not qualify for the 60day automatic approval. All applications, however, will be considered on a timely basis by the Commission.

A) We are applying for:

☒ Option 1: A cash rebate reasonable arrangement.

OR

☐ Option 2: An exemption from the cost recovery mechanism implemented by the electric utility.

B) The value of the option that we are seeking is:

Option 1: A cash rebate reasonable arrangement, which is the lesser of (show both amounts):

☒ A cash rebate of \$ 10,808 (Attach documentation showing the methodology used to determine the cash rebate value and calculations showing how this payment amount was determined).

OR

☐ A cash rebate valued at no more than 50% of the total project cost, which is equal to \$ \_\_\_\_\_ (Attach documentation and calculations showing how this payment amount was determined).

Option 2: An exemption from payment of the electric utility's energy efficiency/peak demand reduction rider.

☐ An exemption from payment of the electric utility's energy efficiency/peak demand reduction rider for \_\_\_\_\_ months (not to exceed 24 months).



*The University of Toledo- Carlson Library*

(Attach calculations showing how this time period was determined).

OR

- ☐ Ongoing exemption from payment of the electric utility's energy efficiency/peak demand reduction rider for an initial period of 24 months because this program is part of an ongoing efficiency program that is practiced by our organization. (Attach documentation that establishes your organization's ongoing efficiency program. In order to continue the exemption beyond the initial 24 month period your organization will need to provide a future application establishing additional energy savings and the continuance of the organization's energy efficiency program).

### **Section 6: Cost Effectiveness**

The program is cost effective because it has a benefit/cost ratio greater than 1 using the (choose which applies):

- ☐ Total Resource Cost (TRC) Test. The calculated TRC value is: \_\_\_\_\_  
(Continue to Subsection 1, then skip Subsection 2)
- ☒ Utility Cost Test (UCT). The calculated UCT value is: See Exhibit 3(Skip to Subsection 2).

#### Subsection 1: TRC Test Used (please fill in all blanks).

The TRC value of the program is calculated by dividing the value of our avoided supply costs (capacity and energy) by the sum of our program costs and our electric utility's administrative costs to implement the program.

Our avoided supply costs were \_\_\_\_\_.

Our program costs were \_\_\_\_\_.

The utility's administrative costs were \_\_\_\_\_.



Subsection 2: UCT Used (please fill in all blanks).

We calculated the UCT value of our program by dividing the value of our avoided supply costs (capacity and energy) by the costs to our electric utility (including administrative costs and incentives paid or rider exemption costs) to obtain our commitment.

Our avoided supply costs were See Exhibit 3.

The utility's administrative costs were See Exhibit 3.

The utility's incentive costs/rebate costs were See Exhibit 3.

## **Section 7: Additional Information**

Please attach the following supporting documentation to this application:

- Narrative description of your program including, but not limited to, make, model, and year of any installed and replaced equipment.
- A copy of the formal declaration or agreement that commits your program to the electric utility, including:
  - 1) any confidentiality requirements associated with the agreement;
  - 2) a description of any consequences of noncompliance with the terms of the commitment;
  - 3) a description of coordination requirements between you and the electric utility with regard to peak demand reduction;
  - 4) permission by you to the electric utility and Commission staff and consultants to measure and verify energy savings and/or peak-demand reductions resulting from your program; and,
  - 5) a commitment by you to provide an annual report on your energy savings and electric utility peak-demand reductions achieved.
- A description of all methodologies, protocols, and practices used or proposed to be used in measuring and verifying program results. Additionally, identify and explain all deviations from any program measurement and verification guidelines that may be published by the Commission.



Customer Legal Entity Name: The University of Toledo

Site Address: Carlson Library

Principal Address: 2801 West Bancroft Street

Project No.	Project Name	Narrative description of your program including, but not limited to, make, model, and year of any installed and replaced equipment:	Description of methodologies, protocols and practices used in measuring and verifying project results	What date would you have replaced your equipment if you had not replaced it early? Also, please explain briefly how you determined this future replacement date.	Please describe the less efficient new equipment that you rejected in favor of the more efficient new equipment.
1	Carlson Library Energy Efficiency Lighting Upgrade	Carlson Library is the largest of the University of Toledo Libraries and where the majority of the collections are held. A major renovation was conducted on the building in 2006 and large changes were made with respect to the lighting. For this reason, a ComCheck was conducted to determine the savings over code for this renovation. All fixture types and input wattages are listed in the ComCheck report. The project cost was obtained by dividing the total electrical cost for the renovation by 2 (half to this project and half to Project 2).	The type and number of lights were obtained from the as build drawings and input into ComCheck for a comparison to code (ASHRAE 90.1 -2004). See attachment A for the output ComCheck report. Attachment B & C contain information on the light fixtures. The rebate amount was determined by multiplying the Watts saved (16,200) by \$0.80/W = \$12,960.	N/A	The lighting that was installed as part of this renovation was more efficient than code (ASHRAE 90.1 -2004) by 16,200 watts. It was determined that the higher initial cost of the more efficient equipment was worth the reduced long term operating costs. The long run times in the library played a large part in the financials of this lighting upgrade.
2	Carlson Library Occupancy Sensor Install	Carlson Library is the largest of the University of Toledo Libraries and where the majority of the collections are held. A major renovation was conducted on the building in 2006 and large changes were made with respect to the lighting. Part of this renovation included the installation of occupancy sensors to reduce run times on the installed lighting. The project cost was obtained by dividing the total electrical cost for the renovation by 2 (half to this project and half to Project 1).	A 20% runtime reduction was assumed with the installation of the occupancy sensors. The savings was calculated by taking the kW usage found in Project 1 and reducing the run time by 20% to 4,008 to obtain the kWh saved. The rebate amount was calculated using the \$25/sensor prescriptive amount. The number of occupancy sensors was found on the as-built drawings.	N/A	The less efficient equipment in this case would have been not installing occupancy sensors at all. The additional up front cost of the sensors, however, was determined to be worth the energy savings that could be achieved by reduced run times.

Docket No. 11-2128

Site: 2801 West Bancroft Street



## Exhibit 2

**Customer Legal Entity Name:** The University of Toledo

**Site Address:** Carlson Library

**Principal Address:** 2801 West Bancroft Street

	Unadjusted Usage, kwh (A)	Weather Adjusted Usage, kwh (B)	Weather Adjusted Usage with Energy Efficiency Addbacks, kwh (C) <i>Note 1</i>
2010	75,334,512	75,334,512	75,455,518
2009	84,645,244	84,645,244	84,766,250
<b>Average</b>	<b>79,989,878</b>	<b>79,989,878</b>	<b>80,110,884</b>

Project Number	Project Name	In-Service Date	Project Cost \$	50% of Project Cost \$	KWh Saved/Year (D) counting towards utility compliance	KWh Saved/Year (E) eligible for incentive	Utility Peak Demand Reduction Contribution, KW (F)	Prescriptive Rebate Amount (G) \$	Eligible Rebate Amount (H) \$ <i>Note 2</i>
1	Carlson Library Energy Efficiency Lighting Upgrade	01/11/2007	\$384,723	\$192,361	81,162	81,162	16	\$12,960	\$9,720
2	Carlson Library Occupancy Sensor Install	01/11/2007	\$384,723	\$192,361	39,844	39,844	-	\$1,450	\$1,088
					-	-	-		
					-	-	-		
					-	-	-		
					-	-	-		
					-	-	-		
Total			\$769,445		121,006	121,006	16	\$14,410	\$10,808

Docket No. 11-2128

**Site:** 2801 West Bancroft Street

## Notes

(1) Customer's usage is adjusted to account for the effects of the energy efficiency programs included in this application. When applicable, such adjustments are prorated to the in-service date to account for partial year savings.

(2) The eligible rebate amount is based upon 75% of the rebates offered by the FirstEnergy Commercial and Industrial Energy Efficiency programs or 75% of \$0.08/kWh for custom programs for all energy savings eligible for a cash rebate as defined in the PUCO order in Case NO.10-834-EL-EEC dated 9/15/2010, not to exceed the lesser of 50% of the project cost or \$250,000 per project. The rebate also cannot exceed \$500,000 per customer per year, per utility service territory.



### Exhibit 3 Utility Cost Test

UCT = Utility Avoided Costs / Utility Costs

Project	Total Annual Savings, MWh (A)	Utility Avoided Cost \$/MWh (B)	Utility Avoided Cost \$ (C)	Utility Cost \$ (D)	Cash Rebate \$ (E)	Administrator Variable Fee \$ (F)	Total Utility Cost \$ (G)	UCT (H)
1	81	\$ 308	\$ 25,021	\$ 1,773	\$9,720	\$812	\$ 12,305	2.0
2	40	\$ 308	\$ 12,283	\$ 1,773	\$1,088	\$398	\$ 3,259	3.77
<b>Total</b>	<b>121</b>	<b>\$ 308</b>	<b>37,304</b>	<b>3,546</b>	<b>\$10,808</b>	<b>\$1,210</b>	<b>15,564</b>	<b>2.4</b>

#### Notes

(A) From Exhibit 2, = kWh saved / 1000

(B) This value represents avoided energy costs (wholesale energy prices) from the Department of Energy, Energy Information Administration's 2009 Annual Energy Outlook (AEO) low oil prices case. The AEO represents a national average energy price, so for a better representation of the energy price that Ohio customers would see, a Cinergy Hub equivalent price was derived by applying a ratio based on three years of historic national average and Cinergy Hub prices. This value is consistent with avoided cost assumptions used in EE&PDR Program Portfolio and Initial Benchmark Report, filed Dec 15, 2009 (See Section 8.1, paragraph a).

(C) = (A) \* (B)

(D) Represents the utility's costs incurred for self-directed mercantile applications for applications filed and applications in progress. Includes incremental costs of legal fees, fixed administrative expenses, etc.

(E) This is the amount of the cash rebate paid to the customer for this project.

(F) Based on approximate Administrator's variable compensation for purposes of calculating the UCT, actual compensation may be less.

(G) = (D) + (E) + (F)

(H) = (C) / (G)

The University of Toledo ~ Carlson Library  
Docket No. 11-2128

Site: 2801 West Bancroft Street





COMcheck Software Version 3.8.1

# Interior Lighting and Power Compliance Certificate

## 90.1 (2004) Standard

### Section 1: Project Information

Project Type: **New Construction**

Project Title :

Construction Site:

Owner/Agent:

Designer/Contractor:

### Section 2: Interior Lighting and Power Calculation

A Area Category	B Floor Area (ft2)	C Allowed Watts / ft2	D Allowed Watts (B x C)
Common Space Types:Office - Open Plan	12368	1.1	13605
Common Space Types:Office - Enclosed	453	1.1	498
Post Office:Sorting Area	306	1.2	367
Common Space Types:Conference/Meeting/Multipurpose	9361	1.3	12169
Common Space Types:Lobby	1533	1.3	1993
Common Space Types:Active Storage	299	0.8	239
Common Space Types:Electrical/Mechanical	104	1.5	156
Common Space Types:Corridor/Transition	1259	0.5	630
Common Space Types:Classroom/Lecture/Training	2279	1.4	3191
Library:Reading Area	17751	1.2	21301
Library:Stacks	797	1.7	1355
Common Space Types:Restrooms	364	0.9	328
Common Space Types:Food Preparation	110	1.2	132
Total Allowed Watts =			55964

### Section 3: Interior Lighting Fixture Schedule

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixtures	D Fixture Watt.	E (C X D)
Common Space Types:Office - Open Plan (12368 sq.ft.)				
Linear Fluorescent 1: 1A: 48" T8 32W / Electronic	3	101	72	7272
Compact Fluorescent 1: 10A: Triple 4-pin 42W / Electronic	1	7	42	294
Common Space Types:Office - Enclosed (453 sq.ft.)				
Linear Fluorescent 1 copy 1: 1A: 48" T8 32W / Electronic	3	6	72	432
Post Office:Sorting Area (306 sq.ft.)				
Linear Fluorescent 1 copy 2: 1A: 48" T8 32W / Electronic	3	4	72	288
Common Space Types:Conference/Meeting/Multipurpose (9361 sq.ft.)				
Linear Fluorescent 1 copy 3: 1A: 48" T8 32W / Electronic	3	82	72	5904
Compact Fluorescent 1 copy 1: 10A: Triple 4-pin 42W / Electronic	1	82	42	3444
Compact Fluorescent 1 copy 1: 10B: Triple 4-pin 42W / Electronic	1	8	42	336
HID 1 copy 1: 15A: Metal Halide 50W / Standard	1	10	50	500
HID 3 copy 1: 19A: Metal Halide 50W / Standard	1	5	50	250
Compact Fluorescent 5: 17A: Triple 4-pin 42W / Electronic	4	4	168	672
Linear Fluorescent 2: 3A: 48" T8 32W / Electronic	2	25	48	1200
Compact Fluorescent 1 copy 2: 10C: Triple 4-pin 42W / Electronic	1	6	42	252
Compact Fluorescent 6: 20A: Twin Tube 55W / Electronic	2	2	110	220



Compact Fluorescent 6 copy 1: 20B: Twin Tube 55W / Electronic	4	10	220	2200
Common Space Types:Lobby (1533 sq.ft.)				
Linear Fluorescent 1 copy 4: 1A: 48" T8 32W / Electronic	3	3	72	216
Compact Fluorescent 1 copy 2: 10A: Triple 4-pin 42W / Electronic	1	13	42	546
Common Space Types:Active Storage (299 sq.ft.)				
Linear Fluorescent 1 copy 5: 1A: 48" T8 32W / Electronic	3	4	72	288
Common Space Types:Electrical/Mechanical (104 sq.ft.)				
Linear Fluorescent 1 copy 6: 1A: 48" T8 32W / Electronic	3	2	72	144
Common Space Types:Corridor/Transition (1259 sq.ft.)				
Linear Fluorescent 1 copy 7: 1A: 48" T8 32W / Electronic	3	10	72	720
Compact Fluorescent 1 copy 3: 10A: Triple 4-pin 42W / Electronic	1	14	42	588
Common Space Types:Classroom/Lecture/Training (2279 sq.ft.)				
Linear Fluorescent 1 copy 8: 1A: 48" T8 32W / Electronic	3	8	72	576
Compact Fluorescent 1 copy 3: 10B: Triple 4-pin 42W / Electronic	1	14	42	588
Library:Reading Area (17751 sq.ft.)				
Linear Fluorescent 1 copy 9: 1A: 48" T8 32W / Electronic	3	62	72	4464
Compact Fluorescent 1 copy 2: 10A: Triple 4-pin 42W / Electronic	1	44	42	1848
Compact Fluorescent 1 copy 2: 10B: Triple 4-pin 42W / Electronic	1	39	42	1638
Linear Fluorescent 4: 18A: 48" T8 32W / Electronic	6	6	148	888
HID 3: 19A: Metal Halide 50W / Standard	1	30	50	1500
Compact Fluorescent 5 copy 1: 17A: Triple 4-pin 42W / Electronic	4	6	168	1008
Linear Fluorescent 3: 5A: 48" T8 32W / Electronic	2	6	48	288
Library:Stacks (797 sq.ft.)				
Linear Fluorescent 1 copy 10: 1A: 48" T8 32W / Electronic	3	8	72	576
Common Space Types:Restrooms (364 sq.ft.)				
Linear Fluorescent 2 copy 1: 3A: 48" T8 32W / Electronic	2	8	48	384
Common Space Types:Food Preparation (110 sq.ft.)				
Linear Fluorescent 2 copy 2: 3A: 48" T8 32W / Electronic	2	5	48	240
Total Proposed Watts =				39764

## Section 4: Requirements Checklist

### Lighting Wattage:

- ☐ 1. Total proposed watts must be less than or equal to total allowed watts.

Allowed Watts	Proposed Watts	Complies
55964	39764	YES

- ☐ 2. Exit signs 5 Watts or less per sign.

### Controls, Switching, and Wiring:

- ☐ 3. Independent manual or occupancy sensing controls for each space (remote switch with indicator allowed for safety or security).  
☐ 4. Occupant sensing control in class rooms, conference/meeting rooms, and employee lunch and break rooms.

#### Exceptions:

- ☐ Spaces with multi-scene control; shop classrooms, laboratory classrooms, and preschool through 12th grade classrooms.  
☐ 5. Automatic shutoff control for lighting in >5000 sq.ft buildings by time-of-day device, occupant sensor, or other automatic control.

#### Exceptions:

- ☐ 24 hour operation lighting; patient care areas; where auto shutoff would endanger safety or security.  
☐ 6. Master switch at entry to hotel/motel guest room.  
☐ 7. Separate control device for display/accent lighting, case lighting, task lighting, nonvisual lighting, lighting for sale, and demonstration lighting.  
☐ 8. Tandem wired one-lamp and three-lamp ballasted luminaires (No single-lamp ballasts).

#### Exceptions:

- ☐ Electronic high-frequency ballasts.  
☐ Luminaires not on same switch.  
☐ Recessed luminaires 10 ft. apart or surface/pendant not continuous.  
☐ Luminaires on emergency circuits.

### Voltage Drop:



- ☐ 9. Feeder conductors have been designed for a maximum voltage drop of 2 percent.
- ☐ 10. Branch circuit conductors have been designed for a maximum voltage drop of 3 percent.

**Interior Lighting PASSES:** Design 29% better than code.

## Section 5: Compliance Statement

*Compliance Statement:* The proposed lighting design represented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed lighting system has been designed to meet the 90.1 (2004) Standard requirements in COMcheck Version 3.8.1 and to comply with the mandatory requirements in the Requirements Checklist.

\_\_\_\_\_  
Name - Title

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

## Section 6: Post Construction Compliance Statement

### Record Drawings and Operating and Maintenance Manuals:

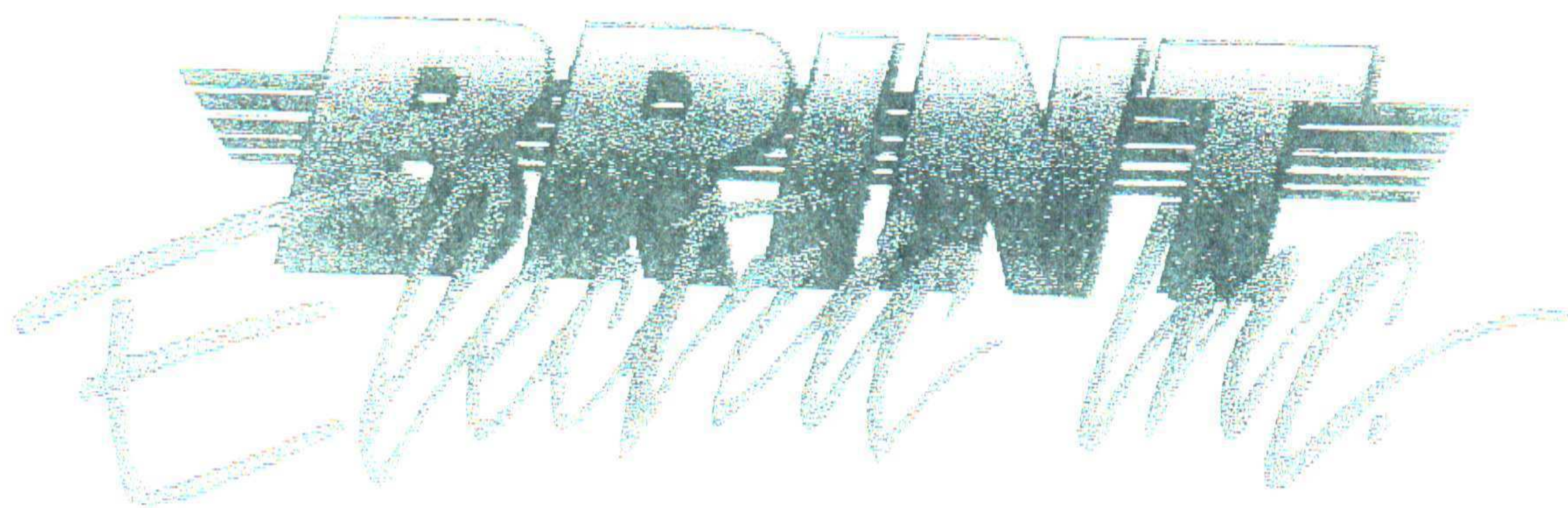
- ☐ 1. Construction documents with record drawings and operating and maintenance manuals provided to the owner.

\_\_\_\_\_  
Lighting Designer or Contractor Name

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date





University of Toledo – Carlson  
Library Renovation (Phase 1)

Brint Project #5326-1

Lighting Fixture Shop Cuts  
LF-2A, LF-10A, LF-10B, LF-10C  
Re-submitted For Approval

Specification Section:  
265100

**APPROVED**

By Kevin McCall at 2:50 pm, Feb 05, 2007





Job Name:  
University of Texas - Austin, Texas  
Department

Catalog Number:

STR24-354G-MPC-A-3EB5277  
GLE-F5035

Notes

Type:

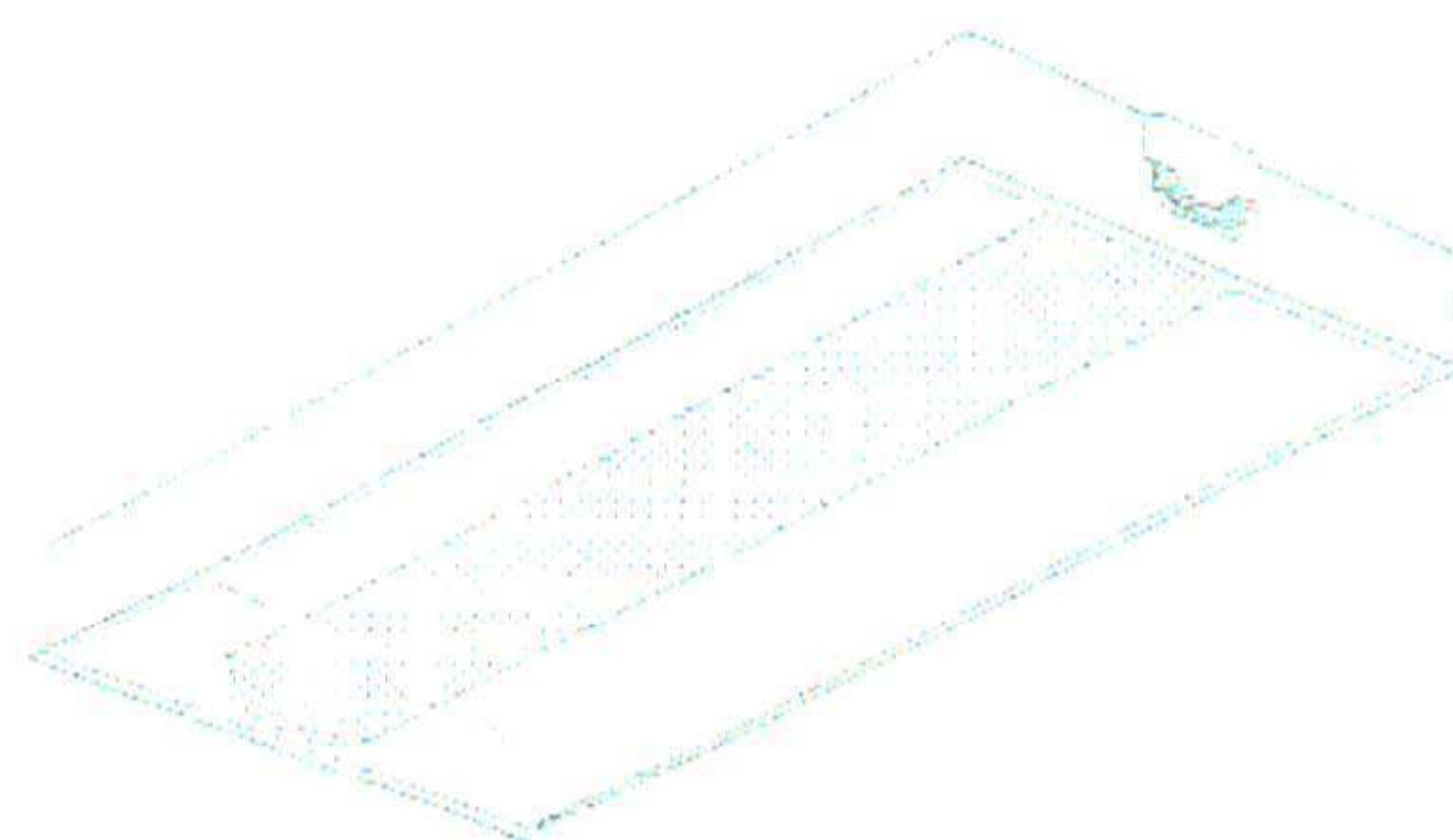
LF2A/ALT

1/1/2011

## Stratus

## STR24-3

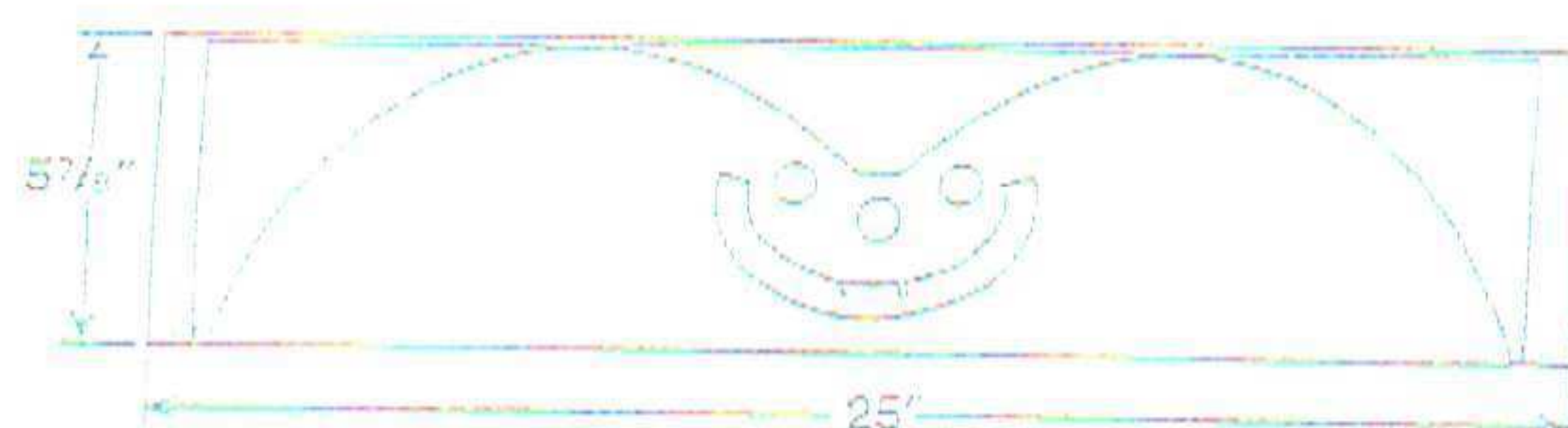
2' x 4', 3 Lamp, Linear  
Indirect Recessed Luminaire



Cross Section - 2'x4', 3-lamp, lay-in  
Recessed



Surface



Top View

Surface  
K.O. Dimensions  
A - 3/16" Mounting  
Knockout  
B - 1/8" Supply Stem  
Knockout  
C - 2" Surface H.O.



