

**Fraunhofer | Center for Sustainable Energy
Boston, MA
Schematic Lighting Design**



Xiaoyin Wu
2013.11.11



Based in Boston, MA, the Fraunhofer Center for Sustainable Energy Systems (CSE) is an applied research and development laboratory dedicated to the commercialization of clean energy technologies. CSE engages in collaborative research and development with private companies, government entities, and academic institutions, performing research that broadly benefits firms, industries, and society.

Project Overview

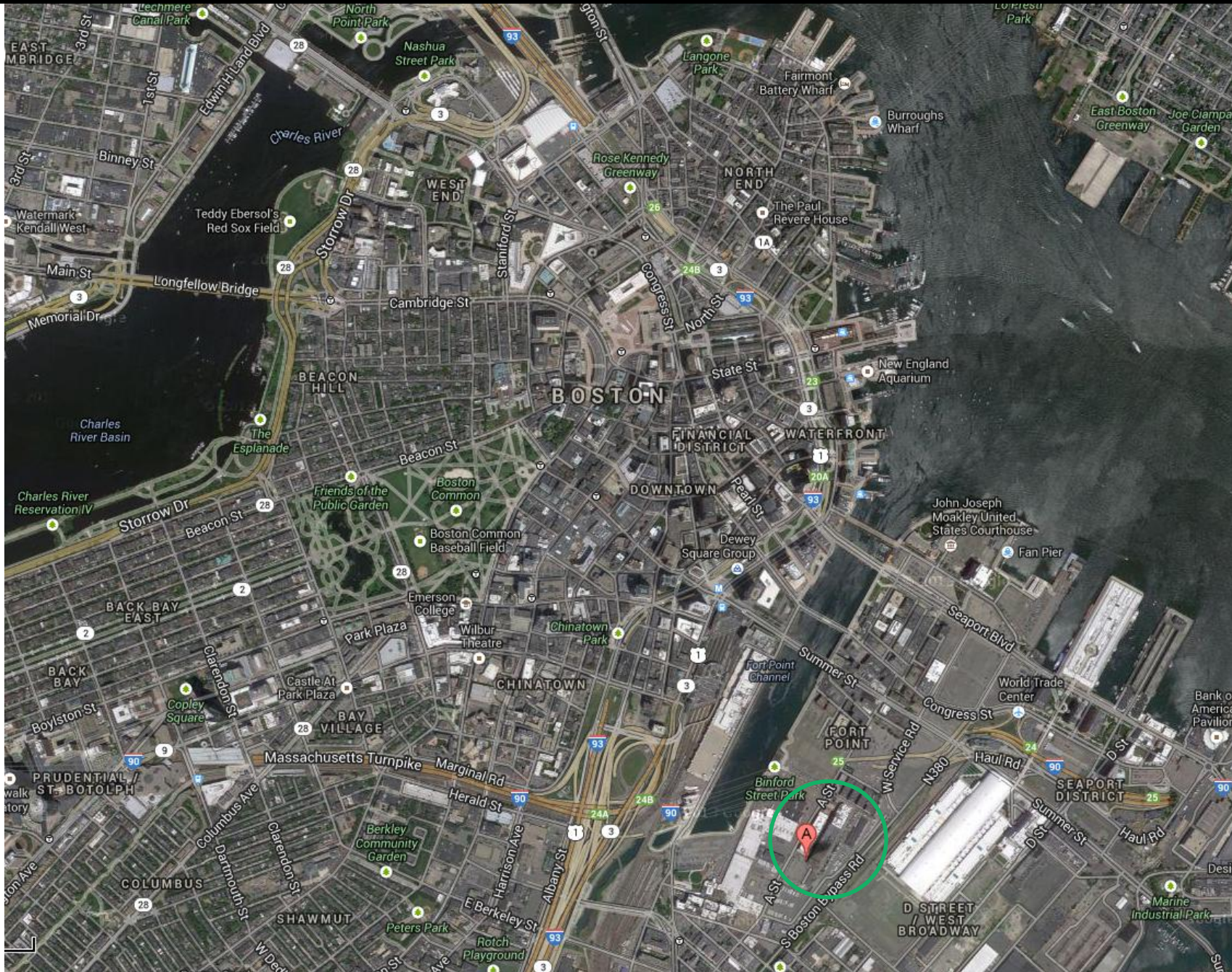
| | |
|----------------------|--|
| Building Name- | Fraunhofer CSE |
| Location- | 5 Channel Center Street, Boston, MA |
| Occupancy Type- | Offices and research laboratories (Group B) Conference room (Group A-3) |
| Size- | 42150SF |
| Stories above Grade- | 6 |
| Project Teams- | General Contractor: Gilbane Building Co. Architects: DiMella Shaffer Structural Engineer: McNamara/Salvia, Inc. MEP/FP/Tel Data Engineer: BR+A Consulting Engineers Lighting Consultant: Lam Partners Plumbing/HVAC Services: Northeastern Mechanical |

Architecture



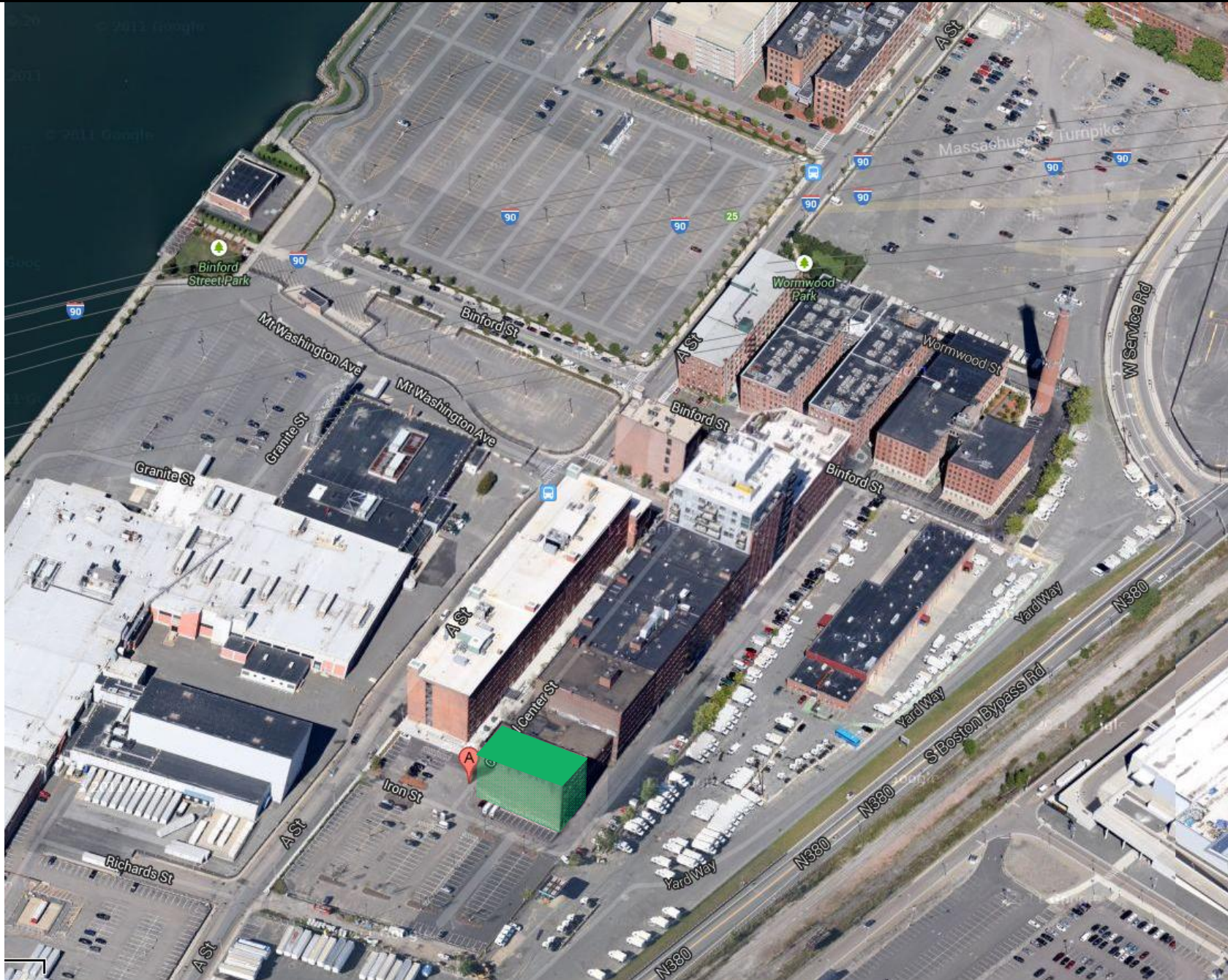
The project is a renovation for a 100-year old **historical** building of six-story, three-bay loft brick structure with **classical revival-style** detailing. The Fort Point Channel district is marked by an exceptional degree of **visual uniformity**. Fraunhofer Building, is a loft structure built in 1913 by the Boston Wharf Company, and represent a well-preserved collection of late 19th and early 20th century lofts. The loft buildings are generally masonry, with simple volumes and flat roofs. Buildings are elegantly proportioned, with classically inspired details concentrated at entrances and cornices. And the structure is left unchanged in this project to **conserve the significant continuity** throughout the District in terms of massing, scale, and style.

