

Designers Light Forum

Wireless Control Systems: If Only You Could Get Them
to Work Like You Want

Ruth Taylor, Pacific Northwest National Laboratory
Craig Bernecker, Parsons School of Design
Dan Blitzler, Practical Lighting Workshop
Melanie Taylor, WSP

August 19, 2020



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material of construction or any method or manner of handling, using, distributing, or dealing in any material or product.

Questions related to specific materials, methods, and services will be addressed at the conclusion of this presentation.

Learning Objectives

At the end of the this course, participants will be able to:

1. Read between the lines of product descriptions
2. Understand practical approaches to making their system work
3. Write a specification to get what they want
4. Receive an update on new wireless systems in practice

What We'll Cover Today

- NGLS timeline & developments since 2019
- The role of communication - lessons learned
 - Client to/from Specifier
 - Manufacturer to/from Specifier
 - Specifier to/from Installer
 - Manufacturer to/from Installer
 - Who talks to the user/client?
- What's Next for NGLS and the Living Lab

Steering Committee

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Vice President, Lighting Design
WSP

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Founder and Director
The Lighting Education Institute

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Morlights, LLC

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Senior Lighting Designer
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Nathan Mitten, Ph.D.
Senior Manager of Property Standards & Improvements
Kimco Realty Corporation



Office of ENERGY EFFICIENCY
& RENEWABLE ENERGY

What NGLS is All About

REAL PRACITIONERS



- Researchers are practitioners
- Knowledgeable of lighting systems
- Diverse backgrounds and qualifications
- Dedicated to improving systems

REAL SETTINGS



- Functional classrooms and parking lots
- Semi-controlled environments to allow for comparison

REAL PLAYERS



- Local installation contractors
- Facility staff
- Faculty, students and end users

REAL SYSTEMS



- Diverse system approaches
- Partnerships and stand-alone systems
- Industry leaders and new players

NGLS Timeline

2019 - 2020

**NGLS INDOOR
Evaluations
Parsons School of Design,
NYC**

**NGLS OUTDOOR
Evaluations, Virginia Tech
Transportation Institute**

2017-2018

INDOOR Evaluations 1 – Easily Installed and Configured Connected Systems

Phase 1: Full Luminaire Replacements (7)

Phase 2: Troffer Retrofit Kit Replacements (5)



June 10-14, 2019
INDOOR Evaluations 1
Phase 3: System Updates/Upgrades

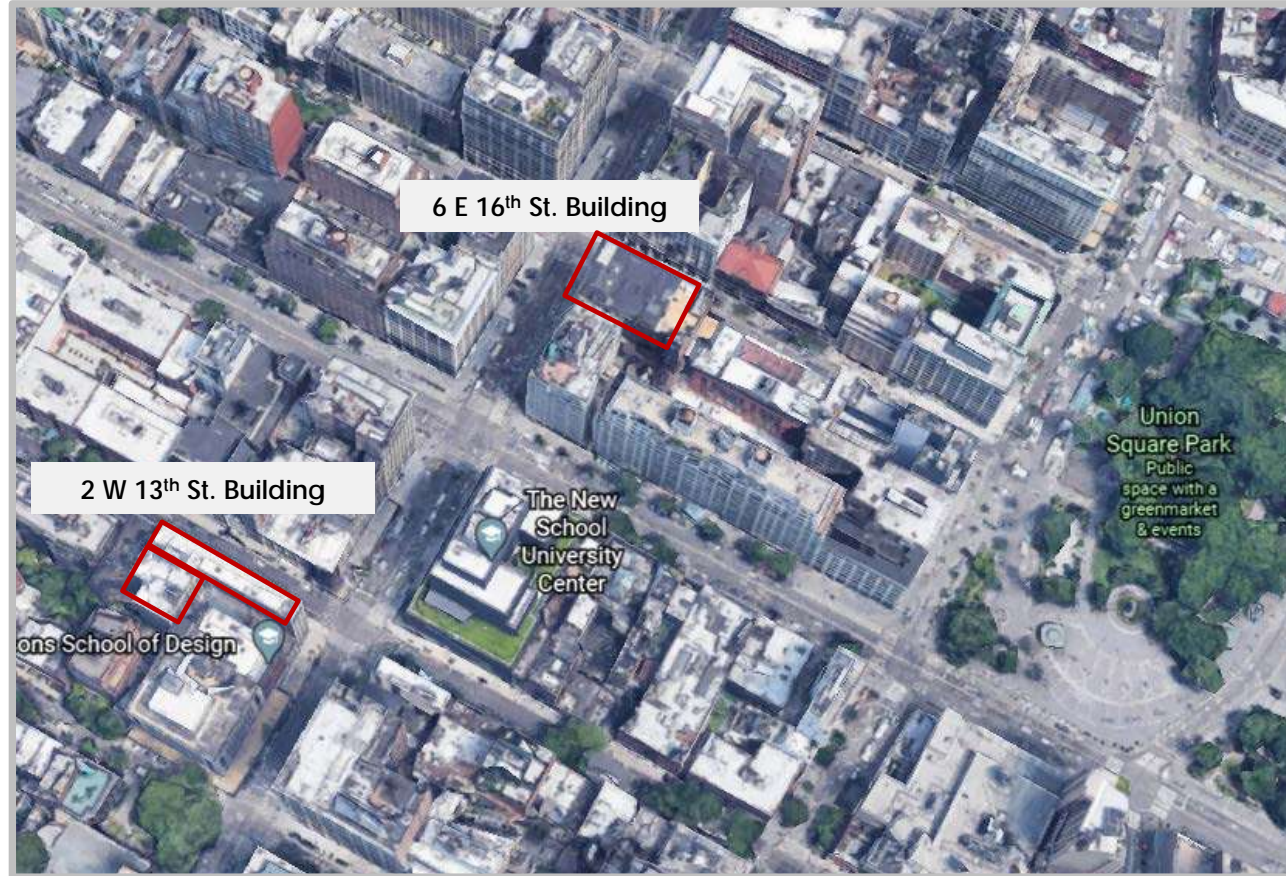
July 31-August 2, 2019
Phase 3: New System Installations

2020
Phase 4 – New Systems
Tunable Lighting Study

July 8-19, 2019
Installation |
Commissioning
Evaluation

September 9-12, 2019
Full Performance
Evaluation

NGLS Living Lab – Parsons, The New School, Midtown Manhattan



Floor 3



Floor 5



Floor 6



Floor 8

- Existing Living Lab Installations
- Future Possible Living Lab Installations
- Tunable Lighting Study (CBI Collaboration)



Floor 9



Floor 10



Floor 11



Floor 7



Floor 12



••• Evaluating ••• Configuration ••• Complexity

To find the real 'pressure points', *people* need to observe and evaluate the *people* installing and configuring the system in real time, without assistance - it just can't be done in a demonstration, mock-up, or testing lab.



How this Presentation Will Work



10

- Client to/from Specifier
- Manufacturer to/from Specifier
- Specifier to/from Installer
- Manufacturer to/from Installer





Craig Bernecker, Ph.D., FIES, LC
Professor of Lighting Design
Director, MFA Lighting Program
School of Constructed Environments
Parsons School of Design

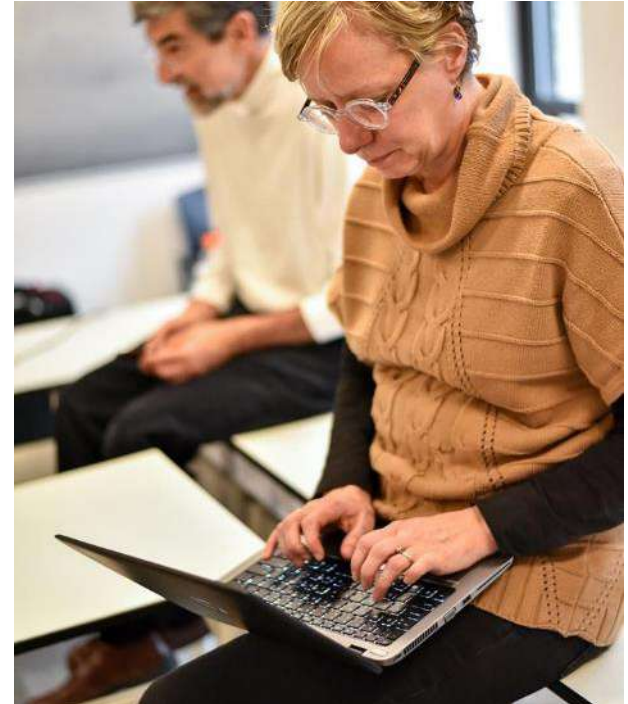
The Owner/ Client





Melanie Taylor, IALD, LEED AP, CLD
Vice President, Lighting Design
WSP

The Specifier





Dan Blitzer, FIES, LC, DLFNY
Practical Lighting Workshop

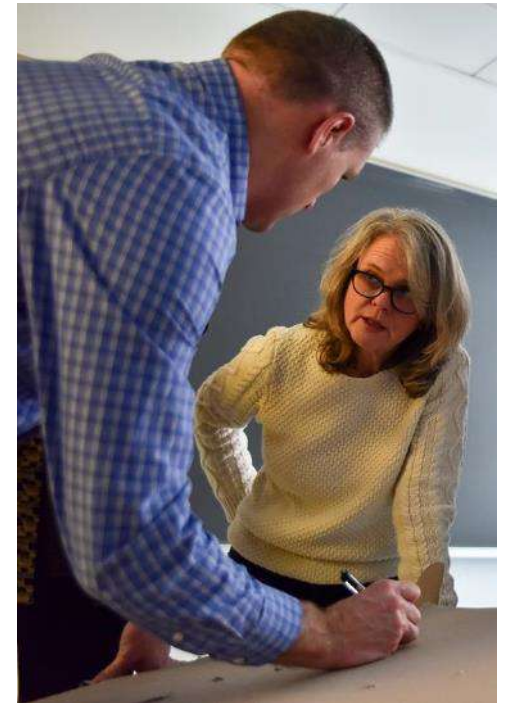
The Manufacturer





Ruth Taylor
NGLS Program Manager
Pacific Northwest National Laboratory

The Contractor





Communication: Client to Specifier





NGLS Living Lab – The New School

Why Parsons?

The screenshot displays the website for The New School, specifically the 'Buildings' section under 'Sustainability Initiatives'. The page features a navigation menu with links for ABOUT, ACADEMICS, SCHOOLS, ADMISSION, EVENTS, GIVING, NEWS, and OUR WORK. The breadcrumb trail reads 'Home > Buildings > Sustainability Initiatives'. The main heading is 'BUILDINGS' in red. A central image shows a modern building at night with a prominent glass facade. To the left is a sidebar menu with links: Environmental Health and Safety, Facilities Management, Sustainability Initiatives (with sub-links for Sustainability Dashboard, Energy and Emissions, Water Conservation, Waste Management, Building Operations, and Goals and Commitments), FAQ, and Schedule a Visit. To the right is a 'Sustainability Initiatives' section with four red buttons: TISHMAN ENVIRONMENT DESIGN CENTER, FY2016 BUILDINGS SUSTAINABILITY REPORT, FY2015 BUILDINGS SUSTAINABILITY REPORT, and STUDENT SUSTAINABILITY GUIDE. Below these is a 'Related Links' section with links to Environmental Health and Safety, University Center Sustainability, Sustainable Dining, and Advisory Committee on Investor Relations.