### Ceiling Compatibility



For surface installation in exposed grid ceilings. Maximum ceiling grid size 1' x 1' and maximum tile height 1 1/2" allowed.



For hard ceiling applications, fixtures must be ordered with a flange kit that will fit directly into the recessed ceiling opening for a clean finished appearance. Not available in row. For T5 row configurations contact your local Columbia Representative.

Flange kit cut out dimension for single FK24 only: 24 1/2" x 48 1/4"

### Type

### Job Description

### Features

- Precision optical system produces an efficient luminaire without sacrificing high visual comfort.
- Completely recessed, provides a clean ceiling while providing soft, uniform indirect illumination in rooms with ceilings as low as 8 feet.
- Available for use with T8, T5 or HO T5 linear fluorescent lamps.
- White powder coat finish, painted after fabrication.
- Ease of installation and maintenance.
- UL listed 1570 and OUL approved.

### Construction

Luminaire housing and endcaps are die formed close gauge cold rolled steel. The two piece aluminum reflector is profiled to a precision curve and finished with a matte white paint that provides soft, uniform, indirect illumination. Matte white perforated light basket snaps securely into place for ease of lamp replacement. Thermoplastic light traps snap into the housing at both ends of the light basket to prevent light leaks.

### Finish

Custom formulated soft non-glare white powder coat finish on the housing, light basket, and reflector is applied after fabrication.

### Shielding

A perforated metal light basket (46% opening) with an opal acrylic overlay is standard.

### Installation

For fast wiring connections without the necessity of opening fixture or wireway, a flex connector adaptor plate is furnished with each luminaire.

### Labels & Electrical

All luminaires are listed with U.L. and OUL and bear appropriate recessed fixture labels. Completely wired with class "P" thermally protected, resetting, HFF, OBM ballast. Sound rated A. All ballast leads extend a minimum of 8" through the access opening.

### Recessed Ceiling Compatibility

The Stratus is available to fit NEMA type G (lay-in) and type F (overlapping flange) recessed ceiling systems. The type G unit fits into a standard grid ceiling. For type F applications, a type G fixture must be ordered along with a flange kit for the fixture to sit in. The flange kit is assembled in the field and is wired directly to the ceiling structure. The flange kit should be installed before the fixture is installed. For row mounting applications, contact factory.

### Surface or Pendant Mount

Attractive surface mount units available to match performance and aesthetics of recessed models. See reverse side for ordering information.

Q40.1



**Columbia**  
 Engineering

Environmental Laboratories

STR24-332G

1. The luminaire was tested in a test chamber with a 1000 watt 240 volt 60 Hz power supply. The test chamber was maintained at 70°F and 50% RH.

2. The luminaire was tested for 1000 hours.

3. The luminaire was tested for 1000 hours.

4. The luminaire was tested for 1000 hours.

5. The luminaire was tested for 1000 hours.

Time (hrs)	Temp (°F)	Humidity (%)	Power (W)	Voltage (V)	Current (A)	Power Factor	Efficiency (%)	Light Output (lm)	Color Temp (°K)	Beam Angle (°)	Mounting Height (ft)	Room Type	Notes
0	70	50	1000	240	4.17	0.95	85	1000	4000	60	10	Office	
100	70	50	1000	240	4.17	0.95	85	1000	4000	60	10	Office	
200	70	50	1000	240	4.17	0.95	85	1000	4000	60	10	Office	
300	70	50	1000	240	4.17	0.95	85	1000	4000	60	10	Office	
400	70	50	1000	240	4.17	0.95	85	1000	4000	60	10	Office	
500	70	50	1000	240	4.17	0.95	85	1000	4000	60	10	Office	
600	70	50	1000	240	4.17	0.95	85	1000	4000	60	10	Office	
700	70	50	1000	240	4.17	0.95	85	1000	4000	60	10	Office	
800	70	50	1000	240	4.17	0.95	85	1000	4000	60	10	Office	
900	70	50	1000	240	4.17	0.95	85	1000	4000	60	10	Office	
1000	70	50	1000	240	4.17	0.95	85	1000	4000	60	10	Office	

1000 hours summary:  
 1000 hours tested at 70°F and 50% RH.  
 1000 hours tested at 70°F and 50% RH.  
 1000 hours tested at 70°F and 50% RH.  
 1000 hours tested at 70°F and 50% RH.  
 1000 hours tested at 70°F and 50% RH.

1000 hours summary:  
 1000 hours tested at 70°F and 50% RH.  
 1000 hours tested at 70°F and 50% RH.  
 1000 hours tested at 70°F and 50% RH.  
 1000 hours tested at 70°F and 50% RH.  
 1000 hours tested at 70°F and 50% RH.

1000 hours

1000 hours

Tested by: J. A. Anderson, Jr. Date: 10/1/98

Energy Data

LER: 63  
 Input Watts: 82

Energy Cost: \$4.53  
 BF: .88

The above energy calculations were conducted using a specific lamp/ballast combination. Actual results may vary depending upon the lamp and ballast used. Lamp and ballast specifications are subject to change without notice.

\*Comparative annual lighting energy cost per 1000 lumens based on 3300 hours and 80 lm per RW.

Coefficients of Utilization	Coefficients of Utilization											
	Zonal Ceiling Mounted						Floor Reflectance = 20					
	RC	RW	70	50	30	10	70	50	30	10	50	0
1	82	80	87	88	81	88	88	84	88	84	82	49
2	57	52	49	45	38	51	47	44	49	48	43	41
3	52	46	41	36	30	43	41	37	43	40	37	34
4	47	41	35	32	26	40	40	35	38	34	31	28
5	43	38	30	27	22	36	35	30	34	30	28	24
6	40	35	27	23	19	33	31	28	30	28	26	21
7	36	28	23	20	16	30	28	23	27	23	20	16
8	33	25	20	17	14	28	25	20	24	20	17	14
9	31	23	18	15	12	26	22	18	22	18	15	13
10	29	21	16	13	10	25	20	16	20	16	13	12

Virtual Comfort Probability	VCP											
	Reflectance - 80, 50, 20						Work Plane Illumination - 100 Fc @ 2.5 ft					
	Room	Room	Room	Room	Room	Room	Luminaire	Luminaire	Luminaire	Luminaire	Luminaire	Luminaire
	W	L	H	8.5	10.0	13.0	16.0	H	8.5	10.0	13.0	16.0
20	20			60	65	50	90		60	60	74	87
20	40			63	67	63	70		47	49	62	69
30	30			64	68	65	78		50	52	67	68
30	60			68	73	68	80		47	48	67	61
40	40			69	75	69	84		50	50	61	66
40	80			69	75	69	84		49	49	67	60
60	30			77	80	63	71		54	56	68	68
60	40			81	86	67	82		58	62	62	68
60	60			83	88	68	88		61	60	68	60
60	80			83	88	61	80		60	60	68	68

Example: STR24-332G-IAPO-EB8120

Includes "A" for Air Handling in Part Number

Ordering Information

Series

STR

Fixture Size

24" x 24"

No. of Lamps in Cross Section

3 - 2 Lamps

Lamp Type

32 - W, T8, 32 Watt  
 28 - W, T8 Linear, 28 Watt  
 54 - W, T8 Linear High Output, 54 Watt

Ceiling Type

GL - Grid Lay-In  
 SM - Surface Mount

Shielding

MPO - Metal Pan  
 w/cover

Voltage

120 - 120V

277 - 277V

Ballast

OCT - Magnetic T8 Control  
 EB8 - Electronic T8  
 EB8D - Dimming Electronic T8  
 EB6 - Electronic T6  
 \*Contact factory for availability.

Options

GLR - Fast Blow Fuse  
 GMF - Slow Blow Fuse  
 BL - Emergency Battery Back  
 FK24 - Range Kit (Shipped separately)  
 DI - Dimmable



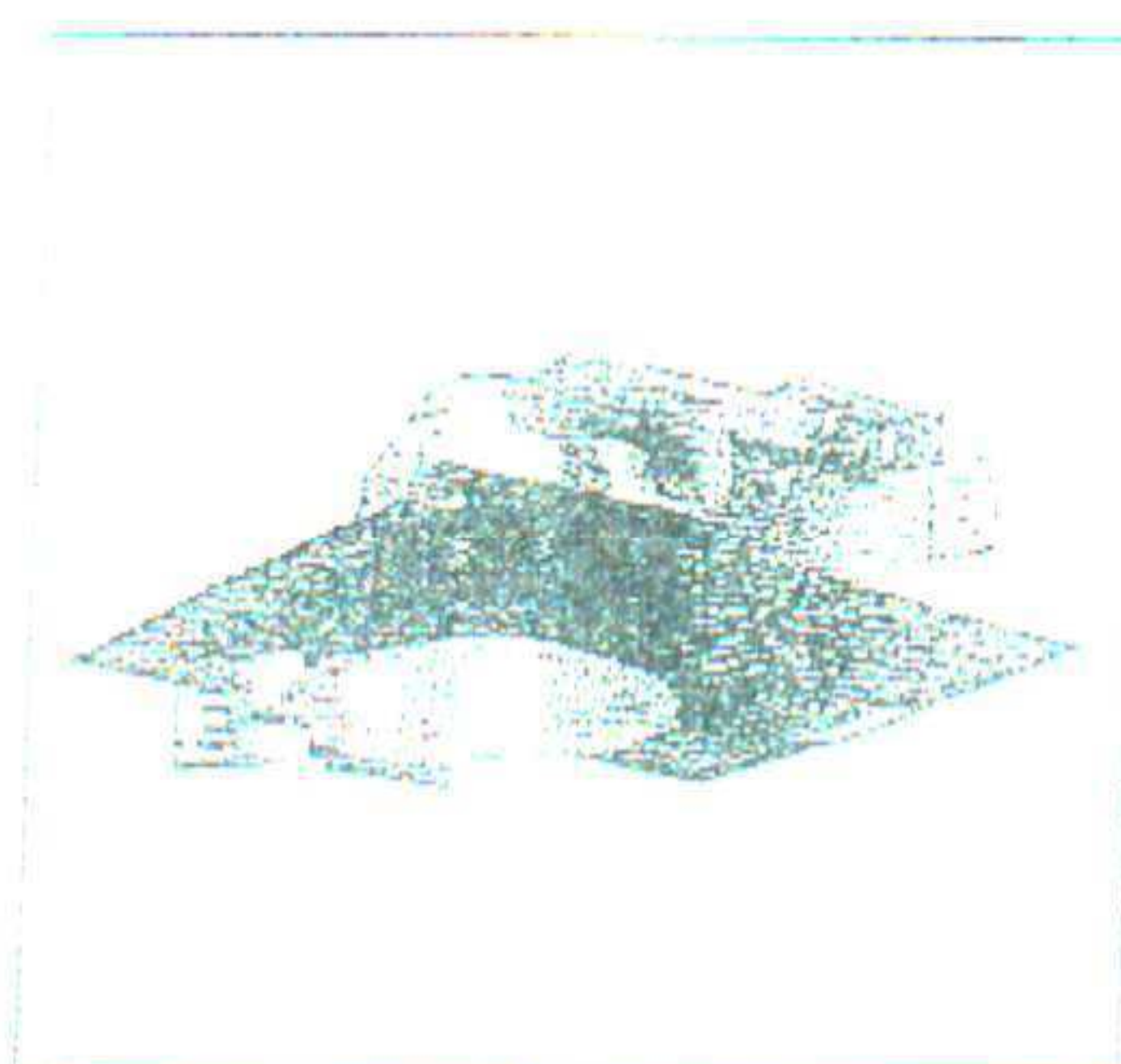
Supplied by: Escrow.com

Electre-Lume, Inc.  
Manufacturers  
Representatives

Job Name:  
University of Texas - CA Building  
Renovator

Catalog Number:  
CFT832HEB PSDFA STF802H  
B24  
Notes:

Type:  
LF10A/ALT  
LF10A/ALT



Featuring VIRTUOSOURCE® Reflector

## 8" Horizontal Open & Wall Wash Downlight CFT832HEB

One 26W, 32W, or 42W Triple Tube  
4-Pin Lamp  
Non-IC Rated  
120V, 208V, 240V, 277V or 347V

Size: 8" x 14 1/2"  
FRONT VIEW  
SIDE VIEW



Ceiling Cutout: 8 1/2"  
Maximum Ceiling Thickness: 1 1/4"  
For conversion to millimeters  
multiply inches by 25.4  
Not to Scale

### APPLICATIONS:

The CFT832HEB offers a horizontally lamped compact fluorescent downlight and wall wash fixture that provides superior brightness and glare control. The multi-volt, multi-volt ballast provides the ability to change wattages by simply changing the lamp. This luminaire is ideal for a wide variety of medium to high ceiling applications including commercial, retail, and hospitality. The CFT832HEB is compatible with the Signos8 family of architectural elements.

### HOUSING:

One-piece painted 18-gauge cold rolled steel platform. Prewired J-box with snap-on cover for easy access. Vented at lamp tip and socket for maximum light output. Same housing accommodates downlight and wall wash downlight reflectors.

### REFLECTOR:

High purity aluminum Alzak® Virtual Source® irradiance suppressed reflector. Selfrim (ST) standard. Painted white self-rim (VVT) available. Baffled units standard with painted white self-rim.

### BALLAST:

One (1) compact fluorescent Class P electronic multi-volt (120V through 277V) ballast suitable for operating all 26W, 32W, and 42W triple tube lamps, HPF and EOL protection standard. Accessible from below ceiling. 347V available (specify wattage when ordering).

### LAMP:

One (1) 26W (GX24q-3 base), 32W (GX24q-3 base), or 42W (GX24q-4 base) 4-pin triple tube compact fluorescent lamp. Lamp furnished by others.

### SOCKET:

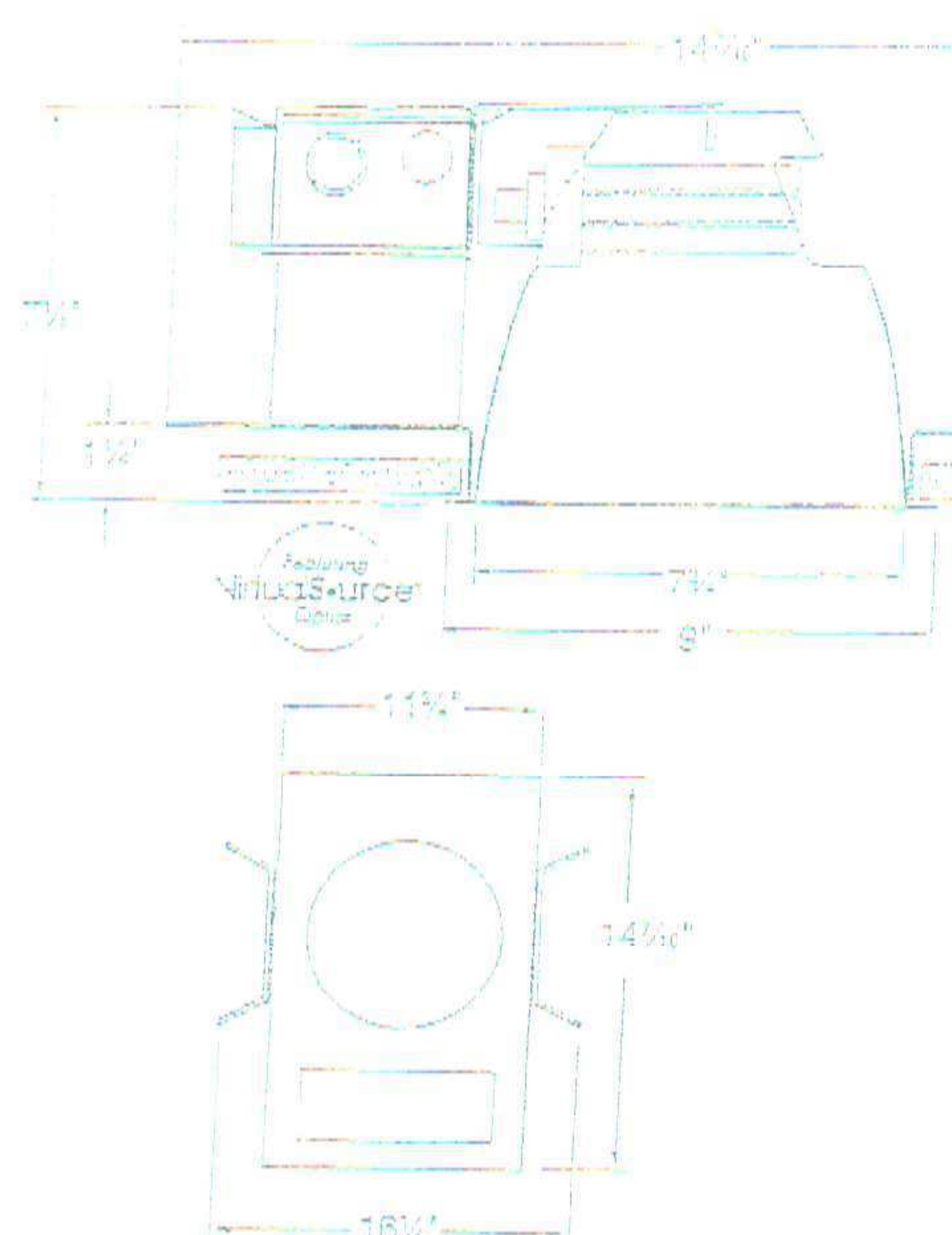
One (1) injection molded socket suitable for 26W, 32W, and 42W triple tube lamps (vented).

### INSTALLATION:

Universal adjustable mounting brackets accommodate 1 1/2" or 2 1/4" lathing channel (by others) or Prescolite 24" bar hangers (B24 or B6).

### LABELS:

UL, CSA listed for damp locations  
Approved for through wiring  
Nontype I.C.



### CATALOG NUMBER:

EXAMPLE: CFT832HEBDMEMSTF804H-B6

HOUSING	HOUSING OPTIONS	HOUSING OPTIONS	REFLECTOR	REFLECTOR OPTIONS	ACCESSORIES
<input checked="" type="checkbox"/> CFT832HEB 8" (1) 26W/32W/ 42W triple tube, multi-volt electronic ballast	<input type="checkbox"/> 347V (Specify wattage) <input type="checkbox"/> CP Chicago Plenum Fixture construction and/or specifications may vary. Refer to Chicago Plenum specification sheet on www.prescolite.com for details. Prefix housing catalog number <input type="checkbox"/> 3DM 3D AddressPro™ digital dimming ballast for programmable dimming capability. Refer to dimming specification sheet #PL3112	<input type="checkbox"/> DM Electronic analog dimming ballast (Compatible factory for wall control system compatibility) <input type="checkbox"/> EM Emergency battery pack with remote test switch and indicator light <input type="checkbox"/> PSDFA Fuse kit installation in factory <input type="checkbox"/> RIF1 Radio interference filter (single channel)	<input type="checkbox"/> STF802H @ 8" Specular clear Alzak <input type="checkbox"/> STF803H @ 8" Champagne gold Alzak <input type="checkbox"/> STF804H @ 8" Pewter Alzak <input type="checkbox"/> STF802HMFPC @ 8" American Mott™ clear <input type="checkbox"/> STF802HDSG @ 8" EuroSaw™ <input type="checkbox"/> WTP805H 8" Biscuit <input type="checkbox"/> WTP806H 8" White <input type="checkbox"/> WTP807H 8" Black cone	<input type="checkbox"/> SS Semi-specular finish <input type="checkbox"/> L Regressed clear lens <input type="checkbox"/> SL Regressed prismatic sawed lens <input type="checkbox"/> WW Wall wash reflector (not available with profile or lensed units) <input type="checkbox"/> TRG Trim ring gasket (factory installed) <input type="checkbox"/> WT Painted white self- rim (VVT) for 3T	<input type="checkbox"/> B24 Set of two (2) 24" bar hangers for T-bar ceilings <input type="checkbox"/> B6 Set of two (2) bar hangers for ceiling joist, up to 24" center <input type="checkbox"/> PSDFI Fuse kit for field installation <input type="checkbox"/> SCA8D Shaped ceiling accessory (can now be packaged) <input type="checkbox"/> Signos8 architectural glass elements Refer to specification sheet ARCH-312- 001 through 005

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ARCH-CPL-015





Model Name:  
CFT802HEB-STD-32W Triple  
32W Triple

Catalog Number:  
CFT802HEB-STD-32W Triple  
32W Triple

Type:  
LF10A/ALT

# PHOTOMETRIC DATA

## Architektür - 8" Horizontal Open & Wall Wash Downlights - CFT802HEB

### BALLAST DATA

	32W Triple			32W Triple			32W Triple		
	120V	277V	347V	120V	277V	347V	120V	277V	347V
Total System Watts	33W	33W	33W	33W	33W	33W	33W	33W	33W
Input Current (Amperes)	0.25	0.12	0.17	0.25	0.12	0.17	0.25	0.12	0.17
Input Frequency (Hz)	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60
Power Factor	>97%	>97%	>97%	>97%	>97%	>97%	>97%	>97%	>97%
Ballast Factor	>98%	>98%	>98%	>98%	>98%	>98%	>98%	>98%	>98%
Total Harmonic Distortion	<10%	<10%	<10%	<10%	<10%	<10%	<10%	<10%	<10%
Total Harmonic Distortion	<18°C (3°F)	<18°C (3°F)	<18°C (3°F)	<18°C (3°F)	<18°C (3°F)	<18°C (3°F)	<18°C (3°F)	<18°C (3°F)	<18°C (3°F)

### LAMP DATA

	32W Triple	32W Triple	32W Triple
Rated Watts	1800	2400	3200
Rated lumens	69	75	76
Efficiency (LPW)	10,000 hours	10,000 hours	10,000 hours
Rated Life	82	82	82
CRI	0° F	0° F	0° F
Minimum Starting Temp			

### LUMINANCE DATA IN CANDELA/SQ. METER

Angle in Vertical	Average 0°	Average 45°	Average 90°
45°	9428	9887	9944
55°	3228	3349	3150
65°	0	0	0
75°	0	0	0
85°	0	0	0

### CFT802HEB-STD-32W Triple Clear Alkaline Reflector with Prismatic Lens

Lamp: One 32W Triple

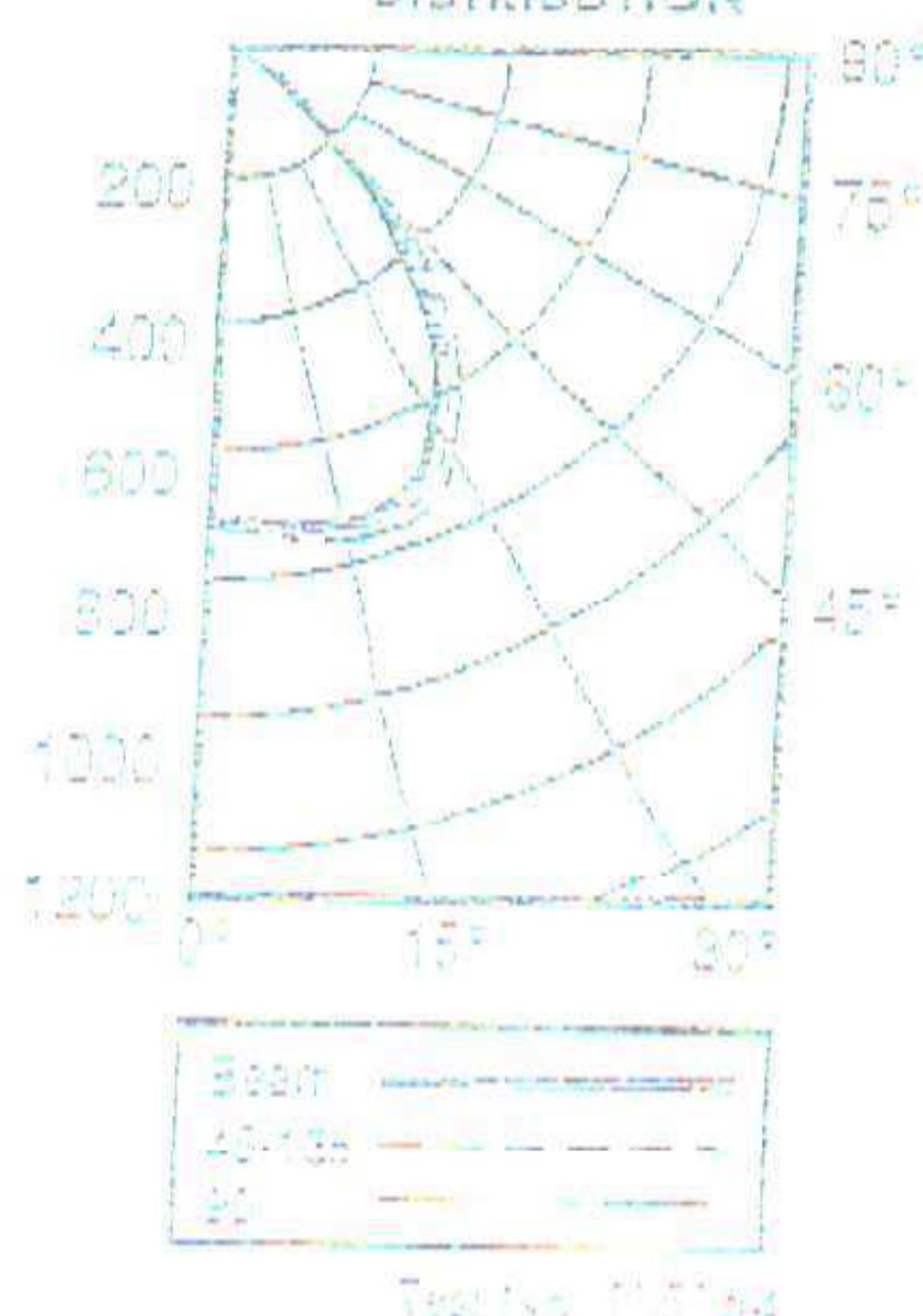
Efficiency: 52.0%

### AVERAGE INITIAL FOOTCANDLES

Multiple Units (Square Array)  
Ceiling 80% Wall 50% Floor 20%

SPACING	RCR1	RCR3	RCR7
8.0	15	13	10
9.0	12	10	7
10.0	10	8	6
11.0	8	7	5
12.0	7	6	4

### CANDLEPOWER DISTRIBUTION



### CANDLEPOWER SUMMARY

Angle	0°	45°	90°
0°	570	570	570
5°	565	569	582
15°	900	902	922
25°	745	613	651
35°	480	526	544
45°	202	212	214
55°	55	55	55
65°	0	0	0
75°	0	0	0
85°	0	0	0

### COEFFICIENTS OF UTILIZATION

Zonal Cavity Method

Beam Angle	% Effective Floor-Cavity Reflection				
	80%	70%	50%	30%	10%
0°	70	50	30	10	0
5°	69	49	29	9	0
10°	68	48	28	8	0
15°	67	47	27	7	0
20°	66	46	26	6	0
25°	65	45	25	5	0
30°	64	44	24	4	0
35°	63	43	23	3	0
40°	62	42	22	2	0
45°	61	41	21	1	0
50°	60	40	20	0	0
55°	59	39	19	0	0
60°	58	38	18	0	0
65°	57	37	17	0	0
70°	56	36	16	0	0
75°	55	35	15	0	0
80°	54	34	14	0	0
85°	53	33	13	0	0
90°	52	32	12	0	0

### NOTES

- 1. For details of fixture, see separate literature.
- 2. Refer to [www.prescolite.com](http://www.prescolite.com) for additional photometric test data.
- 3. When ordering a sloped ceiling fixture, specify the degree of slope in the mounting area of 15°. For a more precise degree of wall lighting applications, please consult factory.
- 4. Sloped ceiling fixture and housing must be applied at the same time.



