

Lindsey Beane

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



Final Report

Cost Analysis Breadth

After completing the design scheme that could be implemented on all lobby floors I studied the existing lighting installation cost to my design. The comparison included costs of material and labor. When this comparison was considered I had not planned to have a cove fixture, but instead to surface mount fixtures on the existing beams. After careful consideration I decided that the design need to be cleaner cut then a surface mounting design could provide. So, I have proposed to add a cove as well as the ceiling washing fixtures. So, the pricing for this new installation is significantly more expensive.

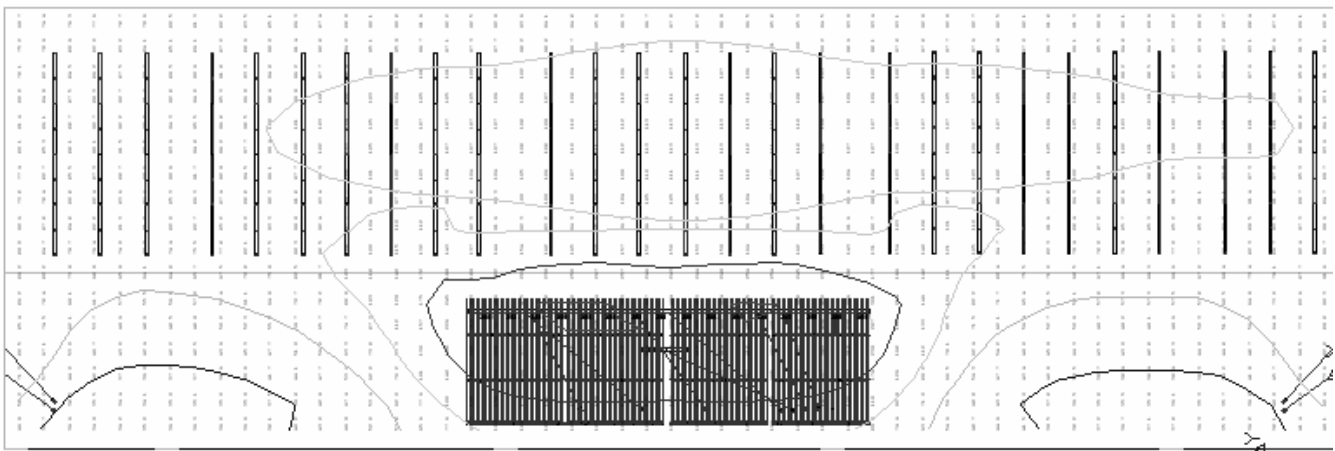
Existing Conditions

Lighting Schedule

VE-N	Fluorescent Strip Light (1) Lamp	Hubbell Lighting	Cleanroom-air Foil Series CR-X-8T-1-R-CL-A-1-CR5-1	(1) T8 Assumed 32W	120	34	0.666	L5725
VE-NC	Fluorescent Strip Light (1) Lamp 4' and 8' lengths.	Hubbell Lighting Duray	Cleanroom-air Foil Series CR-X-8T&40-1-R-CL-A-1-CR5-1 LS 96 or LS 48 Depending on	(1) T8 Assumed 32W Gel Fits T12 lamp	120	34	0.666	L5725

Lighting Layout

The layout is very uniform with the exception of colored strips used to define spaces between the columns. These are surface mounted strip fluorescents. This design provided a very economical approach to the lighting design. Half of the fixtures are 8' in length which also greatly reduced the cost of labor for the installation.



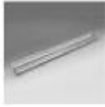
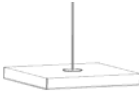

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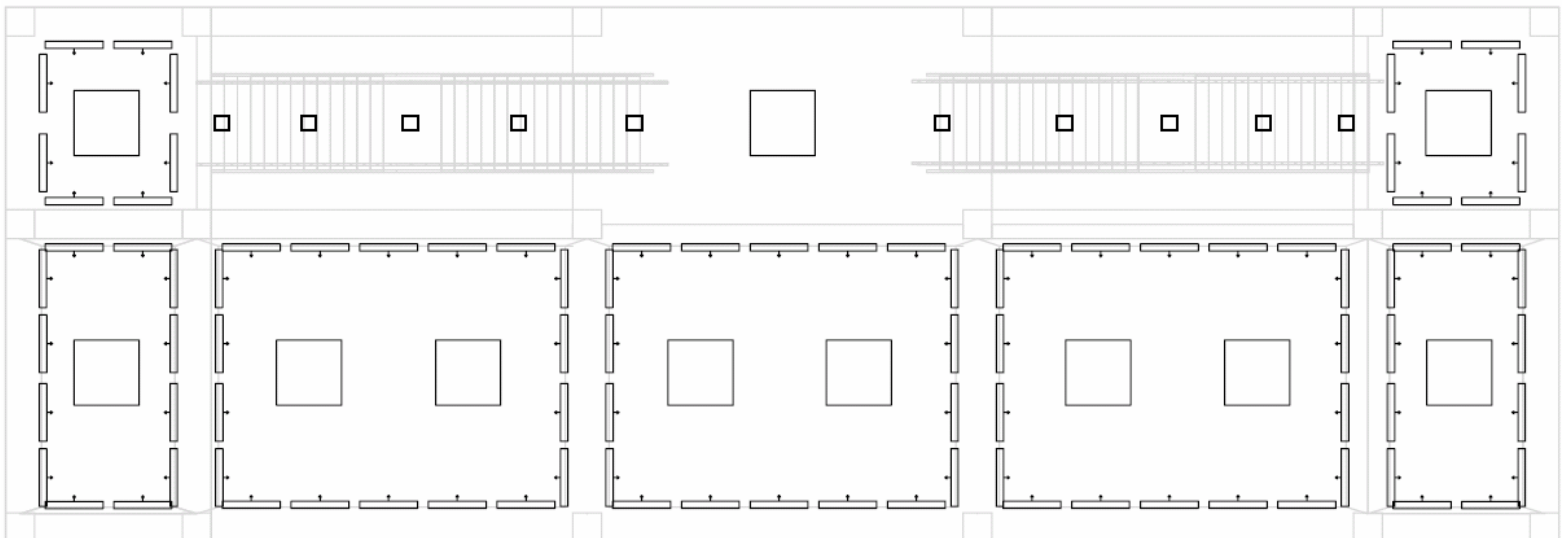
New Design for Comparison Lighting Schedule

