

Food Network, Chelsea Market, New York, NY
Lighting Existing Conditions and Design Criteria Report
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Executive Summary

This report thoroughly examines the existing lighting conditions for four areas in the Food Network Space in Chelsea Market, New York, New York. These areas are an open office area on the 3rd floor, the boardroom on the 3rd floor, the audience holding area on the concourse level and the dining area on the 6th floor. The IESNA design criteria as well as the AHRAE 90.1 standard are used as guidelines to compare the spaces to for conformity. This report also sets out the IESNA design criteria as they will be considered for redesign of the spaces. The spaces were analyzed using simplified models in AGI32.

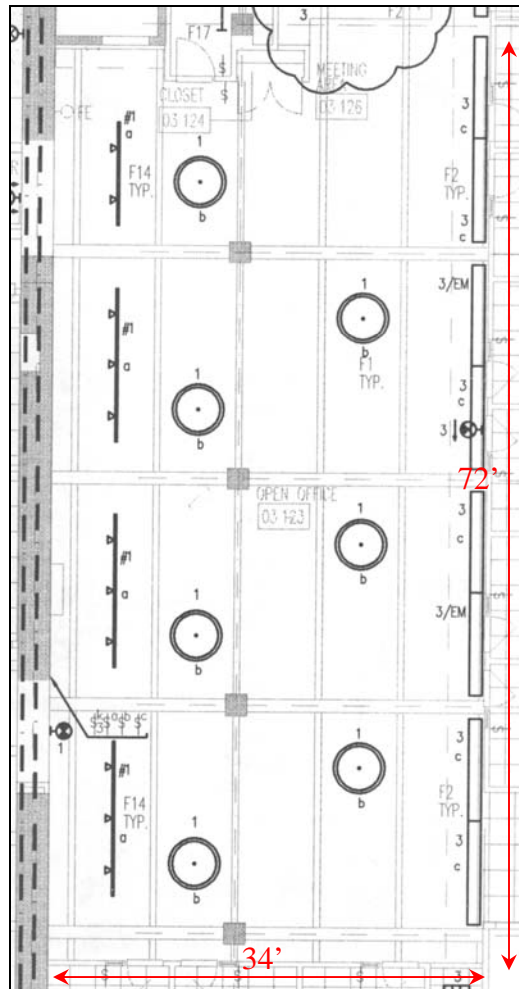
In regards to the IESNA criteria, all of the spaces greatly exceed the recommended illuminance values. In the dining and board rooms, this may be alleviated through the use of the dimming systems that are in place. Also through the dimming systems, the requirement for system control and flexibility is met very well in the board room and dining area. The design also does a good job of highlighting the important features in these rooms. The open office area does not have a dimming system, but the different types of fixtures can be switched separately to bring down the levels. This however, may cause unwanted shadowing. Although it has a simplified design, the audience holding area performs well and creates a welcoming environment that should provide a good start to the audience member's experiences. As in the other spaces, the illuminance values are a bit high, and there are no means to reduce them through dimming here.

None of the spaces conform to the ASHRAE standard regarding automatic shutoff for spaces greater than 350 square feet in building of at least 5000 square feet. Aside from the audience holding area, all of the spaces also greatly exceed the wattage per square foot allowances set forth in the ASHRAE standard.

Open Office Area

Existing Conditions

The open office area is typical of this type of space. The lighting system consists of custom pendant fixtures, track lighting, and wall washers. There is some VDT use in this area as well. There are no exterior windows, and thus now opportunity for incorporating daylight.



Existing Luminaires

<u>Designation</u>	<u>Description</u>	<u>Lamp</u>	<u>Ballast</u>	<u>V</u>	<u>W</u>	<u>Amt</u>
F1	Large custom pendant fixture	6-FT55DL/830 2-CFTR42/830	Electronic	277	500	7
F2	Fluorescent wall mounted uplight	1-F54T5/841/HO	Electronic	277	60	16
F14	Surface mounted halogen track light	1-Q50MR16/C/NFL	None	277	50	11

Open Office Area

Existing Light Loss Factors

<u>Luminaire</u>	<u>Ballast Factor</u>	<u>Maintenance Category</u>	<u>Cleaning Interval</u>	<u>RSDD</u>	<u>LDD</u>	<u>LLD</u>	<u>Total LLF</u>
F1	1.0	IV	Clean, 24 Months	0.96	0.8	0.86	0.66
F2	1.0	VI	Clean, 24 Months	0.8	0.77	0.93	0.57
F14	1.0	IV	Clean, 24 Months	0.96	0.8	0.97	0.74

Controls

Each type of fixture is controlled by its own switch for a total of 3 switches. This does not meet ASHRAE 90.1, which requires that areas greater than 250 square feet in buildings larger than 5000 square feet have an automatic shutoff.

Assumed Finishes

Walls: White Paint, reflectance: 0.7

Ceiling and Columns: White Painted Concrete, reflectance: 0.77

Floor: Blue Carpet, reflectance: 0.3

Furnishings

This space is furnished with 21 cubicles; each cubicle also has a chair and computer.