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Hubbell  
Lighting, Inc.



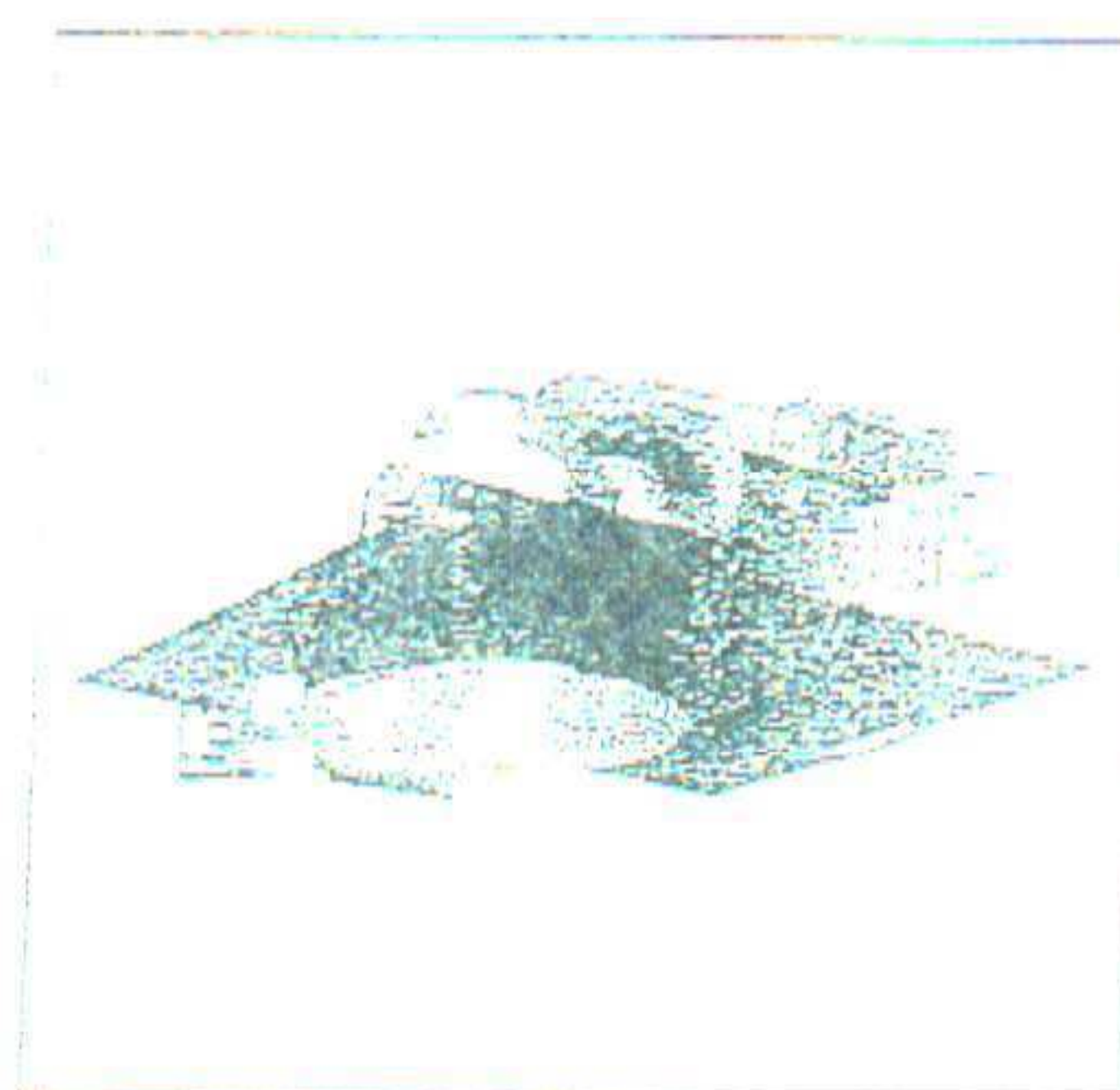
Elementary Design -

Elementary Design, Inc.  
Regulatory  
Information

Job Name:  
University of "Design" Library  
Renovation

Catalog Number:  
CFT832HEB FSDFA STF802H  
334  
Notes

Type:  
LF10B/ALT  
E-01016



Featuring VirtualSource® Reflection

## 8" Horizontal Open & Wall Wash Downlight CFT832HEB

One 26W, 32W, or 42W Triple Tube  
4-Pin Lamp  
Non-IC Rated  
120V, 208V, 240V, 277V, or 347V

Date: \_\_\_\_\_  
Rev: \_\_\_\_\_  
Rev: \_\_\_\_\_  
Project: \_\_\_\_\_

## Architektur

Ceiling Cutout: 8 1/2"  
Maximum Ceiling Thickness: 1 1/2"  
For conversion to millimeters,  
multiply inches by 25.4  
Not to Scale

### APPLICATIONS:

The CFT832HEB offers a horizontally lamped compact fluorescent downlight and wall wash fixture that provides superior brightness and glare control. The multi-watt, multi-volt ballast provides the ability to change wattages by simply changing the lamp. This luminaire is ideal for a wide variety of medium to high ceiling applications including commercial, retail, and hospitality. The CFT832HEB is compatible with the Signas8 family of architectural elements.

### HOUSING:

One-piece painted 16-gauge cold rolled steel platform. Prewired J-box with snap-on cover for easy access. Vented at lamp tip and socket for maximum light output. Same housing accommodates downlight and wall wash downlight reflectors.

### REFLECTOR:

High purity aluminum Alzak® Virtual Source® iridescence suppressed reflector. Self-trim (ST) standard. Painted white self-trim (WT) available. Baffled units standard with painted white self-trim.

### BALLAST:

One (1) compact fluorescent Class P electronic multi-volt (120V through 277V) ballast suitable for operating all 26W, 32W, and 42W triple tube lamps. RPT and EOL protection standard. Accessible from below ceiling. 347V available (specify voltage when ordering).

### LAMP:

One (1) 26W (GX24q-3 base), 32W (GX24q-3 base), or 42W (GX24q-4 base) 4-pin triple tube compact fluorescent lamp. Lamp furnished by others.

### SOCKET:

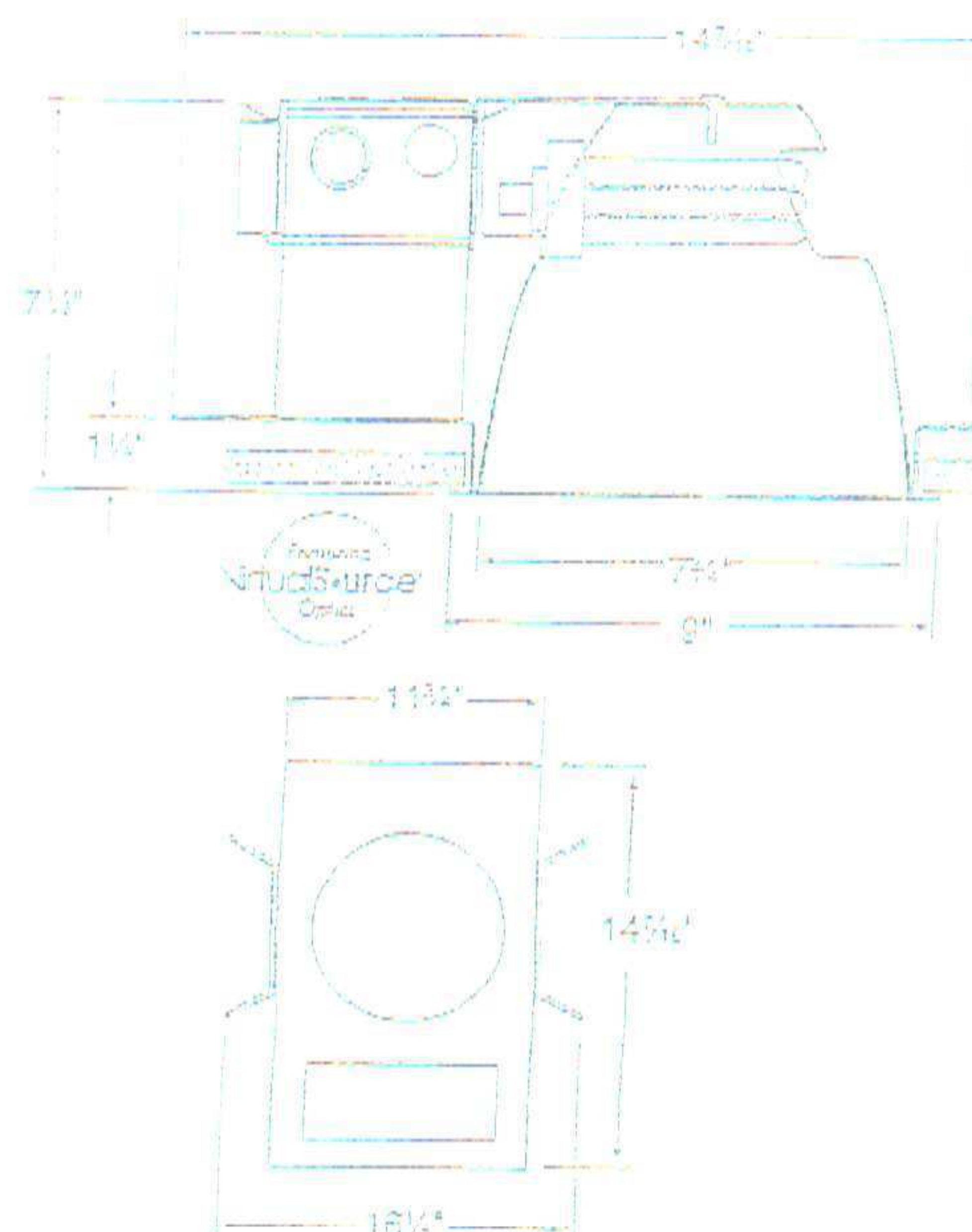
One (1) injection molded socket suitable for 26W, 32W, and 42W triple tube lamps (vented).

### INSTALLATION:

Universal adjustable mounting brackets accommodate 1 1/4" or 1 1/2" lath channel (by others) or Frescolite 24" bar hangers (B24 or B6).

### LABELS:

UL, CSA listed for damp locations. Approved for through wiring. Non-type I.C.



### CATALOG NUMBER:

EXAMPLE: CFT832HEBDMEM-STF804H-B6

HOUSING	HOUSING OPTIONS	HOUSING OPTIONS	REFLECTORS	REFLECTOR OPTIONS	ACCESSORIES
<input type="checkbox"/> CFT832HEB 8" (1) 26W/32W/ 42W triple tube, multi-volt electronic ballast	<input type="checkbox"/> 347V (Specify voltage) <input type="checkbox"/> CP Chicago Plenum. Fixture construction and/or specifications may vary. Refer to Chicago Plenum specification sheets on www.prescolite.com for details. (Prate housing catalog number) <input type="checkbox"/> SDM 20-AddressPro™ digital dimming ballast for programmable dimming capability. Refer to dimming specification sheet #PR3117	<input type="checkbox"/> DM Electronic analog dimming ballast (Contact factory for wall control system compatibility) <input type="checkbox"/> EM Emergency battery pack with remote test switch and indicator light <input type="checkbox"/> FSDFA Fuse kit installed in factory <input type="checkbox"/> RJFI Radio Interference Filter (single circuit)	<input type="checkbox"/> STF802H Ⓞ 8" Specular clear Alzak <input type="checkbox"/> STF803H Ⓞ 8" Champagne gold Alzak <input type="checkbox"/> STF804H Ⓞ 8" Pewter Alzak <input type="checkbox"/> STF802HMF Ⓞ 8" American Made™ clear <input type="checkbox"/> STF802HDS Ⓞ 8" EuroSpec™ <input type="checkbox"/> WTF805H 8" Black baffles <input type="checkbox"/> WTF806H 8" White baffles <input type="checkbox"/> WTF807H 8" Black cone	<input type="checkbox"/> SS Semi-specular finish <input type="checkbox"/> L Regressed clear lens <input type="checkbox"/> SL Regressed prismatic spread lens <input type="checkbox"/> WW Wall wash reflector (not available with baffles or recessed rims) <input type="checkbox"/> TRG Trim ring gasket (factory installed) <input type="checkbox"/> WT Painted white self- trim (baffles WT for ST)	<input type="checkbox"/> B24 Set of two (2) 24" bar hangers for T-bar ceilings <input type="checkbox"/> B6 Set of two (2) bar hangers for ceiling joists up to 24" centers <input type="checkbox"/> FSDFI Fuse kit for field installation <input type="checkbox"/> SCABD Sloped ceiling adapter (see note on back page) <input type="checkbox"/> Signas8 Architectural glass elements Refer to specification sheet ARCH-SIG- 003 through 008

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ARCH-CFL-013







Submitted by: **Electro-Lume, Inc.**Electro-Lume, Inc.  
Manufacturers  
Representatives

Job Name:

University of Toledo - Carson Library  
Renovation

Catalog Number:

CFT832HEB PSDFA

STF802-HWW B24

(Notes)

Type:

LF10C/ALT

© 2000-2001

Featuring **VIRTUALSOURCE**®

## 8" Horizontal Open & Wall Wash Downlight CFT832HEB

One 26W, 32W, or 42W Triple Tube  
4-Pin Lamp

Non-IC Rated

120V, 208V, 240V, 277V, or 347V

DATE:

TIME:

REV. NAME:

PROJECT:

Architektur

Ceiling Cutout: 8 1/2"

Maximum Ceiling Thickness: 1 1/2"

For conversion to millimeters,  
multiply inches by 25.4

Not to Scale

### APPLICATIONS:

The CFT832HEB offers a horizontally-lensed compact fluorescent downlight and wall wash fixture that provides superior brightness and glare control. The multi-volt, multi-volt ballast provides the ability to change wattages by simply changing the lamp. This luminaire is ideal for a wide variety of medium to high ceiling applications including commercial, retail, and hospitality. The CFT832HEB is compatible with the Signos8 family of architectural elements.

### HOUSING:

One-piece painted 16-gauge cold rolled steel platform. Prewired J-box with snap-on cover for easy access. Vented at lamp tip and sealer for maximum light output. Same housing accommodates downlight and wall wash downlight reflectors.

### REFLECTOR:

High purity aluminum Alzak® Virtual Source® iridescence suppressed reflector. Bell-trim (ST) standard. Painted white self-trim (WT) available. Baffled units standard with painted white self-trim.

### BALLAST:

One (1) compact fluorescent Class "P" electronic multi-volt (120V through 277V) ballast suitable for operating all 26W, 32W, and 42W triple tube lamps. HPF and EOL protection standard. Accessible from below ceiling. 347V available (specify wattage when ordering).

### LAMP:

One (1) 26W (GX24q-3 base), 32W (GX24q-3 base), or 42W (GX24q-4 base) 4-pin triple tube compact fluorescent lamp. Lamp furnished by others.

### SOCKET:

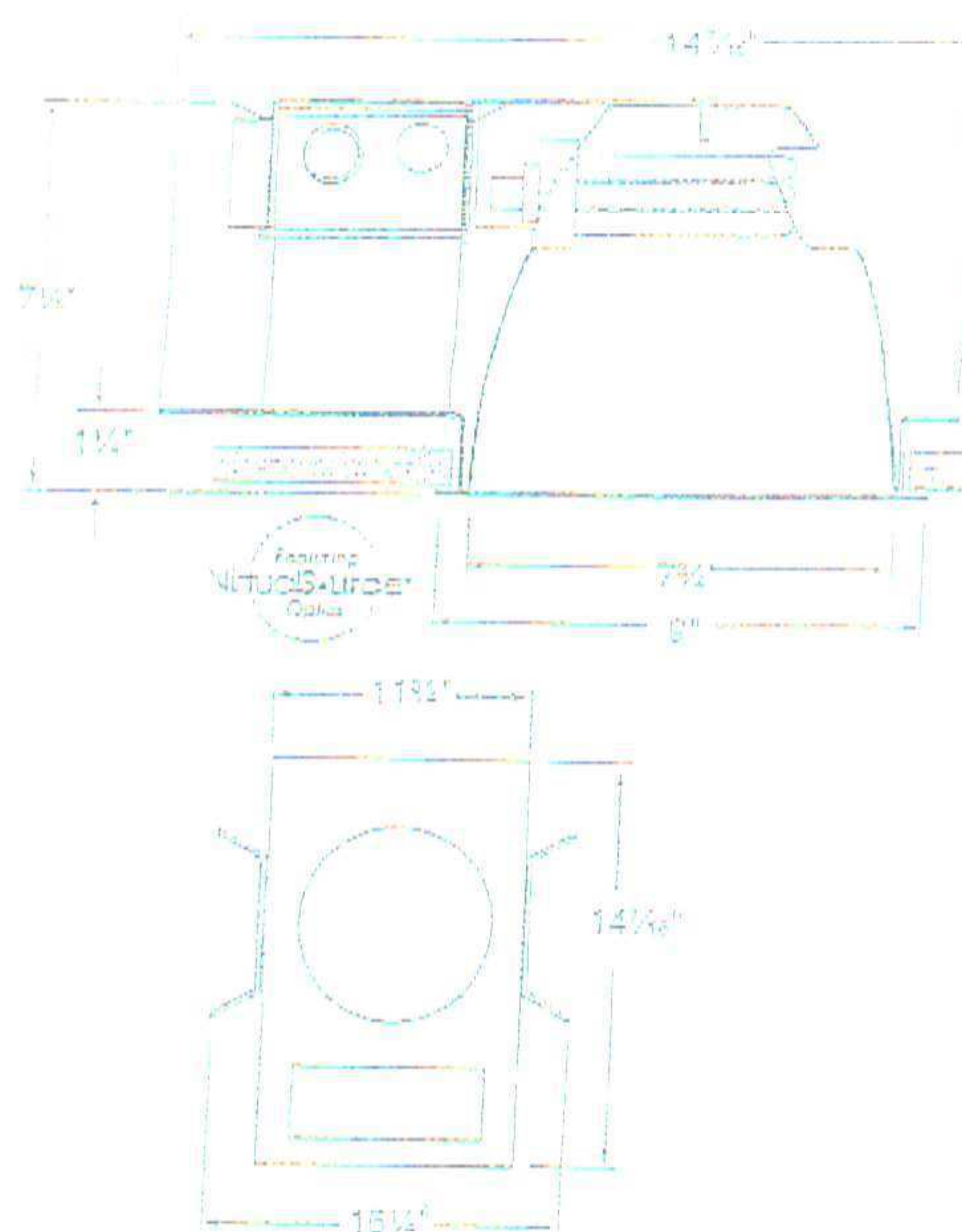
One (1) injection molded socket suitable for 26W, 32W, and 42W triple tube lamps (vented).

### INSTALLATION:

Universal adjustable mounting brackets accommodate 1 1/2" or 3/4" lath channel (by others) or Prescolite 24" bar hangers (B24 or B6).

### LABELS:

UL, CSA listed for damp locations  
Approved for through wiring  
Non-type I.C.



CATALOG NUMBER:

EXAMPLE: CFT832HEBDMEM-STF804H-B6

HOUSING	HOUSING OPTIONS	HOUSING OPTIONS	REFLECTORS	REFLECTOR OPTIONS	ACCESSORIES
<input type="checkbox"/> CFT832HEB 8 1/2" 26W/32W/42W Triple tube, multi-volt electronic ballast	<input type="checkbox"/> 347V (Specify wattage) CP Chicago Plenum, Fixture construction and/or specifications may vary. Refer to Chicago Plenum specification sheets on www.prescolite.com for details. (Prep housing catalog number) <input type="checkbox"/> 3DM 3D AddressPro® digital dimming ballast for programmable dimming capability. Refer to dimming specification packet #PSC117	<input type="checkbox"/> DM Electronic analog dimming ballast (Contact factory for wall control system compatibility) <input type="checkbox"/> EM Emergency battery pack with remote test switch and indicator light <input type="checkbox"/> PSDFA Fuse kit installation factory <input type="checkbox"/> RIFT Radio interference filter (single circuit)	<input type="checkbox"/> STF802H © 8" Specular clear Alzak <input type="checkbox"/> STF803H © 8" Champagne gold Alzak <input type="checkbox"/> STF804H © 8" Pewter Alzak <input type="checkbox"/> STF802HMF © 8" American Mako™ clear <input type="checkbox"/> STF802HDS © 8" EuroSpot™ <input type="checkbox"/> WTF805H 8" Black Baffle <input type="checkbox"/> WTF806H 8" White Baffle <input type="checkbox"/> WTF807H 8" Black Baffle	<input type="checkbox"/> SS Semi-specular finish <input type="checkbox"/> L Regressed deep lens <input type="checkbox"/> SL Regressed prismatic spread lens <input type="checkbox"/> WW Wall wash reflector (not available with baffle or lensed trim) <input type="checkbox"/> TRG Trim ring gasket (factory installed) <input type="checkbox"/> WT Painted white self- trim (substitute WT for ST)	<input type="checkbox"/> B24 Set of two (2) 24" bar hangers for T-bar ceilings <input type="checkbox"/> B6 Set of two (2) bar hangers for ceiling joists up to 24" centers <input type="checkbox"/> PSDFI Fuse kit for field installation <input type="checkbox"/> SCASD Sloped ceiling equator (see note on next page) <input type="checkbox"/> Signos8 Architectural glare elements Refer to specification sheet ARCH-SIG- 001 through 008

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ARCH-CFL-015



Submitted by: Electra-Lume

Electra-Lume, Inc.  
Manufacturers  
of LED Lighting

Job Name:  
University of Texas - Dallas - 4000  
- 4000 4000

Catalog Number:  
CFT832HEB-FSD-FA  
STF8002HWW-B34  
Notes:

Type:  
LF10C/ALT

E-30-2881

# PHOTOMETRIC DATA

Architektür - 8" Horizontal Open &  
Wall Wash Downlights - CFT832HEB

## ELECTRIC DATA

	120V			277V			347V		
	120V	277V	347V	120V	277V	347V	120V	277V	347V
Total System Watts	25W	25W	32W	35W	35W	42W	44W	47W	48W
Input Current (amps)	0.23	0.11	0.11	0.29	0.13	0.12	0.36	0.17	0.14
Input Frequency (Hz)	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60
Power Factor	>97%	>97%	>97%	>97%	>97%	>97%	>97%	>97%	>97%
Ballast Factor	>92%	>92%	>92%	>92%	>92%	>92%	>92%	>92%	>92%
Total Harmonic Distortion	<10%	<10%	<10%	<10%	<10%	<10%	<10%	<10%	<10%
Total Harmonic Distortion	<10% (0°F)	<10% (0°F)	<10% (0°F)	<10% (0°F)	<10% (0°F)	<10% (0°F)	<10% (0°F)	<10% (0°F)	<10% (0°F)

## LAMP DATA

	25W Triple	32W Triple	42W Triple
Rated Watts	25W	32W	42W
Rated Lumens	1800	2400	3200
Efficacy (LPW)	84	75	76
Rated Life	10,000 hours	10,000 hours	10,000 hours
CR	82	82	82
Minimum Starting Temp	0°F	0°F	0°F

## LUMINANCE DATA IN CANDELA/SQ. METER

Angle in Vertical	Average 0°	Average 45°	Average 90°
45°	9428	9887	9944
55°	3228	3349	3150
65°	0	54	0
75°	0	0	0
85°	0	0	0

CFT832HEB-STTTP Clear Alzaid® Reflector with Prismatic Lens

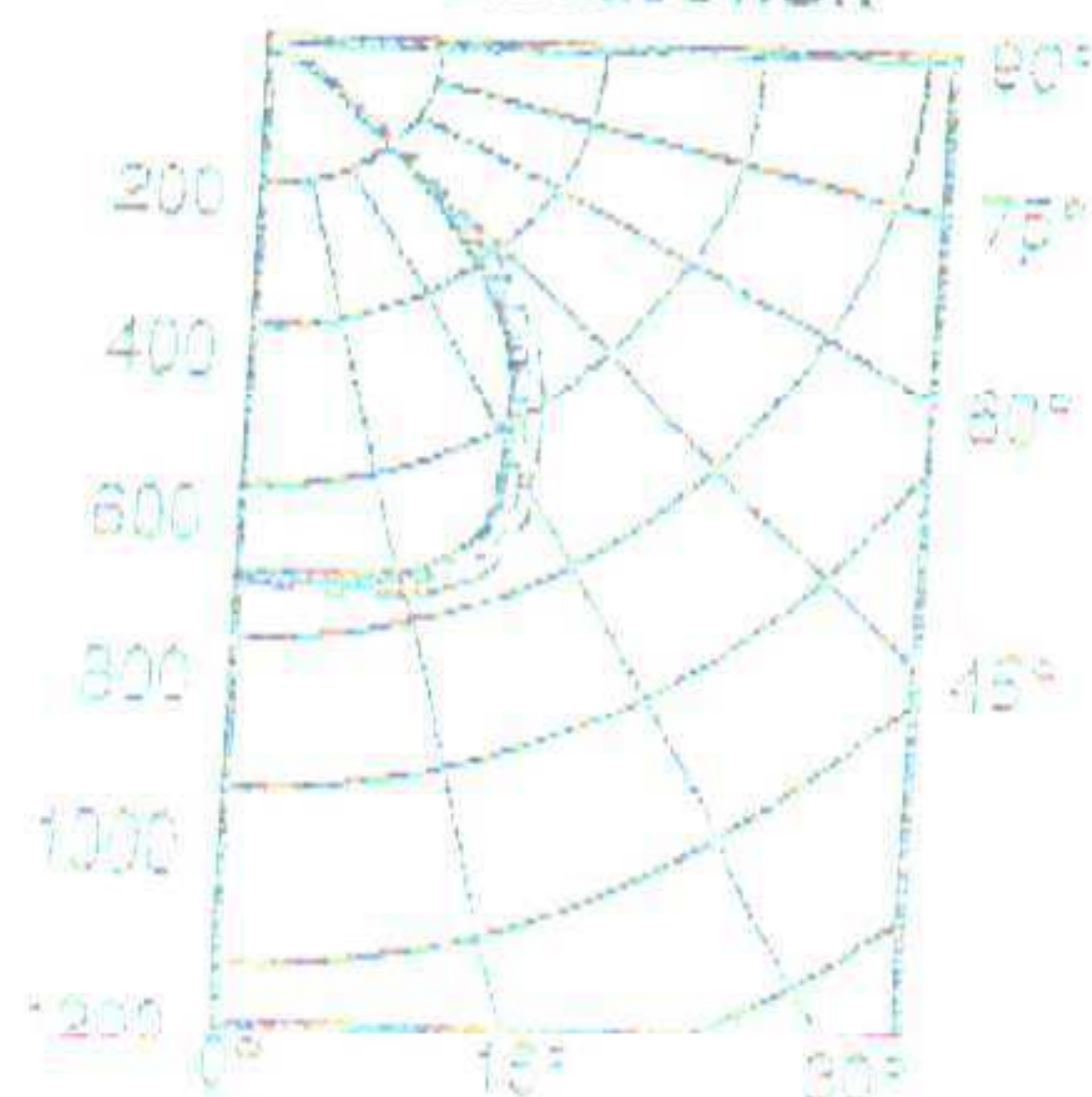
Lamp: One 32W Triple  
Shading Criteria:  
0° = 1.1  
90° = 1.2  
at 52.0%

## AVERAGE INITIAL FOOTCANDLES

Multiple Units (Square Array)  
Ceiling 90% Wall 50% Floor 20%

SPACING	RCE1	RCE3	RCE7
8.0	13	13	10
9.0	12	10	7
10.0	10	8	6
11.0	8	7	5
12.0	7	6	4

## CANDLEPOWER DISTRIBUTION



## CANDLEPOWER SUMMARY

Angle	0°	45°	90°
0	870	870	870
5	859	859	859
10	900	900	900
15	743	813	851
20	480	536	542
25	302	313	314
30	26	55	55
35	0	1	0
40	0	0	0
45	0	0	0

## COEFFICIENTS OF UTILIZATION Zonal Cavity Method

		20% Effective Floor Cavity Reflectance					20% Effective Ceiling Cavity Reflectance				
		80%					70%				
		50%					30%				
		10%					0%				
Room Index	Beam Spread	70	50	30	10	0	70	50	30	10	0
1	0-15	50	40	30	20	10	40	30	20	10	0
2	16-30	40	30	20	10	0	30	20	10	0	0
3	31-45	30	20	10	0	0	20	10	0	0	0
4	46-60	20	10	0	0	0	10	0	0	0	0
5	61-75	10	0	0	0	0	0	0	0	0	0
6	76-90	0	0	0	0	0	0	0	0	0	0
7	91-105	0	0	0	0	0	0	0	0	0	0
8	106-120	0	0	0	0	0	0	0	0	0	0
9	121-135	0	0	0	0	0	0	0	0	0	0
10	136-150	0	0	0	0	0	0	0	0	0	0

CFT832HEB-STTTP

Source: FSD-FA

## NOTES

① Depends on Actual Source location

Refer to [www.prescolite.com](http://www.prescolite.com) for additional photometric data (IES Files)

When ordering a sloped ceiling adapter, specify the degree of slope in 3° increments max. of 36°. For a more precise degree or wall ceiling adaptation, please contact factory. Sloped ceiling adapter and housing must be installed using same size.