building | concept | four spaces | design solutions



building | concept | four spaces | design solutions





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clean—SIMPLICITY

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coordination—COLLABORATIVE

Clean | Simplicity



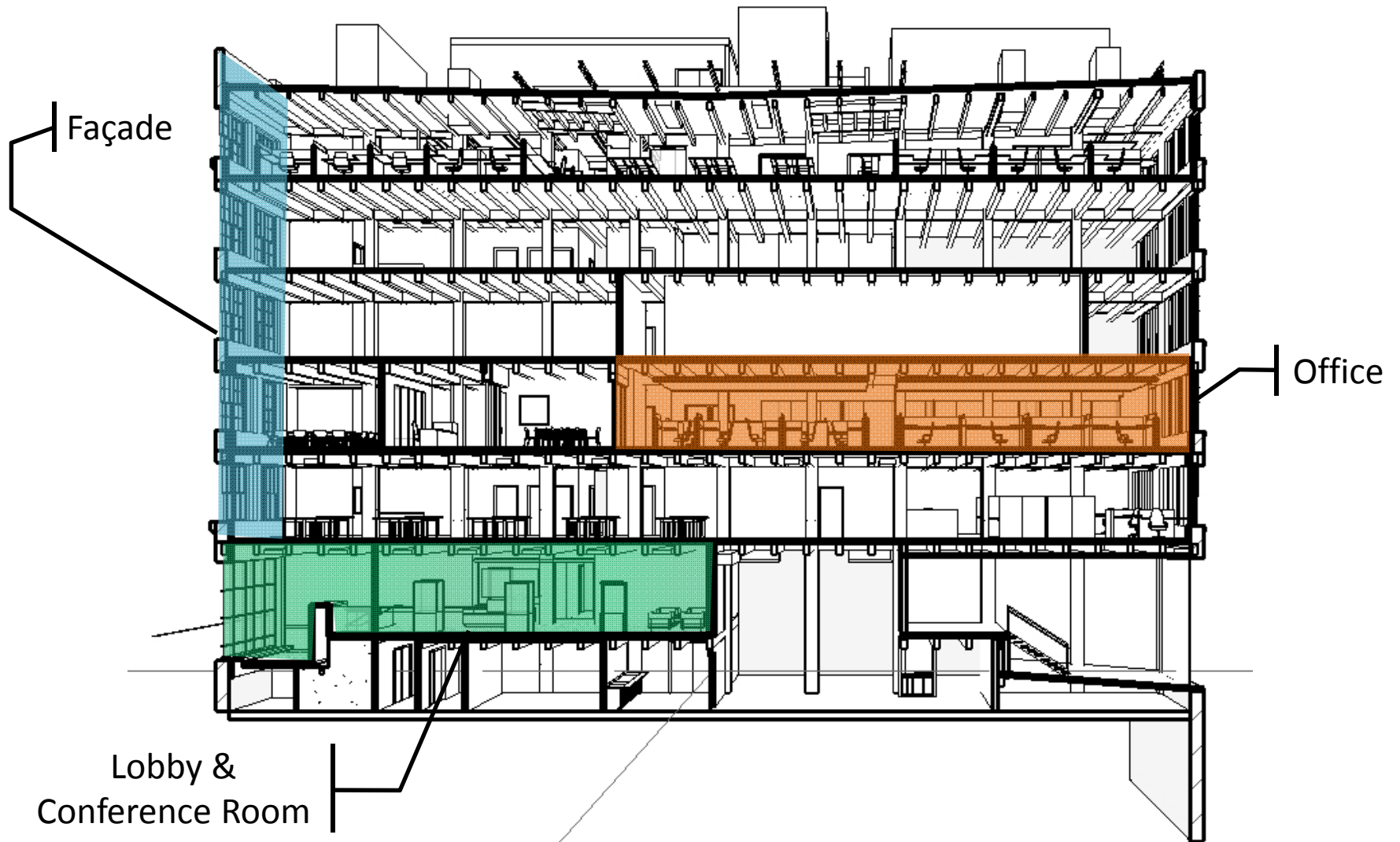
Technology | Intelligent



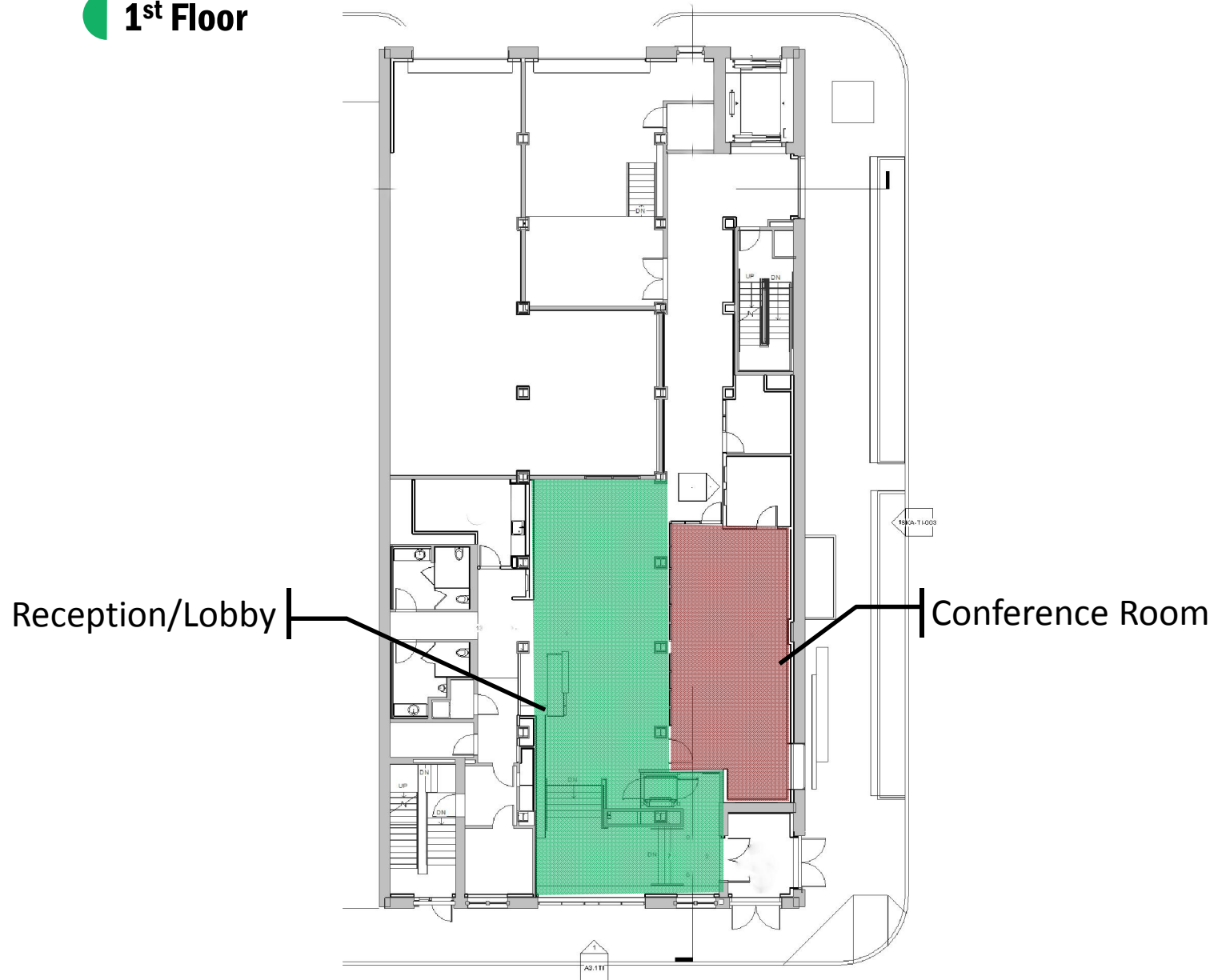
