

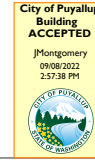
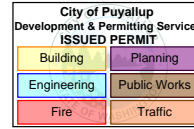
Building Envelope Requirements List, pg 1 of 10

2018 WSEC Requirements for Commercial Buildings including Group R2, R3 & R4 over 3 stories & all R1 -- Administered by ©2022 NEEA, All rights reserved

The following information is necessary to check a building permit application for compliance with the building envelope 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



Date: 2022-06-30

Applies	Code Section	Component	Compliance Information Required In Permit Documentation	Location in Documents	Building Department Notes
SCOPE					
	C103.1	Construction documents - General	For a tenant space (first build-out) project, indicate if there is no envelope scope included in the project.		THE APPROVED CONSTRUCTION PLANS, DOCUMENTS AND ALL ENGINEERING MUST BE POSTED ON THE JOB AT ALL INSPECTIONS IN A VISIBLE AND READILY ACCESSIBLE LOCATION.
	C103.1	Construction documents - General	For an alteration project, indicate if there is no envelope scope included in the project.		FULL SIZED LEDGIBLE COLOR PLANS ARE REQUIRED TO BE PROVIDED BY THE PERMITEE ON SITE FOR INSPECTION
	C402.1.1.1	Low energy spaces	Identify low energy spaces on plans; include calculations if applicable that demonstrate eligibility for envelope provisions exemption		
	C402.1.1.2	Semi-heated spaces	Identify semi-heated spaces on plans, include mechanical heating system type and calculations that demonstrate eligibility for wall insulation exemption	Semi-heated space includes the Mechanical Penthouse on A104. Mechanical heating system _____.	Calculations can be found on G025, no wall insulation exemption taken.
	C402.1.1.3	Greenhouse spaces	Identify greenhouse spaces on plans; include non-opaque assembly information and mechanical heating system type if applicable, that demonstrates eligibility for envelope provisions exemption		
	C402.1.2	Equipment buildings	Provide building sf area, average wall and roof U-factor, installed electrical and mechanical equipment information and heating setpoint restriction, that demonstrates eligibility for envelope provisions exemption		
NA	C402.1.2.1	Standalone elevator hoistways	Provide building area, average wall and roof U-factor, installed mechanical equipment information and heating setpoint restriction, that demonstrates eligibility for envelope provisions exemption		
	C410.2	Walk-in cooler and freezer spaces	Identify walk-in cooler and freezer spaces on plans; including site assembled, site constructed and prefabricated units		
			Identify warehouse cooler and freezer spaces on plans		
	C101.4.1	Mixed residential & commercial building	Identify spaces with different occupancy requirements on plans		

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	C503.2	Change of space conditioning alteration	Identify on plans existing unconditioned spaces changing to semi-heated or conditioned space, and existing semi-heated spaces changing to conditioned space; provide calculations for existing and final level of space conditioning		
	C505.1	Change of occupancy alteration	Identify on plans existing F, S and U-occupancy spaces undergoing a change in occupancy and final occupancy type		
			Group R spaces permitted before July 1, 2002 that are undergoing a change to a commercial occupancy shall be identified on plans		
			Commercial (non-Group R) occupancy spaces undergoing a change to Group R shall be identified on plans		

ENVELOPE PROVISIONS

YES	C103.2 C103.6.3 C402.1.3 C402.1.4 C402.1.5	Compliance documentation	Indicate envelope thermal performance compliance path (prescriptive or component performance) and provide WSEC envelope compliance reports	Component performance alternative per C406.10 Enhanced envelope performance. See sheet G025 for calculations.	
YES			If complying via component performance, demonstrate that the Proposed Total UA is equal to or less than the Allowable Total UA	See sheet G025 for Proposed Total UA to Allowable Total UA Calculations.	
			If complying via total building performance, provide a list of all proposed envelope component types, areas and U-values		
YES	C303.1.1 C303.1.2	Insulation identification	Indicate identification mark shall be applied to all insulation materials and insulation installed such that the mark is readily observable during inspection	See Wall Type General Notes on Sheet A011.	
YES	C303.1.3 C402.4.3	Fenestration product rating	Indicate fenestration products shall be labeled with NFRC U-factor, SHGC, VT and leakage rating, or if products do not have an NFRC rating, indicate applicable Chapter 3 default values	See General Window / Door Notes on Sheet A621.	
YES	C303.1.1 C402.2.1	General insulation installation	Indicate installation methods, thicknesses, densities and clearances to achieve the intended R-value of all insulation materials	See A011 for exterior wall assemblies and roof types. See spec section 075303 for roofing installation instructions, & G025 for continuous insulation notes.	
YES			Where two or more layers of rigid insulation will be used, indicate that edge joints between layers are staggered, or exception taken	See A011 for roof types.	