Prescolite

Web: [www.prescolite.com](http://www.prescolite.com) • Tech Support: (888) 777-4832  
101 Corporate Drive, Suite 1 • Spanaway, SC 29309 U.S.A. • Phone (804) 891-6000  
Prescolite is a leader in indoor lighting and, with its commitment, offers the highest quality products.  
Copyright 2000 Prescolite. All rights reserved. Specifications subject to change without notice. • Prescolite is a registered trademark of Prescolite, Inc.



Hubbell  
Lighting, Inc.





University of Toledo – Carlson  
Library Renovation (Phase 1)

Brint Project #5326-1  
Lighting Fixture (LF-5A) Shop Cuts  
Submitted For Approval

Specification Section:  
265100

**APPROVED**

*By Kevin McCall at 7:32 am, Mar 14, 2007*





INDIRECT

# AL, ACCENT LIGHT T12 OR T8 LAMPS

Project: UT Carlson Library

Location: Toledo, OH

## DESCRIPTION

Accent Light system provides an easy and flexible means of fluorescent wall wash illumination that is capable of being adjusted to fit actual job-site conditions. Row lengths and corners have the flexibility that make custom factory fabrication components unnecessary. (CSA approval available. Use suffix "CSA").

## CONSTRUCTION

Accent Light offers a variety of lighting diffusers which will fit most suspended ceilings. Low brightness parabolic baffles are cantilevered from the ceiling side, approximately 3/4" off the wall. This minimizes wall irregularities and shadows. Unique "fan" corners provide some flexibility for non-perpendicular corners. Snap in electrical components and pre-wired quick connect plugs simplify installation.

## ORDERING INFORMATION

Use ordering guide and detailed Row Length Selector R4-2 for 1-Light or R4-3 for 2-Light) to custom design your job with the standard components of Accent Light.

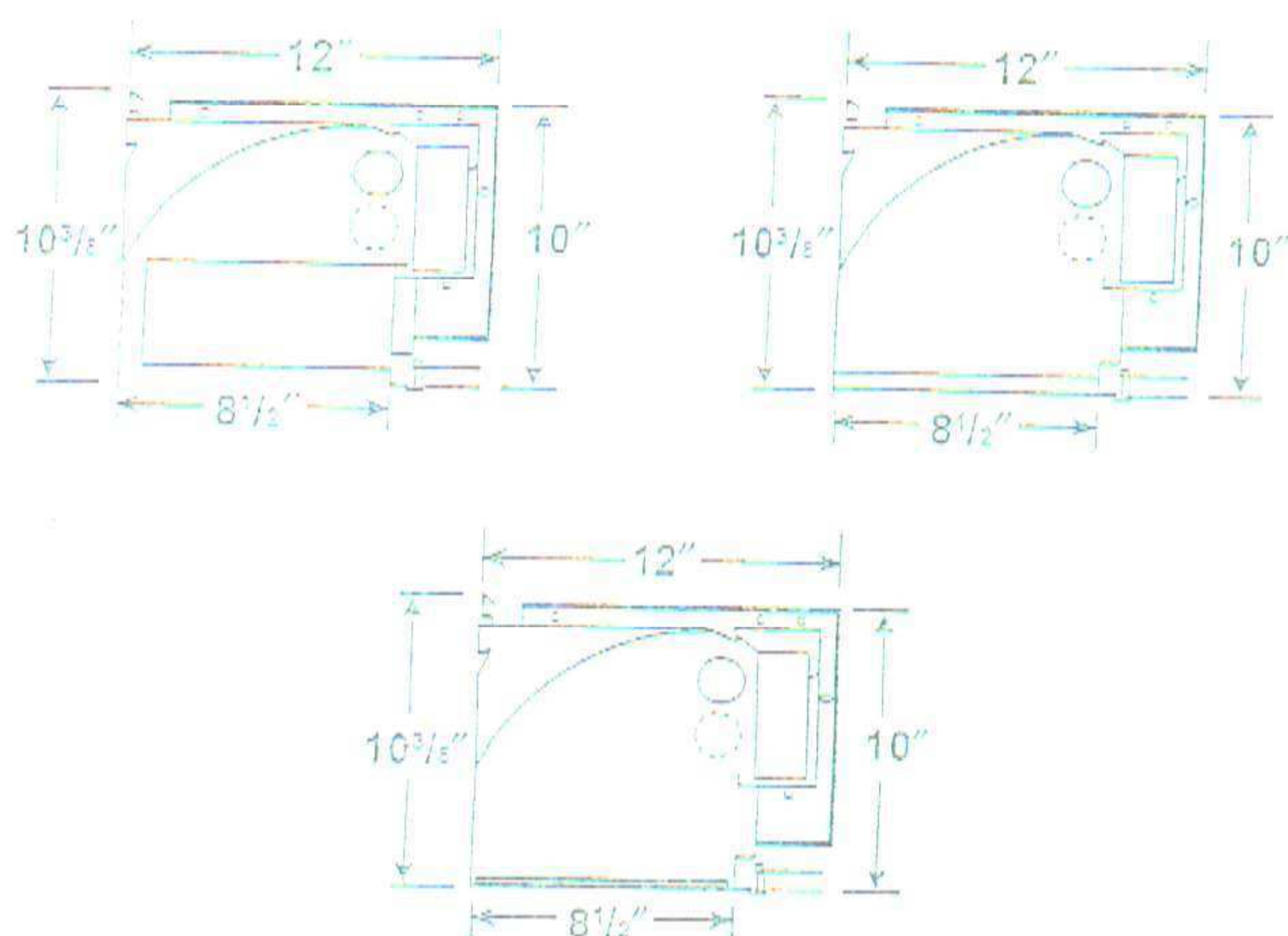
## FINISH

Painted parts are treated with a five-stage phosphate bonding process and finished with a high temperature baked enamel after fabrication.

## LABELS AND ELECTRICAL

All fixtures bear UL recessed fixture label. CSA approval available. Use suffix "CSA".

CROSS SECTIONS



Dimensions and specifications subject to change without notice.

ORDERING INFORMATION

AL - 2T8	A12 - EB8LH	277 - S	25.00' - GLR
Model AL - Accent Light	Reflector R - With Gloss White Reflector (Not available with 4" regress) N - No Reflector	Voltage 120 - 120V 277 - 277V 347 - 347V	Catalog Code No.
No. of Lamps In Cross Section 1T8 - One T8 Lamp Staggered 2T8 - Two T8 Lamps Staggered 1T12 - One T12 Lamp Staggered 2T12 - Two T12 Lamps Staggered	Shielding LD - Low Indescent Semi-Specular Aluminum Parabolic Louver SP - Specular Aluminum Parabolic Louver WCB - White Cross Baffle A12 - Acrylic Pattern 12 Prismatic Lens OP - Opal Lens NA - Open, No Shielding	Air Function S - Static E - Extract	00.00 - Row Length Code* 90OC - 90° Outside Corner 90IC - 90° Inside Corner 135OC - 135° Outside Corner 135IC - 135° Inside Corner *Specify row length - Example: 30' 8" row would be 30.08. Dimension should be the "wall to wall" dimension. Corners are static.
Shielding Placement P - 3/4" Regress (Parabolic louver only) R1 - 1" Regress (Lens or WCB) R4 - 4" Regress (Lens only) FC - Flush to Ceiling (Lens or WCB)		Ballast Type EB8 - Electronic T8 OCT - Magnetic T8 / Octron EB12 - Electronic T12 LE - Energy Saving Magnetic T12 Unless specified, Alera will use fewest ballasts possible.	Options DL - Demo Label EL - Emergency Battery Pack (Specify placement in row) GLR - Fast Blow Fuse GMF - Slow Blow Fuse CSA - Approved, Canadian Standards Association

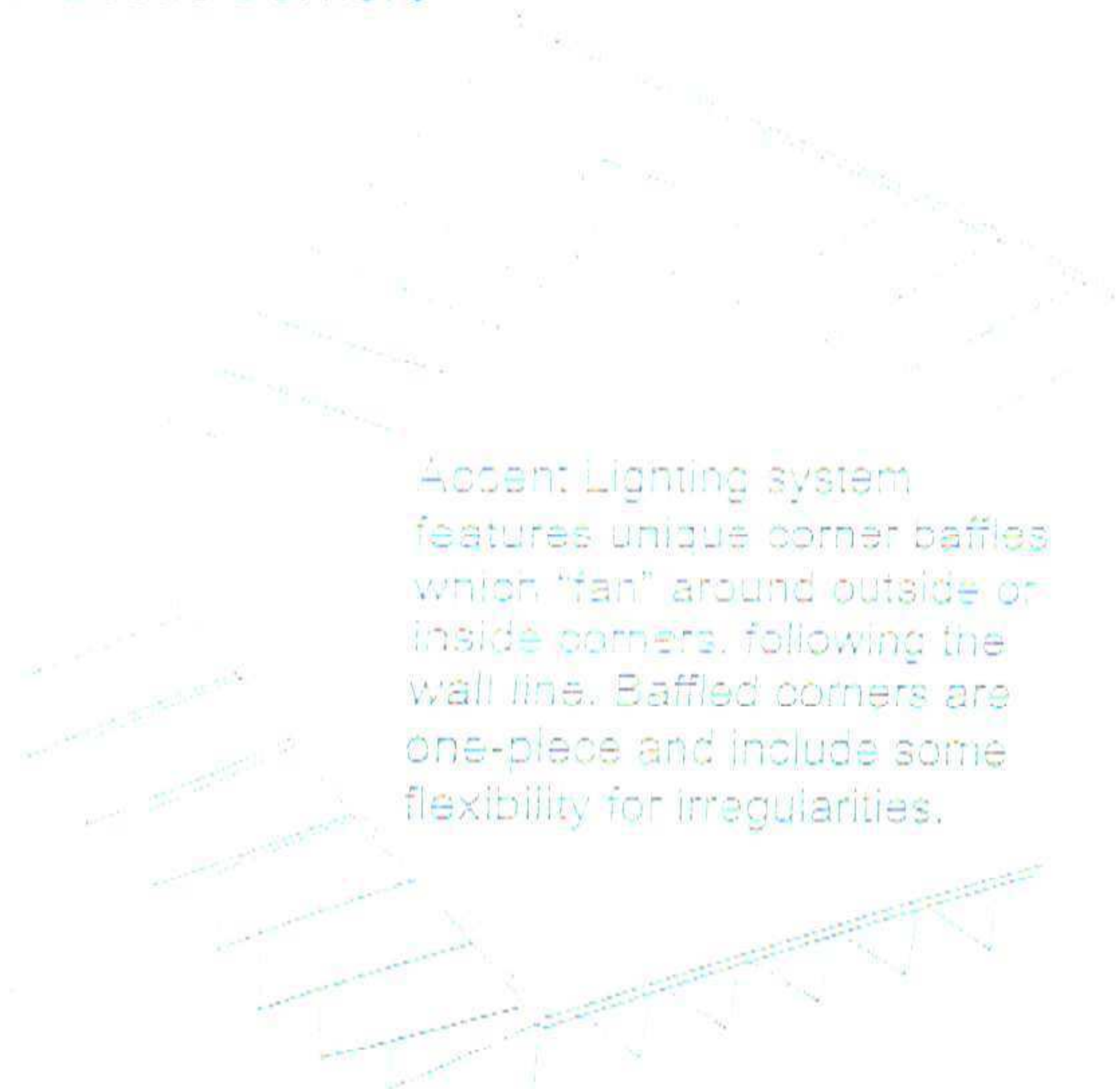
ALERA  
LIGHTING



## DESIGN FEATURES

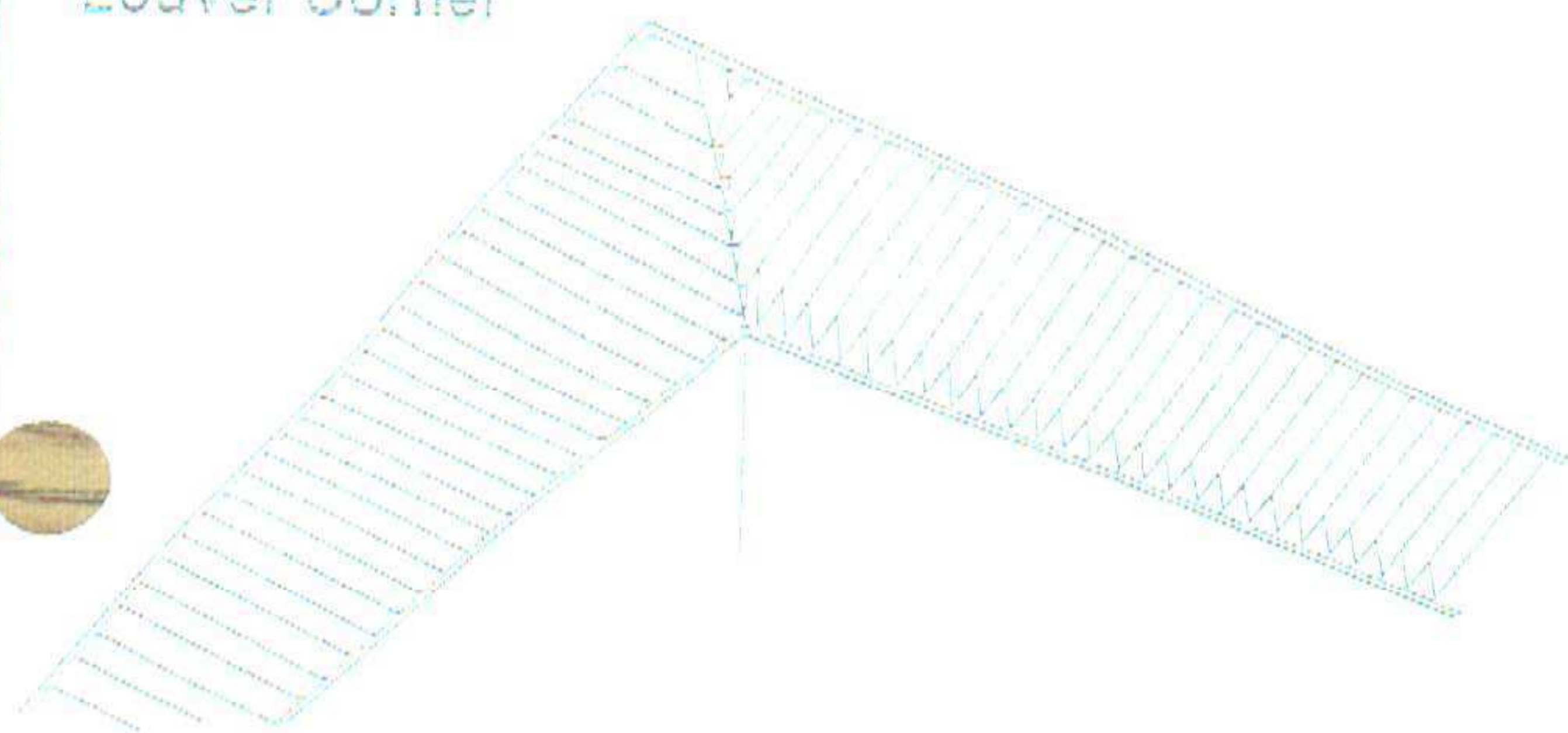
AL

### Parabolic Corners



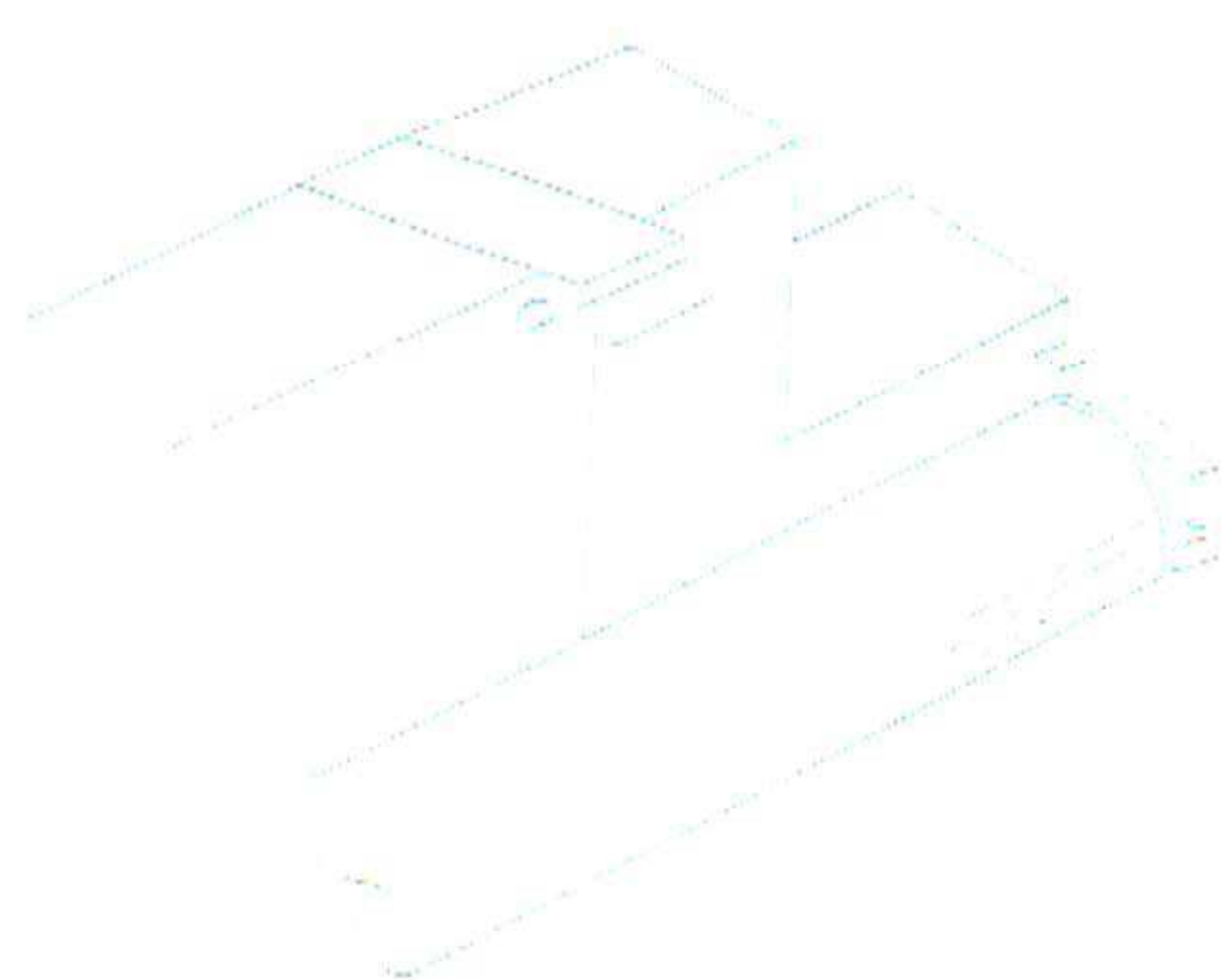
Accent Lighting system features unique corner baffles which "fan" around outside or inside corners, following the wall line. Baffled corners are one-piece and include some flexibility for irregularities.

### Louver Corner



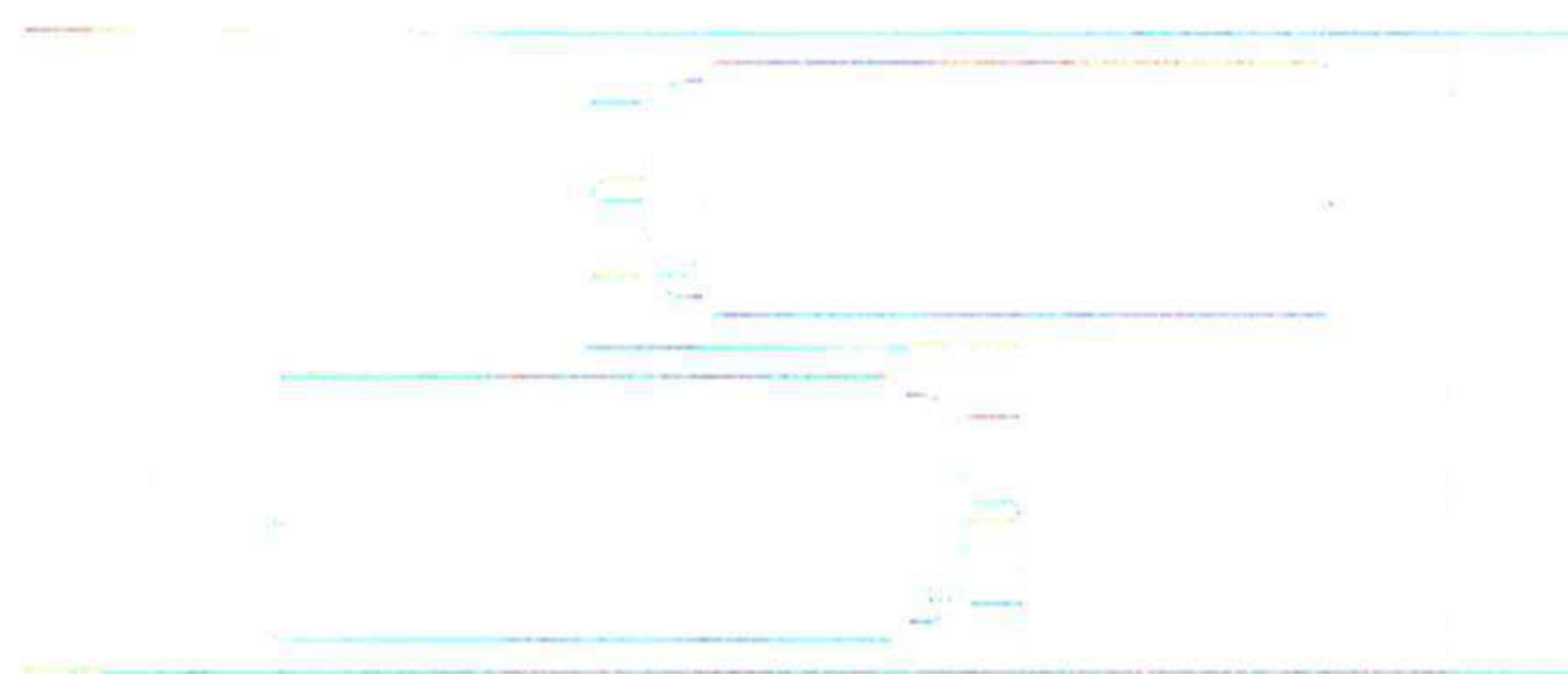
Straight blade louvers have a 45° mitered corner. Louvers and lenses are shipped in 4' lengths. Straight end is field measured and cut to required wall length.