Coordination | Collaborative



Spaces



1st Floor



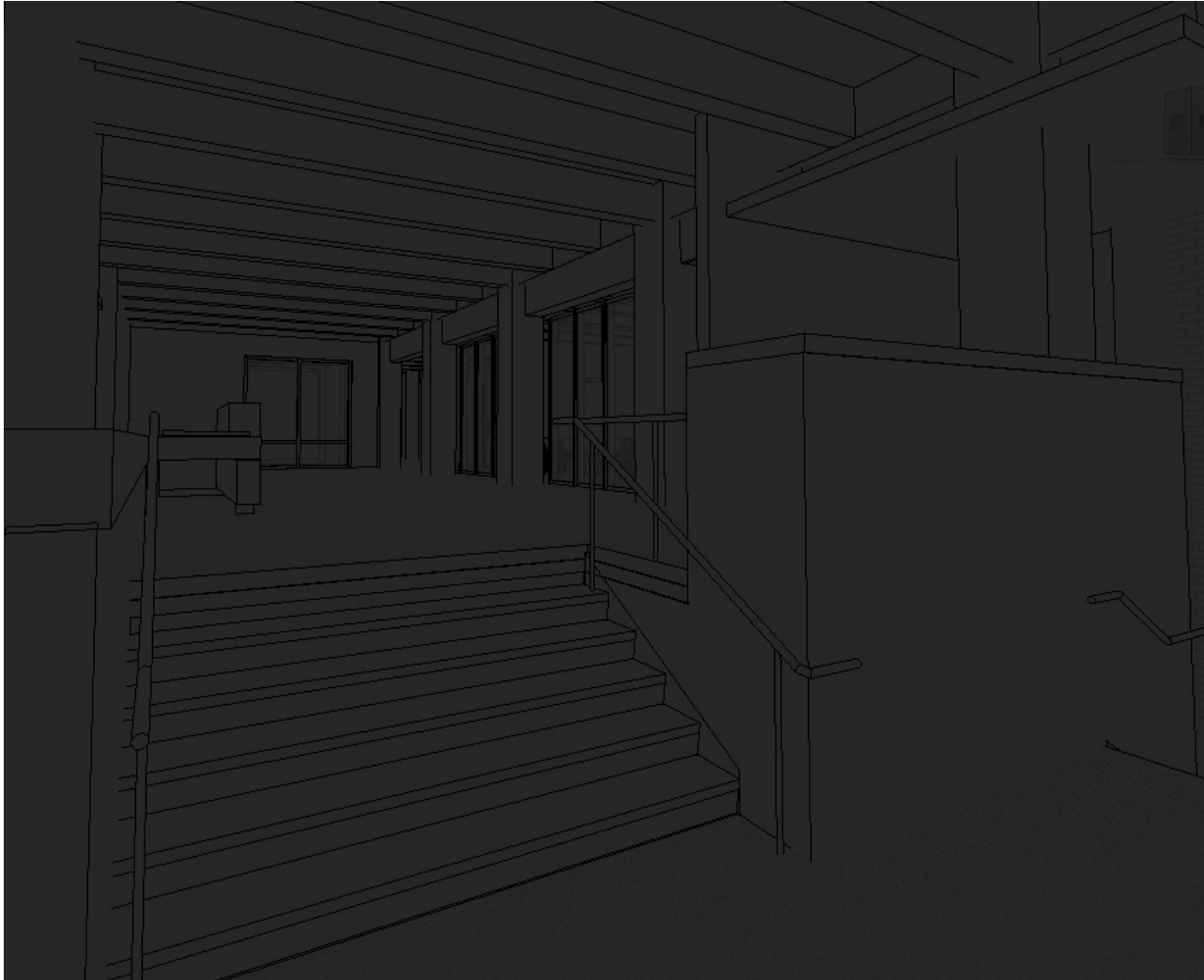
Criteria

| Space | | Eh | Ev | Avg:Min |
|--------------------|----------------|---------|--------|---------|
| Lower Lobby (F112) | | 100 lux | 30 lux | 4:1 |
| Upper Lobby (F113) | Reception Desk | 150 lux | 50 lux | 4:1 |
| | General Area | 100 lux | 30 lux | 4:1 |