THE NEW SCHOOL

ABOUT ACADEMICS SCHOOLS ADMISSION EVENTS GIVING NEWS OUR WORK

Home > Buildings > Sustainability Initiatives

BUILDINGS

Sustainability Initiatives

Environmental Health and Safety

Facilities Management

Sustainability Initiatives

- Sustainability Dashboard
- Energy and Emissions
- Water Conservation
- Waste Management
- Building Operations
- Goals and Commitments

FAQ

Schedule a Visit

TISHMAN ENVIRONMENT DESIGN CENTER

FY2016 BUILDINGS SUSTAINABILITY REPORT

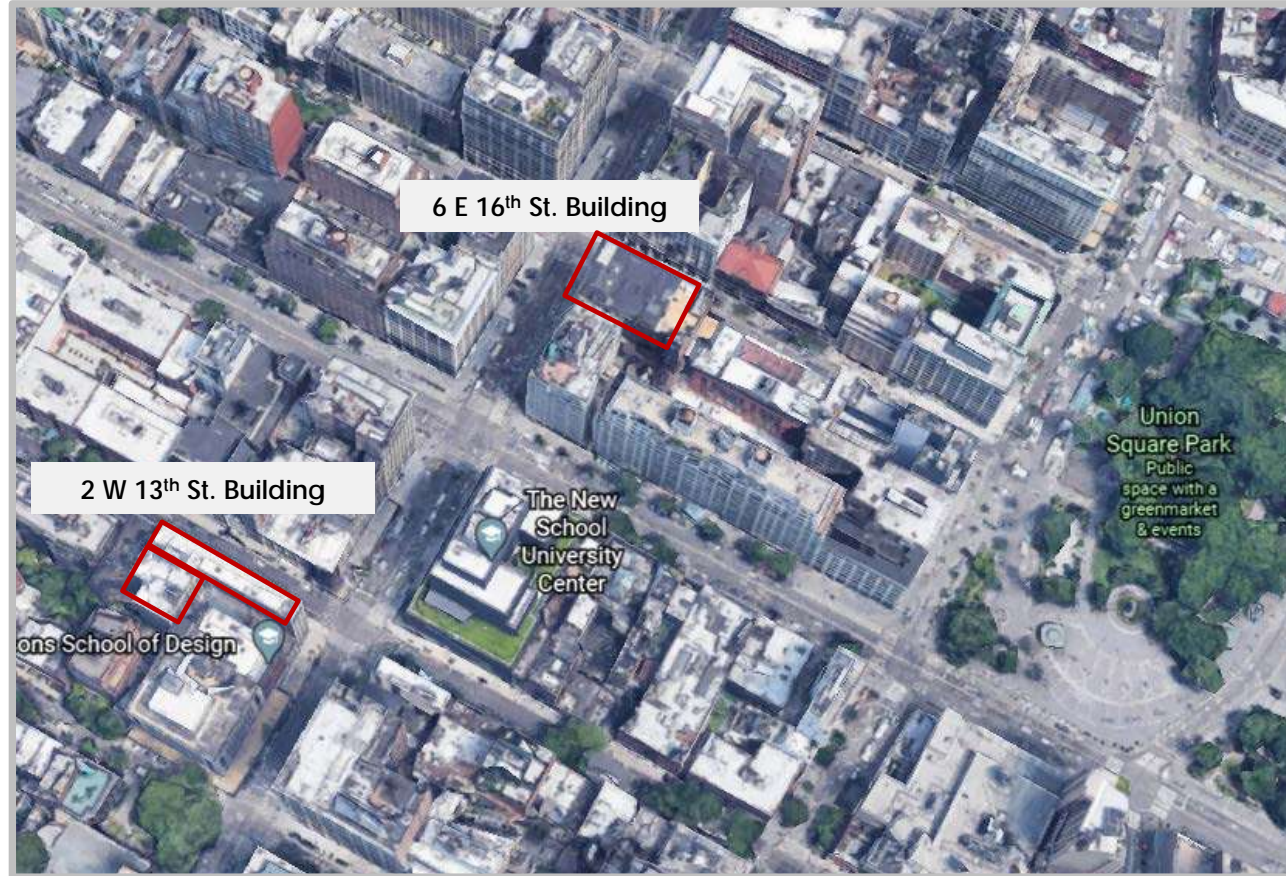
FY2015 BUILDINGS SUSTAINABILITY REPORT

STUDENT SUSTAINABILITY GUIDE

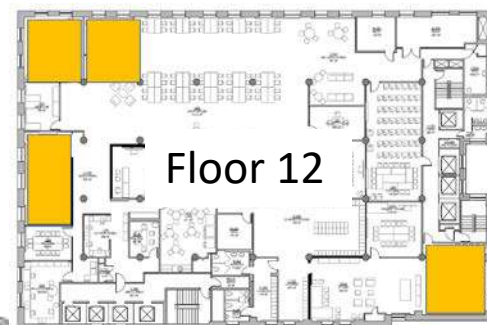
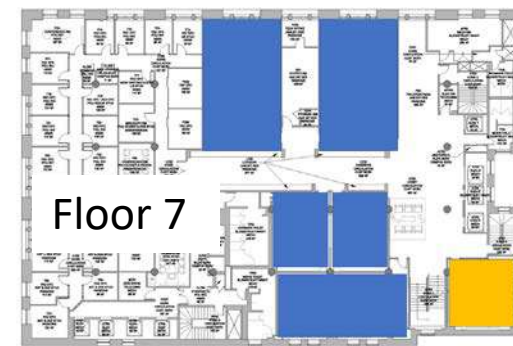
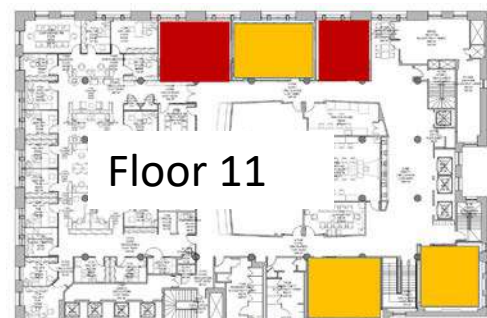
Related Links

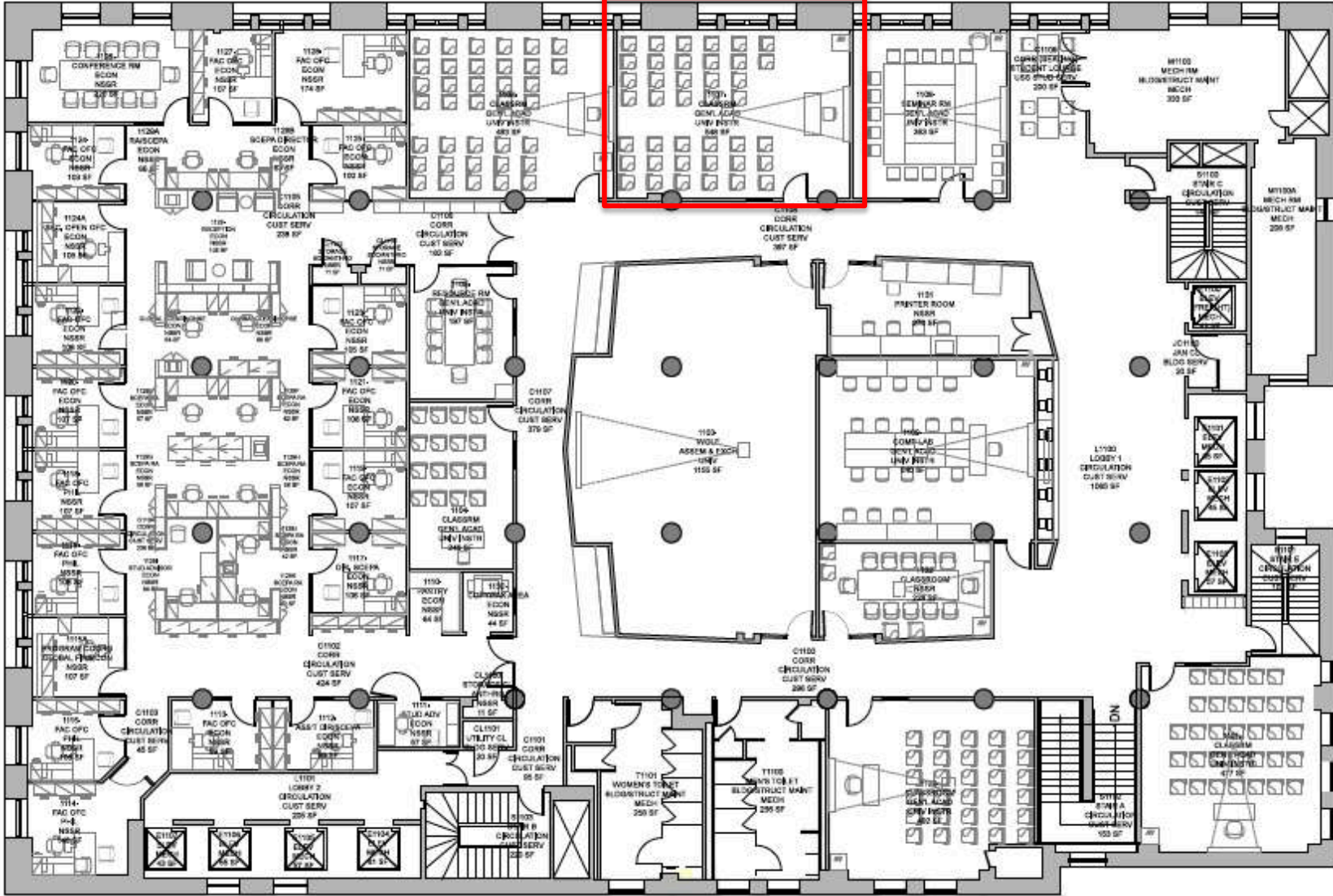
- Environmental Health and Safety
- University Center Sustainability
- Sustainable Dining
- Advisory Committee on Investor Relations

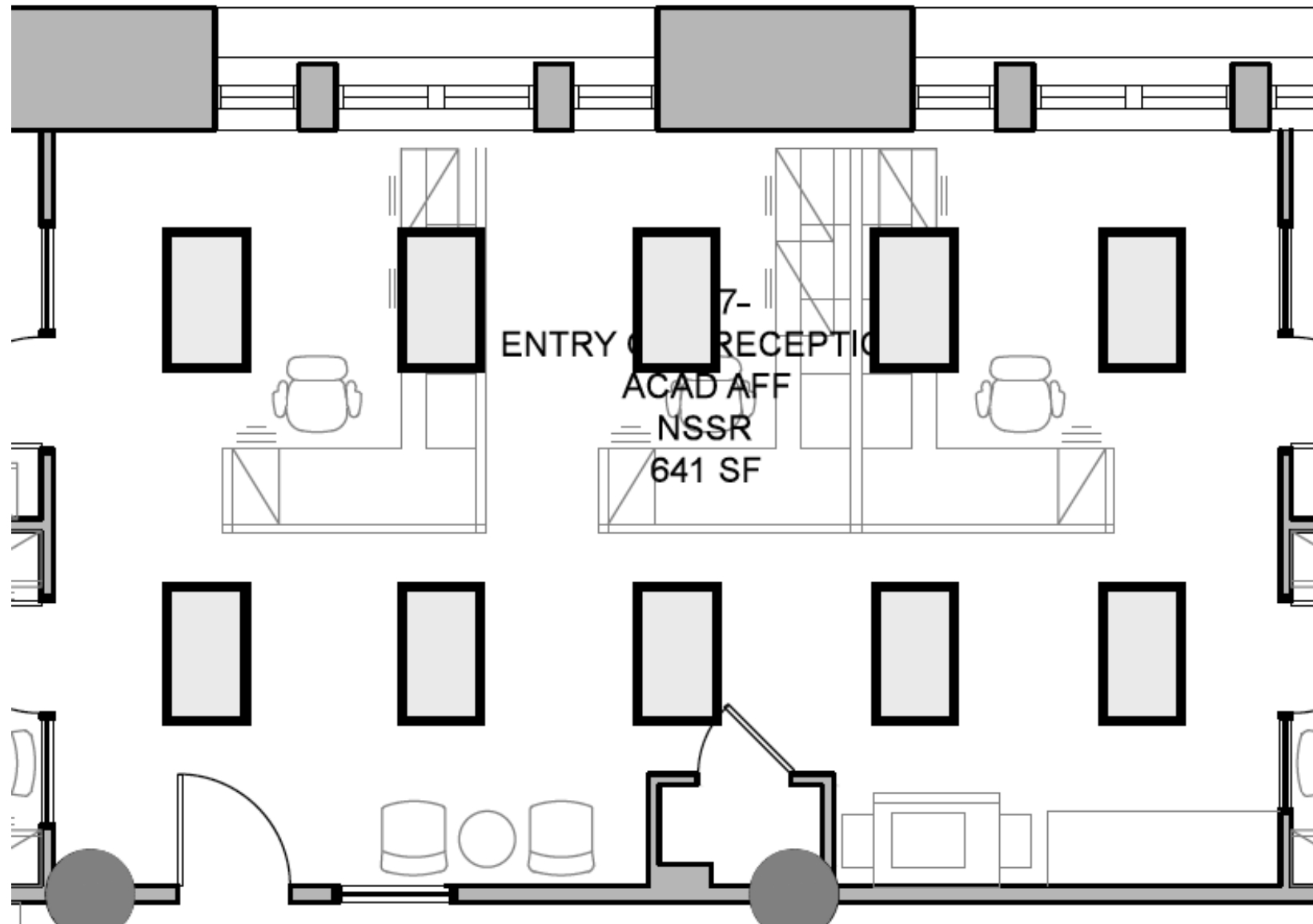
NGLS Living Lab – Parsons, The New School, Midtown Manhattan



