

STANDARD SEQUENCE OF OPERATIONS

ASHRAE 90.1 - 2013

STANDARD SEQUENCE OF OPERATIONS

AUTO ON¹
 MANUAL ON (VACANCY)
 AUTO OFF (30MIN MAX)
 AUTO PARTIAL OFF²
 AUTO OFF AFTER HOURS
 TIME ON
 TIME OFF
 ASTRONOMIC or PHOTOCCELL ON/OFF
 AUTO STEP CONTROL WITH OFF⁴
 AUTO CONTINUOUS DIM WITH OFF⁴
 MANUAL BI-LEVEL DIM WITH OFF^{4,5}
 MANUAL CONTINUOUS DIM CONTROL⁶
 MANUAL ON/OFF SWITCH
 MANUAL DIMMER SWITCH
 DISPLAY, ACCENT, TASK CONTROL⁷
 RECEPTACLE CONTROL

v0.1 - 110217

ROOM TYPE	OCCUPANCY SENSOR			TIME SWITCH			DAYLIGHT CTL	LT REDUCT		MANUAL CONTROL			SEQUENCE OF OPERATION
Offices (enclosed ≤ 250 sq ft)	50%		20 min				D	●	D	●	D	●	Auto On 50%. Occupancy sensor Auto Full Off. Local control and ≥50% light reduction with two on/off controls. Auto receptacle control. Where ≥150W in daylight area, use continuous dimming daylighting control and dimmer switch.
Offices (enclosed > 250 sq ft)	50%		20 min				D	●	D	●	D	●	Auto On 50%. Occupancy sensor Auto Full Off. Local control and ≥50% light reduction with two on/off controls. Auto receptacle control. Where ≥150W in daylight area, use continuous dimming daylighting control and dimmer switch.
Office Open Plan (w/individual workstations)	50%		20 min				D	●	D	●	D	●	Auto On 50%. Occupancy sensor Auto Full Off. Local control and ≥50% light reduction with two on/off controls. Auto receptacle control. Where ≥150W in daylight area, use continuous dimming daylighting control and dimmer switch.
Classroom	50%		20 min				D	●	D	●	D	●	Auto On 50%. Occupancy sensor Auto Full Off. Local control and ≥50% light reduction with two on/off controls. Auto receptacle control. Where ≥150W in daylight area, use continuous dimming daylighting control and dimmer switch.
Laboratory Classroom		●	50% 20 min		close		D	●	D	●	D		Manual On. Partial Auto Off 50%. Scheduled Off after hours. Local control and ≥50% light reduction with two on/off controls. Where ≥150W in daylight area, use continuous dimming daylighting control and dimmer switch.
Laboratory (non-classroom)	50%		20 min				D	●	D	●	D	●	Auto On 50%. Occupancy sensor Auto Full Off. Local control and ≥50% light reduction with two on/off controls. Where ≥150W in daylight area, use continuous dimming daylighting control and dimmer switch.
Lecture/Training rooms	50%		20 min				D	●	D	●	D	●	Auto On 50%. Occupancy sensor Auto Full Off. Local control and ≥50% light reduction with two on/off controls. Where ≥150W in daylight area, use continuous dimming daylighting control and dimmer switch.
Conference/Meeting Room	50%		20 min				D	●	D	●	D	●	Auto On 50%. Occupancy sensor Auto Full Off. Local control and ≥50% light reduction with two on/off controls. Auto receptacle control. Where ≥150W in daylight area, use continuous dimming daylighting control and dimmer switch.
Copy/Print Room	50%		20 min				D	●	D	●	D	●	Auto On 50%. Occupancy sensor Auto Full Off. Local control and ≥50% light reduction with two on/off controls. Auto receptacle control. Where ≥150W in daylight area, use continuous dimming daylighting control and dimmer switch.
Electrical/Mech/Equip Rooms		●	20 min							●			Manual On. Occupancy sensor Auto Off; Local On/Off control device.
Restroom	100%		20 min							●			Auto On 100%. Occupancy sensor Auto Full Off; Local On/Off control device.
Lounge/Break Room	50%		20 min				D	●	D	●	D	●	Auto On 50%. Occupancy sensor Auto Full Off. Local control and ≥50% light reduction with two on/off controls. Auto receptacle control. Where ≥150W in daylight area, use continuous dimming daylighting control and dimmer switch.
Dining Area (Cafeteria)	50%		20 min				D	●	D	●	D	●	Auto On 50%. Occupancy sensor Auto Full Off. Local control and ≥50% light reduction with two on/off controls. Where ≥150W in daylight area, use continuous dimming daylighting control and dimmer switch.
Dining Area (Family & all others)		●			close		D	●	D	●	D	●	Manual On. Scheduled Shut Off at business close. After hours 2 hour override from local control device. Local control and ≥50% light reduction with two on/off controls or dimmer. Where ≥150W in daylight area, continuous dimming daylighting control with dimmer switch.
