LUTRON HXL

Lutron is illuminating the human experience with HXL, a holistic approach to human centric lighting, using four elements of lighting design:

QUALITY LIGHT | NATURAL LIGHT | CONNECTION TO THE OUTDOORS | PERSONALIZED ADAPTIVE CONTROLS

Project Type (check applicable):

- ○ New Construction
- ○ Existing Retrofit

Project Requirements (check all that apply):

- ○ LEED
- ○ WELL
- ○ Living Building Challenge
- ○ Special Code Requirements
- ○ Brand Guidelines | Brand: _____
- ○ Existing Building Standard

Rate in Order of Priority (1=Lowest; 10=Highest):

- ___ Energy Savings
- ___ Environmentally Conscious
- ___ Budget Friendly
- ___ Maximizing Daylight Harvesting
- ___ Mimicking Natural Light Indoors
- ___ Data Driven Optimizations
- ___ Building System Integration
- ___ Individual Control for Occupants
- ___ Single Source Manufacturer
- ___ Aesthetics (WOW factor)

Scope of Work (check all that apply):

LIGHTING
- ○ Fixture Selection
- ○ Lighting Layout
- ○ Sequence of Opps

CONTROLS
- ○ Code Compliance
- ○ Device Layout
- ○ Building Integration

SHADING
- ○ Manual
- ○ Screens
- ○ Automated Solar Tracking
- ○ Motorized
- ○ Blackouts

Code Requirement (check applicable):

- ○ ASHRAE 90.1 2010
- ○ IECC 2012
- ○ ASHRAE 90.1 2013
- ○ IECC 2015
- ○ ASHRAE 90.1 2016
- ○ IECC 2018

see code comparison chart on page 3

HXL DESIGN CONSIDERATIONS

Light Sources

Tunable White Fixtures
ability to shift between warmer and cooler temperatures

Full Color Spectrum
shades of white (1400K to 6000K) + rainbow of saturated colors

Vibrancy Mode
ability to remix white light to bring out bold colors

Dimming Capabilities
down to 1% or 0.1%

Controls

Integrate Lighting and Shading
into one controls system

Change Interior Lighting and Shading
balance and change based on outdoor conditions

Seamlessly Shift Between Color Temperatures

Personal Control
option for occupants to dim and change color temp of lighting

Integration With Building Systems
and occupant workplace apps

Shading

Fabric Openness Factor
preserves views to outdoors

Automated Control
raise and lower based on sun's position and intensity

Personal Control
option for occupants to raise and lower shades at will

ONE SOURCE ASSOCIATES, INC.

LIGHTING CONTROL SEQUENCE OF OPERATION TYPICAL

Conference Room

Daylight Harvesting (if needed): All luminaires in the conference rooms shall be dimmed to maintain 35FC average at the work plane (2.5FT AFF). *To be determined by lighting designer or electrical engineer.*

Occupancy Sensor: Occupancy sensor shall be programmed as a vacancy sensor. If motion is not detected after a maximum of 15 minutes, the occupancy sensor shall trigger the lights to off, with 0% light output.

Control Requirements: Conference shall include a 5-scene keypad with raise/lower. When keypad is utilized by end-user, lights shall raise/lower to the associated levels into the space for a 15 minute time period, then the photosensor shall take precedence over keypad for light level control, such that if adequate daylight is present, lighting levels shall be maintained at the dimmed or off setting. If occupant utilizes switch to change lighting levels a second time, lights shall be overridden to the manual level for a period of 30 minutes before the photosensor initiated lighting levels take priority.

Scenes & Engraving:	**Scene 1: ON** *all lights to full output*	**Scene 2: A/V** *all lights dim to 1%*	**Scene 3: Presentation** *all lights dim to 50%*	**Scene 4: Ambiance** *only perimeter cove ON*	**Scene 5: OFF**	**Sensor Type: VACANCY** **Photocell: YES**	**Timeout: 15 MIN** **System: STANDALONE**

Commercial Open Office

Daylight Harvesting (if needed): All luminaires in the office shall be dimmed to maintain 35FC average at the work plane (2.5FT AFF). *To be determined by lighting designer or electrical engineer.*

Occupancy Sensor: Occupancy sensor shall be disabled during work hours based on timeclock schedule. During nighttime hours, the open office lighting shall be activated by occupancy sensor. When the zone is unoccupied for a minimum of 10 minutes, the lighting shall be reduced to 20% light output. If the space remains unoccupied for a minimum of 30 minutes, all lighting levels shall return to off, 0% light output.