- Existing Living Lab Installations
- Future Possible Living Lab Installations
- Tunable Lighting Study (CBI Collaboration)









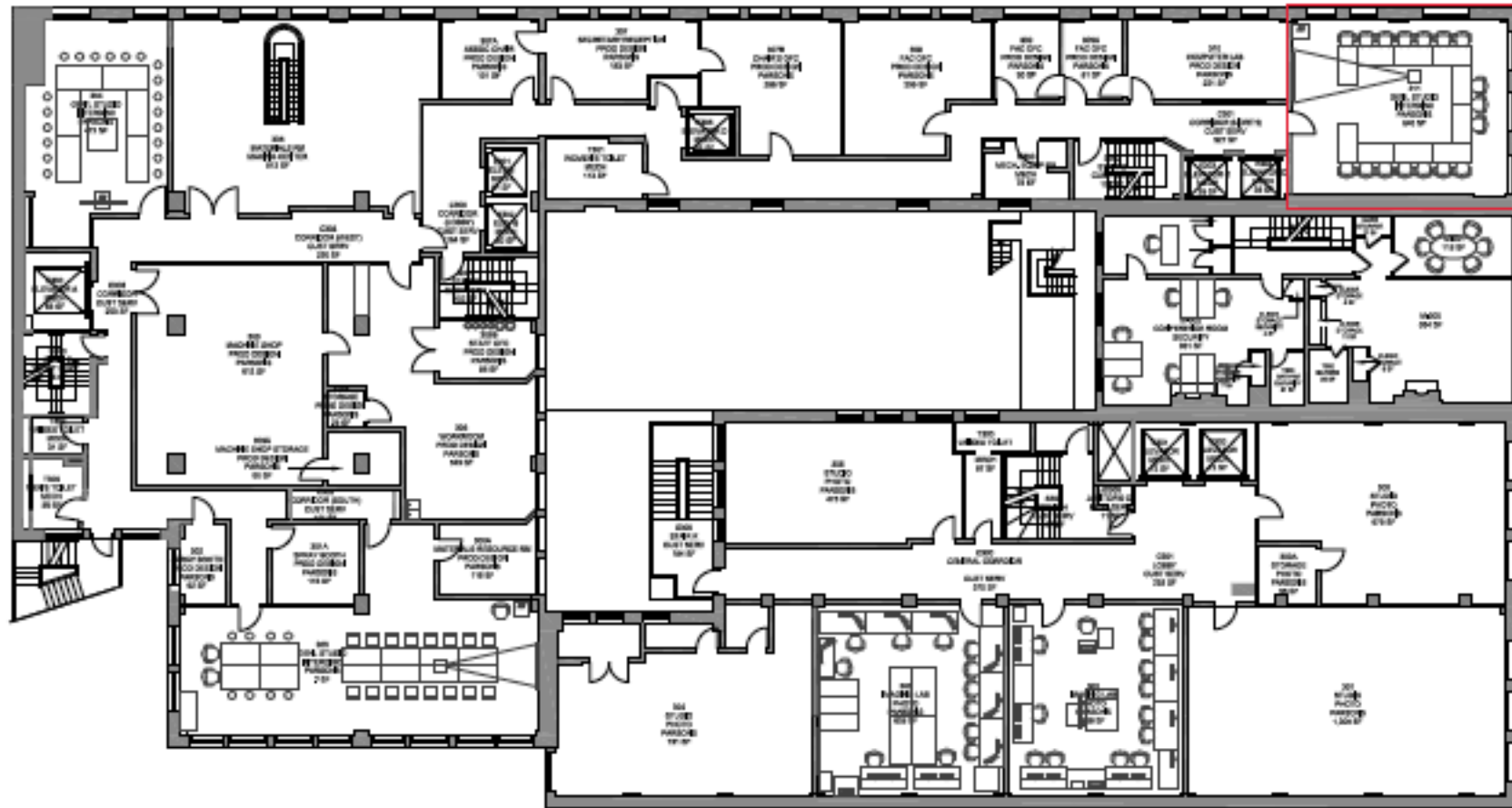


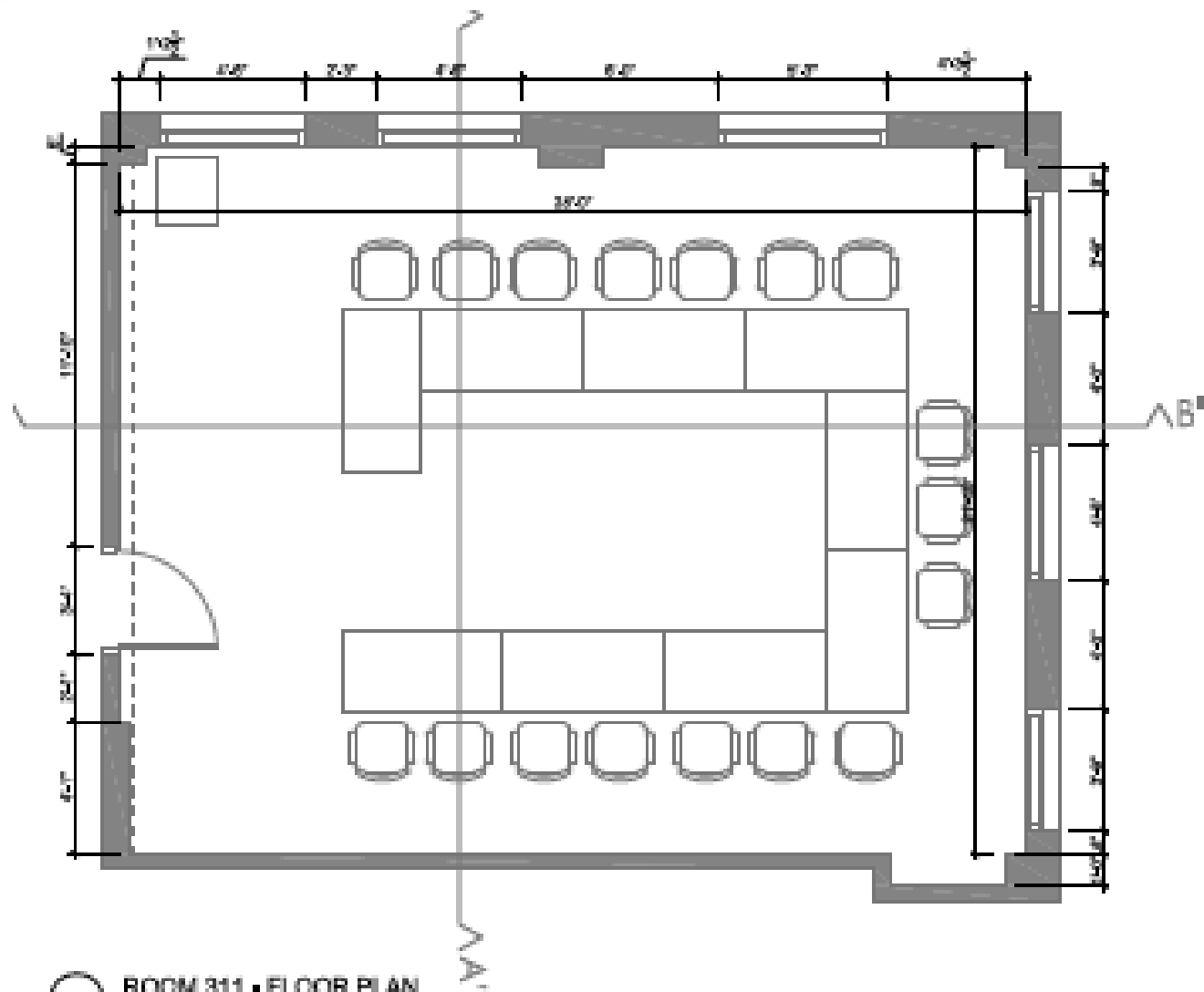




LEDucation







01 ROOM 311 • FLOOR PLAN
SCALE: 3/16"=1'







Client/Owner Objectives

- Code at least cost
- Code as max performance
- Spatial productivity
- User productivity
- User experience
- Discretionary energy savings



NGLS Initial Focus

- Luminaire and control systems that are:
 - Marketed as “easy” to install and configure
 - Intended for contractor setup and configuration without prior training
 - Configurable without manufacturer assistance
 - No lighting designer involved

We had to start with the most basic systems to develop our evaluation protocols and procedures and come away with results and recommendations that are tangible and actionable.



•••
Evaluating
Configuration
Complexity

To find the real 'pressure points', *people* need to observe and evaluate the *people* installing and configuring the system in real time, without assistance - it just can't be done in a demonstration, mock-up, or testing lab.

Conversation:
Specifier to
Client

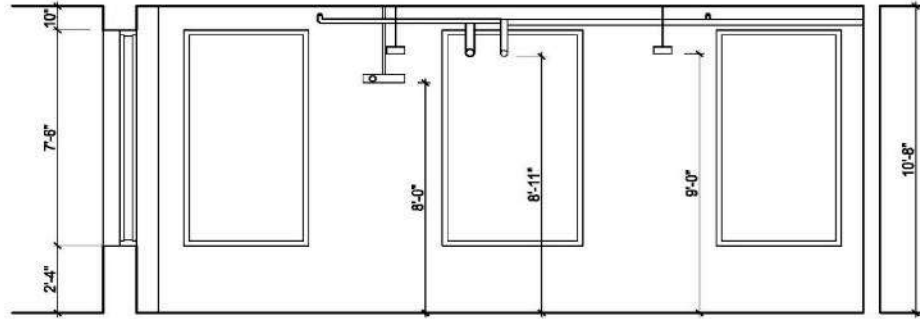
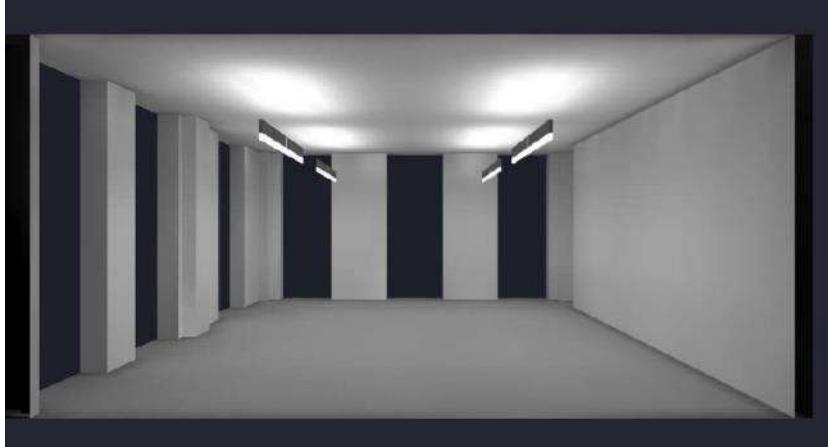


