

WSR 19-24-014
PERMANENT RULES
DEPARTMENT OF
CHILDREN, YOUTH, AND FAMILIES

[Filed November 21, 2019, 2:37 p.m., effective December 22, 2019]

Effective Date of Rule: Thirty-one days after filing.

Purpose: Allow early childhood education and assistance program enrollment for specific children when space is available; establish a prioritization system for these enrollments; and establish enrollment thresholds for children from families with income above one hundred ten percent of federal poverty level. Rules implement chapters 408 and 409, Laws of 2019.

Citation of Rules Affected by this Order: New WAC 110-425-0083, 110-425-0084, 110-425-0085 and 110-425-0087; and amending WAC 110-425-0030 and 110-425-0080.

Statutory Authority for Adoption: RCW 43.216.512, 43.216.525, 43.216.540, 43.216.555.

Adopted under notice filed as WSR 19-19-084 on September 17, 2019.

Changes Other than Editing from Proposed to Adopted Version: "Eligible child" has the same meaning as "child allowed for enrollment." corrected to read "Eligible child has the same means as "child eligible for enrollment" in definition of "Child eligible for enrollment."

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 0, Repealed 0; or Recently Enacted State Statutes: New 4, Amended 2, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 0, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 0, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 0, Amended 0, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 0, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 0, Repealed 0.

Date Adopted: November 21, 2019.

Brenda Villarreal
Rules Coordinator

AMENDATORY SECTION (Amending WSR 19-03-041, filed 1/8/19, effective 2/8/19)

WAC 110-425-0030 Definitions. ~~((+))~~ "Child allowed for enrollment" means a child that DCYF may permit to be enrolled in ECEAP under RCW 43.216.512, but who is not in the group that will be entitled to ECEAP beginning in the 2022-23 school year under RCW 43.216.556.

"Child eligible for enrollment" means a child who is eligible for ECEAP under RCW 43.216.505(4). This child is in the group that will be entitled to ECEAP beginning in the 2022-23 school year under RCW 43.216.556. Under RCW 43.216.514, a child eligible for enrollment must be given enrollment priority over a child allowed for enrollment. "Eli-

gible child" has the same meaning as "child eligible for enrollment."

"Contractor" means a public or private organization that contracts with the department of children, youth, and families to provide local ECEAP services.

~~((2))~~ "Department" means the department of children, youth, and families.

~~((3))~~ "ECEAP" means the early childhood education and assistance program.

~~((4))~~ "Eligible organization" means public or private organizations including, but not limited to, school districts, educational service districts, community and technical colleges, local governments, nonprofit organizations, and for-profit organizations provided that their proposed ECEAP is free from religious instruction, activities, or symbolism.

~~((5))~~ "Federal poverty level" or "FPL" means the measure of income in relation to family size issued by the federal U.S. Department of Health and Human Services and used to calculate ECEAP income eligibility.

"Performance standards" means the most current release of the ECEAP performance standards as incorporated into the ECEAP contract, which are accessible at <https://www.dcyf.wa.gov/services/early-learning-providers/eceap/contractors>.

AMENDATORY SECTION (Amending WSR 19-03-041, filed 1/8/19, effective 2/8/19)

WAC 110-425-0080 ((Eligibility for services.)) Children eligible for enrollment. ~~((+))~~ A child is eligible for enrollment in ECEAP if the child is at least three years old by August 31st of the school year, is not age-eligible for kindergarten, and is either:

~~((a))~~ (1) From a family with income at or below one hundred ten percent of the federal poverty level (FPL);

(2) Qualified by a school district for special education services under RCW 28A.155.020. All children on a school district individualized education program (IEP) meet this requirement~~((;~~

~~(b) From a family with income at or below one hundred ten percent of the federal poverty guidelines established by the U.S. Department of Health and Human Services);~~ or

~~((c))~~ (3) From a family with income that exceeds one hundred ten percent federal poverty level ((("over income" and is homeless or)) and is impacted by specific risk factors ((identified by the department that are linked by research to school performance, provided that)) incorporated into the department's prioritization system described in WAC 110-425-0085(4) which includes preference for enrollment of children from families with the lowest income, children in foster care, or children from families with multiple needs. No more than ten percent of slots statewide are enrolled with children eligible under this provision.

~~((2) Contractors may provide ECEAP services to over-income children without IEPs as follows:~~

~~(a) Contractors must actively recruit and enroll income-eligible children within their service area.~~

~~(b) Contractors may enroll over-income children without IEPs up to the initial over-income limit assigned by the department to each contractor annually.~~

(i) This limit is based on contractor size; contractors with fewer funded ECEAP slots are allowed higher over-income percentages to provide flexibility to fill classes in rural areas.

(ii) For sites operated by tribes or tribal organizations, the department will set initial over-income limits at twenty-five percent.

(iii) The department may adjust limits midyear if slots are moved between contractors.

(e) Contractors may apply for additional over-income slots for the current year using the application provided by the department if:

(i) The contractor has enrolled all assigned over-income slots;

(ii) Additional funded slots are available; and

(iii) Efforts to recruit income-eligible children within the contractor's service area have been exhausted.

(d) The department will consider the following factors when reviewing applications for additional over-income slots:

(i) The statewide number of enrolled over-income children without IEPs must not equal more than twenty-five percent of the total funded ECEAP slots;

(ii) The similarity of the income levels, risk factors, and priority points of the children described in the applications and other ECEAP children enrolled in over-income slots;

(iii) The statewide plan to serve all income-eligible children from families who choose to participate;

(iv) The requesting contractor's need to fill slots to fully enroll a class to ensure access to services for income-eligible children; and

(v) The presence of unserved, income-eligible children in other locations in the state.

(3) Eligible, enrolled children maintain their eligibility for ECEAP until kindergarten, without reverification of income or risk factors. All previously enrolled children returning for a new school year may be reprioritized against new children when enrollment slots are limited.

(4) Children are not eligible for ECEAP if they are enrolled in Head Start, however Head Start duration funds may be used to increase the length of the ECEAP preschool day when federal funds are provided to a contractor specifically for this purpose.

(5) Children served by school district special education may be simultaneously enrolled in ECEAP.

(6) Once contractors have established a pool of eligible children, contractors must prioritize the eligible children for available ECEAP slots using the department priority point system which is based on state law and department review of research linking risk factors to school performance, including:

(a) For children eligible by income or qualification for special education, prioritization of children from families with the lowest incomes, children in foster care, and families with multiple needs;

(b) For over-income children eligible under subsection (1)(c) of this section, prioritization of children experiencing homelessness or impacted by specific developmental or environmental risk factors that are linked by research to school performance;

(c) For allowable children from over-income families who are not eligible nor proposed to be entitled to ECEAP in 2022-2023, prioritization of children experiencing homelessness, involved in the child welfare system, or with a developmental delay or disability that does not meet the eligibility criteria for special education provided for in RCW 28A.155.020;

(d) Child age, with priority for children who are within one year of kindergarten age; and

(e) State law requiring ECEAP priority for children in foster care, in the child welfare system, homeless, in families with the lowest income, or in families with multiple risk factors.))

NEW SECTION

WAC 110-425-0083 Additional children allowed for enrollment. (1) A child is allowed for enrollment in ECEAP as space is available if the child is at least three years old by August 31st of the enrollment school year and is not age-eligible for kindergarten, and is either:

(a) From a family above one hundred ten percent but less than or equal to one hundred thirty percent of FPL; or

(b) From a family above one hundred thirty percent but less than or equal to two hundred percent of FPL and with one or more specific risk factors as described in the department's prioritization system under WAC 110-425-0085(4).

(2) A child is allowed for enrollment in ECEAP as space is available if the child:

(a) Has received services from the early support for infants and toddlers program (ESIT), early head start (EHS), or the birth to three early childhood education and assistance program;

(b) Turned three years of age any time after August 31st of the enrollment school year;

(c) Has a first class start date in ECEAP on or after their third birthday; and

(d) Is from a family with income:

(i) At or below two hundred percent of FPL; or

(ii) Above two hundred percent of FPL with one or more additional specific risk factors as described in the department's prioritization system under WAC 110-425-0085(4).

NEW SECTION

WAC 110-425-0084 Duration of enrollment and allowance of dual enrollments. (1) Enrolled children remain qualified for ECEAP until kindergarten, without reverification of income or risk factors. All previously enrolled children returning for a new school year may be reprioritized against new children when enrollment slots are limited.

(2) Children may not be enrolled in ECEAP if they are enrolled in Head Start, however Head Start duration funds may be used to increase the length of the ECEAP preschool day when federal funds are provided to a contractor specifically for this purpose.

(3) Children served by school district special education may be simultaneously enrolled in ECEAP.

NEW SECTION

WAC 110-425-0085 Prioritization system. (1) Once contractors have established a pool of children who are eligible or allowed for enrollment, contractors must prioritize the children for available funded ECEAP slots.

(2) The department establishes an ECEAP prioritization system based on priority points attributed to each child who is eligible or allowed for enrollment. This system is updated periodically as related research becomes available. The most current prioritization system is accessible at <https://www.dcyf.wa.gov/services/early-learning-providers/eceap/contractors/direct-service-staff/enrollment> and is incorporated into the early learning management system (ELMS) which manages ECEAP eligibility and enrollment.

(3) The ECEAP prioritization system incorporates the prioritization requirements included in RCW 43.216.505(4), 43.216.512, and 43.216.514.

(4) Priority points are awarded for:

- (a) Child welfare system involvement;
- (b) Homelessness;
- (c) Family income calculated as a percentage of the federal poverty level;
- (d) Four-year olds who are within one year of kindergarten eligibility;
- (e) Limited-English proficiency which shall have the same meaning as the phrase "English as a second language" under RCW 43.216.512;
- (f) Individualized education program (IEP);
- (g) Suspected or diagnosed developmental delay or disability for a child without an IEP;
- (h) Incarcerated parent;
- (i) Child's previous expulsion from an early learning setting due to behavior;
- (j) Family domestic violence;
- (k) Family substance abuse;
- (l) Family mental illness;
- (m) Other risk factors determined by the department to be linked by research to school performance.

NEW SECTION

WAC 110-425-0087 Contractor slots for children above one hundred ten percent of FPL. (1) With regard to children eligible for enrollment, RCW 43.216.505 (4)(c) establishes a limit of ten percent of total statewide enrollment for children that meet criteria established by WAC 110-425-0080 (1)(c).

(2) With regard to children allowed for enrollment, RCW 43.216.512 establishes a limit of twenty-five percent of total statewide enrollment.

(3) The department sets an initial limit for each contractor of slots for children above one hundred ten percent of FPL who do not have an IEP, in order to manage the statewide limits.

(a) This limit is based on each contractor's size, enrollment history, and to provide flexibility to fill classes in rural areas.

(b) For sites operated by tribes or tribal organizations, the department sets the initial limit at twenty-five percent.

(c) The department may adjust limits midyear if slots are reallocated between contractors.

(d) This contractor limit is managed in ELMS.

(4) Once a contractor has enrolled their limit of children above one hundred ten percent of FPL who do not have an IEP, the contractor may request an increase of their limit if:

(a) The contractor has unfilled funded slots; and

(b) Efforts to recruit children eligible for enrollment or with higher priority points within the contractor's service area have been exhausted.

(5) The department will consider the following factors when reviewing requests for additional slots above one hundred ten percent of FPL:

(a) ECEAP enrollments have not reached the statewide limits of children eligible and allowed for enrollment above one hundred ten percent of FPL who do not have an IEP under RCW 43.216.505(4) and 43.216.512;

(b) The requesting contractor's need to fill slots to fully enroll a class to ensure access to services children at or below one hundred ten percent of FPL;

(c) The requesting contractor's community need for additional flexibility to serve additional children; and

(d) The presence of unserved children at or below one hundred ten percent of FPL in other locations in the state.

WSR 19-24-025**PERMANENT RULES****DEPARTMENT OF ECOLOGY**

[Order 18-07—Filed November 22, 2019, 1:59 p.m., effective December 23, 2019]

Effective Date of Rule: Thirty-one days after filing.

Purpose: Chapter 173-460 WAC, Controls for new sources of toxic air pollutants, this rule includes air quality permitting requirements for businesses that emit toxic air pollutants.

The amendments:

- Update the list of toxic air pollutants.
- Recalculate:
 - Acceptable source impact levels (ASIL).
 - Small quantity emission rates (SQER).
 - De minimis emission values.
- Specify the number of significant digits of emissions rates (i.e., de minimis and SQERs) and concentrations (i.e., ASILs).
- Update language in the rule to use the acronym "TAP" instead of "toxic air pollutant."

Citation of Rules Affected by this Order: Amending WAC 173-460-040, 173-460-080, and 173-460-150.

Statutory Authority for Adoption: Chapter 70.94 RCW, Washington Clean Air Act.

Other Authority: Not applicable.

Adopted under notice filed as WSR 19-12-092 on June 4, 2019.

Changes Other than Editing from Proposed to Adopted Version: WAC 173-460-150, changes throughout table.

- Common names and order of toxic air pollutants, we edited the names and order of chemicals to make it easier to find them in the table. The new system groups chemical families near each other instead of throughout the table.
- Scientific notation, we simplified the table by providing all emission threshold values in the scientific notation format (1.0E+00). Displaying ASILs, SQERs, and de minimis emission values in the table in two formats - decimal and scientific notation - was confusing.

WAC 173-460-150, pollutant specific changes.

- Asbestos, the amendments add six types of asbestos to the list of toxic air pollutants: Actinolite, Amosite, Anthophyllite, Chrysotile, Crocidolite, and Tremolite. Each of these has its own unique CAS number. The ASILs, SQERs, and de minimis emissions levels are identical to those of the general listing for "Asbestos (fibers/cubic centimeter)." This change should reduce confusion about the coverage of the existing asbestos group listing.
- Cobalt, we added "and compounds, NOS" to clarify that all forms of cobalt compounds are equally toxic based on the mass of cobalt in a cobalt compound.
- Dimethyl mercury, we retained the original listing of "dimethyl mercury" because we mistakenly changed the name to "methyl mercury (dimethyl mercury)" when we proposed the rule.
- Ethyl carbamate, we added urethane as a common name for this chemical because it has the same CAS number.
- Fluorides, we corrected the misspelling of fluoride in the common name of this pollutant.
- Libby amphibole asbestos, we corrected the misspelling of amphibole and added "and amphibole, NOS" to be more expansive and protect public health. This was due to EPA's toxicological review of Libby amphibole asbestos that highlights concerns about a variety of amphiboles.
- Nickel carbonate hydroxide, we corrected the CAS number to 12607-70-4.
- Nickel oxide, we added nickel monoxide and nickel(II) oxide as common names for nickel oxide because they have the same CAS number.
- Nickel oxide black, we added CAS 1314-06-3 for this pollutant because the rule did not include one. We added nickel sesquioxide and nickel(III) oxide as common names for nickel oxide black because they have the same CAS number.
- Sulfur trioxide, we corrected the CAS number to 7446-11-9.

A final cost-benefit analysis is available by contacting Elena Guilfoil, Department of Ecology, Air Quality Program, P.O. Box 47600, Olympia, WA 98504-7600, phone 360-407-6800, people with speech disability may call TTY at 877-833-6341, people with impaired hearing may call Washington relay service at 711, email elena.guilfoil@ecy.wa.gov, website <https://fortress.wa.gov/ecy/publications/SummaryPages/1902026.html>.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal

Rules or Standards: New 0, Amended 0, Repealed 0; or Recently Enacted State Statutes: New 0, Amended 0, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 1, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 3, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 0, Amended 2, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 0, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 0, Repealed 0.

Date Adopted: November 22, 2019.

Maia D. Bellon
Director

AMENDATORY SECTION (Amending WSR 09-11-131, filed 5/20/09, effective 6/20/09)

WAC 173-460-040 New source review. (1) Applicability and exemptions. This chapter supplements the new source review requirements of WAC 173-400-110 by adding review requirements for new and modified toxic air pollutant sources. An action that is exempt from new source review under WAC 173-400-110 (4) or (5) is exempt under this chapter as well, except that a local air authority may adopt its own list of exemptions in accordance with RCW 70.94.331 (2)(b) to operate in lieu of or in addition to the exemptions in WAC 173-400-110 (4) and (5). An action that requires a notice of construction application under WAC 173-400-110 is subject to the review requirements of this chapter, unless the emissions before control equipment of each (~~toxic air pollutant~~) TAP (rounded to two significant digits) from a new source or the increase in emissions from each modification is less than the applicable de minimis emission threshold for that TAP listed in WAC 173-460-150.

(2) New source review of a modification is limited to the emission unit or units proposed to be modified and the TAPs whose emissions would increase as a result of the modification.

(3) The permitting authority that is reviewing a notice of construction application for a new or modified toxic air pollutant source must ensure that:

(a) The new or modified emission units use tBACT for emissions control for the (~~toxic air pollutants~~) TAPs with emission increases that trigger the need to submit a notice of construction application; and

(b) The new or modified emission units comply with WAC 173-460-070 as demonstrated by using the procedures established in WAC 173-460-080 or, failing that, demonstrates compliance by using the additional procedures in WAC 173-460-090 and/or 173-460-100.

AMENDATORY SECTION (Amending WSR 09-11-131, filed 5/20/09, effective 6/20/09)

WAC 173-460-080 First tier review. (1) A notice of construction application for a new or modified toxic air pol-

lutant source must include an acceptable source impact level analysis for each TAP emitted by the new or modified emission units with an emission increase greater than the de minimis emission level specified in WAC 173-460-150. The permitting authority may complete this analysis.

(2) The acceptable source impact analysis requirement of WAC 173-460-070 can be satisfied for any TAP using either dispersion modeling or the small quantity emission rate.

(a) Dispersion modeling. The applicant who relies on dispersion modeling must model the increase in the emissions of each TAP emitted by the new or modified emission units, after application of tBACT. The notice of construction application must demonstrate that the modeled ambient impact (rounded to two significant digits) of the aggregate emissions increase of each TAP does not exceed the ASIL for that TAP as listed in WAC 173-460-150. If concentrations predicted by dispersion screening models exceed applicable acceptable source impact levels, more refined modeling and/or emission techniques must be used. Refined modeling techniques must be approved by the permitting authority.

(b) Small quantity emission rates. An applicant may show for any TAP that the increase in emissions of that TAP (rounded to two significant digits), after application of

tBACT, is less than the small quantity emission rate listed for that TAP in WAC 173-460-150.

(3) Reduction of TAPs from existing emission units. An applicant may include in ((#)) an acceptable source impact analysis proposed reductions in actual emissions of a particular TAP from emission units at the source that are not new or modified for the purpose of offsetting emissions of that TAP caused by the new or modified source. The reductions in TAP emissions authorized by this subsection must be included in the approval order as enforceable emission limits and must meet all the requirements of WAC 173-460-071.

(4) Decision criteria.

(a) If the permitting authority finds that the modeled impact of the increase in emissions of a TAP from the new or modified emission units does not exceed the ASIL for that TAP then the authority may approve the notice of construction application.

(b) If the permitting authority finds that the modeled impact of the increase in emissions of a TAP from the new or modified emission units exceeds the ASIL for that TAP then the permitting authority may not approve the project. The applicant may file a second tier review application in compliance with WAC 173-460-090.

AMENDATORY SECTION (Amending WSR 09-11-131, filed 5/20/09, effective 6/20/09)

WAC 173-460-150 Table of ASIL, SQER and de minimis emission values. The following table lists the common name of ((~~toxic air pollutants~~)) TAPs, the chemical abstract service (CAS) number; the averaging period; the acceptable source impact level (ASIL); the small quantity emission rate (SQER); and de minimis emission value((s)).

Common Name	CAS #	Averaging Period	ASIL ($\mu\text{g}/\text{m}^3$)	SQER (lb/averaging period)	De Minimis (lb/averaging period)
((1,1,1,2-Tetrachloroethane	630-20-6	year	0.135	25.9	1.3
1,1,1,2-Tetrafluoroethane	811-97-2	24-hr	8.00E+04	10500	526
1,1,1-Trichloroethane	71-55-6	24-hr	1000	131	6.57
1,1,2,2-Tetrachloroethane	79-34-5	year	0.0172	3.3	0.165
1,1,2-Trichloroethane	79-00-5	year	0.0625	12	0.6
1,1-Dichloroethane	75-34-3	year	0.625	120	6
1,1-Dichloroethylene	75-35-4	24-hr	200	26.3	1.31
1,1-Difluoroethane	75-37-6	24-hr	4.00E+04	5260	263
1,1-Dimethylhydrazine	57-14-7	24-hr	0.5	0.0657	0.00329
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	39001-02-0	year	0.000263	0.0505	0.00252
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-Dioxin	3268-87-9	year	0.000263	0.0505	0.00252
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	year	2.63E-06	0.000505	2.52E-05
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	year	2.63E-06	0.000505	2.52E-05
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822-46-9	year	2.63E-06	0.000505	2.52E-05
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	year	2.63E-07	5.05E-05	2.52E-06
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227-28-6	year	2.63E-07	5.05E-05	2.52E-06
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	57653-85-7	year	2.63E-07	5.05E-05	2.52E-06
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	year	2.63E-07	5.05E-05	2.52E-06
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	year	2.63E-07	5.05E-05	2.52E-06
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408-74-3	year	2.63E-07	5.05E-05	2.52E-06
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	year	5.26E-07	0.000101	5.05E-06
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321-76-4	year	2.63E-08	5.05E-06	2.52E-07
1,2,3-Trichloropropane	96-18-4	24-hr	1.84	0.242	0.0121

Common Name	CAS #	Averaging Period	ASIL ($\mu\text{g}/\text{m}^3$)	SQER (lb/averaging period)	De Minimis (lb/averaging period)
1,2-Dibromo-3-chloropropane	96-12-8	year	0.000526	0.101	0.00505
1,2-Dibromoethane	106-93-4	year	0.0141	2.71	0.135
1,2-Dichloroethane	107-06-2	year	0.0385	7.39	0.369
1,2-Dichloropropane	78-87-5	year	0.1	19.2	0.959
1,2-Dimethylhydrazine	540-73-8	year	6.25E-06	0.0012	6.00E-05
1,2-Diphenylhydrazine	122-66-7	year	0.004	0.768	0.0384
1,2-Epoxybutane	106-88-7	24-hr	20	2.63	0.131
1,3-Butadiene	106-99-0	year	0.00588	1.13	0.0564
1,3-Dichloropropene	542-75-6	year	0.0625	12	0.6
1,3-Propane Sultone	1120-71-4	year	0.00145	0.278	0.0139
1,4-Dichlorobenzene	106-46-7	year	0.0909	17.4	0.872
1,4-Dioxane	123-91-1	year	0.13	24.9	1.25
1,6-Dinitropyrene	42397-64-8	year	9.09E-05	0.0174	0.000872
1,6-Hexamethylene diisocyanate	822-06-0	24-hr	0.07	0.00920	0.000460
1,8-Dinitropyrene	42397-65-9	year	0.000909	0.174	0.00872
1-[(5-Nitrofurfurylidene)-amino]-2-imidazolidinone	555-84-0	year	0.00196	0.376	0.0188
1-Amino-2-methylantraquinone	82-28-0	year	0.0233	4.47	0.224
1-Chloro-1,1-difluoroethane	75-68-3	24-hr	5.00E+04	6570	329
1-Nitropyrene	5522-43-0	year	0.00909	1.74	0.0872
2,3,3',4,4',5'-Hexachlorobiphenyl	69782-90-7	year	5.26E-05	0.0101	0.000505
2,3,3',4,4',5'-Hexachlorobiphenyl	38380-08-4	year	5.26E-05	0.0101	0.000505
2,3,3',4,4'-Pentachlorobiphenyl	32598-14-4	year	0.000263	0.0505	0.00252
2,3,3',4,4',5,5'-Heptachlorobiphenyl	39635-31-9	year	0.000263	0.0505	0.00252
2',3,4,4',5'-Pentachlorobiphenyl	65510-44-3	year	0.000263	0.0505	0.00252
2,3',4,4',5'-Pentachlorobiphenyl	31508-00-6	year	0.000263	0.0505	0.00252
2,3,4,4',5'-Pentachlorobiphenyl	74472-37-0	year	5.26E-05	0.0101	0.000505
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	year	2.63E-07	5.05E-05	2.52E-06
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	year	5.26E-08	1.01E-05	5.05E-07
2,3,7,8-Tetrachlorodibenzo-p-dioxin & Related Compounds, NOS	—	year	2.63E-08	5.05E-06	2.52E-07
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9	year	2.63E-07	5.05E-05	2.52E-06
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746-01-6	year	2.63E-08	5.05E-06	2.52E-07
2,3',4,4',5,5'-Hexachlorobiphenyl	52663-72-6	year	0.000263	0.0505	0.00252
2,4,6-Trichlorophenol	88-06-2	year	0.05	9.59	0.48
2,4-Diaminoanisole	615-05-4	year	0.152	29.2	1.46
2,4-Diaminoanisole Sulfate	39156-41-7	year	0.27	51.8	2.59
2,4-Diaminotoluene	95-80-7	year	0.000909	0.174	0.00872
2,4-Dinitrotoluene	121-14-2	year	0.0112	2.15	0.107
2-Acetylaminofluorene	53-96-3	year	0.000769	0.148	0.00738
2-Amino-3-methyl-9H-pyrido[2,3-b]indole	68006-83-7	year	0.00294	0.564	0.0282
2-Amino-3-methylimidazo-[4,5-f]quinoline	76180-96-6	year	0.0025	0.48	0.024
2-Amino-5-(5-Nitro-2-Furyl)-1,3,4-Thiadiazol	712-68-5	year	0.000217	0.0416	0.00208
2-Aminoanthraquinone	117-79-3	year	0.106	20.3	1.02
2-Chloroacetophenone	532-27-4	24-hr	0.03	0.00394	0.000197
2-Ethoxyethanol	110-80-5	24-hr	70	9.20	0.460
2-Methoxyethanol	109-86-4	24-hr	60	7.89	0.394
2-Methyl-1-nitroanthraquinone	129-15-7	year	0.000833	0.16	0.00799
2-Methylphenol	95-48-7	24-hr	600	78.9	3.94
2-Naphthylamine	91-59-8	year	0.00196	0.376	0.0188

