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Wattstopper® Quick Guide to

VERMONT CBES (2020)

Commercial Lighting Control Requirements

Scope: Lighting system controls for interior and exterior applications

Exceptions: Continuously lighted security and emergency areas; exit stairs, ramps, passageways; emergency egress lighting normally off; R-2 dwelling and sleeping units; non-R-2 dwelling units with ≥ 90% high-efficacy fixtures and lamps; as required for safety and production in industrial or manufacturing process areas

Alterations: Code applies when ≥ 10% of the lighting system is replaced, or when the alteration increases the lighting power

LUMINAIRE LEVEL LIGHTING CONTROLS

INTERIOR LIGHTING CONTROLS

OCCUPANCY SENSOR REQUIREMENTS

Occupancy Sensor Controls C405.2.1 ▪ Lights auto off within 20 minutes of occupants leaving ▪ Manual off control	**Required for the Following Space Types** ▪ Class/lecture/training ▪ Enclosed offices ▪ Locker rooms ▪ Conference/meeting ▪ Open plan offices ▪ Spaces ≤ 300ft² ▪ Copy/print rooms ▪ Restrooms ▪ Warehouse ▪ Lounges/break rooms ▪ Storage rooms	**Key Exceptions** ▪ None
Manual On or Partial Auto On C405.2.1.1.2 ▪ Manual on or partial auto on to ≤ 50% power	**Lighting Full Auto On Only Permitted for** ▪ Public corridors ▪ Primary entrances ▪ Restrooms ▪ Stairways ▪ Lobbies ▪ Areas where manual on would endanger safety and security	**Key Exceptions** ▪ Where full auto on is permitted, Manual On or Partial Auto On control is not required
Warehouse Aisle & Open Areas C405.2.1.2 ▪ Automatically reduce lighting ≥ 50% when unoccupied (Auto off by timeswitch or occupancy sensor required)	**Each aisle independently controlled, cannot control lighting beyond aisles**	**Key Exceptions** ▪ Need not comply with auto off, manual or partial on or manual off provisions of C405.2.1.1
Occupancy Sensors in Open Office C405.2.1.3 ▪ Control zone limited to no more than 600ft² ▪ Auto off or reduce lights ≥ 80% light power ▪ Auto off all zones within 20 minutes		**Key Exceptions** ▪ Where open offices are < 300ft² comply with section C405.2.1.1
Egress Lighting Control C405.2.1.4 ▪ Where egress lighting is required when a space is occupied, reduce lighting power by ≥ 50% light power when unoccupied for longer than 15 minutes		**Key Exceptions** ▪ Where LPD is ≤ 50% space-by-space LPA ▪ Where egress lighting ≤ 0.02W/ft2 ▪ Emergency lighting meeting NFPA 1 or 101

TIMESWITCH REQUIREMENTS (where occupancy sensors not used)

Time Switch Controls C405.2.2 ▪ Scheduled lighting shut off ▪ Provide manual override & light reduction control ▪ Override for ≤ 2 hours, control area ≤ 5,000ft²	**In Mall Concourses, Auditoriums, Sales Areas, Manufacturing Facilities, Sports Arenas** ▪ Override permitted > 2 hours with captive key switch ▪ Control area ≥ 20,000ft²	**Key Exceptions** ▪ Where patient care is directly provided ▪ Where auto off endangers safety or security ▪ 24/7 operations ▪ Shop and laboratory classrooms
Light Reduction Control C405.2.2.2 ▪ Manual controls that uniformly dim or switch off ≥ 50% of lighting	**Choose between bilevel switching or dimming light reduction controls in the space**	**Key Exceptions** ▪ One luminaire < 50W or LPD < 0.3W/ft2 ▪ Daylight-responsive control zones ▪ The following space types: ▪ Corridors ▪ Equipment rooms ▪ Lobbies ▪ Elect/mech rooms

ADDITIONAL LIGHTING CONTROL REQUIREMENTS

Manual Controls C405.2.5 ▪ Readily accessible to occupants ▪ Controlled lighting is visible from manual control device	**Choose between switching or dimmingmanual controls**	**Key Exceptions** ▪ When installed remotely, identify the area controlled and indicate the lighting's status
Daylight Responsive Control C405.2.3 ▪ Automatic continuous dimming to ≤ 15% in offices, classrooms, labs, library reading rooms. Automatic step dimming with two levels plus on/off ▪ Configure to completely turn lighting off ▪ Authorized calibration in space with ready access ▪ Control sidelit independent of toplit area ▪ Incorporate three-minute or more cycle time delay ▪ Daylight controlled area limited to 2500ft² ▪ Occupant override allowed with auto reset within 12 hrs	**Primary daylight area lighting power > 150W?** **YES** → **Daylight Control Required** **NO** → **Daylight Control Not Required**	**Key Exceptions** ▪ Direct patient care areas ▪ Specific application lighting ▪ Sidelight fenestration is < 24ft² ▪ Obstructions block daylight ▪ Visible transmittance is too low ▪ Daylight zone LPD is < 35% of LPA ▪ Where LPD is reduced by equation 4-8 ▪ Vertical fenestration < 10% of daylight zone ▪ Parking garages where net opening < 40%
Specific Application Controls C405.2.4 ▪ Manual control independent from general lighting ▪ Auto off by timeswitch or occupancy sensor	**Required for the Following Lighting** ▪ Display & accent ▪ Lighting for sale ▪ Supplemental task ▪ Display cases ▪ Lighting for education ▪ Under shelf/cabinet ▪ Food warming ▪ Plant growth	**Key Exceptions** ▪ None
Sleeping Units C405.2.4.2 ▪ Auto off all permanent luminaires and switched receptacles within 20 minutes of occupants leaving		**Key Exceptions** ▪ Where lighting and switched receptacles are controlled by card key controls ▪ Spaces where direct patient care provided
Exterior Lighting Controls C405.2.6 ▪ Auto off when daylight available ▪ Façade & landscape lights auto off up to one hour after business close to one hour before business open ▪ All other lighting reduce power ≥ 30% no later than midnight to 6 AM, one hour after closing to one hour before opening, or when no activity for > 15 min		**Key Exceptions** ▪ Covered vehicle entrance/exits where required for eye adaptation ▪ Lighting controlled from within a dwelling unit

ADDITIONAL ENERGY EFFICIENCY CREDITS

Additional Energy Efficiency Credits C406.1 ▪ Comply with a minimum of six credits: 2.1 Reduce lighting power to ≤ 90% LPA 2.2 Reduce lighting power to ≤ 80% LPA 3. Provide enhanced digital lighting controls 10. Controlled receptacles	**Buildings must select efficiency credit package options to achieve a minimum of six credits from Table C406.1**	**Key Exceptions** Tenant space alterations which previously complied with one of these package options
Lighting System Functional Testing C407.3 ▪ Prior to passing final inspection, the design professional/ agency provides evidence the lighting controls have been tested, calibrated, adjusted, programmed, and in proper working condition	**Documentation Requirements** Provide required documents to the owner within 90 days after the certificate of occupancy is issued	**Key Exceptions** ▪ None