### Snap-In Lighting Units



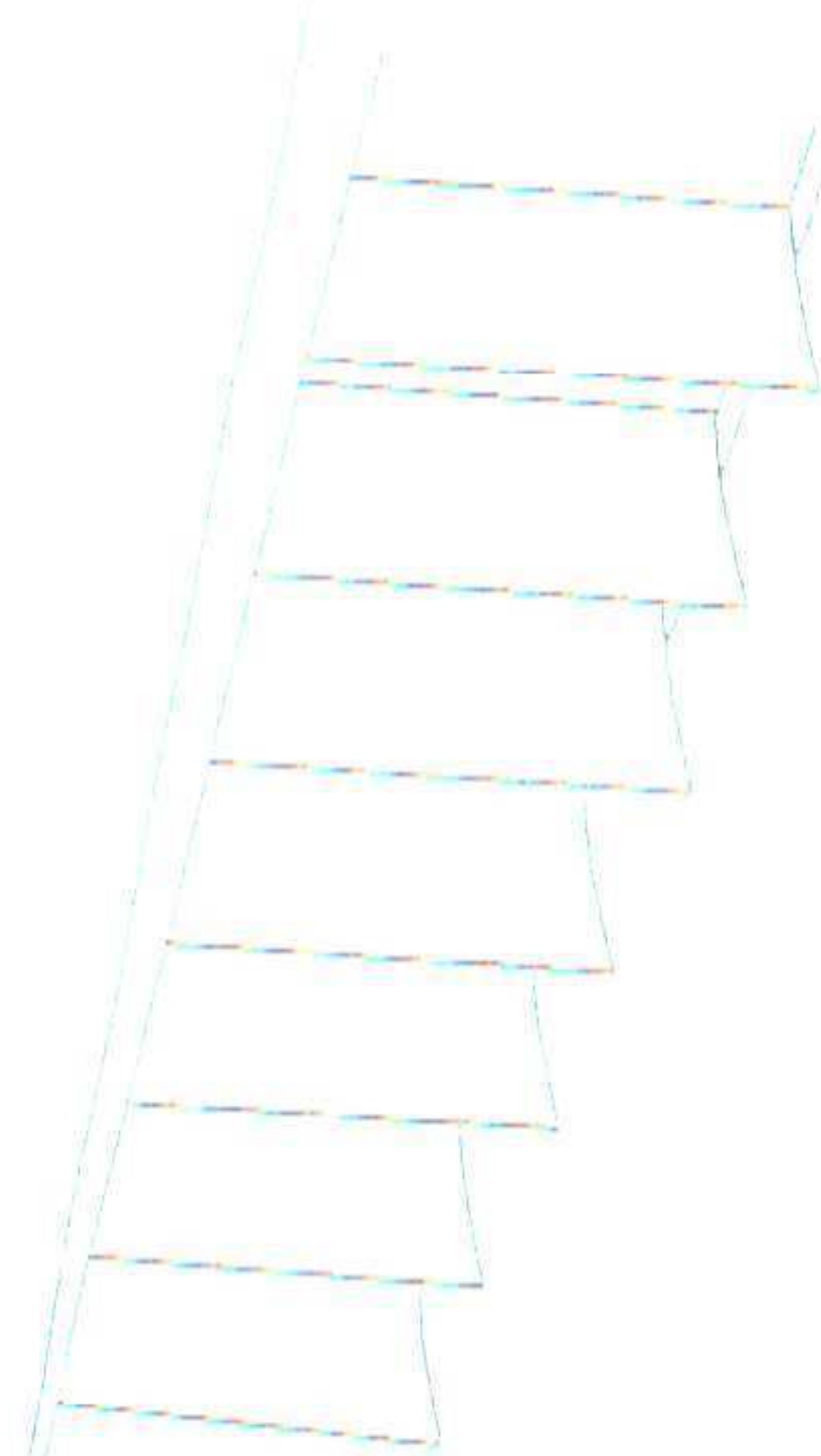
Individual lighting fixtures are equipped with metal mounting clips that fix the unit quickly and firmly in place within the housing and without the use of tools.

### Overlap Lamps



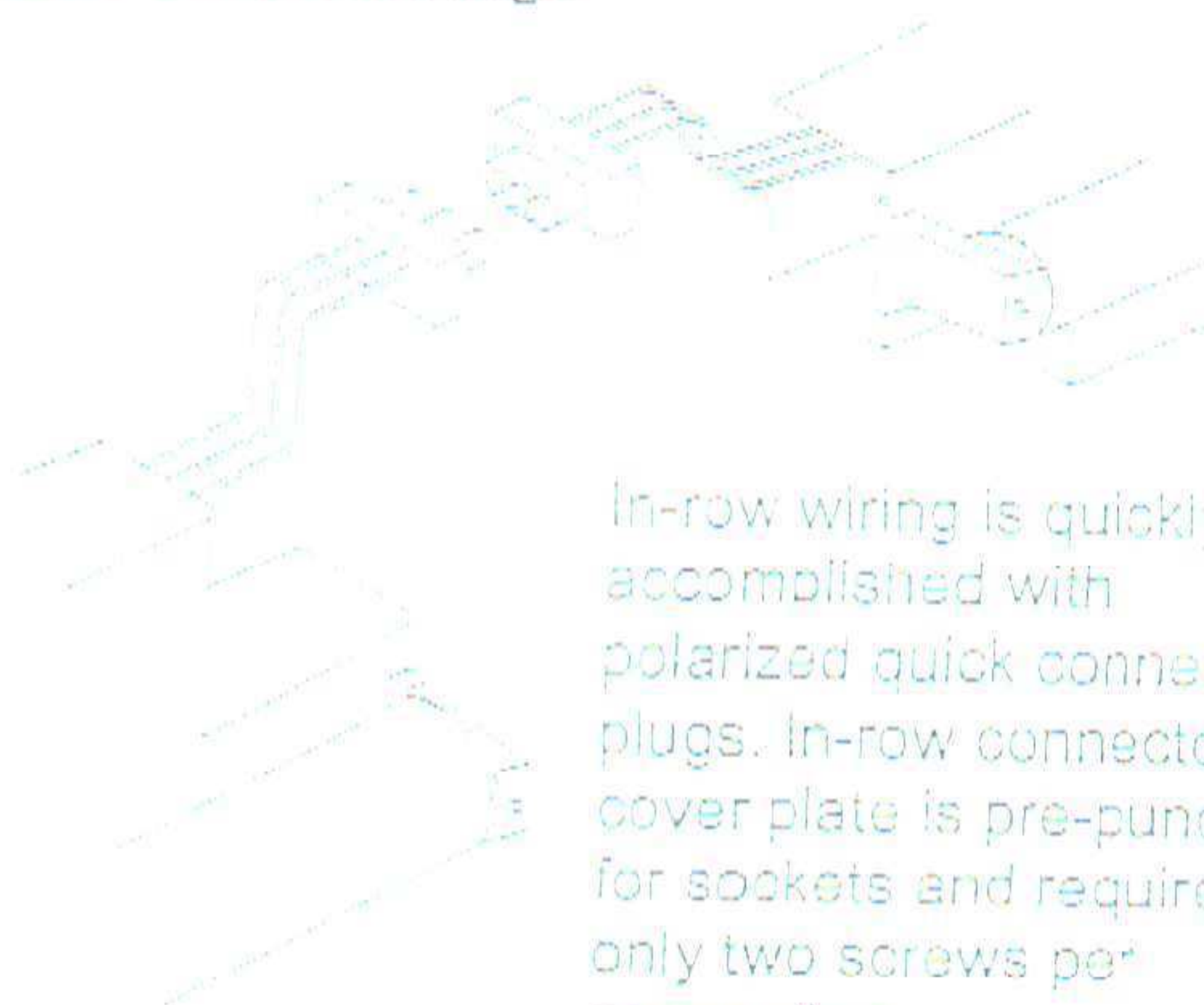
Lamps overlap 3" to eliminate shadows on wall caused by socket, lamp ends and lamp darkening. Shields are provided with adjustable units to prevent bright spots in long overlap areas.

### Parabolic Cantilever Baffle



All parabolic baffles in Accent Light are cantilevered from ceiling side of the system to give illumination on wall. Space allows light to "wash out" uneven surfaces in wall construction. Baffles are of sturdy construction to assure continuity and alignment.

### Quick Connect Plugs



In-row wiring is quickly accomplished with polarized quick connect plugs. In-row connector cover plate is pre-punched for sockets and requires only two screws per connection.

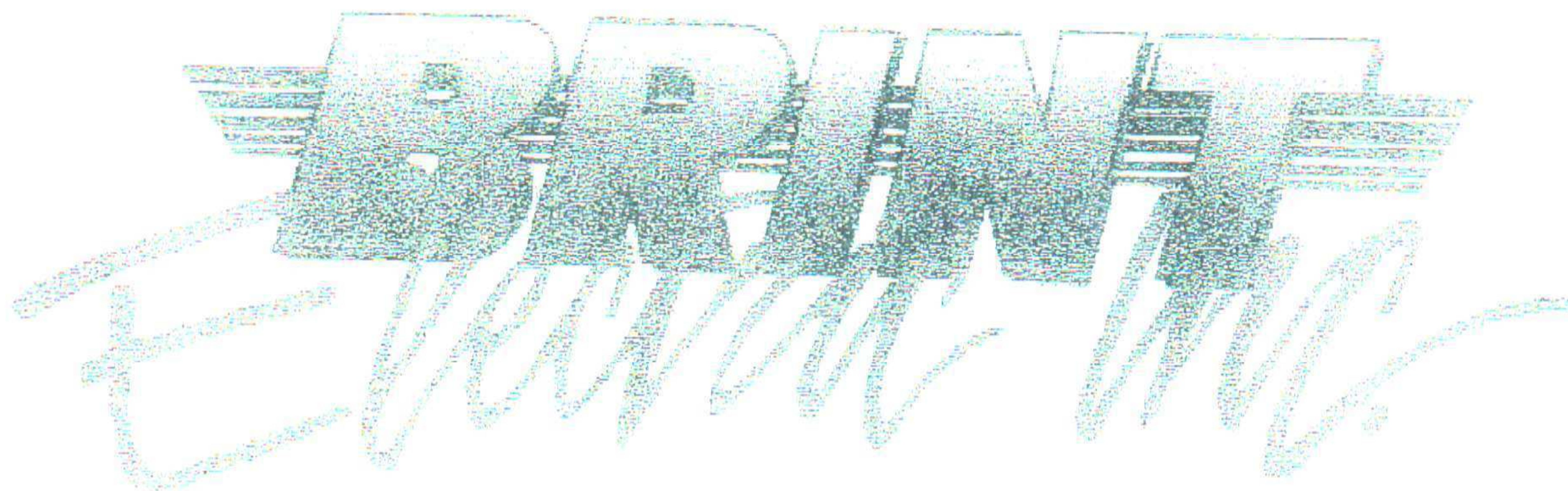


**ALERA**  
LIGHTING

www.aleralighting.com • 3803 North Sullivan Rd. • Spokane, WA 99216 • (509) 921-8300

AL 05/00





University of Toledo – Carlson  
Library Renovation (Phase 1)

Brint Project #5326-1  
Lighting Fixture Shop Cuts  
LF-19A (resubmit) and LF-20A&B  
Submitted For Approval

Specification Section:  
265100







CATALOG NO.: 083082 VAR42426-2

TYPE: LF19A

PLEASE MARK ANY CHANGES TO THE SPECIFICATIONS AS SHOWN.  
IF NONE ARE INDICATED, VISA LIGHTING WILL PROVIDE THE  
PRODUCT AS SHOWN. DESIGN MODIFICATION RIGHTS RESERVED.

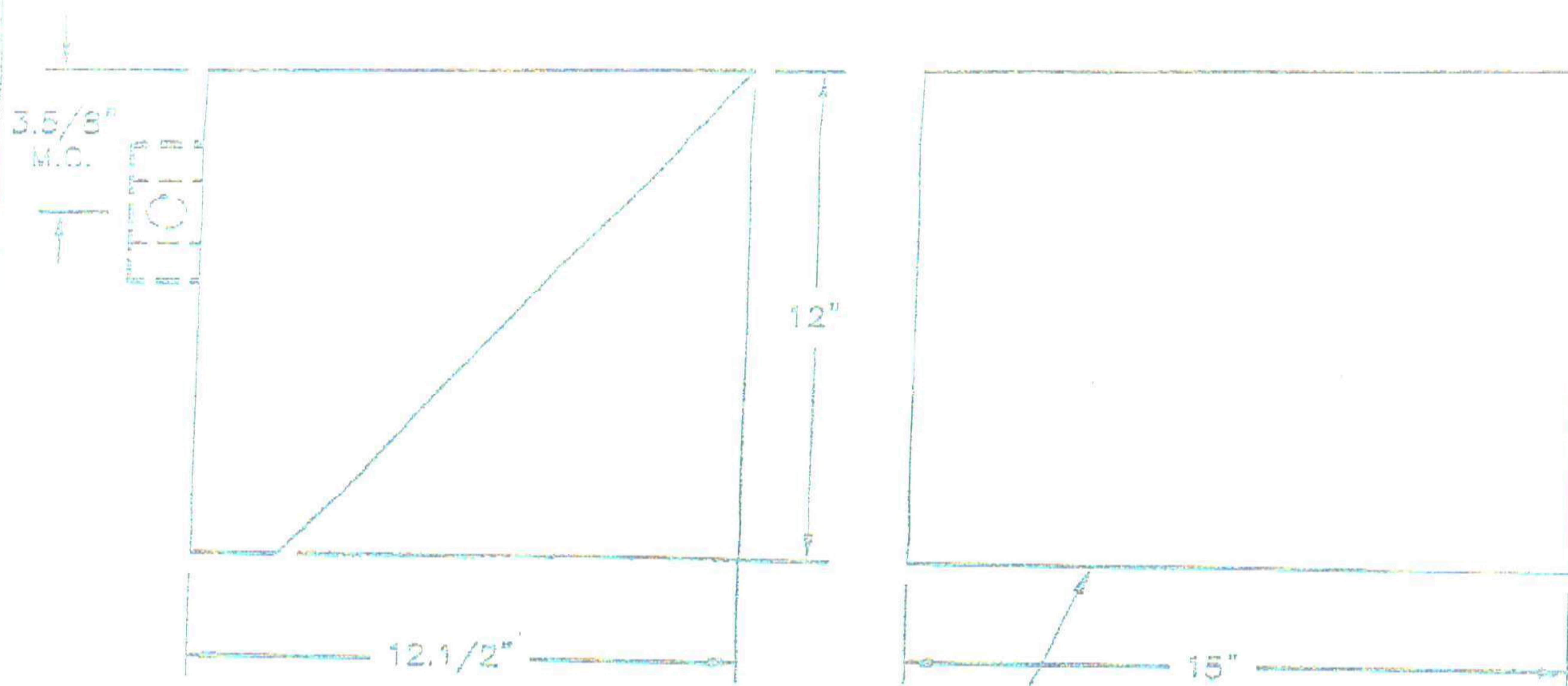
JOB NAME: J. OF T. CARLSON

ENG: ORR

DATE: 01/25/07

SCALE: 3/16

CHK'D:



SLOTTED BOTTOM TO ALLOW  
FOR DRAINAGE. LIGHT WILL  
ALSO PROJECT FROM THESE SLOTS

HOUSING: FABRICATED ALUMINUM.

FINISH: PAINTED, THERMOSET ACRYLIC POWDER COAT, ONE OF VISA'S STANDARD  
COLORS. COLOR SELECTION: \_\_\_\_\_

MOUNTING: MOUNTS TO A 4" OCTAGONAL ELECTRICAL BOX (BY OTHERS) WITH  
A UNIVERSAL MOUNTING STRAP AND HARDWARE PROVIDED. SEE  
MOUNTING CENTER DIMENSION (M.C.) ON THE ABOVE DRAWING TO  
LOCATE THE CENTER OF THE BOX TO THE TOP OF THE FIXTURE.

LAMPING: PROVISIONS FOR (1)-50W, ED-17 ANSI M110, MEDIUM BASE  
METAL HALIDE LAMP.

BALLAST: PROVIDED WITH 120/277V, 0.80/0.40A, H.P.F., METAL HALIDE,  
ENCAPSULATED FOR REMOTE MOUNTING WITH SPLICE COMPARTMENT  
AND MOUNTING BRACKETS. MAXIMUM LEAD WIRE LENGTH FROM LAMP  
TO BALLAST IS 25 FEET USING #14 AWC WIRES.

FUSING: FIXTURE PROVIDED WITH HLR-GLR FUSE.

NOTE: THIS FIXTURE IS U.L. LISTED FOR WET LOCATION.

LENS: PROVIDED WITH A NON-SEALED CLEAR GLASS TOP LENS TO KEEP MAJOR DEBRIS OUT

APPROVED AS  
SUBMITTED  
APPROVED WITH  
REVISIONS  
DATE

DATE

THIS DOCUMENT CONTAINS INFORMATION WHICH IS THE PROPERTY OF VISA LIGHTING, AND MAY NOT, IN WHOLE OR PART, BE DUPLICATED, DISCLOSED, OR USED  
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VISA LIGHTING, 1717 WEST CIVIC DRIVE, MILWAUKEE, WI. 53209 \* 414-354-6600 \* 414-354-7436 \* [www.visalighting.com](http://www.visalighting.com)



Project: UT Carlson Library Seminar Room 1009  
Doc # 281116BFS-02  
Date: 01/24/2007

## BILL OF MATERIALS

Ln #	Qty	Part Number	Description
------	-----	-------------	-------------

NOTE: Please be aware brightline has changed their model numbers from the ones specified. This Bill of Materials has been updated with the current model numbers.

1. 2 MTD2LCW7

FIXTURE TYPE 'LF-20A' ←  
brightline Mini Dorned-T Videoconferencing Fixtures

- 277VAC Operation
- Lutron Hi-Lume Ballast
- White Finish
- 2-Lamp Carriage Rotate, plus Contrast Lamp  
(3 lamps total each fixture)

*This fixture contains a Contrast Lamp circuit to provide a small amount of ambient light.*

2. 2 FIXTD2CSBF

Control Screens Broad Field 2-lamp

3. 6 00955W35K82

Lamps 55W 3500K Biax 82-CRI

4. 10 TDT2LTRW7

FIXTURE TYPE 'LF-20B' ←  
brightline Dorned-T Double Videoconferencing Fixtures

- 277VAC Operation
- Lutron Hi-Lume Ballast
- White Solid Panel Finish
- Bay 1: 2-Lamp Task Light
- Bay 2: 2-Lamp Carriage Rotate  
(4 lamps total each fixture)

*This fixture contains a Task Light circuit to provide downlighting. The Task Light lamp bay does not rotate or aim.*

5. 10 FIXTD2CSBF

Control Screens Broad Field 2-lamp

6. 40 00955W35K82

Lamps 55W 3500K Biax 82-CRI

7. 6

### SUPPLIERS SERVICES

Sets of submittals, including product data sheets.

8. 1

12-month limited warranty on the fixtures from date of shipment.  
Warranty excludes expendable items such as color media, lamps, or normal wear and tear.

9. 1

Seven-day-a-week, toll-free service line.

10.

### TERMS AND CONDITIONS

The Bill of Materials and pricing are based on our interpretation of the drawings, plans and specifications received in this office and represent a system using brightline components that fulfill the design intent of the project. Orders placed for the above referenced project shall be "as



Project: UT Carlson Library Seminar Room 1009  
Doc # 061116BFS-02  
Date: 01/24/2007

## BILL OF MATERIALS

Ln #	Qty	Part Number	Description
			per Vincent Lighting Bill of Materials".
11.			Unless otherwise stated the pricing does not include any applicable sales or use tax. All shipments are FOB factory, ground freight allowed to the jobsite. Freight claims must be filed directly with the shipper. Payment terms are net 30 days on approved accounts. All items will be shipped COD unless credit approval has been granted in advance.
12.			Release for manufacture and shipment of all equipment is required within 60 calendar days after drawing submittal. Orders not properly released within this period are subject to a 2% per month increase.
13.			Submittal drawings normally require 30-45 days after receipt of written purchase order; lead time for fabrication after approval and proper release is 30-90 days.
14.			Orders placed and subsequently cancelled, where either as-built or submittal drawings have been started or the purchase of special materials is required, will be assessed a cancellation charge of 25% of the quoted price for the order or actual costs incurred, whichever is greater.

END OF BILL OF MATERIALS





# brightline.

Evolutionary Lighting Systems

Mini T-Series

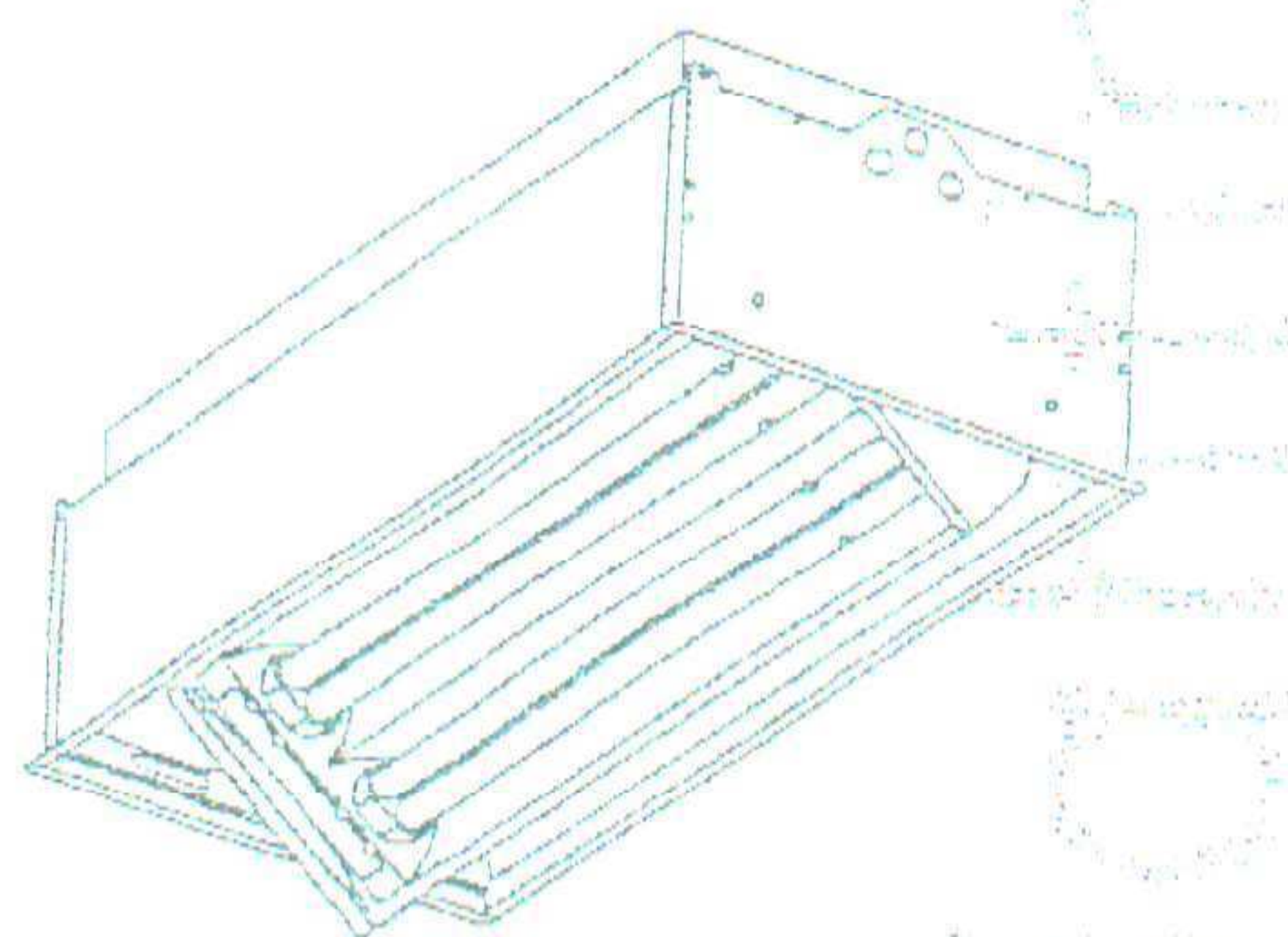
Fixture

TYPE: LF-20A

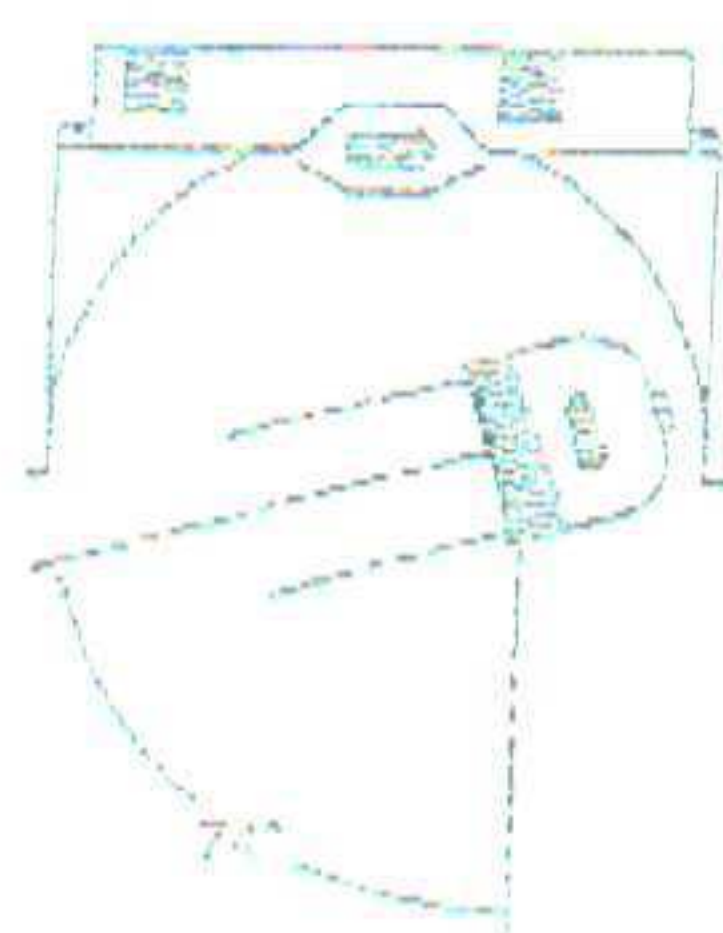
The brightline T-Series Fixture family was introduced to provide the technology of fluorescent video lighting for suspended ceiling applications. Applications include video conferencing, e-learning, tele-medicine, newsrooms and non-traditional studios. Fixtures deliver vertical foot-candles ideal for camera lighting.