Lighting Performance Requirements

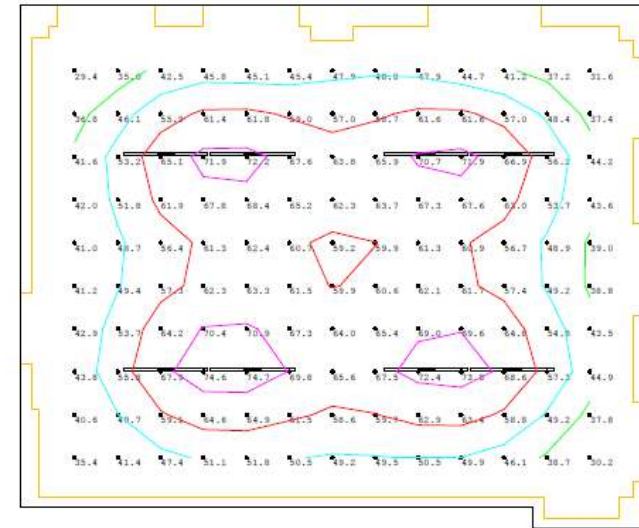
| Task Plane Illumination | Illuminance Uniformity | Maximum Luminance Ratio | |
|-------------------------------|--------------------------------------|--|--|
| | | Between task and immediate background surfaces | Between task and distant background surfaces (ceiling, walls, floor) |
| Average initial at full power | Average to minimum across work plane | Between task and immediate background surfaces | Between task and distant background surfaces (ceiling, walls, floor) |
| 45 – 55 fc | 2:1 | 3:1 | 10:1 or 1:10 |

Connected Lighting Power Density of not more than 1.0 w/SF

Example

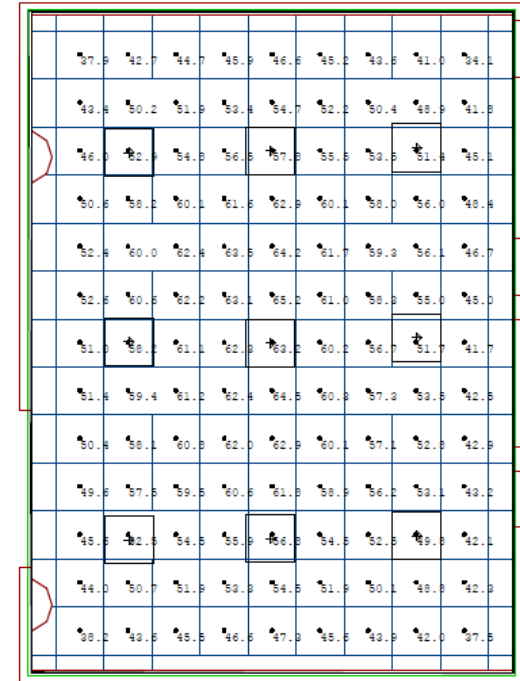
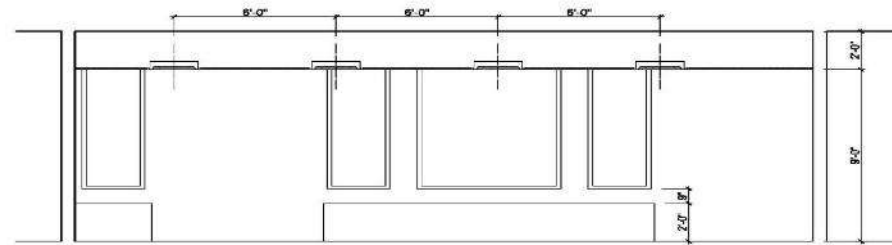
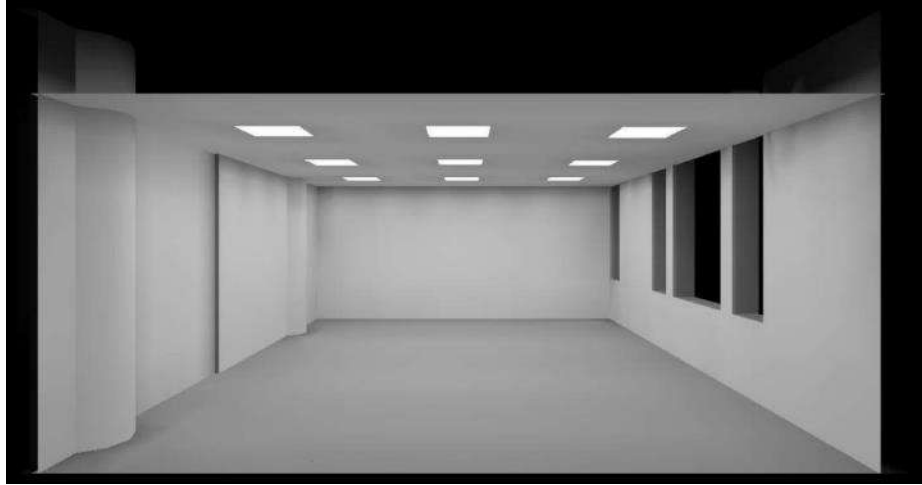


Area = 694.00 Sq.ft
Total Watts = 454.4
LPD = 0.655 Watts/Sq.ft



StatArea_1
Illuminance (Fc)
Average = 55.66
Maximum = 74.7
Minimum = 29.4
Avg/Min Ratio = 1.89
Max/Min Ratio = 2.54

Example



1107

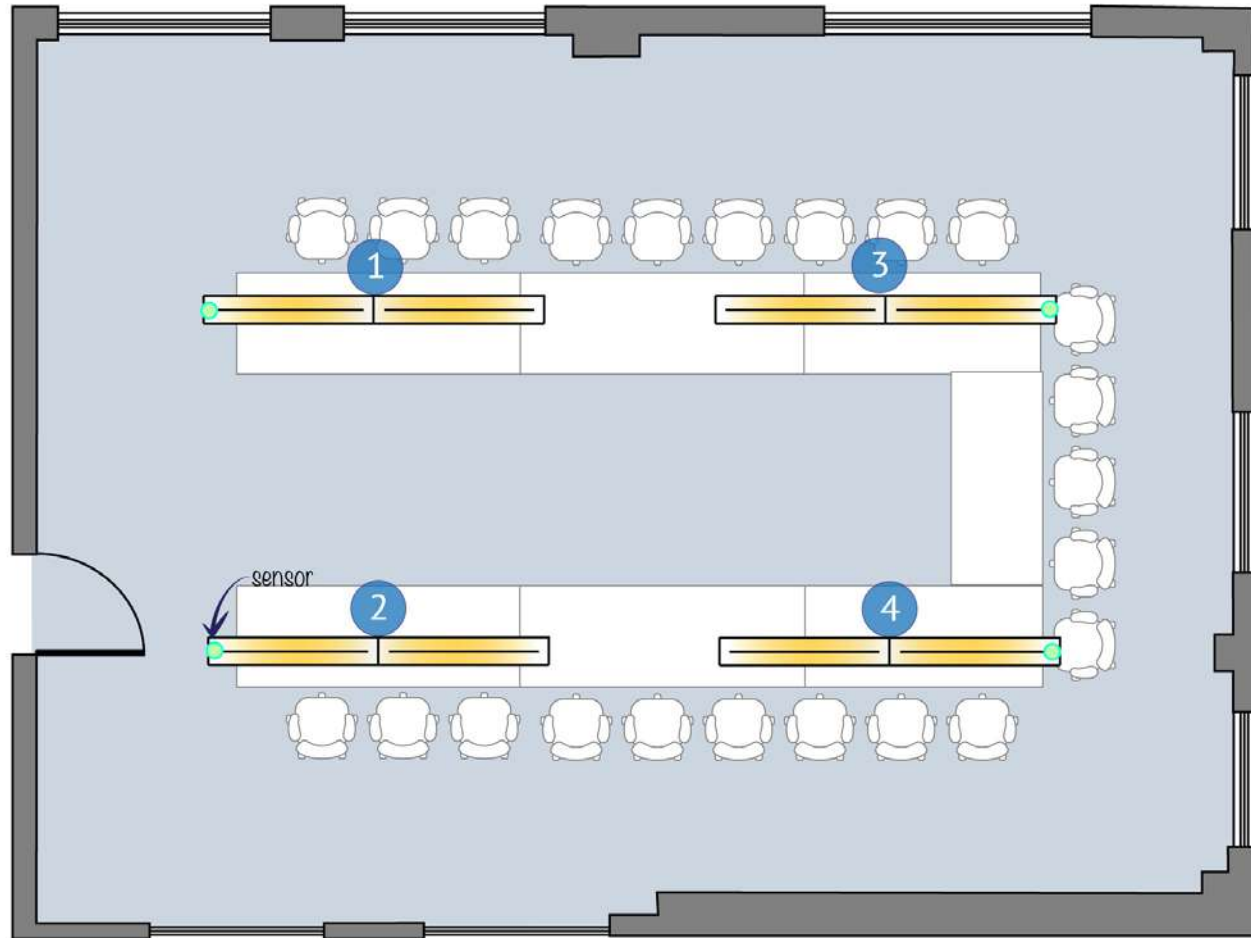
Illuminance (Fc)
 Average = 52.95
 Maximum = 65.2
 Minimum = 34.1
 Avg/Min Ratio = 1.55
 Max/Min Ratio = 1.91

| LPD Area Summary | | |
|------------------|-------------|-------|
| Area | Total Watts | LPD |
| 550.2 | 210.6 | 0.383 |

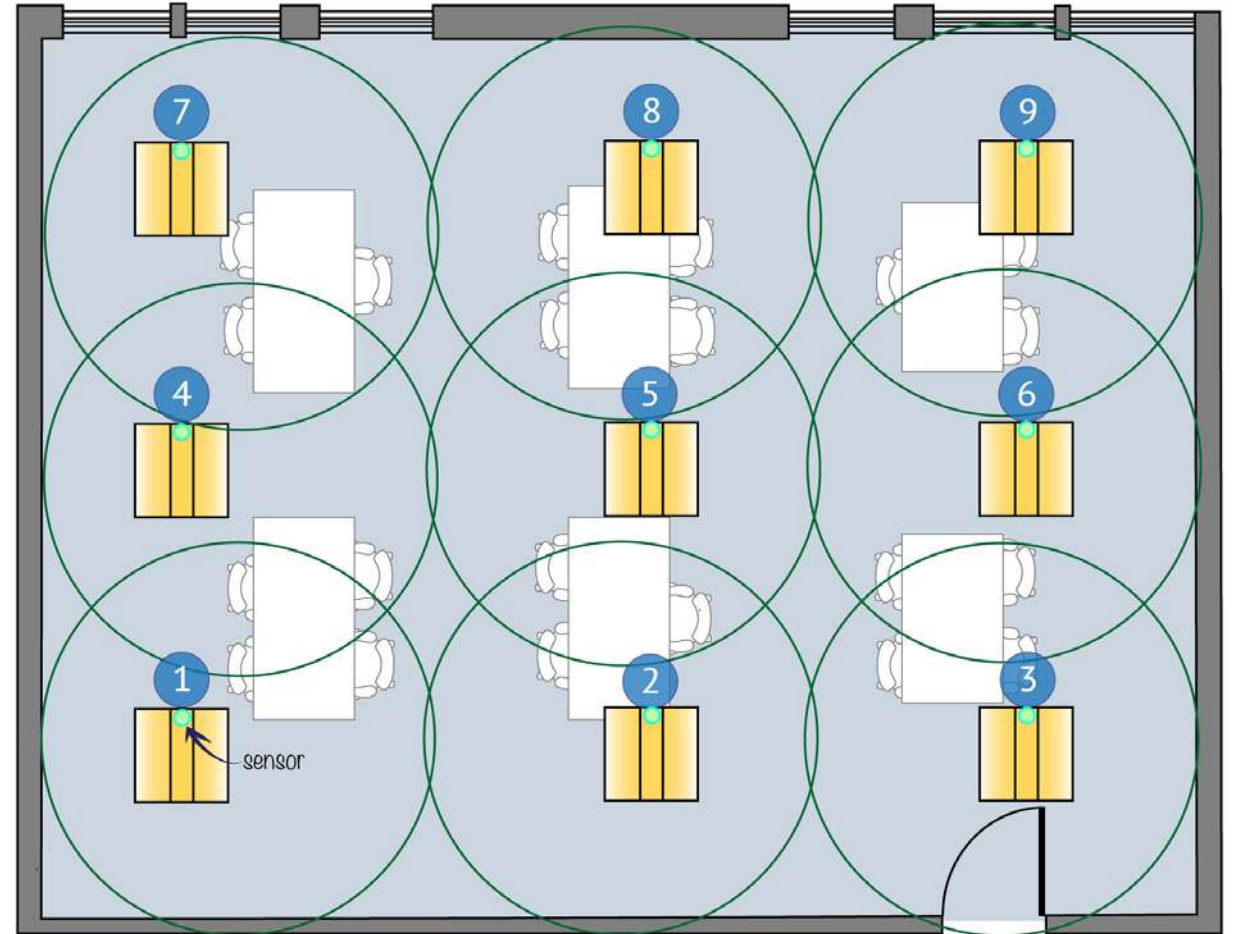
Control Performance Requirements

1. **Vacancy control** (manual on/auto off) of two zones with a time out period of 5 minutes.
2. **Manual continuous dimming** of the same two zones indicated in item 1. Minimum dimming level of each zone shall be $\leq 10\%$ of lumen output.
3. **Daylight harvesting** to maintain task plane illumination at the current level provided by the electric lighting (whether full output, task-tuned, or manual dimmed).
4. **Field-adjustable high-end trim** to lower maximum system light output. System shall be delivered with high-end trim set at 100%.
5. Control settings shall be adjustable by the user **without factory assistance**.

