Computer Classroom

Design Concepts

The purpose of this space is to act as a classroom to computer based classes. Its secondary function is to act as a small computer lab for students to use when there aren't any classes going on in it at that time. The space has a ceiling height of 15'. For my design concept, I wanted to use an indirect/direct system for a few reasons. The first, and most important, is a system with primarily uplight won't cause direct glare on computer screens very easily. Since the ceiling is 15' high, indirect glare shouldn't be a big issue either. The other reason I wanted to use a primarily uplight system is because students are usually looking down at their illuminated computer screen when working in this room, which means the uplight isn't really wasted by going to the ceiling instead of the workplane. I also want the system to run on dimming ballasts so that when the teacher is teaching from their computer (PowerPoint for example), the lights can be dimmed down to a comfortable level instead of turning them all off or leaving them on.

Design Criteria

System Control and Flexibility

As stated above, I want the system to run on dimming ballasts. This will allow the teacher or students to set the correct level for what is going on in the classroom space at that time.

Appearance of Space

The appearance of this space isn't very important in my opinion. Most of the time, students will have their heads down involved in whatever is happening on their computer screens, so they are going to pay little attention to their surroundings.

Glare

Glare is a large consideration for this space. Indirect/direct lighting is being used to prevent as much direct glare as possible, and the 15' ceiling will help to prevent indirect glare coming back down from the ceiling onto the computer screens.

Atmosphere

The atmosphere for this space is fairly quiet and self-contained. Most of the time, students are doing work by themselves at the computers, but occasionally there will be people doing group work in the space.

IES Criteria:

Horizontal:
Reading VDT screen: 10 FC
Reading paper/taking notes w/ #2 pencil: 40 FC
Keyboard reading: 30 FC

Vertical:
Educational: 5 FC

Power Allowances from ASHREA 90.1:

1.4-1.6 w/ft^2

Table 9-B – Common Space Types for Space-by-Space Method

Space Type	W/ft² Range	Space Type	W/ft² Range
Office, enclosed	1.5	Dining area	1.0 to 2.2
Office, open	1.3	Foot preparation	2.2
Conference, meeting, multipurpose	1.5	Restrooms	1.0
Classroom, lecture , training	1.4 to 1.6	Corridor, transition	0.5 to 1.6
Audience, seating area	0.5 to 3.2	Stairs, active	0.9
Lobby	0.8 to 1.8	Storage, active	1.1 to 2.9
Atrium, first three floors	1.3	Storage, inactive	0.3 to 1.4
Atrium, each additional floor	0.2	Electrical, mechanical	1.3
Lounge, recreation	1.4		

Fixture Schedule (see appendices for cut sheets and light loss factors):

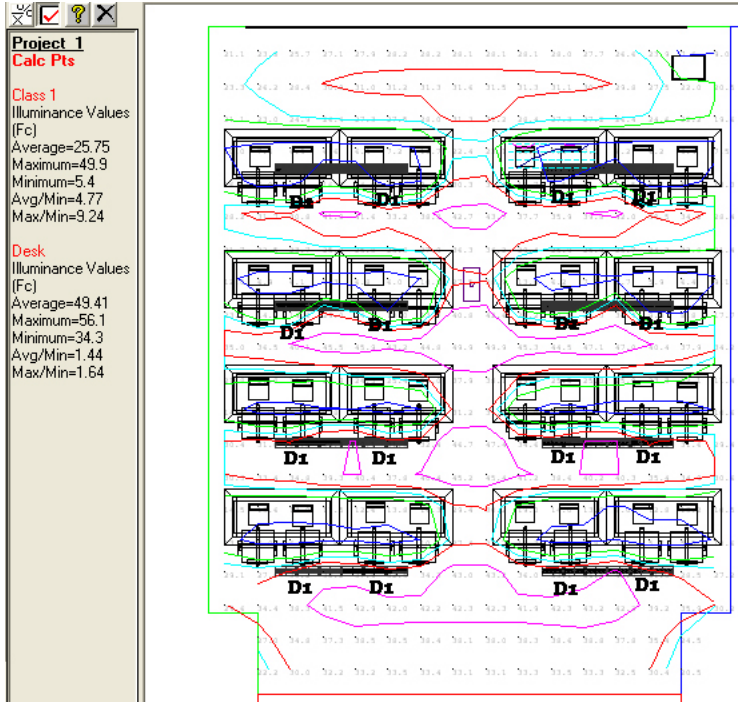| Type	Description	Lamps	Voltage	Wattage	Ballast	Quantity
D1	Indirect/direct pendant	(2) 54w T5HO	277	118	Dimming	16

16 indirect/direct * 118 watts/fixture = 1888 watts @ 277v
Power density = 1888 watts / 1280 ft^2 = 1.48 watts/ft^2

Therefore, power density is ok.

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Lighting Plan

Project_1
Calc Pts

Class 1
Illuminance Values
(Fc)
Average=25.75
Maximum=49.9
Minimum=5.4
Avg/Min=4.77
Max/Min=9.24

Desk
Illuminance Values
(Fc)
Average=49.41
Maximum=56.1
Minimum=34.3
Avg/Min=1.44
Max/Min=1.64

Isoline Values

Daylight Factor
Veiling Luminance   Visibility Level
GR/UGR   Luminance
Exitance
Illuminance

☑ Isolines For Illuminance Values

Line Width [0]   Ft   (0 = Pixel)

☐ Label Isolines: Increment [0]   Ft
                   Text Size [1]   Ft

Value (Fc)	Color	Value (Fc)	Color	Value (Fc)	Color
	⬛ (black)	30	🟥 (red)		(teal)
10	🟦 (blue)	40	🟪 (magenta)		(dark red)
20	🟩 (green)	50	(navy)		(purple)
25	(cyan)		(dark green)		(olive)

Clear Values

Ok
Cancel
Help

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Note: D1 go to Panel HV5

2 of D1 go to emergency Panel NEH

Renderings

Conclusion

The computer classroom provides a lighting solution that supplies enough light into the space while preventing glare and creating a comfortable and non-distracting environment for the people working in the space. Also, the dimming ballasts allow for custom light levels that match the needs of the people in the space.