## Specifications

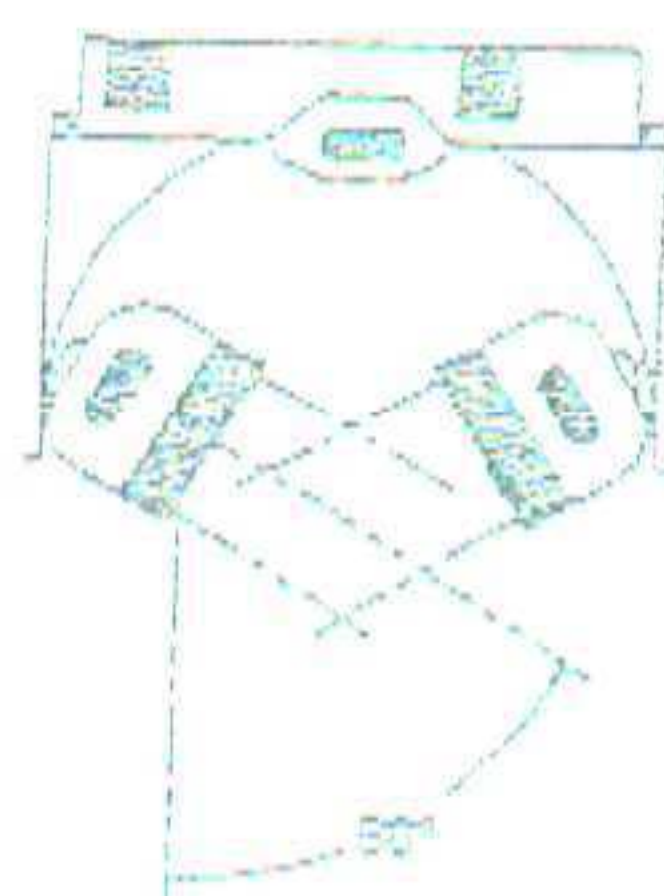
- Fixture housing is made of formed, cold-rolled sheet steel. Low-gloss off-white finish (RAL9010) standard; custom colors available. Dome shaped interior fixture housing. Perforated Filler Panels optional.
- Three sizes of lamp carriages are available, housing one, two or three 55W lamps. Reflectors are of formed aluminum specular sheet metal construction; 95% reflectance.
- Direct/indirect task lights are available, providing for soft, glare-free room illumination. Contrast lights can be added to Rotate carriage fixtures.
- Ballasts are available in switched and a variety of dimmed configurations; see the Ballast Type chart on the back of this page. All ballasts are high-frequency electronic, with a Power Factor > 97, THD < 20%, and a Class A sound rating. Ballasts are housed in a removable housing on the top of the fixture. Power and control inputs are from the side.
- Single-axis motorized fixtures available; in a "1-1" fixture, one or both carriages can be motorized.
- All brightline fixtures use 55W compact fluorescent lamps; available in a variety of color temperatures and CRI ratings. See Lamp Type chart on reverse. Studioline and Cinema Series lamps are specifically optimized for video camera applications.
- Articulation: Rotation on a single-axis; or Drop-Pan-Tilt on three axes. DPT fixture carriages in the "up" position will rotate. A sliding bracket on Rotate lamp carriage allows for greater range of angular movement.
- A variety of Control Screens are available; see chart of Screen types on reverse. Aluminum-finish Screens standard; black optional. Prismatic lenses are available for one- and two-lamp carriages.
- Dimensions: 23.69 x 11.69 x 7.76 in. [60.2 x 29.7 x 19.7 cm]



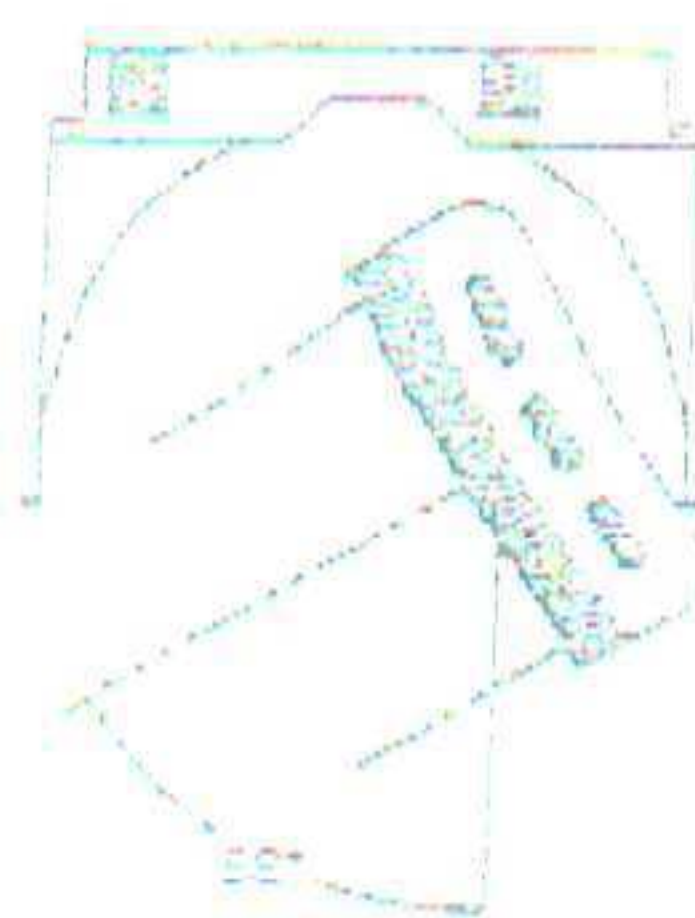
Fixture shown with two Lamp Rotate Carriage



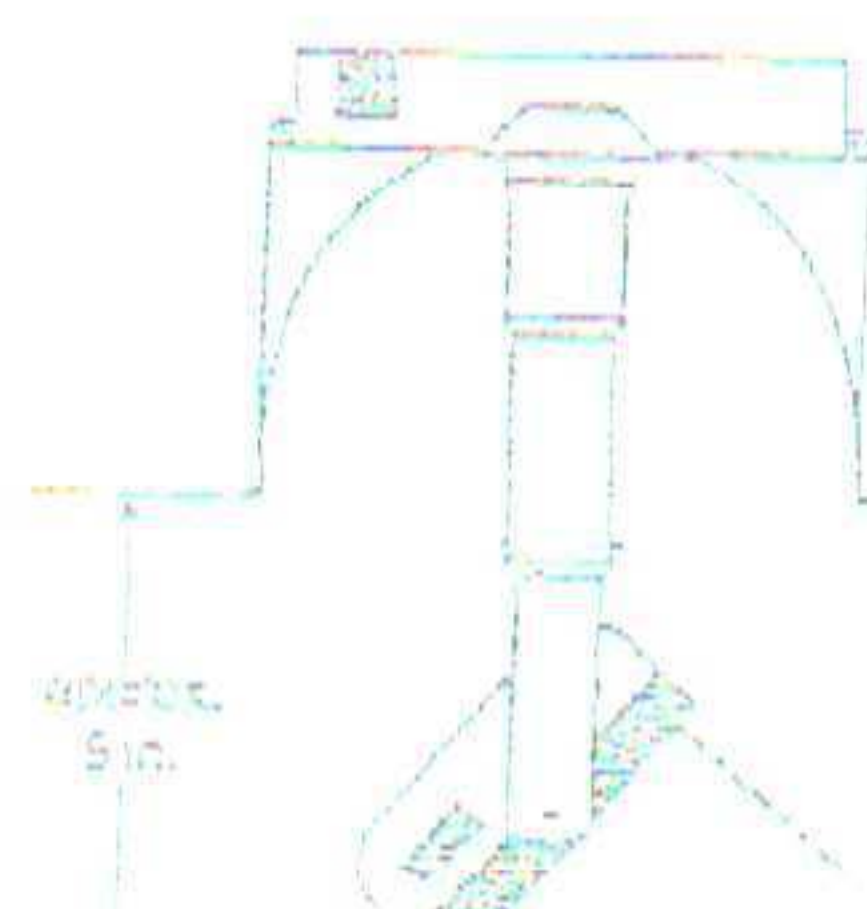
One Lamp with maximum right slide and with contrast light



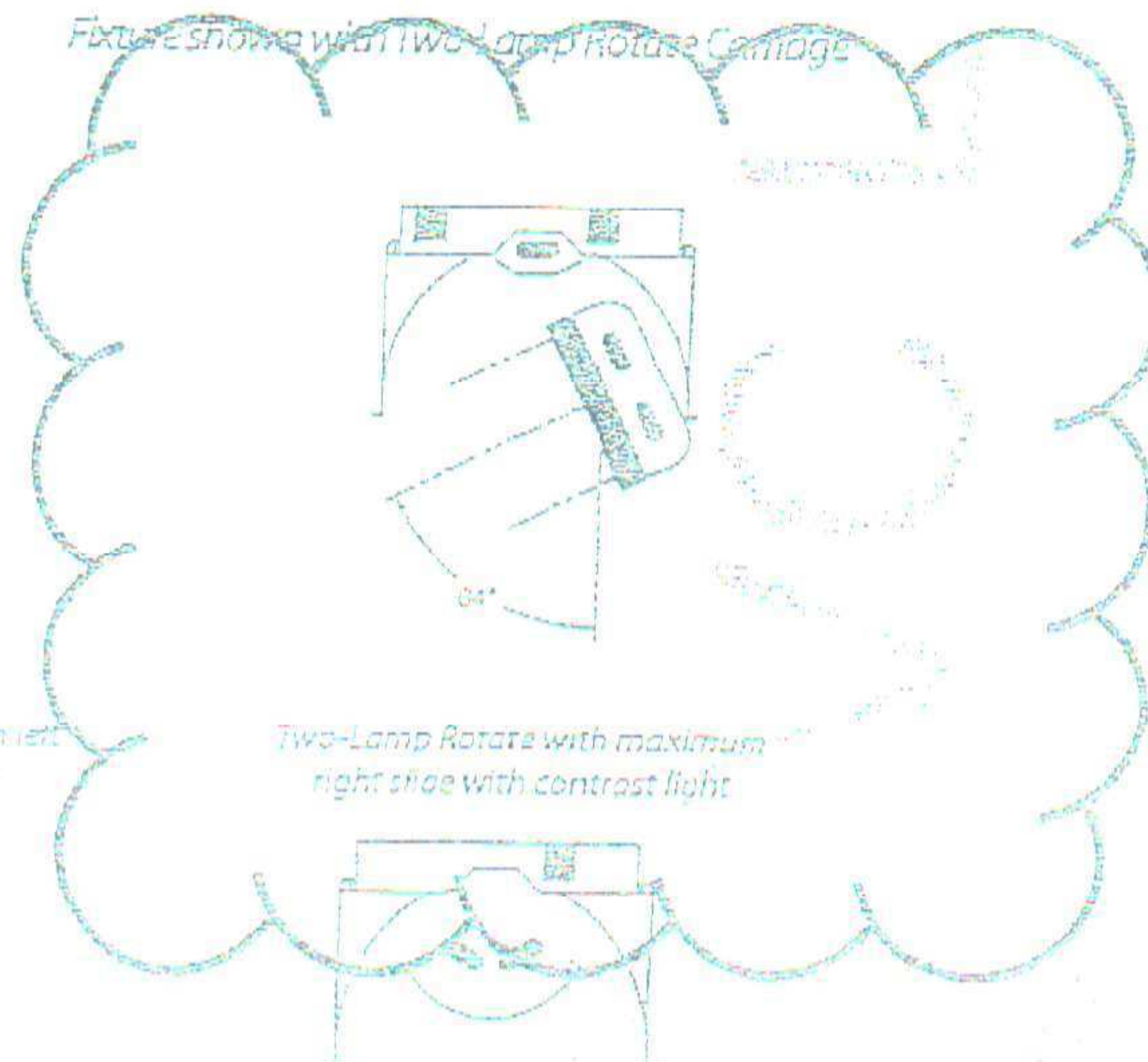
One-On-One Lamp Rotate with maximum left and right slide with contrast light



Three-Lamp Rotate with maximum right slide



Two-Lamp Drop-Pan-Tilt in dropped position and tilted



Two-Lamp Rotate with maximum right slide with contrast light

Task Light showing lamps and perforated diffusion screen



## Control Screens and Lenses

TYPE: LF-20A

Description	Thickness	One-Lamp	Two-Lamp	Three-Lamp
Broad Field Screen	0.25	FIX-TD1/CS-BF	FIX-TD2/CS-BF	FIX-TD3/CS-BF
Medium Field Screen	0.50	FIX-TD1/CS-MF	FIX-TD2/CS-MF	FIX-TD3/CS-MF
Narrow Field Screen	0.75	FIX-TD1/CS-NF	FIX-TD2/CS-NF	FIX-TD3/CS-NF
Prismatic Lens	0.125	FIX-TD1/LENS	FIX-TD2/LENS	NA

Note: natural finish screen with off-white frame standard; black screen optional (add -B suffix to Part Number)

## Lamp Types and Specifications

Color Temperature	CRI	Lumens	Life	Part No.
3000° Kelvin	82	4800	10,000 Hrs	009-55W30K82
3000° Kelvin	96	3000	10,000 Hrs	009-55W30K96
3500° Kelvin	82	4800	10,000 Hrs	009-55W35K82
4100° Kelvin	82	4800	10,000 Hrs	009-55W41K82
5000° Kelvin	98	3000	10,000 Hrs	009-55W50K98
3200° Kelvin Studioline	85	3800	8,000 Hrs	009-55W32KSP
5600° Kelvin Studioline	85	3800	8,000 Hrs	009-55W56KSP
3200° Kelvin Cinema Series	86	4100	8,000 Hrs	009-55W32KGC86
5600° Kelvin Cinema Series	95	2650	8,000 Hrs	009-55W32KGCP95

## Ballast Types and Voltages

Code	Ballast type	Control	100V	100-120V	220-230V	277V
A	Analog	0 to +10VDC	✓	✓	✓	✓
K	Lutron® ECO-10	Three-Wire Line Voltage		✓		
I	Lutron® HI-Lume	Three-Wire Line Voltage		✓		✓
N	Switch	On-Off	✓	✓	✓	
P	Advance® Mark X	Two-Wire Line Voltage		✓		✓
X	Digital	DAI or DSI Digital		✓	✓	✓

Note: other ballast types and voltages may be available; contact factory for details

## Model Number Guide

Example: M1D2X-R-W1



brightline.

580 Mayer Street, Suite 100, St. Louis, MO 63102 Phone 1-412-206-0106 Fax 1-412-206-0146 - www.brightlines.com





# brightline.

Efficiency. Lighting Systems.

T-Series Fixtures • Studio Lighting

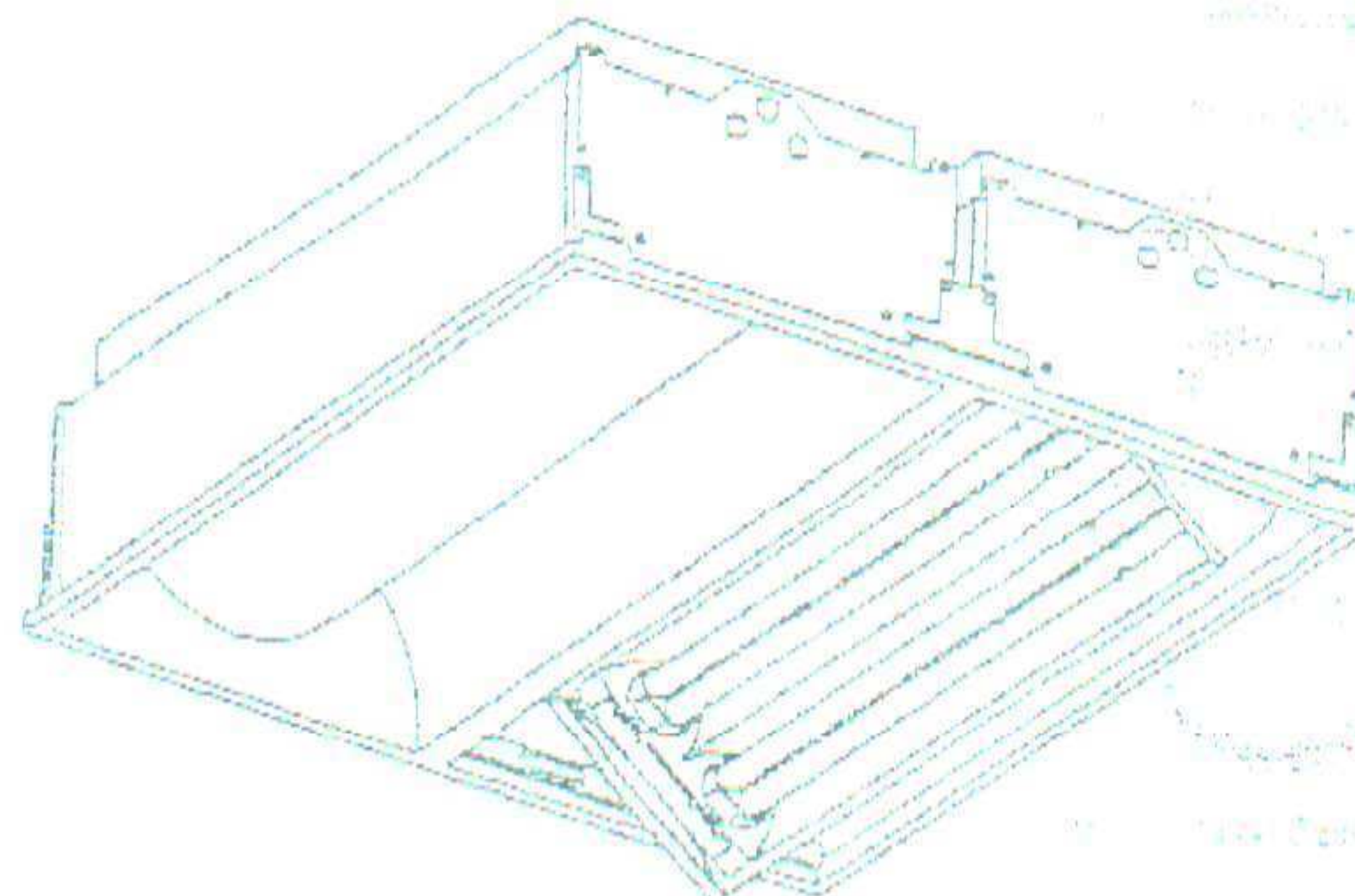
TYPE: LF-20B

The brightline T-Series Fixture family was introduced to provide the technology of fluorescent video lighting for suspended ceiling applications. Applications include video conferencing, e-learning tele-medicine, newsrooms and non-traditional studios. Fixtures deliver vertical foot-candles ideal for camera lighting.

## Specifications

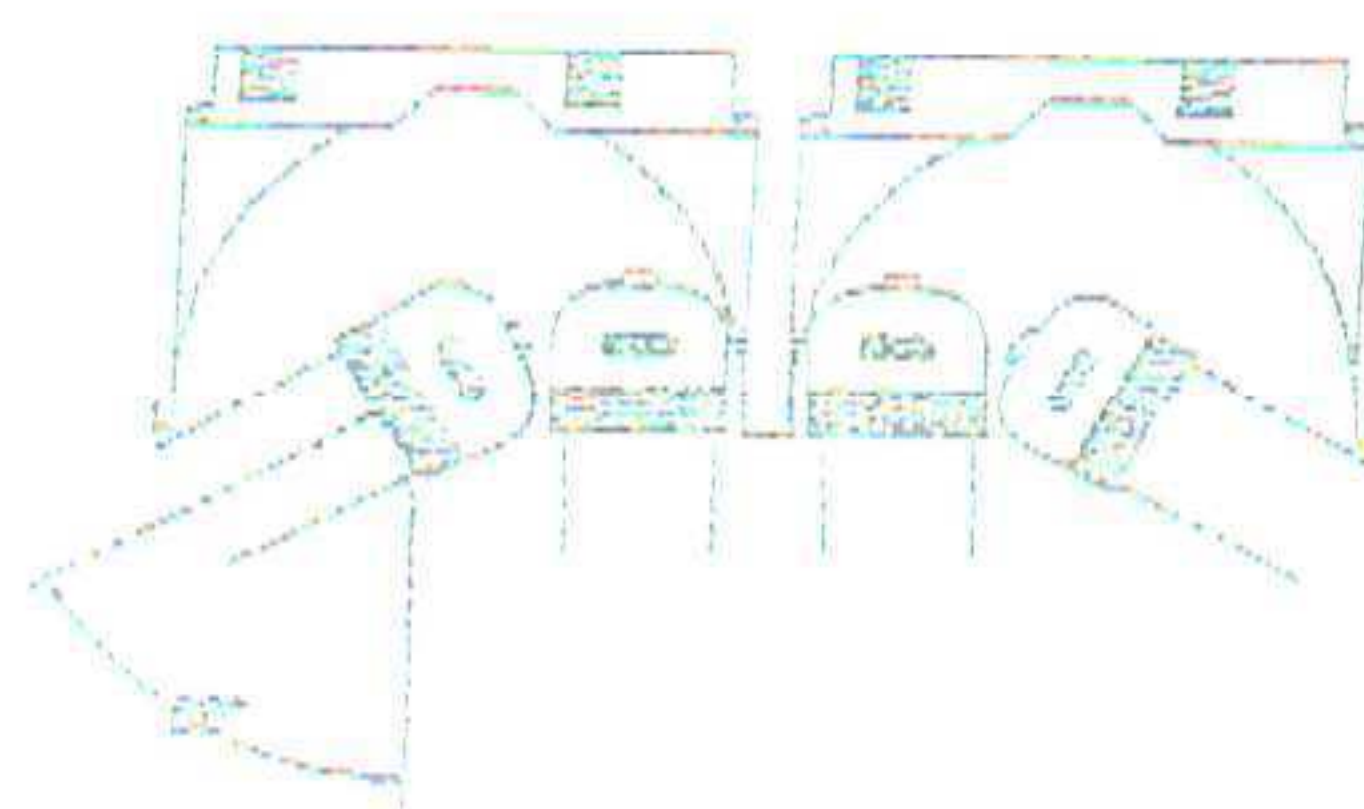
- Fixture housing is made of formed, cold-rolled sheet steel. Low-gloss off-white finish (RAL9010) standard; custom colors available. Dome shaped interior fixture housings.
- Three sizes of lamp carriages are available, housing one, two or three 55W lamps. Reflectors are of formed aluminum specular sheet metal construction; 95% reflectance.
- Direct/indirect task lights are available, providing for soft, glare-free room illumination. Contrast lights can be added to Rotate carriage fixtures.
- Ballasts are available in switched and a variety of dimmed configurations; see the Ballast Type chart on the back of this page. All ballasts are high-frequency electronic, with a Power Factor > 97, THD < 20%, and a Class A sound rating. Ballasts are housed in a removable housing on the top of the fixture. Power and control inputs are from the side.
- Single-axis motorized fixtures available; in a "1-1" fixture, one or both carriages can be motorized.
- All brightline fixtures use 55W compact fluorescent lamps; available in a variety of color temperatures and CRI ratings. See Lamp Type chart on reverse. Studioline and Cinema Series lamps are specifically optimized for video camera applications.

- Articulation: Rotation on a single-axis; or Drop-Pan-Tilt on three axes. DPT fixture carriages in the "up" position will rotate. A sliding bracket on Rotate lamp carriage allows for greater range of angular movement.
- A variety of Control Screens are available; see chart of Screen types on reverse. Aluminum finish Screens standard; black optional. Prismatic lenses are available for one- and two-lamp carriages.
- Dimensions: 23.69 x 23.69 x 7.76 in. [60.2 x 60.2 x 19.7 cm]

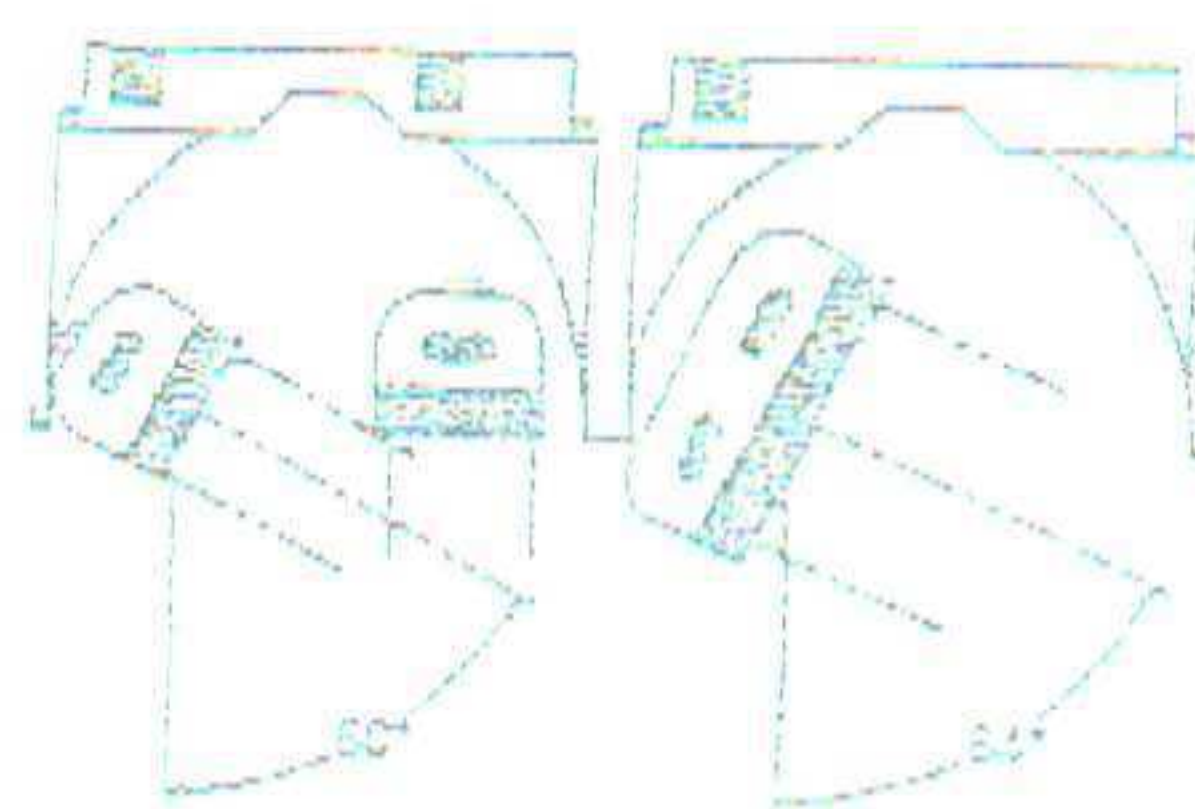


Fixture shown with Task Light and Two-Lamp Rotate Carriage  
Copyright © 2005 Brightline Inc.