Common Name	CAS #	Averaging Period	ASIL ($\mu\text{g}/\text{m}^3$)	SQER (lb/averaging period)	De Minimis (lb/averaging period)
2-Nitrofluorene	607-57-8	year	0.0909	17.4	0.872
2-Nitropropane	79-46-9	24-hr	20	2.63	0.131
3,3',4,4',5,5'-Hexachlorobiphenyl	32774-16-6	year	0.000263	0.0505	0.00252
3,3',4,4',5-Pentachlorobiphenyl	57465-28-8	year	2.63E-07	5.05E-05	2.52E-06
3,3',4,4'-Tetrachlorobiphenyl	32598-13-3	year	0.000263	0.0505	0.00252
3,3'-Dichlorobenzidine	91-94-1	year	0.00294	0.564	0.0282
3,4,4',5-Tetrachlorobiphenyl	70362-50-4	year	0.000263	0.0505	0.00252
3-Amino-9-ethylcarbazole hydrochloride	6109-97-3	year	0.0455	8.73	0.437
3-Chloro-2-methyl-propene	563-47-3	year	0.025	4.8	0.24
3-Methyleholanthrene	56-49-5	year	0.000159	0.0305	0.00153
3-Methylphenol	108-39-4	24-hr	600	78.9	3.94
4,4'-Diaminodiphenyl Ether	101-80-4	year	0.025	4.8	0.24
4,4-Methylene-bis(2-chloroaniline)	101-14-4	year	0.00233	0.447	0.0224
4,4-Methylene-bis(2-Methylaniline)	838-88-0	year	0.00385	0.739	0.0369
4,4'-Methylene-bis(n,n'-dimethyl)aniline	101-61-1	year	0.0769	14.8	0.738
4,4'-Methylenedianiline	101-77-9	year	0.00217	0.416	0.0208
4,4'-Methylenedianiline Dihydrochloride	13552-44-8	year	0.00294	0.564	0.0282
4,4-Thiodianiline	139-65-1	year	0.000233	0.0447	0.00224
4-Aminobiphenyl	92-67-1	year	0.000167	0.032	0.0016
4-Chloro-o-phenylenediamine	95-83-0	year	0.217	41.6	2.08
4-Dimethylaminoazobenzene	60-11-7	year	7.69E+04	1.48E+07	7.38E+05
4-Methylphenol	106-44-5	24-hr	600	78.9	3.94
4-Nitropyrene	57835-92-4	year	0.00909	1.74	0.0872
5-Methylehrysene	3697-24-3	year	0.000909	0.174	0.00872
5-Nitroacenaphthene	602-87-9	year	0.027	5.18	0.259
5-Nitro-o-Anisidine	99-59-2	year	0.0714	13.7	0.685
6-Nitrochrysene	7496-02-8	year	9.09E-05	0.0174	0.000872
7,12-Dimethylbenz[a]anthracene	57-97-6	year	1.41E-05	0.00271	0.000135
7h-Dibenzo[e,g]carbazole	194-59-2	year	0.000909	0.174	0.00872
A-alpha-c(2-amino-9h-pyrido[2,3-b]indole)	26148-68-5	year	0.00877	1.68	0.0841
Acetaldehyde	75-07-0	year	0.37	71	3.55
Acetamide	60-35-5	year	0.05	9.59	0.48
Acetonitrile	75-05-8	year	60	1.15E+04	576
Aerolein	107-02-8	24-hr	0.06	0.00789	0.000394
Acrylamide	79-06-1	year	0.000769	0.148	0.00738
Acrylic Acid	79-10-7	24-hr	1	0.131	0.00657
Acrylonitrile	107-13-1	year	0.00345	0.662	0.0331
Actinomycin D	50-76-0	year	4.00E-07	7.68E-05	3.84E-06
Alar	1596-84-5	year	0.196	37.6	1.88
Aldrin	309-00-2	year	0.000204	0.0391	0.00196
Allyl-Chloride	107-05-1	year	0.167	32	1.6
alpha-Hexachlorocyclohexane	319-84-6	year	0.0013	0.249	0.0125
Amitrole	61-82-5	year	0.0037	0.71	0.0355
Ammonia	7664-41-7	24-hr	70.8	9.31	0.465
Ammonium bisulfate	7803-63-6	1-hr	120	0.263	0.0131
Ammonium sulfate	7783-20-2	1-hr	120	0.263	0.0131
Aniline	62-53-3	year	0.625	120	6
Antimony Trioxide	1309-64-4	24-hr	0.2	0.0263	0.00131
Aramite	140-57-8	year	0.116	22.3	1.11

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Arsenic & Inorganic Arsenic Compounds	—	year	0.000303	0.0581	0.00291
Arsine	7784-42-1	24-hr	0.05	0.00657	0.000329
Asbestos	1332-21-4	year	1.59E-05	0.00305	0.000153
Auramine	492-80-8	year	0.004	0.768	0.0384
Azaserine	115-02-6	year	0.000323	0.062	0.0031
Azathioprine	446-86-6	year	0.00196	0.376	0.0188
Azobenzene	103-33-3	year	0.0323	6.2	0.31
Barium Chromate	10294-40-3	year	1.49E-05	0.00286	0.000143
Benz[a]anthracene	56-55-3	year	0.00909	1.74	0.0872
Benzene	71-43-2	year	0.0345	6.62	0.331
Benzidine	92-87-5	year	7.14E-06	0.00137	6.85E-05
Benzo[a]pyrene	50-32-8	year	0.00909	0.174	0.00872
Benzo[b]fluoranthene	205-99-2	year	0.00909	1.74	0.0872
Benzo[j]fluoranthene	205-82-3	year	0.00909	1.74	0.0872
Benzo[k]fluoranthene	207-08-9	year	0.00909	1.74	0.0872
Benzyl Chloride	100-44-7	year	0.0204	3.91	0.196
Benzyl Violet 4B	1694-09-3	year	0.175	33.6	1.68
Beryllium & Compounds (NOS)	—	year	0.000417	0.08	0.004
Beryllium Oxide	1304-56-9	year	0.000417	0.08	0.004
Beryllium Sulfate	13510-49-1	year	1.16E-06	0.000223	1.11E-05
beta-Butyrolactone	3068-88-0	year	0.00345	0.662	0.0331
Beta-hexachlorocyclohexane	319-85-7	year	0.00233	0.447	0.0224
beta-Propiolactone	57-57-8	year	0.00025	0.048	0.0024
Bis(chloroethyl)ether	111-44-4	year	0.00141	0.271	0.0135
Bis(chloromethyl)ether	542-88-1	year	7.69E-05	0.0148	0.000738
Bromodichloromethane	75-27-4	year	0.027	5.18	0.259
Bromoform	75-25-2	year	0.909	174	8.72
Butylated hydroxyanisole	25013-16-5	year	17.5	3360	168
C.I. Basic Red 9 Monohydrochloride	569-61-9	year	0.0141	2.71	0.135
Cadmium & Compounds	7440-43-9	year	0.000238	0.0457	0.00228
Captafol	2425-06-1	year	0.0233	4.47	0.224
Captan	133-06-2	year	1.52	292	14.6
Carbon disulfide	75-15-0	24-hr	800	105	5.26
Carbon monoxide	630-08-0	1-hr	23000	50.4	1.14
Carbon Tetrachloride	56-23-5	year	0.0238	4.57	0.228
Chlorambucil	305-03-3	year	7.69E-06	0.00148	7.38E-05
Chlordane	57-74-9	year	0.00294	0.564	0.0282
Chlordecone	143-50-0	year	0.000217	0.0416	0.00208
Chlorendic Acid	115-28-6	year	0.0385	7.39	0.369
Chlorinated Paraffins	108171-26-2	year	0.04	7.68	0.384
Chlorine	7782-50-5	24-hr	0.2	0.026	0.00131
Chlorine dioxide	10049-04-4	24-hr	0.2	0.026	0.00131
Chlorobenzene	108-90-7	24-hr	1000	131	6.57
Chlorobenzilate	510-15-6	year	0.0323	6.2	0.31
Chlorodifluoromethane	75-45-6	24-hr	5.00E+04	6570	328
Chloroform	67-66-3	year	0.0435	8.35	0.417
Chloromethyl methyl ether	107-30-2	year	0.00145	0.278	0.0139
Chloropierin	76-06-2	24-hr	0.4	0.053	0.00263
Chlorothalonil	1897-45-6	year	1.12	215	10.7

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Chlorozotocin	54749-90-5	year	1.45E-05	0.00278	0.000139
Chromic Acid	11115-74-5	year	1.51E-05	0.0029	0.000145
Chromic Trioxide	1333-82-0	year	1.28E-05	0.00246	0.000123
Chromic(VI) Acid	7738-94-5	year	1.51E-05	0.0029	0.000145
Chromium Hexavalent: Soluble, except Chromic Trioxide	—	year	6.67E-06	0.00128	6.40E-05
Chromium(VI)	18540-29-9	year	6.67E-06	0.00128	6.40E-05
Chrysene	218-01-9	year	0.0909	17.4	0.872
Cinnamyl Anthranilate	87-29-6	year	0.769	148	7.38
Cobalt	7440-48-4	24-hr	0.1	0.013	0.000657
Coke Oven Emissions	8007-45-2	year	0.00162	0.311	0.0155
Copper & Compounds	—	1-hr	100	0.219	0.011
Cumene	98-82-8	24-hr	400	52.6	2.63
Cupferron	135-20-6	year	0.0159	3.05	0.153
Cyclohexane	110-82-7	24-hr	6000	789	39.4
Cyclophosphamide (anhydrous)	50-18-0	year	0.00588	1.13	0.0564
Cyclophosphamide (Hydrated)	6055-19-2	year	0.00625	1.2	0.06
D & C Red No. 9	5160-02-1	year	0.667	128	6.4
Dacarbazine	4342-03-4	year	7.14E-05	0.0137	0.000685
Dantron	117-10-2	year	0.0455	8.73	0.437
DDD	72-54-8	year	0.0145	2.78	0.139
DDE	72-55-9	year	0.0103	1.98	0.0988
DDT	50-29-3	year	0.0103	1.98	0.0988
Di(2-ethylhexyl)phthalate	117-81-7	year	0.0417	8	0.4
Diazinon	333-41-5	24-hr	9	1.18	0.0591
Dibenz[a,h]acridine	226-36-8	year	0.00909	1.74	0.0872
Dibenz[a,h]anthracene	53-70-3	year	0.000833	0.16	0.00799
Dibenz[a,j]acridine	224-42-0	year	0.00909	1.74	0.0872
Dibenzo[a,e]pyrene	192-65-4	year	0.000909	0.174	0.00872
Dibenzo[a,h]pyrene	189-64-0	year	9.09E-05	0.0174	0.000872
Dibenzo[a,i]pyrene	189-55-9	year	9.09E-05	0.0174	0.000872
Dibenzo[a,l]pyrene	191-30-0	year	9.09E-05	0.0174	0.000872
Dibromochloromethane	124-48-1	year	0.037	7.1	0.355
Dichloromethane	75-09-2	year	1	192	9.59
Dichlorvos	62-73-7	year	0.012	2.3	0.115
Dieldrin	60-57-1	year	0.000217	0.0416	0.00208
Diesel Engine Exhaust, Particulate	—	year	0.00333	0.639	0.032
Diethanolamine	111-42-2	24-hr	3	0.394	0.0197
Diethyl mercury	627-44-1	24-hr	1.00E-99	1.00E-99	1.00E-99
Diethylstilbestrol	56-53-1	year	1.00E-05	0.00192	9.59E-05
Diglycidyl Resorcinol Ether	101-90-6	year	0.00204	0.391	0.0196
Dihydrosofrole	94-58-6	year	0.0769	14.8	0.738
Dimethyl Mercury	593-74-8	24-hr	1.00E-99	1.00E-99	1.00E-99
Dimethylcarbamoyl Chloride	79-44-7	year	0.00027	0.0518	0.00259
Dimethylvinylechloride	513-37-1	year	7.69	1480	73.8
Direct Black 38	1937-37-7	year	4.76E+04	9.13E+06	4.57E+05
Direct Blue 6	2602-46-2	year	0.000476	0.0913	0.00457
Direct Brown 95	16071-86-6	year	0.000526	0.101	0.00505
Disperse Blue 1	2475-45-8	year	0.769	148	7.38
Disulfoton	298-04-4	24-hr	6	0.789	0.0394

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Epichlorohydrin	106-89-8	year	0.0435	8.35	0.417
Estradiol 17b	50-28-2	year	9.09E-05	0.0174	0.000872
Ethyl Carbamate	51-79-6	year	0.00345	0.662	0.0331
Ethyl Chloride	75-00-3	24-hr	3.00E+04	3940	197
Ethylbenzene	100-41-4	year	0.4	76.8	3.84
Ethylene Glycol	107-21-1	24-hr	400	52.6	2.63
Ethylene glycol monobutyl ether	111-76-2	24-hr	1.30E+04	1710	85.4
Ethylene glycol monoethyl ether acetate	111-15-9	24-hr	300	39.4	1.97
Ethylene glycol monomethyl ether acetate	110-49-6	24-hr	90	11.8	0.590
Ethylene oxide	75-21-8	year	0.0114	2.19	0.109
Ethylene Thiourea	96-45-7	year	0.0769	14.8	0.738
Ethyleneimine	151-56-4	year	5.26E-05	0.0101	0.000505
Ferrie Sulfate	10028-22-5	1-hr	120	0.263	0.0131
Fluoride-containing chemicals, NOS	—	24-hr	13	1.71	0.0854
Fluorine gas F ₂	7782-41-4	24-hr	15.8	2.08	0.104
Formaldehyde	50-00-0	year	0.167	32	1.6
Furmeeyelox	60568-05-0	year	0.116	22.3	1.11
Furylfuramide	3688-53-7	year	0.0145	2.78	0.139
gamma-Hexachlorocyclohexane	58-89-9	year	0.00323	0.62	0.031
Glu-P-1	67730-11-4	year	0.000714	0.137	0.00685
Glu-P-2	67730-10-3	year	0.0025	0.48	0.024
Glutaraldehyde	111-30-8	24-hr	0.08	0.0105	0.000526
Gyromitrin	16568-02-8	year	0.000345	0.0662	0.00331
HC Blue 1	2784-94-3	year	0.0667	12.8	0.64
Heptachlor	76-44-8	year	7.69E-05	0.0148	0.000738
Heptachlor epoxide	1024-57-3	year	0.000385	0.0739	0.00369
Heptachlorodibenzo-p-dioxins, NOS	37871-00-4	year	2.63E-06	0.000505	2.52E-05
Hexachlorobenzene	118-74-1	year	0.00196	0.376	0.0188
Hexachlorobutadiene	87-68-3	year	0.0455	8.73	0.437
Hexachlorocyclohexane	608-73-1	year	0.000909	0.174	0.00872
Hexachlorocyclopentadiene	77-47-4	24-hr	0.2	0.026	0.00131
Hexachlorodibenzo-p-Dioxins, NOS	34465-46-8	year	2.63E-07	5.05E-05	2.52E-06
Hexachloroethane	67-72-1	year	0.0909	17.4	0.872
Hydrazine	302-01-2	year	0.000204	0.0391	0.00196
Hydrazine Sulfate	10034-93-2	year	0.00116	0.223	0.0111
Hydrogen chloride	7647-01-0	24-hr	9	1.18	0.0591
Hydrogen Cyanide	74-90-8	24-hr	9	1.18	0.0591
Hydrogen Fluoride	7664-39-3	24-hr	14	1.84	0.0920
Hydrogen Selenide	7783-07-5	1-hr	5	0.011	0.000548
Hydrogen Sulfide	7783-06-4	24-hr	2	0.263	0.0131
Indeno[1,2,3-cd]pyrene	193-39-5	year	0.00909	1.74	0.0872
Isophorone	78-59-1	24-hr	2000	2.63	13.1
Isopropyl Alcohol	67-63-0	1-hr	3200	7.01	0.35
Lasiocarpine	303-34-4	year	0.000455	0.0873	0.00437
Lead and compounds (NOS)	—	year	0.0833	16	10
Lead Acetate	301-04-2	year	0.0125	2.4	0.12
Lead Chromate	7758-97-6	year	4.14E-05	0.00794	0.000397
Lead Chromate Oxide	18454-12-1	year	7.01E-05	0.0135	0.000673
Lead Subacetate	1335-32-6	year	0.0909	17.4	0.872

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Maleic Anhydride	108-31-6	24-hr	0.7	0.0920	0.00460
Manganese & Compounds	—	24-hr	0.04	0.00526	0.000263
Melphalan	148-82-3	year	2.70E-05	0.00518	0.000259
Melphalan HCl	3223-07-2	year	2.70E-05	0.00518	0.000259
Mercury, Elemental	7439-97-6	24-hr	0.09	0.0118	0.000591
Methyl Alcohol	67-56-1	24-hr	4000	526	26.3
Methyl Bromide	74-83-9	24-hr	5	0.657	0.0629
Methyl Chloride	74-87-3	24-hr	90	11.8	0.591
Methyl Ethyl Ketone	78-93-3	24-hr	5000	657	32.9
Methyl Isobutyl Ketone	108-10-1	24-hr	3000	394	19.7
Methyl Isoocyanate	624-83-9	24-hr	1	0.131	0.00657
Methyl methacrylate	80-62-6	24-hr	700	92.0	4.60
Methyl Methanesulfonate	66-27-3	year	0.0357	6.85	0.343
Methyl Tertiary Butyl Ether	1634-04-4	year	3.85	739	36.9
Methylene diphenyl isocyanate	101-68-8	24-hr	0.7	0.0920	0.00460
Methylthiouracil	56-04-2	year	0.00909	1.74	0.0872
Miehler's ketone	90-94-8	year	0.004	0.768	0.0384
Mirex	2385-85-5	year	0.000196	0.0376	0.00188
Mitomycin C	50-07-7	year	4.35E-07	8.35E-05	4.17E-06
Monoerotaline	315-22-0	year	0.000345	0.0662	0.00331
m-Xylene	108-38-3	24-hr	221	29.0	1.45
n,n-Dimethylformamide	68-12-2	24-hr	80	10.5	0.526
n-[4-(5-nitro-2-furyl)-2-thiazolyl]-acetamide	531-82-8	year	0.00233	0.447	0.0224
Naphthalene	91-20-3	year	0.0294	5.64	0.282
n-Hexane	110-54-3	24-hr	700	92.0	4.60
Nickel Refinery Dust	—	year	0.0042	0.806	0.0403
Nickel Subsulfide	12035-72-2	year	0.00204	0.391	0.0196
Nifurthiazole	3570-75-0	year	0.00152	0.292	0.0146
Nitric Acid	7697-37-2	1-hr	86	0.188	0.00942
Nitritotriacetic acid	139-13-9	year	0.667	128	6.4
Nitritotriacetic acid, trisodium salt monohydrate	18662-53-8	year	0.345	66.2	3.31
Nitrofen	1836-75-5	year	0.0435	8.35	0.417
Nitrofurazone	59-87-0	year	0.0027	0.518	0.0259
Nitrogen dioxide	10102-44-0	1-hr	470	1.03	0.457
n-Methyl-n-nitro-n-nitrosoguanidine	70-25-7	year	0.000417	0.08	0.004
n-Nitrosodiethanolamine	1116-54-7	year	0.00125	0.24	0.012
n-Nitrosodiethylamine	55-18-5	year	1.00E-04	0.0192	0.000959
n-Nitrosodimethylamine	62-75-9	year	0.000217	0.0416	0.00208
n-Nitroso-di-n-butylamine	924-16-3	year	0.000323	0.062	0.0031
n-Nitrosodi-n-propylamine	621-64-7	year	0.0005	0.0959	0.0048
n-Nitrosodiphenylamine	86-30-6	year	0.385	73.9	3.69
n-Nitrosomorpholine	59-89-2	year	0.000526	0.101	0.00505
n-Nitroso-n-ethylurea	759-73-9	year	0.00013	0.0249	0.00125
n-Nitroso-n-methylethylamine	10595-95-6	year	0.000159	0.0305	0.00153
n-Nitroso-n-methylurea	684-93-5	year	2.94E-05	0.00564	0.000282
n-Nitroso-n-Methylurethane	615-53-2	year	3.23E-05	0.0062	0.00031
n-Nitrososnormicotine	16543-55-8	year	0.0025	0.48	0.024
n-Nitrosopiperidine	100-75-4	year	0.00037	0.071	0.00355
n-Nitrosopyrrolidine	930-55-2	year	0.00167	0.32	0.016