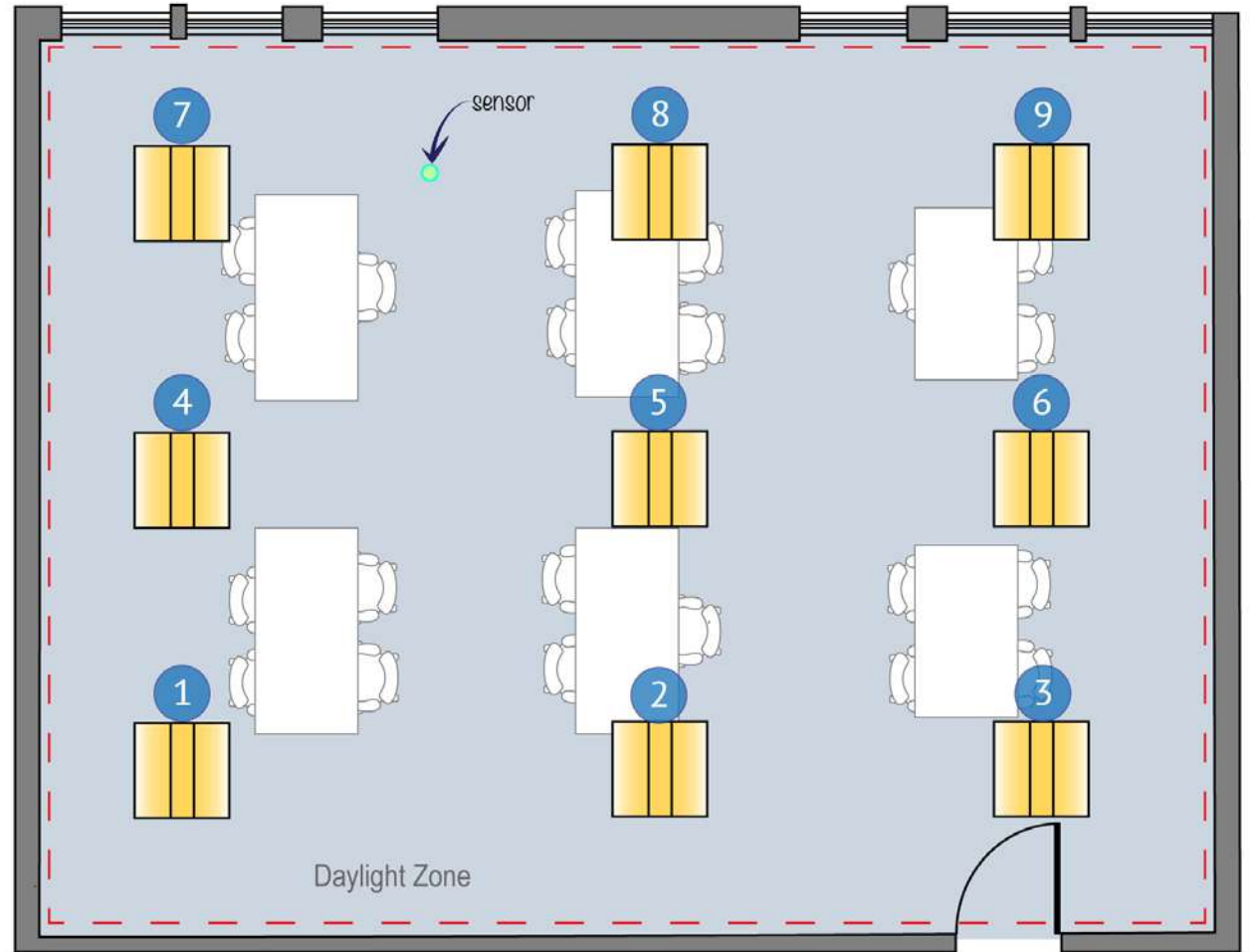
Sensor Location



Sensors in Each Luminaire



Central Sensor



Vocabulary

Gaps and confusion between client and specifier

- Site, building, project
- Room, group, zone
- Device, fixture, switch, sensor, node
- Hub, bridge, gateway
- Discover, find
- Profile, scene, behavior
- Configure, program, adjust, commission
- Write, save, apply, confirm, push
- Timeout period, hold time, prolong time



Communication: Specifier to Manufacturer



NGLS Specification

1. **Vacancy control** (manual on/auto off) of two zones with a time out period of 5 minutes.
2. **Manual continuous dimming** of the same two zones indicated in item 1. Minimum dimming level of each zone shall be $\leq 10\%$ of lumen output.
3. **Daylight harvesting** to maintain task plane illumination at the current level provided by the electric lighting (whether full output, task-tuned, or manual dimmed).
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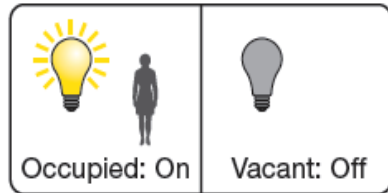
NGLS Vacancy Control Spec

- Specification
 - System shall provide for **vacancy control** (manual on/auto off) of two zones, with a **user-adjustable time out period** of 5 minutes.

Does the Product Meet the Spec – Vacancy Control

- Manufacturer Documentation

1 - System Brochure



Occupancy/vacancy sensing turns lights on when occupants are in a space and off when they vacate the space.

3 - Programming Guide

Sensitivity

Tap "Sensitivity" to adjust the sensitivity of the occupancy/vacancy sensors.

Timeout

Tap "Timeout" to change the occupancy timeout for fixture sensors.

2 - Sensor Specification

Default Sensor Settings for DFCSJ-OEM-OCC (adjustable ONLY via the Vive hub user interface unless otherwise noted)

- Occupancy sensor timeout: 15 minutes
- Occupancy sensor sensitivity: Medium
- Mode: Occupancy detection (auto-ON, auto-OFF)

NGLS Spec - Daylight Harvesting

System shall provide daylight harvesting to maintain task plane illumination at the current level provided by the electric lighting (whether full output, task-tuned, or manual dimmed). When daylight contribution exceeds task plane illumination, luminaires shall operate at lowest dimmed level (stay illuminated until switched off manually or by presence detection control).



Does the Product Meet the Spec - Daylighting

- Manufacturer Documentation

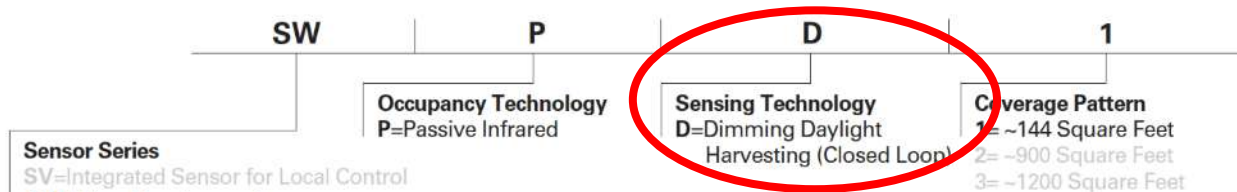
1 - System Brochure



3 - Programming Guide/User Manual

With the closed loop approach, the sensor controls the fixture it is directly connected to. A closed loop sensor “looks” at the surface directly below the sensor. It reads the reflected light level from the surface including light contributed by the electric light and the daylight that falls within the sensor’s view. **As daylight contribution increases, the sensor dims the electric light to keep the light level on the surface as consistent as possible.** If bright daylight causes the surface light level to be above the desired level even after the light level has been fully dimmed, after a period of time the **fixture will dim to OFF**. As daylight contribution decreases and the surface light level lowers, the fixture will turn back ON and then raise the amount of electric light accordingly.

2 - Sensor Specification



Does not meet spec

Sensor Location

| Daylight Sensor Physical Configuration | | |
|--|-----------------------------------|-------------------------------|
| Entrant | Mounting | Location in Luminaire Housing |
| <u>Lumenwerx</u> | Luminaire-integrated | End |
| Selux | Luminaire-integrated | End |
| Cooper | Luminaire-integrated | End |
| Signify 1 | Luminaire-integrated | End |
| <u>Silvair</u> | Luminaire-integrated | End |
| Cree | Luminaire-integrated | End |
| Lutron | Luminaire-integrated | End |
| Acuity | Luminaire-integrated ¹ | End |
| LG | Luminaire-integrated ¹ | End |
| Signify 2 | Luminaire-integrated | Side |
| <u>Maxlite</u> | Luminaire-integrated | Side |
| Crestron | Central (1 sensor) | NA |
| RAB | Central (1 sensor) | NA |
| <u>Nextek</u> | Central (2 sensors) | NA |

¹ Integrated sensor included in half of the luminaires, not in each luminaire.

NGLS Spec - Zones and Dimming

System shall provide manual continuous dimming of **two zones**.

Minimum dimming level of each zone shall be $\leq 10\%$ of lumen output.

Does the Product Meet the Spec – Zones and Dimming

- Manufacturer Documentation

1 - System Website



2 - Programming Guide/User Manual

Features + Benefits by Solution

| | Local Networked Solutions | | System-Wide Networked Solutions | Software + Connected Building |
|---|---------------------------|---|---------------------------------|-------------------------------|
| Controls Enabled Luminaires | ● | ● | ● | ● |
| Manual Dimming | ● | ● | ● | ● |
| Motion Sensing & Daylight Harvesting | ● | ● | ● | ● |
| Plug Load Control | ● | ● | ● | ● |
| Mobile Apps for Device Configuration | ● | ● | ● | ● |
| Dynamic Tunable White | | ● | ● | ● |
| Astronomical and Time of Day Scheduling | | | ● | ● |
| Automated Demand Response (ADR) | | | ● | ● |
| BMS Integration (BACnet) | | | ● | ● |
| Sitewide configuration + Management | | | ● | ● |
| System Visualization + Utilization Dashboards | | | | ● |
| Unified Lighting + BMS | | | | ● |