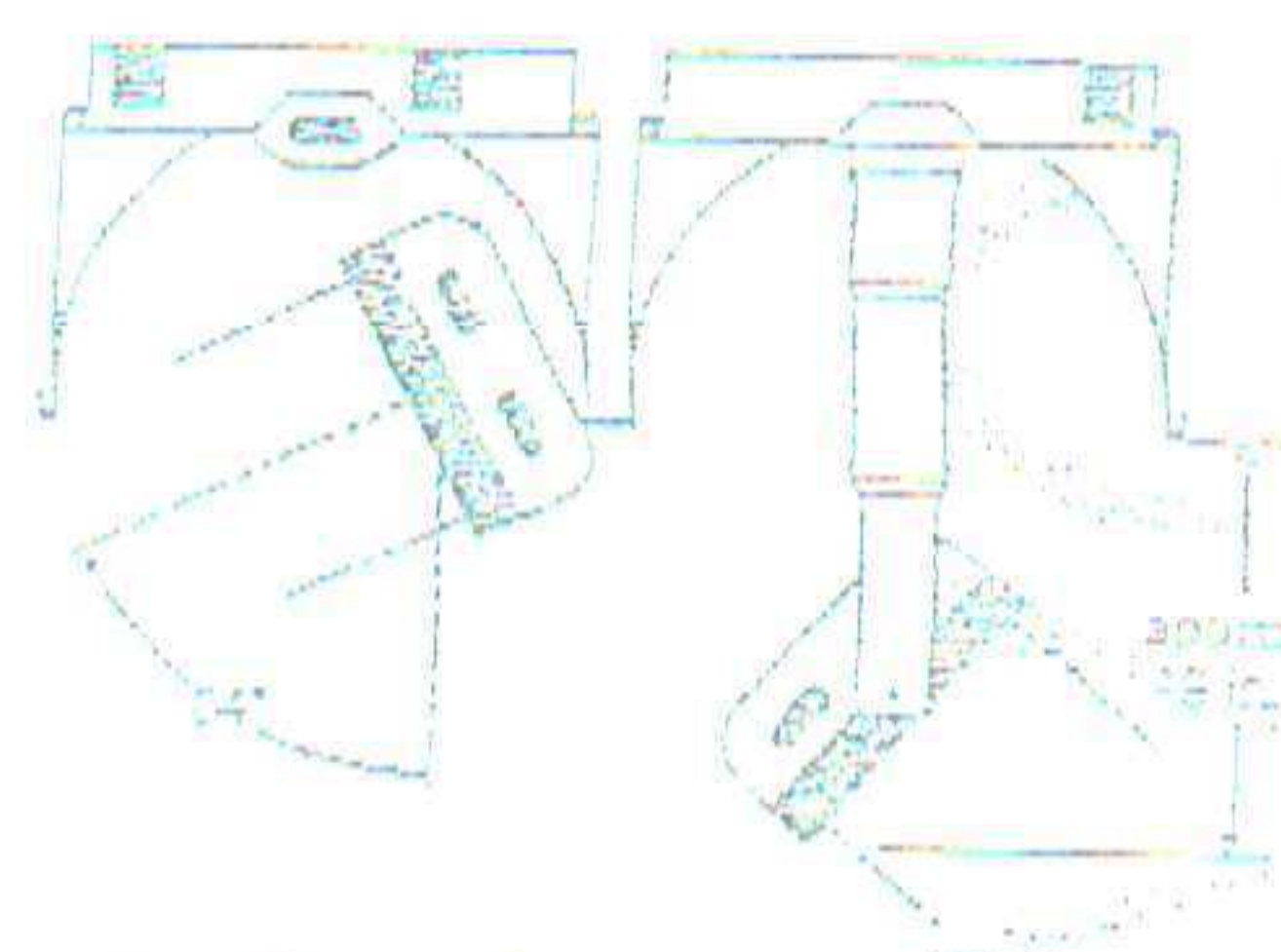
## Sample Fixture Configurations



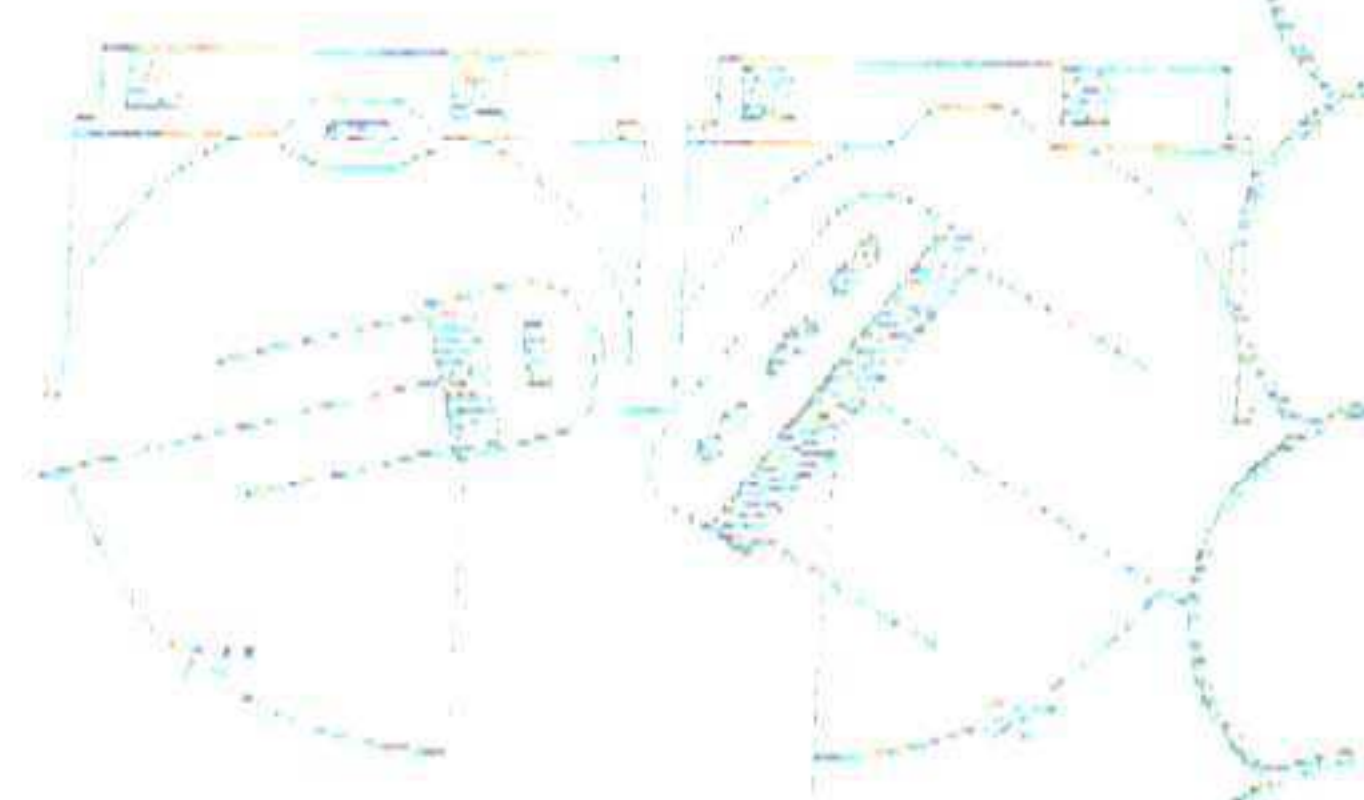
Two One-Lamp Rotate with slide to achieve maximum outward rotation



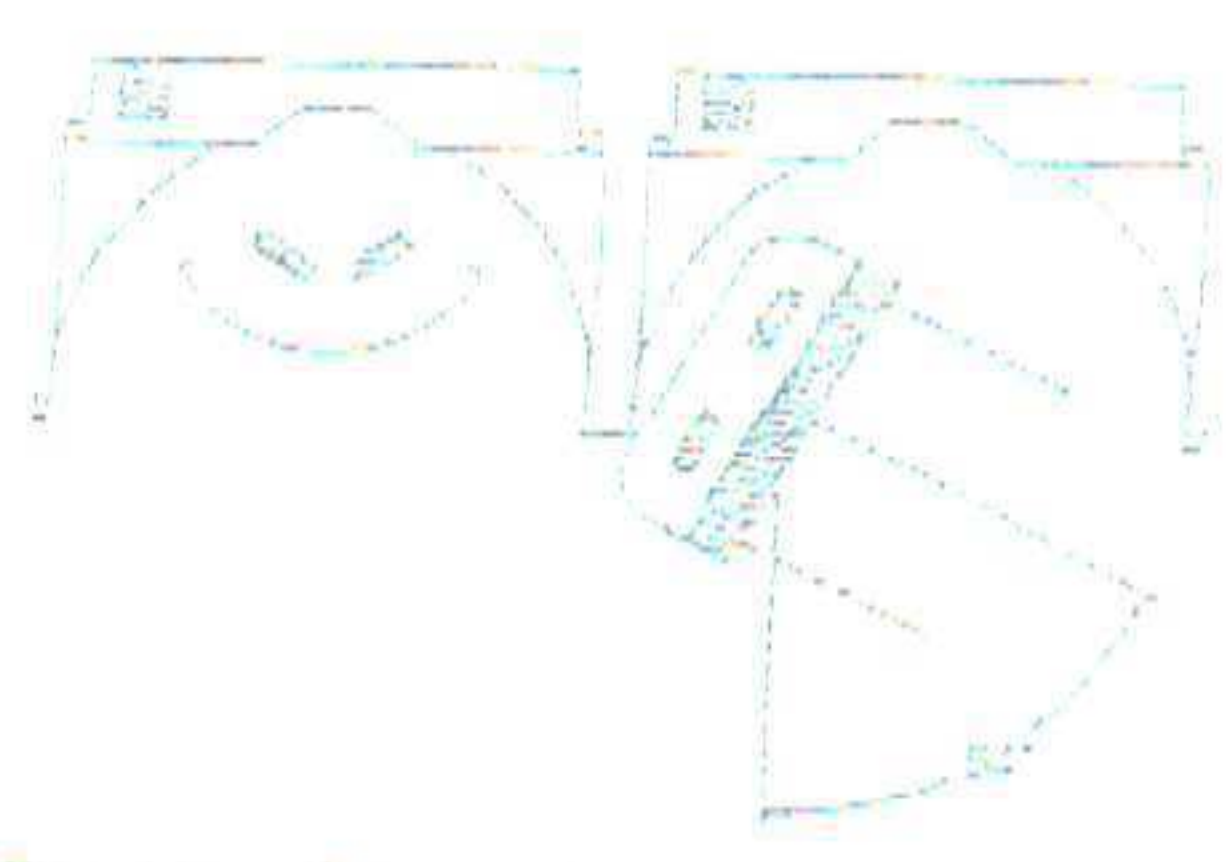
One-Lamp Rotate with maximum left slide and Two-Lamp Rotate with maximum left slide



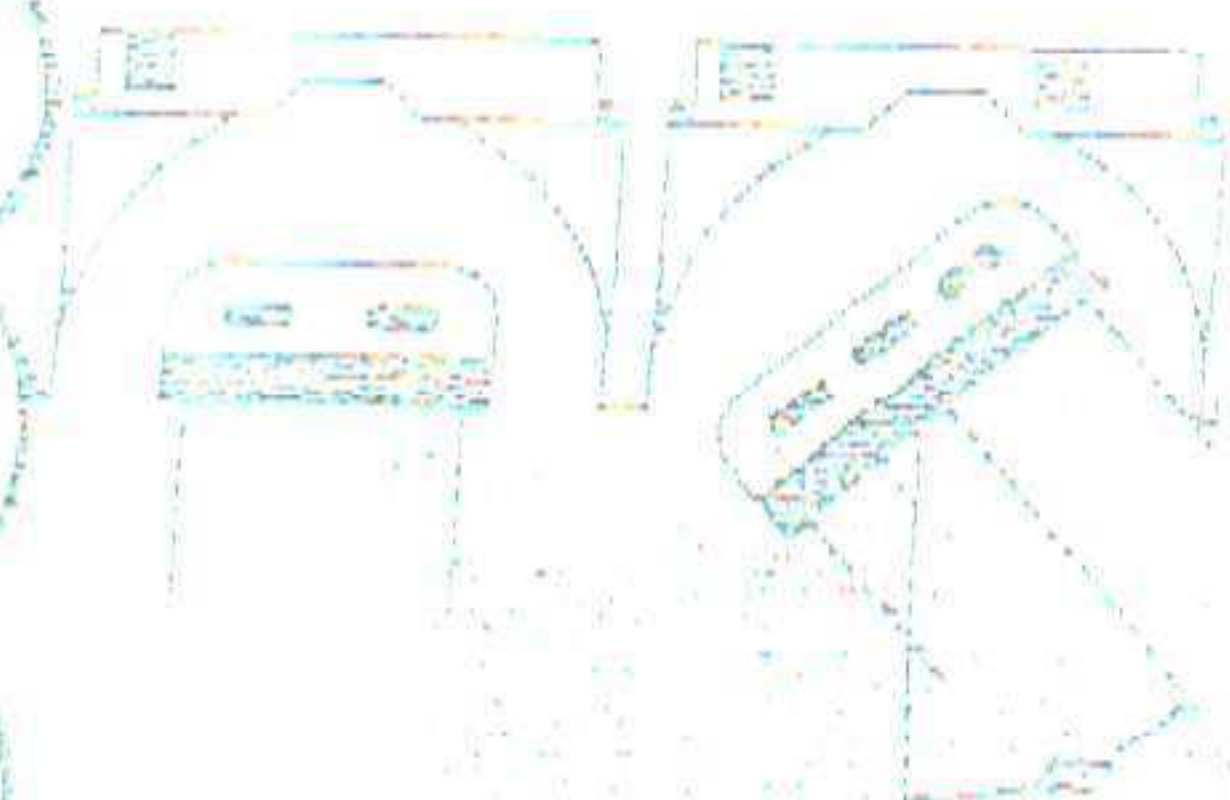
Two-Lamp Rotate with maximum left slide and with Contrast Light and Two-Lamp Drop-Pan-Tilt in dropped position and tilted



One-Lamp Rotate with maximum left slide and Contrast Light and Three-Lamp Rotate with maximum left slide



Two-Lamp Rotate with maximum left slide and Task Light showing perforated diffusion screen



Two-Lamp Rotate in centered position and Three-Lamp Rotate in centered position



## TYPE: LF-20B

### Control Screens and Lenses

Description	Thickness	One-Lamp	Two-Lamp	Three-Lamp
Broad Field Screen	0.25	FIX-TD1/CS-BF	FIX-TD2/CS-BF	FIX-TD3/CS-BF
Medium Field Screen	0.50	FIX-TD1/CS-MF	FIX-TD2/CS-MF	FIX-TD3/CS-MF
Narrow Field Screen	0.75	FIX-TD1/CS-NF	FIX-TD2/CS-NF	FIX-TD3/CS-NF
Prismatic Lens	0.125	FIX-TD1/LENS	FIX-TD2/LENS	NA

Note: natural finish screen with off-white frame standard; black screen optional (add -B suffix to Part Number)

### Lamp Types and Specifications

Color Temperature	CRI	Lumens	Life	Part No.
3000° Kelvin	82	4800	10,000 Hrs	009-55W30K82
5000° Kelvin	96	3000	10,000 Hrs	009-55W30K96
3500° Kelvin	82	4800	10,000 Hrs	009-55W35K82
4100° Kelvin	82	4800	10,000 Hrs	009-55W41K82
5000° Kelvin	98	3000	10,000 Hrs	009-55W50K98
3200° Kelvin Studioline	85	3800	8,000 Hrs	009-55W32KSP
5600° Kelvin Studioline	85	3800	8,000 Hrs	009-55W56KSP
3200° Kelvin Cinema Series	86	4100	8,000 Hrs	009-55W32KGC86
5600° Kelvin Cinema Series	95	2650	8,000 Hrs	009-55W32KGC95

### Ballast Types and Voltages

Code	Ballast Type	Control	100V	100-120V	220-230V	277V
A	Analog	0 to +10VDC	✓	✓	✓	✓
K	Lutron® ECO-10	Three-Wire Line Voltage		✓		
L	Lutron® Hi-Lume	Three-Wire Line Voltage		✓		✓
N	Switch	On-Off	✓	✓	✓	
P	Advance® Mark X	Two-Wire Line Voltage		✓		✓
X	Digital	DALI or DSI Digital		✓	✓	✓

Note: other ballast types and voltages may be available; contact factory for details

### Model Number Guide

Example: TDT2X-TR-W1



5800 Meyer Street, Suite 100, Dallas, TX 75241-1507 Phone 1.412.206.0105 Fax 1.412.206.0146 www.brightlines.com





# CI-200 Series Passive Infrared Ceiling Sensors



PROJECT

LOCATION/TYPE

## Product Overview

### Description

WattStopper's CI-200 Series Passive Infrared (PIR) Ceiling Sensors provide 360° coverage to detect occupancy in the controlled area. These low-profile sensors reliably control lighting in a variety of applications.

### Operation

The CI-200 Series Sensors are 24 VDC and control lighting through WattStopper power packs. Utilizing the latest PIR technology, they turn lighting on when a difference is detected between the infrared energy from a human being in motion and the background space within the controlled area. After the area is vacated for a user-adjustable time delay, lighting automatically turns off.

### Coverage

Coverage from the CI-200 Series Sensors can reach up to 1200 square feet using the Extended Range Lens, and 500 square feet using the High Density Lens (circular pattern) for walking motion. For typical desktop-level activity, coverage can reach up to 300 square feet.

### Applications

Applications include open office spaces, computer rooms, conference rooms, classrooms and warehouses. Areas with high ceilings or with two-level lighting can also be controlled. Due to low initial cost and the great energy saving potential, the sensors offer fast paybacks.

## Features

- ASIC technology reduces components and enhances reliability
- Pulse Count Processing eliminates false off without reducing sensitivity
- Detection Signature Analysis eliminates false triggers and provides immunity to RFI and EMI
- Low-profile design ensures a clean and uncluttered ceiling appearance
- User-adjustable time delay from 15 seconds to 30 minutes by two-minute increments
- Sensitivity is programmed through a DIP switch which has four settings ranging from minimum to maximum
- Light-level output can create bi-level lighting for added convenience and energy savings
- Isolated relay can be used to interface with HVAC, EMS or an additional lighting load
- LED indicates occupancy detection
- Qualifies for ARRA-funded public works projects



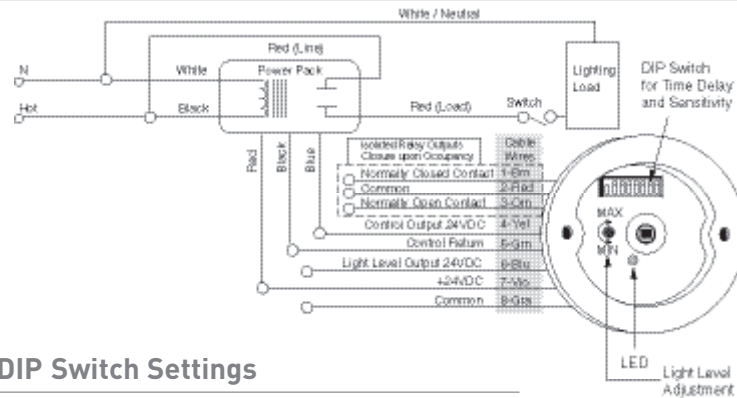


## Specifications

- Dual-element, temperature compensated pyroelectric sensor
- CI-200 contains isolated relay with N/O and N/C outputs; rated for 1 Amp at 24 VDC/VAC
- Adjustable digital time delay: 15 seconds to 30 minutes with  $\pm 2\%$  tolerance
- Integrated light level sensor: 4-190 footcandles (43-2,045 lux)
- Mounting options: ceiling tile, round mud ring
- Max. CI-200s per power pack: B = 5, BZ = 7
- Max. CI-205s per power pack: B = 10, BZ = 13
- Dimensions: 3.3" x 2.2" (84mm x 56mm) diameter x depth; extends approximately .36" (9.1mm) from ceiling
- UL and cUL listed
- Five year warranty

## Wiring, Mounting & Settings

### Wiring Diagram

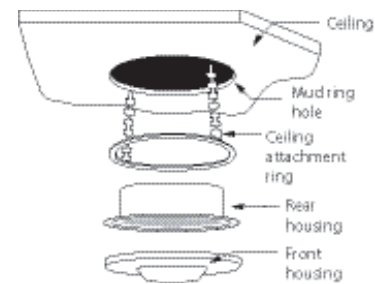


### DIP Switch Settings

DIP Switch #	1	2	3	4	5	6	DIP Switch #	7	8
Time Delays							Sensitivity		
15 seconds	●	●	●	●	●	●	Minimum	-	-
2 minutes	-	-	-	-	-	-	Medium Low	-	-
4 minutes	-	-	-	-	-	-	Medium High	●	-
6 minutes	-	-	-	-	-	-	Maximum	●	●
8 minutes	-	●	●	●	●	●			
10 minutes	-	●	●	●	●	●			
12 minutes	-	●	●	●	●	●			
14 minutes	-	●	●	●	●	●			
16 minutes	-	●	●	●	●	●			
18 minutes	-	●	●	●	●	●			
20 minutes	●	●	●	●	●	●			
22 minutes	-	●	●	●	●	●			
24 minutes	-	●	●	●	●	●			
26 minutes	-	●	●	●	●	●			
28 minutes	-	●	●	●	●	●			
30 minutes	-	●	●	●	●	●			
Override									

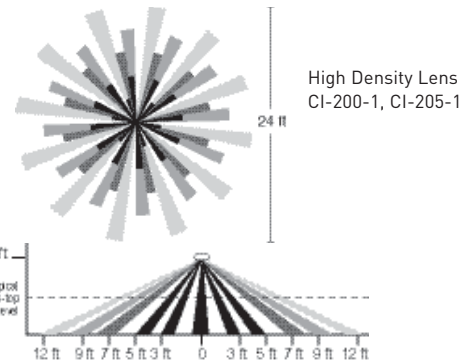
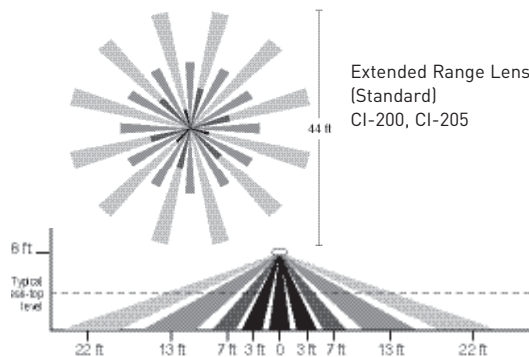
● = ON - = OFF  
 ► = Factory Presets

### Mounting



## Coverage

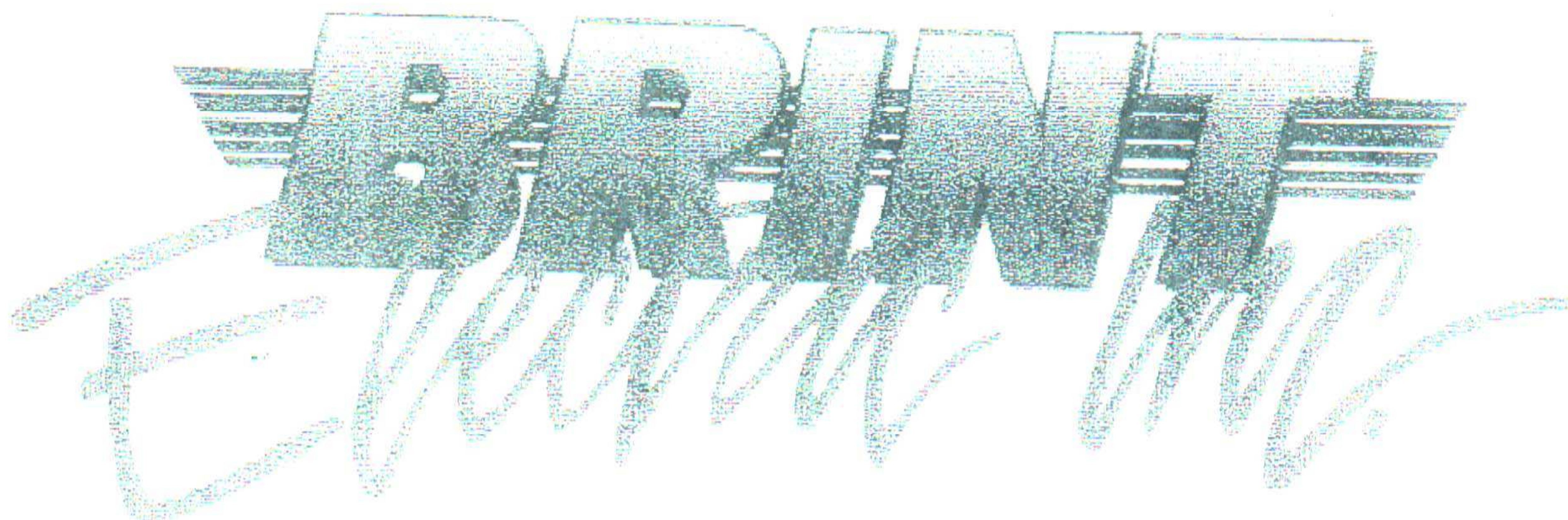
### Coverage Patterns



## Ordering Information

Catalog No.	Voltage	Current	Coverage	Features
<input type="checkbox"/> CI-200	24 VDC	20 mA	360°; up to 1200 ft <sup>2</sup> (111.5 m <sup>2</sup> )	Isolated relay, light level
<input type="checkbox"/> CI-200-U				
<input type="checkbox"/> CI-200-1	24 VDC	20 mA	360°; up to 500 ft <sup>2</sup> (46.5 m <sup>2</sup> )	Isolated relay, light level
<input type="checkbox"/> CI-205	24 VDC	11 mA	360°; up to 1200 ft <sup>2</sup> (111.5 m <sup>2</sup> )	
<input type="checkbox"/> CI-205-U				
<input type="checkbox"/> CI-205-1	24 VDC	11 mA	360°; up to 500 ft <sup>2</sup> (46.5 m <sup>2</sup> )	
<input type="checkbox"/> MB-1	Industrial Mounting Bracket			
<input type="checkbox"/> MB-2	Industrial Mounting Bracket for HID fixtures			





University of Toledo – Carlson  
Library Renovation (Phase 1)

Brint Project #5326-1  
Occupancy Sensor Shop Cuts  
Submitted For Approval

Specification Section:  
265100

Brint Electric Inc.  
7825 W. Central Ave.  
Toledo, Ohio 43617

Job # 5326-1  
Date 1/10/07  
Reviewed For Approval  
By: [Signature]



# CI-200 Passive Infrared Sensor

360° coverage

Adjustable time delay and sensitivity

ASD enhances reliability and helps eliminate false triggers

Isolated relay for use with HVAC or other control systems (CI-200)

Built-in light level sensor (CI-205)