Common Name	CAS #	Averaging Period	ASIL ($\mu\text{g}/\text{m}^3$)	SQER (lb/averaging period)	De Minimis (lb/averaging period)
o-Anisidine	90-04-0	year	0.025	4.8	0.24
o-Anisidine Hydrochloride	134-29-2	year	0.0323	6.2	0.31
o-Phenylphenate, Sodium	132-27-4	year	1.16	223	11.1
ortho-Aminoazotoluene	97-56-3	year	0.000909	0.174	0.00872
o-Toluidine	95-53-4	year	0.0196	3.76	0.188
o-Toluidine Hydrochloride	636-21-5	year	0.027	5.18	0.259
o-Xylene	95-47-6	24-hr	221	29.0	1.45
Ozone	10028-15-6	1-hr	180	0.394	0.0197
para-Cresidine	120-71-8	year	0.0233	4.47	0.224
p-Chloro-o-toluidine	95-69-2	year	0.013	2.49	0.125
Pentabromodiphenyl Ether	32534-81-9	24-hr	6	0.789	0.0394
Pentachlorophenol	87-86-5	year	0.217	41.6	2.08
Perchloroethylene	127-18-4	year	0.169	32.4	1.62
Phenacetin	62-44-2	year	1.59	305	15.3
Phenazopyridine	94-78-0	year	0.0204	3.91	0.196
Phenazopyridine hydrochloride	136-40-3	year	0.0233	4.47	0.224
Phenesterin	3546-10-9	year	2.33E-05	0.00447	0.000224
Phenobarbital	50-06-6	year	0.00769	1.48	0.0738
Phenol	108-95-2	24-hr	200	26.3	1.31
Phenoxybenzamine	59-96-1	year	0.00112	0.215	0.0107
Phenoxybenzamine hydrochloride	63-92-3	year	0.0013	0.249	0.0125
Phosgene	75-44-5	24-hr	0.3	0.0394	0.00197
Phosphine	7803-51-2	24-hr	0.8	0.105	0.00526
Phosphoric Acid	7664-38-2	24-hr	7	0.920	0.0460
Phosphorus	7723-14-0	24-hr	20	2.63	0.131
Phthalic Anhydride	85-44-9	24-hr	20	2.63	0.131
p-Nitrosodiphenylamine	156-10-5	year	0.159	30.5	1.53
Polybrominated Biphenyls	—	year	0.000116	0.0223	0.00111
Polychlorinated Biphenyls, NOS	1336-36-3	year	0.00175	0.336	0.0168
Ponceau 3R	3564-09-8	year	0.217	41.6	2.08
Ponceau MX	3761-53-3	year	0.769	148	7.38
Potassium Bromate	7758-01-2	year	0.00714	1.37	0.0685
Procabazine	671-16-9	year	0.00025	0.048	0.0024
Procabazine Hydrochloride	366-70-1	year	0.000294	0.0564	0.00282
Propylene	115-07-1	24-hr	3000	394	19.7
Propylene Glycol	57-55-6	24-hr	28.5	3.75	0.187
Propylene Glycol Dinitrate	6423-43-4	24-hr	0.276	0.0363	0.00181
Propylene glycol monomethyl ether	107-98-2	24-hr	7000	920	46.0
Propylene oxide	75-56-9	year	0.27	51.8	2.59
Propylthiouracil	51-52-5	year	0.00345	0.662	0.0331
p-Xylene	106-42-3	24-hr	221	29.0	1.45
Refractory Ceramic Fibers	—	24-hr	0.03 fibers/cm ³	0.00394	0.000197
Reserpine	50-55-5	year	0.000323	0.062	0.0031
Safrole	94-59-7	year	0.0159	3.05	0.153
Selenium & Selenium Compounds (other than Hydrogen Selenide)	—	24-hr	20	2.63	0.131
Short-chain (C10-13) chlorinated paraffins	85535-84-8	year	0.04	7.68	0.384
Silica (crystalline, Respirable)	7631-86-9	24-hr	3	0.394	0.0197
Sodium Hydroxide	1310-73-2	1-hr	8	0.0175	0.000876

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Sodium Sulfate	7757-82-6	1-hr	120	0.263	0.0131
Sterigmatocystin	10048-13-2	year	1.00E-04	0.0192	0.000959
Streptozotocin	18883-66-4	year	3.23E-05	0.0062	0.00031
Styrene	100-42-5	24-hr	900	118	5.91
Styrene Oxide	96-09-3	year	0.0217	4.16	0.208
Sulfallate	95-06-7	year	0.0185	3.55	0.178
Sulfur dioxide	7446-09-05	1-hr	660	1.45	0.457
Sulfur Mustard	505-60-2	24-hr	0.7	0.0920	0.00460
Sulfuric Acid	7664-93-9	24-hr	1	0.131	0.00657
Tetrabromodiphenyl Ether	40088-47-9	24-hr	6	0.789	0.0394
Thioacetamide	62-55-5	year	0.000588	0.113	0.00564
Thiourea	62-56-6	year	0.0476	9.13	0.457
Titanium Tetrachloride	7550-45-0	24-hr	0.1	0.0131	0.00657
Toluene	108-88-3	24-hr	5000	657	32.9
Toluene diisocyanates	26471-62-5	24-hr	0.07	0.00920	0.000460
Toluene-2,4-diisocyanate	584-84-9	24-hr	0.07	0.00920	0.000460
Toluene-2,6-diisocyanate	91-08-7	24-hr	0.07	0.00920	0.000460
Toxaphene	8001-35-2	year	0.00294	0.564	0.0282
Trans-1,2-dichloroethene	156-60-5	24-hr	807	106	5.30
Trans-2[(dimethylamino)methylimino]-5-[2-(5-nitro-2-furyl)-vinyl]-1,3,4-oxadiazole	55738-54-0	year	0.00769	1.48	0.0738
Trichloroethylene	79-01-6	year	0.5	95.9	4.8
Triethylamine	121-44-8	24-hr	200	26.3	1.31
Tris-(1-Aziridinyl)phosphine sulfide	52-24-4	year	0.000294	0.0564	0.00282
Tris(2,3-dibromopropyl)phosphate	126-72-7	year	0.00152	0.292	0.0146
Tryptophan-P-1	62450-06-0	year	0.000135	0.0259	0.0013
Tryptophan-P-2	62450-07-1	year	0.0011	0.211	0.0106
Vanadium	7440-62-2	24-hr	0.2	0.0263	0.00131
Vanadium Pentoxide	1314-62-1	1-hr	30	0.0657	0.00329
Vinyl acetate	108-05-4	24-hr	200	26.3	1.31
Vinyl Bromide	593-60-2	24-hr	3	0.394	0.00197
Vinyl Chloride	75-01-4	year	0.0128	2.46	0.123))
Acetaldehyde	75-07-0	year	3.7E-01	6.0E+01	3.0E+00
Acetamide	60-35-5	year	5.0E-02	8.1E+00	4.1E-01
Acetonitrile	75-05-8	24-hr	6.0E+01	4.4E+00	2.2E-01
2-Acetylaminofluorene	53-96-3	year	4.6E-04	7.5E-02	3.8E-03
Acrolein	107-02-8	24-hr	3.5E-01	2.6E-02	1.3E-03
Acrylamide	79-06-1	year	6.0E-03	9.8E-01	4.9E-02
Acrylic acid	79-10-7	24-hr	1.0E+00	7.4E-02	3.7E-03
Acrylonitrile	107-13-1	year	3.4E-03	5.6E-01	2.8E-02
Actinomycin D	50-76-0	year	4.0E-07	6.5E-05	3.2E-06
Alar (daminozide)	1596-84-5	year	2.0E-01	3.2E+01	1.6E+00
Aldrin	309-00-2	year	2.0E-04	3.3E-02	1.7E-03
Allyl chloride	107-05-1	year	1.7E-01	2.7E+01	1.4E+00
3-Amino-9-ethylcarbazole hydrochloride	6109-97-3	year	4.5E-02	7.4E+00	3.7E-01
2-Amino-3-methyl-9H-pyrido[2,3-b]indole	68006-83-7	year	2.9E-03	4.8E-01	2.4E-02
1-Amino-2-methylantraquinone	82-28-0	year	2.3E-02	3.8E+00	1.9E-01
2-Amino-3-methylimidazo[4,5-f]quinoline	76180-96-6	year	2.5E-03	4.1E-01	2.0E-02
2-Amino-5-(5-nitro-2-furyl)-1,3,4-thiadiazole	712-68-5	year	2.2E-04	3.5E-02	1.8E-03

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A-alpha-c(2-amino-9h-pyrido[2,3-b]indole)	26148-68-5	year	8.7E-03	1.4E+00	7.1E-02
2-Aminoanthraquinone	117-79-3	year	6.4E-02	1.0E+01	5.2E-01
o-Aminoazotoluene	97-56-3	year	9.1E-04	1.5E-01	7.4E-03
4-Aminobiphenyl	92-67-1	year	1.7E-04	2.7E-02	1.4E-03
Amitrole	61-82-5	year	3.7E-03	6.0E-01	3.0E-02
Ammonia	7664-41-7	24-hr	5.0E+02	3.7E+01	1.9E+00
Ammonium bisulfate	7803-63-6	1-hr	1.2E+02	2.2E-01	1.1E-02
Aniline	62-53-3	year	6.3E-01	1.0E+02	5.1E+00
o-Anisidine	90-04-0	year	2.5E-02	4.1E+00	2.0E-01
o-Anisidine hydrochloride	134-29-2	year	3.2E-02	5.2E+00	2.6E-01
Antimony trioxide	1309-64-4	24-hr	2.0E-01	1.5E-02	7.4E-04
Aramite	140-57-8	year	1.2E-01	1.9E+01	9.4E-01
Tris(1-aziridinyl)phosphine sulfide	52-24-4	year	2.9E-04	4.8E-02	2.4E-03
Arsenic & inorganic arsenic compounds, NOS	==	year	3.0E-04	4.9E-02	2.5E-03
Arsine	7784-42-1	24-hr	1.5E-02	1.1E-03	5.6E-05
Asbestos (fibers/cubic centimeter)	1332-21-4	year	4.3E-06	7.1E-04	3.5E-05
Actinolite asbestos (fibers/cubic centimeter)	12172-67-7	year	4.3E-06	7.1E-04	3.5E-05
Amosite asbestos (fibers/cubic centimeter)	12172-73-5	year	4.3E-06	7.1E-04	3.5E-05
Anthophyllite asbestos (fibers/cubic centimeter)	17068-78-9	year	4.3E-06	7.1E-04	3.5E-05
Chrysotile asbestos (fibers/cubic centimeter)	12001-29-5	year	4.3E-06	7.1E-04	3.5E-05
Crocidolite asbestos (fibers/cubic centimeter)	12001-28-4	year	4.3E-06	7.1E-04	3.5E-05
Libby amphibole asbestos and amphiboles, NOS (fibers/cubic centimeter)	==	year	5.9E-06	9.6E-04	4.8E-05
Tremolite asbestos (fibers/cubic centimeter)	14567-73-8	year	4.3E-06	7.1E-04	3.5E-05
Auramine	492-80-8	year	4.0E-03	6.5E-01	3.2E-02
Azaserine	115-02-6	year	3.2E-04	5.2E-02	2.6E-03
Azathioprine	446-86-6	year	2.0E-03	3.2E-01	1.6E-02
Azobenzene	103-33-3	year	3.2E-02	5.2E+00	2.6E-01
Barium chromate	10294-40-3	year	2.0E-05	3.2E-03	1.6E-04
Benz[a]anthracene	56-55-3	year	5.5E-03	8.9E-01	4.5E-02
Benzene	71-43-2	year	1.3E-01	2.1E+01	1.0E+00
Benzidine	92-87-5	year	4.3E-06	7.0E-04	3.5E-05
Benzo[a]pyrene	50-32-8	year	1.0E-03	1.6E-01	8.2E-03
Benzo[b]fluoranthene	205-99-2	year	5.5E-03	8.9E-01	4.5E-02
Benzo[j]fluoranthene	205-82-3	year	5.5E-03	8.9E-01	4.5E-02
Benzo[k]fluoranthene	207-08-9	year	5.5E-03	8.9E-01	4.5E-02
Benzyl chloride	100-44-7	year	2.0E-02	3.3E+00	1.7E-01
Benzyl violet 4B	1694-09-3	year	1.8E-01	2.8E+01	1.4E+00
Beryllium & compounds, NOS	==	year	4.2E-04	6.8E-02	3.4E-03
Beryllium oxide	1304-56-9	year	4.2E-04	6.8E-02	3.4E-03
Beryllium sulfate	13510-49-1	year	1.2E-06	1.9E-04	9.4E-06
beta-Butyrolactone	3068-88-0	year	3.4E-03	5.6E-01	2.8E-02
beta-Propiolactone	57-57-8	year	2.5E-04	4.1E-02	2.0E-03
Bis(2-chloroethyl) ether	111-44-4	year	1.4E-03	2.3E-01	1.1E-02
Bis(chloromethyl) ether	542-88-1	year	7.7E-05	1.2E-02	6.2E-04
Boron & compounds, NOS	==	24-hr	3.0E+02	2.2E+01	1.1E+00
Bromobenzene	108-86-1	24-hr	6.0E+01	4.4E+00	2.2E-01
Bromodichloromethane	75-27-4	year	2.7E-02	4.4E+00	2.2E-01
Bromoform	75-25-2	year	9.1E-01	1.5E+02	7.4E+00

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Bromomethane (methyl bromide)	74-83-9	24-hr	5.0E+00	3.7E-01	1.9E-02
1-Bromopropane	106-94-5	24-hr	1.0E+02	7.4E+00	3.7E-01
1,3-Butadiene	106-99-0	year	3.3E-02	5.4E+00	2.7E-01
Butylated hydroxyanisole	25013-16-5	year	1.8E+01	2.8E+03	1.4E+02
C.I. basic red 9 monohydrochloride	569-61-9	year	1.4E-02	2.3E+00	1.1E-01
Cadmium & compounds, NOS	=	year	2.4E-04	3.9E-02	1.9E-03
Caprolactam	105-60-2	24-hr	2.2E+00	1.6E-01	8.2E-03
Captafol	2425-06-1	year	2.3E-02	3.8E+00	1.9E-01
Captan	133-06-2	year	1.5E+00	2.5E+02	1.2E+01
Carbon disulfide	75-15-0	24-hr	8.0E+02	5.9E+01	3.0E+00
Carbon monoxide	630-08-0	1-hr	2.3E+04	4.3E+01	1.1E+00
Carbon tetrachloride	56-23-5	year	1.7E-01	2.7E+01	1.4E+00
Carbonyl sulfide	463-58-1	24-hr	1.0E+01	7.4E-01	3.7E-02
Cerium oxide	1306-38-3	24-hr	9.0E-01	6.7E-02	3.3E-03
Chlorambucil	305-03-3	year	7.7E-06	1.2E-03	6.2E-05
Chlordane	57-74-9	year	1.0E-02	1.6E+00	8.1E-02
Chlordecone	143-50-0	year	2.2E-04	3.5E-02	1.8E-03
Chlorendic acid	115-28-6	year	3.8E-02	6.2E+00	3.1E-01
Chlorinated paraffins	108171-26-2	year	4.0E-02	6.5E+00	3.2E-01
Chlorine	7782-50-5	24-hr	1.5E-01	1.1E-02	5.6E-04
Chlorine dioxide	10049-04-4	24-hr	6.0E-01	4.4E-02	2.2E-03
1-Chloro-1,1-difluoroethane	75-68-3	24-hr	5.0E+04	3.7E+03	1.9E+02
3-Chloro-2-methyl-1-propene	563-47-3	year	2.5E-02	4.1E+00	2.0E-01
2-Chloroacetophenone	532-27-4	24-hr	3.0E-02	2.2E-03	1.1E-04
Chloroalkanes C10-13 (chlorinated paraffins)	85535-84-8	year	4.0E-02	6.5E+00	3.2E-01
Chlorobenzene	108-90-7	24-hr	1.0E+03	7.4E+01	3.7E+00
Chlorobenzilate	510-15-6	year	3.2E-02	5.2E+00	2.6E-01
Chlorodifluoromethane (Freon 22)	75-45-6	24-hr	5.0E+04	3.7E+03	1.9E+02
Chloroethane (ethyl chloride)	75-00-3	24-hr	3.0E+04	2.2E+03	1.1E+02
Chloroform	67-66-3	year	4.3E-02	7.1E+00	3.5E-01
Chloromethane (methyl chloride)	74-87-3	24-hr	9.0E+01	6.7E+00	3.3E-01
Chloromethyl methyl ether	107-30-2	year	1.4E-03	2.4E-01	1.2E-02
4-Chloro-o-phenylenediamine	95-83-0	year	2.2E-01	3.5E+01	1.8E+00
p-Chloro-o-toluidine	95-69-2	year	1.3E-02	2.1E+00	1.1E-01
Chloropicrin	76-06-2	24-hr	4.0E-01	3.0E-02	1.5E-03
Chloroprene	126-99-8	year	2.0E-03	3.3E-01	1.6E-02
Chlorothalonil	1897-45-6	year	1.1E+00	1.8E+02	9.1E+00
Chlorozotocin	54749-90-5	year	1.4E-05	2.4E-03	1.2E-04
Chromic trioxide	1333-82-0	year	7.7E-06	1.3E-03	6.3E-05
Chromic(VI) acid	7738-94-5	year	9.1E-06	1.5E-03	7.4E-05
Chromium(III), insoluble particulates, NOS	=	24-hr	5.0E+00	3.7E-01	1.9E-02
Chromium(III), soluble particulates, NOS	=	24-hr	1.0E-01	7.4E-03	3.7E-04
Chromium(VI) & compounds, NOS	=	year	4.0E-06	6.5E-04	3.3E-05
Chrysene	218-01-9	year	5.5E-02	8.9E+00	4.5E-01
Cinnamyl anthranilate	87-29-6	year	7.7E-01	1.2E+02	6.2E+00
Cobalt and compounds, NOS	7440-48-4	24-hr	1.0E-01	7.4E-03	3.7E-04
Coke oven emissions	=	year	9.7E-04	1.6E-01	7.9E-03
Copper & compounds	=	1-hr	1.0E+02	1.9E-01	9.3E-03
p-Cresidine	120-71-8	year	2.3E-02	3.8E+00	1.9E-01

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Cresols (mixture), including m-cresol, o-cresol, p-cresol	1319-77-3	24-hr	6.0E+02	4.4E+01	2.2E+00
m-Cresol (3-methylphenol)	108-39-4	24-hr	6.0E+02	4.4E+01	2.2E+00
o-Cresol (2-methylphenol)	95-48-7	24-hr	6.0E+02	4.4E+01	2.2E+00
p-Cresol (4-methylphenol)	106-44-5	24-hr	6.0E+02	4.4E+01	2.2E+00
Cumene	98-82-8	24-hr	4.0E+02	3.0E+01	1.5E+00
Cupferron	135-20-6	year	1.6E-02	2.6E+00	1.3E-01
Cyclohexane	110-82-7	24-hr	6.0E+03	4.4E+02	2.2E+01
Cyclophosphamide (anhydrous)	50-18-0	year	5.9E-03	9.6E-01	4.8E-02
Cyclophosphamide (hydrated)	6055-19-2	year	6.3E-03	1.0E+00	5.1E-02
D & C red no. 9	5160-02-1	year	6.7E-01	1.1E+02	5.4E+00
Dacarbazine	4342-03-4	year	7.1E-05	1.2E-02	5.8E-04
Dantron	117-10-2	year	4.5E-02	7.4E+00	3.7E-01
Di(2-ethylhexyl)phthalate	117-81-7	year	4.2E-01	6.8E+01	3.4E+00
2,4-Diaminoanisole	615-05-4	year	1.5E-01	2.5E+01	1.2E+00
2,4-Diaminoanisole sulfate	39156-41-7	year	2.7E-01	4.4E+01	2.2E+00
4,4'-Diaminodiphenyl ether	101-80-4	year	2.5E-02	4.1E+00	2.0E-01
2,4-Diaminotoluene (2,4-toluene diamine)	95-80-7	year	9.1E-04	1.5E-01	7.4E-03
Diazinon	333-41-5	24-hr	1.0E+01	7.4E-01	3.7E-02
Dibenz[a,h]acridine	226-36-8	year	5.5E-03	8.9E-01	4.5E-02
Dibenz[a,h]anthracene	53-70-3	year	5.0E-04	8.2E-02	4.1E-03
Dibenz[a,j]acridine	224-42-0	year	5.5E-03	8.9E-01	4.5E-02
Dibenzo[a,e]pyrene	192-65-4	year	5.5E-04	8.9E-02	4.5E-03
Dibenzo[a,h]pyrene	189-64-0	year	5.5E-05	8.9E-03	4.5E-04
Dibenzo[a,i]pyrene	189-55-9	year	5.5E-05	8.9E-03	4.5E-04
Dibenzo[a,l]pyrene	191-30-0	year	5.5E-05	8.9E-03	4.5E-04
7H-Dibenzo[c,g]carbazole	194-59-2	year	5.5E-04	8.9E-02	4.5E-03
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	year	3.2E-04	5.2E-02	2.6E-03
Tris(2,3-dibromopropyl)phosphate	126-72-7	year	1.5E-03	2.5E-01	1.2E-02
1,4-Dichlorobenzene	106-46-7	year	9.1E-02	1.5E+01	7.4E-01
3,3'-Dichlorobenzidine	91-94-1	year	2.9E-03	4.8E-01	2.4E-02
DDD (dichlorodiphenyldichloroethane)	72-54-8	year	1.4E-02	2.4E+00	1.2E-01
DDE (dichlorodiphenyldichloroethylene)	72-55-9	year	1.0E-02	1.7E+00	8.4E-02
DDT (dichlorodiphenyltrichloroethane)	50-29-3	year	1.0E-02	1.7E+00	8.4E-02
1,1-Dichloroethane (ethylidene dichloride)	75-34-3	year	6.3E-01	1.0E+02	5.1E+00
trans-1,2-Dichloroethene	156-60-5	24-hr	8.1E+02	6.0E+01	3.0E+00
1,1-Dichloroethylene (1,1-DCE)	75-35-4	24-hr	2.0E+02	1.5E+01	7.4E-01
Dichloromethane	75-09-2	year	6.0E+01	9.8E+03	4.9E+02
1,2-Dichloropropane (propylene dichloride)	78-87-5	year	1.0E-01	1.6E+01	8.1E-01
1,3-Dichloropropene	542-75-6	year	2.5E-01	4.1E+01	2.0E+00
2,3-Dichloropropene	78-88-6	24-hr	9.2E+00	6.8E-01	3.4E-02
Dichlorvos (DDVP)	62-73-7	year	1.2E-02	2.0E+00	9.8E-02
Dieldrin	60-57-1	year	2.2E-04	3.5E-02	1.8E-03
Diesel engine exhaust, particulate	=	year	3.3E-03	5.4E-01	2.7E-02
Diethanolamine	111-42-2	24-hr	3.0E+00	2.2E-01	1.1E-02
Diethylstilbestrol	56-53-1	year	1.0E-05	1.6E-03	8.1E-05
1,1-Difluoroethane	75-37-6	24-hr	4.0E+04	3.0E+03	1.5E+02
Diglycidyl resorcinol ether	101-90-6	year	2.0E-03	3.3E-01	1.7E-02
Dihydrosafrole	94-58-6	year	7.7E-02	1.2E+01	6.2E-01
4-Dimethylaminoazobenzene	60-11-7	year	7.7E-04	1.2E-01	6.2E-03

Common Name	CAS #	Averaging Period	ASIL ($\mu\text{g}/\text{m}^3$)	SQER (lb/averaging period)	De Minimis (lb/averaging period)
trans-2[(dimethylamino)-methylimino]-5-[2-(5-nitro-2-furyl)-vinyl]-1,3,4-oxadiazole	55738-54-0	year	7.7E-03	1.2E+00	6.2E-02
7,12-Dimethylbenz[a]anthracene	57-97-6	year	8.5E-06	1.4E-03	6.9E-05
Dimethyl carbamoyl chloride	79-44-7	year	2.7E-04	4.4E-02	2.2E-03
1,1-Dimethylhydrazine	57-14-7	24-hr	5.0E-01	3.7E-02	1.9E-03
1,2-Dimethylhydrazine	540-73-8	year	6.3E-06	1.0E-03	5.1E-05
Dimethylvinylchloride	513-37-1	year	7.7E-02	1.2E+01	6.2E-01
1,6-Dinitropyrene	42397-64-8	year	5.5E-05	8.9E-03	4.5E-04
1,8-Dinitropyrene	42397-65-9	year	5.5E-04	8.9E-02	4.5E-03
2,4-Dinitrotoluene	121-14-2	year	1.1E-02	1.8E+00	9.1E-02
1,4-Dioxane	123-91-1	year	2.0E-01	3.2E+01	1.6E+00
1,2-Diphenylhydrazine (hydrazobenzene)	122-66-7	year	4.0E-03	6.5E-01	3.2E-02
Direct black 38	1937-37-7	year	4.8E-04	7.7E-02	3.9E-03
Direct blue 6	2602-46-2	year	4.8E-04	7.7E-02	3.9E-03
Direct brown 95	16071-86-6	year	5.3E-04	8.5E-02	4.3E-03
Disperse blue 1	2475-45-8	year	7.7E-01	1.2E+02	6.2E+00
Disulfoton	298-04-4	24-hr	2.0E-01	1.5E-02	7.4E-04
Epichlorohydrin	106-89-8	year	4.3E-02	7.1E+00	3.5E-01
1,2-Epoxybutane	106-88-7	24-hr	2.0E+01	1.5E+00	7.4E-02
Estradiol 17B	50-28-2	year	9.1E-05	1.5E-02	7.4E-04
Ethyl benzene	100-41-4	year	4.0E-01	6.5E+01	3.2E+00
Ethyl carbamate (urethane)	51-79-6	year	2.1E-03	3.4E-01	1.7E-02
Ethylene dibromide (EDB, 1,2-dibromoethane)	106-93-4	year	1.7E-03	2.7E-01	1.4E-02
Ethylene dichloride (EDC, 1,2-dichloroethane)	107-06-2	year	3.8E-02	6.2E+00	3.1E-01
Ethylene glycol	107-21-1	24-hr	4.0E+02	3.0E+01	1.5E+00
Ethylene glycol monobutyl ether	111-76-2	24-hr	8.2E+01	6.1E+00	3.0E-01
Ethylene glycol monoethyl ether (2-ethoxyethanol)	110-80-5	24-hr	7.0E+01	5.2E+00	2.6E-01
Ethylene glycol monoethyl ether acetate	111-15-9	24-hr	3.0E+02	2.2E+01	1.1E+00
Ethylene glycol monomethyl ether (2-methoxyethanol)	109-86-4	24-hr	6.0E+01	4.4E+00	2.2E-01
Ethylene glycol monomethyl ether acetate	110-49-6	24-hr	9.0E+01	6.7E+00	3.3E-01
Ethylene oxide	75-21-8	year	2.0E-04	3.3E-02	1.6E-03
Ethylene thiourea	96-45-7	year	7.7E-02	1.2E+01	6.2E-01
Ethyleneimine	151-56-4	year	5.3E-05	8.5E-03	4.3E-04
Ferric sulfate	10028-22-5	1-hr	1.2E+02	2.2E-01	1.1E-02
Fluorides (fluoride containing chemicals), NOS	==	24-hr	1.3E+01	9.6E-01	4.8E-02
Fluorine gas F ₂	7782-41-4	24-hr	1.6E+01	1.2E+00	5.9E-02
Formaldehyde	50-00-0	year	1.7E-01	2.7E+01	1.4E+00
Furmecyclox	60568-05-0	year	1.2E-01	1.9E+01	9.4E-01
Furylfuramide	3688-53-7	year	1.4E-02	2.4E+00	1.2E-01
Glu-P-1	67730-11-4	year	7.1E-04	1.2E-01	5.8E-03
Glu-P-2	67730-10-3	year	2.5E-03	4.1E-01	2.0E-02
Glutaraldehyde	111-30-8	24-hr	8.0E-02	5.9E-03	3.0E-04
Guthion (azinphos-methyl)	86-50-0	24-hr	1.0E+01	7.4E-01	3.7E-02
Gyromitrin	16568-02-8	year	3.4E-04	5.6E-02	2.8E-03
HC blue 1	2784-94-3	year	6.7E-02	1.1E+01	5.4E-01
Heptachlor	76-44-8	year	7.7E-04	1.2E-01	6.2E-03
Heptachlor epoxide	1024-57-3	year	3.8E-04	6.2E-02	3.1E-03
Heptachlorodibenzo-p-dioxin, NOS	37871-00-4	year	2.6E-06	4.3E-04	2.1E-05
Hexachlorobenzene	118-74-1	year	2.2E-03	3.5E-01	1.8E-02