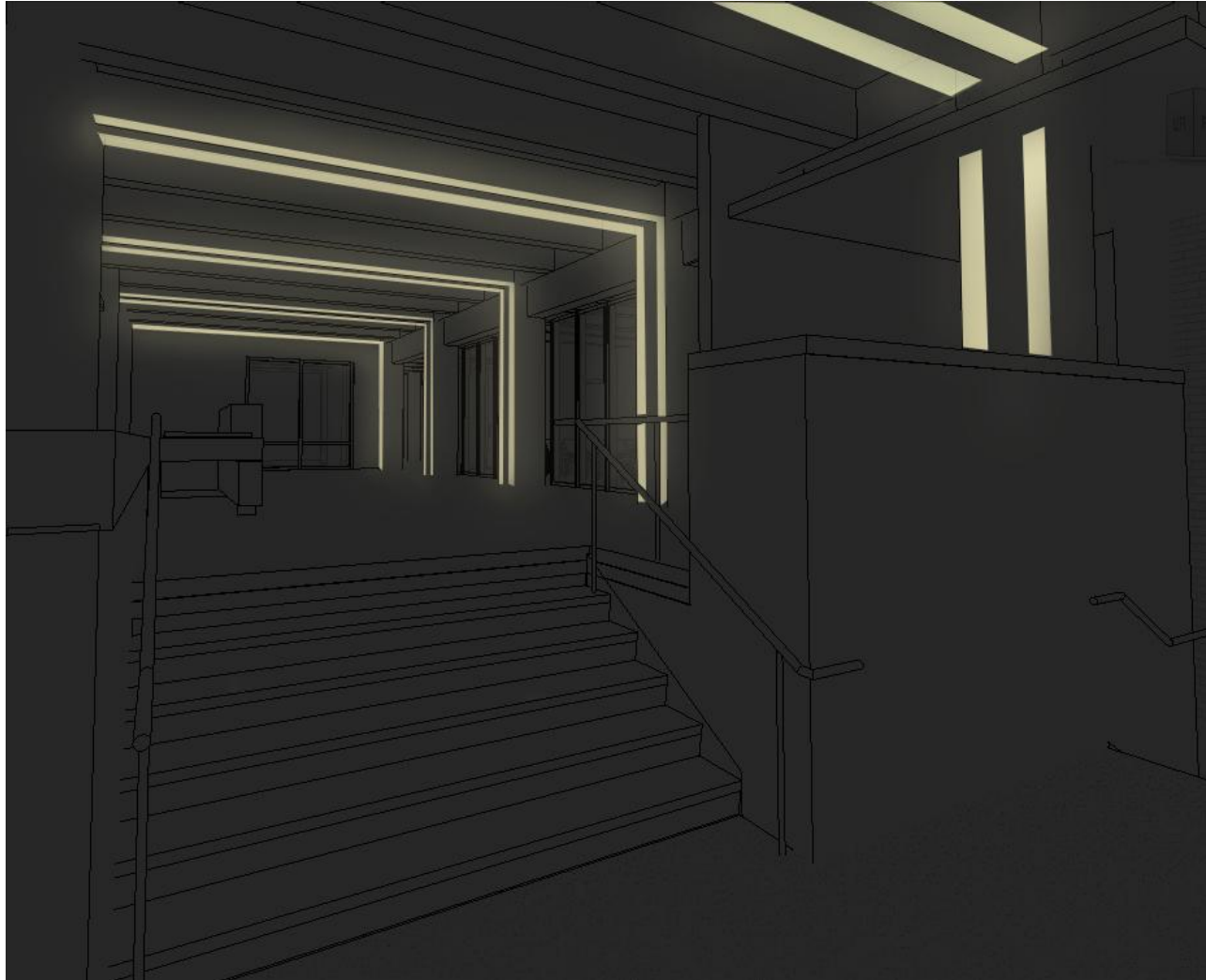
Lobby | Reception



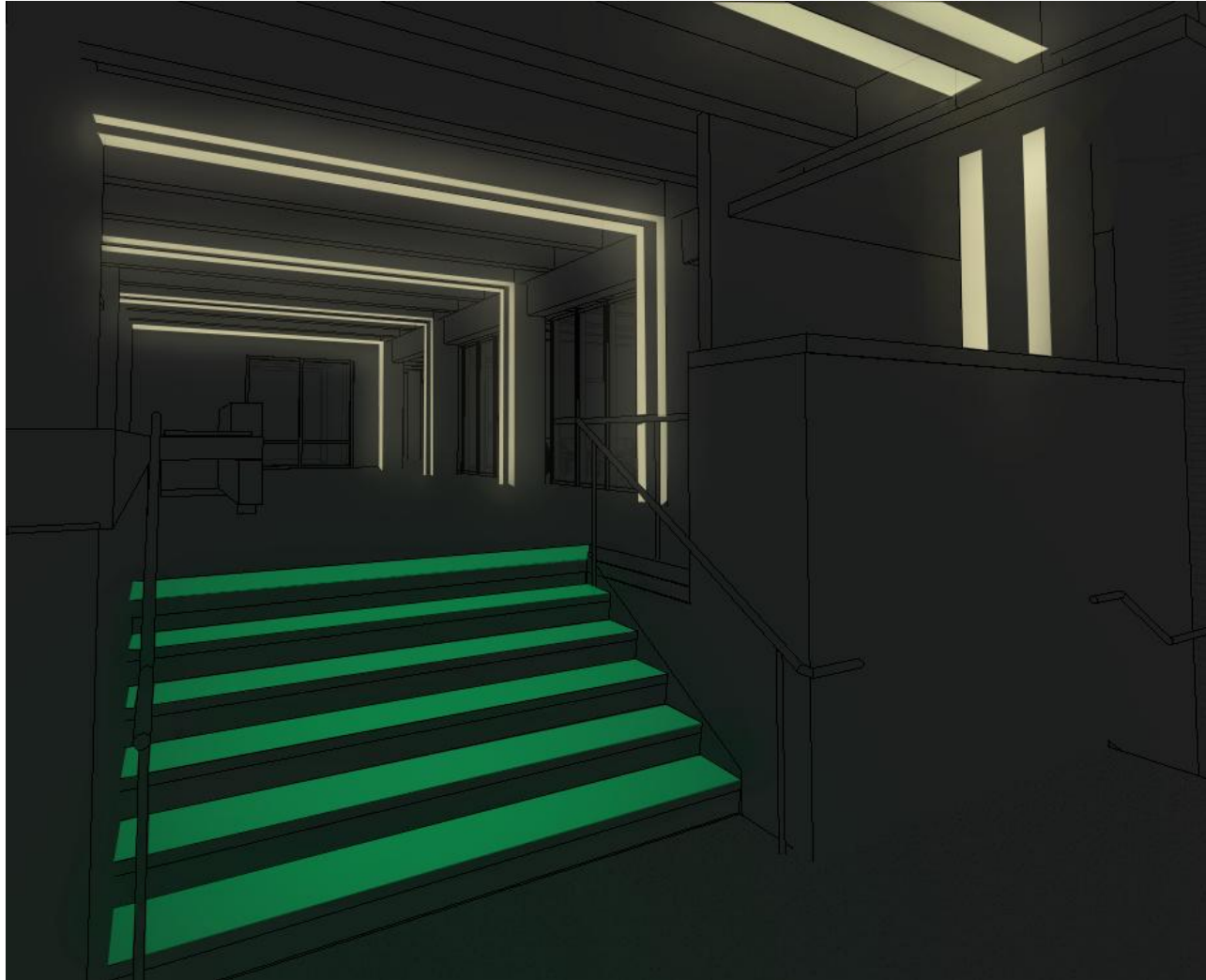
Lobby | Reception



Lobby | Reception



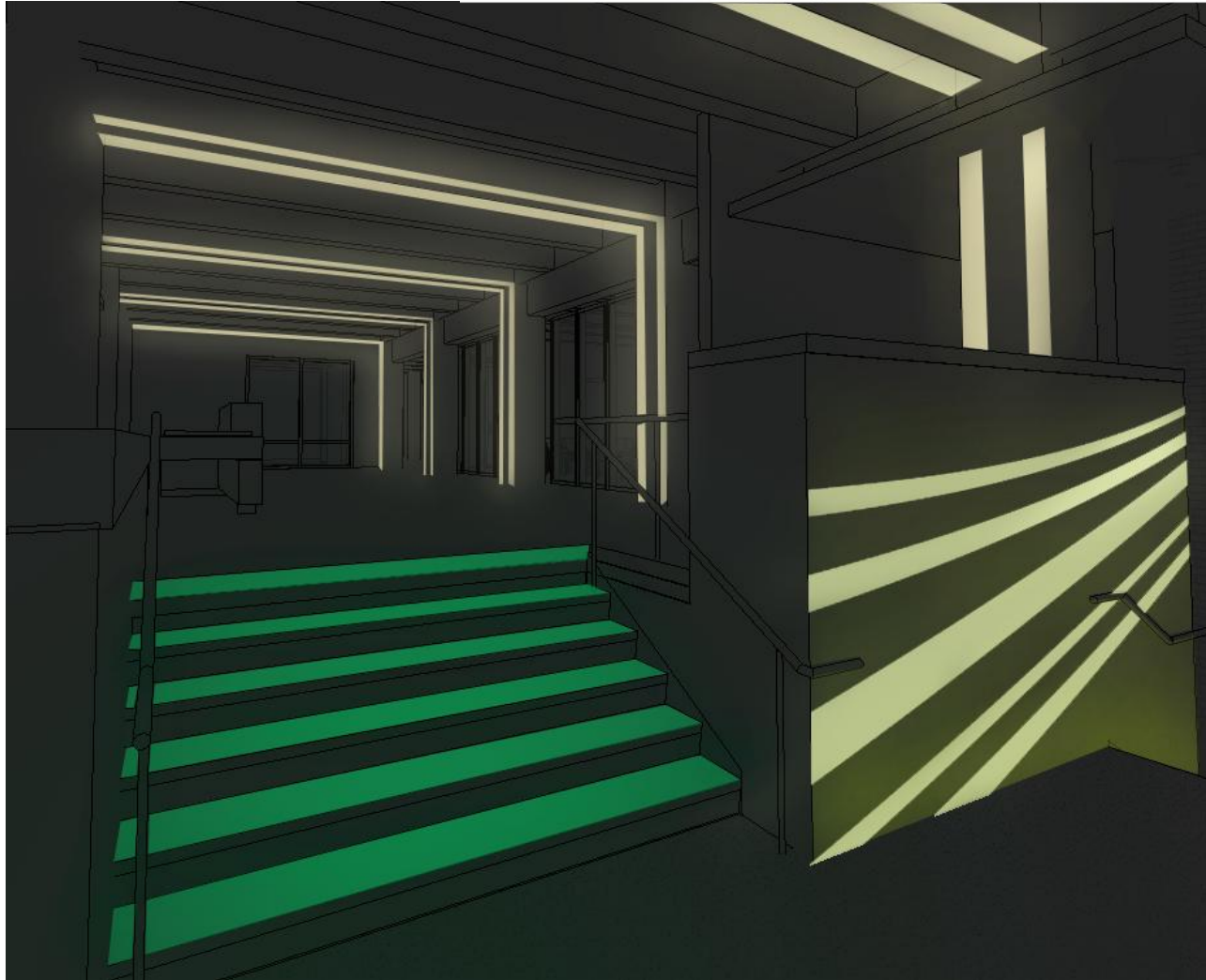
Lobby | Reception



