

LIGHTING LAYOUT GUIDE SERIES

WAREHOUSE

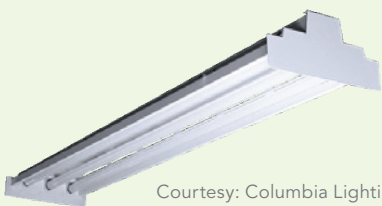
T8 FLUORESCENT

ROOM CHARACTERISTICS

Length: 72'
Width: 150'
Height: 28' Open Ceiling
Reflectivity:

Ceiling	= 80%
Walls	= 30%
Floor	= 20%
Product	= 30%

PRODUCT SPECIFICATIONS



Courtesy: Columbia Lighting

Dimensions: 9.75" x 96" (8 ft.)
Louvers: Blade type
Lamps: (3) F32T8 HP (6 total)
Lumens per Lamp: 3100
Ballast Factor: 0.88*
Lamp Lumen Depreciation: 0.95
Total Fixture Efficiency: ~83%
Watts: 166

*If the light levels are higher than required, consider a lower ballast factor (BF) for greater savings (see options on back).

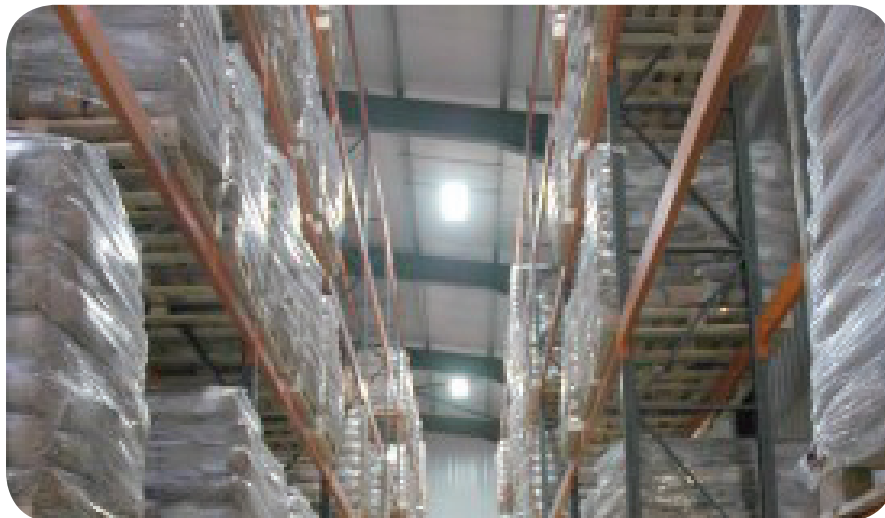


Photo credit: Dairygold-Warehouse

THE OPPORTUNITY

In a typical high, open ceiling warehouse application, it is possible to provide high quality lighting that adequately illuminates the warehouse shelves while meeting or beating the local energy. The situation requires luminaires with optical control capable of effectively distributing light onto the vertical surfaces, which provides excellent product recognition and improved productivity.

THE SOLUTION

Install industrial high bay fluorescent luminaires located over the center of each aisle. Luminaires equipped with T8 HP electronic ballasts and 32w T8 HP lamps will deliver 10+ average maintained vertical footcandles on the face of the stacks.

DESIGN CONSIDERATIONS

Stacks have a large impact on the illumination of the space. Vertical surfaces absorb and block light. The stack layout must correspond to the lighting layout to minimize shadows, (if luminaires are installed off center of the aisles).



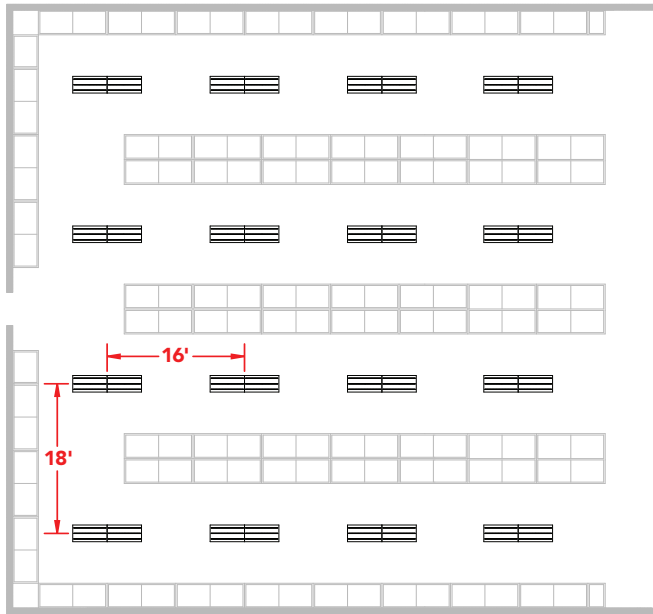
The Lighting Design Lab is a Northwest utility sponsored education facility focused on quality energy efficient lighting solutions. Additional guides are available at the Lighting Design Lab website.

WWW.LIGHTINGDESIGNLAB.COM
(206) 325-9711 or Toll Free: (800) 354-3864
2915 4th Avenue South Seattle, WA 98134

With support from 

LAYOUT OPTIONS

Warehouse 3-lamp T8 High Performance | 18' x 16' Spacing



INSTALLATION SPECS

Number of Luminaires: 72

Luminaire Spacing: 18' x 16' on center

Mounting Condition: Pendant

Average Illumination: horizontal 19 footcandles
vertical 11 footcandles

Watts/sq. ft.: ~0.50

CONTROLS

Occupancy sensors or building energy management systems now **MUST** be used to turn lights off automatically when occupants are away, or after hours. NOTE: One cost effective solution is specifying luminaires with integral occupancy sensors. This will minimize wiring labor costs.

Daylight harvesting controls, by code, now **MUST** be used on all luminaires within the 'Daylight Zone', (typically 70% of the ceiling height in all directions from the edge of the skylight, or equal to the window height away from the wall).

ENERGY SAVING OPTIONS

STRATEGY	WATTS/LUMINAIRE	SAVINGS	LIGHT LEVELS
Daylight dimming ballasts (first row near windows)	~33w (@ 20% dimming)	80%	Higher than base design
Integrated occupancy sensors	83w (average)	20% to 40%	Equal to base design
Lower factor ballast	128w (BF of 0.77)	23%	~13.5 fc vert., ~9 fc hor.

ADDITIONAL ENERGY CODE INFORMATION

JURISDICTION	CODE	LIGHTING POWER ALLOWANCE (WAREHOUSES)
Seattle	2009 Seattle Energy Code	0.50 w/sq. ft. (1.15 w/sq. ft. rack allowance)
Washington	2009 WSEC	0.50 w/sq. ft. (1.15 w/sq. ft. rack allowance)
Oregon	2010 OEESC	0.73 w/sq. ft.
Idaho	2009 IECC	0.80 w/sq. ft.
Montana	2009 IECC	0.80 w/sq. ft.