Corridor (non-manufacturing)	100%		50% 20 min		close		D			●	D	●	Occupancy sensor Auto On 100%. Partial Auto Off 50%. Scheduled Shut-Off after hours. Local On/off control device. Where ≥150W in daylight area, use continuous dimming daylighting control and dimmer switch.
Corridor (manufacturing)	100%		20 min				D			●	D	●	Occupancy sensor Auto On 100%. Occupancy sensor Auto Full Off. Local On/Off control device; Where ≥150W in daylight area, use continuous dimming daylighting control and dimmer switch.
Stairwell	100%		50% 20 min		close		D	●	D	●	D		Occupancy sensor Auto On 100%. Partial Auto Off 50%. Scheduled Shut-Off. Local on/off control and ≥50% light reduction with two on/off controls. Where ≥150W in daylight area, use continuous dimming daylighting control and dimmer switch.
Storage Room (<50 sq ft)		●	20 min							●			Manual On. Occupancy sensor Auto Full Off. Local On/Off control device.
Storage Room (>50 and ≤1000 sq ft)		●	20 min				D			●	D		Manual On. Occupancy sensor Auto Full Off. Where ≥150W in daylight area, use continuous dimming daylighting control and dimmer switch.
Storage Room (>1000 sq ft)		●	50% 20 min		close		D			●	D		Manual On. Occupancy sensor Partial Auto Off 50%. Scheduled Shut Off. Local On/off control device. Where ≥150W in daylight area, use continuous dimming daylighting control and dimmer switch.
Library Stacks	50%		50% 20 min	open	close		D	●	D	●	D		Scheduled On 50%. Occupancy sensor Auto On to 100%. Partial Auto Off 50%. Scheduled Shut Off. After hours 2 hour override from local control device. Local control and ≥50% light reduction with two on/off controls. Where ≥150W in daylight area, use continuous dimming daylighting control and dimmer switch.
Library Reading Area	50%			open	close		D	●	D	●	D		Scheduled On 50%. Scheduled Shut Off. After hours 2 hour override from local control device. Local control and ≥50% light reduction with two on/off controls. Where ≥150W in daylight area, continuous dimming daylighting control with dimmer switch.
Multipurpose Room	50%		20 min				D	●	D	●	D	●	Auto On 50%. Occupancy sensor Auto Full Off. Local control and ≥50% light reduction with two on/off controls. Where ≥150W in daylight area, use continuous dimming daylighting control and dimmer switch.
Gymnasium/Fitness Center	50%		20 min				D	●	D	●	D	●	Auto On 50%. Occupancy sensor Auto Full Off. Local control and ≥50% light reduction with two on/off controls. Where ≥150W in daylight area, use continuous dimming daylighting control and dimmer switch.
Locker Room	50%		20 min				D	●	D	●	D		Auto On 50%. Occupancy sensor Auto Full Off. Local control and ≥50% light reduction with two on/off controls. Where ≥150W in daylight area, use continuous dimming daylighting control and dimmer switch.
Warehouse/Storage Area	50%		50% 20 min	open	close		D	●	D	●	D		Scheduled On 50%. Occupancy sensor Partial Auto Off ≥50%. Scheduled Shut Off. Local control device. After hours 2 hour override from local control device. Where ≥150W in daylight area, continuous dimming daylighting control.
Building Façade / Landscape	100%				6AM ³ 12AM ³	●							Dusk Auto On with astronomical time switch or photocell. Scheduled Shut Off no later than midnight or business close. Morning Auto On no earlier than 6AM or business open. Dawn Auto Off.
Exterior / Parking Lots / Site Lighting	100%				6AM ³ 12AM ³	●							Dusk Auto On with astronomical time switch or photocell. Reduce at least 30% from midnight or up to one hour after business close. Auto On 100% at 6:00AM or up to one hour before business open. Dawn Auto Off.
Parking Garage	100%		30% 20 min	open	close		●						Scheduled On 100% when open. Reduce lighting by at least 30% when no activity detected. Scheduled Shut Off. Where perimeter open walls exists, automatically reduce light level in response to daylight.
Hotel / Motel Guestrooms										CK			Manual On and Auto Off lighting and switched receptacles with captive key control.

