



2021 Seattle Energy Code Individual Code Change Proposals

1/20/2022 version

- **Red Text: Introductory comment for each proposed change**
- **Yellow highlight: New proposals for this code**
- **Aqua highlight: Existing 2018 Seattle amendments transferred to 2021 code** (Typically, existing Seattle amendments carried forward are *not* shown in this document.)

C101.7 Vesting. Clarification requested by staff regarding vesting of TI projects.

C101.7 Vesting of initial tenant improvements. The initial tenant improvements of spaces within a building are permitted to comply with the codes applicable to the base building, if the permit applications are submitted within the 18-month timeframe specified in Section 101.3.2 of the Seattle Building Code.

Table C402.1.3 Prescriptive R-value for wood framed wall. Since R-25 std is considered equivalent for Group R, it should also be equivalent for other buildings.

Table C402.1.3

**Opaque Thermal Envelope Insulation Component
Minimum Requirements, R-value Method^a, (4)**

CLIMATE ZONE	5 AND MARINE 4	
	All Other	Group R
Walls, Above Gradeⁱ		
Mass ^h	Exterior: R-16 c.i. Interior: R-13 + R-6 ci wood stud, or R-13 + R-10 ci metal stud	Exterior: R-16 c.i. Interior: R-13 + R-6 ci wood stud, or R-13 + R-10 ci metal stud
Mass transfer deck slab edge	N/R	N/R
Metal buildings	R-13 + R-14ci	R-13 + R-14ci
Steel framed	R-13 + R-10ci	R-19 + R-8.5ci
Wood framed and other	R-13 + R-7.5ci std or R-20 + R-3.8ci std or R-25 std	R-13 + R-7.5ci std or R-20 + R-3.8ci std or R-25 std

Section C402.4 & Table C402.4 New proposal requiring 20% of vision glazing to be very low U-value, typically triple glazing. Intention is to establish triple glazing as a standard product line in Seattle, to reduce cost and lead time, before going to 100% in some future code cycle. Exception for small (<5,000 sf) buildings. Adds about 15% to cost of curtain wall, so if only applied to 20% of glazing, total cost increase will be about 3%.

C402.4 Fenestration. Fenestration shall comply with Sections C402.4 through C402.4.4 and Table C402.4.

Column A values in Table C402.4 apply to a maximum of 80 percent of the total building vertical fenestration

area. The minimum 20 percent of fenestration required to meet the Column B high-performance U-factors is permitted to be met using any combination of vertical fenestration types with Column B values listed.

Daylight responsive controls shall comply with this section and Section C405.2.5.

Exceptions:

- Buildings or additions with less than 5,000 square feet of conditioned floor area are not required to provide the Column B high performance fenestration.
- For prescriptive envelope compliance, single-pane glazing is permitted for security purposes and for revolving doors, not to exceed 1 percent of the gross exterior wall area. Where Section C402.1.5, component performance alternative, is used, the single glazing shall be included in the percentage of the total glazing area, U-factor and SHGC requirements.

**Table C402.4
Building Envelope Fenestration Maximum U-factor and
SHGC Requirements**

CLIMATE ZONE	5 AND MARINE 4 standard performance portion (max 80% of fenestration area)	High performance portion (min 20% of fenestration area)
U-factor for Class AW windows rated in accordance with AAMA/CSA101/I.S.2/A440, vertical curtain walls and site-built fenestration products ^a U-factors for no more than 80% of fenestration area in project		U-factors for no less than 20% of fenestration in project.
Fixed ^b U-factor	((U-0.38)) U-0.34	U-0.24
Operable ^c U-factor	((U-0.40)) U-0.36	U-0.28
<i>Entrance doors^d</i>		
U-factor	U-0.60	N/A
U-factor for all other vertical fenestration U- factors for no more than 80% of vision glass in project.		
Fixed U-factor	((U-0.30)) U-0.26	U-0.20
Operable or mulled windows with fixed and operable sections U- factor	U-0.28	U-0.22

CLIMATE ZONE	5 AND MARINE 4 standard performance portion (max 80% of fenestration area)	High performance portion (min 20% of fenestration area)
SHGC for all vertical fenestration		
	Fixed	Operable
PF < 0.2	0.38	0.33
0.2 ≤ PF < 0.5	0.46	0.40
PF ≥ 0.5	0.61	0.53
Skylights		
U-factor	((U-0.50)) U-0.45	
SHGC	((0.35)) 0.32	

C402.4.1 Maximum area. Proposal to set maximum allowable glazing area by occupancy and use type, rather than a straight 30 or 35%. This gives large office and multifamily a 40% baseline. Grocery and standalone retail percentages were doubled (from ASHRAE baseline) to allow for exceptional circumstances. Also required some re-wording for Equation 4-3.

C402.4.1 Maximum area. The total building vertical fenestration area (not including opaque doors and opaque spandrel panels) shall not exceed ((30 percent of the total building gross above-grade wall area)) the percentage of above-grade wall area permitted by Table C402.4.1. The skylight area shall not exceed 5 percent of the total building gross roof area (skylight-to-roof ratio).

Table C402.4.1

Allowable Vertical Glazing Area Percentages

Occupancy	Building Area Type	Maximum prescriptive vertical fenestration %
Group A-2 or B	Restaurant (quick service)	34
Group A-2 or B	Restaurant (full service)	24
Group B	Healthcare (outpatient)	21
Group B	Office (5000 ft ² or smaller)	19
Group B	Office (5000 to 50,000 ft ²)	31
Group B	Office (larger than 50,000 ft ²)	40
Group B	University or college	30
Group E	School (primary and secondary)	22

Group I-2	Hospital	27
Group M	Grocery Store	7-15
Group M	Retail (standalone)	11-20
Group M	Retail (strip mall)	20
Group R-1	Hotel/motel (75 or fewer rooms)	24
Group R-1	Hotel/motel (more than 75 rooms)	34
Group R-2	Multifamily 7 stories or less	35
Group R-2	Multifamily 8 stories or taller	40
Group S-2	Warehouse (non-refrigerated)	6
	All other	30

Equation 4-3—SHGC Rate Calculations

$$\text{Proposed Total SHGCxA} \leq \text{Allowable Total SHGCxA}$$

Where:

- Proposed Total SHGCxA = SHGCxA-glaz-prop + SHGCxA-sky-prop
- Allowable Total SHGCxA = SHGCxA-glaz-allow + SHGCxA-sky-allow
- SHGCxA-glaz-prop = Sum of (proposed SHGCx proposed area) for each distinct vertical fenestration type **and each occupancy type**
- SHGCxA-sky-prop = Sum of (proposed SHGCx proposed area) for each distinct skylight type
- SHGCxA-glaz-allow = Sum of (code maximum vertical fenestration SHGC from Table C402.4, or Section C402.4.1.3 if applicable, x proposed area) for each distinct vertical fenestration type **and each occupancy type**, not to exceed the code maximum area
- SHGCxA-sky-allow = Sum of (code maximum skylight SHGC from Table C402.4 x proposed area) for each distinct skylight type, not to exceed the code maximum area

C402.4.1.1.2 High-performance fenestration. Decrease the required U-factor for glazing to qualify as “high-performance,” making it essentially triple glazing or equivalent, and matching the requirement for 20% of standard glazing to be triple or equivalent. Also clarifies that fixed and operable in the “all other” category can be combined, same as for fixe & operable curtain wall.

C402.4.1.1.2 High-performance fenestration. All of the following requirements shall be met:

1. All vertical fenestration in the building shall comply with the following U-factors:

- a. *U*-factor for Class AW windows rated in accordance with AAMA/CSA101/I.S.2/A440, vertical curtain walls and site-built fenestration products (fixed) = ~~((0.31))~~ **0.24**
 - b. *U*-factor for Class AW windows rated in accordance with AAMA/CSA101/I.S.2/A440, vertical curtain walls and site-built fenestration products (operable) = ~~((0.36))~~ **0.28**
 - c. Entrance doors = 0.60
 - d. *U*-factor for all other vertical fenestration, fixed = ~~((0.23))~~ **0.20**
 - e. *U*-factor for all other vertical fenestration, operable, or mulled windows with fixed and operable sections = ~~((0.24))~~ **0.22**
2. The SHGC of the vertical fenestration shall be no more than 0.90 times the maximum SHGC values listed in Table C402.4.

An area-weighted average shall be permitted to satisfy the *U*-factor requirement for each fenestration product category listed in Item 1 of this section. Individual fenestration products from different fenestration product categories shall not be combined in calculating the area-weighted average *U*-factor, except that fenestration from lines a. and b. are permitted to be combined, and the fenestration from lines d and e are permitted to be combined.

C402.5.4.1 Low-rise multifamily complying with commercial energy code provisions. Clarify how to test air barrier low-rise mixed-use buildings.

C402.5.4.1 Low-rise residential building areas conforming to commercial energy code requirements.
Where the residential provisions of this code require R-2 occupancy areas of 1, 2, and 3-story buildings to comply with the commercial provisions of the code, then the entire mixed-use building shall be tested to meet the standards for commercial uses.

C403.1 Clarification about compliance with ASHRAE 90.4. (staff request)

C403.1 General. Mechanical systems and equipment serving heating, cooling, ventilating, and other needs shall comply with this section.

- EXCEPTIONS:1. Energy using equipment used by a manufacturing, industrial or commercial process other than for conditioning spaces or maintaining comfort and amenities for the occupants are exempt from all Section C403 subsections except for Section C403.3.2, Tables C403.3.2 (1) through (16) inclusive, Sections C403.3.4.1, C403.3.4.2, C403.3.4.3, C403.7.7, C403.9.2.1, C403.10.3, C403.11.2, and C403.11.3, as applicable. Data center and computer room HVAC equipment is not covered by this exception.
2. Data center systems are exempt from Sections C403.4 and C403.5, but shall comply with ASHRAE 90.4 Sections 6 and 8 according to Section C403.1.3.

C403.1.1 Table listing TSPR occupancies. Easier to understand scope of the requirement in a table than in a list within a paragraph. Also clarification to exception #5.

C403.1.1 HVAC total system performance ratio (HVAC TSPR). For systems serving ((office (including medical office), retail, library, and education occupancies and buildings, which are subject to the requirements of Section C403.3.5 without exceptions, and the dwelling units and residential common areas within Group R-2 multi-family buildings)) occupancies included in Table C403.1.1, the HVAC total system performance ratio (HVAC TSPR) of the proposed design HVAC system shall be greater than or equal to the HVAC TSPR of the standard reference design as calculated according to Appendix D, Calculation of HVAC Total System Performance Ratio.

**Table C403.1.1
Occupancy Classifications Requiring TSPR**

Occupancy Classification	Inclusions	Excluded
A	Library	All other Group A uses
B	Office, medical office, library	All other Group B uses
E	All occupancies included	
M	All occupancies included	
R	Dwelling units and common areas within Group R-2 areas of buildings	R-1, R-3
F, H, I, S, U		All occupancies

EXCEPTIONS 1. Buildings in which the sum of the conditioned floor area of occupancies included in to Section C403.1.1: Table C403.1.1 office, retail, education, library and multifamily spaces is less than 5,000 square feet. Areas that are eligible for any of the exceptions below do not count towards the 5,000 square feet.

2. HVAC systems using district heating water, chilled water or steam.
3. HVAC systems connected to a low-carbon district energy exchange system.
4. HVAC systems not included in Table D601.10.1.
5. HVAC systems with chilled water supplied by absorption chillers, heat recovery chillers, water to water heat pumps, air to water heat pumps, or a combination of air and water cooled chillers on the same chilled water loop with no more than 10 percent of the cooling capacity of the combination being supplied by air cooled chillers.

...

C403.1.4 Exceptions to the heat pump heating rule.

- Exception 2: Permits electric resistance wattage to be averaged over all the rooms in one apartment.
- Exception 11: Requires hydronic systems using district heating coils to be sized large enough to work with 120°F water, to accommodate future change to heat pump.

- Exception 16: Clarification for Seattle climate
- Exception 18: Clarification requested by staff that electric resistance “standby equipment” is permissible.

C403.1.4 Use of electric resistance and fossil fuel-fired HVAC heating equipment. HVAC heating energy shall not be provided by electric resistance or fossil fuel combustion appliances. For the purposes of this section, electric resistance HVAC heating appliances include, but are not limited to, electric baseboard, electric resistance fan coil and VAV electric resistance terminal reheat units and electric resistance boilers. For the purposes of this section, fossil fuel combustion HVAC heating appliances include, but are not limited to, appliances burning natural gas, heating oil, propane, or other fossil fuels.

EXCEPTIONS:...

2. Dwelling and sleeping units. Dwelling or sleeping units are permitted to be heated using electric resistance appliances as long as the installed HVAC heating capacity in any separate space is not greater than specified in 2.1 through 2.3. Where a single dwelling unit includes multiple habitable spaces that are all heated with electric resistance heat, individual spaces are permitted have more electric resistance heating capacity than specified in 2.1 through 2.3, where the total electric resistance heating capacity for the dwelling unit is less than or equal to the total allowed.

SDCI Informative Note for exception 2: As an example, a one-bedroom apartment could, instead of placing 750 watts of heating in the living room and another 750 watts in the bedroom (1500 watt total), could place 1000 watts in the living room and 500 watts in the bedroom, for the same 1500 watt total.

2.1. Seven hundred fifty watts in Climate Zone 4, and 1000 watts in Climate Zone 5 in each habitable space with exterior fenestration.

2.2. One thousand watts in Climate Zone 4, and 1300 watts in Climate Zone 5 for each habitable space that has two primary walls facing different cardinal directions, each with exterior fenestration. Bay windows and other minor offsets are not considered primary walls.