Common Name	CAS #	Averaging Period	ASIL ($\mu\text{g}/\text{m}^3$)	SQER (lb/averaging period)	De Minimis (lb/averaging period)
Hexachlorobutadiene	87-68-3	year	4.5E-02	7.4E+00	3.7E-01
Hexachlorocyclohexane	608-73-1	year	9.1E-04	1.5E-01	7.4E-03
alpha-Hexachlorocyclohexane	319-84-6	year	1.3E-03	2.1E-01	1.1E-02
beta-Hexachlorocyclohexane	319-85-7	year	2.3E-03	3.8E-01	1.9E-02
gamma-Hexachlorocyclohexane (lindane)	58-89-9	year	3.2E-03	5.2E-01	2.6E-02
Hexachlorocyclopentadiene	77-47-4	24-hr	2.0E-01	1.5E-02	7.4E-04
Hexachlorodibenzo-p-dioxins, NOS	34465-46-8	year	2.6E-07	4.3E-05	2.1E-06
Hexachloroethane	67-72-1	year	9.1E-02	1.5E+01	7.4E-01
Hexamethylene diisocyanate	822-06-0	24-hr	7.0E-02	5.2E-03	2.6E-04
n-Hexane	110-54-3	24-hr	7.0E+02	5.2E+01	2.6E+00
2-Hexanone	591-78-6	24-hr	3.0E+01	2.2E+00	1.1E-01
Hydrazine	302-01-2	year	2.0E-04	3.3E-02	1.7E-03
Hydrazine sulfate	10034-93-2	year	1.2E-03	1.9E-01	9.4E-03
Hydrogen chloride	7647-01-0	24-hr	9.0E+00	6.7E-01	3.3E-02
Hydrogen cyanide	74-90-8	24-hr	8.0E-01	5.9E-02	3.0E-03
Hydrogen fluoride	7664-39-3	24-hr	1.4E+01	1.0E+00	5.2E-02
Hydrogen sulfide	7783-06-4	24-hr	2.0E+00	1.5E-01	7.4E-03
Indeno[1,2,3-cd]pyrene	193-39-5	year	5.5E-03	8.9E-01	4.5E-02
Isophorone	78-59-1	24-hr	2.0E+03	1.5E+02	7.4E+00
Isopropyl alcohol	67-63-0	1-hr	3.2E+03	5.9E+00	3.0E-01
Lasiocarpine	303-34-4	year	4.5E-04	7.4E-02	3.7E-03
Lead & compounds, NOS	=	year	8.3E-02	1.4E+01	1.0E+01
Lead acetate	301-04-2	year	1.3E-02	2.0E+00	1.0E-01
Lead chromate oxide	18454-12-1	year	4.2E-05	6.9E-03	3.4E-04
Lead chromate	7758-97-6	year	2.5E-05	4.1E-03	2.0E-04
Lead phosphate	7446-27-7	year	8.3E-02	1.4E+01	6.8E-01
Lead subacetate	1335-32-6	year	9.1E-02	1.5E+01	7.4E-01
Malathion	121-75-5	24-hr	2.0E+01	1.5E+00	7.4E-02
Maleic anhydride	108-31-6	24-hr	7.0E-01	5.2E-02	2.6E-03
Manganese & compounds	=	24-hr	3.0E-01	2.2E-02	1.1E-03
Melphalan	148-82-3	year	2.7E-05	4.4E-03	2.2E-04
Mercury, elemental	7439-97-6	24-hr	3.0E-02	2.2E-03	1.1E-04
Diethyl mercury	627-44-1	24-hr	1.4E-01	1.0E-02	5.2E-04
Dimethyl mercury	593-74-8	24-hr	1.4E-01	1.0E-02	5.2E-04
Methyl alcohol (methanol)	67-56-1	24-hr	2.0E+04	1.5E+03	7.4E+01
3-Methylcholanthrene	56-49-5	year	9.6E-05	1.6E-02	7.8E-04
5-Methylchrysene	3697-24-3	year	5.5E-04	8.9E-02	4.5E-03
4,4'-Methylenebis(2-chloroaniline) (MOCA)	101-14-4	year	1.4E-03	2.3E-01	1.1E-02
4,4'-Methylenebis(2-methylaniline)	838-88-0	year	3.8E-03	6.2E-01	3.1E-02
4,4'-Methylenebis(N,N'-dimethylaniline)	101-61-1	year	7.7E-02	1.2E+01	6.2E-01
4,4'-Methylenedianiline	101-77-9	year	2.2E-03	3.5E-01	1.8E-02
4,4'-Methylenedianiline dihydrochloride	13552-44-8	year	2.2E-03	3.5E-01	1.8E-02
Methylene diphenyl diisocyanate (MDI)	101-68-8	24-hr	8.0E-02	5.9E-03	3.0E-04
Methyl ethyl ketone	78-93-3	24-hr	5.0E+03	3.7E+02	1.9E+01
Methyl isobutyl ketone (MIBK, hexone)	108-10-1	24-hr	3.0E+03	2.2E+02	1.1E+01
Methyl isocyanate	624-83-9	24-hr	1.0E+00	7.4E-02	3.7E-03
Methyl methacrylate	80-62-6	24-hr	7.0E+02	5.2E+01	2.6E+00
Methyl methanesulfonate	66-27-3	year	3.6E-02	5.8E+00	2.9E-01
2-Methyl-1-nitroanthraquinone	129-15-7	year	8.3E-04	1.4E-01	6.8E-03

Common Name	CAS #	Averaging Period	ASIL ($\mu\text{g}/\text{m}^3$)	SQER (lb/averaging period)	De Minimis (lb/averaging period)
<u>N-Methyl-N-nitro-N-nitrosoguanidine</u>	<u>70-25-7</u>	<u>year</u>	<u>4.2E-04</u>	<u>6.8E-02</u>	<u>3.4E-03</u>
<u>Methyl tert-butyl ether</u>	<u>1634-04-4</u>	<u>year</u>	<u>3.8E+00</u>	<u>6.2E+02</u>	<u>3.1E+01</u>
<u>Methylthiouracil</u>	<u>56-04-2</u>	<u>year</u>	<u>9.1E-03</u>	<u>1.5E+00</u>	<u>7.4E-02</u>
<u>Michler's ketone</u>	<u>90-94-8</u>	<u>year</u>	<u>4.0E-03</u>	<u>6.5E-01</u>	<u>3.2E-02</u>
<u>Mirex</u>	<u>2385-85-5</u>	<u>year</u>	<u>2.0E-04</u>	<u>3.2E-02</u>	<u>1.6E-03</u>
<u>Mitomycin C</u>	<u>50-07-7</u>	<u>year</u>	<u>4.3E-07</u>	<u>7.1E-05</u>	<u>3.5E-06</u>
<u>Monocrotaline</u>	<u>315-22-0</u>	<u>year</u>	<u>3.4E-04</u>	<u>5.6E-02</u>	<u>2.8E-03</u>
<u>N,N-Dimethylformamide</u>	<u>68-12-2</u>	<u>24-hr</u>	<u>8.0E+01</u>	<u>5.9E+00</u>	<u>3.0E-01</u>
<u>Naphthalene</u>	<u>91-20-3</u>	<u>year</u>	<u>2.9E-02</u>	<u>4.8E+00</u>	<u>2.4E-01</u>
<u>2-Naphthylamine</u>	<u>91-59-8</u>	<u>year</u>	<u>2.0E-03</u>	<u>3.2E-01</u>	<u>1.6E-02</u>
<u>Nickel & compounds, NOS</u>	<u>==</u>	<u>year</u>	<u>3.8E-03</u>	<u>6.2E-01</u>	<u>3.1E-02</u>
<u>Nickel acetate</u>	<u>373-02-4</u>	<u>year</u>	<u>1.2E-02</u>	<u>1.9E+00</u>	<u>9.4E-02</u>
<u>Nickel carbonate</u>	<u>3333-67-3</u>	<u>year</u>	<u>7.8E-03</u>	<u>1.3E+00</u>	<u>6.3E-02</u>
<u>Nickel carbonate hydroxide</u>	<u>12607-70-4</u>	<u>year</u>	<u>6.6E-03</u>	<u>1.1E+00</u>	<u>5.4E-02</u>
<u>Nickel carbonyl</u>	<u>13463-39-3</u>	<u>year</u>	<u>1.1E-02</u>	<u>1.8E+00</u>	<u>9.1E-02</u>
<u>Nickel chloride</u>	<u>7718-54-9</u>	<u>year</u>	<u>8.5E-03</u>	<u>1.4E+00</u>	<u>6.9E-02</u>
<u>Nickel hydroxide</u>	<u>12054-48-7</u>	<u>year</u>	<u>6.1E-03</u>	<u>9.9E-01</u>	<u>4.9E-02</u>
<u>Nickel nitrate hexahydrate</u>	<u>13478-00-7</u>	<u>year</u>	<u>1.9E-02</u>	<u>3.1E+00</u>	<u>1.5E-01</u>
<u>Nickel oxide (nickel monoxide, nickel(II) oxide)</u>	<u>1313-99-1</u>	<u>year</u>	<u>4.9E-03</u>	<u>7.9E-01</u>	<u>4.0E-02</u>
<u>Nickel oxide black (nickel sesquioxide, nickel(III) oxide)</u>	<u>1314-06-3</u>	<u>year</u>	<u>5.4E-03</u>	<u>8.8E-01</u>	<u>4.4E-02</u>
<u>Nickel refinery dust</u>	<u>==</u>	<u>year</u>	<u>4.2E-03</u>	<u>6.8E-01</u>	<u>3.4E-02</u>
<u>Nickel subsulfide</u>	<u>12035-72-2</u>	<u>year</u>	<u>2.1E-03</u>	<u>3.4E-01</u>	<u>1.7E-02</u>
<u>Nickel sulfate</u>	<u>7786-81-4</u>	<u>year</u>	<u>1.0E-02</u>	<u>1.6E+00</u>	<u>8.2E-02</u>
<u>Nickel sulfate hexahydrate</u>	<u>10101-97-0</u>	<u>year</u>	<u>1.7E-02</u>	<u>2.8E+00</u>	<u>1.4E-01</u>
<u>Nickel sulfide</u>	<u>11113-75-0</u>	<u>year</u>	<u>6.0E-03</u>	<u>9.7E-01</u>	<u>4.8E-02</u>
<u>Nickelocene</u>	<u>1271-28-9</u>	<u>year</u>	<u>1.2E-02</u>	<u>2.0E+00</u>	<u>1.0E-01</u>
<u>Nifurthiazole</u>	<u>3570-75-0</u>	<u>year</u>	<u>1.5E-03</u>	<u>2.5E-01</u>	<u>1.2E-02</u>
<u>Nitric acid</u>	<u>7697-37-2</u>	<u>1-hr</u>	<u>8.6E+01</u>	<u>1.6E-01</u>	<u>8.0E-03</u>
<u>Nitrilotriacetic acid</u>	<u>139-13-9</u>	<u>year</u>	<u>6.7E-01</u>	<u>1.1E+02</u>	<u>5.4E+00</u>
<u>Nitrilotriacetic acid, trisodium salt monohydrate</u>	<u>18662-53-8</u>	<u>year</u>	<u>3.4E-01</u>	<u>5.6E+01</u>	<u>2.8E+00</u>
<u>Nitrobenzene</u>	<u>98-95-3</u>	<u>year</u>	<u>2.5E-02</u>	<u>4.1E+00</u>	<u>2.0E-01</u>
<u>Nitrofen</u>	<u>1836-75-5</u>	<u>year</u>	<u>4.3E-02</u>	<u>7.1E+00</u>	<u>3.5E-01</u>
<u>2-Nitrofluorene</u>	<u>607-57-8</u>	<u>year</u>	<u>5.5E-02</u>	<u>8.9E+00</u>	<u>4.5E-01</u>
<u>Nitrofurazone</u>	<u>59-87-0</u>	<u>year</u>	<u>2.7E-03</u>	<u>4.4E-01</u>	<u>2.2E-02</u>
<u>1-[(5-Nitrofurfurylidene)-amino]-2-imidazolidinone</u>	<u>555-84-0</u>	<u>year</u>	<u>2.0E-03</u>	<u>3.2E-01</u>	<u>1.6E-02</u>
<u>N-[4-(5-nitro-2-furyl)-2-thiazolyl]-acetamide</u>	<u>531-82-8</u>	<u>year</u>	<u>2.3E-03</u>	<u>3.8E-01</u>	<u>1.9E-02</u>
<u>Nitrogen dioxide</u>	<u>10102-44-0</u>	<u>1-hr</u>	<u>4.7E+02</u>	<u>8.7E-01</u>	<u>4.6E-01</u>
<u>2-Nitropropane</u>	<u>79-46-9</u>	<u>24-hr</u>	<u>2.0E+01</u>	<u>1.5E+00</u>	<u>7.4E-02</u>
<u>1-Nitropyrene</u>	<u>5522-43-0</u>	<u>year</u>	<u>5.5E-03</u>	<u>8.9E-01</u>	<u>4.5E-02</u>
<u>4-Nitropyrene</u>	<u>57835-92-4</u>	<u>year</u>	<u>5.5E-03</u>	<u>8.9E-01</u>	<u>4.5E-02</u>
<u>5-Nitroacenaphthene</u>	<u>602-87-9</u>	<u>year</u>	<u>1.6E-02</u>	<u>2.6E+00</u>	<u>1.3E-01</u>
<u>6-Nitrochrysene</u>	<u>7496-02-8</u>	<u>year</u>	<u>5.5E-05</u>	<u>8.9E-03</u>	<u>4.5E-04</u>
<u>N-Nitrosodiethanolamine</u>	<u>1116-54-7</u>	<u>year</u>	<u>1.3E-03</u>	<u>2.0E-01</u>	<u>1.0E-02</u>
<u>N-Nitrosodiethylamine</u>	<u>55-18-5</u>	<u>year</u>	<u>6.0E-05</u>	<u>1.0E-02</u>	<u>4.9E-04</u>
<u>N-Nitrosodimethylamine</u>	<u>62-75-9</u>	<u>year</u>	<u>1.3E-04</u>	<u>2.1E-02</u>	<u>1.1E-03</u>
<u>N-Nitrosodi-N-butylamine</u>	<u>924-16-3</u>	<u>year</u>	<u>3.2E-04</u>	<u>5.2E-02</u>	<u>2.6E-03</u>
<u>N-Nitrosodi-N-propylamine</u>	<u>621-64-7</u>	<u>year</u>	<u>5.0E-04</u>	<u>8.1E-02</u>	<u>4.1E-03</u>
<u>N-Nitrosodiphenylamine</u>	<u>86-30-6</u>	<u>year</u>	<u>3.8E-01</u>	<u>6.2E+01</u>	<u>3.1E+00</u>
<u>p-Nitrosodiphenylamine</u>	<u>156-10-5</u>	<u>year</u>	<u>1.6E-01</u>	<u>2.6E+01</u>	<u>1.3E+00</u>

Common Name	CAS #	Averaging Period	ASIL ($\mu\text{g}/\text{m}^3$)	SQER (lb/averaging period)	De Minimis (lb/averaging period)
N-Nitrosomorpholine	59-89-2	year	5.3E-04	8.5E-02	4.3E-03
N-Nitroso-N-ethylurea	759-73-9	year	7.8E-05	1.3E-02	6.4E-04
N-Nitroso-N-methylethylamine	10595-95-6	year	1.6E-04	2.6E-02	1.3E-03
N-Nitroso-N-methylurea	684-93-5	year	1.8E-05	2.9E-03	1.4E-04
N-Nitroso-N-methylurethane	615-53-2	year	3.2E-05	5.2E-03	2.6E-04
N-Nitrosornicotine	16543-55-8	year	2.5E-03	4.1E-01	2.0E-02
N-Nitrosopiperidine	100-75-4	year	3.7E-04	6.0E-02	3.0E-03
N-Nitrosopyrrolidine	930-55-2	year	1.7E-03	2.7E-01	1.4E-02
Oleum	8014-95-7	1-hr	1.2E+02	2.2E-01	1.1E-02
Ozone	10028-15-6	1-hr	1.8E+02	3.3E-01	2.0E-02
Parathion	56-38-2	24-hr	2.0E-05	1.5E-06	7.4E-08
Pentachlorophenol	87-86-5	year	2.2E-01	3.5E+01	1.8E+00
Perchloroethylene	127-18-4	year	1.6E-01	2.7E+01	1.3E+00
Phenacetin	62-44-2	year	1.6E+00	2.6E+02	1.3E+01
Phenazopyridine	94-78-0	year	2.0E-02	3.3E+00	1.7E-01
Phenazopyridine hydrochloride	136-40-3	year	2.3E-02	3.8E+00	1.9E-01
Phenesterin	3546-10-9	year	2.3E-05	3.8E-03	1.9E-04
Phenobarbital	50-06-6	year	7.7E-03	1.2E+00	6.2E-02
Phenol	108-95-2	24-hr	2.0E+02	1.5E+01	7.4E-01
Phenoxybenzamine	59-96-1	year	1.1E-03	1.8E-01	9.1E-03
Phenoxybenzamine hydrochloride	63-92-3	year	1.3E-03	2.1E-01	1.1E-02
o-Phenylphenate, sodium	132-27-4	year	1.2E+00	1.9E+02	9.4E+00
Phosgene	75-44-5	24-hr	3.0E-01	2.2E-02	1.1E-03
Phosphine	7803-51-2	24-hr	8.0E-01	5.9E-02	3.0E-03
Phosphoric acid	7664-38-2	24-hr	7.0E+00	5.2E-01	2.6E-02
Phosphorus	7723-14-0	24-hr	2.0E+01	1.5E+00	7.4E-02
Phosphorus, white	12185-10-3	24-hr	2.0E+01	1.5E+00	7.4E-02
Phthalic anhydride	85-44-9	24-hr	2.0E+01	1.5E+00	7.4E-02
Polybrominated biphenyls	==	year	1.2E-04	1.9E-02	9.4E-04
Polybrominated diphenyl ethers (PBDEs) [containing less than 10 bromine atoms]	==	24-hr	6.0E+00	4.4E-01	2.2E-02
Polychlorinated biphenyls (PCBs), NOS	1336-36-3	year	1.8E-03	2.8E-01	1.4E-02
PCB 77 (3,3',4,4'-tetrachlorobiphenyl)	32598-13-3	year	2.6E-04	4.3E-02	2.1E-03
PCB 81 (3,4,4',5-tetrachlorobiphenyl)	70362-50-4	year	9.1E-05	1.5E-02	7.4E-04
PCB 105 (2,3,3',4,4'-pentachlorobiphenyl)	32598-14-4	year	9.1E-04	1.5E-01	7.4E-03
PCB 114 (2,3,4,4',5-pentachlorobiphenyl)	74472-37-0	year	9.1E-04	1.5E-01	7.4E-03
PCB 118 (2,3',4,4',5-pentachlorobiphenyl)	31508-00-6	year	9.1E-04	1.5E-01	7.4E-03
PCB 123 (2,3',4,4',5'-pentachlorobiphenyl)	65510-44-3	year	9.1E-04	1.5E-01	7.4E-03
PCB 126 (3,3',4,4',5-pentachlorobiphenyl)	57465-28-8	year	2.6E-07	4.3E-05	2.1E-06
PCB 156 (2,3,3',4,4',5-hexachlorobiphenyl)	38380-08-4	year	9.1E-04	1.5E-01	7.4E-03
PCB 157 (2,3,3',4,4',5'-hexachlorobiphenyl)	69782-90-7	year	9.1E-04	1.5E-01	7.4E-03
PCB 167 (2,3',4,4',5,5'-hexachlorobiphenyl)	52663-72-6	year	9.1E-04	1.5E-01	7.4E-03
PCB 169 (3,3',4,4',5,5'-hexachlorobiphenyl)	32774-16-6	year	9.1E-07	1.5E-04	7.4E-06
PCB 189 (2,3,3',4,4',5,5'-heptachlorobiphenyl)	39635-31-9	year	9.1E-04	1.5E-01	7.4E-03
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	35822-46-9	year	2.6E-06	4.3E-04	2.1E-05
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	39227-28-6	year	2.6E-07	4.3E-05	2.1E-06
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	57653-85-7	year	2.6E-07	4.3E-05	2.1E-06
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	19408-74-3	year	2.6E-07	4.3E-05	2.1E-06
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	3268-87-9	year	9.1E-05	1.5E-02	7.4E-04

