

Lighting, Motor and Electrical Requirements List, pg 1 of 10

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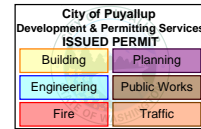
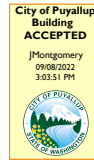
The following information is necessary to check a permit application for compliance with the lighting systems, motors and electrical system requirements in the Washington State Energy Code, Commercial Provisions.

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Project:
Pierce College New STEM Building - 2018 WSEC
1601 39th Ave SE
Puyallup, WA 98374

THE APPROVED CONSTRUCTION PLANS, DOCUMENTS AND ALL ENGINEERING MUST BE POSTED ON THE JOB AT ALL READILY ACCESSIBLE LOCATIONS.

FULL SIZED LEDGIBLE COLOR PLANS ARE REQUIRED TO BE PROVIDED BY THE PERMITEE ON SITE FOR INSPECTION



Date: 2022-06-30

Applies	Code Section	Component	Compliance Information Required In Permit Documentation	Location in Documents	Building Department Notes
LIGHTING SCOPE					
	C103.1	Construction documents - General	For a shell & core or tenant space (first build-out) project, indicate if there is no lighting scope included in the project.		
	C103.1	Construction documents - General	For an alteration project, indicate if there is no lighting scope included in the project.		
LIGHTING CONTROLS					
	C405.2	Lighting controls, general	For all lighting fixtures, indicate lighting control method on plans for spaces and lighting zone(s) served, or exception taken		
	C405.2, Option 2	Luminaire level lighting controls (LLLC)	Indicate on plans all fixtures provided with LLLC in lieu of C405.2 lighting controls; provide description of control capabilities and performance parameters		
	C405.2.5, Item 3 C405.2.1.1 C405.2.3.1	Lighting in dwelling units (dormitory, hotel and all other than multifamily)	Indicate method of automatic control of all installed luminaires in dwelling units in buildings other than multifamily (occupancy or light reduction controls)		
	C405.2.5, Item 2	Lighting in sleeping units	Indicate method of automatic off control of all installed luminaires in sleeping units (vacancy or key card control); also refer to Receptacles		
	C405.2.3 C405.2.3.1 C405.2.5	Manual controls	Indicate on plans the method of manual lighting control, location of manual control device and the area or specific application it serves		
	C405.2.3.1 C405.2.1.1 C405.2.4	Manual interior light reduction controls	Indicate on plans which method of manual 50% lighting load reduction is provided, or indicate applicable exception		
	C405.2.1 C405.2.2.1 C405.2.1, Exception 3	Method of automatic shut-off control	Indicate on plans the method of automatic shut-off control during unoccupied periods (occupancy sensor, time switch or digital timer switch) for all lighting zones		
	C405.2.1	Occupant sensor controls	Indicate on plans all luminaires that are controlled by occupant sensor controls; indicate controls are configured to turn luminaires 100% off when the space is unoccupied		
	C405.2.1 C405.2.1.1	Occupant sensor controls	Indicate if occupant sensor controls are configured to be manual on or automatic on to not more than 50% power; indicate spaces eligible for exception that allows automatic on to 100% power		