2.3. Two hundred fifty watts in spaces adjoining the *building thermal envelope* but without exterior fenestration.

For the purposes of this section, habitable space is as defined in the International Building Code. ((For buildings in locations with exterior design conditions below 4°F (-16°C), an additional 250 watts above that allowed for Climate Zone 5 is permitted in each space with fenestration.))

11. **District energy.** Steam or hot water district energy systems that utilize fossil fuels as their primary source of heat energy, that serve multiple buildings, and that were already in existence prior to the effective date of this code, including more energy-efficient upgrades to such existing systems, are permitted to serve as the primary heating energy source. Any hydronic system served by fossil fuel-fired district energy shall be sized to provide all

required space heating at Seattle design winter outdoor temperature with maximum entering water temperature at design conditions of 118°F, to permit future conversion to heat pump heating.

16. **DOAS ERV auxiliary heat.** Dedicated outdoor air systems with energy recovery ventilation are permitted to utilize ~~((fossil fuel for Climate Zone 5 or))~~ electric resistance ~~((in Climate Zone 4 or 5))~~ for auxiliary heating to preheat outdoor air for defrost or as auxiliary supplemental heat to temper supply air to 55°F (13°C) or lower for buildings or portions of buildings that do not have hydronic heating systems.

18. **Essential facilities.** Groups I-2 and I-3 occupancies that by regulation are required to have in place redundant emergency backup systems are permitted to use fossil fuels for emergency generators and for redundant emergency space heating and water heating appliances, provided that such systems are sized and controlled to operate only upon loss of electrical power.

19. **Standby heating equipment.** Standby HVAC heating equipment provided in addition to the primary HVAC heating system that is controlled such that it will only be in operation when the primary HVAC heating equipment is not available is permitted to be electric resistance.

Commented [DJ1]: Clarification requested by staff

C403.3.2. Clarification of how to reference new DOE equipment testing procedures.

C403.3.2 HVAC equipment performance requirements. Equipment shall meet the minimum efficiency requirements of Tables C403.3.2(1) through C403.3.2 (16) when tested and rated in accordance with the applicable test procedure. After new equipment efficiency values including HSPF2, EER2, and SEER2 have been published by the US Department of Energy, equipment is permitted to meet those values in lieu of the table values. Plate-type liquid-to-liquid heat exchangers shall meet the minimum requirements of AHRI 400. The efficiency shall be verified through certification and listed under an *approved* certification program or, if no certification program exists, the equipment efficiency ratings shall be supported by data furnished by the manufacturer. Where multiple rating conditions or performance requirements are provided, the equipment shall satisfy all stated requirements. Where components, such as indoor or outdoor coils, from different manufacturers are used, calculations and supporting data shall be furnished by the designer that demonstrates that the combined efficiency of the specified components meets the requirements herein.

Table C403.3.5. Add clarification for R-2 dwelling units. From David Reddy: Dwelling & sleeping units are already required to have balanced ventilation with heat recovery, essentially meaning that they have a kind of DOAS. This change applies the DOAS rules to those buildings that use central or rooftop systems.

**Table C403.3.5
Occupancy Classifications Requiring DOAS**

Occupancy Classification^a	Inclusions	Exempted
A-1	All occupancies not specifically exempted	Television and radio studios
A-2	Casinos (gaming area)	All other A-2 occupancies
A-3	Lecture halls, community halls, exhibition halls, gymnasiums, courtrooms, libraries, places of religious worship	All other A-3 occupancies
A-4, A-5		All occupancies excluded
B	All occupancies not specifically exempted	Food processing establishments including commercial kitchens, restaurants, cafeterias; laboratories for testing and research; data processing facilities and telephone exchanges; air traffic control towers; animal hospitals, kennels, pounds; ambulatory care facilities
F, H, I, R , S, U		All occupancies excluded
R	Group R-occupancy spaces that are required to include energy recovery ventilation systems by Sections C403.3.6 and C403.7.6	Groups R-1 and R-3, Group R-2 dwelling and sleeping units served by energy recovery ventilation systems that serve only one dwelling or sleeping unit
E, M	All occupancies included	

a. Occupancy classification from the *International Building Code* Chapter 3.

C403.3.5.2 DOAS fan power. David Reddy suggestion to reduce fan power.

C403.3.5.2 DOAS fan power. For a DOAS that does not have at least one fan or fan array with fan electrical input power ≥ 1 kW, the total combined fan power shall not exceed ~~(4)~~ **0.8** watts per cfm of outdoor air as calculated in accordance with Equation 4-10 using design maximum airflows and external static pressures. For a DOAS with at least one fan or fan array with fan electrical input power ≥ 1 kW, the DOAS shall comply with the fan power limitations of Section C403.8.1. DOAS total combined fan power shall include all supply, exhaust and other fans utilized for the purpose of ventilation. This fan power restriction applies to each DOAS in the permitted project, but does not include the fan power associated with the zonal heating and cooling equipment.

(Equation 4-10)

$$\text{DOAS Total Combined Fan Power} \left(\frac{\text{Watts}}{\text{CFM}} \right) = \sum \left(\frac{\text{Fan bhp}}{\eta_m} \right) \times \frac{746}{\text{CFM}_{\text{supply}}}$$

Where:

Fan bhp	≡	Brake horsepower for each supply, exhaust and other fan in the system at design maximum airflow rate.
η_m	≡	Fan motor efficiency including all motor, drive and other losses for each fan in the system.
CFM _{supply}	≡	Design maximum airflow rate of outdoor (supply) air.

C403.7.6.1 HRV efficiency (From CA code)

C403.7.6.1 Ventilation for Group R-2 occupancy. For all Group R-2 dwelling and sleeping units, a balanced ventilation system with heat recovery system with minimum ~~(60)~~ 67 percent sensible recovery effectiveness shall provide outdoor air directly to each habitable space in accordance with the *International Mechanical Code*. The ventilation system shall allow for the design flow rates to be tested and verified at each habitable space as part of the commissioning process in accordance with Section C408.2.2. The return/exhaust air stream temperature for heat recovery device selection shall be 70°F (21°C), or as calculated by the *registered design professional*.

EXCEPTION: Heat recovery and energy recovery ventilators (H/ERVs) that are rated and listed in accordance with HVI 920 can demonstrate compliance with the sensible recovery effectiveness requirement using the sensible recovery effectiveness (ASRE) rating of the equipment at 32°F test conditions. Applied flow rate for ASRE rating shall be no less than the design flow rate or the closest value interpolated between two listed flow rates.

C403.8.4 Fractional HP fan efficiency. Scope change is David Reddy suggestion, to cover fans between 1/12 and 1.0 HP. HRV efficacy is latest CA code standard.

C403.8.4 Low-capacity ventilation fans. Mechanical ventilation system ((fans with motors less than 1/12 hp (0.062 kW) in capacity)) types listed in Table C403.8.4 with an input power less than 746 watts (1 HP) shall meet the efficacy requirements of Table C403.8.4 ((at one or more rating points)). Airflow shall be tested in accordance with the test procedure referenced in Table C403.8.4 and listed. The efficacy, airflow divided by power, shall be reported in the product listing or shall be derived from the input power and airflow values reported in the product listing or on the label. The efficacy shall be determined using the input power at a listed airflow that is not less than the design airflow or shall be determined by interpolating between the input power at the two nearest listed airflow rates. Design airflow, power, and efficacy shall be reported on the mechanical equipment schedule submitted in the permit documents.

- EXCEPTIONS:
1. Where ventilation fans are a component of a listed heating or cooling appliance.
 2. Dryer exhaust duct power ventilators and domestic range booster fans that operate intermittently.
 3. Fans in radon mitigation systems.
 4. Fans not covered within the scope of the test methods referenced in Table C403.8.5
 5. Ceiling fans regulated under 10 CFR 430 Appendix U.

Commented [MM2]: I've copied the existing exception to C403.3.6 to this section. Also, I did an analysis of the HVI database and found that you could switch to HVI's SRE metric instead of ASRE without disqualifying any models, so you might as well use HVI's SRE here, which is a more stringent target than the ASRE.

Commented [DJ3]: Is this still relevant?

Commented [MM4R3]: Yes. We need to keep this language, because this is the foundation for the determination of fan efficacy.

Commented [MM5]: I've copied the existing exception to C403.3.6 to this section. Also, I did an analysis of the HVI database and found that you could switch to HVI's SRE metric instead of ASRE without disqualifying any models, so you might as well use HVI's SRE here, which is a more stringent target than the ASRE.

Commented [DR6]: I took the last sentence from Mike's EXCEPTION added to C403.7.6.1, and tailored it to clarify the fan efficacy should be at the flow rate closest to design flow.

6. Mechanical ventilation system types with an input power greater than 62 watts having electronically commutated motors or motors with a minimum efficiency of 70 percent when rated in accordance with DOE 10 CFR 431. Such systems shall also have the means to adjust motor speed for either balancing or remote control. Belt-driven fans may use sheave adjustment for airflow balancing in lieu of a varying motor speed. The efficiency shall be verified through certification under an approved certification program, or, where no certification program exists, the equipment efficiency rating shall be supported by data furnished by the motor manufacturer.

The efficacy shall be determined at a listed airflow that is not less than the design airflow or shall be determined by interpolating between the efficacies determined at the two nearest listed airflow rates.

Table C403.8.4
Low-Capacity Ventilation Fan Efficacy^a

Fan Location	Airflow Rate Minimum (cfm)	Minimum Efficacy (cfm/watt)	Airflow Rate Maximum (cfm)
HRV or ERV	Any	((1.2)) 1.7 cfm/watt	Any
Range hood	Any	2.8 cfm/watt	Any
In-line fan	Any	3.8 cfm/watt	Any
Bathroom, utility room	<90	2.8 cfm/watt	<90
Bathroom, utility room	90	3.5 cfm/watt	Any

For SI: 1 cfm/ft = 47.82 W.

^a Airflow shall be tested in accordance with HVI 916 and listed. Efficacy shall be listed or shall be derived from listed power and airflow. Fan efficacy for fully ducted HRV, ERV, balanced and in-line fans shall be determined at a static pressure not less than 0.2 inch w.e. Fan efficacy for ducted range hoods, bathroom, and utility room fans shall be determined at a static pressure not less than 0.1 inch w.e.

Table C403.8.4
Low-Capacity Ventilation Fan Efficacy^a

Fan Location System Type	Airflow Rate Minimum (cfm)	Minimum Efficacy (cfm/watt)	Minimum Static Pressure for Testing	Test Procedure
Balanced ventilation system without heat or energy recovery	Any	1.2 ^a	0.2 inch w.e.	ASHRAE Standard 51 (ANSI/AMCA Standard 210)
HRV or ERV	Any	((1.2)) 1.7 ^a cfm/watt	0.2 inch w.e. ^b	CAN/CSA 439-18
Range hood	Any	2.8	0.1 inch w.e.	ASHRAE 51 (ANSI/AMCA Standard 210)
In-line supply or exhaust fan	Any	3.8	0.2 inch w.e.	
((Bathroom, utility room)) Other exhaust fan	<90	2.8	0.1 inch w.e.	
	>90 and <200	3.5	0.1 inch w.e.	
	≥200	4.0	0.1 inch w.e.	

Commented [MM7]: Adding this column was a nice simplification to the section, Duane. I like it.

Commented [DJ8]: Conform to CA code

For SI: 1 cfm/ft = 47.82 W.

- a. For balanced systems, HRVs, and ERVs, the efficacy shall be determined as the outdoor airflow divided by the total fan power of the system.
- b. The minimum static pressure for determining HRV or ERV fan efficacy shall be 0.4 inch w.c. for airflows greater than or equal to 100 L/s. ((Airflow shall be tested in accordance with HVI 916 and listed. Efficacy shall be listed or shall be derived from listed power and airflow. Fan efficacy for fully ducted HRV, ERV, balanced and in line fans shall be determined at a static pressure not less than 0.2 inch w.c. Fan efficacy for ducted range hoods, bathroom, and utility room fans shall be determined at a static pressure not less than 0.1 inch w.c.))

C403.8.7 Occupied Standby Controls (From 2024 IECC proposal CEPI 108.)

Add new definition as follows:

OCCUPIED-STANDBY MODE. Mode of operation when an HVAC zone is scheduled to be occupied and an occupant sensor indicates no occupants are within the zone.

Revise as follows:

C403.7 Ventilation and exhaust systems.

In addition to other requirements of Section C403 applicable to the provision of ventilation air or the exhaust of air, ventilation and exhaust systems shall be in accordance with Sections C403.7.1 through C403.7.8, **and Section C403.8.7.**

Add new text as follows:

C403.8.7 Occupied standby controls.

Occupied standby controls in compliance with C403.8.7.1 and C403.8.7.2 are required for zones and systems serving zones where no less than 90 percent of the floor area of the zone consists of use types including those listed below and other space types with similar use and occupancy, and none of the spaces within the zone are required by the International Mechanical Code to have ventilation airflow greater than zero when unoccupied.