Common Name	CAS #	Averaging Period	ASIL ($\mu\text{g}/\text{m}^3$)	SQER (lb/averaging period)	De Minimis (lb/averaging period)
<u>1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)</u>	<u>40321-76-4</u>	year	<u>2.6E-08</u>	<u>4.3E-06</u>	<u>2.1E-07</u>
<u>2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)</u>	<u>1746-01-6</u>	year	<u>2.6E-08</u>	<u>4.3E-06</u>	<u>2.1E-07</u>
<u>2,3,7,8-Tetrachlorodibenzo-p-dioxin & related compounds, NOS</u>	==	year	<u>2.6E-08</u>	<u>4.3E-06</u>	<u>2.1E-07</u>
<u>1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)</u>	<u>67562-39-4</u>	year	<u>2.6E-06</u>	<u>4.3E-04</u>	<u>2.1E-05</u>
<u>1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)</u>	<u>55673-89-7</u>	year	<u>2.6E-06</u>	<u>4.3E-04</u>	<u>2.1E-05</u>
<u>1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)</u>	<u>70648-26-9</u>	year	<u>2.6E-07</u>	<u>4.3E-05</u>	<u>2.1E-06</u>
<u>1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)</u>	<u>57117-44-9</u>	year	<u>2.6E-07</u>	<u>4.3E-05</u>	<u>2.1E-06</u>
<u>1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)</u>	<u>72918-21-9</u>	year	<u>2.6E-07</u>	<u>4.3E-05</u>	<u>2.1E-06</u>
<u>2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)</u>	<u>60851-34-5</u>	year	<u>2.6E-07</u>	<u>4.3E-05</u>	<u>2.1E-06</u>
<u>1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)</u>	<u>39001-02-0</u>	year	<u>9.1E-05</u>	<u>1.5E-02</u>	<u>7.4E-04</u>
<u>1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)</u>	<u>57117-41-6</u>	year	<u>9.1E-07</u>	<u>1.5E-04</u>	<u>7.4E-06</u>
<u>2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)</u>	<u>57117-31-4</u>	year	<u>9.1E-08</u>	<u>1.5E-05</u>	<u>7.4E-07</u>
<u>2,3,7,8-Tetrachlorodibenzofuran (TcDF)</u>	<u>51207-31-9</u>	year	<u>2.6E-07</u>	<u>4.3E-05</u>	<u>2.1E-06</u>
<u>Ponceau 3R</u>	<u>3564-09-8</u>	year	<u>2.2E-01</u>	<u>3.5E+01</u>	<u>1.8E+00</u>
<u>Ponceau MX</u>	<u>3761-53-3</u>	year	<u>7.7E-01</u>	<u>1.2E+02</u>	<u>6.2E+00</u>
<u>Potassium bromate</u>	<u>7758-01-2</u>	year	<u>7.1E-03</u>	<u>1.2E+00</u>	<u>5.8E-02</u>
<u>Procarbazine</u>	<u>671-16-9</u>	year	<u>2.5E-04</u>	<u>4.1E-02</u>	<u>2.0E-03</u>
<u>Procarbazine hydrochloride</u>	<u>366-70-1</u>	year	<u>2.9E-04</u>	<u>4.8E-02</u>	<u>2.4E-03</u>
<u>1,3-Propane sultone</u>	<u>1120-71-4</u>	year	<u>1.4E-03</u>	<u>2.4E-01</u>	<u>1.2E-02</u>
<u>Propionaldehyde</u>	<u>123-38-6</u>	24-hr	<u>8.0E+00</u>	<u>5.9E-01</u>	<u>3.0E-02</u>
<u>Propylene</u>	<u>115-07-1</u>	24-hr	<u>3.0E+03</u>	<u>2.2E+02</u>	<u>1.1E+01</u>
<u>Propylene glycol</u>	<u>57-55-6</u>	24-hr	<u>2.8E+01</u>	<u>2.1E+00</u>	<u>1.1E-01</u>
<u>Propylene glycol dinitrate</u>	<u>6423-43-4</u>	24-hr	<u>2.8E-01</u>	<u>2.1E-02</u>	<u>1.0E-03</u>
<u>Propylene glycol monomethyl ether</u>	<u>107-98-2</u>	24-hr	<u>7.0E+03</u>	<u>5.2E+02</u>	<u>2.6E+01</u>
<u>Propylene oxide</u>	<u>75-56-9</u>	year	<u>2.7E-01</u>	<u>4.4E+01</u>	<u>2.2E+00</u>
<u>Propylthiouracil</u>	<u>51-52-5</u>	year	<u>3.4E-03</u>	<u>5.6E-01</u>	<u>2.8E-02</u>
<u>Refractory ceramic fibers (fibers/cubic centimeter)</u>	==	24-hr	<u>3.0E-02</u>	<u>2.2E-03</u>	<u>1.1E-04</u>
<u>Reserpine</u>	<u>50-55-5</u>	year	<u>3.2E-04</u>	<u>5.2E-02</u>	<u>2.6E-03</u>
<u>Safrole</u>	<u>94-59-7</u>	year	<u>9.6E-03</u>	<u>1.6E+00</u>	<u>7.8E-02</u>
<u>Selenide, hydrogen</u>	<u>7783-07-5</u>	1-hr	<u>5.0E+00</u>	<u>9.3E-03</u>	<u>4.6E-04</u>
<u>Selenium & selenium compounds (other than hydrogen selenide)</u>	==	24-hr	<u>2.0E+01</u>	<u>1.5E+00</u>	<u>7.4E-02</u>
<u>Silica, crystalline (respirable)</u>	<u>7631-86-9</u>	24-hr	<u>3.0E+00</u>	<u>2.2E-01</u>	<u>1.1E-02</u>
<u>Sodium hydroxide</u>	<u>1310-73-2</u>	1-hr	<u>8.0E+00</u>	<u>1.5E-02</u>	<u>7.4E-04</u>
<u>Sodium sulfate</u>	<u>7757-82-6</u>	1-hr	<u>1.2E+02</u>	<u>2.2E-01</u>	<u>1.1E-02</u>
<u>Sterigmatocystin</u>	<u>10048-13-2</u>	year	<u>1.0E-04</u>	<u>1.6E-02</u>	<u>8.1E-04</u>
<u>Streptozotocin</u>	<u>18883-66-4</u>	year	<u>3.2E-05</u>	<u>5.2E-03</u>	<u>2.6E-04</u>
<u>Styrene</u>	<u>100-42-5</u>	24-hr	<u>8.7E+02</u>	<u>6.5E+01</u>	<u>3.2E+00</u>
<u>Styrene oxide</u>	<u>96-09-3</u>	year	<u>2.2E-02</u>	<u>3.5E+00</u>	<u>1.8E-01</u>
<u>Sulfallate</u>	<u>95-06-7</u>	year	<u>1.9E-02</u>	<u>3.0E+00</u>	<u>1.5E-01</u>
<u>Sulfur dioxide</u>	<u>7446-09-5</u>	1-hr	<u>6.6E+02</u>	<u>1.2E+00</u>	<u>4.6E-01</u>
<u>Sulfur mustard</u>	<u>505-60-2</u>	24-hr	<u>2.0E-02</u>	<u>1.5E-03</u>	<u>7.4E-05</u>
<u>Sulfur trioxide</u>	<u>7446-11-9</u>	1-hr	<u>1.2E+02</u>	<u>2.2E-01</u>	<u>1.1E-02</u>
<u>Sulfuric acid</u>	<u>7664-93-9</u>	24-hr	<u>1.0E+00</u>	<u>7.4E-02</u>	<u>3.7E-03</u>
<u>Tertiary-butyl acetate</u>	<u>540-88-5</u>	year	<u>7.7E-01</u>	<u>1.2E+02</u>	<u>6.2E+00</u>
<u>1,1,1,2-Tetrachloroethane</u>	<u>630-20-6</u>	year	<u>1.4E-01</u>	<u>2.2E+01</u>	<u>1.1E+00</u>
<u>1,1,1,2-Tetrachloroethane</u>	<u>79-34-5</u>	year	<u>1.7E-02</u>	<u>2.8E+00</u>	<u>1.4E-01</u>
<u>1,1,1,2-Tetrafluoroethane</u>	<u>811-97-2</u>	24-hr	<u>8.0E+04</u>	<u>5.9E+03</u>	<u>3.0E+02</u>
<u>Tetrahydrofuran</u>	<u>109-99-9</u>	24-hr	<u>2.0E+03</u>	<u>1.5E+02</u>	<u>7.4E+00</u>

Common Name	CAS #	Averaging Period	ASIL (µg/m³)	SQER (lb/averaging period)	De Minimis (lb/averaging period)
Thioacetamide	62-55-5	year	5.9E-04	1.0E-01	4.8E-03
4,4-Thiodianiline	139-65-1	year	2.3E-04	3.8E-02	1.9E-03
Thiourea	62-56-6	year	4.8E-02	7.7E+00	3.9E-01
Titanium tetrachloride	7550-45-0	24-hr	1.0E-01	7.4E-03	3.7E-04
Toluene	108-88-3	24-hr	5.0E+03	3.7E+02	1.9E+01
Toluene diisocyanates (2,4- and 2,6-)	26471-62-5	24-hr	8.0E-03	5.9E-04	3.0E-05
Toluene-2,4-diisocyanate	584-84-9	24-hr	8.0E-03	5.9E-04	3.0E-05
Toluene-2,6-diisocyanate	91-08-7	24-hr	8.0E-03	5.9E-04	3.0E-05
o-Toluidine	95-53-4	year	2.0E-02	3.2E+00	1.6E-01
o-Toluidine hydrochloride	636-21-5	year	2.7E-02	4.4E+00	2.2E-01
Toxaphene (polychlorinated camphenes)	8001-35-2	year	2.9E-03	4.8E-01	2.4E-02
1,1,1-Trichloroethane (methyl chloroform)	71-55-6	24-hr	5.0E+03	3.7E+02	1.9E+01
1,1,2-Trichloroethane (vinyl trichloride)	79-00-5	year	6.3E-02	1.0E+01	5.1E-01
Trichloroethylene (TCE)	79-01-6	year	2.1E-01	3.4E+01	1.7E+00
2,4,6-Trichlorophenol	88-06-2	year	3.2E-01	5.2E+01	2.6E+00
1,2,3-Trichloropropane	96-18-4	24-hr	3.0E-01	2.2E-02	1.1E-03
Triethylamine	121-44-8	24-hr	2.0E+02	1.5E+01	7.4E-01
1,2,3-Trimethylbenzene	526-73-8	24-hr	6.0E+01	4.4E+00	2.2E-01
1,2,4-Trimethylbenzene	95-63-6	24-hr	6.0E+01	4.4E+00	2.2E-01
1,3,5-Trimethylbenzene	108-67-8	24-hr	6.0E+01	4.4E+00	2.2E-01
Tryptophan-P-1	62450-06-0	year	1.4E-04	2.2E-02	1.1E-03
Tryptophan-P-2	62450-07-1	year	1.1E-03	1.8E-01	8.9E-03
Uranium, insoluble compounds, NOS	==	24-hr	8.0E-01	5.9E-02	3.0E-03
Uranium, soluble salts, NOS	==	24-hr	4.0E-02	3.0E-03	1.5E-04
Vanadium (fume or dust)	7440-62-2	24-hr	1.0E-01	7.4E-03	3.7E-04
Vanadium pentoxide	1314-62-1	1-hr	3.0E+01	5.6E-02	2.8E-03
Vinyl acetate	108-05-4	24-hr	2.0E+02	1.5E+01	7.4E-01
Vinyl bromide	593-60-2	24-hr	3.0E+00	2.2E-01	1.1E-02
Vinyl chloride	75-01-4	year	1.1E-01	1.8E+01	9.2E-01
Xylene (mixture), including m-xylene, o-xylene, p-xylene	1330-20-7	24-hr	2.2E+02	1.6E+01	8.2E-01
m-Xylene	108-38-3	24-hr	2.2E+02	1.6E+01	8.2E-01
o-Xylene	95-47-6	24-hr	2.2E+02	1.6E+01	8.2E-01
p-Xylene	106-42-3	24-hr	2.2E+02	1.6E+01	8.2E-01

NOS - Not otherwise specified. This applies to situations where emission factors for a group of pollutants is reported, but specific isomers, congeners, or chemicals are not reported.

**WSR 19-24-027
PERMANENT RULES
DEPARTMENT OF
NATURAL RESOURCES**

[Filed November 22, 2019, 4:15 p.m., effective November 22, 2019]

Effective Date of Rule: November 22, 2019.

Purpose: Rule amendment to align the department of natural resources' rules regarding silvicultural burning in urban growth areas with legislation passed in 2019. Until the 2019 legislative session, burning regulated by the department was prohibited in urban growth areas. The legislature adopted

2SHB 1784, which amends RCW 70.94.6514 to allow "...outdoor burning that reduces the risk of a wildfire, or is normal, necessary, and customary to ongoing silvicultural activities consistent with silvicultural burning authorized under RCW 70.94.6531(1)...." Rule is effective immediately upon filing of this CR-103 pursuant to RCW 34.05.380 (3)(a).

Citation of Rules Affected by this Order: Amending WAC 332-24-205.

Statutory Authority for Adoption: RCW 70.94.6542.

Adopted under notice filed as WSR 19-17-049 on August 16, 2019.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 0, Repealed 0; or Recently Enacted State Statutes: New 0, Amended 1, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 0, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 0, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 0, Amended 0, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 0, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 0, Repealed 0.

Date Adopted: November 22, 2019.

George Geissler
Washington State Forester
Deputy Supervisor
Wildfire and Forest Health

AMENDATORY SECTION (Amending WSR 98-11-047, filed 5/18/98, effective 6/18/98)

WAC 332-24-205 General rules—Minimum requirements for all burning. The following rules apply to all burning regulated by the department:

(1) The department reserves the right to restrict, regulate, refuse, revoke or postpone outdoor fires under RCW 76.04.205 and 76.04.315, and chapter 70.94 RCW due to adverse fire weather or to prevent restriction of visibility, excessive air pollution or a nuisance.

(2) Burning shall not be allowed within nonattainment areas of the state as established by Washington department of ecology for particulate matter ten microns or less or carbon monoxide, except for:

- (a) Fires for improving and maintaining fire dependent ecosystems; or
- (b) Fires for training wildland firefighters; or
- (c) Fires set for a defined research project; or
- (d) Military training exercises; or
- (e) The exclusive purpose of managing storm or flood-related debris; or
- (f) Where exempted by local or state air pollution control agencies.

(3) Burning shall not be allowed inside urban growth areas as designated under growth management plans, or in cities of greater than ten thousand population as follows:

(a) In urban growth areas where reasonable alternatives exist.

(b) In cities with a population of ten thousand or more as established by the office of financial management:

- (i) That exceed or threaten to exceed federal or state ambient air quality standards; and
- (ii) Where reasonable alternatives to outdoor burning exist, in accordance with WAC 173-425-090.

(c) ~~((After December 31, 2000, burning shall not be allowed in urban growth areas or cities with a population of ten thousand or more.))~~ Outdoor burning that reduces the risk of a wildfire, or is normal, necessary, and customary to ongoing silvicultural activities consistent with silvicultural burning authorized under RCW 70.94.6534(1), is allowed within the urban growth area in accordance with RCW 70.94.6534. Before issuing a burn permit within the urban growth area for any burn that exceeds one hundred tons of material, the

department of natural resources shall consult with department of ecology.

(4) No fires shall be ignited when:

(a) The department of ecology has declared an air pollution episode for the geographic area pursuant to chapter 173-435 WAC; or

(b) The department of ecology or a local air pollution control authority has declared impaired air quality for the geographic area in which the burning is to be done.

(5) A person responsible for a burn at the time an episode or impaired air quality is called pursuant to chapter 173-425 WAC, shall extinguish the fire by:

- (a) Withholding fuel from the burn;
- (b) Allowing the fire to burn down; and
- (c) Aggressively putting out the fire until there is no visible smoke, unless otherwise allowed by the department.

(6) Prior to lighting, the person doing the burning must telephone the department, and obtain any special instructions for the day and location of the proposed burn. Those instructions thereupon become part of the conditions of burning.

(7) The fire must not include rubber products, plastic products, asphalt, garbage, dead animals, petroleum products, paints, or any similar prohibited materials that emit dense smoke or create offensive odors when burned, pursuant to RCW 70.94.775(1).

(8) If the fire creates a nuisance from smoke or flying ash, it must be extinguished. For purposes of this section, a nuisance exists when emissions from any open fire cause physical discomfort or health problems to people residing in the vicinity of the burning or physical damage to property.

(9) Burning within the department's fire protection areas shall not:

- (a) Cause visibility to be obscured on public roads and highways by the smoke from such fires; or
- (b) Endanger life or property through negligent spread of fire or pollutants.

(10) A person capable of extinguishing the fire must attend the fire at all times and the fire must be completely extinguished before being left unattended.

(11) No fires are to be within fifty feet of structures, or within five hundred feet of forest slash without a written burning permit.

(12) The landowner or landowner's designated representative's written permission must be obtained before kindling a fire on the land of another.

(13) The department reserves the authority to provide waivers, exceptions, and/or to impose additional requirements through the use of written burning permits and the smoke management plan.

WSR 19-24-029
PERMANENT RULES
DEPARTMENT OF
LABOR AND INDUSTRIES

[Filed November 25, 2019, 9:39 a.m., effective January 1, 2020]

Effective Date of Rule: January 1, 2020.

Purpose: This rule adoption amends the tables of classification base premium rates, experience rating plan parameters, experience modification factor calculation limitations, and retrospective rating plan size groupings for the workers' compensation insurance program for calendar year 2020. Classification base rates were amended to align with expected losses. The department proposes a 0.8 percent overall average premium rate decrease.

This adoption is also notice that the director intends to transfer the amount of the accident and medical-aid funds combined that exceed ten percent of funded liabilities as required by RCW 51.44.023.

Citation of Rules Affected by this Order: Amending WAC 296-17-855 Experience modification, 296-17-875 Table I, 296-17-880 Table II, 296-17-885 Table III, 296-17-890 Table IV, 296-17-895 Industrial insurance accident fund base rates, stay at work and medical aid base rates by class of industry, 296-17-89502 Industrial insurance accident fund, stay at work, medical aid and supplemental pension rates by class of industry for nonhourly rated classifications, 296-17-89507 Horse racing rates, 296-17-920 Assessment for supplemental pension fund, 296-17B-540 Determining loss incurred for each claim, and 296-17B-900 Retrospective rating plans standard premium size ranges.

Statutory Authority for Adoption: RCW 51.16.035 (base rates), 51.32.073 (supplemental pension), 51.18.010 (retrospective rating), and 51.04.020(1) (general authority).

Other Authority: Not applicable.

Adopted under notice filed as WSR 19-19-066 on September 17, 2019.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 0, Repealed 0; or Recently Enacted State Statutes: New 0, Amended 0, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 0, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 11, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 0, Amended 0, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 0, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 0, Repealed 0.

Date Adopted: November 25, 2019.

Joel Sacks
Director

AMENDATORY SECTION (Amending WSR 18-24-073, filed 11/30/18, effective 1/1/19)

WAC 296-17-855 Experience modification. The basis of the experience modification shall be a comparison of the actual losses charged to an employer during the experience period with the expected losses for an average employer reporting the same exposures in each classification. The comparison shall contain actuarial refinements designed to weigh the extent to which the actual experience is credible, due con-

sideration being given to the volume of the employer's experience. Except for those employers who qualify for an adjusted experience modification as specified in WAC 296-17-860 or 296-17-865, the experience modification factor shall be calculated from the formula:

$$\text{EXPERIENCE MODIFICATION FACTOR} = \frac{\text{Credible Actual Primary Loss} + \text{Credible Actual Excess Loss}}{\text{Expected Loss}}$$

Where

$$\text{Credible Actual Primary Loss} = \text{Actual Primary Loss} \times \text{Primary Credibility}$$

$$+ \text{Expected Primary Loss} \times (100\% - \text{Primary Credibility})$$

$$\text{Credible Actual Excess Loss} = \text{Actual Excess Loss} \times \text{Excess Credibility}$$

$$+ \text{Expected Excess Loss} \times (100\% - \text{Excess Credibility})$$

The meaning and function of each term in the formula is specified below.

For each claim, the actual primary loss is the first dollar portion of the claim costs, which has been shown in actuarial studies, to have the greater credibility in predicting future experience. These amounts are summed over all claims. For each claim in excess of \$20,112 the actual primary loss shall be determined from the formula:

$$\text{ACTUAL PRIMARY LOSS} = \frac{50,280}{(\text{Total loss} + 30,168)} \times \text{total loss}$$

For each claim, less than \$20,112 the full value of the claim shall be considered a primary loss.

For each claim, the excess actual loss is the remaining portion of the claim costs, which have been shown in actuarial studies to have less credibility in predicting future experience. The excess actual loss for each claim shall be determined by subtracting the primary loss from the total loss. These amounts are summed over all claims.

For any claim without disability benefits (time loss, partial permanent disability, total permanent disability or death) either actually paid or estimated to be paid, the total actual losses for calculating the primary loss and excess loss shall first be reduced by the lesser of (~~\$3,050~~) \$3,220 or the total cost of the claim. Here are some examples for these claims:

Total Loss	Type of Claim	Total Loss (after deduction)	Primary Loss	Excess Loss
((300	Medical Only	0	0	0
4,000	Medical Only	950	950	0
4,000	Timeless	4,000	4,000	0
30,000	Medical Only	26,950	23,724	3,226
30,000	Timeless	30,000	25,070	4,930
130,000	PPD	130,000	40,810	89,190
500,000	TPD Pension	286,074	45,484	240,590

Total Loss	Type of Claim	Total Loss (after deduction)	Primary Loss	Excess Loss	TOTAL LOSS AFTER DEDUCTION	PRIMARY LOSS
2,000,000	TPD Pension	286,074	45,484	240,590	15,000	15,000
300	Medical Only	0	0	0	20,112	20,112
4,000	Medical Only	780	780	0	29,834	25,000
4,000	Timeloss	4,000	4,000	0	44,627	30,000
30,000	Medical Only	26,780	23,644	3,136	69,102	35,000
30,000	Timeloss	30,000	25,070	4,930	100,000	38,627
130,000	PPD	130,000	40,810	89,190	117,385	40,000
500,000	TPD Pension	300,137	45,688	254,449	200,000	43,690
2,000,000	TPD Pension	300,137	45,688	254,449	((286,074)) **	((45,484))
					<u>300,137</u>	<u>45,688</u>

** Maximum claim value

Note: The deduction, ((~~\$3,050~~) \$3,220), is twice the average case incurred cost of these types of claims occurring during the three-year period used for experience rating. On average this results in reducing the average actual loss about seventy percent for these types of claims adjusted. This is done to help make the transition between the two different experience rating methods better by helping make the change in experience factor reasonable for small changes to the actual losses.

For each employer, the primary credibility and the excess credibility determines the percentage weight given to the corresponding actual primary losses and the actual excess losses, included in the calculation of the experience modification, based on the volume of expected losses. Primary credibility and excess credibility values are set forth in Table II.

An employer's expected losses shall be determined by summing the expected loss for each of the three years of the experience period, which are calculated by multiplying the reported exposure in each classification during the year by the corresponding classification expected loss rate and rounding the result to the nearest cent. Classification expected loss rates by year are set forth in Table III.

Expected losses in each classification shall be multiplied by the classification "Primary-Ratio" to obtain "expected primary losses" which shall be rounded to the nearest cent. Expected excess losses shall then be calculated by subtracting expected primary losses from expected total losses rounded to the nearest cent. Primary-Ratios are also set forth in Table III.

AMENDATORY SECTION (Amending WSR 18-24-073, filed 11/30/18, effective 1/1/19)

WAC 296-17-875 Table I.

**Primary Losses for Selected Claim Values
Effective January 1, (~~2019~~) 2020**

TOTAL LOSS AFTER DEDUCTION	PRIMARY LOSS
5,000	5,000
10,000	10,000

AMENDATORY SECTION (Amending WSR 18-24-073, filed 11/30/18, effective 1/1/19)

WAC 296-17-880 Table II.