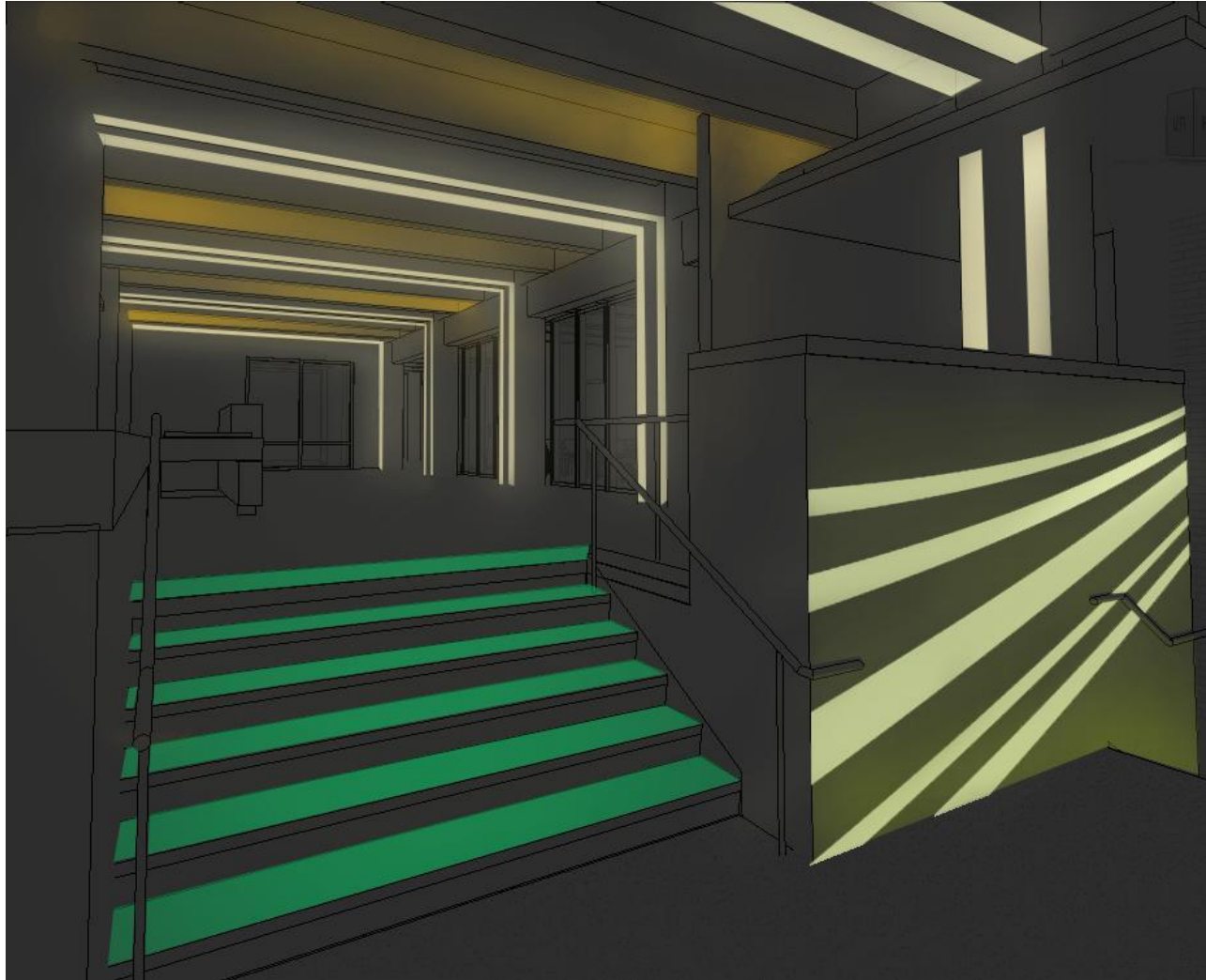
Lobby | Reception



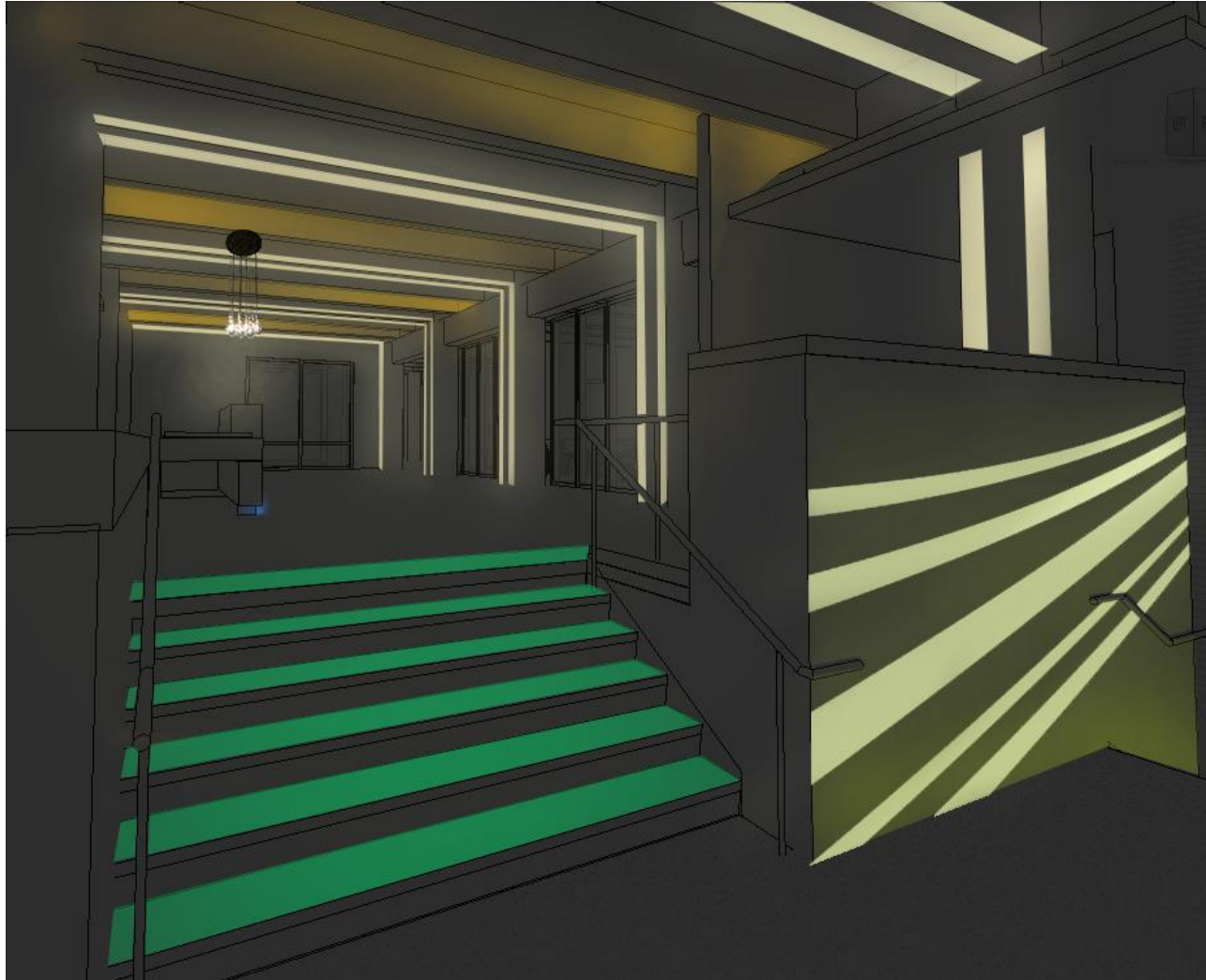
Fraunhofer



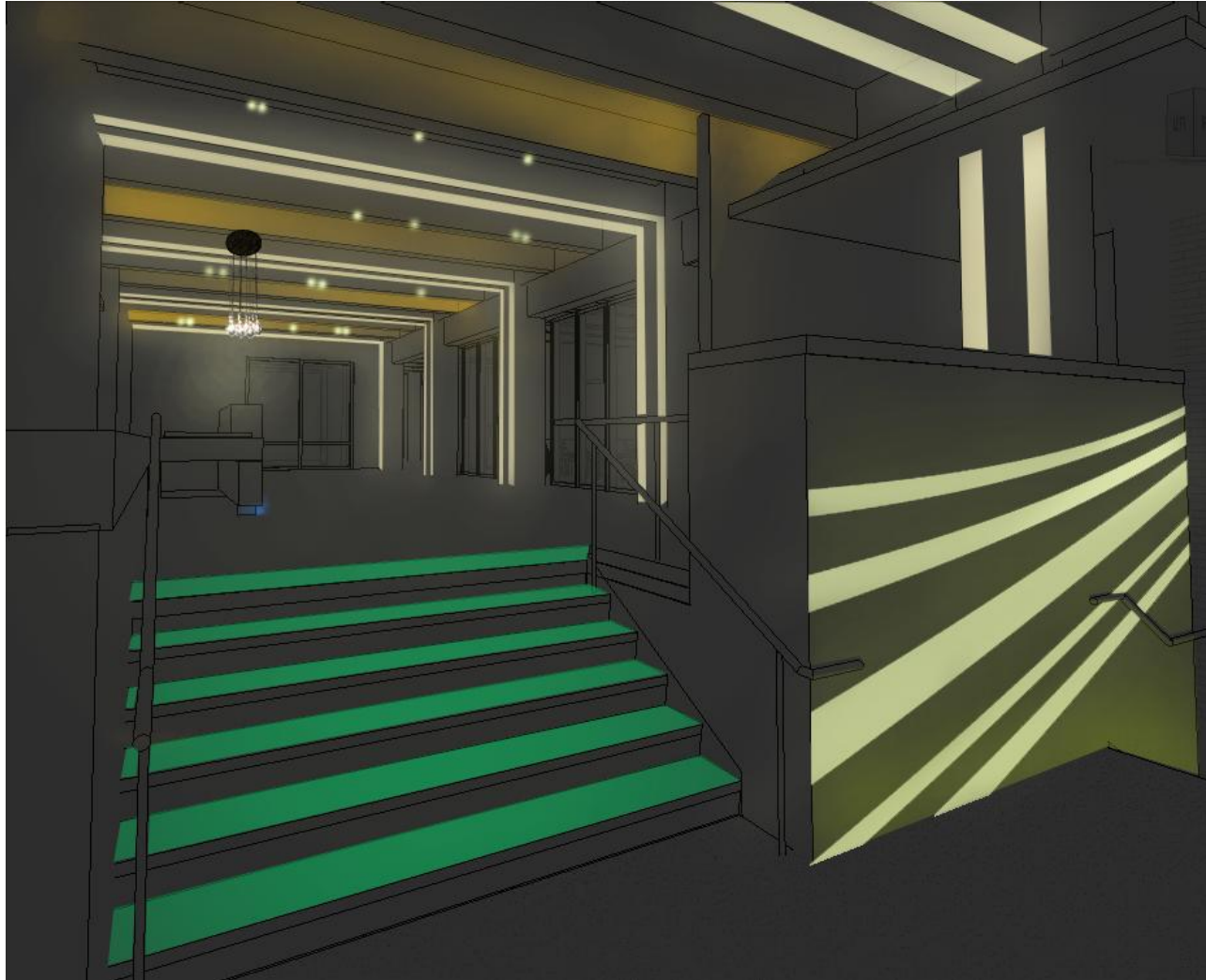
Lobby | Reception



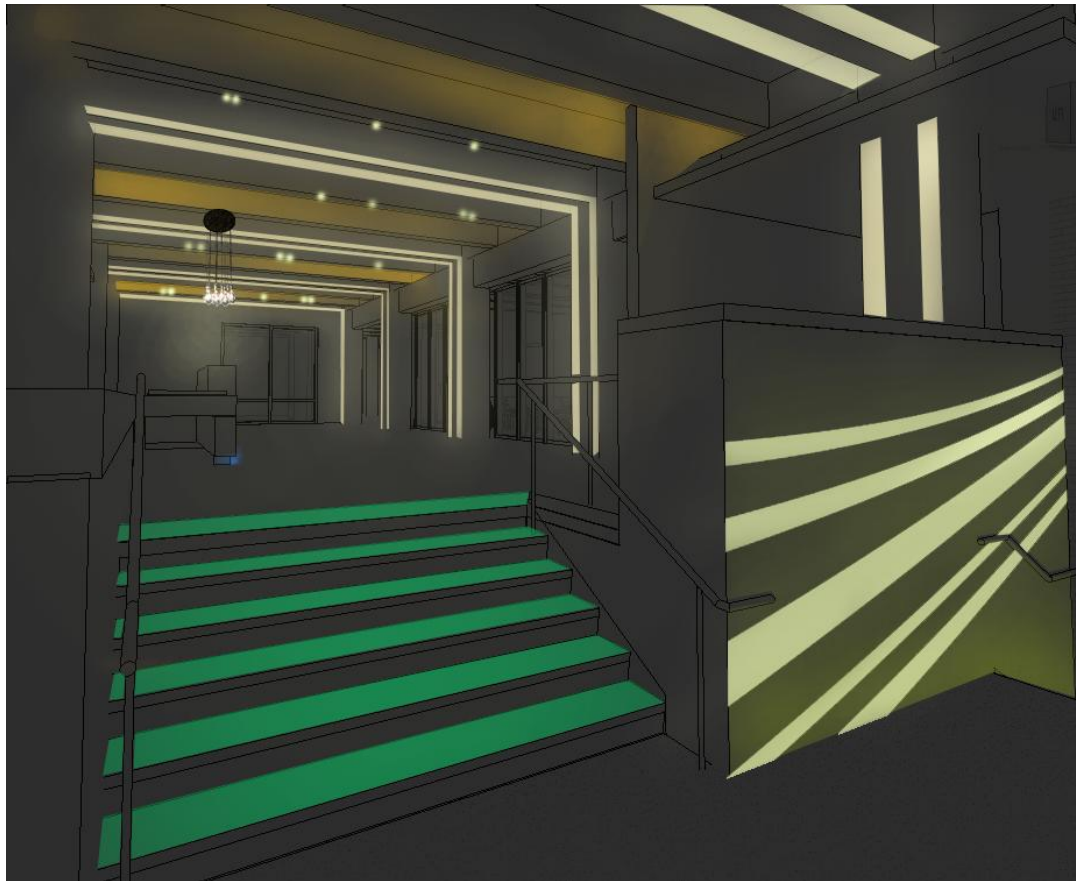
Lobby | Reception



