

Washington State Energy Codes

An Overview

The Washington State Energy Code (commercial) is updated every three years – most recently in 2018. It regulates the energy use of all new and renovated buildings in the state. It operates alongside the Seattle Commercial Energy Code (SCEC), which was updated in December 2020 and builds on the WSEC with additional recommendations.

This guide outlines the major elements of the code that affect commercial lighting, and demonstrates how Enlighted meets its stringent new guidelines for both interior and exterior lighting.

The Washington code took effect in February 2021, and the revised Seattle code goes into force on July 1, 2021. All new builds and renovations will be required to meet the new energy guidelines in their jurisdictions.

Compliance can be calculated by a space-by-space method, or a building area method. The Enlighted IoT platform functions for both, with a user-friendly interface that helps complete these calculations.

The Enlighted IoT platform supports instant compliance with the lighting requirements in the 2018 WSEC, and goes above and beyond what is required by the code. Because it uses data-driven insights for lighting controls, it can be instantly reconfigured to meet current,

and future, code requirements. In addition, the Enlighted platform easily generates settings reports that are required by Section C408 of the code.

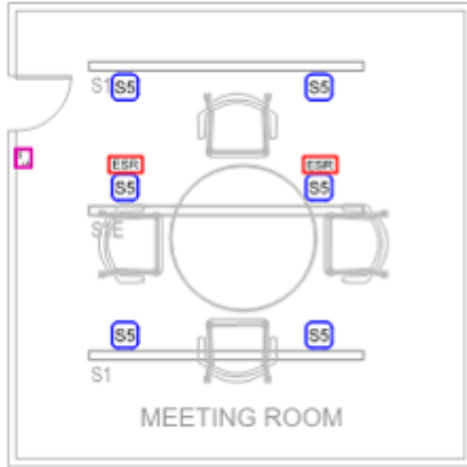
Each update of WSEC creates new requirements for building projects. Implementing Enlighted now can ensure immediate compliance. Because the Enlighted platform is easily upgradeable, with wireless networks and programmable adjustments, it can help building owners prepare their buildings to ensure future compliance as well.

To ensure your building project is fully compliant with the WSEC, please [contact us directly](#).

Area Controls

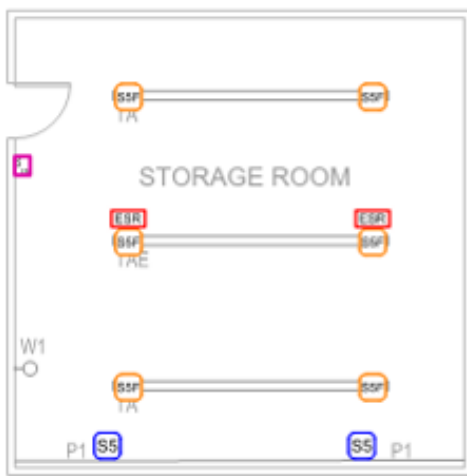
Lighting Type or Building Area	WSEC 2018 Requirement	How Enlighted Provides Immediate Compliance and Future Proofing
Dwelling and sleeping units	<p>C405.1.1 No less than 90% of the lamps serving dwelling units or sleeping units shall be provided by light emitting diodes (LED), T-8 or smaller diameter linear fluorescent lamps, or other lamps with a minimum efficacy of 65 lumens per watt.</p>	Enlighted sensors are pre-installed in LED luminaires, allowing energy savings and fully controllable lighting.
All lighting controls	<p>C405.2 Lighting systems shall be provided with controls that comply with one of the following: 1. Lighting controls as specified in Sections C405.2.1 through C405.2.7. 2. Luminaire level lighting controls (LLLC) and lighting controls as specified in Sections C405.2.1, C405.2.3 and C405.2.5.</p> <p>The LLLC luminaire must be independently configured to:</p> <p>Monitor occupant activity to brighten or dim lighting when occupied or unoccupied.</p> <p>Monitor ambient light, and brighten or dim artificial light to maintain desired light level.</p> <p>Each control strategy must be re-configurable for parameters including: bright and dim set points, timeouts, dimming fade rates, sensor sensitivity adjustments, and wireless zoning configuration.¹</p>	Enlighted sensors contain occupancy and ambient light sensors, and control lighting levels in response to easily reconfigurable settings. This feature ensures compliance with the LLLC guidelines, because each luminaire can be independently configured from a central user interface to meet all requirements.
<ul style="list-style-type: none"> • Classrooms/lecture/training rooms • Conference/meeting/multipurpose rooms • Copy/print rooms • Lounge/breakrooms • Enclosed offices • Open plan office areas • Restrooms • Storage rooms • Locker rooms • Other spaces 300 square feet (28 m²) or less that are enclosed by floor-to-ceiling height partitions • Warehouse storage areas • Enclosed fire rated stairways • Service corridors • Covered parking areas 	<p>C405.2.1 Occupant sensor controls shall be installed to control lights in all areas.</p>	Enlighted sensors create a dense network that covers every inch of space in a facility, allowing controls that respond to occupant location and movement. See room layout diagram.