**PRIMARY AND EXCESS CREDIBILITY VALUES
Effective January 1, (~~2019~~) 2020**

Maximum Claim Value = ((~~\$286,074~~) \$300,137

Average Death Value = ((~~\$286,074~~) \$300,137

Expected Losses	Primary Credibility	Excess Credibility
((0 - 6,095	12%	7%
6,096 - 6,507	13%	7%
6,508 - 6,923	14%	7%
6,924 - 7,343	15%	7%
7,344 - 7,769	16%	7%
7,770 - 8,200	17%	7%
8,201 - 8,637	18%	7%
8,638 - 9,080	19%	7%
9,081 - 9,527	20%	7%
9,528 - 9,982	21%	7%
9,983 - 10,442	22%	7%
10,443 - 10,910	23%	7%
10,911 - 11,384	24%	7%
11,385 - 11,866	25%	7%
11,867 - 12,358	26%	7%
12,359 - 12,853	27%	7%
12,854 - 13,360	28%	7%
13,361 - 13,874	29%	7%
13,875 - 14,398	30%	7%
14,399 - 14,935	31%	7%
14,936 - 15,477	32%	7%
15,478 - 16,034	33%	7%

Expected Losses		Primary Credibility	Excess Credibility	Expected Losses		Primary Credibility	Excess Credibility
16,035	- 16,602	34%	7%	321,504	- 322,287	64%	19%
16,603	- 17,183	35%	7%	322,288	- 348,621	65%	19%
17,184	- 17,776	36%	7%	348,622	- 355,829	65%	20%
17,777	- 18,384	37%	7%	355,830	- 375,906	66%	20%
18,385	- 19,012	38%	7%	375,907	- 389,370	66%	21%
19,013	- 19,652	39%	7%	389,371	- 403,367	67%	21%
19,653	- 20,313	40%	7%	403,368	- 422,911	67%	22%
20,314	- 20,993	41%	7%	422,912	- 431,005	68%	22%
20,994	- 21,696	42%	7%	431,006	- 456,448	68%	23%
21,697	- 22,423	43%	7%	456,449	- 458,819	69%	23%
22,424	- 23,177	44%	7%	458,820	- 486,811	69%	24%
23,178	- 23,961	45%	7%	486,812	- 489,989	69%	25%
23,962	- 24,782	46%	7%	489,990	- 514,985	70%	25%
24,783	- 25,640	47%	7%	514,986	- 523,532	70%	26%
25,641	- 26,546	48%	7%	523,533	- 543,341	71%	26%
26,547	- 27,507	49%	7%	543,342	- 557,072	71%	27%
27,508	- 28,530	50%	7%	557,073	- 571,882	72%	27%
28,531	- 29,637	51%	7%	571,883	- 590,612	72%	28%
29,638	- 30,849	52%	7%	590,613	- 600,608	73%	28%
30,850	- 32,199	53%	7%	600,609	- 624,153	73%	29%
32,200	- 32,337	54%	7%	624,154	- 629,521	74%	29%
32,338	- 33,755	54%	8%	629,522	- 657,694	74%	30%
33,756	- 35,657	55%	8%	657,695	- 658,627	75%	30%
35,658	- 53,965	56%	8%	658,628	- 687,922	75%	31%
53,966	- 59,479	57%	8%	687,923	- 691,234	75%	32%
59,480	- 84,958	57%	9%	691,235	- 717,411	76%	32%
84,959	- 87,505	57%	10%	717,412	- 724,775	76%	33%
87,506	- 110,594	58%	10%	724,776	- 747,094	77%	33%
110,595	- 121,044	58%	11%	747,095	- 758,315	77%	34%
121,045	- 136,390	59%	11%	758,316	- 776,978	78%	34%
136,391	- 154,586	59%	12%	776,979	- 791,855	78%	35%
154,587	- 162,340	60%	12%	791,856	- 807,058	79%	35%
162,341	- 188,128	60%	13%	807,059	- 825,396	79%	36%
188,129	- 188,456	61%	13%	825,397	- 837,340	80%	36%
188,457	- 214,734	61%	14%	837,341	- 858,935	80%	37%
214,735	- 221,666	61%	15%	858,936	- 867,827	81%	37%
221,667	- 241,176	62%	15%	867,828	- 892,477	81%	38%
241,177	- 255,208	62%	16%	892,478	- 898,518	82%	38%
255,209	- 267,783	63%	16%	898,519	- 926,018	82%	39%
267,784	- 288,749	63%	17%	926,019	- 929,417	83%	39%
288,750	- 294,559	64%	17%	929,418	- 959,559	83%	40%
294,560	- 321,503	64%	18%	959,560	- 960,525	84%	40%

Expected Losses		Primary Credibility	Excess Credibility	Expected Losses		Primary Credibility	Excess Credibility
960,526	- 991,845	84%	41%	1,850,574	- 1,888,258	100%	67%
991,846	- 993,097	84%	42%	1,888,259	- 1,926,225	100%	68%
993,098	- 1,023,377	85%	42%	1,926,226	- 1,964,476	100%	69%
1,023,378	- 1,026,638	85%	43%	1,964,477	- 2,003,016	100%	70%
1,026,639	- 1,055,129	86%	43%	2,003,017	- 2,041,850	100%	71%
1,055,130	- 1,060,180	86%	44%	2,041,851	- 2,080,980	100%	72%
1,060,181	- 1,087,096	87%	44%	2,080,981	- 2,120,406	100%	73%
1,087,097	- 1,093,720	87%	45%	2,120,407	- 2,160,137	100%	74%
1,093,721	- 1,119,286	88%	45%	2,160,138	- 2,200,170	100%	75%
1,119,287	- 1,127,261	88%	46%	2,200,171	- 2,240,516	100%	76%
1,127,262	- 1,151,697	89%	46%	2,240,517	- 2,281,172	100%	77%
1,151,698	- 1,160,800	89%	47%	2,281,173	- 2,322,147	100%	78%
1,160,801	- 1,184,336	90%	47%	2,322,148	- 2,363,441	100%	79%
1,184,337	- 1,194,342	90%	48%	2,363,442	- 2,405,060	100%	80%
1,194,343	- 1,217,200	91%	48%	2,405,061	- 2,447,009	100%	81%
1,217,201	- 1,227,881	91%	49%	2,447,010	- 2,489,286	100%	82%
1,227,882	- 1,250,294	92%	49%	2,489,287	- 2,531,901	100%	83%
1,250,295	- 1,261,423	92%	50%	2,531,902	- 2,574,852	100%	84%
1,261,424	- 1,283,621	93%	50%	2,574,853	- 2,618,152	100%	85%
1,283,622	- 1,294,963	93%	51%	2,618,153	and higher	100%	86%))
1,294,964	- 1,317,184	94%	51%	0	= 5,973	12%	7%
1,317,185	- 1,328,503	94%	52%	5,974	= 6,377	13%	7%
1,328,504	- 1,350,984	95%	52%	6,378	= 6,785	14%	7%
1,350,985	- 1,362,043	95%	53%	6,786	= 7,196	15%	7%
1,362,044	- 1,385,022	96%	53%	7,197	= 7,614	16%	7%
1,385,023	- 1,395,584	96%	54%	7,615	= 8,036	17%	7%
1,395,585	- 1,419,304	97%	54%	8,037	= 8,464	18%	7%
1,419,305	- 1,429,124	97%	55%	8,465	= 8,898	19%	7%
1,429,125	- 1,453,830	98%	55%	8,899	= 9,336	20%	7%
1,453,831	- 1,462,665	98%	56%	9,337	= 9,782	21%	7%
1,462,666	- 1,488,603	99%	56%	9,783	= 10,233	22%	7%
1,488,604	- 1,496,204	99%	57%	10,234	= 10,692	23%	7%
1,496,205	- 1,523,628	100%	57%	10,693	= 11,156	24%	7%
1,523,629	- 1,558,906	100%	58%	11,157	= 11,629	25%	7%
1,558,907	- 1,594,440	100%	59%	11,630	= 12,111	26%	7%
1,594,441	- 1,630,231	100%	60%	12,112	= 12,596	27%	7%
1,630,232	- 1,666,285	100%	61%	12,597	= 13,093	28%	7%
1,666,286	- 1,702,602	100%	62%	13,094	= 13,597	29%	7%
1,702,603	- 1,739,188	100%	63%	13,598	= 14,110	30%	7%
1,739,189	- 1,776,042	100%	64%	14,111	= 14,636	31%	7%
1,776,043	- 1,813,170	100%	65%	14,637	= 15,167	32%	7%
1,813,171	- 1,850,573	100%	66%	15,168	= 15,713	33%	7%

Expected Losses		Primary Credibility	Excess Credibility	Expected Losses		Primary Credibility	Excess Credibility		
<u>15,714</u>	=	<u>16,270</u>	<u>34%</u>	<u>7%</u>	<u>315,074</u>	=	<u>315,841</u>	<u>64%</u>	<u>19%</u>
<u>16,271</u>	=	<u>16,839</u>	<u>35%</u>	<u>7%</u>	<u>315,842</u>	=	<u>341,649</u>	<u>65%</u>	<u>19%</u>
<u>16,840</u>	=	<u>17,420</u>	<u>36%</u>	<u>7%</u>	<u>341,650</u>	=	<u>348,712</u>	<u>65%</u>	<u>20%</u>
<u>17,421</u>	=	<u>18,016</u>	<u>37%</u>	<u>7%</u>	<u>348,713</u>	=	<u>368,388</u>	<u>66%</u>	<u>20%</u>
<u>18,017</u>	=	<u>18,632</u>	<u>38%</u>	<u>7%</u>	<u>368,389</u>	=	<u>381,583</u>	<u>66%</u>	<u>21%</u>
<u>18,633</u>	=	<u>19,259</u>	<u>39%</u>	<u>7%</u>	<u>381,584</u>	=	<u>395,300</u>	<u>67%</u>	<u>21%</u>
<u>19,260</u>	=	<u>19,907</u>	<u>40%</u>	<u>7%</u>	<u>395,301</u>	=	<u>414,453</u>	<u>67%</u>	<u>22%</u>
<u>19,908</u>	=	<u>20,573</u>	<u>41%</u>	<u>7%</u>	<u>414,454</u>	=	<u>422,385</u>	<u>68%</u>	<u>22%</u>
<u>20,574</u>	=	<u>21,262</u>	<u>42%</u>	<u>7%</u>	<u>422,386</u>	=	<u>447,319</u>	<u>68%</u>	<u>23%</u>
<u>21,263</u>	=	<u>21,975</u>	<u>43%</u>	<u>7%</u>	<u>447,320</u>	=	<u>449,643</u>	<u>69%</u>	<u>23%</u>
<u>21,976</u>	=	<u>22,713</u>	<u>44%</u>	<u>7%</u>	<u>449,644</u>	=	<u>477,075</u>	<u>69%</u>	<u>24%</u>
<u>22,714</u>	=	<u>23,482</u>	<u>45%</u>	<u>7%</u>	<u>477,076</u>	=	<u>480,189</u>	<u>69%</u>	<u>25%</u>
<u>23,483</u>	=	<u>24,286</u>	<u>46%</u>	<u>7%</u>	<u>480,190</u>	=	<u>504,685</u>	<u>70%</u>	<u>25%</u>
<u>24,287</u>	=	<u>25,127</u>	<u>47%</u>	<u>7%</u>	<u>504,686</u>	=	<u>513,061</u>	<u>70%</u>	<u>26%</u>
<u>25,128</u>	=	<u>26,015</u>	<u>48%</u>	<u>7%</u>	<u>513,062</u>	=	<u>532,474</u>	<u>71%</u>	<u>26%</u>
<u>26,016</u>	=	<u>26,957</u>	<u>49%</u>	<u>7%</u>	<u>532,475</u>	=	<u>545,931</u>	<u>71%</u>	<u>27%</u>
<u>26,958</u>	=	<u>27,959</u>	<u>50%</u>	<u>7%</u>	<u>545,932</u>	=	<u>560,444</u>	<u>72%</u>	<u>27%</u>
<u>27,960</u>	=	<u>29,044</u>	<u>51%</u>	<u>7%</u>	<u>560,445</u>	=	<u>578,800</u>	<u>72%</u>	<u>28%</u>
<u>29,045</u>	=	<u>30,232</u>	<u>52%</u>	<u>7%</u>	<u>578,801</u>	=	<u>588,596</u>	<u>73%</u>	<u>28%</u>
<u>30,233</u>	=	<u>31,555</u>	<u>53%</u>	<u>7%</u>	<u>588,597</u>	=	<u>611,670</u>	<u>73%</u>	<u>29%</u>
<u>31,556</u>	=	<u>31,690</u>	<u>54%</u>	<u>7%</u>	<u>611,671</u>	=	<u>616,931</u>	<u>74%</u>	<u>29%</u>
<u>31,691</u>	=	<u>33,080</u>	<u>54%</u>	<u>8%</u>	<u>616,932</u>	=	<u>644,540</u>	<u>74%</u>	<u>30%</u>
<u>33,081</u>	=	<u>34,944</u>	<u>55%</u>	<u>8%</u>	<u>644,541</u>	=	<u>645,454</u>	<u>75%</u>	<u>30%</u>
<u>34,945</u>	=	<u>52,886</u>	<u>56%</u>	<u>8%</u>	<u>645,455</u>	=	<u>674,164</u>	<u>75%</u>	<u>31%</u>
<u>52,887</u>	=	<u>58,289</u>	<u>57%</u>	<u>8%</u>	<u>674,165</u>	=	<u>677,409</u>	<u>75%</u>	<u>32%</u>
<u>58,290</u>	=	<u>83,259</u>	<u>57%</u>	<u>9%</u>	<u>677,410</u>	=	<u>703,063</u>	<u>76%</u>	<u>32%</u>
<u>83,260</u>	=	<u>85,755</u>	<u>57%</u>	<u>10%</u>	<u>703,064</u>	=	<u>710,279</u>	<u>76%</u>	<u>33%</u>
<u>85,756</u>	=	<u>108,382</u>	<u>58%</u>	<u>10%</u>	<u>710,280</u>	=	<u>732,152</u>	<u>77%</u>	<u>33%</u>
<u>108,383</u>	=	<u>118,623</u>	<u>58%</u>	<u>11%</u>	<u>732,153</u>	=	<u>743,149</u>	<u>77%</u>	<u>34%</u>
<u>118,624</u>	=	<u>133,662</u>	<u>59%</u>	<u>11%</u>	<u>743,150</u>	=	<u>761,438</u>	<u>78%</u>	<u>34%</u>
<u>133,663</u>	=	<u>151,494</u>	<u>59%</u>	<u>12%</u>	<u>761,439</u>	=	<u>776,018</u>	<u>78%</u>	<u>35%</u>
<u>151,495</u>	=	<u>159,093</u>	<u>60%</u>	<u>12%</u>	<u>776,019</u>	=	<u>790,917</u>	<u>79%</u>	<u>35%</u>
<u>159,094</u>	=	<u>184,365</u>	<u>60%</u>	<u>13%</u>	<u>790,918</u>	=	<u>808,888</u>	<u>79%</u>	<u>36%</u>
<u>184,366</u>	=	<u>184,687</u>	<u>61%</u>	<u>13%</u>	<u>808,889</u>	=	<u>820,593</u>	<u>80%</u>	<u>36%</u>
<u>184,688</u>	=	<u>210,439</u>	<u>61%</u>	<u>14%</u>	<u>820,594</u>	=	<u>841,756</u>	<u>80%</u>	<u>37%</u>
<u>210,440</u>	=	<u>217,233</u>	<u>61%</u>	<u>15%</u>	<u>841,757</u>	=	<u>850,470</u>	<u>81%</u>	<u>37%</u>
<u>217,234</u>	=	<u>236,352</u>	<u>62%</u>	<u>15%</u>	<u>850,471</u>	=	<u>874,627</u>	<u>81%</u>	<u>38%</u>
<u>236,353</u>	=	<u>250,104</u>	<u>62%</u>	<u>16%</u>	<u>874,628</u>	=	<u>880,548</u>	<u>82%</u>	<u>38%</u>
<u>250,105</u>	=	<u>262,427</u>	<u>63%</u>	<u>16%</u>	<u>880,549</u>	=	<u>907,498</u>	<u>82%</u>	<u>39%</u>
<u>262,428</u>	=	<u>282,974</u>	<u>63%</u>	<u>17%</u>	<u>907,499</u>	=	<u>910,829</u>	<u>83%</u>	<u>39%</u>
<u>282,975</u>	=	<u>288,668</u>	<u>64%</u>	<u>17%</u>	<u>910,830</u>	=	<u>940,368</u>	<u>83%</u>	<u>40%</u>
<u>288,669</u>	=	<u>315,073</u>	<u>64%</u>	<u>18%</u>	<u>940,369</u>	=	<u>941,314</u>	<u>84%</u>	<u>40%</u>

Expected Losses		Primary Credibility	Excess Credibility	Expected Losses		Primary Credibility	Excess Credibility		
<u>941,315</u>	=	<u>972,008</u>	<u>84%</u>	<u>41%</u>	<u>1,813,563</u>	=	<u>1,850,493</u>	<u>100%</u>	<u>67%</u>
<u>972,009</u>	=	<u>973,235</u>	<u>84%</u>	<u>42%</u>	<u>1,850,494</u>	=	<u>1,887,700</u>	<u>100%</u>	<u>68%</u>
<u>973,236</u>	=	<u>1,002,909</u>	<u>85%</u>	<u>42%</u>	<u>1,887,701</u>	=	<u>1,925,186</u>	<u>100%</u>	<u>69%</u>
<u>1,002,910</u>	=	<u>1,006,105</u>	<u>85%</u>	<u>43%</u>	<u>1,925,187</u>	=	<u>1,962,956</u>	<u>100%</u>	<u>70%</u>
<u>1,006,106</u>	=	<u>1,034,026</u>	<u>86%</u>	<u>43%</u>	<u>1,962,957</u>	=	<u>2,001,013</u>	<u>100%</u>	<u>71%</u>
<u>1,034,027</u>	=	<u>1,038,976</u>	<u>86%</u>	<u>44%</u>	<u>2,001,014</u>	=	<u>2,039,360</u>	<u>100%</u>	<u>72%</u>
<u>1,038,977</u>	=	<u>1,065,354</u>	<u>87%</u>	<u>44%</u>	<u>2,039,361</u>	=	<u>2,077,998</u>	<u>100%</u>	<u>73%</u>
<u>1,065,355</u>	=	<u>1,071,846</u>	<u>87%</u>	<u>45%</u>	<u>2,077,999</u>	=	<u>2,116,934</u>	<u>100%</u>	<u>74%</u>
<u>1,071,847</u>	=	<u>1,096,900</u>	<u>88%</u>	<u>45%</u>	<u>2,116,935</u>	=	<u>2,156,167</u>	<u>100%</u>	<u>75%</u>
<u>1,096,901</u>	=	<u>1,104,716</u>	<u>88%</u>	<u>46%</u>	<u>2,156,168</u>	=	<u>2,195,706</u>	<u>100%</u>	<u>76%</u>
<u>1,104,717</u>	=	<u>1,128,663</u>	<u>89%</u>	<u>46%</u>	<u>2,195,707</u>	=	<u>2,235,549</u>	<u>100%</u>	<u>77%</u>
<u>1,128,664</u>	=	<u>1,137,584</u>	<u>89%</u>	<u>47%</u>	<u>2,235,550</u>	=	<u>2,275,704</u>	<u>100%</u>	<u>78%</u>
<u>1,137,585</u>	=	<u>1,160,649</u>	<u>90%</u>	<u>47%</u>	<u>2,275,705</u>	=	<u>2,316,172</u>	<u>100%</u>	<u>79%</u>
<u>1,160,650</u>	=	<u>1,170,455</u>	<u>90%</u>	<u>48%</u>	<u>2,316,173</u>	=	<u>2,356,959</u>	<u>100%</u>	<u>80%</u>
<u>1,170,456</u>	=	<u>1,192,856</u>	<u>91%</u>	<u>48%</u>	<u>2,356,960</u>	=	<u>2,398,069</u>	<u>100%</u>	<u>81%</u>
<u>1,192,857</u>	=	<u>1,203,323</u>	<u>91%</u>	<u>49%</u>	<u>2,398,070</u>	=	<u>2,439,500</u>	<u>100%</u>	<u>82%</u>
<u>1,203,324</u>	=	<u>1,225,288</u>	<u>92%</u>	<u>49%</u>	<u>2,439,501</u>	=	<u>2,481,263</u>	<u>100%</u>	<u>83%</u>
<u>1,225,289</u>	=	<u>1,236,195</u>	<u>92%</u>	<u>50%</u>	<u>2,481,264</u>	=	<u>2,523,355</u>	<u>100%</u>	<u>84%</u>
<u>1,236,196</u>	=	<u>1,257,949</u>	<u>93%</u>	<u>50%</u>	<u>2,523,356</u>	=	<u>2,565,789</u>	<u>100%</u>	<u>85%</u>
<u>1,257,950</u>	=	<u>1,269,064</u>	<u>93%</u>	<u>51%</u>	<u>2,565,790</u>	=	<u>and higher</u>	<u>100%</u>	<u>86%</u>
<u>1,269,065</u>	=	<u>1,290,840</u>	<u>94%</u>	<u>51%</u>					
<u>1,290,841</u>	=	<u>1,301,933</u>	<u>94%</u>	<u>52%</u>					
<u>1,301,934</u>	=	<u>1,323,964</u>	<u>95%</u>	<u>52%</u>					
<u>1,323,965</u>	=	<u>1,334,802</u>	<u>95%</u>	<u>53%</u>					
<u>1,334,803</u>	=	<u>1,357,322</u>	<u>96%</u>	<u>53%</u>					
<u>1,357,323</u>	=	<u>1,367,672</u>	<u>96%</u>	<u>54%</u>					
<u>1,367,673</u>	=	<u>1,390,918</u>	<u>97%</u>	<u>54%</u>					
<u>1,390,919</u>	=	<u>1,400,542</u>	<u>97%</u>	<u>55%</u>					
<u>1,400,543</u>	=	<u>1,424,753</u>	<u>98%</u>	<u>55%</u>					
<u>1,424,754</u>	=	<u>1,433,412</u>	<u>98%</u>	<u>56%</u>					
<u>1,433,413</u>	=	<u>1,458,831</u>	<u>99%</u>	<u>56%</u>					
<u>1,458,832</u>	=	<u>1,466,280</u>	<u>99%</u>	<u>57%</u>					
<u>1,466,281</u>	=	<u>1,493,155</u>	<u>100%</u>	<u>57%</u>					
<u>1,493,156</u>	=	<u>1,527,728</u>	<u>100%</u>	<u>58%</u>					
<u>1,527,729</u>	=	<u>1,562,551</u>	<u>100%</u>	<u>59%</u>					
<u>1,562,552</u>	=	<u>1,597,626</u>	<u>100%</u>	<u>60%</u>					
<u>1,597,627</u>	=	<u>1,632,959</u>	<u>100%</u>	<u>61%</u>					
<u>1,632,960</u>	=	<u>1,668,550</u>	<u>100%</u>	<u>62%</u>					
<u>1,668,551</u>	=	<u>1,704,404</u>	<u>100%</u>	<u>63%</u>					
<u>1,704,405</u>	=	<u>1,740,521</u>	<u>100%</u>	<u>64%</u>					
<u>1,740,522</u>	=	<u>1,776,907</u>	<u>100%</u>	<u>65%</u>					
<u>1,776,908</u>	=	<u>1,813,562</u>	<u>100%</u>	<u>66%</u>					

AMENDATORY SECTION (Amending WSR 18-24-073, filed 11/30/18, effective 1/1/19)

WAC 296-17-885 Table III.