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YES	C103.2 C402.2.1	Roof assembly insulation	Indicate R-value(s) of cavity/continuous insulation on roof sections	See A011 for roof types.	
YES			Indicate framing materials on roof sections	See A011 for roof types.	
NA			Indicate method of framing for ceilings below vented attics and vaulted ceilings per A102.2 (std, adv)		
YES			Provide area weighted average U-factor calculation for insulation whose thickness varies by 1 inch or less		
			Indicate effective U-factors of tapered insulation entirely above deck per A102.2.6; include roof configuration and slope, maximum R-value at peak and minimum R-value at low point for all roof surfaces	Tapered insulation calculated per equation d. OF C402.1.4. and table A102.2.6.1	
NA			Indicate R-values for thermal spacers and each insulation layer, and liner system (LS) method for metal building roofs	See G025 for component U values. See A011 for roof type assemblies. Metal building N/A.	
	C402.2.1.1	Skylight curb insulation	Indicate skylight curb insulation R-value on roof section, if not included in skylight NFRC rating		
NO	C402.2.1.2	Rooftop HVAC equipment curbs	Indicate rooftop HVAC equipment curb insulation R-value on roof section	No insulation beyond roofing build-up.	
YES	C103.2 C402.2.3 C402.2.4 C303.2.1	Above/below grade wall insulation	Indicate R-value(s) of cavity/continuous insulation on wall sections	See Sheet A011 for wall types.	
YES			Indicate framing materials on wall sections	See Sheet A011 for wall types.	
NA			Indicate method of framing for wood construction per A103.2 (std, int, adv)		
NA			Indicate material density category, wall weight and heat capacity for qualifying mass walls		
NA			For qualifying ASTM C90 masonry walls, indicate loose-fill core insulation material and percentage of cores filled including grouted cores, bond beams, vertical fills, headers and any other grouted cores		
YES			Indicate method of protection of exposed exterior basement/crawlspace wall insulation	See Sheet A351 for foundation details.	
	C103.2 C402.4.4	Opaque doors	Indicate rated U-factor or R-value (non-swinging) on wall sections or in door schedules - applies to doors with less than 50% glazed area	See General Window/Door Notes on Sheet A600.	
NA	C402.4.4	Garage doors	Indicate rated U-factor for sectional and tilt-up garage doors on wall sections or in door schedules - applies to garage doors with less than 14% glazed area; all other garage doors shall comply as opaque doors	No exterior overhead sectional doors.	

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NA	C402.2.5	Floor over outdoor or unconditioned space insulation	Indicate R-value(s) of cavity/continuous insulation on floor sections	All floors over unconditioned space protected by soffit type S1. See Sheet A011 & G025 for it's assembly.	
NA			Indicate framing material on floor sections	All floors over unconditioned space protected by soffit type S1. See Sheet A011 & G025 for it's assembly.	
NA			Indicate material density category and weight of qualifying mass floors	All floors over unconditioned space protected by soffit type S1. See Sheet A011 & G025 for it's assembly.	
YES	C402.2.6 C303.2.1	Slab-on-grade floor insulation	Indicate R-value of continuous insulation on wall section or foundation detail	See Sheet A351 for foundation details.	
YES			Indicate insulation extends down vertically and/or horizontally the required distance from top of slab	See Sheet A351 for foundation details.	
YES			Indicate method of protection of exposed exterior slab edge insulation	See Sheet A351 for foundation details.	
NA			Indicate R-value of continuous insulation on wall section or foundation detail		
NA			Indicate insulation extends down vertically from top of slab and then horizontally under the entire slab		
NA			Indicate method of protection of exposed exterior slab edge insulation		
NA	C402.2.8	Radiant heating system insulation	Indicate insulation R-value behind radiant panels, U-bend/headers and bottom surface of radiantly heated floors (other than heated slab-on-grade)		
YES	C402.4.1 C502.2.1	Vertical fenestration maximum area	Provide total gross sf area of all above grade wall elements and rough opening sf area of all vertical fenestration elements in the building, for the prescriptive max allowed window-to-wall ratio (WWR) calculation in the WSEC envelope compliance reports; demonstrate compliance for each space conditioning category separately	Compliance has been demonstrated, refer to envelope compliance report.	
	C402.4.1.1 C405.2.4.1 C502.2.1	Increased prescriptive maximum vertical fenestration area with daylight zones and controls	Provide calculations showing that not less than 50% of the total conditioned floor area is within a daylight zone; demonstrate compliance for each space conditioning category separately		