Create a New Group

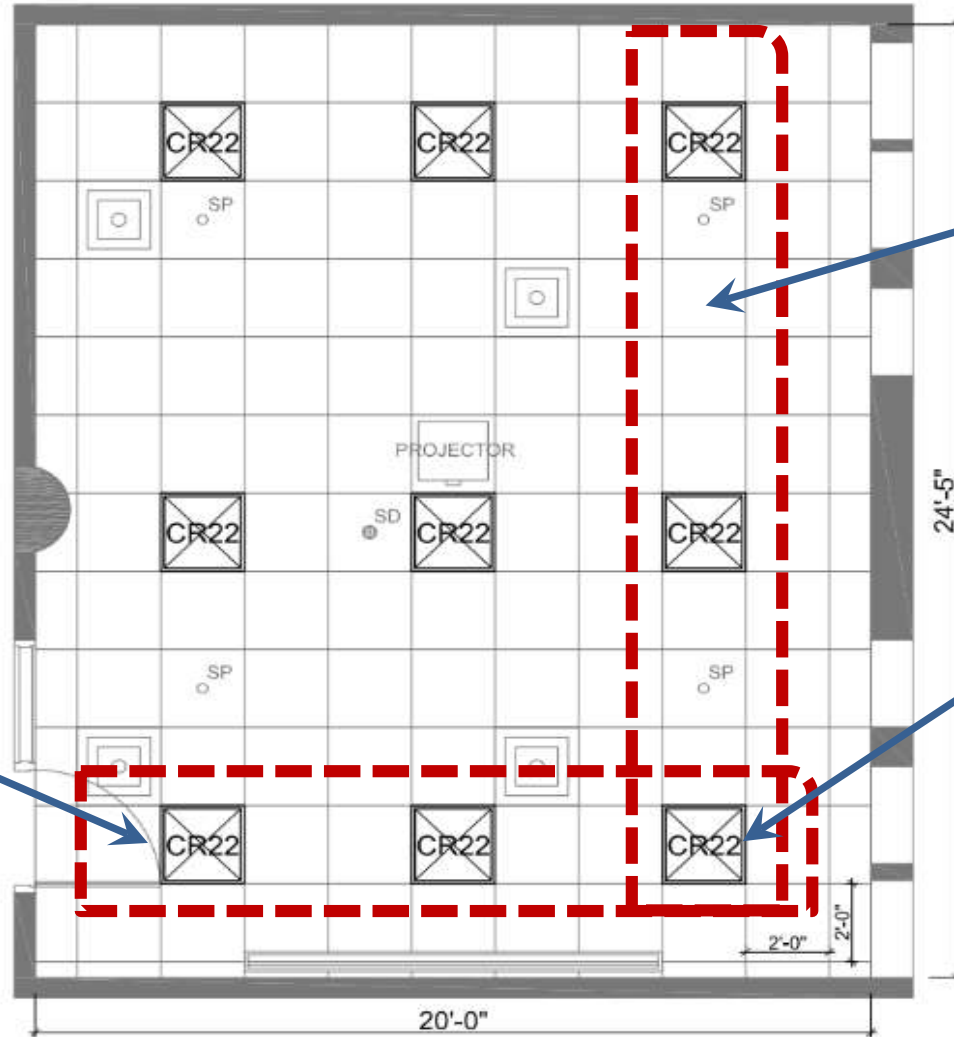
Users can also select to prohibit or allow manual change on the scene switch.



Looks like dim to 0%



Conflicting/ Overlapping Zones



Presentation Zone -
Lights should dim
when the projector
screen is in use.
Active control by
the user.

Daylighting Zone –
Lights should dim
when daylight is
detected to
maintain target
light levels.
Passive control.

What does this
fixture do? What
command takes
precedence?

Vocabulary

Gaps and confusion between specific and manufacturer

- Site, building, project
- Room, group, zone
- Device, fixture, switch, sensor, node
- Hub, bridge, gateway
- Discover, find
- Profile, scene, behavior
- Configure, program, adjust, commission
- Write, save, apply, confirm, push
- Timeout period, hold time, prolong time



Communication:
Manufacturer to
Specifier





Evaluated System Approaches

Entries can be categorized by how manufacturers approached:

- System Architecture
- Wall Controls
- User-configurable features
- Configuration Tools
- Documentation and Instructions



Submitted Systems

| Control | Luminaire | System | Entrant | |
|-------------------------|-----------|---------------|-----------|----|
| nLight Air | Acuity | Single Source | Acuity | * |
| Wavelinx | Cooper | Single Source | Cooper | * |
| SmartCast | Cree | Single Source | Cree | * |
| SensorConnect | LG | Single Source | LG | * |
| LightCloud | RAB | Single Source | RAB | * |
| SpaceWise (2) | Signify | Single Source | Signify | * |
| Zum (Crestron) | Starfire | Compound | Crestron | ** |
| Magnum Energy Solutions | LumenWerx | Compound | LumenWerx | |
| Vive (Lutron) | Orion | Compound | Lutron | ** |
| Avi-On Air | Maxlite | Compound | Maxlite | |
| Nextek | | Compound | Nextek | ** |
| EasySense (Signify) | Selux | Compound | Selux | |
| Silvair | Finelite | Compound | Silvair | ** |

Submitted System Luminaires

- Luminaires (9)
 - recessed 2x2s (4)
 - pendants (5)
- Retrofit Kits (5)
 - 2x4 (3)
 - 2x2 (1)
 - 1x4 (1)

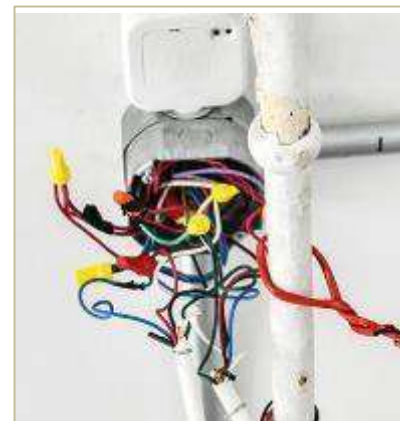


Submitted System Lighting Performance

- Efficacy range: 94-140 lm/W
- Wattage Range: 24-70 watts
- Measured Illuminance: 30-57 fc (45-55 fc)
- Calculated Power Density: 0.36-0.81 W/sf (< 1 W/sf)

System Architecture –

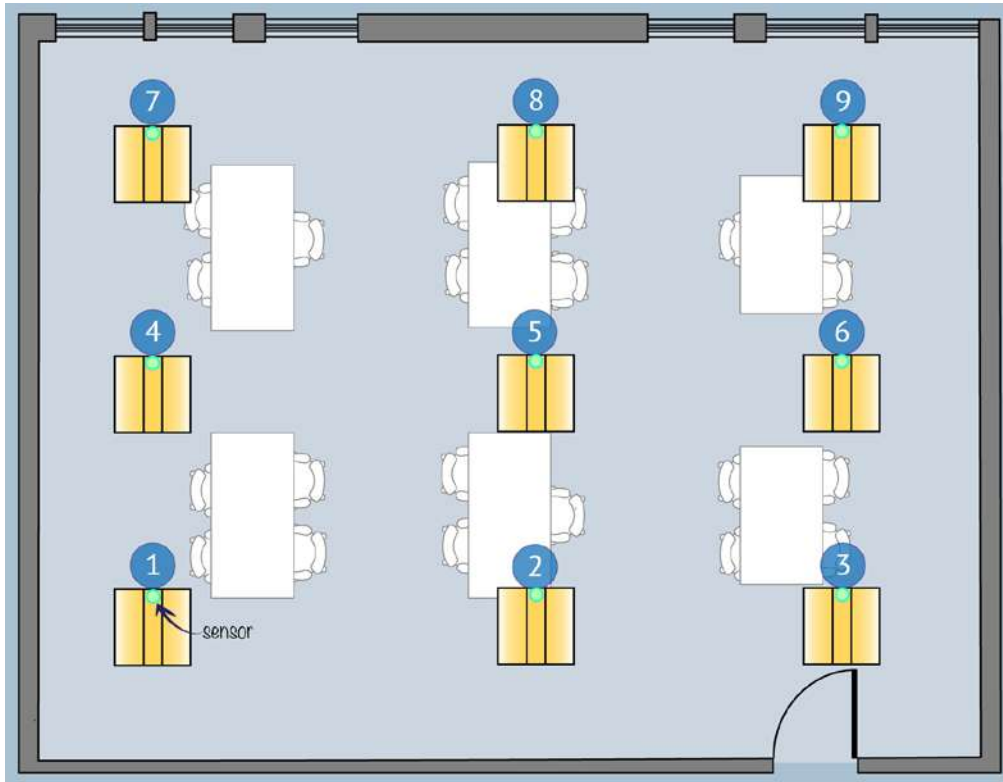
| | Least Complex (9) | Moderately Complex (2) | Most Complex (3) |
|------------|--|---|--|
| Components | Luminaire-integrated sensor and control Wall switch | Luminaire-integrated sensor and control Wall switch Local area network device | Remote mounted sensor and control Wall switch |
| Connection | Wireless | Wireless | Wired Wireless PoE |



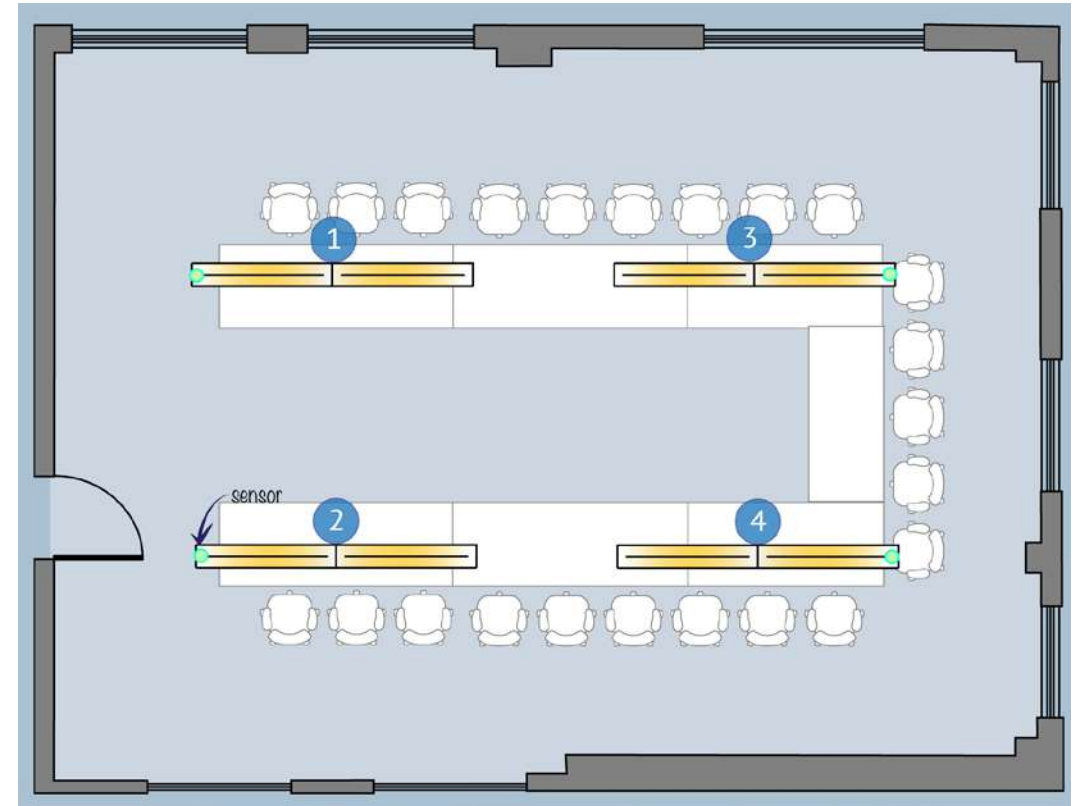
User-Configurable Settings

| Daylight Harvesting Operational Configuration | | | | | | |
|---|---------------|-------------------|--------------|----------------------|-----------------|--|
| Entrant | Design | Default Operation | Calibration | Response | Manual Override | User-configurable Settings |
| Signify | Closed loop | Enabled | Auto | Individual | Yes | <ul style="list-style-type: none"> • Enable/Disable |
| Cree | Closed loop | Enabled | Auto | Individual | Yes | <ul style="list-style-type: none"> • Specify minimum dim level (%) |
| Cooper | Closed loop | Disabled | Auto | Individual | Yes | <ul style="list-style-type: none"> • Enable/Disable • Set daylighting target (fc) |
| Lutron | Closed loop | Enabled | Auto | Individual | Yes | <ul style="list-style-type: none"> • Enable/Disable • Set DLH target with +/- slider |
| Acuity | Closed loop | Enabled | Auto or User | Individual or zoned* | Yes | <ul style="list-style-type: none"> • Enable/Disable • Set daylighting target (fc) |
| Silvair | Open /Closed* | Disabled | User | Individual or zoned* | Yes | <ul style="list-style-type: none"> • Enable/disable • Set daylighting target (fc) |

Grouping for Occupancy Sensing



On board sensors controlling entire room (6)



Onboard sensors controlling each zone separately (5)

Wall Controls



Pre-configured Rocker
(6 Systems)



Pre-configured Multi Button
(3 Systems)



Site Configurable Rocker
(3 Systems)



Site Configurable Multi Button
(2 Systems)