1. Classroom/lecture/training rooms
2. Conference/meeting/multipurpose rooms
3. Lounges and breakrooms
4. Enclosed offices/open office areas/reception areas/lobbies
5. Assembly areas
6. Library stacks

C403.8.7.1 Occupied standby zone controls. For zones required to provide occupied-standby controls, within 5 minutes of all spaces in that zone entering *occupied-standby mode*, the zone control shall operate as follows:

1. Active heating set point shall be setback at least 1°F (0.5°C).

2. Active cooling set point shall be setup at least 1°F (0.5°C).
3. Airflow supplied to the zone shall be controlled as follows, depending on system type:
 - 3.1 Spaces that are required to have occupancy sensors in accordance with Section C403.7.2 are required to shut off the outdoor airflow in accordance with that section.
 - 3.2 Small dedicated outdoor air systems (DOAS) that serve multiple heating and cooling system zones without automatic zone control dampers are not required to shut off the DOAS supply airflow by zone. A system is considered a small DOAS when:
 - a. the area served is no greater than 25,000 square feet (2323 m2) of conditioned floor area, and;
 - b. the DOAS does not serve more than one floor.
 - 3.3 Other dedicated outdoor air systems (DOAS) that serve multiple heating and cooling system zones without automatic zone control dampers are required to shut off the DOAS supply airflow when all the zones on any one floor or in any one area up to 25,000 square feet enter *occupied-standby mode*. The maximum zone sizes for DOAS supply airflow shutoff are as follows:
 - a. 25,000 square feet (2323 m2) of conditioned floor area, or;
 - b. not more than one floor.
 - 3.4 For systems other than those identified in 3.2 and 3.3 above, all airflow (outdoor airflow and supply airflow) supplied to the zone shall be shut off whenever the space temperature is between the active heating and cooling set points.

Exception: Airflow (outdoor airflow and supply airflow) for *replacement air* or makeup air is permitted to be supplied during *occupied-standby mode* for any of the space types identified in 3.1 through 3.4 above.

C403.8.7.2 Occupied standby system controls. Multiple zone systems that are capable of automatically resetting or that are required in accordance with Section C403.6.10 to reset the effective minimum outdoor air setpoint and that serve zones with occupied-standby zone controls shall reset the effective minimum outdoor air setpoint based on a zone outdoor air requirement of zero for all zones in *occupied-standby mode*. Sequences of operation for system outside air reset shall comply with an *approved method*.

Exception. Airflow (outdoor airflow and supply airflow) for *replacement air* or makeup air is permitted to be supplied during *occupied-standby mode*.

C403.10.1.2 Duct insulation. Clarification of insulation requirements for ducts conveying unconditioned air. From Eric Vander Mey.

C403.10.1.2 Other supply and return ducts. All other supply and return air ducts and plenums shall be insulated with a minimum of R-6 insulation where located in unconditioned spaces, and where located outside the building with a minimum of R-8 insulation in Climate Zone 4 and R-12 insulation in Climate Zone 5. Ducts located underground beneath buildings shall be insulated as required in this section or have an equivalent *thermal distribution efficiency*. Underground ducts utilizing the *thermal distribution efficiency*

method shall be listed and labeled to indicate the R-value equivalency. Where located within a building envelope assembly, the duct or plenum shall be separated from the building exterior or unconditioned or exempt spaces by minimum insulation value as required for exterior walls by Section C402.1.3.

- EXCEPTIONS:
1. Where located within equipment.
 2. Supply and return ductwork located in unconditioned spaces where the design temperature difference between the interior and exterior of the duct or plenum does not exceed 15°F (8°C) and are insulated in accordance with Table C403.10.1.2.

Where located within conditioned space, supply ducts which convey supply air at temperatures less than 55°F or greater than 105°F shall be insulated with a minimum insulation R-value in accordance with Table C403.10.1.2.

EXCEPTION: Ductwork exposed to view within a zone that serves that zone is not required to be insulated.

Where located within conditioned space, return or exhaust air ducts that convey return or exhaust air downstream of an energy recovery media shall be insulated with a minimum insulation R-value in accordance with Table C403.10.1.2.

Where located within conditioned space, ducts that convey air from outside the conditioned space shall be insulated with a minimum insulation R-value in accordance with Table C403.10.1.2.

Where located within conditioned space, ducts that convey ambient air to and from outdoors for HVAC heat pumps, service hot water heat pumps, or air conditioning units shall be insulated with a minimum insulation R-value in accordance with Table C403.10.1.2.

All ducts, air handlers, and filter boxes shall be sealed. Joints and seams shall comply with Section 603.9 of the *International Mechanical Code*.

Table C403.10.1.2
Supply, Return, Exhaust and Relief Air Ductwork Insulation

Duct System	Duct Location and Use	Climate Zone	Minimum Installed Duct Insulation R-value ^{a,b}	Notes
Supply air or return air	Outside the building (outdoors and exposed to weather) ^c	4C	R-8	See Section C403.10.1.2 for details
Supply air or return air	Outside the building (outdoors and exposed to weather) ^c	5B	R-12	See Section C403.10.1.2 for details
Supply air or return air	Unconditioned space (enclosed but not in the building conditioned envelope)	4C and 5B	R-6	See Section C403.10.1.2 for details
Supply air or return air	Unconditioned space where the duct conveys air that is within 15°F of the air temperature of the surrounding unconditioned space	4C and 5B	R-3.3	See IMC Section 603.12 for additional requirements for condensation control at ductwork
Supply air or return air	Where located in a building envelope assembly	4C and 5B	R-16	Duct or plenum is separated from building envelope assembly with

Duct System	Duct Location and Use	Climate Zone	Minimum Installed Duct Insulation R-value ^{a,b}	Notes
				the minimum insulation value
Supply air	Within conditioned space where the supply duct conveys air that is less than 55°F or greater than 105°F	4C and 5B	R-3.3	See Section C403.10.1.2 for details
Supply air	Within conditioned space that the duct directly serves where the supply duct conveys air that is less than 55°F or greater than 105°F	4C and 5B	None	See Section C403.10.1.2 for details
Supply air	Within conditioned space where the supply duct conveys air that is 55°F or greater and 105°F or less	4C and 5B	None	
Return or exhaust air	Within conditioned space, downstream of an energy recovery media, upstream of an automatic shutoff damper	4C	R-8	
Return or exhaust air	Within conditioned space, downstream of an energy recovery media, upstream of an automatic shutoff damper	5B	R-12	
Relief or exhaust air	Conditioned space and downstream of an automatic shutoff damper	4C and 5B	R-16	
Exhaust or other air duct	Duct conveying air from unconditioned space through conditioned space	4C and 5B	R-16	
Condenser air intake and outlet	Conditioned space and conveys ambient air to or from the outdoors to heat pump or AC unit condenser	4C and 5B	< 2800 CFM = R-8 ≥ 2800 CFM = R-16	

^a Insulation R-values, measured in h·ft²·°F/Btu, are for the insulation as installed and do not include film resistance. The required minimum thicknesses do not consider water vapor transmission and possible surface condensation. Insulation resistance measured on a horizontal plane in accordance with ASTM C518 at a mean temperature of 75°F at the installed thickness.

^b See *International Mechanical Code* Sections 603.12 and 604 for further details on duct insulation requirements.

^c Includes attics above insulated ceilings, parking garages and crawl spaces.

C403.12 Single zone VAV Remove reference to gas boilers for clarity.

7. Single-zone VAV systems shall comply with one of the following options:

7.1. Single-zone VAV air handling units with a hydronic heating coil connected to systems with hot water generation equipment limited to the following types of equipment: ((Gas-fired hydronic boilers with a thermal efficiency, E_t , of not less than 92 percent,)) air-to-water heat pumps or heat recovery chillers. Hydronic heating coils shall be sized for a maximum entering hot water temperature of 120°F for peak anticipated heating load conditions.

C403.15 Clean water pumps. Pump efficiency standard from 2024 IECC proposal CEPI-83. Also, new Hydraulic Institute ER rating, suggested by NEEA, Kevin Rose & Nicole Dunbar.

C403.15 Clean water pumps.

Clean water pumps meeting all the following criteria shall achieve a ((PEI)) Pump Energy Index (PEI) rating not greater than 1.0 **and a Hydraulic Institute Energy Rating (ER) greater than zero:**

1. Shaft input power is greater than or equal to 1.0 hp (0.75 kW) and less than or equal to 200 hp (149.1 kW) at its BEP.
2. Designated as either an End Suction Close-coupled, End Suction Frame Mounted, In-line, Radially Split Vertical, or Submersible Turbine pump.
3. A flow rate of 25 gal/min (1.58 L/s) or greater at its *best efficiency point (BEP)* at full impeller diameter
4. Maximum head of 459 ft at its *BEP* at full impeller diameter and the number of stages required for testing
5. Design temperature range from 14°F (-10°C) to 248°F (120°C)
6. Designed to operate with either:
 - 6.1. a 2- or 4-pole induction motor, or
 - 6.2. a non-induction motor with a speed of rotation operating range that includes speeds of rotation between 2880 and 4320 rpm and/or 1440 and 2160 rpm, and
 - 6.3. in either (1) or (2), the driver and impeller must rotate at the same speed
7. For submersible turbine pumps, a 6 inch (152 mm) or smaller bowl diameter
8. For end-suction close-coupled pumps and end-suction frame-mounted/own bearings pumps, specific speed less than or equal to 5000 rpm when calculated using U.S. customary units

Exceptions: The following pumps are exempt from these requirements:

1. Fire pumps
2. Self-priming pumps
3. Prime-assisted pumps
4. Magnet-driven pumps
5. Pumps designed to be used in a nuclear facility subject to 10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

6. Pumps meeting the design and construction requirements set forth in U.S. Military Specification MIL-P-17639F, "Pumps, Centrifugal, Miscellaneous Service, Naval Shipboard Use" (as amended); MIL-P-17881D, "Pumps, Centrifugal, Boiler Feed, (Multi-Stage)" (as amended); MIL-P-17840C, "Pumps, Centrifugal, Close-Coupled, Navy Standard (For Surface Ship Application)" (as amended); MIL-P-18682D, "Pump, Centrifugal, Main Condenser Circulating, Naval Shipboard" (as amended); MIL-P-18472G, "Pumps, Centrifugal, Condensate, Feed Booster, Waste Heat Boiler, And Distilling Plant" (as amended).

SDCI Informative Note: See Chapter 2 for definition of "clean water pump." This does not refer solely to potable water pumps, but more generally to pumps that move water carrying minimal solids, and that may contain anti-freeze additives.

BEST EFFICIENCY POINT (BEP). The pump hydraulic power operating point (consisting of both flow and head conditions) that results in the maximum efficiency.

CLEAN WATER PUMP. A device that is designed for use in pumping water with a maximum nonabsorbent free solid content of 0.016 lb/ft³ (0.256 kg/m³) and with a maximum dissolved solid content of 3.1 lb/ft³ (49.66 kg/m³), provided that the total gas content of the water does not exceed the saturation volume, and disregarding any additives necessary to prevent the water from freezing at a minimum of 14°F (-10°C).

PUMP ENERGY INDEX (PEI). The ratio of a pump's energy rating divided by the energy rating of a minimally compliant pump. For pumps with the constant load operating mode, the relevant PEI is PEI_c. For pumps with the variable load operating mode, the relevant PEI is PEI_v.

Table C404.3.1 Piping Volume and Maximum Piping Lengths. We currently allow ½" and 5/8" pipe between the circulating loop and a "public lavatory" to be 8 feet long. Should we extend that to include 3/8" pipe? (I believe that 3/8" is permitted if serving only a single fixture.)

Table C404.3.1
Piping Volume and Maximum Piping Lengths

Nominal Pipe Size (inches)	Volume (liquid ounces per foot length)	Maximum Piping Length (feet)	
		Public lavatory faucets	Other fixtures and appliances
1/4	0.33	6	50
5/16	0.5	4	50
3/8	0.75	3 (8)	50
1/2	1.5	((2)) 8	43
5/8	2	((1)) 8	32
3/4	3	0.5	21
7/8	4	0.5	16
1	5	0.5	13
1 1/4	8	0.5	8
1 1/2	11	0.5	6
2 or larger	18	0.5	4

C404.6 pipe insulation. Remove some irrelevant information, clarify “vertical support” exception, and clarify for tubular insulation that you can’t get out of our pipe insulation requirements just because a manufacturer recommends thinner insulation. New Table C404.6 to make more readable, consolidating hot water pipe insulation thickness requirements in one place, instead of having to go back to a table in C403 and its footnotes.

C404.6 Insulation of piping. Piping from a water heater to the termination of the heated water fixture supply pipe shall be insulated in accordance with Table ~~((C403.10.3))~~ **C404.6**. On both the inlet and outlet piping of a storage water heater or heated water storage tank, the piping to a heat trap or the first 8 feet (2438 mm) of piping, whichever is less, shall be insulated. Piping that is heat traced shall be insulated in accordance with Table ~~((C403.10.3))~~ **C404.6** or the heat trace manufacturer’s instructions. Tubular pipe insulation shall be installed in accordance with the insulation manufacturer’s instructions, **or Table C404.6, whichever results in thicker insulation.**

- EXCEPTION: Tubular pipe insulation shall not be required on the following:
1. The tubing from the connection at the termination of the fixture supply piping to a plumbing fixture or plumbing appliance.
 2. Valves, pumps, strainers and threaded unions in piping that is 1 inch (25 mm) or less in nominal diameter.
 3. Piping from user-controlled shower and bath mixing valves to the water outlets.
 4. ~~((Cold water piping of a demand recirculation water system.))~~
 5. Tubing from a hot drinking-water heating unit to the water outlet.
 6. ~~((Piping at))~~ **Vertical pipe riser** locations where a vertical support of the piping is installed.
 7. ~~((Piping surrounded by building insulation with a thermal resistance (R value) of not less than R-3.))~~
 8. Hot water piping that is part of the final pipe run to the plumbing fixture and is not part of the heated-water circulation system circulation path is not required to meet the minimum insulation requirements of Section C404.6.

