

Docket # 15-BSTD-01

2016 Building Standards Update, and hopefully also 2013 improvement

15-Day Language Is Not Enough, Especially With No Light Fixture Maintenance Category

November 26, 2015

Greetings

I am writing this on Thanksgiving, and I have lots to be thankful for, but there are no thanks to the CEC or IBEW.

Although the 15-day language is better than existing, and it may be good enough for the utility 3rd party rebate programs to survive, it is not even close to being good enough for most lighting retrofits, especially when the existing fixtures are relatively efficient, existing burn time is relatively low, and in union or prevailing wage jobs. These are quite common.

Many existing buildings were built or retrofitted with relatively efficient lighting and/or only have 3000 or less annual hours of operation.

I do not understand why the IBEW canceled light fixture maintenance category for interior lighting retrofits this year, because that greatly reduces the possibility of lighting retrofit projects for all contractors, including union ones. \$60 - \$90 per hour for inside wireman wages, plus an extra 30% for the contractor, kills the majority of lighting retrofit projects if anything other than TLEDs or reduced wattage fluorescent lamps are used with existing ballasts. If the IBEW will not reinstate light fixture maintenance category, why shouldn't the State of California, even with a democratic governor, de-couple prevailing wages from union wages? And just because the IBEW has been pushing controls certification for its members, does it make sense pushing controls mandates, when those controls are not cost effective saving energy, because that reduces the number and size of lighting retrofit projects, which hurts all contractors, including union ones? I am stating this as a democrat with deep family union roots.

Other than using TLEDs with existing ballasts, I would like anybody from the CEC, including Jim Benya, to provide cost effective lighting retrofit specifications with 15-day language in a non-prevailing or non-union office building, which has:

- 1000 2x4 lensed troffers
- Each troffer has 2 25W F32T8 fluorescent lamps and 12-year old generic .88 BF instant start electronic ballast, which consumes 47W
- \$.14/KWH electric rate
- 3000 annual hours, set by time clock
 - Plus numerous private office workers manually turn their lights off
- Each fixture now consumes \$19.74 of electricity per year
 - Installers making \$28 per hour, which after contractor mark-up is \$40 per hour to end-customer
 - 4 fixtures per hour, which is \$10 per fixture
- \$.40 lamp recycling cost
- Title 24 costs, including that 35% reduction may not work out, while providing sufficient light
- Typical IOU or MUNI rebates
- End-customer may accept up to a 4-year payback, but really prefers less than 3 years

Even TLEDs with existing ballasts, and even if the TLEDs can increase ballast life by 5 years, does not have that good of financial returns. End-customer may pay \$15 for each TLED after contractor mark-up.

Adding occupancy sensors will make financial returns even worse, because low lighting wattage after retrofit and additional parts and labor for sensors.

Also other than using TLEDs with existing ballasts, I would like anybody from the CEC, including Jim Benya, and/or anybody from the IBEW to provide cost effective lighting retrofit specifications with 15-day language in a prevailing wage public elementary school, which has

- 500 8' wrap arounds in hard ceiling
- Each wrap around has 4 extra long life 28W F32T8 fluorescent lamps and 10-year old high performance .77 BF instant start ballast, which consumes 84W
- \$.16/KWH electric rate
- 1400 annual hours
 - Teachers and/or students do a great job of manually turning off lights when they leave
 - No summer school
- Each fixture now consumes \$18.82 of electricity per year
- Installers making \$90 per hour, which after contractor mark-up is \$120 per hour to end-customer
 - 3 fixtures per hour, which is \$40 per fixture
- \$.40 lamp recycling cost
- Title 24 costs, including that 35% reduction may work out with new LED fixtures
- Typical IOU or MUNI rebates
- End-customer may accept up to a 5-year payback, but really prefers less than 4 years

Even TLEDs with existing ballasts and even if the TLEDs can increase ballast life by 5 years, does not have that good of financial returns, because labor cost to end-customer should be about \$30 and very low annual hours of operation. End-customer may pay \$15 for each TLED after contractor mark-up.

Adding occupancy sensors in each classroom will increase annual hours of operation and additional parts and labor cost for the parts and labor.

Although Prop 39 can help with school projects now, what about after those funds evaporate?

This table includes system wattages with the full range of 4' fluorescent T8s and electronic ballasts.