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			Indicate in envelope plans that all lighting fixtures located within daylight zones shall be provided with daylight responsive controls per Section C405.2.4.1		
			Indicate that the VT of vertical fenestration is at least 1.1 times the rated SHGC or no less than VT-0.55, whichever is greater		
	C402.4.1.3 C502.2.1	Increased prescriptive maximum vertical fenestration area with high-performance glazing	Indicate high performance U-factors and SHGC values in fenestration schedules		
			Indicate if an area-weighted U-factor is used for multiple fenestration elements within the same fenestration category per Table C402.4; provide area-weighted U-factor calculation		
	C402.1.5	Wall/vertical fenestration target area adjustment	Indicate if component performance with target area adjustment will be used to account for vertical fenestration area in excess of the prescriptive maximum allowed; include target area adjustment in WSEC envelope compliance reports		
	C402.4.1 C502.2.2	Skylight maximum area	Provide total gross sf area of roof, and rough opening sf area of all skylight elements in the building, for the prescriptive max allowed skylight-to-roof ratio (SRR) calculation in the WSEC envelope compliance reports; demonstrate compliance for each space conditioning category separately		
	C402.1.5.2	Roof/skylight target area adjustment	Indicate if component performance with target area adjustment will be used to account for skylight area in excess of the prescriptive maximum allowed; include target area adjustment in WSEC envelope compliance reports		
YES	C402.4 C402.4.3.4 C303.1.3	U-factors, SHGC and VT for all fenestration assemblies	Indicate U-factors, SHGC and VT values in fenestration schedules	See glazing notes on Sheet A621.	
NA			Indicate if an area-weighted U-factor is used for multiple fenestration elements within the same fenestration category per Table C402.4; provide area-weighted U-factor calculation	All storefront have a similar U-factor.	
YES			Indicate if values are NFRC or default; if default then specify frame type, glazing layers, gap width, low-e coatings, gas-fill	All values are per NFRC. See spec section 084113 for details.	
NA	C402.4.3	Permanent shading devices	For each group of windows with similar orientation and overhang or permanent projection geometry, provide projection factor calculations (Equation C4-6) for north and non-north orientations		
	C402.4.2	Single story spaces requiring skylights	Provide list of enclosed, single story spaces that exceed 2,500 sf; for each space identify the space use, floor area, floor to ceiling height, whether skylights are installed, and any exception taken		