● = Designation for code compliant default control design for spaces without daylighting control

D = Where daylighting control is required, "D" designation indicates controls required in the space for code compliance design

CK = Captive Key Switch system for use in Hotel/Motel and Guest Suites

NOTES: ¹ Lighting may be Manual On or Auto Partial On to ≤50%. Full Auto On to 100% is only permitted in Corridors, Stairwells, Lobbies, Restrooms, Healthcare, Elect/Mech Rooms, Storage Rooms <50sqft and where Manual On endangers safety or security

² Partial Auto Off must reduce lighting by ≥50% during normal operating hours. Full Auto Off would comply with Partial Auto Off.

³ Exterior / Parking / Site lighting must Auto Off during daylight hours, reduce by at least 30% between the hours of midnight and 6AM or from one hour after business close until 6AM before business opening.

⁴ Automatic daylight control required where ≥150W of lighting is in the toplight or sidelight daylight area. Continuous dimming with Off is used and assumes 0-10V dimming fixtures in daylight and non-daylight area unless known otherwise.

⁵ Code does not require automatic continuous dimming, but it is a general Wattstopper default design when daylighting is required.

⁶ Manual bilevel lighting reduction control must allow ≥50% of the general lighting to be manually turned off by a control device located in the space.

⁷ Display, Accent and Task lighting must be independently controlled from other lighting in the space. It is required to Auto Off with occupancy sensors or time switch control, but is exempt from automatic daylighting control.

Since no sequence of operation was provided, DLM devices will be commissioned to follow the standard sequence of operations provided. This sample chart is provided to be changed by the owner as needed. If there is no start-up/commissioning included,