Table C404.6
Required Pipe Insulation Thickness for Service Water Heating

Location	Water Temp	Nominal Pipe or Tube Size					Insulation Conductivity	
		< 1"	1 to < 1-1/2	1-1/2 to < 4	4 to < 8	8 or larger	Conductivity Btu • in. / (h • ft ² • °F) ^b	Mean Rating Temp, °F
Circulation Loop Piping not in-partition	105 – 140°F	2.0	2.0	2.5	2.5	2.5	0.21 - 0.28	100
	141 – 200°F	2.5	2.5	3.0	3.0	3.0	0.25 - 0.29	125
All other piping not in-partition	105 – 140°F	1.0	1.0	1.5	1.5	1.5	0.21 - 0.28	100
	141 – 200°F	1.5	1.5	2.0	2.0	2.0	0.25 - 0.29	125
In-partition ^a Circulation Loop Piping < 1-1/2 inch	105 – 140°F	1.0	1.0	1.5	1.5	1.5	0.21 - 0.28	100
	141 – 200°F	1.5	1.5	2.0	2.0	2.0	0.25 - 0.29	125
In-partition ^a All other piping < 1-1/2 inch	105 – 140°F	1.0	1.0	1.0	1.0	1.0	0.21 - 0.28	100
	141 – 200°F	1.0	1.0	1.0	1.0	1.0	0.25 - 0.29	125

a. In a partition within a conditioned space, for piping smaller than 1-1/2 inch
b. For insulation outside the stated conductivity range, conform to requirements of Table C403.10.1

C404.7.1.2 Multiple riser SHW circulation. Clarifies the phrase “extended periods” and exempts Group R and Group I occupancies from the automatic shutdown requirement. Improved wording on item #4 and exception from David Reddy.

C404.7.1.2 Multiple riser systems. Where the circulation system serves multiple domestic hot water risers or piping zones, the following **equipment and** controls shall be provided:

1. Controls shall be configured to automatically turn off the circulation pump during **((extended))** periods **of time exceeding 4 hours** when hot water is not required.

2. System shall include means for balancing the flow rate through each individual hot water supply riser or piping zone.

3. For circulation systems that use a variable flow circulation pump, each **Each** riser and piping zone shall have a self-actuating thermostatic balancing valve.

4. A variable speed circulation pump that automatically adjusts speed to reduce flow to maintain a constant pressure or recirculation return temperature.

EXECPTION: Multiple riser systems serving Group R and Group I occupancies are not required to have controls that automatically turn off the circulation pump.

Table C405.2.1 Add parking to occ sensor list. Seems like parking needs to be part of this list, since the lighting is required to be reduced by 30% after 20 minutes of no occupant detection.

Table C405.4.2.1

Occupant sensor control locations

	Comply with Section
Classrooms/lecture/training rooms	<u>C405.2.1.1</u>
Conference/meeting/multipurpose rooms	<u>C405.2.1.1</u>
Copy/print rooms	<u>C405.2.1.1</u>
Lounge/breakrooms	<u>C405.2.1.1</u>
Enclosed offices	<u>C405.2.1.1</u>
Open plan office areas	<u>C405.2.1.3</u>
Restrooms	<u>C405.2.1.1</u>
Storage rooms	<u>C405.2.1.1</u>
Locker rooms	<u>C405.2.1.1</u>
Other spaces 300 square feet (28 m ²) or less that are enclosed by floor-to-ceiling height partitions	<u>C405.2.1.1</u>
Warehouse storage areas	<u>C405.2.1.2</u>
Library stacks	<u>C405.2.1.2</u>
Enclosed fire rated stairways	<u>C405.2.1.5</u>
Corridors	((C405.2.1.6)) <u>C405.2.1.5</u>
Covered parking	<u>C405.2.10</u>

C405.2.4 Dimming. From 2024 IECC proposal CEPI-156. This proposal requires dimming capability in most major space types. Why didn't we think of this a long time ago? (Existing "light reduction control" language is struck.)

~~((C405.2.3)) C405.2.4 Light reduction controls~~ **Dimming controls.**

Commented [DJ9]: From 2024 IECC CEPI-156

Dimming controls complying with Section C405.2.4.1 are required for general lighting in the following space types. The space types listed include other spaces with substantially similar uses.

1. Classroom / lecture hall / training room.
2. Conference / multipurpose / meeting room.
3. In a dining area for bar/lounge or leisure, family dining.
4. Laboratory.
5. Lobby.
6. Lounge / Break Room.
7. Offices.
8. Gymnasium / fitness center.
9. Library reading room.
10. In a health care facility for imaging rooms, exam rooms, nursery, and nurses' station.
11. Spaces not provided with occupant sensor controls complying with Section C405.2.1.1.

Exceptions:

1. Luminaires controlled by daylight responsive controls complying with Section C405.2.4.
2. Luminaires controlled by special application controls complying with Section C405.2.5.

~~((C405.2.3.4)) C405.2.4.1 Light reduction~~ **Dimming control function.**

Spaces required to have dimming control shall be provided with *manual* controls that allow lights to be dimmed from full output to 10 percent of full power or lower with continuous dimming, as well as turning lights off. *Manual* control shall be provided within each room to dim lights.

C405.2.6 Change "nonhuman life forms" phrase. "Plants and animals" should do fine. "Nonhuman life forms" sounds like something out of Star Wars.

C405.2.6 Additional lighting controls. Specific application lighting shall be provided with controls, in addition to controls required by other sections, for the following:

...

3. Lighting for life support of ~~((nonhuman life forms))~~ **plants and animals** and food warming, shall be controlled by a dedicated control that is independent of the controls for other lighting within the room or space. ~~((Each control zone shall be no greater than the area served by a single luminaire or 4,000 square feet (372 m²), whichever is larger.))~~

C405.4.1 Total connected interior lighting power. This was added two code cycles ago as a staff suggestion, but I don't believe that it's ever been used. Delete entirely.

~~((As an option, in areas of the building where all interior lighting equipment is fed from dedicated lighting branch circuits, the total connected interior lighting power is permitted to be calculated as the sum of the capacities of the lighting branch circuits serving those areas. For the purposes of this section, the connected interior lighting power of a 20 ampere circuit is considered to be 16 amperes, and that of a 15 ampere circuit is 12 amperes. Use of this alternative and the boundaries of the applicable areas shall be clearly documented on the electrical construction documents.))~~

C405.4.2.2.1 Retail lighting power. From 2024 IECC CECPI-7 proposal updating retail allowances for the first time in decades.

C405.4.2.2.1 Additional interior lighting power. Where using the Space-by-Space Method, an increase in the interior lighting power allowance is permitted for specific lighting functions. Additional power shall be permitted only where the specified lighting is installed in addition to and automatically controlled separately from *general lighting*, in accordance with Section C405.2.6. This additional power shall be used only for the specified luminaires and shall not be used for any other purpose.

An increase in the interior lighting power allowance is permitted for lighting equipment to be installed in sales areas specifically to highlight merchandise. The additional lighting power shall be determined in accordance with Equation 4-14.

(Equation 4-14)

Additional Interior Lighting Power Allowance = 500 watts + (Retail Area 1 × ~~((0.45))0.40~~ W/ft²) + (Retail Area 2 × ~~((0.45))0.40~~ W/ft²) + (Retail Area 3 × 1.05 ~~((1.05))0.70~~ W/ft²) + (Retail Area 4 × 1.87 ~~((1.87))1.00~~ W/ft²).

Where:

Retail Area 1 = The floor area for all products not listed in Retail Area 2, 3 or 4.

Retail Area 2 = The floor area used for the sale of vehicles, sporting goods and small electronics.

Retail Area 3 = The floor area used for the sale of furniture, clothing, cosmetics and artwork.

Retail Area 4 = The floor area used for the sale of jewelry, crystal and china.

EXCEPTION: Other merchandise categories are permitted to be included in Retail Areas 2 through 4, provided that justification documenting the need for additional lighting power based on visual inspection, contrast, or other critical display requirement is *approved* by the code official.

Table C405.4.2.(1) building area method. 2024 IECC reduces LPAs by about 5%, so if Seattle code reduces them 10% below the 2024, it will result in about a 5% overall reduction. Note several rows in 2018 space by space table have been eliminated in 2021 table. No need to keep them. Footnotes c & d stricken because commercial code no longer references residential energy code.

Table C405.4.2(1)

Interior Lighting Power Allowances—Building Area Method

NOTE: Reduce all the interior LPDs 10% below 2024 IECC (about 5% below current WA LPDs)

Building Area Type	LPD (w/ft ²)	<u>LPD</u> (w/ft ²)	<u>IECC</u> <u>2024</u>	<u>WA 2021 (-</u> <u>10%)</u>
Automotive facility	0.64	<u>0.58</u>	0.73	<u>0.66</u>
Convention center	0.64	<u>0.58</u>	0.64	<u>0.58</u>
Court house	0.79	<u>0.71</u>	0.75	<u>0.68</u>
Dining: Bar lounge/leisure	0.79	<u>0.71</u>	0.74	<u>0.68</u>
Dining: Cafeteria/fast food	0.72	<u>0.65</u>	0.70	<u>0.63</u>
Dining: Family	0.71	<u>0.64</u>	0.65	<u>0.59</u>
Dormitory ^{a,b}	0.46	<u>0.41</u>	0.52	<u>0.47</u>
Exercise center	0.67	<u>0.60</u>	0.72	<u>0.65</u>
Fire station ^a	0.54	<u>0.49</u>	0.56	<u>0.51</u>
Gymnasium	0.75	<u>0.68</u>	0.75	<u>0.68</u>
Health care clinic	0.70	<u>0.63</u>	0.77	<u>0.69</u>
Hospital ^a	0.84	0.84	0.92	<u>0.83</u>
Hotel/motel ^{a,b}	0.56	<u>0.50</u>	0.53	<u>0.48</u>
Library	0.83	<u>0.75</u>	0.83	<u>0.75</u>
Manufacturing facility	0.82	<u>0.74</u>	0.82	<u>0.74</u>
Motion picture theater	0.44	<u>0.40</u>	0.43	<u>0.39</u>
Multifamily ^c	0.41	<u>0.37</u>	0.46	<u>0.42</u>
Museum	0.55	<u>0.50</u>	0.56	<u>0.51</u>
Office	0.64	<u>0.58</u>	0.62	<u>0.62</u>
Parking garage	0.14	<u>0.13</u>	0.17	<u>0.15</u>
Penitentiary	0.65	0.65	0.65	<u>0.65</u>
Performing arts theater	0.84	<u>0.76</u>	0.82	<u>0.74</u>
Police station	0.66	<u>0.60</u>	0.62	<u>0.56</u>
Post office	0.65	<u>0.59</u>	0.64	<u>0.58</u>
Religious building	0.67	<u>0.60</u>	0.66	<u>0.60</u>
Retail	0.84	<u>0.76</u>	0.78	<u>0.70</u>
School/university	0.70	<u>0.63</u>	0.70	<u>0.63</u>
Sports arena	0.62	<u>0.54</u>	0.73	<u>0.66</u>

Town hall	0.69	<u>0.62</u>	0.67	<u>0.60</u>
Transportation	0.50	<u>0.45</u>	0.56	<u>0.51</u>
Warehouse	0.40	<u>0.36</u>	0.45	<u>0.41</u>
Workshop	0.91	<u>0.82</u>	0.86	<u>0.78</u>

Table C405.4.2.(2) space by space method. 2024 IECC reduces LPAs by about 5%, so if Seattle code reduces them 10% below the 2024, it will result in about a 5% overall reduction – same as building area method. Note that grey highlight indicates no change from ASHRAE recommendation, as these are for healthcare, correctional, and facilities for the visually impaired, which may be impacted by additional regulations.

Common Space-by-Space Types ^a	LPD (w/ft ²)	LPD (w/ft ²)	2021 IECC CECPI-7	10% below new IECC LPAs
Atrium – Less than 20 feet in height	0.39	<u>0.35</u>	<u>0.41</u>	
Atrium - 20 to 40 feet in height	0.48	<u>0.43</u>	<u>0.41</u>	<u>0.39</u>
Atrium - Above 40 feet in height	0.60	<u>0.54</u>	<u>0.51</u>	<u>0.46</u>
Audience/seating area - Permanent				
In an auditorium	0.61	<u>0.55</u>	<u>0.57</u>	<u>0.52</u>
In a gymnasium	0.23	<u>0.21</u>	<u>0.23</u>	<u>0.21</u>
In a motion picture theater	0.27	<u>0.24</u>	<u>0.27</u>	<u>0.24</u>
In a penitentiary	0.67	0.67	<u>0.56</u>	0.56
In a performing arts theater	1.16	<u>1.04</u>	<u>1.09</u>	<u>0.98</u>
In a religious building	0.72	<u>0.65</u>	<u>0.72</u>	<u>0.65</u>
In a sports arena	0.33	<u>0.30</u>	<u>0.27</u>	<u>0.24</u>
Otherwise	0.23	<u>0.21</u>	<u>0.33</u>	<u>0.3</u>
Banking activity area ⁿ	0.61	<u>0.55</u>	<u>0.56</u>	<u>0.51</u>
Breakroom (see lounge/breakroom)				
Classroom/lecture hall/training room				
In a penitentiary	0.89	0.89	0.74	<u>0.74</u>
Otherwise ^m	0.71^m	<u>0.64</u>	<u>0.72</u>	<u>0.65</u>
Computer room, data center	0.94	<u>0.85</u>	<u>0.75</u>	<u>0.68</u>
Conference/meeting/multipurpose	0.97	<u>0.87</u>	<u>0.88</u>	<u>0.79</u>
Copy/print room	0.31	<u>0.28</u>	<u>0.56</u>	<u>0.51</u>
Corridor				
In a facility for the visually impaired used primarily by the staff ^b	0.71	0.71	0.71	<u>0.71</u>
In a hospital	0.71	0.71	0.61	<u>0.61</u>
Otherwise ^{c,k}	0.41	<u>0.37</u>	<u>0.44</u>	<u>0.40</u>
Courtroom ^c	1.20	<u>1.08</u>	<u>1.08</u>	<u>0.97</u>