Design Criteria

Direct Glare: (Very Important)

As VDTs are in use in this area, it is critical to avoid direct glare. The discomfort due to direct glare is not conducive to a good working environment.

Luminances of Room Surfaces: (Very Important)

Ensuring that there is diffuse light will improve comfort and reduce overhead glare. Dark areas at tops of walls should also be avoided as light should be generally uniform and avoid contrasts.

Reflected Glare: (Very Important)

Reflected glare from the desktop and computer screen must be avoided as this causes discomfort to the worker and reduces visibility. Illuminating from the sides of the task or selecting special VDT screens can help eliminate this.

Open Office Area

Source/Task/Eye Geometry: (Very Important)

If this is treated correctly, it can help avoid both shadows and reflected, which as noted previously are important factors with VDT use.

Light Distribution on Task Plane (Uniformity) : (Important)

As noted above, visual comfort is very important. Therefore, the design should reduce contrast by avoiding shadows and bright spots and providing a generally uniform illuminance on the ceiling, walls, and partitions. Luminance ratios should also be checked.

Light Distribution on Task Plane (Uniformity) : (Important)

Patterns should be avoided on the desk top as they can cause discomfort, reduce visibility, and are distracting. The illuminance on the work surface should be higher than the surroundings to improve visibility on the task, but must be uniform on the surface as well.

Surface Characteristics: (Important)

High wall and ceiling reflectances allow for a more effectively lit space. More importantly, they help reduce contrasts of luminaires and their backgrounds, therefore providing a more comfortable environment.

Horizontal Illuminance: 30fc

Adequate lighting must be provided on the desk top so workers can perform tasks more efficiently and comfortably.

Vertical Illuminance: 5fc

As VDT screens are used here, this value is also a very important criterion.

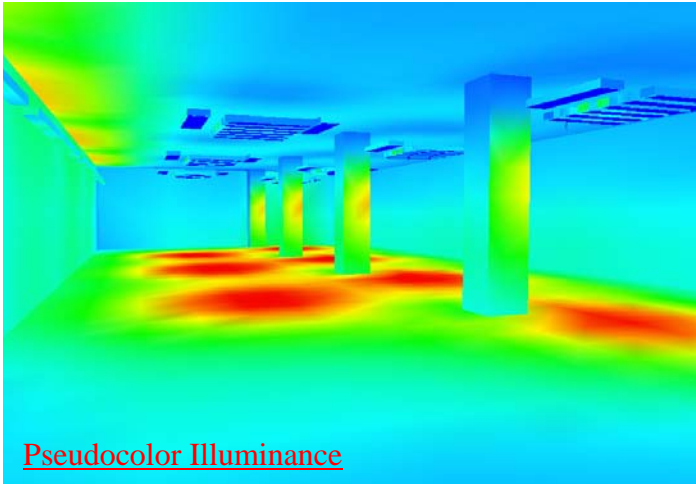
ASHRAE 90.1 Power Allowance: 1.5 W/ft²

Note: "Where lighting equipment is specified to be installed to meet requirements of visual display terminals as the primary viewing task, the smaller of the actual wattage of the lighting equipment or 0.35W/ft² times the area of the space that the lighting equipment is in shall be added to the interior lighting power determined in accordance with this line item."

Existing Power Density: 2.05 W/ft²

Open Office Area

Existing System Performance



work plane horizontal
 Illuminance Values (Fc)
 Average=142.74
 Maximum=334
 Minimum=33.7
 Avg/Min=4.24
 Max/Min=9.92

vertical
 Illuminance Values (Fc)
 Average=105.78
 Maximum=533
 Minimum=34.2
 Avg/Min=3.09
 Max/Min=15.59

113	152	169	245	269	212	136	86.8	62.1	51.5	48.2	47.9	48.9	49.3
72.7	119	198	295	324	255	160	100	72.2	61.3	58.0	56.6	55.6	54.0
69.6	113	190	288	308	244	162	107	83.7	77.8	76.7	73.1	67.5	61.5
65.0	99.1	154	219	240	158	83.7	100	99.6	108	114	105	88.4	73.3
62.4	85.5	117	153	168	142	67.2	89.2	121	158	177	158	120	89.4
105	122	94.7	114	123	114	86.2	104	157	226	263	227	159	107
110	131	111	141	153	140	126	138	195	265	304	284	191	123
72.9	104	149	204	224	191	150	141	174	236	271	234	165	113

34.2	37.5	41.4	45.4	48.1	49.4	48.7	46.5	49.9	283	530	533	306	75.2	55.9	56.1
39.5	46.5	53.6	64.9	75.7	77.7	70.4	64.4	75.8	140	266	305	197	97.5	62.4	52.0
46.2	56.5	70.3	87.4	103	106	94.8	83.3	85.7	109	147	157	123	85.4	63.8	53.4
50.1	62.0	76.5	92.5	106	109	100	90.0	87.5	94.4	105	106	92.9	75.3	61.5	53.2

Open Office Area

Critique

In the open office area, every value is extremely high. The horizontal illuminance is nearly five times the recommended amount, and the vertical illuminance average is an astounding 106 fc when it should only be about 5fc. As one would expect, this also causes the wattage per square foot to be much greater than the recommended amount. The custom fixtures have a good deal of influence on all of these factors, as they are very large and emit a great deal of light each. They also may cause a problem with direct glare on the VDT monitors and create a harsh uncomfortable working environment. As the three different types of light fixtures are controlled by different switches here, it is possible to bring down the levels to more suitable values, but cause significant dark areas, which would be troublesome in this environment.