25 - 32W F32T8 LAMP AND ELECTRONIC BALLAST WATTAGE TABLE																																			
ballast type >>>>>>>>		GEB IS										EE IS										EE PS										GEB RS or PS			
lamp type >>>>>>>>		32W		30W		28W		25W		32W		30W		28W		25W		32W		30W		28W		25W		32W		30W		28W		25W		32W	
system wattage >>>		X	X			X			X	X	X			X			X	X	X	X			X			X	X			X			X	X	
system W saved >>>				X			X					X			X					X		X													
lamp W saved >>>>>>					X			X							X							X													
BF																																			
SUPER LOW BF																																			
1	number of lamps	0.60																																	
2																																			
3																																			
4																																			
EXTRA LOW BF																																			
1	number of lamps	0.71																																	
2																																			
3																																			
4																																			
LOW BF																																			
1	number of lamps	.75 - .78	29	28	1	1.0	26	3	3.0	23	6	6.0	25	24	1	1.0	22	3	3.0	21	4	4.0	25	23	2	2.0	22	3	3.0	21	4	4.0			
2			51	48	3	1.5	45	6	3.0	41	10	5.0	48	45	3	1.5	42	6	3.0	38	10	5.0	46	43	3	1.5	40	6	3.0	38	8	4.0			
3			76	70	6	2.0	67	9	3.0	61	15	5.0	72	67	5	1.7	64	8	2.7	57	15	5.0	71	66	5	1.7	62	9	3.0	56	15	5.0			
4			98	90	8	2.0	86	12	3.0	78	20	5.0	95	88	7	1.8	84	11	2.8	75	20	5.0													
STANDARD BF																																			
1	number of lamps	.87 - .90	31	29	2	2.0	28	3	3.0	25	6	6.0	28	27	1	1.0	25	3	3.0	23	5	5.0	28	27	1	1.0	25	3	3.0	24	4	4.0	32		
2			58	55	3	1.5	51	7	3.5	47	11	5.5	53	51	2	1.0	48	5	2.5	42	11	5.5	55	52	3	1.5	48	7	3.5	44	11	5.5	62		
3			86	81	5	1.7	76	10	3.3	69	17	5.7	80	76	4	1.3	71	9	3.0	64	16	5.3	81	76	5	1.7	71	10	3.3	66	15	5.0	91		
4			112	105	7	1.8	98	14	3.5	90	22	5.5	106	100	6	1.5	95	11	2.8	85	21	5.3	108	100	8	2.0	96	12	3.0	87	21	5.3	119		
REFERENCE BF																																			
1	number of lamps	.96 - 1.04	36	34	2	2.0	33	3	3.0	30	6	6.0	34	32	2	2.0	30	4	4.0	29	5	5.0													
2			66	62	4	2.0	59	7	3.5	52	14	7.0	62	59	3	1.5	55	7	3.5	50	12	6.0													
3			92	87	5	1.7	81	11	3.7	73	19	6.3	89	84	5	1.7	78	11	3.7	73	16	5.3													
HIGH BF																																			
1	number of lamps	1.15 - 1.20	41	39	2	2.0	36	5	5.0	34	7	7.0	38	36	2	2.0	33	5	5.0	32	6	6.0													
2			78	73	5	2.5	68	10	5.0	62	16	8.0	73	70	3	1.5	64	9	4.5	60	13	6.5													
3			111	105	6	2.0	97	14	4.7	88	23	7.7	109	104	5	1.7	94	15	5.0	93	16	5.3													
4			144	135	9	2.3	128	16	4.0				143	136	7	1.8	123	20	5.0	122	21	5.3													
average W reduction with .71 - .90 BF			1.7			3.2			5.5				1.3			2.8			5.0				1.6			3.1			4.7						
Footnotes for this table are listed in next sheet of this file.																																			
Prepared by Stan Walerczyk, principal of Lighting Wizards. www.lightingwizards.com, 1/11/15 version																																			

Footnotes for this table are listed in next sheet of this file.
Prepared by Stan Walerczyk, principal of Lighting Wizards, www.lightingwizards.com, 1/11/15 version

In the past when there was considerable low hanging fruit, such as T12s and magnetic ballasts, financial returns would have been some what decent even with relatively high Title 24 costs and high labor rates, but for the most part, only mom and pop end-customers still have them. One big reason that there is so little low hanging fruit left is that lighting retrofits were done with relatively low cost without having to deal with Title 24 and there was light fixture maintenance category.

One potential problem with the 35% wattage reduction is that it can reward end-customers, who were not efficient and penalize end-customers, who have done previous retrofits, so 35% wattage reduction will not work in another retrofit, so extra Title 24 costs are required.

Even with 15-day language, many lighting retrofit contractor companies, installers, and their sales people, distributors and their sales people do not have a lot to be thankful for. Plus many lighting retrofit projects were not done or were done with TLEDs and existing ballasts, because that did not trigger Title 24, even if they are usually not the best lighting solution.

Why are CEC staff and Jim Benya still being paid?

When the 2013 Title 24 was being planned, a number of real lighting retrofitters, including me, kept stating that the dimming, control and Title 24 costs would not be cost effective, but people at the CEC, Doug Avery and Jim Benya kept stating that they would be. Now the evidence is very clear.

Even before LED products really started to be good, often 2x4 troffers in halls, restrooms, closets and some classrooms also ones in offices with good task lights could be retrofitted with a 1-cove reflector, 1 3100 lumen 32W F32T8 5000K fluorescent lamp and a high performance fixed output .71 - .77 BF instant or program start ballast, which consumes only 25W. Even though Jim Benya may still not accept the benefits of spectrally enhanced lighting, others and I have done millions of square feet with 5000, 6500 and 8000K with very satisfied customers. Plus the IES approved it in TM-24-13. Parts and labor was only \$60 - \$65, even with prevailing or union wages. In rooms with windows on one side, dimming was not necessary, because the row of troffers by the windows could be manually or automatically turned off.

The best thing that the CEC can do is to go back how lighting retrofits were generally done before July 1, 2014, because the free market is much better qualified than the CEC and Jim Benya.

If anybody can provide good reasons why the IBEW should not reinstate light fixture maintenance category for interior retrofits, and if it does not do that, why the State of California should not separate prevailing wages from union wages, please do.

Stan Walerczyk

Stan Walerczyk, HCLP, CLEP
Principal of Lighting Wizards
Vice-Chair of Human Centric Lighting Society (but this is written as an independent individual)
<http://lightingwizards.com/>
[http://humancentriclighting.org/
stan@lightingwizards.com](http://humancentriclighting.org/stan@lightingwizards.com)
808-344-9685