**Expected Loss Rates and Primary Ratios
by Risk Classification and Fiscal Year
Expected Loss Rates in Dollars Per Worker Hour
Effective January 1, (~~2019~~) 2020**

(Class	2015	2016	2017	Primary- Ratio
101	0.8104	0.7040	0.5600	0.445
103	1.2210	1.0713	0.8658	0.433
104	0.7676	0.6698	0.5362	0.436
105	0.9434	0.8247	0.6665	0.524
106	2.2532	1.9787	1.6055	0.466
107	0.7921	0.6894	0.5487	0.414
108	0.7676	0.6698	0.5362	0.436
112	0.5774	0.5082	0.4126	0.435
201	1.3159	1.1400	0.8998	0.409
202	1.7703	1.5405	1.2235	0.393
210	0.6383	0.5569	0.4451	0.431
212	0.8365	0.7275	0.5791	0.430
214	1.1572	1.0033	0.7946	0.430

((Class	2015	2016	2017	Primary- Ratio	((Class	2015	2016	2017	Primary- Ratio
217	1.0326	0.9026	0.7266	0.464	1103	0.9243	0.8059	0.6490	0.502
219	0.7424	0.6459	0.5136	0.416	1104	0.5553	0.4875	0.3967	0.514
301	0.7009	0.6181	0.5063	0.492	1105	0.6515	0.5684	0.4571	0.493
302	1.6445	1.4185	1.1133	0.430	1106	0.2904	0.2567	0.2113	0.531
303	1.6442	1.4349	1.1468	0.406	1108	0.4187	0.3680	0.3000	0.514
306	0.6470	0.5623	0.4484	0.474	1109	1.2502	1.0918	0.8802	0.495
307	0.7170	0.6246	0.4999	0.474	1301	0.4967	0.4306	0.3429	0.502
308	0.5102	0.4508	0.3710	0.516	1303	0.3152	0.2729	0.2187	0.582
403	1.5844	1.3839	1.1163	0.493	1304	0.0180	0.0158	0.0127	0.492
502	0.9842	0.8517	0.6749	0.476	1305	0.4138	0.3592	0.2870	0.506
504	1.6851	1.4854	1.2081	0.413	1401	0.2238	0.2006	0.1683	0.473
507	2.4824	2.2000	1.8071	0.435	1404	0.6336	0.5542	0.4492	0.515
508	0.9932	0.8653	0.6878	0.380	1405	0.6163	0.5370	0.4325	0.535
509	0.6970	0.6035	0.4753	0.390	1407	0.5000	0.4365	0.3542	0.572
510	1.8963	1.6721	1.3621	0.431	1501	0.6596	0.5717	0.4554	0.500
511	1.2101	1.0496	0.8348	0.478	1507	0.4704	0.4128	0.3358	0.521
512	1.0140	0.8895	0.7197	0.457	1701	0.6147	0.5340	0.4269	0.498
513	0.7169	0.6257	0.5024	0.469	1702	1.1671	1.0153	0.8034	0.347
514	1.1645	1.0166	0.8177	0.496	1703	0.7240	0.6271	0.4948	0.411
516	1.1434	1.0004	0.8062	0.462	1704	0.6147	0.5340	0.4269	0.498
517	1.5159	1.3361	1.0855	0.402	1801	0.3462	0.3025	0.2429	0.441
518	0.9090	0.7909	0.6306	0.454	1802	0.6009	0.5235	0.4191	0.500
519	1.0715	0.9296	0.7406	0.488	2002	0.7296	0.6404	0.5192	0.468
521	0.4009	0.3535	0.2892	0.487	2004	0.4678	0.4093	0.3316	0.543
601	0.3916	0.3411	0.2735	0.491	2007	0.6076	0.5374	0.4412	0.475
602	0.5529	0.4775	0.3744	0.396	2008	0.3046	0.2679	0.2184	0.496
603	0.5082	0.4411	0.3499	0.434	2009	0.3352	0.2939	0.2397	0.569
604	0.9062	0.7932	0.6413	0.487	2101	0.5078	0.4494	0.3708	0.523
606	0.4501	0.3930	0.3179	0.550	2102	0.6264	0.5456	0.4396	0.538
607	0.6215	0.5416	0.4350	0.487	2104	0.3148	0.2809	0.2355	0.593
608	0.3131	0.2714	0.2155	0.479	2105	0.5464	0.4758	0.3830	0.548
701	1.2732	1.0841	0.8298	0.418	2106	0.4066	0.3584	0.2930	0.504
803	0.4670	0.4046	0.3233	0.553	2201	0.2422	0.2138	0.1754	0.508
901	0.9090	0.7909	0.6306	0.454	2202	0.5477	0.4795	0.3875	0.488
1002	0.6875	0.6030	0.4872	0.439	2203	0.4236	0.3756	0.3104	0.509
1003	0.5834	0.5096	0.4108	0.494	2204	0.2422	0.2138	0.1754	0.508
1004	0.3608	0.3112	0.2449	0.491	2401	0.3603	0.3127	0.2494	0.485
1005	6.7358	5.8476	4.6419	0.438	2903	0.6155	0.5442	0.4481	0.523
1006	0.1723	0.1496	0.1201	0.565	2904	0.5877	0.5134	0.4128	0.471
1007	0.2401	0.2092	0.1674	0.463	2905	0.4093	0.3592	0.2919	0.517
1101	0.8904	0.7775	0.6265	0.489	2906	0.3859	0.3417	0.2811	0.522
1102	1.3090	1.1351	0.9000	0.437	2907	0.3989	0.3501	0.2853	0.535

((Class	2015	2016	2017	Primary- Ratio	((Class	2015	2016	2017	Primary- Ratio
2908	0.8644	0.7648	0.6288	0.516	3903	0.9627	0.8542	0.7075	0.511
2909	0.3419	0.3030	0.2498	0.509	3905	0.1170	0.1034	0.0856	0.602
3101	0.6610	0.5766	0.4648	0.521	3906	0.4287	0.3786	0.3114	0.524
3102	0.2805	0.2442	0.1953	0.480	3909	0.2484	0.2196	0.1812	0.563
3103	0.3514	0.3092	0.2512	0.458	4101	0.2286	0.2000	0.1620	0.520
3104	0.5496	0.4804	0.3885	0.524	4103	0.4810	0.4216	0.3430	0.531
3105	0.6369	0.5619	0.4610	0.541	4107	0.1674	0.1459	0.1175	0.535
3303	0.3390	0.2966	0.2406	0.540	4108	0.1431	0.1255	0.1025	0.552
3304	0.5481	0.4843	0.4000	0.551	4109	0.1748	0.1549	0.1276	0.516
3309	0.3780	0.3315	0.2701	0.531	4201	0.6503	0.5601	0.4411	0.495
3402	0.4132	0.3615	0.2926	0.520	4301	0.7522	0.6649	0.5495	0.552
3403	0.1402	0.1229	0.0995	0.500	4302	0.7462	0.6558	0.5370	0.550
3404	0.3907	0.3416	0.2769	0.551	4304	0.8970	0.8000	0.6679	0.514
3405	0.2628	0.2303	0.1868	0.508	4305	1.0475	0.9027	0.7136	0.527
3406	0.2537	0.2223	0.1814	0.580	4401	0.3766	0.3342	0.2761	0.495
3407	0.6217	0.5408	0.4328	0.485	4402	0.6397	0.5563	0.4485	0.573
3408	0.1896	0.1641	0.1311	0.584	4404	0.3854	0.3383	0.2751	0.524
3409	0.1378	0.1206	0.0986	0.598	4501	0.1575	0.1378	0.1122	0.594
3410	0.1544	0.1355	0.1109	0.585	4502	0.0533	0.0467	0.0376	0.530
3411	0.4428	0.3854	0.3085	0.484	4504	0.1059	0.0928	0.0756	0.612
3412	0.5314	0.4608	0.3662	0.471	4802	0.3472	0.3073	0.2541	0.544
3414	0.6083	0.5332	0.4315	0.469	4803	0.3187	0.2836	0.2372	0.590
3415	0.6481	0.5696	0.4624	0.447	4804	0.5208	0.4632	0.3859	0.538
3501	0.9194	0.8048	0.6519	0.504	4805	0.3564	0.3149	0.2596	0.549
3503	0.2680	0.2365	0.1941	0.532	4806	0.1020	0.0905	0.0755	0.619
3506	0.6416	0.5611	0.4516	0.467	4808	0.3981	0.3509	0.2870	0.497
3509	0.3450	0.3024	0.2470	0.569	4809	0.2991	0.2655	0.2198	0.507
3510	0.3156	0.2773	0.2266	0.551	4810	0.2041	0.1810	0.1507	0.572
3511	0.6344	0.5556	0.4504	0.514	4811	0.4007	0.3575	0.2993	0.557
3512	0.3380	0.2959	0.2407	0.592	4812	0.4009	0.3526	0.2886	0.544
3513	0.4291	0.3808	0.3146	0.504	4813	0.2034	0.1816	0.1526	0.580
3602	0.0805	0.0704	0.0571	0.563	4814	0.1206	0.1083	0.0918	0.574
3603	0.4634	0.4099	0.3365	0.480	4815	0.2477	0.2230	0.1903	0.588
3604	0.6002	0.5316	0.4373	0.486	4816	0.3409	0.3070	0.2605	0.527
3605	0.4539	0.3950	0.3170	0.523	4900	0.1059	0.0921	0.0733	0.438
3701	0.2805	0.2442	0.1953	0.480	4901	0.0352	0.0305	0.0243	0.510
3702	0.3625	0.3185	0.2592	0.514	4902	0.0887	0.0774	0.0627	0.569
3708	0.5852	0.5120	0.4151	0.530	4903	0.1440	0.1255	0.1013	0.580
3802	0.1748	0.1541	0.1264	0.533	4904	0.0158	0.0138	0.0113	0.565
3808	0.3406	0.2971	0.2385	0.482	4905	0.3758	0.3338	0.2788	0.576
3901	0.1295	0.1141	0.0941	0.607	4906	0.0979	0.0848	0.0680	0.578
3902	0.4326	0.3816	0.3136	0.541	4907	0.0607	0.0535	0.0441	0.603

((Class	2015	2016	2017	Primary- Ratio	((Class	2015	2016	2017	Primary- Ratio
4908	0.0825	0.0727	0.0594	0.581	6206	0.1760	0.1541	0.1257	0.583
4909	0.0317	0.0285	0.0237	0.506	6207	1.0281	0.9065	0.7430	0.502
4910	0.4188	0.3668	0.2977	0.513	6208	0.2290	0.2028	0.1683	0.585
4911	0.0485	0.0427	0.0347	0.483	6209	0.2562	0.2278	0.1891	0.530
5001	6.0798	5.3461	4.3191	0.380	6301	0.1036	0.0896	0.0711	0.515
5002	0.5247	0.4559	0.3658	0.544	6303	0.0494	0.0432	0.0349	0.519
5003	1.6454	1.4269	1.1317	0.437	6305	0.0884	0.0776	0.0637	0.594
5004	0.6923	0.6136	0.5056	0.460	6306	0.2884	0.2512	0.2028	0.560
5005	0.6759	0.5904	0.4736	0.426	6308	0.0522	0.0456	0.0368	0.532
5006	1.0012	0.8745	0.6980	0.369	6309	0.1793	0.1572	0.1285	0.579
5101	0.7912	0.6875	0.5468	0.446	6402	0.2352	0.2071	0.1703	0.586
5103	0.6784	0.5996	0.4923	0.516	6403	0.1454	0.1273	0.1037	0.604
5106	0.6784	0.5996	0.4923	0.516	6404	0.2899	0.2563	0.2123	0.564
5108	0.6934	0.6041	0.4866	0.539	6405	0.4826	0.4208	0.3390	0.530
5109	0.4913	0.4257	0.3380	0.485	6406	0.1318	0.1157	0.0947	0.591
5201	0.2610	0.2271	0.1820	0.548	6407	0.2444	0.2146	0.1755	0.556
5204	0.7936	0.6895	0.5500	0.463	6408	0.4387	0.3845	0.3114	0.494
5206	0.3627	0.3177	0.2564	0.462	6409	0.5610	0.4908	0.3962	0.487
5207	0.1443	0.1275	0.1054	0.561	6410	0.2804	0.2442	0.1966	0.552
5208	0.5811	0.5096	0.4132	0.507	6411	0.0578	0.0511	0.0421	0.549
5209	0.5282	0.4603	0.3700	0.514	6501	0.0943	0.0821	0.0663	0.591
5300	0.0875	0.0762	0.0617	0.589	6502	0.0254	0.0223	0.0181	0.543
5301	0.0284	0.0249	0.0201	0.509	6503	0.0654	0.0565	0.0448	0.560
5302	0.0084	0.0073	0.0059	0.551	6504	0.3159	0.2790	0.2309	0.612
5305	0.0458	0.0399	0.0323	0.584	6505	0.1507	0.1329	0.1101	0.660
5306	0.0399	0.0351	0.0288	0.576	6506	0.1213	0.1063	0.0867	0.574
5307	0.5652	0.4894	0.3898	0.514	6509	0.2511	0.2216	0.1825	0.587
5308	0.0806	0.0707	0.0576	0.585	6510	0.3702	0.3253	0.2625	0.387
6103	0.0857	0.0755	0.0623	0.603	6511	0.2726	0.2395	0.1964	0.577
6104	0.3898	0.3410	0.2770	0.561	6512	0.0806	0.0704	0.0568	0.511
6105	0.3567	0.3111	0.2498	0.497	6601	0.1739	0.1527	0.1247	0.555
6107	0.1243	0.1102	0.0917	0.634	6602	0.5135	0.4546	0.3764	0.539
6108	0.2934	0.2586	0.2126	0.577	6603	0.2512	0.2194	0.1768	0.528
6109	0.0958	0.0830	0.0663	0.532	6604	0.0787	0.0689	0.0562	0.585
6110	0.4553	0.3971	0.3200	0.523	6605	0.2224	0.1944	0.1572	0.542
6120	0.2748	0.2389	0.1919	0.547	6607	0.1111	0.0980	0.0803	0.545
6121	0.2805	0.2455	0.1980	0.467	6608	0.4642	0.4004	0.3139	0.423
6201	0.3383	0.2954	0.2377	0.494	6620	2.7812	2.3981	1.9034	0.594
6202	0.6592	0.5751	0.4637	0.536	6704	0.1167	0.1018	0.0827	0.602
6203	0.1052	0.0937	0.0784	0.636	6705	0.6408	0.5672	0.4712	0.603
6204	0.1286	0.1129	0.0924	0.589	6706	0.2247	0.1998	0.1660	0.511
6205	0.1737	0.1532	0.1255	0.535	6707	11.5610	10.0747	8.2497	0.693

((Class	2015	2016	2017	Primary- Ratio	((Class	2015	2016	2017	Primary- Ratio
6708	7.6176	6.9223	5.9075	0.466	7204	0.0000	0.0000	0.0000	0.500
6709	0.2335	0.2053	0.1683	0.576	7205	0.0000	0.0000	0.0000	0.500
6801	0.6627	0.5613	0.4316	0.571	7301	0.4807	0.4271	0.3539	0.516
6802	0.7495	0.6511	0.5240	0.573	7302	0.7749	0.6859	0.5653	0.496
6803	0.4689	0.4056	0.3179	0.346	7307	0.4452	0.3911	0.3200	0.553
6804	0.2610	0.2285	0.1860	0.589	7308	0.2394	0.2130	0.1775	0.559
6809	4.1622	3.6934	3.0558	0.595	7309	0.2520	0.2217	0.1823	0.601
6901	0.0167	0.0161	0.0149	0.756	7400	1.6308	1.4090	1.1156	0.485))
6902	0.7663	0.6714	0.5411	0.422					
6903	5.0143	4.4156	3.5720	0.358					
6904	0.8478	0.7317	0.5780	0.493	Class	2016	2017	2018	Primary Ratio
6905	0.5895	0.5082	0.4028	0.563	101	0.7400	0.6571	0.5775	0.438
6906	0.2393	0.2259	0.2076	0.655	103	1.0630	0.9535	0.8528	0.433
6907	0.8426	0.7351	0.5946	0.558	104	0.6823	0.6081	0.5376	0.432
6908	0.3233	0.2833	0.2298	0.517	105	0.8320	0.7412	0.6551	0.503
6909	0.1045	0.0916	0.0743	0.555	106	2.1307	1.9093	1.7060	0.466
7100	0.0270	0.0239	0.0197	0.468	107	0.7343	0.6567	0.5830	0.412
7101	0.0207	0.0181	0.0145	0.466	108	0.6823	0.6081	0.5376	0.432
7103	0.7639	0.6571	0.5185	0.537	112	0.5148	0.4666	0.4228	0.408
7104	0.0230	0.0201	0.0164	0.540	201	1.3971	1.2488	1.1075	0.374
7105	0.0169	0.0148	0.0119	0.546	202	1.4944	1.3366	1.1869	0.375
7106	0.2664	0.2330	0.1903	0.612	210	0.6122	0.5482	0.4873	0.416
7107	0.2655	0.2363	0.1974	0.584	212	0.6653	0.5943	0.5269	0.421
7108	0.1854	0.1627	0.1335	0.602	214	1.1611	1.0320	0.9071	0.423
7109	0.1051	0.0922	0.0752	0.564	217	0.9036	0.8070	0.7161	0.452
7110	0.3121	0.2759	0.2257	0.427	219	0.6583	0.5860	0.5167	0.432
7111	0.3253	0.2809	0.2217	0.481	301	0.6738	0.6063	0.5445	0.471
7112	0.7790	0.6821	0.5562	0.592	302	1.5105	1.3340	1.1619	0.425
7113	0.3817	0.3358	0.2761	0.573	303	1.4383	1.2859	1.1437	0.415
7114	0.7173	0.6292	0.5154	0.605	306	0.5663	0.5025	0.4409	0.468
7115	0.4947	0.4355	0.3581	0.588	307	0.6570	0.5832	0.5122	0.485
7116	0.3903	0.3441	0.2809	0.463	308	0.4718	0.4225	0.3767	0.514
7117	1.1384	0.9981	0.8122	0.545	403	1.3967	1.2395	1.0891	0.488
7118	1.4517	1.2718	1.0327	0.526	502	0.7754	0.6852	0.5981	0.462
7119	1.4180	1.2282	0.9823	0.558	504	1.4481	1.3060	1.1776	0.423
7120	5.1925	4.5577	3.7068	0.503	507	2.2323	2.0248	1.8401	0.424
7121	4.7278	4.1472	3.3671	0.506	508	0.9229	0.8274	0.7379	0.373
7122	0.3415	0.3011	0.2469	0.522	509	0.6435	0.5733	0.5054	0.375
7200	1.4181	1.2252	0.9701	0.485	510	1.7700	1.6038	1.4556	0.410
7201	1.3151	1.1379	0.9061	0.522	511	1.0684	0.9476	0.8303	0.463
7202	0.0244	0.0213	0.0174	0.516	512	0.9547	0.8564	0.7652	0.454
7203	0.1001	0.0895	0.0750	0.612	513	0.6900	0.6143	0.5426	0.457
					514	0.9904	0.8847	0.7840	0.473

<u>Class</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>Primary Ratio</u>	<u>Class</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>Primary Ratio</u>
<u>516</u>	<u>1.0815</u>	<u>0.9680</u>	<u>0.8619</u>	<u>0.446</u>	<u>1704</u>	<u>0.6039</u>	<u>0.5338</u>	<u>0.4668</u>	<u>0.481</u>
<u>517</u>	<u>1.3800</u>	<u>1.2474</u>	<u>1.1281</u>	<u>0.392</u>	<u>1801</u>	<u>0.3416</u>	<u>0.3047</u>	<u>0.2697</u>	<u>0.433</u>
<u>518</u>	<u>0.8544</u>	<u>0.7619</u>	<u>0.6733</u>	<u>0.442</u>	<u>1802</u>	<u>0.5464</u>	<u>0.4875</u>	<u>0.4316</u>	<u>0.433</u>
<u>519</u>	<u>0.9451</u>	<u>0.8370</u>	<u>0.7332</u>	<u>0.473</u>	<u>2002</u>	<u>0.6541</u>	<u>0.5863</u>	<u>0.5232</u>	<u>0.464</u>
<u>521</u>	<u>0.4202</u>	<u>0.3783</u>	<u>0.3400</u>	<u>0.465</u>	<u>2004</u>	<u>0.4638</u>	<u>0.4081</u>	<u>0.3535</u>	<u>0.555</u>
<u>601</u>	<u>0.3698</u>	<u>0.3290</u>	<u>0.2896</u>	<u>0.470</u>	<u>2007</u>	<u>0.5975</u>	<u>0.5359</u>	<u>0.4792</u>	<u>0.470</u>
<u>602</u>	<u>0.4930</u>	<u>0.4359</u>	<u>0.3798</u>	<u>0.406</u>	<u>2008</u>	<u>0.2984</u>	<u>0.2663</u>	<u>0.2364</u>	<u>0.527</u>
<u>603</u>	<u>0.5229</u>	<u>0.4647</u>	<u>0.4084</u>	<u>0.414</u>	<u>2009</u>	<u>0.3169</u>	<u>0.2814</u>	<u>0.2475</u>	<u>0.551</u>
<u>604</u>	<u>0.8359</u>	<u>0.7474</u>	<u>0.6646</u>	<u>0.462</u>	<u>2101</u>	<u>0.5070</u>	<u>0.4549</u>	<u>0.4065</u>	<u>0.522</u>
<u>606</u>	<u>0.4404</u>	<u>0.3881</u>	<u>0.3372</u>	<u>0.546</u>	<u>2102</u>	<u>0.7408</u>	<u>0.6495</u>	<u>0.5614</u>	<u>0.543</u>
<u>607</u>	<u>0.5786</u>	<u>0.5096</u>	<u>0.4431</u>	<u>0.496</u>	<u>2104</u>	<u>0.3122</u>	<u>0.2809</u>	<u>0.2516</u>	<u>0.586</u>
<u>608</u>	<u>0.3234</u>	<u>0.2850</u>	<u>0.2473</u>	<u>0.459</u>	<u>2105</u>	<u>0.4910</u>	<u>0.4338</u>	<u>0.3783</u>	<u>0.524</u>
<u>701</u>	<u>1.3971</u>	<u>1.2488</u>	<u>1.1075</u>	<u>0.374</u>	<u>2106</u>	<u>0.4263</u>	<u>0.3816</u>	<u>0.3398</u>	<u>0.503</u>
<u>803</u>	<u>0.4661</u>	<u>0.4085</u>	<u>0.3522</u>	<u>0.537</u>	<u>2201</u>	<u>0.2508</u>	<u>0.2244</u>	<u>0.2000</u>	<u>0.507</u>
<u>901</u>	<u>0.8544</u>	<u>0.7619</u>	<u>0.6733</u>	<u>0.442</u>	<u>2202</u>	<u>0.4784</u>	<u>0.4284</u>	<u>0.3814</u>	<u>0.470</u>
<u>1002</u>	<u>0.6537</u>	<u>0.5855</u>	<u>0.5215</u>	<u>0.435</u>	<u>2203</u>	<u>0.4105</u>	<u>0.3695</u>	<u>0.3317</u>	<u>0.508</u>
<u>1003</u>	<u>0.5503</u>	<u>0.4877</u>	<u>0.4281</u>	<u>0.491</u>	<u>2204</u>	<u>0.2508</u>	<u>0.2244</u>	<u>0.2000</u>	<u>0.507</u>
<u>1004</u>	<u>0.3304</u>	<u>0.2901</u>	<u>0.2504</u>	<u>0.480</u>	<u>2401</u>	<u>0.3586</u>	<u>0.3182</u>	<u>0.2795</u>	<u>0.449</u>
<u>1005</u>	<u>6.3669</u>	<u>5.6532</u>	<u>4.9791</u>	<u>0.426</u>	<u>2903</u>	<u>0.5833</u>	<u>0.5233</u>	<u>0.4681</u>	<u>0.522</u>
<u>1006</u>	<u>0.1676</u>	<u>0.1473</u>	<u>0.1273</u>	<u>0.551</u>	<u>2904</u>	<u>0.5699</u>	<u>0.5113</u>	<u>0.4563</u>	<u>0.442</u>
<u>1007</u>	<u>0.2262</u>	<u>0.2015</u>	<u>0.1781</u>	<u>0.457</u>	<u>2905</u>	<u>0.3742</u>	<u>0.3343</u>	<u>0.2968</u>	<u>0.505</u>
<u>1101</u>	<u>0.8583</u>	<u>0.7632</u>	<u>0.6738</u>	<u>0.472</u>	<u>2906</u>	<u>0.3920</u>	<u>0.3552</u>	<u>0.3207</u>	<u>0.505</u>
<u>1102</u>	<u>1.2903</u>	<u>1.1475</u>	<u>1.0125</u>	<u>0.417</u>	<u>2907</u>	<u>0.3882</u>	<u>0.3463</u>	<u>0.3065</u>	<u>0.521</u>
<u>1103</u>	<u>0.8244</u>	<u>0.7285</u>	<u>0.6369</u>	<u>0.480</u>	<u>2908</u>	<u>0.7985</u>	<u>0.7170</u>	<u>0.6398</u>	<u>0.513</u>
<u>1104</u>	<u>0.4919</u>	<u>0.4408</u>	<u>0.3931</u>	<u>0.488</u>	<u>2909</u>	<u>0.3325</u>	<u>0.3016</u>	<u>0.2740</u>	<u>0.482</u>
<u>1105</u>	<u>0.5682</u>	<u>0.5026</u>	<u>0.4394</u>	<u>0.495</u>	<u>3101</u>	<u>0.6332</u>	<u>0.5601</u>	<u>0.4895</u>	<u>0.506</u>
<u>1106</u>	<u>0.2833</u>	<u>0.2534</u>	<u>0.2252</u>	<u>0.537</u>	<u>3102</u>	<u>0.2638</u>	<u>0.2343</u>	<u>0.2056</u>	<u>0.464</u>
<u>1108</u>	<u>0.3714</u>	<u>0.3325</u>	<u>0.2958</u>	<u>0.506</u>	<u>3103</u>	<u>0.3169</u>	<u>0.2850</u>	<u>0.2556</u>	<u>0.445</u>
<u>1109</u>	<u>1.2517</u>	<u>1.1142</u>	<u>0.9858</u>	<u>0.462</u>	<u>3104</u>	<u>0.5211</u>	<u>0.4623</u>	<u>0.4060</u>	<u>0.526</u>
<u>1301</u>	<u>0.4895</u>	<u>0.4312</u>	<u>0.3745</u>	<u>0.501</u>	<u>3105</u>	<u>0.6432</u>	<u>0.5778</u>	<u>0.5164</u>	<u>0.516</u>
<u>1303</u>	<u>0.3090</u>	<u>0.2693</u>	<u>0.2304</u>	<u>0.570</u>	<u>3303</u>	<u>0.3119</u>	<u>0.2766</u>	<u>0.2431</u>	<u>0.531</u>
<u>1304</u>	<u>0.0165</u>	<u>0.0146</u>	<u>0.0128</u>	<u>0.488</u>	<u>3304</u>	<u>0.5291</u>	<u>0.4729</u>	<u>0.4204</u>	<u>0.533</u>
<u>1305</u>	<u>0.4071</u>	<u>0.3583</u>	<u>0.3114</u>	<u>0.496</u>	<u>3309</u>	<u>0.3549</u>	<u>0.3168</u>	<u>0.2810</u>	<u>0.510</u>
<u>1401</u>	<u>0.2135</u>	<u>0.1950</u>	<u>0.1795</u>	<u>0.467</u>	<u>3402</u>	<u>0.3953</u>	<u>0.3511</u>	<u>0.3087</u>	<u>0.516</u>
<u>1404</u>	<u>0.5881</u>	<u>0.5202</u>	<u>0.4559</u>	<u>0.511</u>	<u>3403</u>	<u>0.1226</u>	<u>0.1095</u>	<u>0.0970</u>	<u>0.485</u>
<u>1405</u>	<u>0.5727</u>	<u>0.5049</u>	<u>0.4395</u>	<u>0.520</u>	<u>3404</u>	<u>0.3620</u>	<u>0.3197</u>	<u>0.2787</u>	<u>0.548</u>
<u>1407</u>	<u>0.4869</u>	<u>0.4286</u>	<u>0.3725</u>	<u>0.558</u>	<u>3405</u>	<u>0.2366</u>	<u>0.2110</u>	<u>0.1863</u>	<u>0.502</u>
<u>1501</u>	<u>0.6324</u>	<u>0.5566</u>	<u>0.4833</u>	<u>0.490</u>	<u>3406</u>	<u>0.2350</u>	<u>0.2069</u>	<u>0.1798</u>	<u>0.576</u>
<u>1507</u>	<u>0.4192</u>	<u>0.3722</u>	<u>0.3275</u>	<u>0.519</u>	<u>3407</u>	<u>0.5897</u>	<u>0.5231</u>	<u>0.4595</u>	<u>0.475</u>
<u>1701</u>	<u>0.6039</u>	<u>0.5338</u>	<u>0.4668</u>	<u>0.481</u>	<u>3408</u>	<u>0.1860</u>	<u>0.1624</u>	<u>0.1394</u>	<u>0.556</u>
<u>1702</u>	<u>1.0232</u>	<u>0.9198</u>	<u>0.8225</u>	<u>0.335</u>	<u>3409</u>	<u>0.1457</u>	<u>0.1292</u>	<u>0.1134</u>	<u>0.560</u>
<u>1703</u>	<u>0.6714</u>	<u>0.5977</u>	<u>0.5276</u>	<u>0.402</u>	<u>3410</u>	<u>0.1457</u>	<u>0.1292</u>	<u>0.1134</u>	<u>0.560</u>