Boardroom

Existing Luminaires

<u>Designation</u>	<u>Description</u>	<u>Lamp</u>	<u>Ballast</u>	<u>V</u>	<u>W</u>	<u>Amt</u>
F1A	Large custom fluorescent pendant fixture	8-F32T8/830	Electronic	277	280	1
F1B	Large custom fluorescent pendant fixture	8-F32T8/830	Electronic	277	280	2
F7	Fluorescent 2' cove fixture	1-F32T8/830	Electronic	277	35	13
F12	Recessed halogen narrow flood fixture	1-Q71MRI6/C/NFL	None	277	71	30

Existing Light Loss Factors

<u>Luminaire</u>	<u>Ballast Factor</u>	<u>Maintenance Category</u>	<u>Cleaning Interval</u>	<u>RSDD</u>	<u>LDD</u>	<u>LLD</u>	<u>Total LLF</u>
F1A	1.0	IV	Clean, 24 Months	0.96	0.8	0.95	0.73
F1B	1.0	IV	Clean, 24 Months	0.96	0.8	0.95	0.73
F7	1.0	VI	Clean, 24 Months	0.8	0.77	0.95	0.59
F12	1.0	IV	Clean, 24 Months	0.96	0.8	0.97	0.74

Controls

The boardroom utilizes Grafik Eye dimming system and is split into 5 zones. It does not, however, meet the ASHRAE 90.1 standard that requires automatic shutoff.

Assumed Finishes

Walls: White Paint, reflectance: 0.7

Glass: Uncoated Tinted Glass, transmittance: 44%

Ceiling: White Painted Concrete, reflectance: 0.77

Floor: Blue Carpet, reflectance: 0.3

Furnishings

The boardroom is furnished with a large table, with 18 chairs. Power/data outlets for computers are mounted in the table. In the corner, there is a small side table with 2 lounge chairs. There is also a ceiling mounted projector and a projection screen. Two cabinets line the walls.

Boardroom

Design Criteria

Appearance of Space and Luminaires: (Very Important)

It is important that this space appears professional as this is where important meetings take place. The lighting should also draw the occupants to the boardroom table and focus attention towards the front of the room and projection screen.

Direct Glare: (Very Important)

Because it causes discomfort and a drop in visibility, direct glare must be avoided. It also would interfere with and VDT monitors that may be in the room.

Modeling of Faces and Objects: (Very Important)

Important professional contacts are made in the boardroom and communication is vital. Therefore, modeling of faces is one of the most pertinent issues here. Interreflected light should increase vertical illuminance on faces and thus make them seem more pleasant and easier to read.

System Control and Flexibility: (Very Important)

This is not listed as an important task through the IESNA recommendations. However, as there is a projection screen in the room, it is important to allow for control of the light scheme to be switched to allow for both general meetings and situations where the projector would be used.

Luminances of Room Surfaces: (Important)

As there is the possibility of VDT use in this room, it is important for room surfaces to interreflect and provide diffuse light to reduce direct glare. This also helps in modeling of faces.

Reflected Glare: (Important)

As there is a large amount of glass walls around the room, attention must be paid to direct glare to avoid causing discomfort to the occupants. There is also the possibility of reflected glare on the table. VDT use in the room also requires that reflected glare be minimized.

Horizontal Illuminance: 30fc

This is important so that sufficient light hits the task plane (the table) so meeting attendees can read and write notes without strain.

Vertical Illuminance: 5fc

It is important to have sufficient vertical illuminance especially for proper modeling of faces.