Lighting, Motor and Electrical Requirements List, pg 2 of 10

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	C405.2.1.2	Occupant sensor controls - warehouses spaces	Indicate each aisleway and corridor within a warehouse space are designated as separate zones that are independently controlled		
			Indicate occupant sensors are configured to automatically reduce lighting power by 50% when the zone is unoccupied and 100% off after the zone is unoccupied for over 20 minutes; indicate controls are configured to automatically restore lighting to full power when the zone or space is occupied		
	C405.2.1.3	Occupant sensor controls - open plan office areas	For open plan office areas larger than 300 sf, indicate general lighting is provided with vacancy controls that reduce lighting power by not less than 80% and are configured to turn luminaires 100% off when the space is unoccupied; indicate that no individual control zone area exceeds 600 sf		
	C405.2.1.4	Occupant sensor controls - parking garages	Indicate parking garage general lighting is provided with vacancy controls that reduce lighting power by not less than 30% and are configured to turn luminaires 100% off when no vehicles or pedestrians are present, unless eligible for an exception; indicate that no individual control zone area exceeds 3,600 sf		
	C405.2.1.5	Occupant sensor controls - enclosed fire-rated stairwells	Indicate stairway lighting is provided with vacancy controls that reduce lighting power by not less than 50% when the stairway is unoccupied		
	C405.2.2.1	Automatic time switch controls	Indicate spaces on plans where time switch controls turn luminaires 100% off during unoccupied hours		
			Indicate spaces on plans where time switch controls are configured to turn on lighting to full power versus 50% power		
			Indicate locations of override switches on plans and the lighting zone(s) served; indicate that the area(s) served by each override switch does not exceeds 5,000 sf		
	C405.2.1, Exception 3	Digital timer switch	Indicate digital timer switch control includes: manual on/off, time delay, audible and visual indication of impending time-out		
	C405.2.4.2 C405.2.4.3	Daylight zones - Sidelit and toplit	Indicate primary and secondary sidelit daylight zone floor areas on plans		
			Indicate toplit daylight zone floor areas on plans		
			For small vertical fenestration assemblies (rough opening less than 10 percent of primary daylight zone floor area) where daylight responsive controls are not required, provide fenestration area to daylight zone floor area calculation(s)		

Lighting, Motor and Electrical Requirements List, pg 3 of 10

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	C405.2.4	Daylight responsive controls	Indicate on plans lighting zone(s) served by daylight responsive controls; indicate that the area served by each control device does not exceeds 2,500 sf		
			Identify sidelit and toplit daylight zones that are not provided with daylight sensing controls and the exception(s) that apply		
	C405.2.4.1.1	Daylight responsive controls	Indicate on plans the lighting load reduction method (continuous dimming, or stepped dimming that provides at least two even steps between 0%-100% of rated power)		
	C405.2.4.1	Daylight responsive controls	Indicate that daylight sensing controls are configured to completely shut off all controlled lights in the lighting zone		
	C405.2.5	Additional controls - Specific application lighting controls	Identify spaces and lighting fixtures on plans that require specific application lighting controls per this section		
	C405.2.5, Item 1	Display and accent lighting	Indicate on plans that manual controls are provided that control display, accent lighting and display case lighting independently from both general area lighting and other lighting applications within the same space		
			Indicate manual and automatic (occupant sensor or time switch) lighting control methods		
	C405.2.5, Item 3	Hotel/motel guest rooms	Indicate method of automatic control - vacancy or captive key control of all installed luminaires and switched receptacles in guest room		
	C405.2.5, Item 1	Supplemental task lighting	Indicate method and location of manual and automatic shut-off control (occupant sensor or time switch) for supplemental task lighting, including under-shelf or under-cabinet lighting		
	C405.2.5, Item 1	Lighting equipment for sale or demonstration	Indicate on plans that lighting equipment for sale or demonstration are controlled independently from both general area lighting and other lighting applications within the same space		
			Indicate manual and automatic (occupant sensor or time switch) lighting control methods		
	C405.2.5, Item 4	Lighting for non-visual applications	Identify all eligible non-visual lighting applications on plans; indicate that the area served by each control device does not exceeds 4,000 sf		
			Indicate on plans that non-visual lighting are controlled independently from both general area lighting and other lighting applications within the same space		

Lighting, Motor and Electrical Requirements List, pg 4 of 10

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			Indicate method of manual lighting control and applicable automatic lighting control		
	C405.2.5, Item 5	Means of egress lighting	Identify on plans egress fixtures that function as both normal and emergency means of egress illumination		
			Provide calculation of lighting power density of total egress lighting		
			If total egress lighting power density is greater than 0.02 W/sq. ft., indicate on plans egress fixtures requiring automatic shut-off during unoccupied periods		
			Indicate method of automatic shut-off control		
	C405.4.1 C405.4.2	Lighting control of exempt interior lighting	Indicate that exempt interior lighting equipment and lighting located within spaces that are eligible for a lighting power exemption are controlled independently from non-exempt and general area lighting		
	C405.2.6	Exterior lighting controls	For decorative exterior lighting, indicate on plans automatic daylight shut-off controls, or exception taken		
			For exterior lighting that is not decorative, indicate on plans automatic daylight or time-switch shut-off controls and setback controls; or indicate exception taken		
			For lighting requiring setback controls, include control sequence that reduces lighting power by at least 30% between 12am-6am, or from 1 hour after closing to 1 hour before opening, or based upon motion sensor		
			For building facade and landscape lighting, indicate control sequence for shut-off control is based on dawn-to-dusk and business opening/closing schedule; indicate whether automatic or time switch controls will be provided for this function		
	C405.5.2	Lighting control of exempt exterior lighting	Indicate that exempt exterior lighting and lighting located within exterior areas/surfaces that eligible for a lighting power exemption are controlled independently from non-exempt exterior lighting		
	C405.5.4	Exterior gas-fired lighting appliances	Indicate ignition system is a method other than continuously burning pilot light		
	C405.2.7	Area controls - Master control switches and circuit power limit	Indicate location(s) of master control switch(es) intended to control multiple independent switches; circuit breaker may not be used as a master control switch		
			Verify that no 20 amp circuit controlled by a single switch or automatic control is loaded beyond 80%		