Meeting room



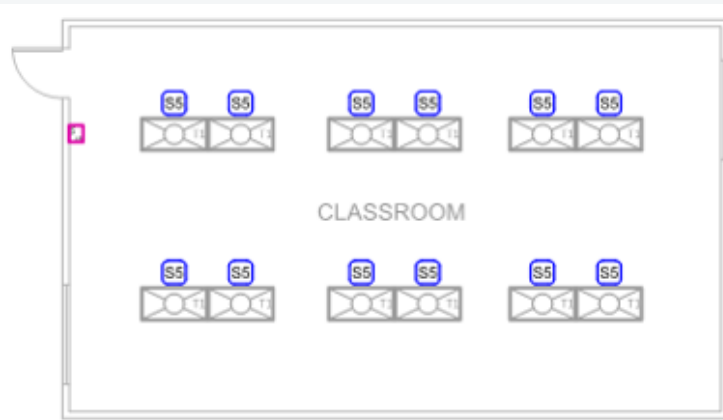
BILL OF MATERIALS		
LEGEND	CODE	DESCRIPTION
S5	SU-5E-IOT/ CU-4E-FMH	Micro Sensor Control Unit, Field installed
ESR	ESRN	UL924 Relay
⌘	WS-2-00	Wireless Room Control

Storage room



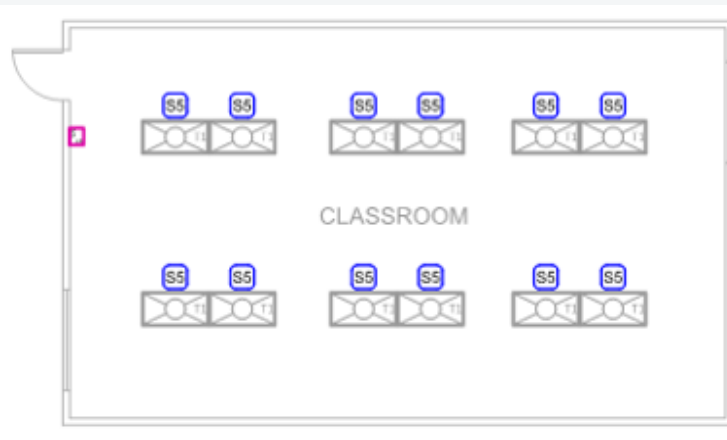
BILL OF MATERIALS		
LEGEND	CODE	DESCRIPTION
S5F	SU-5E-IOT/ CU-4E-FMH	Micro Sensor Control Unit, Factory installed
S5	SU-5E-IOT/ CU-4E-FMH	Micro Sensor Control Unit, Field installed
ESR	ESRN	UL924 Relay
⌘	WS-2-00	Wireless Room Control