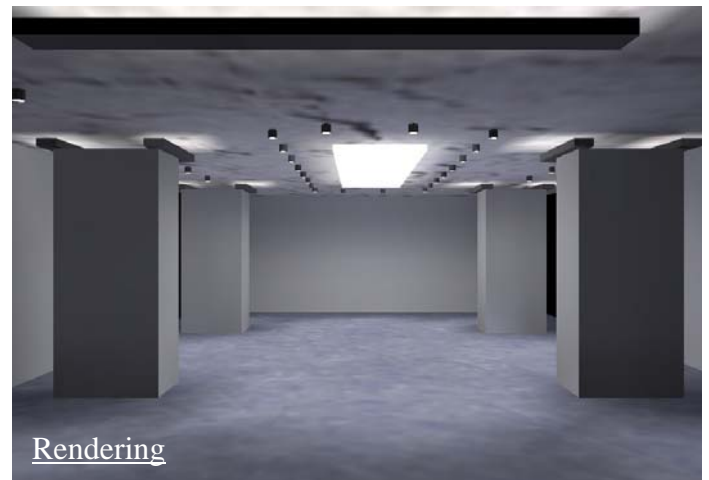
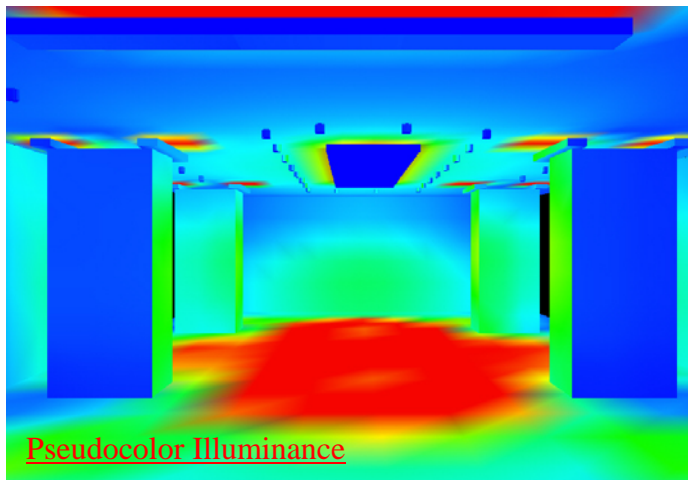
Boardroom

ASHRAE 90.1 Power Allowance: 1.5 W/ft²

Note: "Where lighting equipment is specified to be installed for decorative appearances in addition to lighting equipment specified for general lighting and is switched or dimmed on circuits different from the circuits for general lighting, the smaller of the actual wattage of the decorative lighting equipment or 1.0W/ft² times the area of the space that the decorative lighting equipment is in shall be added to the interior lighting power determined in accordance with this line item"