Plug Load Control: 50% of the receptacles controlled by occupancy sensor

Control Requirements: Offices shall include low voltage wireless switch at entry with dimming raise/lower, 50% dim preset and on/off buttons for control of lighting as a single zone in the office. When switch is utilized by end-user, lights shall raise/lower to the associated levels into the space for a 15 minute time period, then the photosensor shall take precedence over switch for light level control, such that if adequate daylight is present, lighting levels shall be maintained at the dimmed or off setting.
If occupant utilizes switch to change lighting levels a second time, lights shall be overridden to the manual level for a period of 30 minutes before the photosensor initiated lighting levels take priority.

Scenes & Engraving:	**Scene 1: ON**	**Scene 2: 50% DIM**	**Scene 3: OFF**	**Scene 4: RAISE/LOWER dimmer function**	**Sensor Type: VACANCY** **Photocell: YES**	**Timeout: 30 MIN** **System: NETWORKED**

Commercial Private Office

Daylight Harvesting (if needed): All luminaires in the office shall be dimmed to maintain 35FC average at the work plane (2.5FT AFF) *To be determined by lighting designer or electrical engineer.*

Occupancy Sensor: Occupancy sensor shall be programmed as a vacancy sensor. If motion is not detected after a maximum of 15 minutes, the occupancy sensor shall trigger the lights to off, with 0% light output. Occupancy sensors shall also be utilized for control of receptacle relays refer to receptacle control section for further information.

Plug Load Control: 50% of the receptacles controlled by occupancy sensor

Control Requirements: Offices shall include low voltage wireless switch at entry with dimming raise/lower, 50% dim preset and on/off buttons for control of lighting as a single zone in the office. When switch is utilized by end-user, lights shall raise/lower to the associated levels into the space for a 15 minute time period, then the photosensor shall take precedence over switch for light level control, such that if adequate daylight is present, lighting levels shall be maintained at the dimmed or off setting.
If occupant utilizes switch to change lighting levels a second time, lights shall be overridden to the manual level for a period of 30 minutes before the photosensor initiated lighting levels take priority.

Scenes & Engraving:	**Scene 1: ON**	**Scene 2: 50% DIM**	**Scene 3: OFF**	**Scene 4: RAISE/LOWER dimmer function**	**Sensor Type: VACANCY** **Photocell: YES**	**Timeout: 15 MIN** **System: STANDALONE**

Classrooms

Daylight Harvesting: (if needed) All luminaires in the office shall be dimmed to maintain 35FC average at the work plane (2.5FT AFF). *To be determined by lighting designer or electrical engineer.*

Occupancy Sensor: Occupancy sensor shall be programmed as a vacancy sensor, If motion is not detected after a maximum of 15 minutes, the occupancy sensor shall trigger the lights to off, with 0% light output. Occupancy sensors shall also be utilized for control of receptacle relays refer to receptacle control section for further information.

Plug Load Control: 50% of the receptacles controlled by occupancy sensor

Control Requirements: Classrooms shall include low voltage wireless switch by entry wall with on/off buttons for control of lighting as a single zone in the classroom and (2) on/off, raise/lower and 50% dim preset by teaching wall to control general classroom lighting and teaching wall lighting zone. When keypad is utilized by end-user, lights shall raise/lower to the associated levels into the space for a 15 minute time period, then the photosensor shall take precedence over keypad for light level control, such that if adequate daylight is present, lighting levels shall be maintained at the dimmed or off setting. If occupant utilizes switch to change lighting levels a second time, lights shall be overridden to the manual level for a period of 30 minutes before the photosensor initiated lighting levels take priority.

Scenes & Engraving:	**Scene 1: ON** **Scene 1: ON**	**Scene 2: OFF** **Scene 2: 50% DIM**	**Scene 3: OFF** **Scene 3: OFF**	**Scene 4: RAISE/LOWER dimmer function** **RAISE/LOWER dimmer function**	**Sensor Type: VACANCY** **Photocell: YES**	**Timeout: 15 MIN** **System: STANDALONE**

ASHRAE 90.1 & IECC CODE COMPARISON

Scope: All new commercial buildings, residential buildings more than 3 floors (in public spaces) AND all lighting renovations that affect more than 20% of lighting load in a space (90.1-2016) and 10% of number of luminaires in a space (IECC 2018). This includes lamp and ballast replacement.