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			Provide calculations for percentage of conditioned floor area located within a toplit daylight zone; if exception is taken for spaces where the total floor area minus the sidelit zone area is less than 2,500 sf, include percentage of conditioned floor area located within a sidelit daylight zone in calculations		
			Provide calculations for percentage of skylight area in each space over 2,500 SF, OR		
			Provide calculations for skylight effective aperture (Equation C4-5) for each space over 2,500 SF		
			Indicate haze factor of skylight glazing material or diffuser		
NA	C410.2	Walk-in and warehouse cooler and freezer envelope	Indicate insulation R-value in cooler and freezer wall and ceiling assemblies		
NA			Indicate cooler and freezer door insulation R-value; indicate method of minimizing infiltration (strip doors, curtains, spring-hinged doors, etc); provide automatic door closure (or note exception taken)		
NA			For transparent reach-in doors and fixed windows, indicate number of glass panes (double or triple pane); identify whether the interstitial spaces between panes is filled with inert gas or if panes are heat-reflective treated glass		
ADDITIONAL EFFICIENCY CREDITS - ENHANCED ENVELOPE PERFORMANCE					
YES	C406.10	Enhanced envelope performance	To comply with additional efficiency credit, demonstrate envelope thermal performance compliance via component performance; provide WSEC envelope compliance reports that demonstrate Proposed Total UA is 15% lower than the Allowable Total UA	See Component performance alternative results on Sheet G025.	
AIR LEAKAGE					
YES	C402.5.1.1	Air barrier construction and sealing	Identify location and provide diagram of continuous air barrier in plans and sections	See plans 0-3 on Sheet G025 and section diagrams A & B.	
YES			Provide details for all joints, transitions in materials, penetrations in air barrier and note method of sealing (caulked, gasketed, or other approved method)	See Sheets A351, A352, A361, A611, and A631 for details.	
YES	C402.5.3 C402.1.3 C402.1.4	Rooms containing fuel burning space conditioning appliances	For room(s) located within the conditioned space that contain non-direct vent fuel-burning appliances that require outdoor air for combustion, indicate method of isolation from the conditioned space; include sealing of walls, floor and ceiling of room, doorway gasketing and sealing around ductwork and piping penetrations	Insulation and sealing around ductwork and piping is the method.	

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YES			Indicate walls, floor and ceiling of the room envelope are insulated to the same level required for exterior envelope, and combustion air ductwork that passes thru conditioned space is insulated to at least R-8	All combustion air ductwork is insulated to at least R-8.	
YES	C402.5.4	Doors and access openings to shafts, chutes, stairways and elevator lobbies	Indicate locations of all doors and access openings to shafts, chutes, stairways and elevator lobbies	See Sheet A100-A104.	
YES			Indicate method of sealing of these openings (gasketing, weatherstripping, other sealing method); or exception taken	See Sheet 600 & 611 for door details.	
YES	C402.5.5 C403.7.8	Outdoor air intakes, exhausts and relief openings	Indicate locations of all stairway enclosure, elevator shaft and building pressurization relief openings, outside air intakes and exhaust openings	Building outdoor air, exhaust and relief air are all located within air handling units on the roof. All AHU and exhaust fan dampers meet the requirements of C403.7.8 including the leakage rate noted in C403.7.8.3. See Sheets A100-A103 for stair and shaft enclosure locations.	
YES			Note in envelope plans that all relief, outside air intake and exhaust openings shall be provided with dampers in accordance with Mechanical Section C403.7.8	See Air barrier notes under installation on Sheet G025.	
YES	C402.5.8	Recessed lighting in building envelope	Indicate method of sealing between light fixture housing and wall or ceiling	Fixture shall be caulked between the housing and interior ceiling covering.	
YES			Note in envelope plans that all recessed lighting fixtures shall be IC rated and have an air leakage rating not greater than 2 cfm per ASTM E283 test; include these requirements in lighting fixture schedules	See Air barrier notes under installation on Sheet G025.	
NA	C402.5.6	Loading dock seals	Indicate weather seal at cargo and loading dock doors		
YES	C402.5.7	Vestibules	Indicate locations and dimensions of vestibules for building entrances; also indicate vestibule information for exit-only doors in buildings where separate doors for entering and exiting are provided	See Vestibule 1 on Sheet A101 and Vestibule 2 on Sheet A100.	
YES			Indicate locations of all building entrances and exit-only doors provided with an air curtain in lieu of a vestibule	See vestibules 1 & 2 on Sheet G025 for building entrances.	