Existing Power Density: 2.85 W/ft²

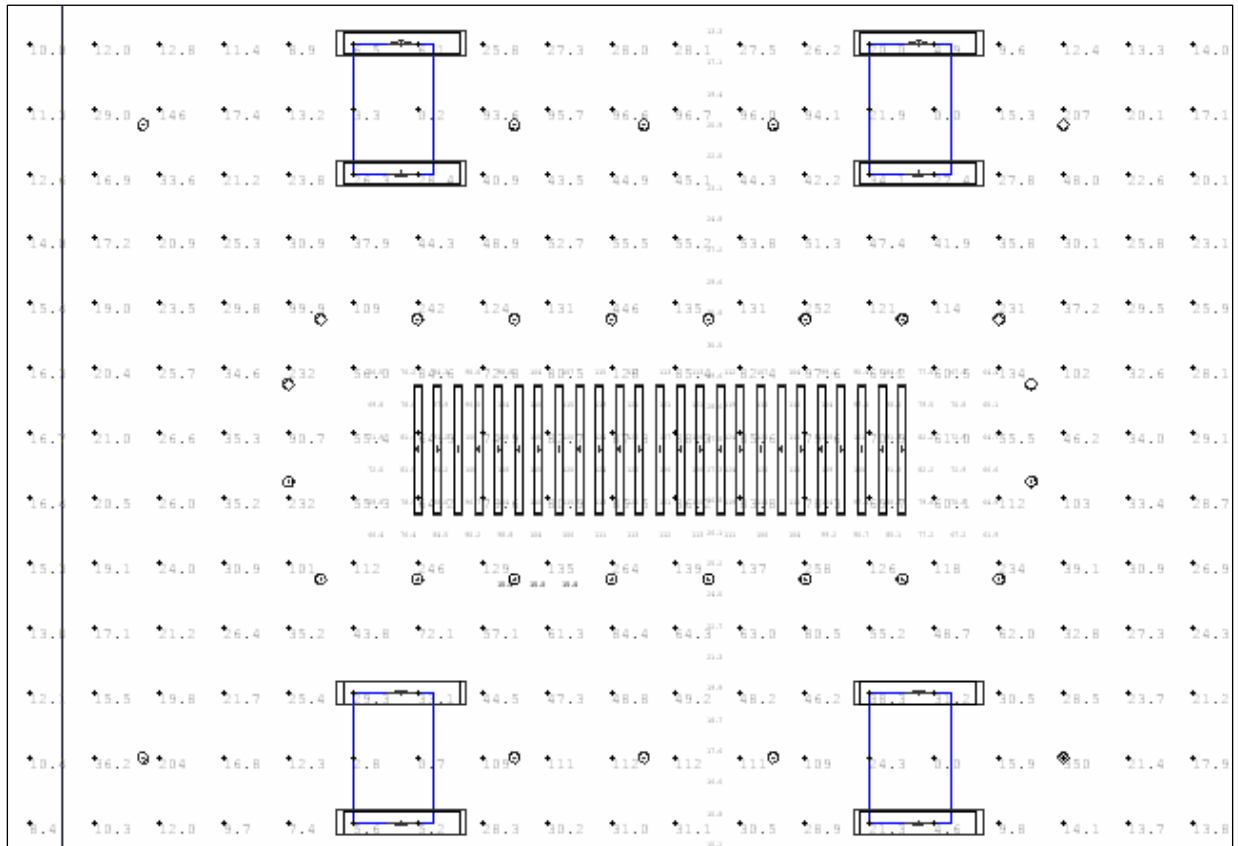
Existing System Performance



Boardroom

Horizontal on Table
Illuminance Values(Fc) Average=99.37 Maximum=127 Minimum=61.9 Avg/Min=1.61 Max/Min=2.05
Hor - Floor
Illuminance Values(Fc) Average=57.91 Maximum=446 Minimum=0.0 Avg/Min=0.00 Max/Min=0.00
Vert - Table
Illuminance Values(Fc) Average=15.49 Maximum=15.8 Minimum=15.0 Avg/Min=1.03 Max/Min=1.05
Vert - General
Illuminance Values(Fc) Average=22.03 Maximum=30.8 Minimum=10.4 Avg/Min=2.12 Max/Min=2.96

Vertical over Table
15.8 15.8 15.8
15.5 15.5 15.4
15.4 15.2 15.0



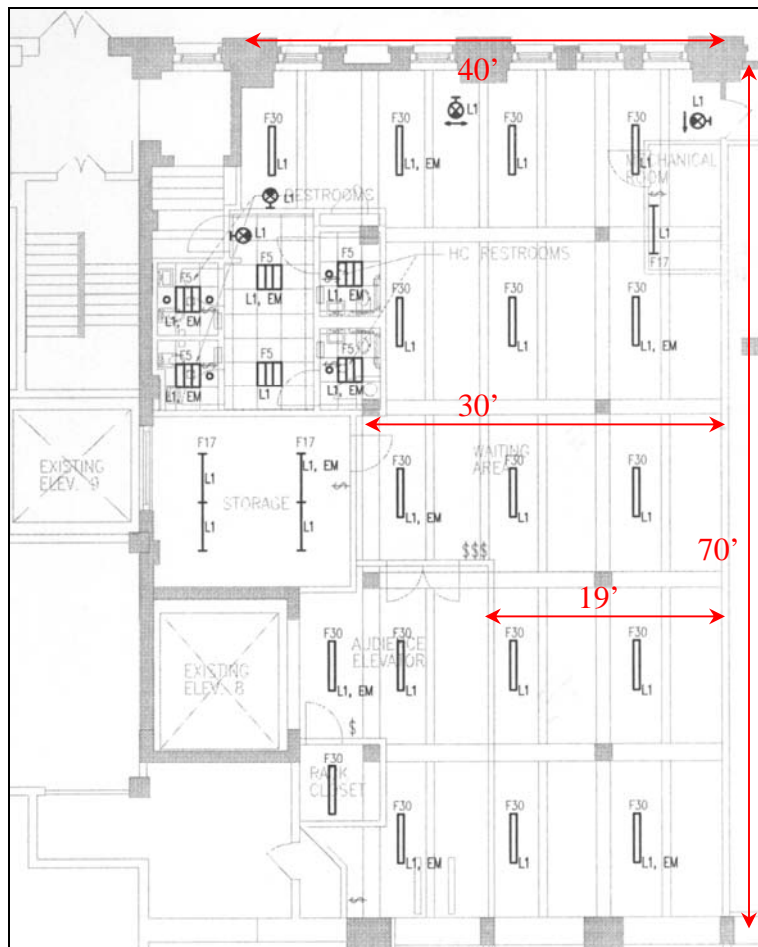
Critique

Again, all values are greatly exceeded. The horizontal and vertical illuminances are more than 3 times greater than they should be around the board room table. More concerning, the wattage per square foot are nearly twice the ASHRAE 90.1 value. Again, the custom fixtures over the table are a primary concern due to the large amount of lamps in each. As the board room table is the most important feature in the room, it is good that this area is emphasized in the lighting, but the vast contrast between it and the rest of the room may be uncomfortable. The high light levels here may also be troublesome when VDT monitors are in use. However, there is a dimming system that can be utilized to bring down the lights to a more suitable level.

Audience Holding Area

Existing Conditions

This space follows the architectural precedent of the concourse of Chelsea market. It showcases nearly all of the original materials, beams, and columns. The lighting follows suit is also simplified. There is one custom fixture in the double height security area. All the rest are 2-T8 Lamp downlight fixtures. There are windows on northern wall but daylighting is not addressed.



Audience Holding Area

Existing Luminaires

<u>Designation</u>	<u>Description</u>	<u>Lamp</u>	<u>Ballast</u>	<u>V</u>	<u>W</u>	<u>Amt</u>
F30	Surface mounted fluorescent downlight	2-F32T8/835	Electronic	277	70	19

Existing Light Loss Factors

<u>Luminaire</u>	<u>Ballast Factor</u>	<u>Maintenance Category</u>	<u>Cleaning Interval</u>	<u>RSDD</u>	<u>LDD</u>	<u>LLD</u>	<u>Total LLF</u>
F30	1.0	IV	Clean, 24 Months	0.95	0.8	0.95	0.72

Controls

There is manual switching to control the waiting area. This does not conform with ASHRAE 90.1 as there is no automatic shutoff

Assumed Finishes

Walls: White Paint, reflectance: 0.7

Ceiling and Columns: white painted concrete, reflectance: 0.77

North Wall: Brick, reflectance: 0.38

Windows: : Uncoated Tinted Glass, transmittance: 44%

Floor: Hardwood, reflectance: 0.23

Furnishings

As this space is primarily for circulation and waiting for short periods of time, there is no furniture.