Lobby | Reception



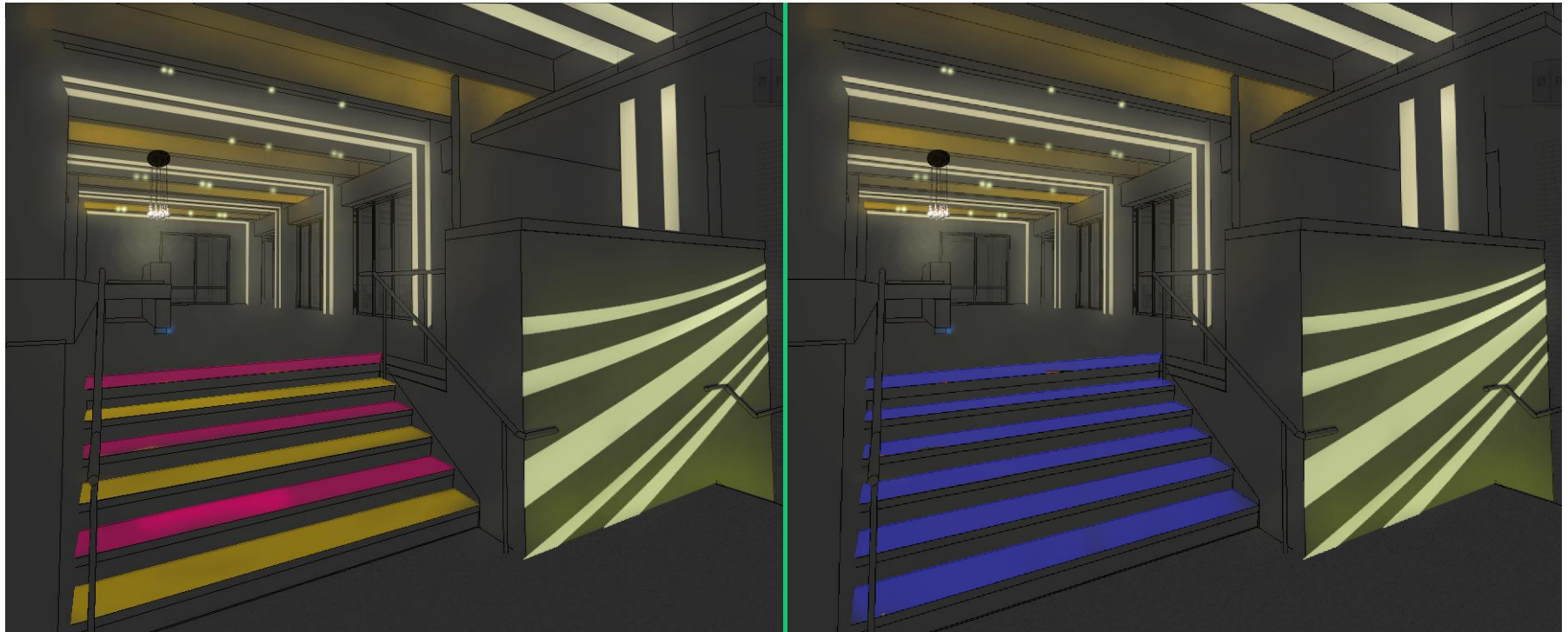
Lobby | Reception



Lobby | Reception

Psychological impression:

festive | somber



Conference Room



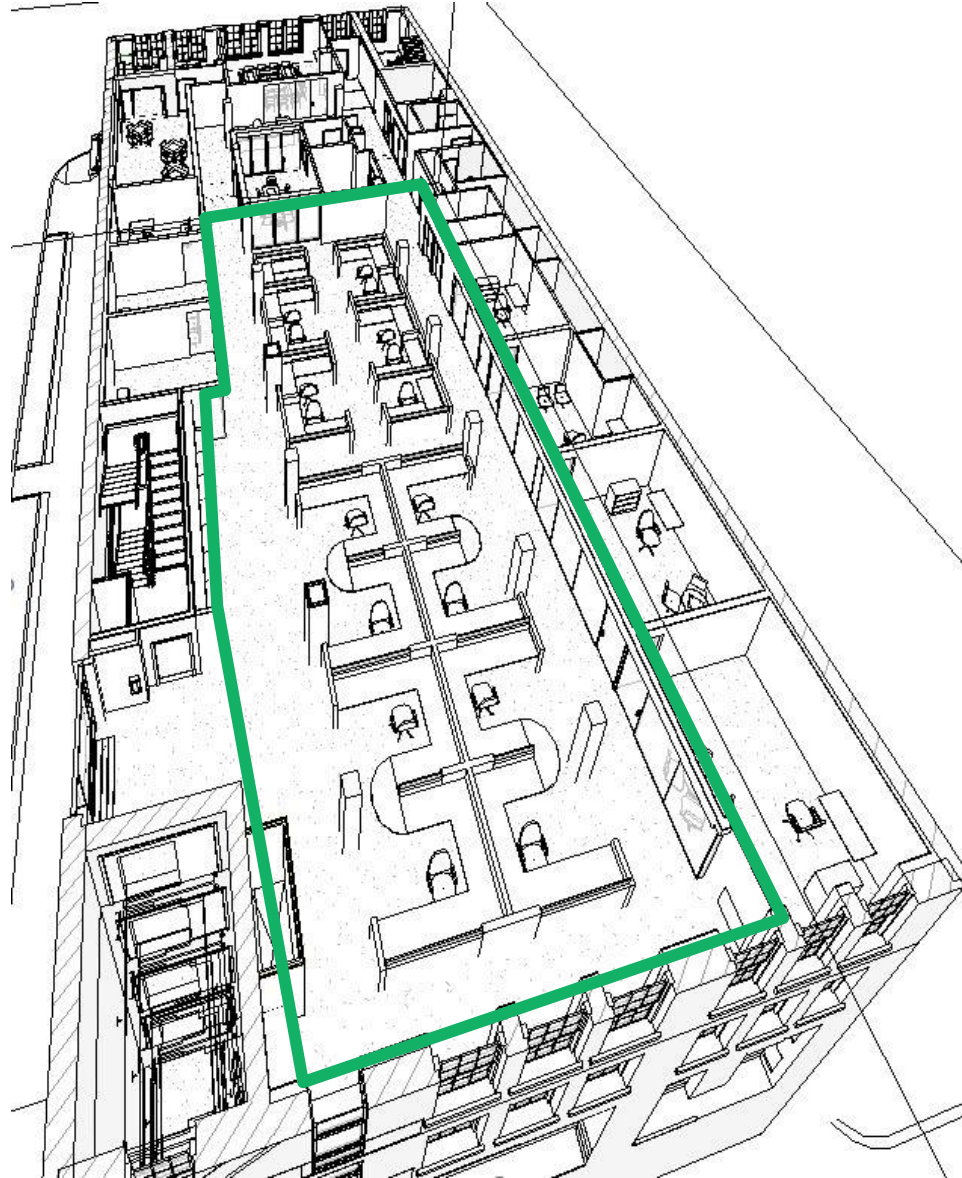
Conference Room



Criteria

| Surface/Purpose | Eh | Ev | Avg:Min |
|-------------------------|-----|-----|---------|
| Meeting | 150 | 75 | 1.5:1 |
| AV | 30 | 30 | |
| Front-screen projection | | 50 | |
| Faces | 300 | 400 | 1.5:1 |