ADDITIONAL EFFICIENCY CREDIT - ENHANCED INTERIOR LIGHTING CONTROLS

Lighting, Motor and Electrical Requirements List, pg 5 of 10

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	C406.4	Enhanced digital lighting controls	To comply with additional efficiency credit, indicate on plans that interior lighting fixtures are configured with all of the following control functions, as applicable: 1) Each fixture is individually addressed, or exception taken; 2) Fixtures are configured for continuous dimming; 3) No more than eight fixtures are controlled by a single daylight sensor; 4) In enclosed and open office areas, illumination levels of overhead general area lighting is configured to be individually adjusted by occupants		
			Include calculations that demonstrate the total lighting power of all interior lighting fixtures configured with enhanced lighting controls is no less than 90% of the total interior lighting power for the area the enhanced lighting controls credit is being applied to		

INTERIOR LIGHTING POWER & EFFICACY

	C405.4.1 C405.4.2	Total connected interior lighting power	Include all luminaires in interior lighting fixture schedule; indicate fixture types, lamps, ballasts, and manufacturer's watts per fixture for the installed lamp		
			Identify spaces eligible for lighting power exemption on plans and in WSEC interior lighting compliance reports; indicate the exception applied		
			Identify lighting equipment eligible for lighting power exemption in fixture schedule and in WSEC interior lighting compliance reports; indicate the exception applied		
	C405.1 C405.1.1	Lighting in dwelling units (multifamily)	For all installed luminaires, include lamp type and number of lamps in lighting fixture schedule; for lamps that are not LED, T-8 or small diameter fluorescent, indicate efficacy of other lamp types is 65 lumens per watt or greater		
			For all installed luminaires, indicate in lighting fixture schedule whether complying via lighting power density or by qualifying lamp type; if by lamp type, include number of lamps		
			For all installed luminaires, indicate in lighting fixture schedule whether complying via lighting power density or by qualifying lamp type; if by lamp type, include number of lamps		

INTERIOR LIGHTING POWER CALCULATION - INDICATE COMPLIANCE PATH TAKEN

	C405.4.2.1	Building Area Method	Demonstrate that total proposed wattage per building area does not exceed maximum allowed wattage per building area; identify locations of building areas on plans; provide WSEC exterior lighting compliance reports		
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Lighting, Motor and Electrical Requirements List, pg 6 of 10

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	C405.4.2.2	Space-By-Space Method	Demonstrate that total proposed wattage does not exceed maximum allowed wattage; identify locations of space types on plans, including retail display areas and areas with display, highlight and decorative lighting; provide WSEC exterior lighting compliance reports		
ADDITIONAL EFFICIENCY CREDITS - REDUCED INTERIOR LIGHTING POWER DENSITY					
	C406.3.1 C406.3.2	Reduced interior lighting power density	To comply with additional efficiency credit, demonstrate that total connected interior lighting wattage is 10% or 20% less than the total maximum allowed lighting wattage for the area the reduced lighting power credit is being applied to; indicate whether lighting power allowance is based on the building area method or space-by-space method; provide WSEC exterior lighting compliance reports		
	C406.3	Reduced interior lighting power density - dwelling unit lamp efficacy	For project with dwelling units, to comply with additional efficiency credit indicate in lighting fixture schedule that lamps within installed interior luminaires have an efficacy rating of at least 65 lumens per watt; include number of lamps and provide calculations that demonstrate at least 95% of lamps have this efficacy rating		
EXTERIOR LIGHTING POWER & EFFICACY					
	C405.5.2	Total connected exterior lighting power	Include all luminaires in exterior lighting fixture schedule; indicate fixture types, lamps, ballasts, and manufacturer's watts per fixture for the installed lamp		
			Identify exterior applications eligible for lighting power exemption on plans and in WSEC exterior lighting compliance reports; indicate exception applied		
	C405.5.3(1)	Exterior lighting zone	Indicate building exterior lighting zone as specified by the AHJ		
	C405.5.1	Exterior building grounds lighting	For building grounds fixtures rated at greater than 50 watts, indicate rated lamp efficacy (in lumens per watt) in fixture schedule		
EXTERIOR LIGHTING POWER CALCULATION					
	C405.5.3	Tradable allowances	Demonstrate that total proposed tradable surface wattage does not exceed maximum allowed tradable surface wattage (including base site allowance); identify locations of tradable surfaces on plans; provide WSEC exterior lighting compliance reports		