Design Criteria

Appearance of Space and Luminaire: (Very Important)

This is the first impression that the audience has of Food Network. The appearance of this space and the audience's reaction to it will form the basis of their experience.

Color Appearance: (Important)

The primary tasks in the area (socialization and eating hors d'oeuvres) require a pleasant appearance of skin and food to provide an appetizing experience for the audience.

Direct Glare: (Important)

Comfort and visibility are important and direct glare would hinder both and therefore must be avoided.

Audience Holding Area

Light Distribution on Surfaces: (Important)

Avoiding distracting patterns and shadows as well as conforming to a good luminance ratio will improve the audiences perceptions by adding to comfort and visibility while ensuring a visually interesting space.

Luminances of Room Surfaces: (Important)

By supplying diffuse light from room surfaces in addition to direct light, nearly every other important design criteria is positively impacted.

Modeling of Faces or Objects: (Important)

As mentioned previously, socialization is an important function in this space. Good modeling of faces will enhance the communication between audience members. The food also must look appetizing to prepare the audience for an excellent experience.

Surface Characteristics: (Important)

As the architecture of this space emphasizes the materials used, they are a source of visual interest. However, undesirable contrast between the luminaires and their background must be avoided.

Horizontal Illuminance: 10fc

Vertical Illuminance: 3fc

Illuminance Note:

Both Illuminance values are not as important in the waiting areas as the other criteria as there aren't tasks performed here that would require high levels of light. A general illumination of faces and of the area are more than adequate at levels listed above.

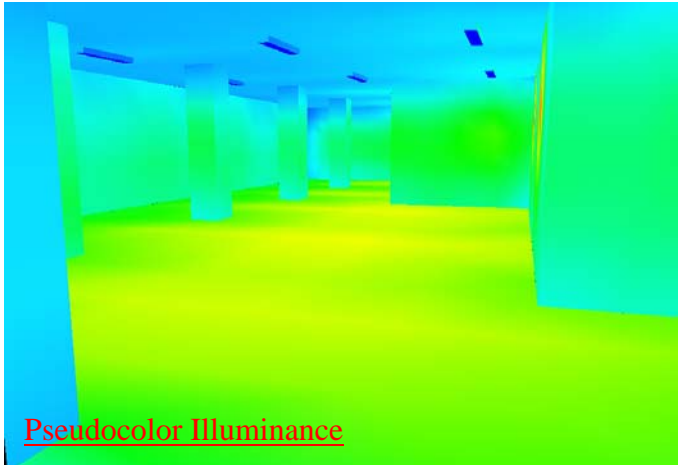
ASHRAE 90.1 Power Allowance: 1.0 W/ft²

Note: "Where lighting equipment is specified to be installed for decorative appearances in addition to lighting equipment specified for general lighting and is switched or dimmed on circuits different from the circuits for general lighting, the smaller of the actual wattage of the decorative lighting equipment or 1.0W/ft² times the area of the space that the decorative lighting equipment is in shall be added to the interior lighting power determined in accordance with this line item"

Existing Power Density: 0.7 W/ft²

Audience Holding Area

Existing System Performance



<p>floor horizontal Illuminance Values (Fc) Average=20.02 Maximum=24.9 Minimum=0.1 Avg/Min=200.20 Max/Min=249.00</p>
<p>Vert – General</p>
<p>Illuminance Values (Fc) Average=5.82 Maximum=6.6 Minimum=4.8 Avg/Min=1.21 Max/Min=1.38</p>

17.3	17.4	17.6	17.6	17.0	16.6	16.3	15.9
21.0	21.1	21.1	21.2	20.7	20.3	19.6	19.2
23.1	23.1	23.1	23.2	22.8	22.4	21.4	20.9
22.6	22.7	22.7	22.8	22.4	22.3	21.4	20.9
20.7	21.0	21.0	21.0	20.6	20.6	20.4	18.8

Horizontal – General

6.6	6.4	6.3	6.2	6.2
6.4	6.2	6.1	6.1	6.1
6.2	6.1	6.0	6.0	5.9
6.1	6.0	5.9	5.8	5.7
6.0	5.9	5.9	5.7	5.6
5.9	5.8	5.7	5.6	5.4
5.6	5.6	5.5	5.3	5.1
5.3	5.3	5.2	5.1	4.8

