

Deep Lighting Retrofits



Matt Kiley
The **KILEY** Company

Changing an Old V8 w/ a New V8





V4

Hybrid



Velco predicts
24% increase
in demand by 2028



Users Want Real Savings

- Save \$ \$ \$ \$ \$
- Energy to save \$ and
Lower Carbon Footprint

Save the MOST Energy

- Facility will ALWAYS opt for the
MOST Savings
(South Burlington High School)

LUMEN TO LUMEN RETROFITS CAN BE
DANGEROUS

13 Footcandles

2.4w/sq.ft



100 Footcandles



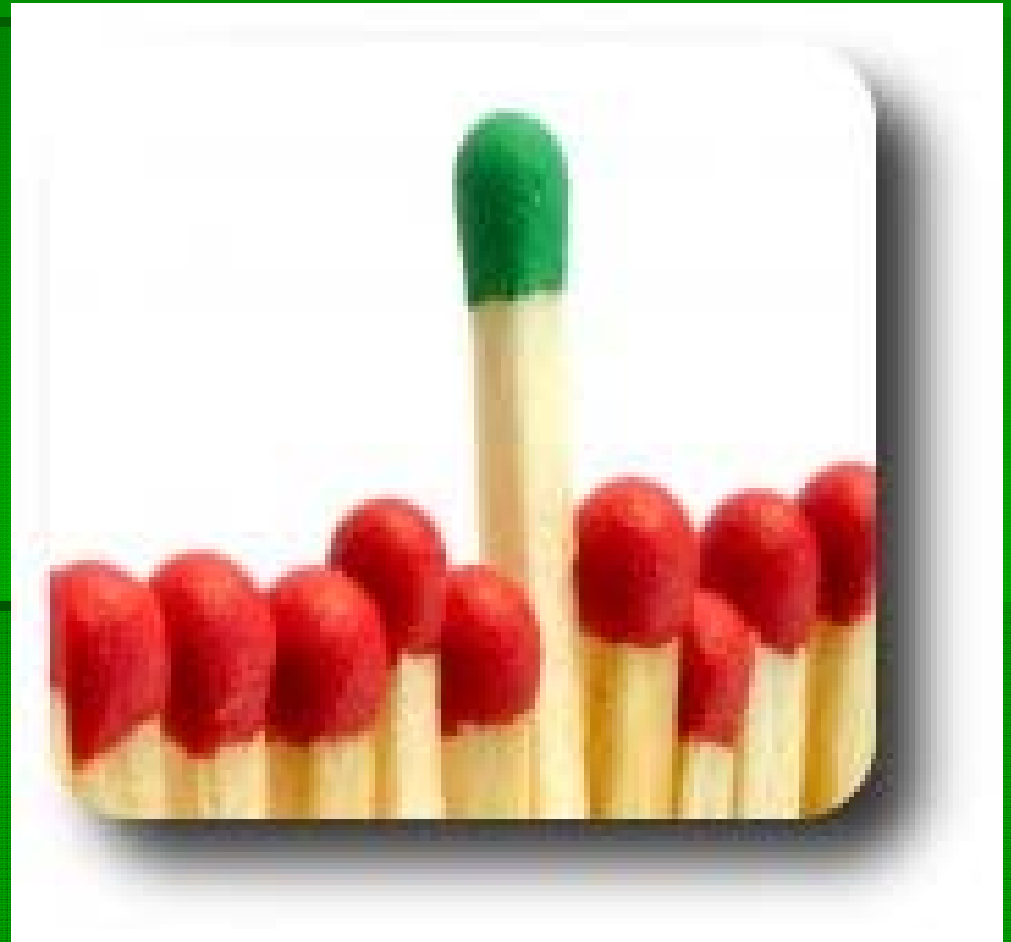
HOW



#1 Independent Design

Beholden to NO ONE except the user

- No Commission
- No Kickbacks
- No Sales Incentive



Experienced

- Knows USER needs, pressures and demands
- Knows the best equipment for the site
- Knows where to buy it at the least cost
- Knows lighting design
- Knows Utility Incentive Procedures
- Knows Lighting Retrofit Contracting