Class room



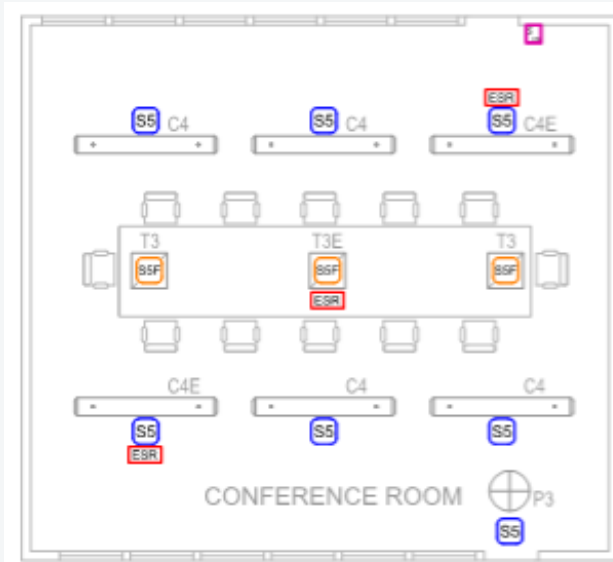
BILL OF MATERIALS		
LEGEND	CODE	DESCRIPTION
S5	SU-5E-IOT/ CU-4E-FMH	Micro Sensor Control Unit, Field installed
⌘	WS-2-00	Wireless Room Control

Warehouse



BILL OF MATERIALS		
LEGEND	CODE	DESCRIPTION
	SU-5E-IOT/ CU-4E-FMH	Micro Sensor Control Unit, Field installed
	WS-2-00	Wireless Room Control

Conference room



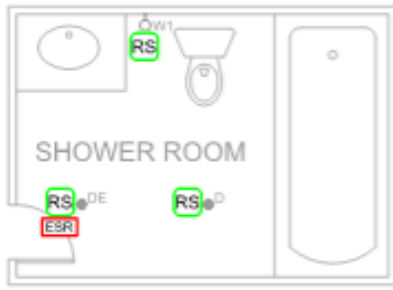
BILL OF MATERIALS		
LEGEND	CODE	DESCRIPTION
	SU-5E-IOT/ CU-4E-FMH	Micro Sensor Control Unit, Factory installed
	SU-5E-IOT/ CU-4E-FMH	Micro Sensor Control Unit, Field installed
	ESRN	UL924 Relay
	WS-2-00	Wireless Room Control

Toilet room



BILL OF MATERIALS		
LEGEND	CODE	DESCRIPTION
	SU-5E-IOT/ CU-4E-FMH	Micro Sensor Control Unit, Field installed
	SU-5E-IOT/ CU-4E-FMH	Micro Sensor Control Unit, Factory installed
	SU-5E-IOT/ CU-4E-NME	Micro Sensor Nipple mount Control Unit, Field installed

Shower room



BILL OF MATERIALS		
LEGEND	CODE	DESCRIPTION
RS	SU-5S-LRW/ CU-4E-FMH	Rugged Sensor Control Unit, Field installed
ESR	ESRN	UL924 Relay

Lighting Type or Building Area	WSEC 2018 Requirement	How Enlighted Provides Immediate Compliance and Future Proofing
Occupant sensor control function	<p>C405.2.1.1 Occupant sensor controls shall:</p> <ol style="list-style-type: none"> 1. Be configured to automatically turn off lights within 20 minutes of all occupants leaving the space. 2. Have manual on or be configured to automatically turn the lighting on to not more than 50 percent power. 3. Have manual controls to allow occupants to turn lights off. 	Enlighted can be programmed to adjust lighting levels at a set time after motion is no longer detected, and room-level controls allow occupants to manually switch lights off.
Open plan office areas	<p>C405.2. General lighting must be controlled in zones with floor areas not greater than 600 sf ft (55m2) within the open plan office space.</p> <p>Lighting must automatically turn off in all control zones within 20 minutes after all occupants have left the space.</p> <p>General lighting power in each control zone must be reduced by not less than 80 percent of the full zone power within 20 minutes of all occupants leaving that control zone.</p> <p>Control functions must switch control zone lights completely off when the zone is unoccupied.</p> <p>Daylight responsive controls must activate open plan office space general lighting or control zone general lighting only when occupancy is detected.</p>	Enlighted can be easily configured in groups and zones, with daylight responsive controls controlled by occupancy sensors.
Parking garages	<p>C405.2.1.4 Lighting power of each luminaire must be automatically reduced by a minimum of 30 percent when there is no vehicle or pedestrian activity detected within a lighting zone for 20 minutes.</p> <p>Lighting must be automatically restored to full power when occupants enter the space.</p>	<p>Enlighted sensors continuously dim fixtures in tune with the ambient light level, space occupancy, and the individual's preferences.</p> <ul style="list-style-type: none"> * The Enlighted system is distributed and does not require centralized control. * Enlighted can be quickly and easily reprogrammed when the floor plan changes.