APPROVED BY: _____

APPROVED DATE: _____

STANDARD SEQUENCE OF OPERATIONS

ROOM TYPE	OCCUPANCY SENSOR		TIME SWITCH		DAYLIGHT CONTROL	LT REDUCT	MANUAL CONTROL		SEQUENCE OF OPERATION
	50%	20 min							
Spaces (< 300 sq ft)						D	●	D	Auto On 50%; Occupancy sensor Auto Off; Local control and ≥50% light reduction with two on/off controls; Where ≥150W in daylight area, use continuous dimming daylighting control and dimmer switch.
Private Offices						D	●	U.....	Auto On 50%; Occupancy sensor Auto Off; Local control and ≥50% light reduction with two on/off controls; Where ≥150W in daylight area, use continuous dimming daylighting control and dimmer switch.
Open Office Areas						D	●	D	Auto On 50%; Occupancy sensor Auto Off; Local control and ≥50% light reduction with two on/off controls; Where ≥150W in daylight area, use continuous dimming daylighting control and dimmer switch.
Class/Lecture/Training rooms						D	●	D	Auto On 50%; Occupancy sensor Auto Off; Local control and ≥50% light reduction with two on/off controls; Where ≥150W in daylight area, use continuous dimming daylighting control and dimmer switch.
Conference/Meeting Room						D	●	D	Auto On 50%; Occupancy sensor Auto Off; Local control and ≥50% light reduction with two on/off controls; Where ≥150W in daylight area, use continuous dimming daylighting control and dimmer switch.
Copy/Print Room						D	●	D	Auto On 50%; Occupancy sensor Auto Off; Local control and ≥50% light reduction with two on/off controls; Where ≥150W in daylight area, use continuous dimming daylighting control and dimmer switch.
Electrical/Mech/Equip Rooms	●								Manual On; Occupancy sensor Auto Off; Local control device.
Janitor Closet	●								Manual On; Occupancy sensor Auto Off; Local control device.
Restroom	100%						●		Auto On 100%; Occupancy sensor Auto Off; Local control and ≥50% light reduction with two on/off controls;
Lunch/Break Rooms/Lounges						D	●	D	Auto On 50%; Occupancy sensor Auto Off; Local control and ≥50% light reduction with two on/off controls; Where ≥150W in daylight area, use continuous dimming daylighting control and dimmer switch.
Public Lobbies						D		D	Auto On 100%; Occupancy sensor Auto Off; Where ≥150W in daylight area, use continuous dimming daylighting control and dimmer switch.
Corridor						D		D	Auto On 100%; Occupancy sensor Auto Off; Where ≥150W in daylight area, use continuous dimming daylighting control and dimmer switch.
Stairwell						D	●	D	Auto On 100%; Occupancy sensor Auto Off; Local control and ≥50% light reduction with two on/off controls; Where ≥150W in daylight area, use continuous dimming daylighting control and dimmer switch.
Storage Room						D	●	D	Auto On 50%; Occupancy sensor Auto Off; Local control and ≥50% light reduction with two on/off controls; Where ≥150W in daylight area, use continuous dimming daylighting control and dimmer switch.
Library Stacks					close	D	●	D	Manual On; Time Off with closing hours. After hours 2 hour override from local control device; Where ≥150W in daylight area, continuous dimming daylighting control with dimmer switch.
Library Open/Reading Area					close	D	●	D	Manual On; Time Off with closing hours. After hours 2 hour override from local control device; Where ≥150W in daylight area, continuous dimming daylighting control with dimmer switch.
Cafeteria / Gym Multipurpose (>1000 sq ft)					11 PM	D	●	D	Manual On; Time Off with closing hours. After hours 2 hour override from local control device; Where ≥150W in daylight area, continuous dimming daylighting control with dimmer switch.
Multipurpose (< 1000 sq ft)						D	●	D	Auto On 50%; Occupancy sensor Auto Off; Local control and ≥50% light reduction with two on/off controls; Where ≥150W in daylight area, use continuous dimming daylighting control and dimmer switch.
Locker Room						D	●	D	Auto On 50%; Occupancy sensor Auto Off; Local control and ≥50% light reduction with two on/off controls; Where ≥150W in daylight area, use continuous dimming daylighting control and dimmer switch.
Lab						D	●	D	Auto On 50%; Occupancy sensor Auto Off; Local control and ≥50% light reduction with two on/off switches; Where ≥150W in daylight area, use continuous dimming daylighting control and dimmer switch.
Warehouse Aisle (Racks)			50% 20 min	20 min	open close	D	●	D	Time On 50%; Occupancy sensor Partial Off ≥50%; Local control device; After hour occupancy sensor Auto On/Off; Where ≥150W in daylight area, continuous dimming daylighting control.
Warehouse Open Area			50% 20 min	20 min	open close	D	●	D	Time On 50%; Occupancy sensor Partial Off ≥50%; Local control device; After hour occupancy sensor Auto On/Off; Where ≥150W in daylight area, continuous dimming daylighting control.
Restaurant / Dining					close	D		D	Manual On; Time Off with closing hours. After hours 2 hour override from local control device; Where ≥150W in daylight area, continuous dimming daylighting control with dimmer switch.
Building Façade / Landscape					open close	●			Dusk Auto On with astronomical time switch or photocell; Evening Time Auto Off as a function of close time. Morning Time On as a function of open time; Dawn Auto Off.
Exterior / Parking Lots / Site Lighting					6AM ¹ 12:00 AM ²	●			Dusk Auto On with astronomical time switch or photocell; Reduce at least 30% from midnight or up to one hour after business close. Auto On to full at 6:00AM or up to one hour before business open. Dawn Auto Off.
Parking Garage					open close				Time On 100% when open. Time Off when closed.
High Rise Residential Corridors						D		D	Auto On 100%; Occupancy sensor Auto Off; Where ≥150W in daylight area, use continuous dimming daylighting control and dimmer switch.
Hotel / Motel Guestrooms								CK	Manual On and Auto Off lighting and switched receptacles with captive key control.

- = Designation for code compliant default control design for spaces without daylighting control
- D = Where daylighting control is required, "D" designation indicates controls required in the space for code compliance design
- CK = Captive Key Switch system for use in Hotel/Motel and Guest Suites