Lighting, Motor and Electrical Requirements List, pg 7 of 10

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			Demonstrate that proposed wattage per non-tradable surface type does not exceed maximum allowed wattage per non-tradable surface type (including base site allowance remaining after tradable allowance calculation); identify locations of non-tradable surfaces on plans; provide WSEC exterior lighting compliance reports		
LIGHTING ALTERATIONS					
	C503.6.1	Interior and parking garage lighting fixture alterations	Where $\geq 50\%$ of existing luminaires in an interior space or parking garage are replaced; indicate compliance path (building area or space-by-space method); include all new and existing-to-remain luminaires in WSEC interior lighting compliance reports; indicate proposed lighting wattage does not exceed maximum allowed per compliance path		
			Where $< 50\%$ of existing luminaires in an interior space or parking garage are replaced; indicate total existing lighting wattage in each space prior to alteration; include all new and existing-to-remain luminaires in WSEC interior lighting compliance reports; indicate proposed total lighting wattage in alteration area does not exceed total existing lighting wattage prior to alteration		
			Where $\geq 50\%$ of existing exterior lighting wattage is replaced; include all new and existing-to-remain luminaires in WSEC exterior lighting compliance reports; indicate proposed total exterior lighting wattage does not exceed maximum allowed		
			Where $< 50\%$ of existing exterior lighting wattage is replaced; indicate total existing lighting wattage prior to alteration; include all new and existing-to-remain luminaires in WSEC interior exterior compliance reports; indicate proposed total exterior lighting wattage does not exceed total existing wattage prior to alteration		
	C503.6.2	Interior lighting wiring and circuiting alterations	Where new wiring is installed to serve new interior luminaires and /or luminaires are relocated to a new circuit; indicate manual and automatic lighting controls are provided (as applicable) - manual (C405.2.3); occupancy sensor (C405.2.1); light reduction (C405.2.3); daylight responsive (C405.2.4); specific application (C405.2.5)		
			Where new wiring is installed to serve new exterior luminaires and /or luminaires are relocated to a new circuit; indicate automatic lighting controls are provided (C405.2.6)		

Lighting, Motor and Electrical Requirements List, pg 8 of 10

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	C503.6.3	Lighting panel alterations	Where a new interior and/or exterior lighting panel is installed or an existing panel is moved (all new raceway and conductor wiring), indicate all applicable lighting controls requirements apply		
	C503.6.4	Newly-created rooms	Where interior space(s) is reconfigured (permanently installed walls or ceiling-height partitions) to create new enclosed spaces, indicate all applicable lighting controls requirements apply		
	C504.2	Lighting repairs	Identify existing luminaires being upgraded with bulb and / or ballast replacement; indicate fixture alteration does not increase existing fixture wattage		
	C505.1	Change of interior space use	Identify spaces on plans where the building area type or space use type is being changed from one type to another per Tables C405.4.2(1) or (2)		
			Indicate compliance method (building area or space-by-space); include all new and existing-to-remain luminaires in WSEC interior lighting compliance reports; indicate proposed lighting wattage does not exceed maximum allowed per compliance path		