Lighting Type or Building Area	WSEC 2018 Requirement	How Enlighted Provides Immediate Compliance and Future Proofing
Enclosed fire-rated stairways	<p>C405.2.1.5 Occupant sensor controls must automatically reduce lighting power by not less than 50% when no occupants have been detected for a period not exceeding 20 minutes and restore lighting to full power when occupants enter the stairway. All portions of stairways must stay illuminated to meet requirements of Section 1009 of the International Building Code when the lighting power is reduced.</p>	Enlighted controls can be set to adjust lighting levels to any power level at and for any preset length of time.
All building areas	<p>C405.2.2 Time switch controls. All areas of a building not provided with occupant sensor controls or digital timer switch controls complying with Section C405.2.1 must have time switch controls except for the following:</p> <ol style="list-style-type: none"> 1. Spaces where patient care is directly provided. 2. Spaces where an automatic shutoff would endanger occupant safety or security. 3. Lighting intended for continuous operation. 4. Shop and laboratory classrooms. 	The Enlighted IoT platform has a central Energy Manager that acts as a clock, allowing operators to program the lights to adjust lighting levels to any level, at any time.
Interior and exterior lighting time switch control function	<p>C405.2.2.1 (interior) and C405.2.6.4 (exterior) Time switch controls must:</p> <ul style="list-style-type: none"> • Have a minimum 7 day clock. • Be capable of being set for 7 different day types per week. • Incorporate an automatic holiday “shutoff” feature, which turns off all controlled loads for at least 24 hours and then resumes normally scheduled operations. • Have program back-up capabilities to prevent the loss of program and time settings for at least 10 hours if power is interrupted. • Include an override switching device that is a manual control, permits controlled lighting to remain on for not more than 2 hours, and controls the lighting for an area not larger than 5,000 sq ft (465 m²). • With a few exceptions for health and safety facilities, time switch controls may automatically turn on the lighting to not more than 50 percent power. 	Enlighted Manage is programmable and automatically backed up to the cloud to maintain settings.
Manual controls in all building areas	<p>C405.2. Manual controls must be readily accessible to occupants, and located where the controlled lights are visible, or identify the area served by the lights and indicate their status.</p> <p>Each control device shall control an area no larger than a single room or 2,500 square feet, with some exceptions for safety or security, and with the exception of restrooms.</p>	The Enlighted IoT platform includes room-based manual controls.

Lighting Type or Building Area	WSEC 2018 Requirement	How Enlighted Provides Immediate Compliance and Future Proofing
Light reduction control	<p>C405.2.3.1 Manual controls must be configured to provide light reduction control that allows the occupant to reduce the connected lighting load between 30 and 70%.</p> <p>With some exceptions², lighting reduction shall be achieved by one of the following:</p> <ol style="list-style-type: none"> 1. Controlling all lamps or luminaires. 2. Dual switching of alternate rows of luminaires, alternate luminaires or alternate lamps. 3. Switching the middle lamp luminaires independently of the outer lamps. 4. Switching each luminaire or each lamp. 	Enlighted wall switches are connected to the platform to provide occupancy control in all required areas. By using an Enlighted LLLC solution, a space can have daylighting everywhere, potentially exempting this need in most spaces.
Sidelit and toplit spaces, with some exceptions	<p>C405.2.4 Daylight responsive controls must be provided to control the lighting in daylight zones.</p>	Enlighted sensors can be programmed to continuously dim or brighten the lights according to the amount of daylight present in the space. LLLC features allow grouping of lights to ensure even lighting levels despite changes in ambient daylight.
All spaces where daylight responsive controls are installed	<p>C405.2.4.1 Daylight responsive controls must:</p> <ul style="list-style-type: none"> • Be controlled independently of lights in sidelit zones. • Be configured so that they can be calibrated from within the space by authorized personnel, in a location with ready access. • Be configured to completely shut off all controlled lights in that zone. • Be controlled in cardinal directions independently of each other. • Incorporate time-delay circuits to prevent cycling of light level changes of less than three minutes. • Serve maximum areas of no more than 2,500 sq ft (232 m²). • Have no occupant override capability of daylight dimming controls, other than a reduction of light output from the level established by the daylighting controls. 	The granular flexibility of Enlighted programming makes it easy to define zones that need to be controlled together, and can take into consideration existing or future skylight or sidelight conditions. This ensures even lighting levels despite changes in ambient daylight.