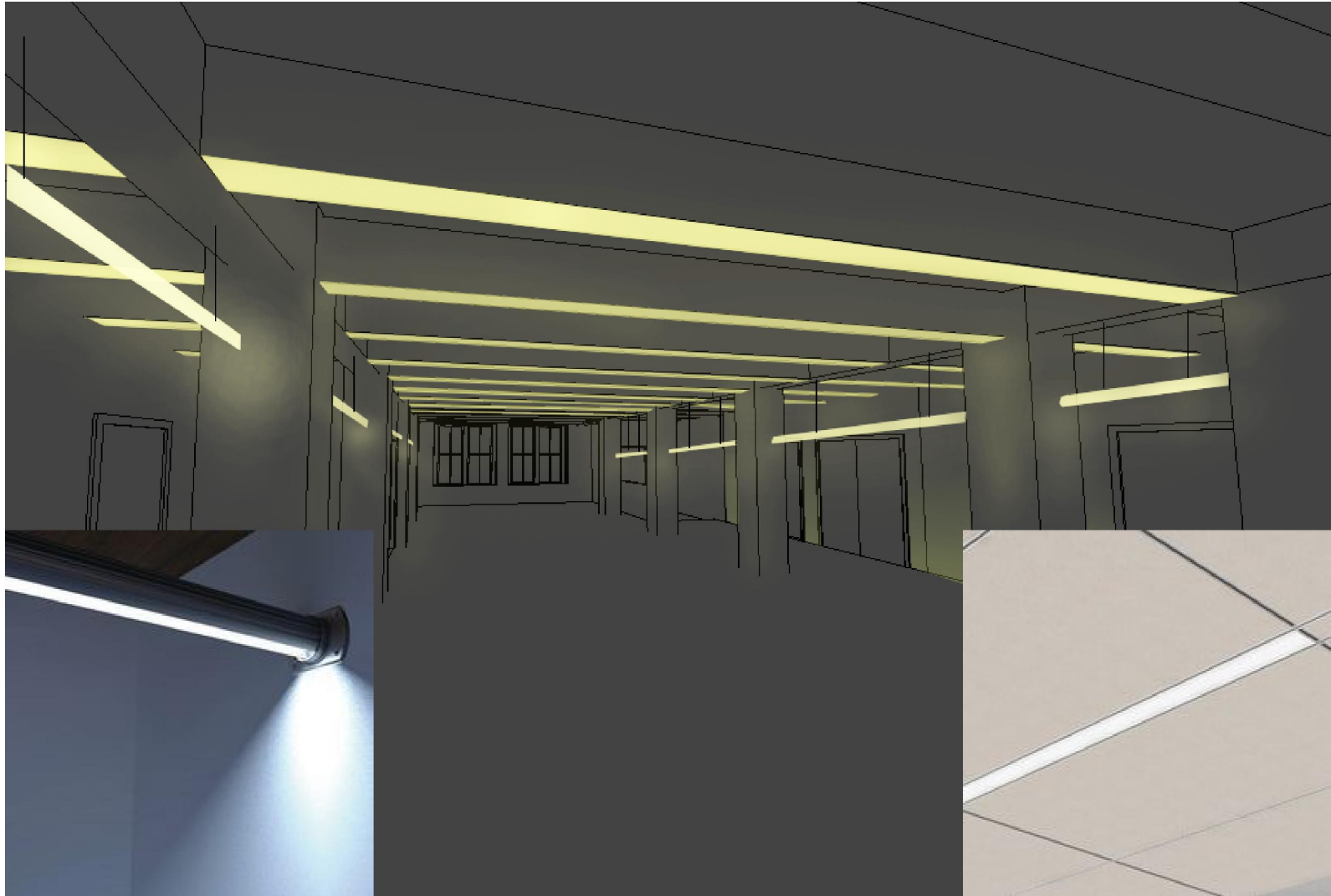
Open Office



Criteria

| Surface/Purpose | Eh | Ev | Avg:Min |
|-----------------------|-----|----|---------|
| Work plane (computer) | 150 | 50 | 1.5:1 |

Open Office



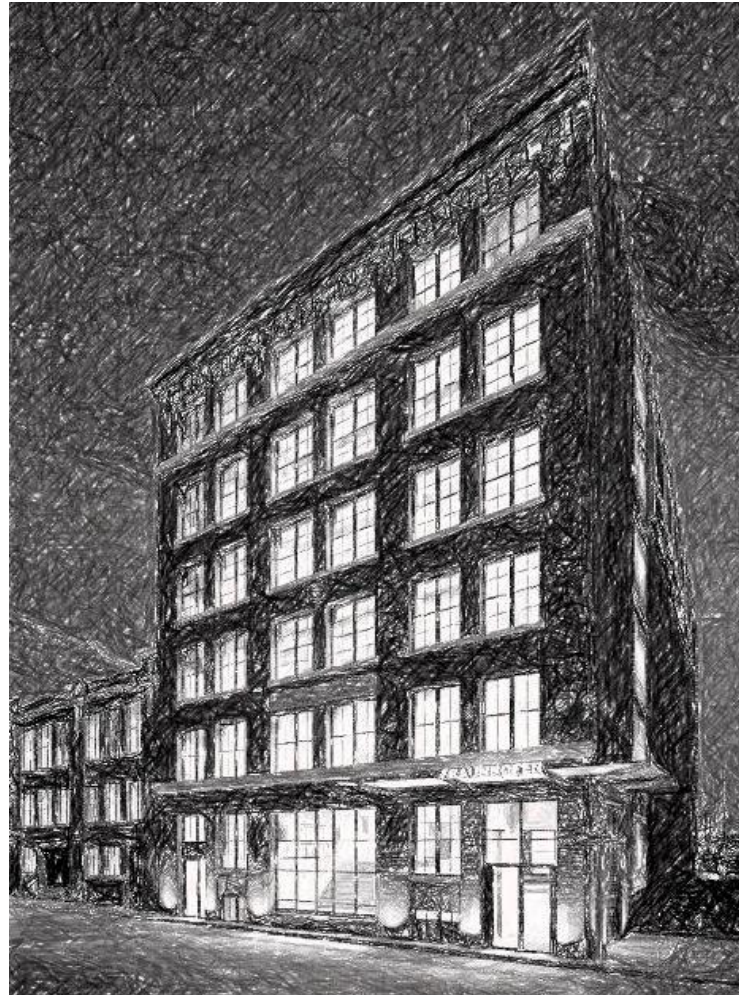
Open Office



Open Office



 Façade



Criteria

IES Illuminance Recommendations

Façade with reflection < 0.5 and low activity: $E_v = 40$ lux

ASHRAE 90.1 (2010) Requirements

Building entrances and exits: main entries = 20W/linear-ft of door width

Façade: 0.1W/sf for each illuminated wall or surface or 2.5 W/linear ft for each illuminated wall or surface length

● Façade



Horsehoe Casino, Cleveland

 Façade



Façade



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QUESTIONS?