RECEPTACLES

	C405.10	Controlled receptacles	Identify all controlled and uncontrolled receptacles on electrical plans in each space in which they are required; include receptacle configuration such as spacing between controlled and uncontrolled, duplex devices, etc		
			Provide schedule that lists the number of controlled and uncontrolled receptacles in each space where controlled receptacles are required - classrooms, private offices, open office areas, conference rooms, copy rooms, break rooms and modular partitions/workstations		
			Indicate on plans the method of automatic control for each controlled receptacle zone (occupant sensor or programmable time-of-day control); indicate that each zone served by a single controller does not exceed 5,000 sf		
	C405.2.5, Item 2	Switched receptacles in sleeping units	Indicate method of automatic off control of all switched receptacles in sleeping units (vacancy or key card control)		
	C503.6.6	Electrical receptacle alterations	Where new receptacles are added or replaced within an alteration project that is 5,000 sf or larger, indicate receptacles are provided with automatic controls per C405.10, or exception taken		

MOTORS, TRANSFORMERS, ELECTRIC METERS, INTERIOR TRANSPORTATION

Lighting, Motor and Electrical Requirements List, pg 9 of 10

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	C405.6	Electrical transformers	Include electrical transformer schedule on electrical plans; indicate transformer type, size, efficiency, or exception taken		
	C405.11	Feeders and branch circuits	Provide documentation that demonstrates maximum voltage drop across feeders and branch circuits does not exceed 5%		
	C405.7	Dwelling unit electrical energy consumption	Indicate on electrical plans that each dwelling unit in Group R-2 has a separate electrical energy meter		
	C405.8	Electric motor efficiency	Include all motors, including fractional hp motors, in electric motor schedule on electrical plans; indicate motor type, horsepower, rpm, rated efficiency, or exception applied		
	C405.9.1	Elevator cabs	For luminaires in each elevator cab, provide calculations that demonstrate average efficacy is not less than 35 lumens per watt		
For elevators that do not have an integral air conditioning system, indicate rated watts per cfm for elevator cab ventilation fans do not exceed 0.33 watts per cfm					
Indicate automatic controls that de-energize lighting and ventilation fans when elevator is stopped and unoccupied for a period of 15 minutes or more					
	C405.9.2	Escalators and moving walks	Indicate escalators comply with ASME A17.1/CSA B44; automatic controls are configured to reduce operational speed to the minimum permitted when not in use		
	C405.9.3	Regenerative drive	Indicate all one-way down or reversible escalators are provided with a variable frequency regenerative drive		

DOCUMENTATION AND SYSTEM REQUIREMENTS TO SUPPORT COMMISSIONING (CX)

	C408.4	Scope of electrical power and lighting systems commissioning	Indicate that all electrical systems (receptacles, transformers, motors, vertical and horizontal transportation) for which the WSEC requires control functions and / or configuration to perform specific functions are required to be commissioned		
			Where total building lighting load is > 20 kW, or where total lighting load of luminaires requiring daylight sensing and / or occupancy control > 10 kW, indicate that all automatic lighting control systems are required to be commissioned; or provide building lighting power calculation demonstrating eligibility for exception		
	C405.13 C408.1.1 C408.1.2 C408.1.4.2 C103.6.3	Commissioning requirements in construction documents	Indicate Cx requirements in plans and specifications for all applicable electrical and lighting control systems per C408		

Lighting, Motor and Electrical Requirements List, pg 10 of 10

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C408.1.2 C408.1.2.1 C408.1.4 C103.6.3	Commissioning requirements in construction documents	Include general summary of Cx plan per C408.1.2 including: 1) Narrative description of activities; 2) Responsibilities of the Cx team; 3) Schedule of activities including verification of project close out documentation per C103.6; 4) Conflict of interest plan (if required)		
C408.1.2 C408.1.4 C103.6.3	Commissioning requirements in construction documents	Include in general summary that a Cx project report and Compliance Checklist (Figure C408.1.4.1) shall be completed by the Certified Cx Professional and provided to the owner prior to the final electrical inspection		
C408.4.1	Functional performance testing criteria	Identify in plans and specifications the intended operation of all equipment and controls during all modes of operation, including interfacing between new and existing-to-remain systems		

PROJECT CLOSE OUT DOCUMENTATION

C103.6.3	Project close out documentation requirements	Indicate in plans that project close out documentation is required including WSEC lighting compliance reports that document all interior and exterior lighting area and / or surface types, lighting power allowances and installed densities		
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If "no" is selected for any question, provide explanation.