Common Space-by-Space Types^a	LPD (w/ft²)	LPD (w/ft²)	2021 IECC CECPI-7	10% below new IECC LPAs
Dining area				
In a penitentiary	0.42	0.42	0.35	0.35
In a facility for the visually impaired used primarily by the staff ^b	1.27	1.27	1.22	1.22
In a bar/lounge or leisure dining ⁿ	0.86	<u>0.77</u>	<u>0.76</u>	0.69
In cafeteria or fast food dining	0.40	<u>0.36</u>	<u>0.36</u>	0.33
In a family dining area ⁿ	0.60	<u>0.54</u>	<u>0.52</u>	0.47
Otherwise	0.43	<u>0.39</u>	<u>0.42</u>	0.38
Electrical/mechanical	0.43	<u>0.39</u>	<u>0.71</u>	0.64
Emergency vehicle garage	0.52	<u>0.47</u>	<u>0.51</u>	0.46
Food preparation	1.09	<u>0.98</u>	<u>1.19</u>	1.07
Laboratory				
In or as a classroom	1.11	<u>1.00</u>	<u>1.05</u>	0.95
Otherwise	1.33	<u>1.20</u>	<u>1.21</u>	1.09
Laundry/washing area	0.53	<u>0.48</u>	<u>0.51</u>	0.46
Loading dock, interior	0.88	<u>0.79</u>	<u>0.88</u>	0.79
Lobby ^c				
In a facility for the visually impaired used primarily by the staff ^b	1.69	1.69	1.44	1.44
For an elevator	0.65	<u>0.59</u>	<u>0.64</u>	0.58
In a hotel	0.51	<u>0.46</u>	<u>0.48</u>	0.43
In a motion picture theater	0.23	<u>0.21</u>	<u>0.20</u>	0.18
In a performing arts theater	1.25	<u>1.13</u>	<u>1.21</u>	1.09
Otherwise	0.84	<u>0.76</u>	<u>0.80</u>	0.72
Locker room	0.52	<u>0.47</u>	<u>0.43</u>	0.39
Lounge/breakroom ⁿ				
In a health care facility ⁿ	0.42	0.42	0.77	0.77
Otherwise ⁿ	0.59	<u>0.53</u>	<u>0.55</u>	0.50
Office				
Enclosed	0.74	<u>0.67</u>	<u>0.73</u>	0.66
Open plan	0.61	<u>0.55</u>	<u>0.56</u>	0.51
Parking area, interior	0.15	<u>0.14</u>	<u>0.11</u>	0.10
Pharmacy area	1.66	1.66	1.59	1.43
Restroom				
In a facility for the visually impaired used primarily by the staff ^b	1.26	1.26	0.96	0.96

Common Space-by-Space Types ^a	LPD (w/ft ²)	LPD (w/ft ²)	2021 IECC CECPI-7	10% below new IECC LPAs
Otherwise ⁿ	0.63	0.57	0.74	0.67
Sales area	1.05	0.95	0.85	0.87
Seating area, general	0.23	0.21	0.21	0.19
((Stairway (see space containing stairway)))				
Security screening general area			0.64	0.64
Security screening in transportation facilities			0.93	0.93
Security screening transportation waiting area			0.56	0.56
Stairwell ⁿ	0.49	0.44	0.47	0.43
Storage room				
< 50 ft ²	0.51	0.46	???	
50-100 ft ²	0.38	0.34	???	
All other storage	0.38	0.34	0.35	0.32
Vehicular maintenance	0.60	0.54	0.59	0.53
Workshop	1.26	1.13	1.17	1.05
Building Specific Space-by-Space Types ^a	LPD (w/ft ²)	LPD (w/ft ²)		
Automotive (see vehicular maintenance)				
Convention center - Exhibit space	0.61	0.55	0.50	0.45
Facility for the visually impaired ^b				
In a chapel (and not used primarily	0.70	0.70	0.58	0.58
In a recreation room (and not used			1.20	1.20
staff) ^b	1.77	1.77		
Fire stations ^g				
Gaming establishments				
High limits game			1.68	1.51
Slots			0.54	0.49
Sportsbook			0.82	0.74
Table games			1.09	0.98
Gymnasium/fitness center				
In an exercise area	0.90	0.83	0.82	0.74
In a playing area	0.85	0.77	0.82	0.74
Health care facility				
In an exam/treatment room	1.40	1.40	1.33	1.33
In an imaging room	0.94	0.94	0.94	0.94
In a medical supply room	0.62	0.62	0.56	0.56
In a nursery	0.92	0.92	0.87	0.87
In a nurse's station	1.17	1.17	1.07	1.07

Common Space-by-Space Types^a	LPD (w/ft²)	LPD (w/ft²)	2021 IECC CECPI-7	10% below new IECC LPAs
In an operating room	2.26	2.26	2.26	2.26
In a physical therapy room	0.91	0.91	0.82	0.82
In a recovery room	1.25	1.25	1.18	1.18
<u>In a telemedicine room</u>			1.44	1.44
Library				
In a reading area ⁿ	0.96	0.86	0.86	0.78
In the stacks	1.10	0.99	1.18	1.06
Manufacturing facility				
In a detailed manufacturing area	0.80	0.72	0.75	0.68
In an equipment room	0.76	0.68	0.73	0.66
In an extra high bay area (greater than floor-to-ceiling height)	1.42	1.28	1.36	1.22
In a high bay area (25 - 50-foot floor-to-ceiling height)	1.24	1.12	1.24	1.12
In a low bay (< 25-foot floor-to-ceiling height)	0.86	0.77	0.86	0.78
Museum				
In a general exhibition area	0.31	0.28	0.31	0.28
In a restoration room	1.10	0.99	1.24	1.12
Performing arts theater dressing/fitting room	0.41	0.37	0.39	0.35
Post office - Sorting area	0.76	0.69	0.71	0.64
Religious buildings				
In a fellowship hall ⁿ	0.54	0.49	0.50	0.45
In a worship/pulpit/choir area ⁿ	0.85	0.77	0.75	0.68
Retail facilities				
In a dressing/fitting room	0.51	0.46	0.45	0.41
<u>Hair salon</u>			0.65	0.59
<u>Nail salon</u>			0.75	0.68
In a mall concourse	0.82	0.74	0.57	0.52
<u>Massage space</u>			0.81	0.73
Sports arena - Playing area				
For a Class 1 facility ⁱ	2.94	2.94	2.86	2.63
For a Class 2 facility ^j	2.01	2.01	1.98	1.78
For a Class 3 facility ^k	1.30	1.30	1.29	1.16
For a Class 4 facility ^l	0.86	0.86	0.86	0.78
<u>Sports arena - Pools</u>				
<u>For a Class 1 facilityⁱ</u>			2.20	1.98

Common Space-by-Space Types ^a	LPD (w/ft ²)	LPD (w/ft ²)	2021 IECC CECPI-7	10% below new IECC LPAs
For a Class 2 facility ^j			1.47	1.32
For a Class 3 facility ^k			0.99	0.89
For a Class 4 facility ^l			0.59	0.53
Transportation				
Airport Hangar			1.36	1.22
In a baggage/carousel area	0.39	0.35	0.28	0.25
In an airport concourse	0.25	0.23	0.49	0.44
At a terminal ticket counter ⁿ	0.51	0.46	0.40	0.36
Passenger loading area			0.71	0.64
Warehouse - Storage area				
For medium to bulky palletized items	0.33	0.30	0.33	0.30
For smaller, hand-carried items	0.69	0.62	0.69	0.63

For SI: 1 foot = 304.8 mm, 1 watt per square foot = 10.76 w/m².

- a. In cases where both a common space type and a building area specific space type are listed, the building area specific space type shall apply.
- b. A 'Facility for the Visually Impaired' is a facility that is licensed or will be licensed by local or state authorities for senior long-term care, adult daycare, senior support or people with special visual needs.
- ~~c. Where sleeping units are excluded from lighting power calculations by application of Section R404.1, neither the area of the sleeping units nor the wattage of lighting in the sleeping units is counted. Additional lighting power allowance of 0.2 watts per square foot for the purpose of highlighting art or exhibits. This additional power shall be permitted only where the specified lighting is installed in addition to and controlled separately from general lighting in accordance with Section C405.2.6. This additional power shall be used only for the specified luminaires, shall not be used for any other purpose, and shall not be added to any other space or the interior power allowance.~~
- ~~d. Where dwelling units are excluded from lighting power calculations by application of Section R404.1, neither the area of the dwelling units nor the wattage of lighting in the dwelling units is counted.~~
- ~~e.~~ Class I facilities consist of professional facilities; and semiprofessional, collegiate, or club facilities with seating for 5,000 or more spectators.
- ~~f.~~ Class II facilities consist of collegiate and semiprofessional facilities with seating for fewer than 5,000 spectators; club facilities with seating for between 2,000 and 5,000 spectators; and amateur league and high school facilities with seating for more than 2,000 spectators.
- ~~g.~~ Class III facilities consist of club, amateur league and high school facilities with seating for 2,000 or fewer spectators.
- ~~h.~~ Class IV facilities consist of elementary school and recreational facilities; and amateur league and high school facilities without provision for spectators.

- h For classrooms, additional lighting power allowance of 4.50 W/ lineal foot of white or chalk boards for directional lighting dedicated to white or chalk boards.
- i Additional lighting power allowance of ~~((0.30))~~ 0.15 W/ft² for ornamental lighting. Qualifying ornamental lighting includes luminaires ~~((such as chandeliers, sconces, lanterns, neon and cold cathode, light emitting diodes, theatrical projectors, moving lights and light color panels when any of those lights are))~~ that are specifically used in a decorative manner ~~((that does not serve as))~~. This additional power shall be permitted only where the specified lighting is installed in addition to and controlled separately from display ~~((lighting))~~ or general lighting in accordance with Section C405.2.6. This additional power shall be used only for the specified luminaires and it shall not be added to any other space or the interior power allowance.
- j Where a space is designated as unfinished, neither the area nor the lighting power in the space shall be calculated as part of the LPA
- k For corridors, additional lighting power allowance of 0.25 W/square foot for display lighting and decorative lighting is permitted where provided for aesthetic purposes. Decorative lighting fixtures in corridors are also permitted to provide general lighting.

C405.8. Electric motor efficiency. Exceptions to coordinate with C403.8.7 Occupied Standby controls

C405.8 Electric motor efficiency. All electric motors, fractional or otherwise, shall meet the minimum efficiency requirements of Tables C405.8(1) through C405.8(4) when tested and rated in accordance with DOE 10 CFR. The efficiency shall be verified through certification under an approved certification program, or, where no certification program exists, the equipment efficiency rating shall be supported by data furnished by the motor manufacturer.

Exception: The standards in this section shall not apply to the following exempt electric motors.

1. Air-over electric motors.
2. Component sets of an electric motor.
3. Liquid-cooled electric motors.
4. Submersible electric motors.
5. Inverter-only electric motors.
6. Mechanical ventilation system types with an input power less than 746 watts that comply with the requirements of Section C403.8.4.

Fractional hp fan motors that are 1/12 hp or greater and less than 1 hp (based on output power) which are not covered by Tables C405.8(3) and C405.8(4) shall be electronically commutated motors or shall have a minimum motor efficiency of 70 percent when rated in accordance with DOE 10 CFR 431. These motors shall also have the means to adjust motor speed for either balancing or remote control. Belt-driven fans may use sheave adjustment for airflow balancing in lieu of a varying motor speed.

Exceptions:

1. Motors that are an integral part of specialized process equipment.
2. Where the motor is integral to a listed piece of equipment for which no complying motor has been approved.
3. Motors used as a component of the equipment meeting the minimum efficiency requirements of Section C403.3.2 and Tables C403.3.2(1) through ~~((C403.3.2(12)))~~ C403.3.2(13), provided that the motor input is included when determining the equipment efficiency.
4. Motors in the airstream within fan coils and terminal units that operate only when providing heating to the space served.

5. Mechanical ventilation system types with an input power less than 746 watts that comply with the requirements of Section C403.8.4, not covered by Tables C405.8(1) through C405.8(4) and are used to power heat recovery ventilators, energy recovery ventilators, or local exhaust fans in Group R subject to the efficacy requirements of Section C403.8.4.
6. Domestic clothes dryer booster fans, range hood exhaust fans, and domestic range booster fans that operate intermittently.
7. Radon and contaminated soil exhaust fans.
8. Group R heat recovery ventilator and energy recovery ventilator fans that are less than 400 cfm.

C405.14.1 Electric-ready at commercial kitchens. Ensuring that restaurants in new buildings have capacity for future electrification, without restricting gas use for restaurants.

C405.14.1 Electric power at gas-fired commercial kitchen appliances. Where gas-fired cooking appliances in commercial kitchens are provided in a building permitted under this 2021 edition of the Seattle Energy Code, an electrical panel shall be provided within or adjacent to each space in which kitchen equipment is located, sized to serve future electric appliances to replace all gas-fired appliances in the space with a minimum capacity of 12 kVA per kBtu of gas appliance input capacity. The main electric service panel for the building shall be wired to and sized to accommodate all such kitchen appliance panels. Permit documents shall include a table listing each gas-fired appliance as well as an equivalent electric appliance providing the same or greater cooking capacity, and the total amperage required for the kitchen electrical panel. This information shall be provided in both the mechanical and the electrical permit documents.

EXCEPTION: This requirement does not apply to gas-fired cooking appliances installed in buildings originally permitted in compliance with an earlier edition of the Seattle Energy Code, if the building's main service panel lacks sufficient capacity to provide power for equivalent electric versions of all the gas-fired equipment identified in the permit application.