Vertical – General

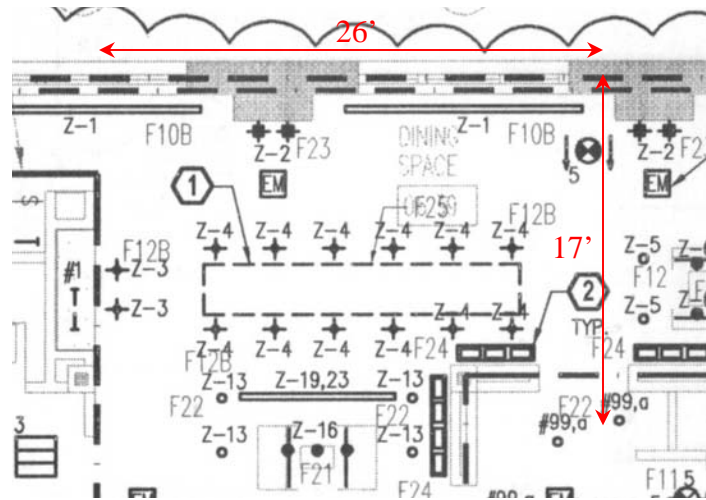
Critique

This space also has higher illuminance values than the IESNA recommendation. At 20fc, the horizontal illuminance is twice the needed value and at 5.82fc, the vertical illuminance is also almost twice its needed value. In this area however, it is not as troublesome, as the wattage per square foot is well within the ASHRAE requirement. As previously noted however, it, like all of the spaces, does not meet the automatic shut off requirement. Overall it does produce an evenly lit, inviting environment while utilizing a simplified design.

Dining Area

Existing Conditions

The dining area and the surrounding kitchen areas are focal points of the entire Food Network space. Only the highest end equipment can be found in this area. The lighting in this area is also in depth and varied to highlight the spaces. Color changing LED fixtures, custom fixtures, floodlights, and varied up and down lights are utilized.



Existing Luminaires

<u>Designation</u>	<u>Description</u>	<u>Lamp</u>	<u>Ballast</u>	<u>V</u>	<u>W</u>	<u>Amt</u>
F10B	Pendant mounted fluorescent fixture	1-FT40/830(up) 2-F54T5HO/830(dwn)	Electronic Dimming	120	165	1
F10	Surface mounted fluorescent downlight	1-F54T5HO/830	Electronic Dimming	120	60	1
F12B	Recessed halogen narrow flood fixture	1-Q71MR1G/C/NFL Diffuse spread lens?	None	120	71	14
F22	Recessed flood incandescent fixture	1-100PAR/CAP/IR/FL	None	120	100	2
F23	Recessed halogen flood fixture	1-Q35MR11/FL	None	120	20	2
F24	Color changing LED fixture	LEDs 12 each RGB, 36 total	None - Power Data Connection	120	50	5
F25	Color changing LED cove fixture	LEDs 15 each RGB, 45 total	None - Power Data Connection	120	5.6	37

Dining Area

Existing Light Loss Factors

<u>Luminaire</u>	<u>Ballast Factor</u>	<u>Maintenance Category</u>	<u>Cleaning Interval</u>	<u>RSDD</u>	<u>LDD</u>	<u>LLD</u>	<u>Total LLF</u>
F10	1.0	III	Clean, 24 Months	0.87	0.84	0.91	0.67
F10B	1.0	IV	Clean, 24 Months	0.95	0.8	0.93	0.71
F12B	1.0	IV	Clean, 24 Months	0.95	0.8	0.97	0.74
F22	1.0	IV	Clean, 24 Months	0.95	0.8	0.97	0.74
F23	1.0	IV	Clean, 24 Months	0.95	0.8	0.97	0.74
F24	1.0	V	Clean, 24 Months	0.95	0.83	0.9	0.71
F25	1.0	VI	Clean, 24 Months	0.8	0.77	0.9	0.55

Controls

The kitchen and dining areas are tied into the studio dimming system. It does not have automatic shutoff and therefore does not conform to ASHRAE 90.1.

Assumed Finishes

- Walls: White Paint, reflectance: 0.7
- Ceiling: White Paint, reflectance: 0.8
- North Wall: Brick, reflectance: 0.38
- Windows: Uncoated Tinted Glass, transmittance: 44%
- Floor: Hardwood, reflectance: 0.23

Furnishings

The dining area is furnished with a large dining table and 20 chairs.

Design Criteria

Color Appearance: (Very Important)

The primary tasks in the area are the presentation and testing of food. As aesthetics are extremely important here, color appearance and contrast are vital.

Appearance of Space and Luminaires: (Important)

As this space is a highlight of the Food Network Space, this can almost be considered very important to relay the importance and emphasis of the space.

Direct Glare: (Important)

To ensure the comfort and visibility of the diner, direct glare must be avoided.

Dining Area

Points of Interest: (Important)

Attention is to be drawn to the food. It is the primary focus of the entire business and is of utmost importance.

System Control and Flexibility: (Important)

Different times of day and types of food require different moods in the dining environment, thus there should be a good deal of flexibility.