(24) 400w MH, 10980 watts
1.8w/ sq ft
75 FC

- Contractor 8496 watts 1.4w/sq ft
125 FC

- Designer 2832 watts .5w/sq ft
▪ 40 FC

#2 Light Meter



- Light Meter Tells you Where you're at.
- Most occupants want LESS light



No Light Level = No Good

- Facility retrofitted in '90's w/ T8 to 1970 IES Standards >70fc now <35fc
- Lumen to Lumen Retrofits are LOST Opportunities (Hazen Union)
- Lumen to Lumen Retrofits can be Harmful (Hardwick Elem)

Establish Clear Facility Objectives w/ initial walkthrough

- Initial Interview and Walkthrough
- Fac Dir see FC & see Opportunities
- Discuss Conservative vs Aggressive Opportunities Base on Light Level Goals
- Gather User comments
- Make sure consultant is beholden ONLY to you and the facility

Must Discuss

- Light Levels (Meat Packing Plant)
- Condition of Equipment
- Availability of Replacement Parts
- Energy Forecasts
- Budget
- Management Support
- Payback Parameters
- Utility Incentives

#3 Conceptual Design

- Audit w/ LIGHT LEVELS
- Facility input
- Conservative Savings Deltas
- Projected Cost
- Rough Payback

Conceptual Spreadsheet Contains all info to:

- Make informed choices
- Set Direction
- Get Approvals to Engage Further
- Set Preliminary Budget

■ BUILD SURVEY

Light Meter SOLICITS Input



#4 Occupant Input

- Discuss Light Level Needs
- Discuss Less Light Where Needed
- Gain user Acceptance
- Discuss New Technologies
- Discuss Occupancy Sensors
- Employee Information Letter

#5 Use Reflectors

- Where to Use Them...where not!
- Good reflector from Bad

"they don't work"



What do Reflectors Do?

- Collect light from top half of lamp
- Redirect it out of luminaire
- Raise Fixture Efficiency 20-40%

Two Important Factors

- Specular Reflectivity
- Reflector Design



Specular Reflectivity

- Silver Laminate 96%
- Dielectric Coated Aluminum 95%
- Specular White 91%
- Anodized Aluminum 85%

Reflector Design Is Critical



(4) lamp T8 troffer, 113 watts 60 FC

Lumen to Lumen

- 4HPT8 Retrofit
- 96 watts
- \$55 end cost
- \$3.23/watt removed

Deep Retrofit

- 2HPT8 w/ reflector
- 49 watts
- \$80 end cost
- \$1.25/watt removed

- Same EXCESSIVE
Light Level

- APPROPRIATE
Light Level

Everything is done for them

- Accurate Survey
- Light Levels Corrected
- Best Payback Attained
- Customized to Budget
- Lowest Possible Cost
- Accurate submittal to Utility

PROOF



HAZEN UNION SCHOOL
7 to 1 Return

313% INCREASE IN DEMAND SAVINGS
(12 vs 38 kw)

245% INCREASE IN USE SAVINGS
(42,000 vs 103,000 kwh)

Light Levels Reduced 100 to 60FC
(300) LESS New Fixtures w/ HPT8 & Miro 4
\$9,000 Additional Energy Savings

MAYO HEALTHCARE

2 to 1 Return 54% More Savings

- 30% Less Fixtures
- Improved Light Levels

6 to 1 Ratio

460% More kw eliminated

456% More kwh removed

\$4.55 vs \$.42 /watt

- Light Level Raised (15-65fc)
- Rebuilt High School Fixtures w/ HPT8 and Miro 4 Reflector.

NORTH COUNTRY HOSPITAL

3 to 1 Return

38% More Savings

- Light Levels Corrected
 - Miro 4 Reflectors
 - Savings \$26,000

JAY-WESTFIELD SCHOOL

7 to 1 Return

383% More Savings

20% LESS Cost

\$3.75 vs \$.80 / watt

- Light Levels Reduced 110 to 65FC
 - 15% LESS Fixtures
 - (8) Less Gym Fixtures

HARTLAND SCHOOL

5 to 1 Return

83% More Savings

25% LESS Cost

\$4.07 vs \$2.18 / watt

- 24% LESS Fixtures

End User Deserves

- Maximum Savings
- Corrected Light Levels
- Lowest Cost per Watt & per Mwh
- Faster Payback
- Faster Implementation

Independent Design Makes it Easy

- Easy for Customer to understand
- Easy for Utility input
- Easy for Contractors to Bid
- Easy to get the best price

Review

- #1 Independent Design
- #2 Light Meter Basis
- #3 Conceptual/Feasibility Analysis
- #4 Occupant Input
- #5 Reflector Use