NOTES: ¹ Lighting may be Manual On or Auto Partial On to ≤50%. Full Auto On to 100% is only permitted in Public Corridors, Stairways, Primary Entrances, Lobbies, Restrooms and where Manual On endangers safety or security
² Partial Auto Off must reduce lighting by ≥50% during normal operating hours in warehouse aisles and warehouse open areas. Each aisle must be independently controlled. Full Auto Off would comply with Partial Auto Off.
³ Exterior / Parking / Site lighting must Auto Off during daylight hours, reduce by at least 30% between the hours of midnight and 6AM or from one hour after business close until 6AM before business opening.
⁴ Automatic daylight control required where ≥150W of lighting is in the twilight or sidelight daylight area. Continuous dimming with Off is used and assumes 0-10V dimming fixtures in daylight and non-daylight area unless known otherwise.
⁵ Code requires automatic continuous dimming with full Off capability in daylighting areas of offices, classrooms, labs and library reading rooms.
⁶ Manual bilevel lighting reduction control must allow ≥50% of the general lighting to be manually turned off by a control device located in the space.
⁷ Display, Accent and Task lighting must be independently controlled from other lighting in the space. It is required to Auto Off with occupancy sensors or time switch control, but is exempt from automatic daylighting control.

Since no sequence of operation was provided, DLM devices will be commissioned to follow the standard sequence of operations provided. This sample chart is provided to be changed by the owner as needed. If there is no start-

APPROVED BY: _____ APPROVED DATE: _____

STANDARD SEQUENCE OF OPERATIONS

ROOM TYPE	OCC SENSOR		PHOTOCELL		DIMMING		TIME CLOCK		SWITCHES		SYSTEM				REMARKS									
	AUTO ON ²	MANUAL ON ³	AUTO OFF	PARTIAL OFF AT NORMAL HOURS	AUTO OFF FOR AFTER HOURS	AUTO DIM @ TARGET FC	SET LEVEL TO TARGET FC	CONTINUOUS ¹	STEP ¹	MULTIZONE ²	TIME ON ⁴	TIME OFF ⁴	ASTRONOMICAL TIME CLOCK	WALL SWITCH		DIMMER SWITCH	SCENE CONTROL	PLUG LOAD	NETWORK	STAND-ALONE	CURRENT MONITORING ⁵	AUXILIARY RELAY	REMOTE SIGNAL CONTROL	DEMAND RESPONSE
Commercial Bldg (> 10,000 sq ft)																								Demand Response required. Total area will need to be broken down to be Title 24 compliant. Current monitoring is included into demand response products.
Areas w/ 1-2 lamp single luminaire (< 100 sq ft)	100%		20 min																					Spaces with more than 100 sq ft will need either continuous dimming or 4 levels of step dimming, depending on lighting type.
Small Office (< 250 sq ft)		•	20 min			•	•	•							•									Multi-level dimming is not needed for LPD < 2 W per sq ft.
Large Office (> 250 sq ft)		•	20 min			•	•	•	7 AM	7 PM					•									Can be either occupancy sensor or time clock or both
Open Office Area		•	20 min			•	•	•	7 AM	7 PM					•									Can be either occupancy sensor or time clock or both
Classroom (> .7 W per sq ft)		•	20 min			•	•	•																Classrooms ≤ 0.7W per sq ft are exempt from multi-level control
Copy Room		•	20 min				•	•							•									Plug load control required. All other Title 24 options are needed per office size requirements.
Electrical Room (< 100 sq ft)	100%		20 min											•										DW-100 sourced
Janitor Closet	100%		20 min											•										DW-100 sourced
Restroom (≥ 100 sq ft)	100%		20 min				•	•							•									
Office Kitchens (≥ 100 sq ft)		•	20 min				•	•							•									
Corridor	100%		50% 10 min	10 min			•	•							•									For residential and hotel applications, corridors can be kept on during after hours. Shall be automatically activated from all design paths of egress.
Lobby	100%		20 min				•	•							•									Plug load only for reception lobby
Storage Room (< 100 sq ft)	100%		20 min											•										DW-100 sourced
Warehouse Aisle (Racks)	100%		50% 20 min	20 min	•	•	•	•	7 AM	5:30 PM					•									
Warehouse Open Area	100%		50% 20 min	20 min	•	•	•	•	7 AM	5:30 PM					•									
Library Stacks	100%		50% 20 min	20 min		•	•	•							•									Must have independent zones for each aisle.
Library Open Area	100%		20 min			•	•	•							•									
Restaurant / Dining		•	20 min			•	•	•							•									
Cafeteria / Gym Multipurpose (> 1000 sq ft)						•	•	•	5 AM	11 PM					•									Room Controller with dimming capabilities and dimming switch will be needed if a photocell is necessary.
Multipurpose (≤ 1000 sq ft)	100%		20 min			•	•	•							•									
Stairwell	100%		50% 20 min	20 min			•	•							•									For residential and hotel applications, stairwells can be kept on during after hours.
Lab		•	30 min			•	•	•							•									
Exterior / Wall	100%		50% 20 min		•		•	•				•			•									Outdoor luminaires with bottoms ≤ 24' above ground need occupancy sensors. No more than 1,500W lighting controlled together.
Parking Garage	100%		50% 20 min		•		•	•							•									Multi-level is not required except when daylighting is needed. Daylight is not needed if daylight opening is less than 36 sq ft total.
Parking Lots/Loading/Unloading Areas					•							•												
High Rise Residential Corridors	100%		50% 20 min				•	•							•									Must be automatically activated from all design paths of egress.
Hotel Guestrooms		•	20 min												•							•		Need HVAC equipment and lights (including plug-in lighting) to be linked to occ sensors. Half of controlled receptacles in guest room. This can be achieved by card key control, occupancy sensing controls, or automatic controls such that no longer than 30 min has been vacant power is switched off.