Horizontal Illuminance: 10fc

Although the IESNA recommendation is 10fc, it may be advantageous to boost this to the next level to allow for close inspection of the food and its presentation. This is also true as system control and flexibility is important here as well. Revised recommendation: 30fc

Vertical Illuminance: 3fc

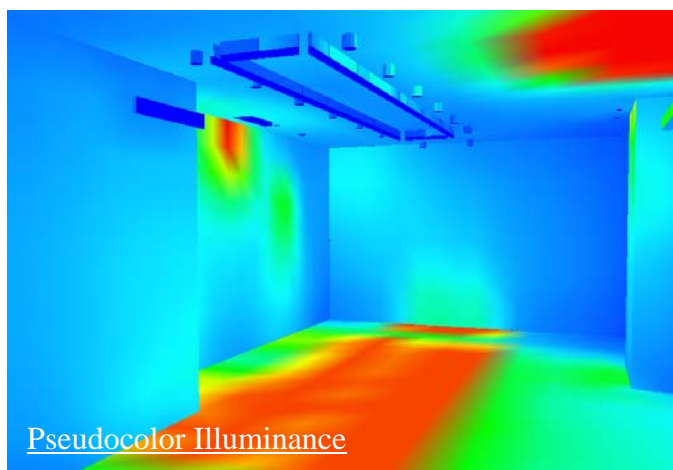
Per reasons noted above, it may also be advantageous to increase this to 5fc.

ASHRAE 90.1 Power Allowance: 1.4 W/ft²

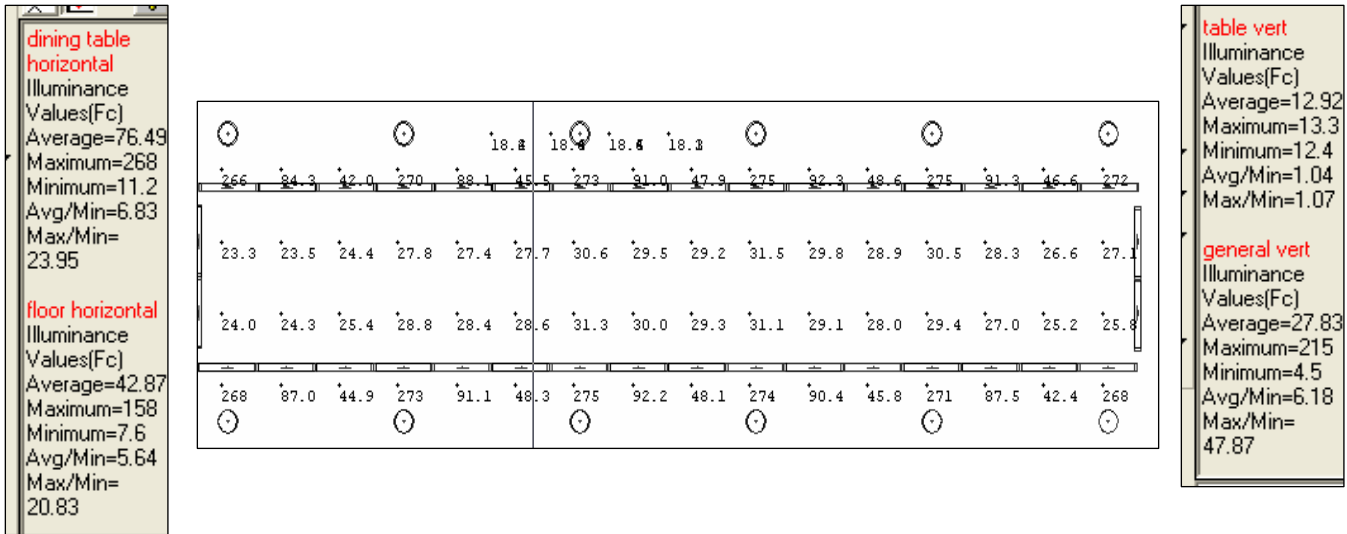
Note: "Where lighting equipment is specified to be installed for decorative appearances in addition to lighting equipment specified for general lighting and is switched or dimmed on circuits different from the circuits for general lighting, the smaller of the actual wattage of the decorative lighting equipment or 1.0W/ft² times the area of the space that the decorative lighting equipment is in shall be added to the interior lighting power determined in accordance with this line item"

Existing Power Density: 4.34 W/ft²

Existing System Performance



Dining Area



Critique

Again, all of the values greatly exceed the recommended values. In the center of the dining room table, values are right around what they should be, but directly below the flood light fixtures, the values jump far above the expected amount. These flood fixtures would highlight the food, but again, the values are just too high. The vertical illuminance above the table are also higher than they should be. The variety of lights is impressive, and they create a high end dining environment. The lighting does a good job of highlighting the main feature – the table. However, the contrast between it and the rest of the area may be uncomfortable. The wattage per square footage is also nearly three times the ASHRAE value. As in the board room, the fixtures here are tied to a dimming system. This allows for the possibility of bringing these values to a more suitable level. It also must be considered that the color LED fixtures may not be set on full white light as assumed here.

Appendix

All relevant files can be found in the folder:

P:\ae48 I w\Technical Assignment I
For User ID: cjq I 78

IES Files:

P:\ae48 I w\Technical Assignment I\ies files

AGI Files:

P:\ae48 I w\Technical Assignment I\agi files

Renderings, Images, and Document Files:

P:\ae48 I w\Technical Assignment I\final document and images