²Exceptions: 1.Light reduction controls are not required in daylight zones with daylight responsive controls complying with Section C405.2.4.

2. Where provided with manual control, the following areas are not required to have light reduction control:

2.1. Spaces that have only one luminaire with a rated power of less than 100 watts.

2.2. Spaces that use less than 0.6 watts per square foot (6.5 W/m²).

2.3.Lighting in corridors, lobbies, electrical rooms, restrooms, storage rooms, airport concourse baggage areas, dwelling and sleeping rooms and mechanical rooms.

Lighting Type or Building Area	WSEC 2018 Requirement	How Enlighted Provides Immediate Compliance and Future Proofing
Dimming controls in all spaces	<p>C405.2.4 Daylight responsive controls must be configured to automatically reduce general lighting power in the daylight zone in response to available daylight, while maintaining uniform illumination in the space through one of the following:</p> <ol style="list-style-type: none"> 1. Continuous dimming using dimming ballasts/ dimming drivers and daylight-sensing automatic controls. The system shall reduce lighting power continuously to less than 15% of rated power at maximum light output. 2. Stepped dimming using multi-level switching and daylight-sensing controls. The system shall provide a minimum of two steps of uniform illumination between 0 and 100% of rated power at maximum light output. Each step shall be in equal increments of power, plus or minus 10%. <p>General lighting within daylight zones in offices, classrooms, laboratories and library reading rooms shall use the continuous dimming method. Stepped dimming is not allowed as a method of daylight zone control in these spaces.</p>	Daylight harvesting can take place at all fixtures. Because Enlighted's control strategy enables dimming and the ability to group controls, even if all fixtures have a unique sensor, even lighting levels can be achieved.
Additional lighting controls for: <ul style="list-style-type: none"> • Display and accent lighting in display cases • Supplemental task lighting, including permanently installed under-shelf or under-cabinet lighting • Lighting equipment that is for sale or demonstration in lighting education • Sleeping units 	<p>C405.2.5 Must be controlled with an occupant sensor complying with Section C405.2.1.1 or a time-switch control complying with Section C405.2.2.1 In addition, a manual control shall be provided to control such lighting separately from the general lighting in the space.</p> <p>Sleeping units shall have control devices or systems configured to automatically switch off all permanently installed luminaires and switched receptacles within 20 minutes after all occupants have left the unit. Some exceptions apply.</p>	Enlighted smart sensors provide occupancy control in all required areas, and can be programmed to adapt automatically to changing conditions or use.
Exterior lighting controls except lighting for covered vehicle entrances or exits from buildings or parking structures where required for safety, security or eye adaption, and lighting controlled from within dwelling units	<p>C405.2.6 Exterior lighting systems must have controls that comply with Sections C405.2.6.1 through C405.2.6.4.</p> <p>Decorative lighting systems shall comply with Sections C405.2.6.1, C405.2.6.2 and C405.2.6.4.</p>	Enlighted sensors provide occupancy control in all required areas.
Daylight shutoff	<p>C405.2.6.1 Lights shall be configured to automatically turn off when daylight is present and satisfies the lighting needs.</p> <p>C405.2.6.2 Facade and landscape lighting shutoff. Building facade and landscape lighting shall be configured to automatically shut off for a minimum of six hours per night or from not later than one hour after business closing to not earlier than one hour before business opening, whichever is less.</p>	Daylight harvesting can take place at all fixtures through IP65 rated sensors on fixtures, and an astronomical timeclock.