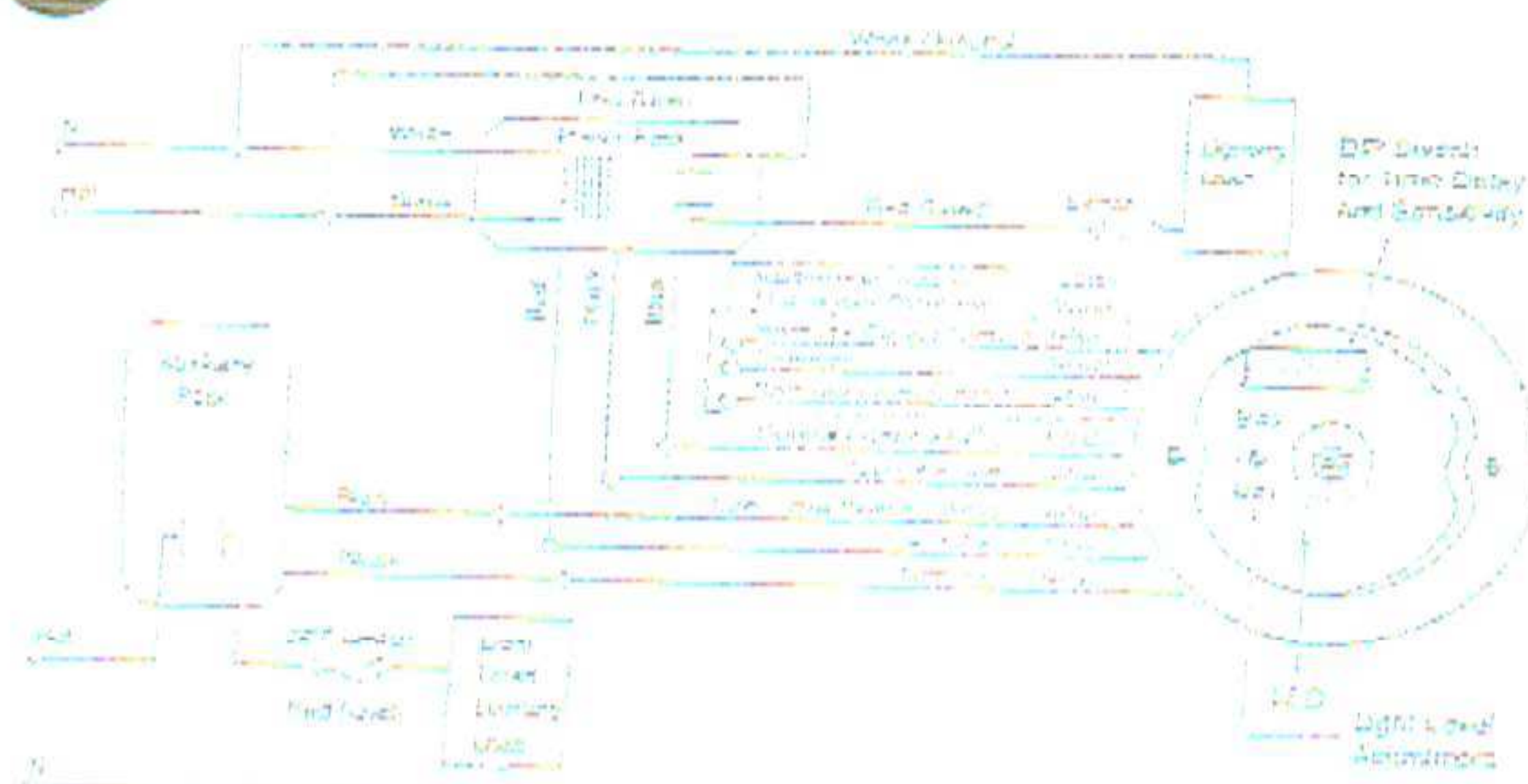
## Specifications

- Time delay 15 sec to 30 min
- Built-in light level sensor 4 to 190 fc (43 to 2,045 lux) (CI-200)
- SPDT isolated relay (CI-200)
- Units per power pack: CI-200 up to 6 (B), up to 7 (BZ); CI-205 up to 10 (B), up to 13 (BZ)
- 3.3" diameter x 2.2" total depth (83.8mm x 55.9mm) Extends approx .36" from ceiling
- UL and CUL listed, 5 year warranty

## Applications

- Open or partitioned office spaces
- Conference rooms
- Computer rooms
- Classrooms

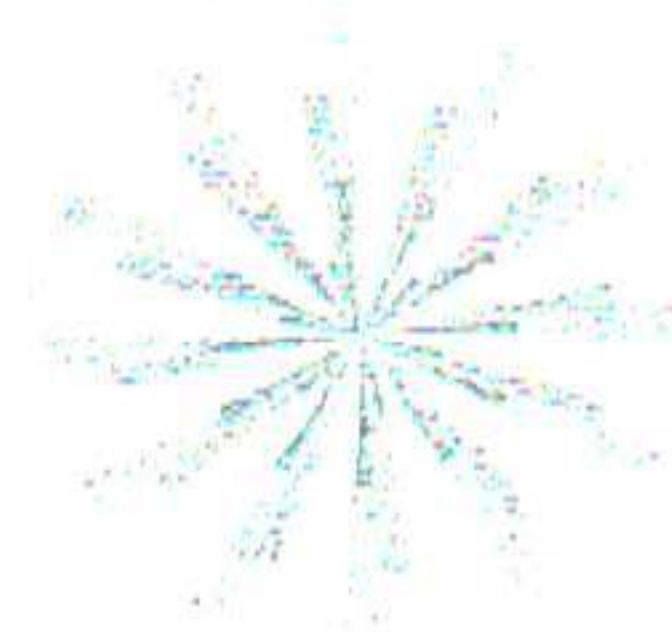
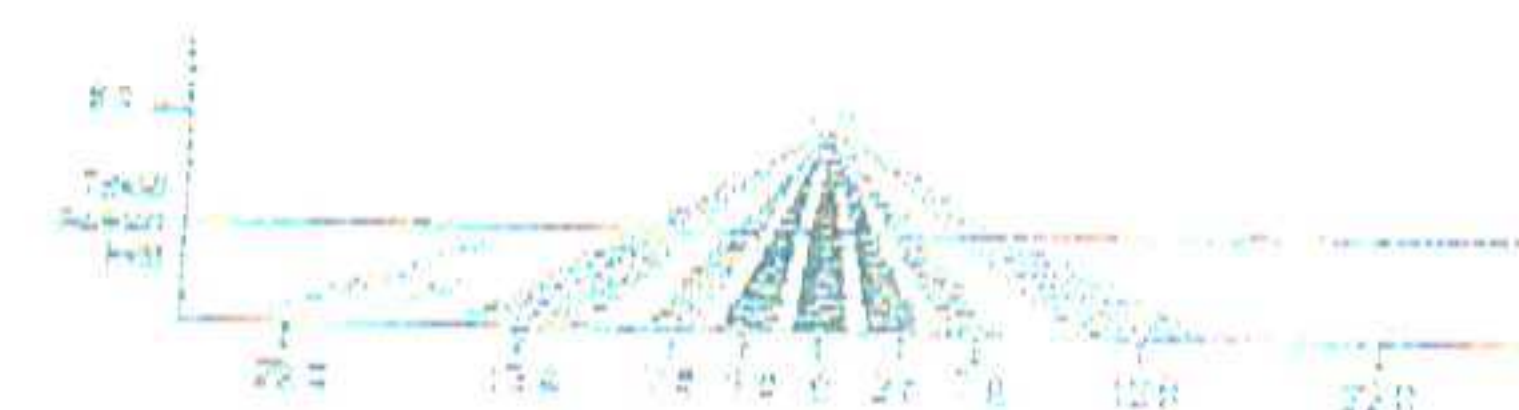
## Wiring & Controls



## Coverage Patterns



Extended Range Lens: CI-200, CI-205



High Density Lens: CI-200-1, CI-205-1



Coverage shown represents half-stop, walking motion. Typical coverage at the end-stop is 500 ft (152.4 m) with the Extended Range lens and 300 ft (91.4 m) with the High Density lens.

## Order Information

CATALOG #	VOLTAGE	CURRENT	COVERAGE
CI-200	24 VDC	20 mA	up to 1200' (365.8 m)
CI-200-1	24 VDC	20 mA	up to 500' (152.4 m)
CI-205	24 VDC	15 mA	up to 1200' (365.8 m)
CI-205-1	24 VDC	15 mA	up to 300' (91.4 m)

All units are white and use White Topper power pack.

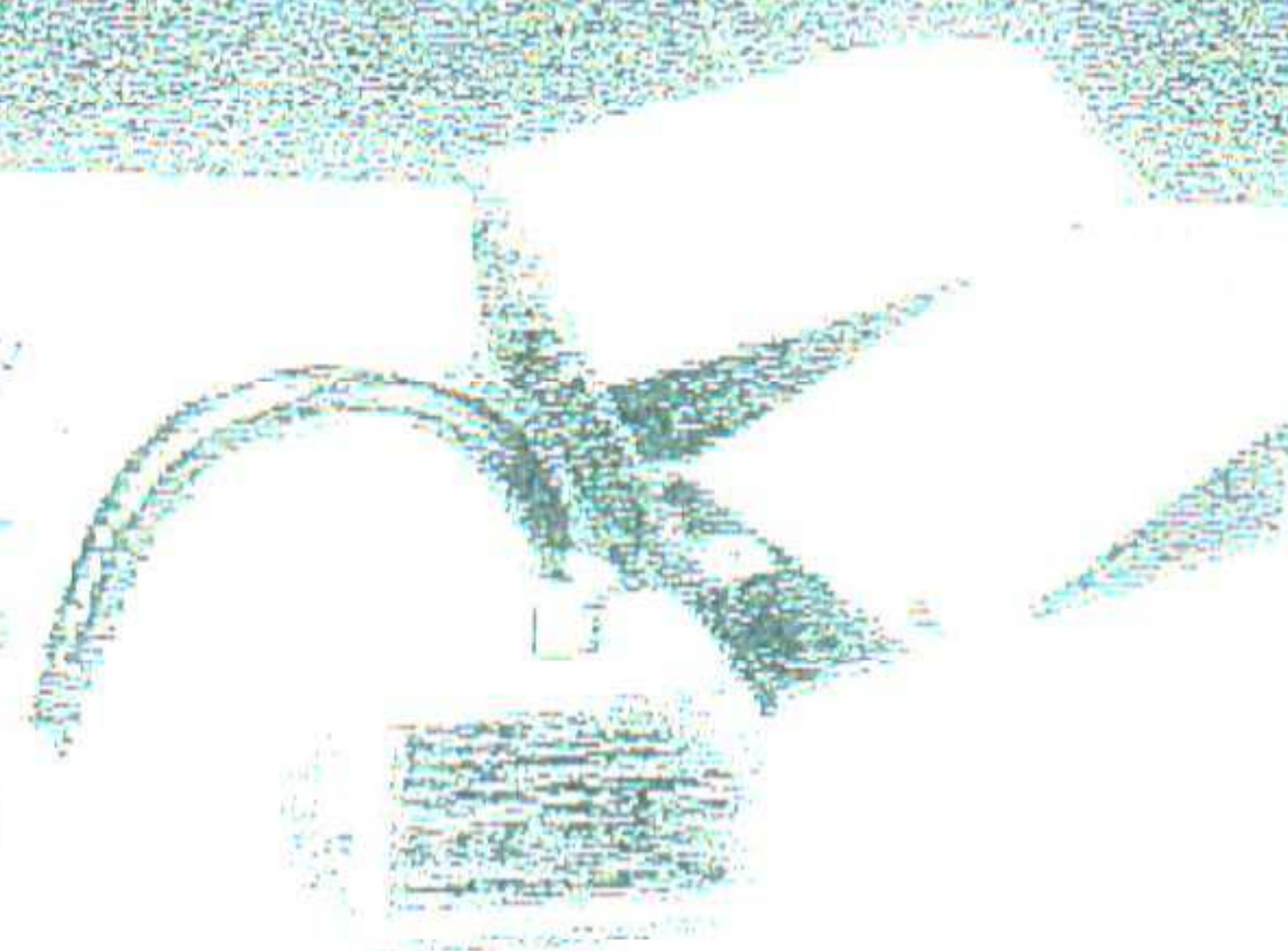


# Power Packs

Fully self-contained transformer and relay

Many models of power pack products for wide range of applications

Plenum rated



Two-relay output power pack that accepts signals from multiple control devices (LC-100)

Daylighting control with photosensor (LC-100)

2 channel dimming with 0-10V ballasts (LC-100)

Load shed dimming or ON/OFF switching capability (LC-100)

## B Power Pack Specifications

- Secondary voltage of 24VDC
- Secondary output of 150 mA, 114 mA with relay connected
- Low voltage leads rated for 300 volts
- UL rated 94V-0 plastic enclosure, units are white
- ABS UL 2043 plenum rated plastic and wiring
- 1.6" x 2.75" x 1.6" (41mm x 70mm x 41mm) with a 1/2" snap-in nipple
- UL and CUL listed, 5 year warranty

## BZ Specifications

- 120/277 VAC voltage input, 60 Hz
- Secondary voltage of 24VDC
- Secondary output of 150 mA, 150 mA with relay connected
- Low voltage leads rated for 300 volts
- UL rated 94V-0 plastic enclosure, units are grey
- ABS UL 2043 plenum rated plastic and wiring
- Relay is Zero Crossing
- Hold-ON/hold-OFF inputs
- LED status and overcurrent indicator
- 1.6" x 2.75" x 1.6" (41mm x 70mm x 41mm) with a 1/2" snap-in nipple
- UL and CUL listed, 5 year warranty

## LC-100 Specifications

- 120/277 VAC voltage input, 50/60 Hz
- 2 relay outputs rated 20 Amp 120V tungsten and ballast, 20 Amp 277V ballast
- Secondary output of 150 mA, 150 mA with relay connected
- Dual switch inputs for on/off or dimming
- 2 isolated NO/NC relays rated 1 Amp @ 24 VDC
- NEMA 1 enclosure, acceptable for use in plenum spaces
- Output power 150mA @ 24 VDC with automatic overload protection
- Dual voltage input 120 or 277 VAC @ 14 watts maximum
- Switch wiring distances up to 1000 feet with 18 gauge wire
- 6.6" x 6.1" x 2.1" (168mm x 156mm x 54mm) with a 1/2" nipple
- UL and CUL listed, 5 year warranty

## Order Information

CATALOG #	INPUT VOLTAGE	LOAD RATINGS			OUTPUT
		BALLAST(A)	INCAN(A)	MOTOR(HP)	
Power Packs					
B120F-P	120VAC, 60Hz	20	15	1	24VDC, 150mA***
B277E-P	277VAC, 60Hz	20	-	-	24VDC, 150mA***
B230E-P	230-240VAC, 50/60Hz	20	15	1	24VDC, 150mA***
B347D-P	347VAC, 60Hz	15	-	-	24VDC, 150mA***
Bz-100	120/277VAC, 60Hz	20	20	1	24VDC, 150mA*
LC-100	120/277 VAC, 50/60 Hz	20	20	1	24VDC, 150mA*
Auxiliary Packs					
S120/277V	120/277VAC	20/20/15	15/-/-	1/-/-	-
327E-3	277VAC	-	-	-	-
Form C Power Packs					
A1100-A**	120VAC, 60Hz	5NO/5NC	5NO/5NC	1NO/1NC	24VDC, 100mA
A2170-A**	170VAC, 60Hz	5NO/5NC	5NO/5NC	2NO/2NC	24VDC, 100mA
2 Relay Power Packs					
C120F-P	120VAC, 60Hz	20*	15*	1*	24VDC, 150mA
C277E-P	277VAC, 60Hz	20*	-	-	24VDC, 150mA
Power Supplies					
A1-120	120VAC, 60Hz	-	-	-	24VDC, 800mA
A1-277	277VAC, 60Hz	-	-	-	24VDC, 800mA

\* 150mA per relay. \*\* Contain an isolated relay with normally open (NO) and normally closed (NC) contacts. \*\*\* Output is 150mA before relay is connected and 114mA after relay is connected.

Output is 150mA with relay connected.



**Mercantile Customer Project Commitment Agreement**  
**Cash Rebate Option**

**THIS MERCANTILE CUSTOMER PROJECT COMMITMENT AGREEMENT** ("Agreement") is made and entered into by and between The Toledo Edison Company, its successors and assigns (hereinafter called the "Company") and The University of Toledo, Taxpayer ID No.34-6401483, its permitted successors and assigns (hereinafter called the "Customer") (collectively the "Parties" or individually the "Party") and is effective on the date last executed by the Parties as indicated below.

**WITNESSETH**

**WHEREAS**, the Company is an electric distribution utility and electric light company, as both of these terms are defined in R.C. § 4928.01(A), and

**WHEREAS**, Customer believes that it is a mercantile customer, as that term is defined in R.C. § 4928.01(A)(19), doing business within the Company's certified service territory; and

**WHEREAS**, R.C. § 4928.66 (the "Statute") requires the Company to meet certain energy efficiency and peak demand reduction ("EE&PDR") benchmarks; and

**WHEREAS**, when complying with certain EE&PDR benchmarks the Company may include the effects of mercantile customer-sited EE&PDR projects; and

**WHEREAS**, Customer has certain customer-sited demand reduction, demand response, or energy efficiency project(s) as set forth in attached Exhibit A (the "Customer Energy Project(s)") that it desires to commit to the Company for integration into the Company's Energy Efficiency & Peak Demand Reduction Program Portfolio Plan ("Company Plan") that the Company will implement in order to comply with the Statute; and

**WHEREAS**, the Customer, pursuant to the Public Utilities Commission of Ohio's ("Commission") September 15, 2010 Order in Case No. 10-834-EL-EEC, desires to pursue a cash rebate of some of the costs pertaining to its Customer Energy Project(s) ("Cash Rebate");

**WHEREAS**, Customer's decision to commit its Customer Energy Project(s) to the Company for inclusion in the Company Plan has been reasonably encouraged by the possibility of a Cash Rebate.

**WHEREAS**, in consideration of, and upon receipt of, said cash rebate, Customer will commit the Customer Energy Project(s) to the Company and will comply with all other terms and conditions set forth herein.

**NOW THEREFORE**, in consideration of the mutual promises set forth herein, and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties, intending to be legally bound, do hereby agree as follows:

1. **Customer Energy Projects.** Customer hereby commits to the Company and Company accepts for integration into the Company Plan the Customer Energy Project(s) set forth on attached Exhibit 1. Said commitment shall be for the life of the Customer Energy Project(s). Company will incorporate said project(s) into the Company Plan to the extent that such projects qualify. In so committing, Customer acknowledges that the information provided to the Company about the Customer Energy Project(s) is true and accurate to the best of its knowledge.
  - a. By committing the Customer Energy Project(s) to the Company, Customer acknowledges and agrees that the Company shall control the use of the kWh and/or kW reductions



resulting from said projects for purposes of complying with the Statute. It is expressly agreed that Customer may use any and all energy related and other attributes created from the Customer Energy Project(s) to the extent permitted by state or federal laws or regulations, provided, and to the extent, that such uses by Customer do not conflict with said compliance by the Company.

- b. The Company acknowledges that some of Customer's Energy Projects contemplated in this paragraph may have been performed under certain other federal and/or state programs in which certain parameters are required to be maintained in order to retain preferential financing or other government benefits (individually and collectively, as appropriate, "Benefits"). In the event that the use of any such project by the Company in any way affects such Benefits, and upon written request from the Customer, Company will release said Customer's Energy Project(s) to the extent necessary for Customer to meet the prerequisites for such Benefits. Customer acknowledges that such release (i) may affect Customer's cash rebate discussed in Article 3 below, and (ii) will not affect any of Customer's other requirements or obligations.
  - c. Any future Customer Energy Project(s) committed by Customer shall be subject to a separate application and, upon approval by the Commission, said projects shall become part of this Agreement.
  - d. Customer will provide Company or Company's agent(s) with reasonable assistance in the preparation of the Commission's standard joint application for approval of this Agreement ("Joint Application") that will be filed with the Commission, with such Joint Application being consistent with then current Commission requirements.
  - e. Upon written request and reasonable advance notice, Customer will grant employees or authorized agents of either the Company or the Commission reasonable, pre-arranged access to the Customer Energy Project(s) for purposes of measuring and verifying energy savings and/or peak demand reductions resulting from the Customer Energy Project(s). It is expressly agreed that consultants of either the Company or the Commission are their respective authorized agents.
2. **Joint Application to the Commission.** The Parties will submit the Joint Application using the Commission's standard "Application to Commit Energy Efficiency/Peak Demand Reduction Programs" ("Joint Application") in which they will seek the Commission's approval of (i) this Agreement; (ii) the commitment of the Customer Energy Project(s) for inclusion in the Company Plan; and (iii) the Customer's Cash Rebate.

The Joint Application shall include all information as set forth in the Commission's standard form which, includes without limitation:

- i. A narrative description of the Customer Energy Project(s), including but not limited to, make, model and year of any installed and/or replaced equipment;
  - ii. A copy of this Agreement; and
  - iii. A description of all methodologies, protocols, and practices used or proposed to be used in measuring and verifying program results.
3. **Customer Cash Rebate and Annual Report.** Upon Commission approval of the Joint Application, Customer shall provide Company with a W-9 tax form, which shall at a minimum include Customer's tax identification number. Within the greater of 90 days of the Commission's approval of the Joint Application or the completion of the Customer Energy Project, the Company



will issue to the Customer the Cash Rebate in the amount set forth in the Commission's Finding and Order approving the Joint Application.

- a. Customer acknowledges: i) that the Company will cap the Cash Rebate at the lesser of 50% of Customer Energy Project(s) costs or \$250,000; ii) the maximum rebate that the Customer may receive per year is \$500,000 per Taxpayer Identification Number per utility service territory; and iii) if the Customer Energy Project qualifies for a rebate program approved by the Commission and offered by the Company, Customer may still elect to file such project under the Company's mercantile customer self direct program, however the Cash Rebate that will be paid shall be discounted by 25%, and
  - b. Customer acknowledges that breaches of this Agreement, include, but are not limited to:
    - i. Customer's failure to comply with the terms and conditions set forth in the Agreement, or its equivalent, within a reasonable period of time after receipt of written notice of such non-compliance;
    - ii. Customer knowingly falsifying any documents provided to the Company or the Commission in connection with this Agreement or the Joint Application.
  - c. In the event of a breach of this Agreement by the Customer, Customer agrees and acknowledges that it will repay to the Company, within 90 days of receipt of written notice of said breach, the full amount of the Cash Rebate paid under this Agreement. This remedy is in addition to any and all other remedies available to the Company by law or equity.
4. **Termination of Agreement.** This Agreement shall automatically terminate:
- a. If the Commission fails to approve the Joint Agreement;
  - b. Upon order of the Commission; or
  - c. At the end of the life of the last Customer Energy Project subject to this Agreement.

Customer shall also have an option to terminate this Agreement should the Commission not approve the Customer's Cash Rebate, provided that Customer provides the Company with written notice of such termination within ten days of either the Commission issuing a final appealable order or the Ohio Supreme Court issuing its opinion should the matter be appealed.

5. **Confidentiality.** Each Party shall hold in confidence and not release or disclose to any person any document or information furnished by the other Party in connection with this Agreement that is designated as confidential and proprietary ("Confidential Information"), unless: (i) compelled to disclose such document or information by judicial, regulatory or administrative process or other provisions of law; (ii) such document or information is generally available to the public; or (iii) such document or information was available to the receiving Party on a non-confidential basis at the time of disclosure.
- a. Notwithstanding the above, a Party may disclose to its employees, directors, attorneys, consultants and agents all documents and information furnished by the other Party in connection with this Agreement, provided that such employees, directors, attorneys, consultants and agents have been advised of the confidential nature of this information and through such disclosure are deemed to be bound by the terms set forth herein.



- b. A Party receiving such Confidential Information shall protect it with the same standard of care as its own confidential or proprietary information.
  - c. A Party receiving notice or otherwise concluding that Confidential Information furnished by the other Party in connection with this Agreement is being sought under any provision of law, to the extent it is permitted to do so under any applicable law, shall endeavor to: (i) promptly notify the other Party, and (ii) use reasonable efforts in cooperation with the other Party to seek confidential treatment of such Confidential Information, including without limitation, the filing of such information under a valid protective order.
  - d. By executing this Agreement, Customer hereby acknowledges and agrees that Company may disclose to the Commission or its Staff any and all Customer information, including Confidential Information, related to a Customer Energy Project, provided that Company uses reasonable efforts to seek confidential treatment of the same.
6. **Taxes.** Customer shall be responsible for all tax consequences (if any) arising from the payment of the Cash Rebate.
7. **Notices.** Unless otherwise stated herein, all notices, demands or requests required or permitted under this Agreement must be in writing and must be delivered or sent by overnight express mail, courier service, electronic mail or facsimile transmission addressed as follows:

**If to the Company:**

FirstEnergy Service Company  
 76 South Main Street  
 Akron, OH 44308  
 Attn: Victoria Nofziger  
 Telephone: 330-384-4684  
 Fax: 330-761-4281  
 Email:

**If to the Customer:**

To Plug Smart on Behalf of  
 The University of Toledo  
 1275 Kinnear Rd. Columbus Ohio, 43202  
 Attn: Lucas Dixon  
 Telephone: 614-580-3352  
 Fax:  
 Email: lucas.dixon@plugsmart.com

or to such other person at such other address as a Party may designate by like notice to the other Party. Notice received after the close of the business day will be deemed received on the next business day; provided that notice by facsimile transmission will be deemed to have been received by the recipient if the recipient confirms receipt telephonically or in writing.

8. **Authority to Act.** The Parties represent and warrant that they are represented by counsel in connection with this Agreement, have been fully advised in connection with the execution thereof, have taken all legal and corporate steps necessary to enter into this Agreement, and that the undersigned has the authority to enter into this Agreement, to bind the Parties to all provisions herein and to take the actions required to be performed in fulfillment of the undertakings contained herein.
9. **Non-Waiver.** The delay or failure of either party to assert or enforce in any instance strict performance of any of the terms of this Agreement or to exercise any rights hereunder conferred, shall not be construed as a waiver or relinquishment to any extent of its rights to assert or rely upon such terms or rights at any later time or on any future occasion.
10. **Entire Agreement.** This Agreement, along with related exhibits, and the Company's Rider DSE, or its equivalent, as amended from time to time by the Commission, contains the Parties' entire understanding with respect to the matters addressed herein and there are no verbal or collateral representations, undertakings, or agreements not expressly set forth herein. No change in, addition to, or waiver of the terms of this Agreement shall be binding upon any of the Parties unless the same is set forth in writing and signed by an authorized representative of each of the Parties. In



the event of any conflict between Rider DSE or its equivalent and this document, the latter shall prevail.

11. **Assignment.** Customer may not assign any of its rights or obligations under this Agreement without obtaining the prior written consent of the Company, which consent will not be unreasonably withheld. No assignment of this Agreement will relieve the assigning Party of any of its obligations under this Agreement until such obligations have been assumed by the assignee and all necessary consents have been obtained.
12. **Severability.** If any portion of this Agreement is held invalid, the Parties agree that such invalidity shall not affect the validity of the remaining portions of this Agreement, and the Parties further agree to substitute for the invalid portion a valid provision that most closely approximates the economic effect and intent of the invalid provision.
13. **Governing Law.** This Agreement shall be governed by the laws and regulations of the State of Ohio, without regard to its conflict of law provisions.
14. **Execution and Counterparts.** This Agreement may be executed in multiple counterparts, which taken together shall constitute an original without the necessity of all parties signing the same page or the same documents, and may be executed by signatures to electronically or telephonically transmitted counterparts in lieu of original printed or photocopied documents. Signatures transmitted by facsimile shall be considered original signatures.

IN WITNESS WHEREOF, the Parties hereto have caused this Agreement to be executed by their duly authorized officers or representatives as of the day and year set forth below.

**The University of Toledo**  
(Customer)

By: Mr. Michael Green

Title: Director of Energy Management

Date: 4/20/2011

**Toledo Edison a First Energy Company**  
(Company)

By:

Title:

Date:



**This foregoing document was electronically filed with the Public Utilities**

**Commission of Ohio Docketing Information System on**

**7/25/2011 5:27:23 PM**

**in**

**Case No(s). 11-3966-EL-EEC**

Summary: Application Application of The Toledo Edison Company and the University of Toledo to Commit Energy Efficiency/Peak Demand Reduction Programs (part 3b of 3) electronically filed by Mr. Kevin P. Shannon on behalf of The Toledo Edison Company