Table C406.1 Energy Credits. Increase Seattle credit requirements by 10% across the board to account for more stringent Seattle code. (2018 Seattle code requires 8 credits vs. WA code 6 credits.) **NOTE:** Group M requirement still under discussion. PNNL is looking at correcting the base code, but meanwhile we've just matched the "all other" category for required credits.

Table C406.1
Energy Measure Credit Requirements

Required Credits for Projects	Section	Occupancy Group					
		Group R-1	Group R-2	Group B	Group E	Group M	All Other
New building energy efficiency credit requirement	C406.2	((54)) 59	((41)) 45	((42)) 46	((48)) 53	((74)) 54	((49)) 54
Building additions energy efficiency credit requirement	C406.2	((27)) 30	((20)) 22	((21)) 23	((23)) 25	((36)) 23	((21)) 23

Required Credits for Projects	Section	Occupancy Group					
		Group R-1	Group R-2	Group B	Group E	Group M	All Other
New building load management credit requirement	C406.3	12	15	27	15	13	26

Table C406.2 Efficiency Measure Credits. Eliminate enhanced commercial kitchen equipment credit (#27) since this is already required by Seattle code.

(Table C406.2 not shown here.)

Table C407.2 Electrical permit issue date. Proposal to let the electrical permit come through after permit issuance but before start of construction.

C407.2 Mandatory requirements. Compliance with ~~(this)~~ Section C407 also requires compliance with those sections shown in Table C407.2. The building permit application for projects utilizing this method shall include in one submittal all building and mechanical drawings and all information necessary to verify that the building envelope and mechanical design for the project corresponds with the annual energy analysis. If credit is proposed to be taken for lighting energy savings, then an electrical permit application shall also be submitted and approved prior to the ~~((issuance of the building permit))~~ **start of building construction**. If credit is proposed to be taken for energy savings from other components, then the corresponding permit application (e.g., plumbing, boiler, etc.) shall also be submitted and approved prior to the building permit application. Otherwise, components of the project that would not be approved as part of a building permit application shall be modeled in the baseline in accordance with ANSI/ASHRAE/IESNA 90.1 Appendix G and in the proposed model in accordance with the requirements of the ~~((Washington State))~~ **Seattle Energy Code**.

Tables C407.3(2) BPFs & C407.3(3) Site Energy Targets. This sets those values 10% (provisionally) below the WA code, in recognition of Seattle's more stringent prescriptive code.

Table C407.3(2)
Building Performance Factors (BPF) to be used for
Compliance with Section C407.3

Building Area Type	Building Performance Factor	Seattle 2018 code BPFs (10% below WA code)	Seattle 2021 code BPFs
Multifamily	0.55	((0.58)) 0.52	((0.55)) 0.50
Health care/hospital	0.71	((0.54)) 0.49	((0.71)) 0.64
Hotel/motel	0.53	((0.64)) 0.58	((0.53)) 0.48
Office	0.45	((0.56)) 0.51	((0.45)) 0.41
Restaurant	0.35	((0.70)) 0.63	((0.35)) 0.32
Retail	0.41	((0.47)) 0.43	((0.41)) 0.37
School	0.36	((0.36)) 0.32	((0.36)) 0.32

Building Area Type	Building Performance Factor	Seattle 2018 code BPFs (10% below WA code)	Seattle 2021 code BPFs
Warehouse	0.19	((0.48)) 0.43	((0.19)) 0.17
All others	0.44	((0.54)) 0.49	((0.44)) 0.40

Table C407.3(3)
Site Energy Performance Targets to be used for
Compliance with Section C407.3

Building Area Type	Site Energy Performance Targets	Seattle Proposal (10% below WA code)
Multifamily	0.59	0.53
Health care/hospital	0.72	0.65
Hotel/motel	0.62	0.56
Office	0.58	0.52
Restaurant	0.59	0.53
Retail	0.46	0.42
School	0.52	0.47
Warehouse	0.29	0.26
All others	0.55	0.50

C407.3.1 UA backstop still requires 20% of glazing area to be high performance. Would not permit compromise of the triple glazing initiative through use of UA calculation. Seattle amendment sentence highlighted in aqua is stricken because each of the referenced sections begins with “All of the following shall...”

C407.3.1 Limits on standard building envelopes. The Proposed Total UA of the proposed building shall be no more than ~~((20 10))~~ percent higher than the Allowed Total UA as defined in Section C402.1.5. ~~Where either Section C402.4.1.1.1 or C402.4.1.1.2 is used to establish the maximum allowable fenestration area for compliance with this section, all of the requirements of the selected section shall be met.~~ The requirement in Section C402.4 for 20 percent of fenestration to be high-performance shall be maintained and that fenestration is not permitted to have a U-factor higher than permitted by Section C402.4.

C407.3.4.1 Unregulated loads. Provides system for approval and posting of claimed energy savings from unregulated loads, and pre-approves three residential equipment types.

C407.3.4.1 Approved unregulated load types. Unregulated load types for which reductions of energy use or carbon emissions are claimed shall be one of those listed in Table C407.3.4.1 or shall be *approved* and publicly listed by SDCI. Requests for approval of such load types shall include the identification with predicted energy use and carbon emissions of the baseline case in addition to the identification with predicted energy use and carbon emissions of the proposed alternate. Listings for specific load types may be withdrawn and made unavailable for subsequent

permit applications in cases by SDCI where it is considered that the unregulated load type listed has become accepted conventional practice.

Table C407.3.4.1 Approved Unregulated Load Types		
In compliance with the requirements of section	Predicted energy and carbon emission reductions (%)	
	Group R-1	Group R-2
C406.2.15 Enhanced residential kitchen equipment	1.2	1.9
C406.2.16 Enhanced residential laundry equipment	N/A	0.6
C406.2.17 Heat pump clothes dryers	0.6	0.6

C408.1 language fix. Fix to help exception 2 make sense grammatically.

C408.1 General. A building commissioning process led by a *certified commissioning professional* and functional testing requirements shall be completed for mechanical systems in Section C403; service water heating systems in Section C404; controlled receptacle and lighting control systems in Section C405; equipment, appliances and systems installed to comply with Sections C406 or C407; energy metering in Section C409; and refrigeration systems in Section C410.

EXCEPTION: Buildings, or portions thereof, which are exempt from Sections C408.2 through C408.7 may be excluded from the commissioning process.

1. Mechanical systems that are not required to comply with Section C403.3.5 are exempt from the commissioning process where the installed total mechanical equipment capacity is less than 180,000 Btu/h (15 tons) cooling capacity and less than 240,000 Btu/h (20 tons) heating capacity and energy recovery ventilation (ERV) equipment is less than 300 cfm capacity.
2. Service water heating systems are exempt from the commissioning process in buildings where the largest service water heating system capacity is less than 200,000 Btu/h and where there are ~~((any))~~ none of the following:
 - 2.1. ~~((No))~~ pools or permanent spas.
 - 2.2. ~~((No))~~ solar thermal water heating.
 - 2.3. ~~((No))~~ recirculation pumps.
 - 2.4. ~~((No))~~ heat pump water heaters, except fully-packaged for individual residential dwelling unit use.
3. Lighting control systems are exempt from the commissioning process in buildings where both the total installed lighting load is less than 10 kW and the lighting load controlled by occupancy sensors or automatic daylighting controls is less than 5 kW.
4. Refrigeration systems are exempt from the commissioning process in buildings if they are limited to self-contained units.

C408.1.2 Commissioning Plan submittal timing. (See item 4 below) This allows the Cx Plan to be submitted after permit issuance, but before first mechanical inspection. Staff request.

C408.1.2 Commissioning plan. A commissioning plan shall be developed by the project's *certified commissioning professional* and shall outline the organization, schedule, allocation of resources, and documentation requirements of the commissioning process.

1. A narrative description of the activities that will be accomplished during each phase of commissioning, including the personnel intended to accomplish each of the activities, systems testing and balancing, functional performance testing, and verification of the building documentation requirements in Section C103.6.

2. Roles and responsibilities of the commissioning team, including the name and statement of qualifications of the *certified commissioning professional*.

3. A listing of the specific equipment, appliances or systems to be tested and a description of the tests to be performed.

4. This plan shall be submitted to SDCI prior to the first mechanical inspection.

C408.1.2 Commissioning Report submittal timing. (See item 6 below) This clarifies that the Cx Report is submitted prior to the final inspection. Staff request.

C408.1.3 Commissioning report. A commissioning report shall be completed and certified by the *certified commissioning professional* and delivered to the building owner or owner's authorized agent. The report shall be organized with mechanical, service water heating, controlled receptacle and lighting control systems, energy metering, and refrigeration findings in separate sections to allow independent review. The report shall record the activities and results of the commissioning process and be developed from the final commissioning plan with all of its attached appendices. The report shall include:

1. Results of functional performance tests.

2. Disposition of deficiencies found during testing, including details of corrective measures used or proposed.

3. Functional performance test procedures used during the commissioning process including measurable criteria for test acceptance, provided herein for repeatability.

4. Commissioning plan.

5. Testing, adjusting and balancing report.

6. This report shall be submitted to SDCI prior to the final inspection.

C408.1.4.2 Commissioning Compliance. This is a new variation on a 2015 code requirement. Rather than a "commissioning permit," it outlines the requirements for compliance, and offers three options for post-occupancy completion. There's some internal SDCI administrative work required here to get this into Accela. Inspector request.

C408.1.4.1 Commissioning compliance.

The mechanical and water heating portions of the commissioning report, in compliance with Sections C408.2, C408.3, and C408.7, shall be submitted to SDCI prior to completion and approval of mechanical permit final inspection.

The controlled receptacle, lighting, and metering portions of the commissioning report, in compliance with Sections C408.4 and C408.6, shall be submitted to SDCI prior to completion and approval of electrical permit *final inspection*.

The following items shall be submitted to SDCI prior to completion and approval of *final inspection* as per Seattle Building Code Section 108.9.10 to demonstrate commissioning compliance:

1. Full commissioning report, in compliance with Section C408.1.3.
 - a. The commissioning report shall include a list of all unresolved deficiencies and any incomplete commissioning work required by Section C408, with description and anticipated date of completion for each, or a statement signed by the *certified commissioning professional* attesting to successful commissioning of the entire project with no unresolved deficiencies or incomplete tests.
 - b. Where tenant spaces will be built out under separate permits, the commissioning report shall describe the *certified commissioning professional's* scope of work required to complete commissioning of the central building HVAC systems and lighting control systems as the tenant spaces are completed.
2. Commissioning checklist, from Figure C408.1.4.1, signed by the *certified commissioning professional*.
3. Statement that the owner has received a copy of the commissioning report, signed by the owner or owner's authorized agent.

C408.1.4.1.1 Post-occupancy commissioning completion. Where there are unresolved deficiencies or other incomplete commissioning tasks that conflict with requirements of this code, the applicant shall comply with the requirements of one of the following three options.

1. In addition to the Temporary Certificate of Occupancy requirements of SBC 109.4, SDCI may issue a temporary certificate of occupancy (TCO) to remain in effect pending resolution of commissioning issues. Applicant must complete all outstanding commissioning work and complete a revised commissioning report before SDCI will issue a final Certificate of Occupancy.
2. Applicant must post a performance bond in the amount of 2 percent of the building permit project valuation as determined in accordance with the *fee subtitle*, to ensure completion of the required commissioning work within 12 months.
3. Applicant must obtain electrical and mechanical permits as required to incorporate all remaining electrical and mechanical work, including required commissioning of those systems. Applicant must complete all outstanding electrical and mechanical commissioning work and complete a revised commissioning report prior to completion and approval of final inspection for those permits.

SDCI Informative Note: An electronic version of the Commissioning Compliance Checklist is available on the SDCI Seattle Energy Code web page.

C408.4.2 High-end trim. Rules for setting high-end trim, from 2024 IECC proposal CEPI-156, plus definition.

C408.4.2 High-end trim. Where lighting controls are configured for *high-end trims*, verify the following:

1. That *high-end trim* has been set.
2. That lighting controls with *ready access* for users cannot increase the lighting power above the maximum level established by the *high-end trim* controls.

HIGH-END TRIM. A lighting control setting which limits the maximum power to individual luminaires or groups of luminaires in a space.

C409.3.1 Submeter garage fan energy.

C409.3.1.1 Parking garage facility fan energy. Ventilation fan energy and any other HVAC energy use within enclosed parking garages larger than 3000 square feet shall be submetered separately.

Exception: Where the total MCA of equipment served equates to less than 10 kVA.

C409.3.3 Lighting system energy use. This category shall include all energy used by interior and exterior lighting, including lighting in parking structures and lots, but not including plug-in task lighting.

C409.3.3.1 Submeter garage lighting.

C409.3.3.1 Parking facility lighting energy. Lighting energy use within parking facilities larger than 3000 square feet shall be submetered separately.

C409.3.5 Exempt outlets in corridors and enclosed stairways from submetering.

C409.3.5 Plug load system energy use. This category shall include all energy used by appliances, computers, plug-in task lighting, and other equipment or equipment covered by other end-use metering categories listed in Section C409.3. In a building where the main service is 480/277 volt, each 208/120 volt panel is permitted to be assumed to serve only plug load for the purpose of Section C409, unless it serves nonresidential refrigeration or cooking equipment.

Exceptions:

1. Where the total connected load of all plug load circuits is less than 50 kVA, end-use metering is not required.
2. Electric receptacles located in fire-rated or smoke-rated corridors, enclosed stairwells, or egress passageways are not required to be submetered.

C411.1 Renewable Energy. Step up renewables to be 0.75W/ft² instead of WA 0.50. This would match the 2024 IECC proposal. The credits required for exception 4 are adjusted to current code.