- D**  **Winona Lighting P1-MC-T5-MCVU-RA-**
 Description: Fluorescent cove light with 1-28T5 lamp (in cross-section). 1-28T5 lamp (in cross-section) Location: Lobby
- F**  **Custom Fixture 4.5' x 4.5' x 6" Square Pendant**
 Description: 4.5' x 4.5' x 6" Pendant with acrylic glass on sides and bottom. Top is opaque and reflective on inner side of fixture. (4) 28T5 bi-pin linear Location: Lobby
- G**  **Winona Lighting 5450-10-F-MB-STD**
 Description: Suspended compact fluorescent decorative pendant with 4-FT40 lamps. 4-FT40 lamps Location: Lobby

Symbol	Type
	D
	F
	G
	I
	J
	M

Lighting Layout

This design requires the installation of a cove to give a seamless approach to the uniform lighting of the space. Additionally, to keep the layout seamless there is a large custom fixture which added greatly to the expensive of the installation. The other two types of fixtures used were specified from Winona without modifications.



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Discussion

The spreadsheet below shows the initial cost analysis of the total installation. After reviewing these costs further a second analysis was needed to put the comparison into perspective.

Existing Design

RS Means #	Type	Quantity	Description	Crew	Output	Hours	Unit	Material	Labor	Total	O & P
2600	VE-N	52	(1) 8' Long Linear Fluorescent	2 Elec	13.4	1.194	ea.	\$2,158.00	\$3,016.00	\$5,174.00	\$6,916.00
2600	VE-NC	42	(1) 8' Long Linear Fluorescent with Sleeve and colored gel	2 Elec	13.4	1.194	ea.	\$1,743.00	\$2,436.00	\$4,179.00	\$5,586.00
2400	VE-NC	80	(1) 4' Long Linear Fluorescent with Sleeve and colored gel	1 Elec	8	1	ea.	\$3,200.00	\$3,920.00	\$7,120.00	\$9,360.00
										\$16,473.00	\$21,862.00

New Design

RS Means #	Type	Quantity	Description	Crew	Output	Hours	Unit	Material	Labor	Total	O & P
3565	D	94	4' Cove fixture and prefabricated steel cove	1 Elec	5	1.6	ea.	\$17,014.00	\$7,332.00	\$24,346.00	\$29,610.00
1600	F	11	4'-6" square pendant, acrylic, with (4) 4' T5 lamps	2 Elec	7.2	2.222	ea.	\$4,565.00	\$1,199.00	\$5,764.00	\$6,820.00
1060	G	10	CFL rectangular pendant	1 Elec	3	2.667	ea.	\$5,500.00	\$1,120.00	\$6,620.00	\$7,800.00
										\$36,730.00	\$44,230.00

Existing Design

Type	Quantity	Description	Material
VE-N	52	(1) 8' Long Linear Fluorescent	\$2,158.00
VE-NC	42	(1) 8' Long Linear Fluorescent with Sleeve and colored gel	\$1,743.00
VE-NC	80	(1) 4' Long Linear Fluorescent with Sleeve and colored gel	\$3,200.00
Total	174		Total \$7,101.00 \$1.79 per s.f.

New Design

Type	Quantity	Description	Material
D	94	4' Cove fixture and prefabricated steel cove	\$17,014.00
F	11	4'-6" square pendant, acrylic, with (4) 4' T5 lamps	\$4,565.00
G	10	CFL rectangular pendant	\$5,500.00
Total	115		Total \$27,079.00 \$6.84 per s.f.

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Conclusions

The goals for this design were to create an appealing lighting design while maintaining an energy and maintenance efficient system. These goals were met by providing concealed fixtures where possible and using mostly fluorescent lighting sources. Fluorescent sources allowed the ability to be energy efficient while maintain the flexibility to be dimmed as well. To complete this design flexibility, a Grafik Eye system was specified for controls. The system design has the option to dim the different layers of light in each major space. The system has a straightforward plan for wiring because the circuiting plan reflects the lighting control zoning plans directly. This design is successful because the electrical layout plan was integrated into the lighting controls to simplify the installation.

Breadth studies provide a better understanding of the overall design. To improve the details of the lighting system other elements of the architectural design are affected. There are two architectural elements that would be modified by this design to avoid conflict with the lighting system plan. The first is the addition of coves in the lobby areas which was analyzed within the fixture cost installation analysis. The second conflict occurs in the auditorium space and affects the size of acoustical reflectors. The outcomes of both studies show that the results can either support the design or suggest modifications. As it turns out, the cost to install the cove lighting significantly adds to the lobby lighting installation costs. As a designer without a budget or limits to creativity, it is still recommended that the design be implemented as planned in this report. The added flexibility, aesthetics, and efficiency make the design a success.