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YES			Indicate exception and criteria utilized for all building entrances and exit-only doors that do not have a vestibule or air curtain	Vestibules 1 & 2 provided at our building entrances per C402.5.7. All other exterior doors are exempt per C402.5.7 Exception 1.	
NA			Indicate required performance for air curtains installed per Exception 7		
YES			For unconditioned vestibules, indicate which envelope assembly (interior or exterior) complies with the requirements for a conditioned space	The exterior envelope complies with the requirements for conditioned space.	
YES	C103.2 C402.5.1.2C 402.5.1.2.1 R402.4.1.2	Building enclosure air leakage test	Indicate in project documents that building enclosure air leakage testing is required for WSEC compliance	See Air Leakage Test Notes on Sheet G025.	
YES			Provide area calculations that account for all six sides of the air barrier boundaries	See Air Leakage Test Notes under Air Barrier Boundary Areas on Sheet G025.	
YES			For commercial buildings, indicate that building enclosure air leakage testing shall be performed per ASTM C779 (or equivalent method approved by the code official) and the target leakage rate is 0.25 cfm/ft ² (1.5 L/s*m ²) at 0.3 in. wg (75 Pa)	See Air Leakage Test Notes on Sheet G025.	
NA			If the building is mixed residential / commercial and three stories or less above grade plane, indicate which building enclosure air leakage test procedure will be used for the Group R-2 / R-3 areas (Section R402.4.1.2 or C402.5.1.2); if per R402.4.1.2, indicate that the target leakage rate is 5 air changes per hour at 0.2 in. wg (50 Pa)		
YES			Include the following requirements in project documents: (1) Submit building enclosure air leakage test reports to jurisdiction and owner; (2) If initial test result exceeds 0.25 cfm/ft ² (1.5 L/s*m ²), indicate that inspection and all practical corrective actions be completed and documented in the air leakage test report; (3) If initial test result exceeds 0.40 cfm/ft ² (2.0 L/s*m ²), indicate that corrective actions shall also include re-testing; (4) Indicate that corrective measures and retesting must be repeated until the test result is 0.40 cfm/ft ² (2.0 L/s*m ²) or less; (4) Include air barrier test report in project close out documentation provided to building owner.	See Air Leakage Test Notes on Sheet G025.	

ADDITIONAL EFFICIENCY CREDITS - REDUCED AIR INFILTRATION

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YES	C406.9	Reduced air infiltration	To comply with additional efficiency credit, indicate in project documents that the building enclosure air leakage test results shall not exceed 0.17 cfm/ft ² at 0.3 in. wg (75 Pa); all documentation requirements per C103.2 and C402.5.1.2 apply	See Air Leakage Test Notes on Sheet G025.	
ALTERATIONS					
	C503.1 C503.3.1	Roof alteration - insulation	For a roof alteration where existing ceiling cavities are exposed, indicate cavities are insulated to full depth at minimum nominal value of R-3.0 per inch		
			For a roof covering replacement where insulation is installed entirely above the roof deck, indicate insulation complies with requirements for new construction per Tables C402.1.3 or C402.1.4		
	C503.1	Wall and floor alteration - insulation	For a wall or floor alteration (floor over outdoor or unconditioned space) where existing envelope cavities are exposed, indicate cavities are insulated to full depth at minimum nominal value of R-3.0 per inch		
	C503.3.2	Addition of vertical fenestration	Where the addition of new vertical fenestration results in a window-to-wall ratio (WWR) exceeding the prescriptive maximum allowed per C402.4.1, demonstrate method of compliance (prescriptive vertical fenestration alternate, component performance with target area adjustment for the alteration area and existing-to-remain areas combined, or total building performance per C407); demonstrate for each space conditioning category separately		
	C503.3.3	Addition of skylights	Where the addition of new skylights results in a skylight-to-roof ratio (SRR) exceeding the prescriptive maximum allowed per C402.4.1, demonstrate method of compliance (component performance compliance with target area adjustment for the alteration area and existing-to-remain areas combined, or total building performance per C407), demonstrate for each space conditioning category separately		
NA	C103.2 C103.6.3 C503.2 C505.1	Change in space conditioning or occupancy compliance documentation	Indicate envelope alteration thermal performance compliance path (prescriptive or component performance with 110% allowance); provide WSEC envelope compliance reports		
NA	C103.2 C103.6.3 C503.2C 505.1	Change in space conditioning or occupancy compliance documentation	If complying via total building performance with 110% allowance, provide a list of all proposed envelope component types, areas and U-values		
PROJECT CLOSE OUT DOCUMENTATION					

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YES	C103.6.3	Project close out documentation requirements	Indicate in plans that project close out documentation is required including applicable calculations, WSEC envelope compliance reports, and fenestration NFRC rating certificates	See Sheets A100-A104	
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