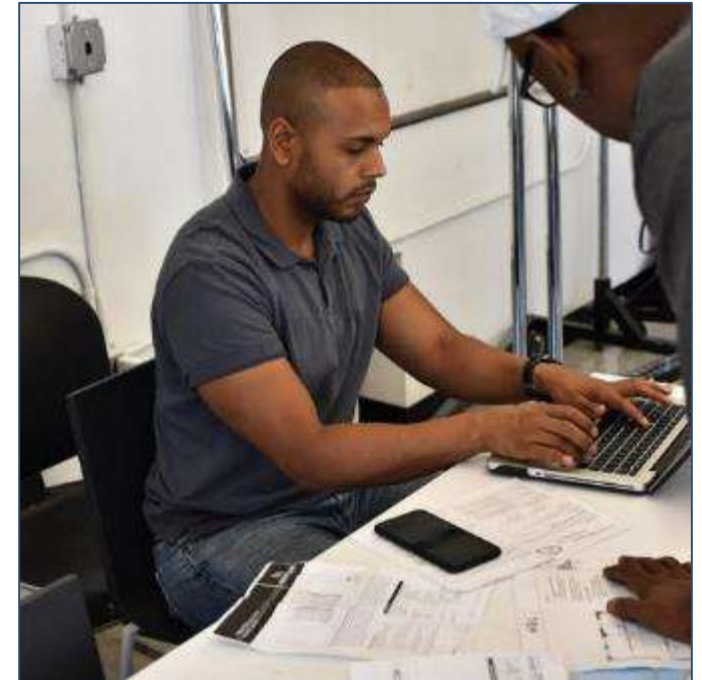
Configuration Tools



Handheld Tool
(1)



Phone App
(10)



Computer Front-end
(3)



Communication: Manufacturer to Contractor

Key Challenges

- Wide variety of systems
- One room – no learning curve
- No site assistance or training



Installation Instructions

ORION
LED LDRs Troffer Retrofit Bracket Kit Installation Instructions
Installation instructions for converting a recessed troffer based fluorescent luminaire to LED
PRODUCT SERIES: LDRM, LDRS Series Troffer Retrofit (2x4, 2x2)

U.S. PAT.

Contents
1. LED Troffer Retrofit Bracket
2. Side Mounting Brackets

Warnings:
 • Risk of fire or electric shock. Disconnect power and ensure power may be changed when used as the installation of LED troffer kit. Check for electrical wiring and components.
 • Risk of fire or electric shock. LED Retrofit for installation requires knowledge of fluorescent electronic ballast. Ballast should be cut off and disconnected. Create a qualified electronic ballast.
 • Risk of fire or electric shock. Ballast kit is not to be installed and turn the electronic ballast and electronic ballast to the lamp and not to the troffer.
 • To prevent physical damage or electrical shock, do not expose wiring to edges of sheet metal or other sharp edges.
 • Do not make or other any open hole in an enclosure of wiring or electrical component except for authorized.

CAUTION: Risk of fire. Consult a qualified electrician to ensure correct branch circuit conductance. THIS PRODUCT MUST BE INSTALLED IN ACCORDANCE WITH THE APPLICABLE ELECTRICAL CODES AND THE INSTALLATION CODE BY A PERSON FAMILIAR WITH THE CONSTRUCTION AND OPERATION OF THE PRODUCT AND THE RELEVANT REGULATIONS. THE RELEVANT ASSEMBLY IS ACCEPTED AS A COMPONENT OF A LUMINAIRE WHERE THE RESPONSIBILITY OF THE COMMISSIONING SHALL BE DETERMINED BY THE AUTHORITY HAVING JURISDICTION. UNDESIRABLE EFFECTS MAY BE MITIGATED BY MEANS OF APPROPRIATE PATH FOR BONDING.

ILL #1
EXISTING FIXTURE
 • Long Holes
 • Holes
 • Mounting Brackets
 • Troffer Cover
 • Fluorescent Lamp

ILL #2
Measuring Bracket
 • Mounting Brackets
 • Luminaire Housing

Instructions:
 1. Disconnect power to existing fixture.
 2. Remove existing door frame (if installed) and lamps. If electronic ballast, abandon ballast and socket bars inside the existing fixture. Otherwise remove them as needed. Please dispose of lamps, door frame, and ballast properly. (See ILL #1)
 3. Lift luminaire housing and slide in both side mounting brackets between the housing and the "T" grid. (See ILL #2) Lower luminaire onto mounting brackets. Optional lift bracket (ILL #3) raises existing troffer for extra clearance.
 4. Hang the LDR by its hinges on one of the mounting brackets. (See ILL #4 & #5)
 5. Install power disconnect (pre-attached to supplied power leads) to the line (black) and neutral (white) wires.
 6. Wire the supplied power leads to the LDR.
 7. Close lid.
 8. Reconnect power.

PHILIPS
Controls Indoor
SpaceWise DT

WaveLix Mobile
WaveLix Mobile Quick Start Guide

General information
WaveLix Mobile is a unique mobile application to programming and use of the WaveLix Wireless Connected Lighting system. WaveLix Mobile eliminates the cost and complexity of programming advanced wireless lighting control systems by using Eaton's patent pending Automatic Code Commissioning functionality.

The purpose of this document is to guide the user on how to use Automatic Code Commissioning as a reference. This document will also explain the icons, screens and their functions.



gives you

- 20 minutes of vacancy
- values
- Favorite Area
- Access Area Scenes
- Access Area menu
- Area raise/lower
- Area zones
- Devices included in Area
- All Available devices on WAC

www.eaton.com/lightingsystems 1

LG
Life's Good

PROJECT 2.0 APP

LG SENSOR CONNECT

2.0 is a stand-alone wireless lighting system for residential spaces such as offices, schools, LG SENSOR CONNECT APP makes it easy for your purpose in the building's space, to and to help facility managers easily maintain more than 10000 independent lighting (in the complex 2.4ghz frequency range) permanent device, and can easily split or merge and user's energy requirements. It can easily jobs, sensors, switches, and schedulers within design the groups. Create a commissioning group and registering the ID of the lighting system commissioning button in the app.



User manual

Communication:
Contractor to
Manufacturer





Start Up Questions

- Where do I find start up instructions? Are they online?
- Will the system operate once power is provided to the fixtures and the wall switches, or are additional start-up steps needed?
- Are there remote sensors (occupancy/daylighting) that need to be configured during initial start-up?
- Are the initial control settings pre-configured, or do control settings have to be configured onsite to enable operation?
- How do I pair the luminaires to the light switches?
- Do any devices need updated firmware before start up?





Configuration Tool Questions

- What type of configuration tool do I need? Where do I download it? Is this the right version?
- What type phone do I need?
- Who do I give the login credentials to? Who will be maintaining the system?
- Is there an instructional video to watch?
- How do I use the app to group the devices? I'm not sure about the zoning, where do I find that information?
- Can someone explain exactly how the system will be used?





Wall Control Questions

- Do the wall switches need line power? Are the wall switches hard-wired to the luminaires for control, or is control accomplished wirelessly?
- How do I pair the switches to the luminaires?
- What if a switch is damaged or needs to be replaced? How will the system recognize the new switch?
- Do the wall controls need extra labels or a placard to clarify operation?



Vocabulary Confusion

When configuring the room at your site, find the device and apply the behavior to the project file.

When programming the zone in your project, discover the fixture and write the profile to the building file.

Find the bridge location before programming the prolong time.

Discover the hub location before configuring the timeout period.



Installer Thoughts

- Information (documentation) communicated to my boss often does not get to me in the field.
- Reading details takes a lot of extra time.
- If something looks familiar, I'm going to skip reading the documentation to save time.
- Age does make a difference – if I need a phone app and a password I might need to get 'the kid' to do it.
- The big picture matters, tell me what you're trying to do.
- Use vocabulary I'm familiar with, a 'device' is not a lighting fixture or a wall switch to me.
- Think about how I see things in the field (from a ladder), the perspective might be different.
- I'm a lot smarter than you think and I'm really good at what I do.



Communication:
Facility Manager
to the Team



Facilities Managers

- I don't have time for this.
- What are the warranties if something goes wrong?
- I can only deal with the complaint in front of me, one at a time.

Vacancy Sensing

“I think everyone is aware that the lighting in room 623 got changed during winter break and has been a problem throughout this semester. I'm having the same teachers coming and complaining to me each week about the lights turning off just a minute or two after they turn them on. I've moved the teachers that I can out of that room but there are some that I have no choice but to leave them there and those teachers are getting frustrated.”

“I'm wondering if there is any trick to the lighting in there that I don't understand, or if there is a plan to change the lighting back to make it uniform with the other rooms.”

Work Order #011770908 (Created Tuesday, November 13, 2018 6:04 PM)

Message from Kazumi Namiki:

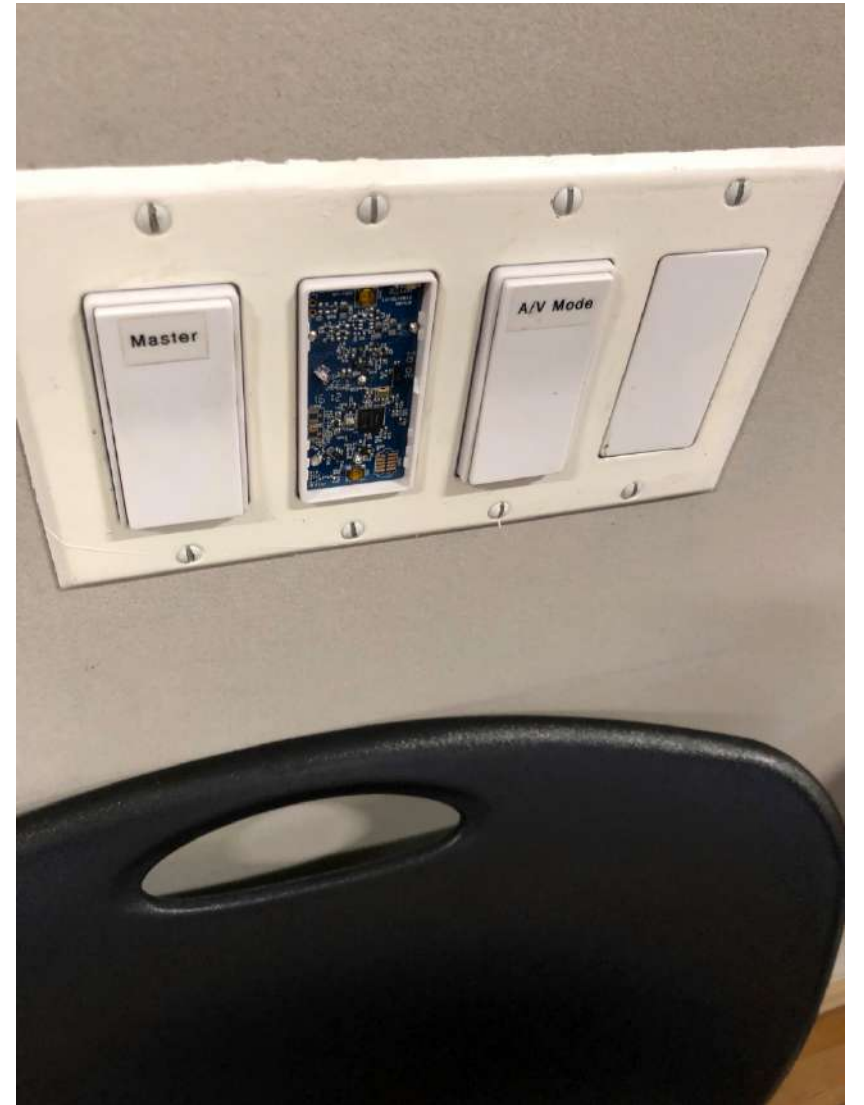
Please check the lights immediately. I opened this request on 10/27 and has no work done yet. Please fix it by tomorrow afternoon. My class starts 6pm and really needs proper lightning.

Custom Task

The lights in the room haven't been fixed yet. It is going to be a health issue. Please fix them immediately.

“Please be advised that our electrician evaluated the lighting issue at 79 Fifth Avenue Room 910. It appears to be a wireless lighting system and found no communication from the box to the switch. We need you to contact the person responsible for installing the departmental lighting project immediately and have them reprogram the box. In the interim, we had to bypass this system but this only allows the lights to remain on at all times. We need to leave the light on because there are evening classes scheduled in this room.”