C411.1 On-site renewable energy. Each new building, or addition larger than 10,000 square feet of gross conditioned floor area, shall include a renewable energy generation system consisting of not less than ~~(0.5)~~ 0.75 W/ft² or 1.7 Btu/ft² multiplied by the sum of the gross conditioned floor area.

EXCEPTIONS: Buildings that qualify for and utilize one of the following are not required to provide onsite renewable energy, but are required to comply with Section C411.1.1.

1. Any building where more than 50 percent of the roof area is shaded from direct beam sunlight by natural objects or by structures that are not part of the building for more than 2500 annual hours between 8:00 a.m. and 4:00 p.m.

2. Any building where more than 80 percent of the roof area is covered by any combination of equipment other than for on-site renewable energy systems, planters, vegetated space, skylights or occupied roof deck.

3. Buildings which can document they do not have adequate roof area to install the required on-site solar and that comply with Section C411.1.1 may install a lesser amount of on-site renewables but not zero.

4. Additional energy measure credits. The on-site renewable energy generation system is not required if additional energy measure credits beyond those required by Table C406.1 are obtained in a number at least equal to the number of credits that would be awarded to the building for a renewable energy generation system of 0.75 W/ft² multiplied by the sum of the gross conditioned floor area. These additional energy measure credits cannot be used to satisfy any other requirement of this code. It is permissible to proportionally substitute any portion of the on-site renewable energy requirement with an equivalent portion of the additional energy measure credits required by this exception.

Table C411.2.1 Add “Renewable Energy Investment Fund” to off-site options. Just in case WA creates such a fund. From 2024 IECC “zero code” appendix update.

Table C411.2.1
Multipliers for Renewable Energy Procurement Methods

Location	Renewable Energy Source	Renewable Energy Factor		
		In the state of Washington	Western Interconnected	In the states of Oregon or Idaho
On-site	On-site renewable energy system	1	NA	NA
Off-site	Directly owned off-site renewable energy system that begins operation after submission of the initial permit application	0.95	0.75	0.85
Off-site	Community renewable energy facility that begins operation after submission of the initial permit application	0.95	0.75	0.85

<u>Location</u>	<u>Renewable Energy Source</u>	<u>Renewable Energy Factor</u>		
		<u>In the state of Washington</u>	<u>Western Interconnected</u>	<u>In the states of Oregon or Idaho</u>
Off-site	Directly owned off-site renewable energy system that begins operation before submission of the initial permit application	0.75	0.55	0.65
Off-site	Community renewable energy facility that begins operation before submission of the initial permit application	0.75	0.55	0.65
Off-site	Renewable Power Purchase Agreement (PPA)	0.75	0.55	0.65
Off-site	Renewable Energy Investment Fund (REIF)	0.95	0.75	0.85

RENEWABLE ENERGY INVESTMENT FUND (REIF). A fund established by the local government or other entity to accept payment from building owners to construct or acquire qualifying renewable energy, together with the associated RECs, on their behalf.

C411.3.1 “Net roof area” definition. Clarify that any deducted “equipment service clearances” can only those required by the manufacturer.

C411.3.1 Minimum area. The minimum area of the solar zone shall be determined by one of the following methods, whichever results in the smaller area:

1. 40 percent of roof area. The roof area shall be calculated as the horizontally projected gross roof area less the area covered by skylights, occupied roof decks, mechanical equipment, mechanical equipment service clearances **required by equipment manufacturer or by code**, and planted areas.

2. 20 percent of electrical service size. The electrical service size is the rated capacity of the total of all electrical services to the building, and the required solar zone size shall be based upon 10 peak watts of photovoltaic per square foot.

C503.4.6 Replacement heating equipment. Makes several significant changes to the rules for moving from gas to heat pump heating:

- **Exception 6** is retained, exempting buildings that would require an electric service upgrade. (This had been stricken in earlier drafts.)
- **Exception 7** categorically exempts: affordable housing, I occupancies (hospital, correctional, etc.), buildings housing nonprofits, and buildings smaller than 20,000.
 - However, those buildings do have to provide a "**future decarbonization plan**" per C503.4.6.1 below.
- **Exception 8** permits buildings to retain half of their existing fossil fuel capacity, controlled to operate only during cold weather or other high-load situations. I'm guessing that that the heat pump will be able to provide 90% of the annual heating.
- **Exception 9** allows like-for-like temporary emergency replacement of one (or more) boilers beyond the 50% allowed by Exception 8. These projects also have to provide a "**future decarbonization plan**" per C503.4.6.1, and they have to ensure timely replacement of the temporary equipment with heat pumps via one of three options: TCO, performance bond, or opening a separate permit for completion of the system.

C503.4.6 Addition or replacement of HVAC heating appliances. Where ~~((a))~~ **one or more** mechanical HVAC

heating appliances **are** added or replaced, the added or replaced appliances shall comply with Section

C403.1.4 or with an alternate compliance option in Table C503.4.6: **Additions, alterations, or replacements**

shall not be made to an existing HVAC heating system that will cause the system to be out of compliance.

SDCI Informative Note:

This section includes requirements for the replacement of both "central HVAC heating systems" and other HVAC heating systems.

The term "central HVAC heating system" for the purposes of this section means a heating system that provides heating to multiple zones, multiple dwelling units or multiple sleeping units. Typically, these are HVAC heating hot water systems, heating sources for HVAC condenser water systems or steam systems that serve multiple steam heating coils. A central HVAC heating system may include multiple pieces of heating equipment.

The following are NOT considered central HVAC heating systems:

- Central VAV air handling units that do not include supplemental heat in the air handling unit.
- Distributed heating systems such as room by room electric baseboard heaters or room by room packaged air conditioning units (PTAC) with electric heat.

Commented [EVM10]: Recommend deleting reference to central system to match 2021 WSEC and based on C503.4.6 including more than central heating equipment.

Commented [DJ11R10]: No - this is important to distinguish central systems from distributed systems. Note that we have that whole definition of "central system" below.

EXCEPTIONS: 1. Terminal unit equipment including, but not limited to, hydronic VAV (~~(boxes)~~) **terminal units**, electric resistance VAV (~~(boxes)~~) **terminal units**, electric duct heaters, water source heat pumps, fan coils, or VRF indoor units that are served by an unaltered central system, **except such modifications to terminal equipment as required to**

accommodate lower-temperature fluids circulated from central HVAC heat pump systems.

2. Air handling equipment with hydronic coils, except such modifications to terminal equipment as required to accommodate lower-temperature fluids circulated from central HVAC heat pump systems.

3. Air handling equipment designed for 100 percent outdoor air that is not subject to the requirements in Section C403.3.5 or that qualifies for an exception to Section C403.3.5.

4. (Reserved.) ((Replacement of existing oil-fired boilers.))

5. Replacement of existing steam boilers with steam distribution pipng to terminal units and replacement of the existing associated boiler feed equipment.

6. Where compliance with Section C403.1.4 would trigger an unplanned utility electrical service upgrade based on the ((NEC)) Seattle Electrical Code Section 220.87 method for determining existing loads, and where the requirements of Section C503.4.6.1 are met.

7. Exempt buildings and occupancies. Replacement of existing central HVAC heating equipment serving any of the following building categories or occupancies are permitted to use the same fuel type as the existing equipment, provided the new equipment has the same or higher efficiency and the same or lower capacity than the existing, and that the requirements of Section C503.4.6.1 are met.

- a. Affordable housing
- b. Group I-1, I-2, or I-3 occupancies
- c. Buildings with more than 50 percent of conditioned floor area occupied by organizations recognized as nonprofit by the State of Washington or by federal tax law
- d. Buildings with no more than 20,000 square feet of conditioned floor area

8. Retention of portion of existing system capacity. For buildings not exempted by Exception 7 above, a maximum of 50 percent of the existing central HVAC heating system fossil fuel or electric resistance heating capacity is permitted to be retained or replaced to serve as supplementary heat for the new heat pump heating system, provided that the heat pump system is sized to provide no less than 50 percent of peak calculated heating load at 32°F OAT and that it is controlled to be used only when the heat pump system capacity is insufficient to meet the heating load, in compliance with the applicable Exception 5, 6, or 7 to Section C403.1.4, and that the requirements of Section C503.4.6.1 are met.

9. Temporary replacement of failing equipment. Temporary like-for-like replacement of one or more HVAC heating appliances, in excess of the 50 percent capacity permitted by Exception 8 above, is permitted where those appliances require immediate replacement, and where no other work on the HVAC system is planned. When using this exception, it is acceptable to replace a single HVAC heating appliance with two or more smaller appliances, provided the total capacity is not greater than that of the original appliance. In addition, the requirements of Section C503.4.6.1 shall be met, and the applicant shall ensure

completion of the required heat pump system in compliance with one of the following options.

- a. SDCI will issue a temporary certificate of occupancy (TCO), which will remain in force until the heat pump heating system is installed and the final inspection of the system has been completed.
- b. Applicant shall post a performance bond in the amount of the full estimated cost of installation of the required heat pump system, to ensure completion of the heat pump system within 48 months.

Commented [DJ12]: Does this need to be expanded out to something closer to the expected life of the equipment? 10 years or something?

Table C503.4.6

Compliance Options for Mechanical Heating Equipment Alterations

Commented [EVM13]: Note: C503.4.6 allows compliance with this table in lieu of C403.1.4. So do you need to remove options for non heat pump heating equipment replacement from this table. Didn't see that changes are proposed for this...

	Proposed Heating Equipment Type^a	Heating Efficiency Table Reference	Alternate Compliance Options to Section C403.1.4
1	Air-Cooled Unitary Heat Pumps	Table C403.3.2(2)	1. Compliance with C403.1.4, except heat pump rated capacity in accordance with Section C403.1.4 exception 5d is permitted to be sized equal to the supplemental internal resistance heating capacity in Climate Zone 4 or 5 ^c 2. Compliance with C403.1.4, except electric resistance mixed air preheat is permissible ^c
2	Packaged terminal, single-package vertical, and room air-conditioner heat pumps	Table C403.3.2(4)	1. Compliance with C403.1.4, except heat pump rated capacity in accordance with Section C403.1.4 Exception 5d is permitted to be sized equal to the supplemental internal resistance heating capacity in Climate Zone 4 or 5
3	Furnaces, duct furnaces, and unit heaters	Table C403.3.2(5)	1. Efficiency: +10% ^b
4	Gas-fired hot water boilers that are not central HVAC heating systems and serve only a single air handler	Table C403.3.2(6)	1. Efficiency: +10% ^b
5	Variable refrigerant flow air-to-air and applied heat pumps	Table C403.3.2(9)	No alternate compliance option
6	DX-DOAS equipment	Table C403.3.2(12) and Table C403.3.2(13)	1. DX-DOAS is provided with heat recovery if not required by C403.3.5.1.
7	Water-source heat pumps	Table C403.3.2(14)	No alternate compliance option

Commented [EVM14]: This table is all fossil fuel furnaces. So is the intent to remove this option from the Table C503.4.6?

Commented [DJ15R14]: I have to decide this. If we're allowing 50% to remain gas, I'd like it to at least be this higher efficiency equipment.

Commented [EVM16]: This table is all fossil fuel boilers. Is the intent to remove this for hot water boilers or to allow this when up to 80% of the coils are replaced.

Commented [DJ17R16]: Same, I think

Commented [DJ18R16]: See added language on footnote b

Commented [EVM19]: Why are WSHPs in this table when Exception 1 does not require compliance with this section?

Commented [DJ20R19]: I think this went into the WA code at someone's request to clarify how heat pumps are treated in the code.

^a Includes replacement of equipment with a unit that is the same type or higher efficiency and the same or lower capacity, or a replacement of one equipment type with a different equipment type.

^b Equipment shall have a capacity-weighted average heating system efficiency that is 10 percent better than that shown in the reference table (1.10 x values in reference table).

^c Option 1 and Option 2 can be combined.

C503.4.6.1 Future decarbonization plan. A schematic-level design of a heat pump system to replace the existing system shall be prepared by a professional engineer and submitted to SDCI. The professional engineer must be identified on schematic design documents that are stamped and identified as “preliminary” in compliance with WAC 196-23-020, but the engineer’s signature and date are not required, and no party is obligated to provide any further development of the schematic design shown. Documents submitted with the schematic design must include:

- a. Completed SDCI Decarbonization Planning Form, available on the SDCI website
- b. One-line system diagrams, showing only the impacted portions of systems
- c. Equipment sized and laid out to scale on plans of the existing facility. Only the impacted areas need be depicted, at a simple schematic level of detail.
- d. Required louvers, ducts, and air handling equipment
- e. Required structural modifications
- f. Required partitions, doors, and other architectural modifications
- g. Required electrical infrastructure
- h. Allowable roof coverage area and mechanical equipment height according to Seattle land use code, and whether departures are required for mechanical equipment roof coverage or maximum mechanical equipment height above roof.
- i. Schematic-level cost estimate, AACE Level 5, ROM, or equivalent, including separate line items for structural, mechanical, electrical, architectural, and utility costs.
- j. Applicable compliance dates and targets for Washington State Clean Buildings Performance Standards and Seattle Building Performance Standards, with maximum allowable energy use index (EUI) and carbon emissions.

C503.5 Replacement service water heating equipment. Makes several significant changes to the rules for moving from gas to heat pump water heating, structured to be similar to the space heating rules above.

C503.5 New service water heating systems ((equipment)). All new service water heating systems shall comply with Section 404.

C503.5.1 Addition or replacement of service water heating equipment. All existing service hot water systems, equipment, and components of existing systems that are altered or replaced shall comply with

Section C404, C408.3, ((C409.5)) C506.1, and C501.6. Additions or alterations shall not be made to an

existing service water heating system that will cause the existing system to become out of compliance.