		ASHRAE 90.1 2010	IECC 2012	ASHRAE 90.1 2013	IECC 2015	ASHRAE 90.1 2016	IECC 2018
Manual Control	**Space Control (local override)**	YES - all areas (exception: if an occupancy or vacancy sensor exist)	YES - all areas (exception: corridors and stairwells)	YES - all areas (exception: remote location allowed)	YES - all areas	YES - all areas (remote location allowed; exceptions: restrooms, stairwells)	YES - all areas (exception: corridors and stairwells)
Multi-Level	**Multi-level Lighting**	ALL spaces (exceptions: corridor, restroom, storage rooms, and areas with a vacancy sensor)	ALL spaces (exceptions: corridors, storage rooms, mechanical room, lobbies, and any space that uses an occupancy sensor)	ALL spaces (exceptions: corridors, restroom, storage rooms)	ALL spaces (exceptions: corridors, storage rooms, mechanical room, lobbies, and any space that uses an occupancy sensor)	ALL spaces (exceptions: corridors, restroom, storage rooms)	ALL spaces (exceptions: corridors, storage rooms, mechanical room, lobbies, and any space that uses an occupancy sensor)
Automatic Shut-Off	**Programmable Timeclock**	Open Office	Open Office, Corridors		Open Office, Corridors		Atrium, Parking Garage, Restaurant
	Occupancy Sensor (Full ON)	Corridors, Restrooms, Stairwells	Restrooms, Stairwells	Corridors, Restrooms, Stairwells	Restrooms, Stairwells	Corridors, Restrooms, Stairwells	Restrooms, Stairwells
	Vacancy Sensor (Full ON)	Classroom, Conference, Private Office, Storage Rooms, Break Rooms	Classroom, Conference, Private Office, Storage Rooms, Break Rooms	Required in nearly all spaces	Classroom, Conference, private office, storage rooms, breakrooms, lounges	Required in nearly all spaces	Classroom, Conference, Private Office, Storage Rooms, Breakrooms, Lounges
	Partial OFF (with Occ Sensor)	Corridors and Stairwells	NONE	Corridors and Stairwells	NONE	Corridors and Stairwells	Open Office (600sf zones shall be reduced by 80% lighting power when zone is vacant. Full off when entire open office is vacant)
	Exceptions: General lighting in shop and lab classrooms, patient care areas, 24/7 operation, and where it would endanger safety.						
Daylight Harvesting	**Daylight Control requirement**	Automatic, multi-level (with 1 interim level between on/off)	Separate zone (switched) OR Automatic, multi-level (with 1 interim level between on/off)	Automatic, multi-level with TWO interim levels (in addition to on/off)	Automatic, multi-level (with 1 interim level between on/off)	Automatic, multi-level with TWO interim levels (in addition to on/off)	Automatic, multi-level (with 1 interim level between on/off)
	Daylight Control Areas	Space larger than 250sqft	>2 Fixtures 30%–40% window to wall ratio requires automatic control	>150W in sidelighted area (>300W must have TWO zones)	>150W Offices, labs, classrooms, and libraries REQUIRE DIMMING	>150W in all sidelighted and toplighted areas in a space (>300W must have TWO zones)	>150W Offices, labs, classrooms, and libraries REQUIRE DIMMING
Other	**Receptacle Control**	50% of receptacles in: Open Offices, Private Offices, Computer Classrooms	NONE	50% of receptacles in: Private Offices, Open Offices, Conference Rooms, copy rooms, breakrooms, and all classrooms	NONE	50% of receptacles in: Private Offices, Open Offices, Conference Rooms, copy rooms, breakrooms, and all classrooms	NONE
	Parking Garage	Occupancy sensors to reduce by at least 30% when unoccupied for 20 min. ones no larger than 3600sqft. Must daylight harvest if opening to wall ratio of more than 40%	Occupancy sensors or Timeclock for automatic shut off	Occupancy sensors to reduce by at least 30% when unoccupied for 20 min. ones no larger than 3600 sqft. Must daylight harvest if opening to wall ratio of more than 40%	Occupancy sensors or Timeclock for automatic shut off	Occupancy sensors to reduce by at least 30% when unoccupied for 20 min. ones no larger than 3600 sqft. Must daylight harvest if opening to wall ratio of more than 40%	Occupancy sensors or Timeclock for automatic shut off