Lighting Type or Building Area	WSEC 2018 Requirement	How Enlighted Provides Immediate Compliance and Future Proofing
Lighting setback	<p>C405.2.6.3 Lighting that is not controlled in accordance with Section C405.2.6.2 shall be controlled so that the total wattage of such lighting is automatically reduced by not less than 30% by selectively switching off or dimming luminaires at one of the following times:</p> <ol style="list-style-type: none"> 1. From not later than 12 midnight to 6 a.m. 2. From not later than one hour after business closing to not earlier than one hour before business opening. 3. During any period when no activity has been detected for 15 minutes or more. 	<p>This feature can be programmed through Manage, allowing multiple areas to immediately comply with guideline changes as they arise. Fixtures are wirelessly controlled through Manage, but hardware installation is needed to meet code requirements.</p>
Area controls	<p>C405.2.7 The maximum lighting power that may be controlled from a single switch or automatic control device shall not exceed that which is provided by a 20 ampere circuit loaded to not more than 80 percent. A master control may be installed provided the individual switches retain their capability to function independently. Circuit breakers may not be used as the sole means of switching.³</p>	<p>This feature can be programmed through Manage.</p>
Controlled receptacles installed in private offices, open offices, conference rooms, printing/copy rooms, breakrooms, workstations and classrooms	<p>C405.10 At least 50% of all 125v, 12- and 20-ampere receptacles shall be controlled. In rooms larger than 200 sq ft, a controlled receptacle shall be located within 72" of each uncontrolled receptacle. All controlled receptacles must be visibly differentiated and controlled by either:</p> <ol style="list-style-type: none"> 1. Automatic occupancy sensors that turn receptacle power off when no occupants have been detected for a maximum of 20 min. 2. A time-of-day operated control device that turns the receptacle power off at specific programmed times for each day of the week. Manually overridden for a maximum of two hours by a timer accessible to occupants. 	<p>Enlighted Plug-Load control complies and switches affected sockets off when space is unoccupied. This feature can be programmed through Manage.</p>

³Exception: Areas less than 5 percent of the building footprint for footprints over 100,000 ft²

Copy room

The floor plan of the copy room shows four sensor locations (S5) and one wireless room control location (WS-2-00). The sensors are located at the top, middle, and bottom of the room, with labels C4 and S1. The wireless room control is located on the left wall.

BILL OF MATERIALS		
LEGEND	CODE	DESCRIPTION
S5	SU-5E-IOT/ CU-4E-FMH	Micro Sensor Control Unit, Field installed
WS-2-00	WS-2-00	Wireless Room Control

Open office

The floor plan of the open office shows multiple sensor locations (S5F, ESR) and one wireless room control location (WS-2-00). The sensors are located throughout the office area, with labels S5F, ESR, and A. The wireless room control is located on the left wall. The plan also shows 'Private Light Zone' and 'Private Light Zone' labels.

BILL OF MATERIALS		
LEGEND	CODE	DESCRIPTION
S5F	SU-5E-IOT/ CU-4E-FMH	Micro Sensor Control Unit, Factory installed
ESR	ESRN	UL924 Relay
WS-2-00	WS-2-00	Wireless Room Control

Private office

The floor plan of the private office shows four sensor locations (S5) and one wireless room control location (WS-2-00). The sensors are located at the top, middle, and bottom of the office, with labels AT and E. The wireless room control is located on the right wall.

BILL OF MATERIALS		
LEGEND	CODE	DESCRIPTION
S5	SU-5E-IOT/ CU-4E-FMH	Micro Sensor Control Unit, Field installed
WS-2-00	WS-2-00	Wireless Room Control

Lighting Type or Building Area	WSEC 2018 Requirement	How Enlighted Provides Immediate Compliance and Future Proofing
<p>Enhanced digital lighting controls for no less than 90% of the total installed interior lighting power</p>	<p>C406.4.1 Interior lighting shall be located, scheduled and operated in accordance with section C405.2, and have luminaires individually addressed and configured for continuous dimming.</p> <p>No more than eight luminaires within a daylight zone shall be controlled by a single daylight responsive control.</p> <p>Luminaires shall be controlled by a digital control system configured with the following:</p> <ul style="list-style-type: none"> • Scheduling and illumination levels of individual luminaires and groups of luminaires are capable of being reconfigured through the system. • Load shedding. • In open and enclosed offices, illumination level of overhead general luminaires configured to be individually adjusted by occupants. • Occupancy sensors and daylight responsive controls are capable of being reconfigured through the system. <p>Construction documents shall include specifications outlining each of the functions required by this section.</p>	<p>Enlighted enables individual addressing for each luminaire, with any size groupings and individual overrides.</p>