EXCEPTIONS:((The following equipment is not required to comply with Section C404.2.1))

1. ((Reserved)) Where compliance with Section C404 would trigger an unplanned utility electrical service upgrade based on the Seattle Electrical Code Section 220.87 method for determining existing loads.

Commented [EVM21]: Recommend adding this exception

2. Replacement of any of the following water heater appliances is not required to comply with Section C404.2.1:

- 2.1. Electric water heaters with an input of 12 kW or less.
- 2.2. Gas storage water heaters with an input of 75,000 Btu/h or less.
- 2.3. Gas instantaneous water heaters with an input of 200,000 Btu/h or less and 2 gallons or less of storage.

Commented [DJ22]: Do we need to keep these exceptions?

3. (Reserved)

4. Exempt buildings & occupancies. Replacement service water heating equipment for the following building categories or occupancies are permitted to use the same fuel type as the existing equipment, provided the new equipment has no lower efficiency and no higher capacity than the existing, and that the requirements of Section C503.4.6.1 are met.

- a. Affordable housing
- b. Group I-1, I-2, or I-3 occupancies
- c. Buildings with more than 50 percent of conditioned floor area occupied by organizations recognized as nonprofit by the State of Washington or by federal tax law
- d. Buildings with no more than 20,000 square feet of conditioned floor area

5. Retention of portion of existing system capacity. A maximum of 50 percent of the existing service water heating system's fossil fuel or electric resistance water heating capacity is permitted to be provided as supplementary heat for the new heat pump service water heating system, provided the heat pump system is sized to provide no less than 50 percent of the peak calculated heating load at 32°F OAT, and that it is controlled to be used only when the heat pump system capacity is insufficient to meet the load, in compliance Section C404.2.1.4.

6. Temporary replacement of failing equipment. Temporary like-for-like replacement of one or more service water heating appliances, in excess of the 50 percent heating capacity permitted by Exception 5 above, is permitted where those appliances require immediate replacement, and where no other work on the service water system is planned. When using this exception, it is acceptable to replace a single appliance with two or more smaller appliances, provided the total capacity is not greater than that of the original appliance. In addition, the requirements of Section C503.4.6.1 shall be met, and the applicant shall ensure completion of the required heat pump water heating system in compliance with one of the following options.

- a. SDCI will issue a temporary certificate of occupancy (TCO), which will remain in force until the heat pump water heating system is installed and the final inspection of the system has been completed.
- b. Applicant shall post a performance bond in the amount of the full estimated cost of installation of the required heat pump service water heating system, to ensure completion of the heat pump system within 48 months.

C503.4.3 Heat pump installation at time of chiller replacement. Requires fossil fuel heating systems to be upgraded to heat pump systems when the chiller system is replaced.

C503.4.3 Alterations or replacement of existing air-cooled chiller systems. Where one or more air-cooled chillers are added or replaced, and the existing central HVAC heating equipment is fossil fuel-fired or electric resistance, the replacement cooling appliance shall be an electric heat pump system. The new electric heat pump shall be integrated with the existing heating system and configured to act as the first stage of heating, with fossil fuel-fired or electric resistance HVAC heating equipment acting as supplemental heat.

- EXCEPTIONS:**
1. Replacement of existing steam boilers that have steam piping distribution to terminal units is not required.
 2. Where compliance with Section C403.1.4 would trigger an unplanned utility electrical service upgrade based on the Seattle Electrical Code Section 220.87 method for determining existing loads, and where the requirements of Section C503.4.6.1 are met, compliance with this section is not required.
 3. **Exempt buildings and occupancies.** The existing heating equipment serving any of the following building categories or occupancies are permitted to remain, if the requirements of Section C503.4.6.1 are met.
 - a. *Affordable housing*
 - b. Group I-1, I-2, or I-3 occupancies
 - c. Buildings with more than 50 percent of conditioned floor area occupied by organizations recognized as nonprofit by the State of Washington or by federal tax law
 - d. Buildings with no more than 20,000 square feet of conditioned floor area

4. Retention of portion of existing system capacity. For buildings not exempted by item 3 above, a maximum of 50 percent of the existing central HVAC system fossil fuel or electric resistance heating capacity is permitted to be retained or replaced to serve as supplementary heat for the new heat pump HVAC heating system, provided that the heat pump system is sized to provide no less than 50 percent of peak calculated load at 32°F OAT and that it is controlled to be used only when the heat pump system heating capacity is insufficient to meet the load, in compliance with the applicable Exception 5, 6, or 7 to Section C403.1.4, and that the requirements of Section C503.4.6.1 are met.

6. Temporary retention of existing heating equipment. Temporary retention of one or more HVAC heating appliances, in excess of the 50 percent capacity permitted by Exception 5 above, is permitted where an existing cooling appliance requires immediate replacement, and where no other work on the HVAC system is planned. In addition, the requirements of Section C503.4.6.1 shall be met, and the applicant shall ensure completion of the required heat pump system in compliance with one of the following options.

- a. SDCI will issue a temporary certificate of occupancy (TCO), which will remain in force until the heat pump heating system is installed and the final inspection of the system has been completed.
- b. Applicant shall post a performance bond in the amount of the full estimated cost of installation of the required heat pump system, to complete the installation of the heat pump system within 48 months.

Commented [EVM23]: Please send over the latest version of this sections so that I can review what exceptions are in there...

Commented [DJ24R23]: OK

C505—Change of space conditioning, occupancy or use. A number of clarifications and corrections for this section. No new requirements.

C505.1 General. Buildings or spaces undergoing a change in space conditioning alteration shall comply with Sections C505.2 and C505.4. Buildings or spaces undergoing a change in occupancy alteration((s)) shall comply with Sections C505.3 and C505.4. Spaces changing from one use type to another shall **also** comply with Section C505.5.

Buildings or spaces undergoing a change in space conditioning, change in occupancy or **change in** use shall conform to the provisions of this code without requiring the unaltered portion of the existing building to comply with this code. Alterations shall be such that the existing building or structure is no less conforming to the provisions of this code than the existing building or structure was prior to the alteration.

~~((A change in space conditioning alteration shall be deemed to comply with this code if the alteration area alone complies or if the alteration area is combined with all other spaces within the existing building that are of the same space conditioning category according to Section C505.2 to demonstrate compliance. A change in occupancy alteration shall be deemed to comply with this code if the alteration area alone complies or if the existing building and the alteration area are combined to demonstrate complete for the whole building. This allowance applies to prescriptive compliance in accordance with Section C505.4 or total building performance in accordance with Section C407.))~~

Buildings or spaces ~~((that were permitted prior to the 2009 Washington State energy code, or were originally permitted as unconditioned, may comply with this section as follows))~~ **are permitted to utilize one of the following modifications for compliance with this section:**

1. **Increased envelope UA with prescriptive compliance.** Where the component performance alternative in Section C402.1.5 is used to demonstrate compliance with this section, **and the project area complies with all other requirements of this code,** the Proposed Total UA is allowed to be up to 110 percent of the Allowable Total UA. This exception ~~((may))~~ **is permitted to** be applied to the project area alone, or to the existing building and project area combined as a whole building.

2. **Increased carbon emissions with total building performance compliance.** Where total building performance in accordance with Section C407 is used to demonstrate compliance with this section, the total annual carbon emissions from energy consumption of the proposed design is allowed to be up to 110 percent of the annual carbon emissions from energy consumption allowed by Section C407.3. This exception ~~((may))~~ **is permitted to** be applied to the project area alone, or to the existing building and project area combined as a whole building.

C505.1.1 Additional energy efficiency credits. Buildings or spaces that are required to comply with Sections C505.2 or C505.3 shall also comply with Section C502.1.1 in the same manner as an addition.

C505.1.2 Renewable energy. Buildings or spaces that are required to comply with Section C505.2 or C505.3 shall also comply with Section C502.1.2 in the same manner as an addition.

C505.2 Change in space conditioning. **For the purposes of this section, space conditioning area categories include the following: low energy space in accordance with Section C402.1.1.1, semi-heated space, and conditioned space.** Spaces undergoing a change in space conditioning ~~((alteration))~~ shall be brought up to full compliance with this code for all disciplines in the following cases:

Commented [DJ25]: These are moved to the respective change of occupancy and change of space conditioning sections below.

1. Any low energy space in accordance with Section C402.1.1.1 that is altered to become *conditioned space* or *semi-heated space* shall be brought into full compliance with this code.

2. Any semi-heated space in accordance with Section C402.1.1.2 that is altered to become conditioned space or any heated but not cooled space that is altered to become both heated and cooled shall be brought into full compliance with this code. Compliance shall include the provisions of Section C406, applied only to the portion of the building undergoing a change in space conditioning.

Exception. A change in space conditioning does not require full compliance with this code if both of the following conditions are met:

1. The existing heated but not cooled space is altered to become both heated and cooled by replacement of the existing heating-only HVAC system with an electric heat pump HVAC system; and

2. The annual carbon emissions of the new HVAC system from both heating and cooling is less than the annual heating-only carbon emissions of the existing HVAC system, as determined by energy modeling in compliance with Section C407 or another *approved* calculation method to quantify the reduced annual carbon emissions.

~~((For buildings with more than one space conditioning category, the interior partition walls, ceilings, floors and fenestration that separate space conditioning areas shall comply with the thermal envelope requirements per the area with the highest level of space conditioning.))~~

Interior walls, ceilings, floors and fenestration that separate conditioned spaces from low energy or semi-heated spaces shall comply with the thermal envelope requirements for conditioned space. Interior walls, ceilings, floors and fenestration that separate semi-heated spaces from low energy spaces shall comply with the thermal envelope requirements for semi-heated space.

~~((A change in space conditioning project shall be deemed to comply with this code if the project area alone complies or if the existing building and the project area combined comply with this code as a whole building.))~~

A change in space conditioning alteration project is permitted to demonstrate compliance either if the alteration area alone complies or if the alteration area combined with all existing spaces of the same space conditioning area category complies. This applies to either prescriptive compliance in accordance with Section C505.4 or total building performance in accordance with Section C407.

Exception. The addition of cooling equipment to already-conditioned rooms or spaces less than 2000 square feet in floor area does not trigger the requirement to comply with this Section 505.2.

C505.3 Change in occupancy. Spaces undergoing a change in occupancy (~~(alteration)~~) shall be brought up to full compliance with this code for all disciplines in the following cases:

1. Any space that is converted from ~~((a))~~ a Group F, S or U occupancy to an occupancy other than Group F, S or U.

2. Any space that is converted to a Group R dwelling unit or portion thereof, from another use or occupancy.

Commented [DJ26]: DJ insert interpretation language here

Commented [DJ27]: Reworded for clarity

Commented [DJ28]: Paragraph moved from above and revised

3. Any Group R dwelling unit or portion thereof permitted prior to July 1, 2002, that is converted to a commercial use or occupancy.

Exception:

1. Where the building or space is altered to become a bakery, commercial kitchen or commercial laundry, and the proposed design uses only all-electric Energy Star-rated process equipment and code compliant all-electric HVAC equipment, improvements to the building envelope immediately adjoining the spaces containing that use shall not be required. For the purposes of this exception, no fossil fuel burning equipment of any kind may be installed within the building or space undergoing the *change of occupancy*.

2. A change in occupancy alteration project is permitted to demonstrate compliance either if the alteration area alone complies or if the alteration area combined with all existing spaces of the same space conditioning area category complies. This applies to either prescriptive compliance in accordance with Section C505.4 or total building performance in accordance with Section C407.

Commented [DJ29]: Do we want to continue this exception, or drop it?

Commented [DJ30]: Paragraph moved from above and revised.

C505.4 Prescriptive compliance. Change in space conditioning and change in occupancy (~~(alterations)~~) projects shall comply with Sections C505.4.1 through C505.4.6.

C505.4.1 Vertical fenestration. ~~((A))~~ Either a change in space conditioning or change in occupancy (~~(alteration)~~) to a space or building with vertical fenestration shall comply with the following:

1. Where the vertical fenestration area of the alteration combined with the vertical fenestration area of all equivalent space conditioning areas in the existing building results in a total vertical fenestration area that is less than or equal to the maximum allowed by Section C402.4.1, the alteration shall comply with Section C402.4.

2. Where the vertical fenestration area of the alteration combined with the vertical fenestration area of all equivalent space conditioning areas in the existing building results in a total vertical fenestration area that is greater than the maximum allowed by Section C402.4.1, the alteration shall comply with one of the following:

2.1. Component performance alternative with target area adjustment in accordance with Section C402.1.5 for the alteration area of the building only.

2.2. Alteration area is combined with all equivalent space conditioning areas to demonstrate compliance with the component performance alternative.

2.3. Total building performance in accordance with Section C407 for the alteration area of the building only.

2.4. Alteration area is combined with all equivalent space conditioning areas to demonstrate total building performance compliance.

C505.4.1.2 Skylights. ~~((A))~~ Either a change in space conditioning (~~(alteration)~~) or change in occupancy to a space or building with skylights shall comply with the following:

1. Where the skylight area of the alteration combined with the skylight area of all equivalent space conditioning areas in the existing building results in a total skylight area that is less than or equal to the maximum allowed by Section C402.4.1, the alteration shall comply with Section C402.4.

2. Where the skylight area of the alteration combined with the skylight area of all equivalent space conditioning areas in the existing building results in a total skylight area that is greater than the maximum allowed by Section C402.4.1, the alteration shall comply with one of the following:

2.1. Component performance alternative with target area adjustment in accordance with Section C402.1.5 for the alteration area of the building only.

2.2. Alteration area is combined with all equivalent space conditioning areas to demonstrate compliance with the component performance alternative.

2.3. Total building performance in accordance with Section C407 for the alteration area of the building only.

2.4. Alteration area is combined with all equivalent space conditioning areas to demonstrate total building performance compliance.