Facilities Managers

- I don't have time for this.
- What are the warranties if something goes wrong?
- I can only deal with the complaint in front of me, one at a time.
- The system doesn't work and I have no way to even get the lights on except the electrical panel down the hall.

Message from Facilities Management:

Hi Anna Our staff are looking into this. We'll get back to you as soon as possible Luana

Custom Task

Comment from faculty member who requested a lighting fix: "There is only one light switch and it only operates half the room. It looks like there used to be another switch, but is gone.

I cannot turn off the lights in the front half of the room- where I need it to be darker for projections."

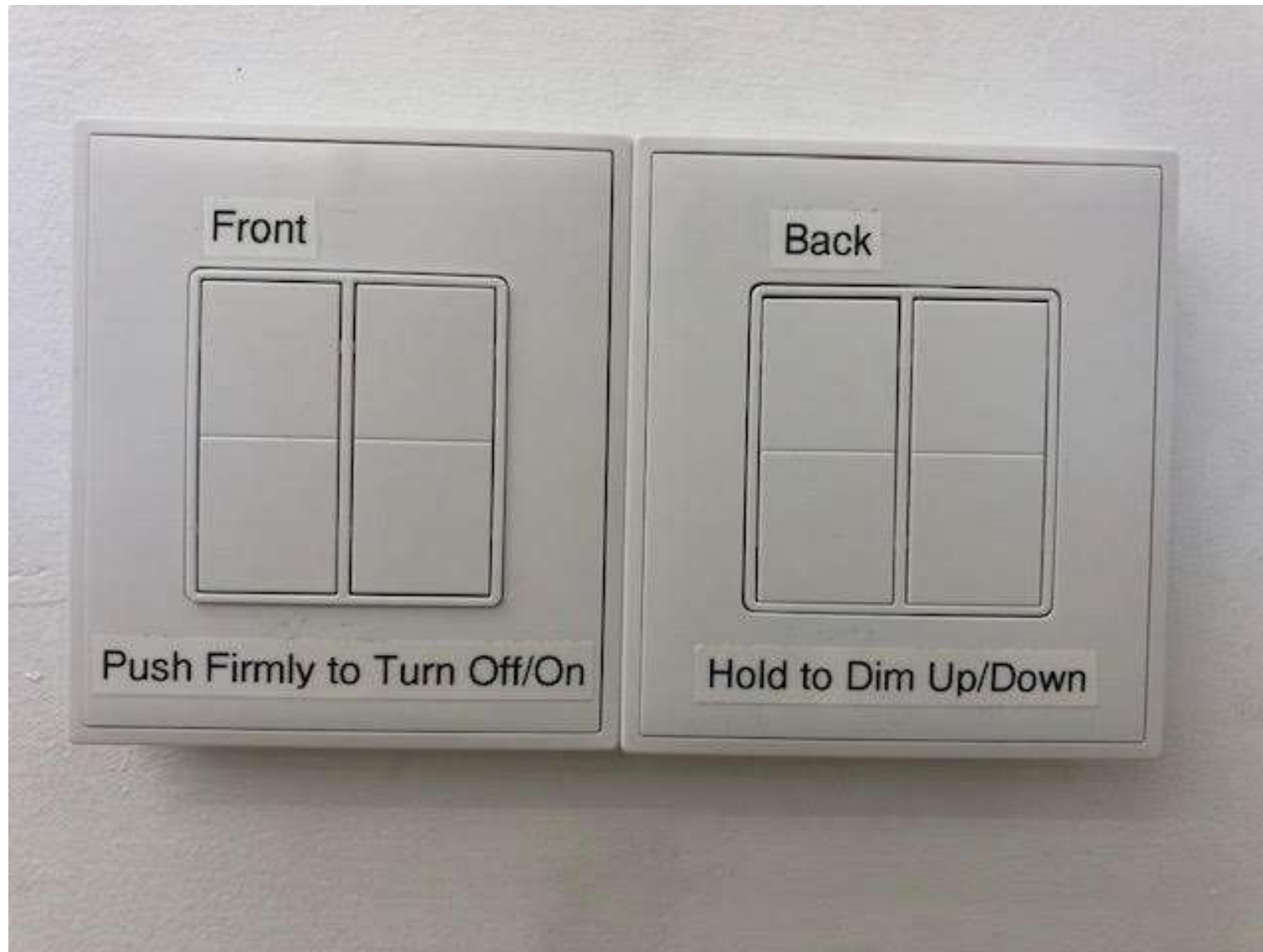
Facilities Managers

- I don't have time for this.
- What are the warranties if something goes wrong?
- I can only deal with the complaint in front of me, one at a time.
- The system doesn't work and I have no way to even get the lights on except the electrical panel down the hall.
- **Someone stole the light switch again.**



As an English Language Studies instructor, I'm requesting guidance regarding the lighting in room 908. Below are some of the issues I encountered in this morning's class, Building D, room 908, CRN 2842, 9:00am- 11:40am:

1. **MANUAL CONTROL:** I was not able to find a way to turn the lights on, off, or dim. This poses a challenge when we explore color and video during the class session, which we will do throughout the semester. **Is it possible to turn manually turn the lights on and off as needed?**
2. **SENSORS:** Three times during today's session the lights went out. I guess because the students were engaged in a whole class discussion, a reading task, and a writing task. Not much time had passed before the lights went out each time. **Is it possible for the sensors to be adjusted to go a bit longer without movement in the room before the lights go out?**
3. **USE of ALL LIGHTS:** It seems that not all of the lights are on in the classroom. To add more light for in-class reading and writing, I pulled the shades up, but that resulted in less ability to see the projected screen while beams of sunlight were shone on students. On cloudy days, this option might not add much light. There are 19 students registered for the class. **Is it possible to have more light in the classroom?**



Room Placards



THE NEW SCHOOL

Operating the lighting controls:

- One switch controls the front (screen) of the room; the other controls the back of the room.
- For Lights ON, push the top of the switch until it clicks.
- For Lights OFF, push the bottom of the switch until it clicks.
- To dim UP, press and hold the top of the switch; release to stop dimming.
- To dim DOWN, press and hold the bottom of the switch; release to stop dimming.
- Lights will automatically turn off after the room is no longer occupied
- Lights will automatically dim when sufficient daylight is present

Problems?
Call or email Facilities at xxx-xxxx or xxxxxx@newschool.edu

Comments?
Please send any thoughts you have – good or bad – regarding the lighting and controls to livinglab@pnnl.gov. And please be sure to identify the room!

Work Order #014164768 (Created Wednesday, February 19, 2020 11:44 AM)

Custom Task

When lights are turned off they turn on 10-15 seconds after. Lighting is not working. Needs lights off for class when showing videos.

Reconfiguration

- How do you figure out if a system is performing correctly?
- How do you change settings if it's not?
- Have you downloaded the app? Is it the latest version? Who has the password?
- Do the instructions you have match the new version of the app?
- What if a switch breaks?
- What if you need to apply a firmware update?

Facilities Managers

- **I don't have time for this.**
- What are the warranties if something goes wrong?
- **I can only deal with the complaint in front of me, one at a time.**

Wireless Control Systems: If Only You Could
Get Them to Work Like You Want!



High Level Takeaways



Closing Thoughts

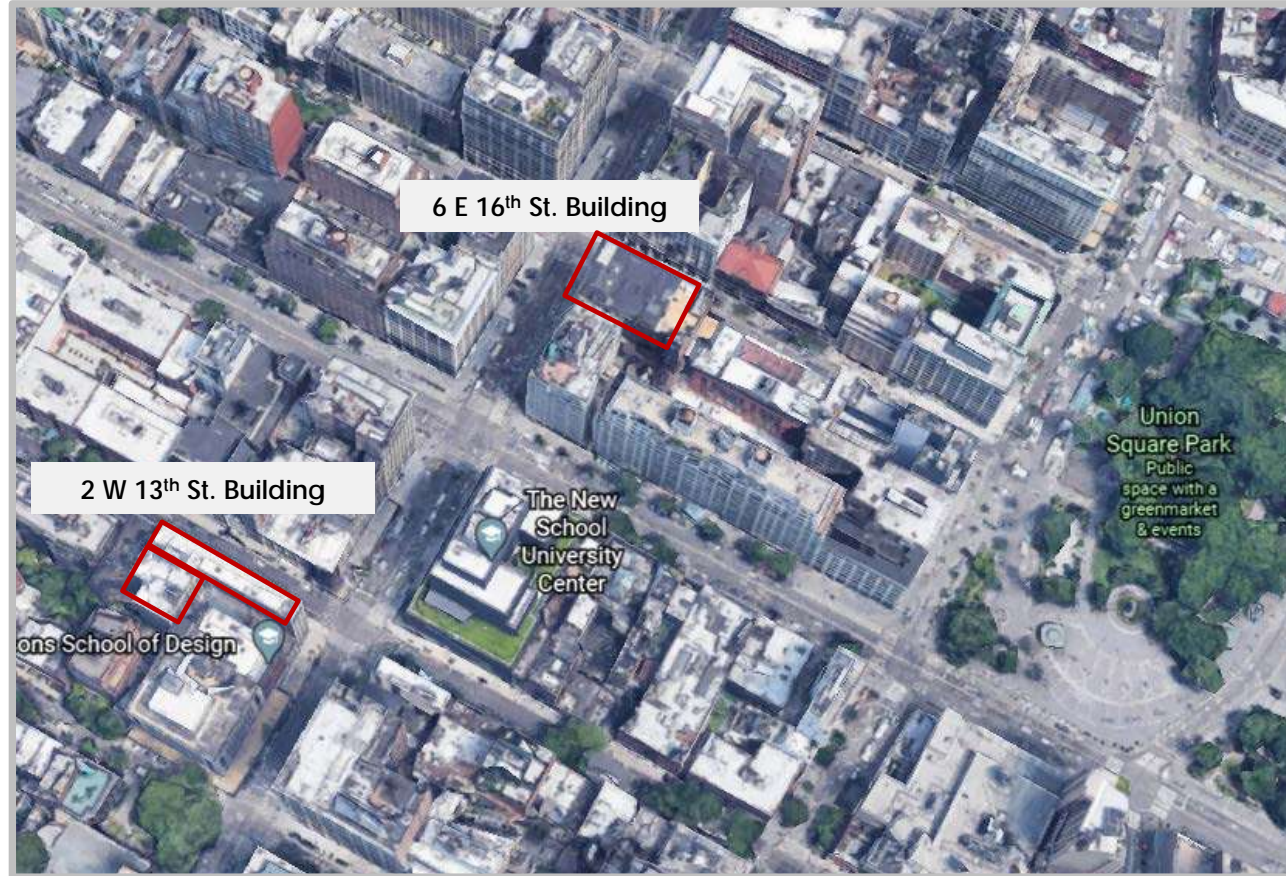
- Some standard vocabulary is essential
- Think about who will be on the ladder and how they get their information
- Both quick start guides, and detailed instructions are needed
- Don't assume just because you made it easy that it is easy, get feedback from the right people
- Local presence onsite is more critical with unfamiliar technologies





NGLS Living Lab - Next Steps

NGLS Living Lab – Parsons, The New School, Midtown Manhattan



Floor 3



Floor 5



Floor 6



Floor 8

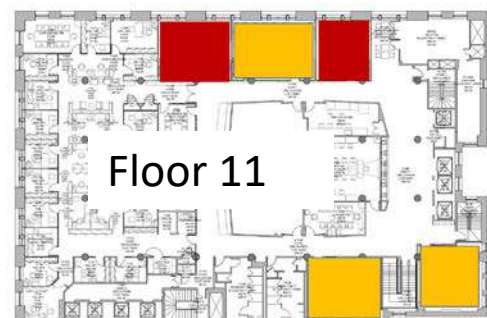
- Existing Living Lab Installations
- Future Possible Living Lab Installations
- Tunable Lighting Study (CBI Collaboration)



Floor 9



Floor 10



Floor 11



Floor 7



Floor 12

QUESTIONS?

This concludes The American Institute of Architects Continuing
Education Systems Course