NOTES: ¹ Continuous dimming and step dimming are chosen based on light source type per Title 24 130.1A. If continuous dimming is not necessary per lighting source, then LMSW-103 will be provided with 50% for step dimming.

² Multizone is shown chosen due to typical rooms. For example, if there is a primary daylight zone and a non-daylighting zone, then these zones must be separated. Therefore, an open office will need separated zones.

³ There are no Title 24 requirements for manual on and auto on. There are only requirements for partial off NH and auto off AH.

⁴ Daylighting is not necessary when areas do not include skylights or glazing < 24 sq ft or skylit-primary sidelit zone is less than 120W. Luminaires in or at least 50% within daylighting zones must be controlled.

⁵ Timedclock settings can be changed to have different time on/off settings. Typical schedules were added in chart above.

⁶ Scene control is not necessary per Title 24 as long as dimming provided is per lighting source standards. Scene control can be checked off by end user if needed.

⁷ Controlled plug load must be within 6 ft of uncontrolled receptacle where controlled plug loads are needed.

NOTES FOR

EXTERIOR:

Exceptions: Signs, facade lighting, statues, bridges, health or life safety lighting.

Luminaires that illuminate public right of way roads, sidewalks, and bikeways.

Exterior Wall: Outdoor luminaires with bottoms less than or equal to 24' above the ground need motion or other controls.

Outdoor lighting needs to be controlled by astronomical time clock and automatically shut off by photocell.

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STANDARD SEQUENCE OF OPERATIONS

ROOM TYPE	AUTO ON ¹		MANUAL ON ²		AUTO OFF		PARTIAL OFF AT NORMAL HOURS		AUTO OFF AFTER HOURS (MAX 20MIN)		AUTO OFF @ TARGET LFC		SET LEVEL TO 50 FC		CONTINUOUS ¹		STEP ¹		MULTIZONE ²		TIME CLOCK		TIME OFF ⁴		ASTRONOMICAL TIME CLOCK		WALL SWITCH		DIMMER SWITCH ⁵		SCENE CONTROL		PLUG LOAD		NETWORK		STAND-ALONE		CURRENT MONITORING ⁶		AUXILIARY RELAY		REMOTE SIGNAL CONTROL		DEMAND RESPONSE					
	OCC SENSOR																																																	
Commercial Bldg (> 10,000 sq ft)																																															Demand Response required. Total area will need to be broken down to be Title 24 compliant. Current monitoring is included into demand response products. Spaces with Total Lighting < .5W/sqft are not included.			
Areas w/ 1-2 lamp single luminaire (< 100 sq ft)	100%		20 min																																												Spaces with more than 100 sq ft will need either continuous dimming or 4 levels of step dimming, depending on lighting type.			
Small Office (≤ 250 sq ft)		●	20 min																																												Plug Load Required. Sensor required space. Partial On or Vacancy if space requires multilevel.			
Large Office (> 250 sq ft)		●	20 min																			7 AM	7 PM																							Can be either occupancy sensor or time clock or both Plug Load Required.				
Open Office Area		●	20 min																			7 AM	7 PM																							Can be either occupancy sensor or time clock or both Plug Load Required.				
Classroom (> .7 W per sq ft)		●	20 min																																												Sensor required space. Classrooms ≤ 0.7W per sq ft are exempt from multi-level control, but require bilevel 30-70%. Partial On or Vacancy if space requires multilevel.			
Conference Room		●	20 min																																												Sensor required space. Plug Load Required. Partial On or Vacancy if space requires multilevel.			
Copy Room		●	20 min																																												Plug load control required. All other Title 24 options are needed per office size requirements.			
Electrical Room (< 100 sq ft)	100%		20 min																																												DW-100 sourced Cannot be solely Automatically Controlled			
Janitor Closet	100%		20 min																																												DW-100 sourced			
Restroom (≥ 100 sq ft)	100%		20 min																																												Restrooms are exempt from multi-level, but require bilevel 30-70%			
Office Kitchens (≥ 100 sq ft)		●	20 min																																															
Corridor	100%		50% 10 min	10 min																																												Full or Partial Off, and Off After Hour for commercial spaces. For residential and hotel applications, corridors can be kept on during after hours. Shall be automatically activated from all design paths of egress.		
Lobby	100%		20 min																																													Plug load required only for reception lobby		
Storage Room (< 100 sq ft)	100%		20 min																																													DW-100 sourced		
Warehouse Aisle (Racks)	100%		50% 20 min	20 min																		7 AM	5:30 PM																											
Warehouse Open Area	100%		50% 20 min	20 min																		7 AM	5:30 PM																											
Library Stacks	100%		50% 20 min	20 min																																													Must have independent zones for each aisle. Full or Partial Off, and Off After Hours	
Library Open Area	100%		20 min																																															
Restaurant / Dining		●	20 min																																															
Cafeteria / Gym Multipurpose (> 1000 sq ft)																						5 AM	11 PM																									Room Controller with dimming capabilities and dimming switch will be needed if a photocell is necessary.		
Multipurpose (≤ 1000 sq ft)	100%		20 min																																															
Stairwell	100%		50% 20 min	20 min																																													Full or Partial Off, and Off After Hour For residential and hotel applications, stairwells can be kept on during after hours.	
Lab		●	30 min																																															
Exterior / Wall	100%		50% 20 min																																															Outdoor luminaires with bottoms ≤ 24' above ground need occupancy sensors. No more than 1,500W lighting controlled together.
Parking Garage	100%		50% 20 min																																															Partial Off required, with no Auto Off. Multi-level is not required except when daylighting is needed. Daylight is not needed if daylight opening is less than 36 sq ft total.
Parking Lots/Loading/Unloading Areas																																																		
High Rise Residential Corridors	100%		50% 20 min																																															Partial Off required, with no Auto Off. Shall be automatically activated from all design paths of egress.
Hotel Guestrooms		●	20 min																																															Need HVAC equipment and lights (including plug-in lighting) to be linked to occ sensors. Half of controlled receptacles in guest room. This can be achieved by card key control, occupancy sensing controls, or automatic controls such that no longer than 30 min has been vacant power is switched off. Time delay is allowed to max 30 minutes.

- NOTES: ¹ Continuous dimming and step dimming are chosen based on light source type per Title 24 130.1A. If continuous dimming is not necessary per lighting source, then LMSW-103 will be provided with 50% for step dimming.
- ² Multizone is shown chosen due to typical rooms. For example, if there is a primary daylight zone and a non-daylighting zone, then these zones must be separated. Therefore, an open office will need separated zones.
- ³ There are no Title 24 requirements for manual on and auto on. There are only requirements for partial off NH and auto off AH.
- ⁴ Daylighting is not necessary when areas do not include skylights or glazing < 24 sq ft or skylit-primary sidelit zone is less than 120W. Luminaires in or at least 50% within daylighting zones must be controlled.
- ⁵ Timedock settings can be changed to have different time on/off settings. Typical schedules were added in chart above.
- ⁶ Scene control is not necessary per Title 24 as long as dimming provided is per lighting source standards. Scene control can be checked off by end user if needed.
- ⁷ Controlled plug load must be within 6 ft of uncontrolled receptacle where controlled plug loads are needed.

NOTES FOR EXTERIOR:

- Exceptions: Signs, façade lighting, statues, bridges, health or life safety lighting.
- Luminaires that illuminate public right of way roads, sidewalks, and bikeways.
- Exterior Wall: Outdoor luminaires with bottoms less than or equal to 24' above the ground need motion or other controls.
- Outdoor lighting needs to be controlled by astronomical time clock and automatically shut off by photocell.

APPROVED BY: _____

APPROVED DATE: _____