<u>Class</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>Primary Ratio</u>	<u>Class</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>Primary Ratio</u>
<u>3411</u>	<u>0.4294</u>	<u>0.3810</u>	<u>0.3346</u>	<u>0.465</u>	<u>4504</u>	<u>0.1030</u>	<u>0.0906</u>	<u>0.0784</u>	<u>0.611</u>
<u>3412</u>	<u>0.4977</u>	<u>0.4391</u>	<u>0.3825</u>	<u>0.470</u>	<u>4802</u>	<u>0.3432</u>	<u>0.3082</u>	<u>0.2760</u>	<u>0.520</u>
<u>3414</u>	<u>0.5806</u>	<u>0.5155</u>	<u>0.4540</u>	<u>0.478</u>	<u>4803</u>	<u>0.3219</u>	<u>0.2890</u>	<u>0.2583</u>	<u>0.568</u>
<u>3415</u>	<u>0.6487</u>	<u>0.5807</u>	<u>0.5176</u>	<u>0.454</u>	<u>4804</u>	<u>0.4953</u>	<u>0.4468</u>	<u>0.4026</u>	<u>0.522</u>
<u>3501</u>	<u>0.4310</u>	<u>0.3872</u>	<u>0.3460</u>	<u>0.516</u>	<u>4805</u>	<u>0.3360</u>	<u>0.3009</u>	<u>0.2683</u>	<u>0.534</u>
<u>3503</u>	<u>0.2612</u>	<u>0.2331</u>	<u>0.2066</u>	<u>0.522</u>	<u>4806</u>	<u>0.0961</u>	<u>0.0859</u>	<u>0.0764</u>	<u>0.602</u>
<u>3506</u>	<u>0.6569</u>	<u>0.5897</u>	<u>0.5262</u>	<u>0.437</u>	<u>4808</u>	<u>0.3972</u>	<u>0.3557</u>	<u>0.3170</u>	<u>0.489</u>
<u>3509</u>	<u>0.3483</u>	<u>0.3081</u>	<u>0.2698</u>	<u>0.550</u>	<u>4809</u>	<u>0.2679</u>	<u>0.2405</u>	<u>0.2151</u>	<u>0.505</u>
<u>3510</u>	<u>0.2986</u>	<u>0.2674</u>	<u>0.2380</u>	<u>0.518</u>	<u>4810</u>	<u>0.1979</u>	<u>0.1772</u>	<u>0.1580</u>	<u>0.560</u>
<u>3511</u>	<u>0.6208</u>	<u>0.5553</u>	<u>0.4942</u>	<u>0.485</u>	<u>4811</u>	<u>0.4194</u>	<u>0.3791</u>	<u>0.3425</u>	<u>0.539</u>
<u>3512</u>	<u>0.3095</u>	<u>0.2741</u>	<u>0.2392</u>	<u>0.589</u>	<u>4812</u>	<u>0.3947</u>	<u>0.3517</u>	<u>0.3110</u>	<u>0.526</u>
<u>3513</u>	<u>0.3838</u>	<u>0.3471</u>	<u>0.3132</u>	<u>0.502</u>	<u>4813</u>	<u>0.1969</u>	<u>0.1771</u>	<u>0.1588</u>	<u>0.575</u>
<u>3602</u>	<u>0.0812</u>	<u>0.0719</u>	<u>0.0628</u>	<u>0.552</u>	<u>4814</u>	<u>0.1134</u>	<u>0.1030</u>	<u>0.0935</u>	<u>0.565</u>
<u>3603</u>	<u>0.4355</u>	<u>0.3918</u>	<u>0.3515</u>	<u>0.475</u>	<u>4815</u>	<u>0.2329</u>	<u>0.2115</u>	<u>0.1926</u>	<u>0.579</u>
<u>3604</u>	<u>0.5787</u>	<u>0.5222</u>	<u>0.4700</u>	<u>0.478</u>	<u>4816</u>	<u>0.3209</u>	<u>0.2934</u>	<u>0.2699</u>	<u>0.517</u>
<u>3605</u>	<u>0.3953</u>	<u>0.3511</u>	<u>0.3087</u>	<u>0.516</u>	<u>4900</u>	<u>0.0905</u>	<u>0.0805</u>	<u>0.0709</u>	<u>0.449</u>
<u>3701</u>	<u>0.2638</u>	<u>0.2343</u>	<u>0.2056</u>	<u>0.464</u>	<u>4901</u>	<u>0.0320</u>	<u>0.0284</u>	<u>0.0249</u>	<u>0.485</u>
<u>3702</u>	<u>0.3208</u>	<u>0.2870</u>	<u>0.2551</u>	<u>0.499</u>	<u>4902</u>	<u>0.0795</u>	<u>0.0702</u>	<u>0.0612</u>	<u>0.547</u>
<u>3708</u>	<u>0.5111</u>	<u>0.4555</u>	<u>0.4028</u>	<u>0.505</u>	<u>4903</u>	<u>0.1358</u>	<u>0.1193</u>	<u>0.1031</u>	<u>0.557</u>
<u>3802</u>	<u>0.1669</u>	<u>0.1499</u>	<u>0.1343</u>	<u>0.496</u>	<u>4904</u>	<u>0.0142</u>	<u>0.0126</u>	<u>0.0110</u>	<u>0.563</u>
<u>3808</u>	<u>0.3212</u>	<u>0.2862</u>	<u>0.2527</u>	<u>0.476</u>	<u>4905</u>	<u>0.3473</u>	<u>0.3112</u>	<u>0.2777</u>	<u>0.565</u>
<u>3901</u>	<u>0.1277</u>	<u>0.1132</u>	<u>0.0994</u>	<u>0.597</u>	<u>4906</u>	<u>0.0919</u>	<u>0.0804</u>	<u>0.0692</u>	<u>0.559</u>
<u>3902</u>	<u>0.4078</u>	<u>0.3644</u>	<u>0.3235</u>	<u>0.524</u>	<u>4907</u>	<u>0.0543</u>	<u>0.0485</u>	<u>0.0428</u>	<u>0.598</u>
<u>3903</u>	<u>0.3181</u>	<u>0.2843</u>	<u>0.2523</u>	<u>0.524</u>	<u>4908</u>	<u>0.0774</u>	<u>0.0693</u>	<u>0.0613</u>	<u>0.578</u>
<u>3905</u>	<u>0.1124</u>	<u>0.1003</u>	<u>0.0887</u>	<u>0.586</u>	<u>4909</u>	<u>0.0309</u>	<u>0.0278</u>	<u>0.0245</u>	<u>0.578</u>
<u>3906</u>	<u>0.4105</u>	<u>0.3671</u>	<u>0.3266</u>	<u>0.527</u>	<u>4910</u>	<u>0.3906</u>	<u>0.3467</u>	<u>0.3051</u>	<u>0.508</u>
<u>3909</u>	<u>0.2328</u>	<u>0.2077</u>	<u>0.1839</u>	<u>0.561</u>	<u>4911</u>	<u>0.0445</u>	<u>0.0401</u>	<u>0.0358</u>	<u>0.460</u>
<u>4101</u>	<u>0.2044</u>	<u>0.1819</u>	<u>0.1605</u>	<u>0.510</u>	<u>5001</u>	<u>6.0559</u>	<u>5.4799</u>	<u>4.9656</u>	<u>0.375</u>
<u>4103</u>	<u>0.4615</u>	<u>0.4110</u>	<u>0.3635</u>	<u>0.517</u>	<u>5002</u>	<u>0.4905</u>	<u>0.4315</u>	<u>0.3741</u>	<u>0.533</u>
<u>4107</u>	<u>0.1656</u>	<u>0.1459</u>	<u>0.1267</u>	<u>0.523</u>	<u>5003</u>	<u>1.6180</u>	<u>1.4399</u>	<u>1.2719</u>	<u>0.409</u>
<u>4108</u>	<u>0.1291</u>	<u>0.1147</u>	<u>0.1010</u>	<u>0.538</u>	<u>5004</u>	<u>0.7301</u>	<u>0.6655</u>	<u>0.6096</u>	<u>0.426</u>
<u>4109</u>	<u>0.1725</u>	<u>0.1565</u>	<u>0.1419</u>	<u>0.501</u>	<u>5005</u>	<u>0.6633</u>	<u>0.5934</u>	<u>0.5282</u>	<u>0.401</u>
<u>4201</u>	<u>0.6717</u>	<u>0.5889</u>	<u>0.5076</u>	<u>0.467</u>	<u>5006</u>	<u>0.9050</u>	<u>0.8148</u>	<u>0.7320</u>	<u>0.358</u>
<u>4301</u>	<u>0.7541</u>	<u>0.6775</u>	<u>0.6071</u>	<u>0.527</u>	<u>5101</u>	<u>0.7394</u>	<u>0.6548</u>	<u>0.5738</u>	<u>0.445</u>
<u>4302</u>	<u>0.6664</u>	<u>0.5928</u>	<u>0.5231</u>	<u>0.527</u>	<u>5103</u>	<u>0.6430</u>	<u>0.5780</u>	<u>0.5171</u>	<u>0.502</u>
<u>4304</u>	<u>0.8957</u>	<u>0.8103</u>	<u>0.7338</u>	<u>0.516</u>	<u>5106</u>	<u>0.6430</u>	<u>0.5780</u>	<u>0.5171</u>	<u>0.502</u>
<u>4305</u>	<u>0.9447</u>	<u>0.8250</u>	<u>0.7081</u>	<u>0.519</u>	<u>5108</u>	<u>0.6488</u>	<u>0.5712</u>	<u>0.4963</u>	<u>0.533</u>
<u>4401</u>	<u>0.3119</u>	<u>0.2766</u>	<u>0.2431</u>	<u>0.531</u>	<u>5109</u>	<u>0.4408</u>	<u>0.3893</u>	<u>0.3388</u>	<u>0.492</u>
<u>4402</u>	<u>0.5830</u>	<u>0.5122</u>	<u>0.4435</u>	<u>0.548</u>	<u>5201</u>	<u>0.2451</u>	<u>0.2171</u>	<u>0.1894</u>	<u>0.537</u>
<u>4404</u>	<u>0.3559</u>	<u>0.3168</u>	<u>0.2794</u>	<u>0.525</u>	<u>5204</u>	<u>0.7558</u>	<u>0.6705</u>	<u>0.5895</u>	<u>0.437</u>
<u>4501</u>	<u>0.1488</u>	<u>0.1312</u>	<u>0.1141</u>	<u>0.586</u>	<u>5206</u>	<u>0.3446</u>	<u>0.3095</u>	<u>0.2767</u>	<u>0.440</u>
<u>4502</u>	<u>0.0514</u>	<u>0.0457</u>	<u>0.0403</u>	<u>0.508</u>	<u>5207</u>	<u>0.1341</u>	<u>0.1196</u>	<u>0.1060</u>	<u>0.553</u>

<u>Class</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>Primary Ratio</u>	<u>Class</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>Primary Ratio</u>
<u>5208</u>	<u>0.5601</u>	<u>0.5003</u>	<u>0.4435</u>	<u>0.492</u>	<u>6411</u>	<u>0.0464</u>	<u>0.0416</u>	<u>0.0372</u>	<u>0.534</u>
<u>5209</u>	<u>0.4960</u>	<u>0.4397</u>	<u>0.3853</u>	<u>0.494</u>	<u>6501</u>	<u>0.0905</u>	<u>0.0790</u>	<u>0.0678</u>	<u>0.576</u>
<u>5300</u>	<u>0.0854</u>	<u>0.0748</u>	<u>0.0644</u>	<u>0.578</u>	<u>6502</u>	<u>0.0243</u>	<u>0.0215</u>	<u>0.0187</u>	<u>0.535</u>
<u>5301</u>	<u>0.0285</u>	<u>0.0255</u>	<u>0.0225</u>	<u>0.495</u>	<u>6503</u>	<u>0.0630</u>	<u>0.0550</u>	<u>0.0471</u>	<u>0.550</u>
<u>5302</u>	<u>0.0075</u>	<u>0.0066</u>	<u>0.0058</u>	<u>0.534</u>	<u>6504</u>	<u>0.2664</u>	<u>0.2383</u>	<u>0.2114</u>	<u>0.601</u>
<u>5305</u>	<u>0.0399</u>	<u>0.0351</u>	<u>0.0306</u>	<u>0.563</u>	<u>6505</u>	<u>0.1505</u>	<u>0.1324</u>	<u>0.1146</u>	<u>0.654</u>
<u>5306</u>	<u>0.0365</u>	<u>0.0324</u>	<u>0.0284</u>	<u>0.577</u>	<u>6506</u>	<u>0.1097</u>	<u>0.0972</u>	<u>0.0852</u>	<u>0.556</u>
<u>5307</u>	<u>0.5695</u>	<u>0.5001</u>	<u>0.4328</u>	<u>0.502</u>	<u>6509</u>	<u>0.2281</u>	<u>0.2032</u>	<u>0.1792</u>	<u>0.590</u>
<u>5308</u>	<u>0.0791</u>	<u>0.0700</u>	<u>0.0611</u>	<u>0.582</u>	<u>6510</u>	<u>0.3357</u>	<u>0.3013</u>	<u>0.2697</u>	<u>0.385</u>
<u>6103</u>	<u>0.0812</u>	<u>0.0721</u>	<u>0.0633</u>	<u>0.601</u>	<u>6511</u>	<u>0.2448</u>	<u>0.2176</u>	<u>0.1918</u>	<u>0.557</u>
<u>6104</u>	<u>0.3448</u>	<u>0.3045</u>	<u>0.2655</u>	<u>0.563</u>	<u>6512</u>	<u>0.0761</u>	<u>0.0677</u>	<u>0.0599</u>	<u>0.483</u>
<u>6105</u>	<u>0.3678</u>	<u>0.3260</u>	<u>0.2856</u>	<u>0.484</u>	<u>6601</u>	<u>0.1554</u>	<u>0.1387</u>	<u>0.1231</u>	<u>0.527</u>
<u>6107</u>	<u>0.1118</u>	<u>0.1004</u>	<u>0.0890</u>	<u>0.639</u>	<u>6602</u>	<u>0.4862</u>	<u>0.4357</u>	<u>0.3895</u>	<u>0.522</u>
<u>6108</u>	<u>0.2573</u>	<u>0.2296</u>	<u>0.2026</u>	<u>0.578</u>	<u>6603</u>	<u>0.2455</u>	<u>0.2173</u>	<u>0.1897</u>	<u>0.541</u>
<u>6109</u>	<u>0.0908</u>	<u>0.0799</u>	<u>0.0693</u>	<u>0.513</u>	<u>6604</u>	<u>0.0720</u>	<u>0.0637</u>	<u>0.0555</u>	<u>0.570</u>
<u>6110</u>	<u>0.3779</u>	<u>0.3335</u>	<u>0.2907</u>	<u>0.514</u>	<u>6605</u>	<u>0.2124</u>	<u>0.1884</u>	<u>0.1648</u>	<u>0.539</u>
<u>6120</u>	<u>0.2605</u>	<u>0.2292</u>	<u>0.1986</u>	<u>0.533</u>	<u>6607</u>	<u>0.0971</u>	<u>0.0866</u>	<u>0.0766</u>	<u>0.547</u>
<u>6121</u>	<u>0.2996</u>	<u>0.2635</u>	<u>0.2283</u>	<u>0.533</u>	<u>6608</u>	<u>0.4283</u>	<u>0.3786</u>	<u>0.3300</u>	<u>0.413</u>
<u>6201</u>	<u>0.3630</u>	<u>0.3213</u>	<u>0.2812</u>	<u>0.501</u>	<u>6620</u>	<u>2.5778</u>	<u>2.2419</u>	<u>1.9036</u>	<u>0.584</u>
<u>6202</u>	<u>0.6549</u>	<u>0.5782</u>	<u>0.5038</u>	<u>0.537</u>	<u>6704</u>	<u>0.1172</u>	<u>0.1027</u>	<u>0.0885</u>	<u>0.597</u>
<u>6203</u>	<u>0.0996</u>	<u>0.0894</u>	<u>0.0794</u>	<u>0.633</u>	<u>6705</u>	<u>0.5939</u>	<u>0.5305</u>	<u>0.4709</u>	<u>0.578</u>
<u>6204</u>	<u>0.1241</u>	<u>0.1098</u>	<u>0.0959</u>	<u>0.583</u>	<u>6706</u>	<u>0.2158</u>	<u>0.1953</u>	<u>0.1766</u>	<u>0.506</u>
<u>6205</u>	<u>0.1669</u>	<u>0.1483</u>	<u>0.1304</u>	<u>0.536</u>	<u>6707</u>	<u>12.4046</u>	<u>10.7263</u>	<u>9.0735</u>	<u>0.686</u>
<u>6206</u>	<u>0.1758</u>	<u>0.1549</u>	<u>0.1346</u>	<u>0.587</u>	<u>6708</u>	<u>7.9276</u>	<u>7.3252</u>	<u>6.8242</u>	<u>0.479</u>
<u>6207</u>	<u>0.9096</u>	<u>0.8145</u>	<u>0.7281</u>	<u>0.490</u>	<u>6709</u>	<u>0.2210</u>	<u>0.1958</u>	<u>0.1716</u>	<u>0.570</u>
<u>6208</u>	<u>0.2306</u>	<u>0.2053</u>	<u>0.1814</u>	<u>0.593</u>	<u>6801</u>	<u>0.5806</u>	<u>0.4948</u>	<u>0.4080</u>	<u>0.568</u>
<u>6209</u>	<u>0.2496</u>	<u>0.2247</u>	<u>0.2017</u>	<u>0.534</u>	<u>6802</u>	<u>0.7042</u>	<u>0.6156</u>	<u>0.5292</u>	<u>0.561</u>
<u>6301</u>	<u>0.0993</u>	<u>0.0875</u>	<u>0.0761</u>	<u>0.493</u>	<u>6803</u>	<u>0.4360</u>	<u>0.3879</u>	<u>0.3414</u>	<u>0.359</u>
<u>6303</u>	<u>0.0451</u>	<u>0.0400</u>	<u>0.0349</u>	<u>0.525</u>	<u>6804</u>	<u>0.2403</u>	<u>0.2126</u>	<u>0.1857</u>	<u>0.576</u>
<u>6305</u>	<u>0.0847</u>	<u>0.0747</u>	<u>0.0652</u>	<u>0.583</u>	<u>6809</u>	<u>3.5552</u>	<u>3.2088</u>	<u>2.8710</u>	<u>0.570</u>
<u>6306</u>	<u>0.2826</u>	<u>0.2477</u>	<u>0.2133</u>	<u>0.569</u>	<u>6901</u>	<u>0.0163</u>	<u>0.0163</u>	<u>0.0162</u>	<u>0.746</u>
<u>6308</u>	<u>0.0487</u>	<u>0.0431</u>	<u>0.0377</u>	<u>0.517</u>	<u>6902</u>	<u>0.7168</u>	<u>0.6426</u>	<u>0.5749</u>	<u>0.424</u>
<u>6309</u>	<u>0.1628</u>	<u>0.1444</u>	<u>0.1268</u>	<u>0.559</u>	<u>6903</u>	<u>4.4373</u>	<u>4.0302</u>	<u>3.6662</u>	<u>0.346</u>
<u>6402</u>	<u>0.2362</u>	<u>0.2090</u>	<u>0.1826</u>	<u>0.584</u>	<u>6904</u>	<u>0.8093</u>	<u>0.7077</u>	<u>0.6084</u>	<u>0.488</u>
<u>6403</u>	<u>0.1282</u>	<u>0.1132</u>	<u>0.0988</u>	<u>0.594</u>	<u>6905</u>	<u>0.5985</u>	<u>0.5219</u>	<u>0.4455</u>	<u>0.532</u>
<u>6404</u>	<u>0.2781</u>	<u>0.2487</u>	<u>0.2215</u>	<u>0.550</u>	<u>6906</u>	<u>0.2374</u>	<u>0.2250</u>	<u>0.2172</u>	<u>0.639</u>
<u>6405</u>	<u>0.4849</u>	<u>0.4292</u>	<u>0.3755</u>	<u>0.506</u>	<u>6907</u>	<u>0.7639</u>	<u>0.6729</u>	<u>0.5848</u>	<u>0.556</u>
<u>6406</u>	<u>0.1275</u>	<u>0.1124</u>	<u>0.0978</u>	<u>0.588</u>	<u>6908</u>	<u>0.3027</u>	<u>0.2698</u>	<u>0.2383</u>	<u>0.495</u>
<u>6407</u>	<u>0.2436</u>	<u>0.2161</u>	<u>0.1897</u>	<u>0.538</u>	<u>6909</u>	<u>0.0974</u>	<u>0.0863</u>	<u>0.0757</u>	<u>0.549</u>
<u>6408</u>	<u>0.4453</u>	<u>0.3972</u>	<u>0.3514</u>	<u>0.486</u>	<u>7100</u>	<u>0.0176</u>	<u>0.0155</u>	<u>0.0132</u>	<u>0.546</u>
<u>6409</u>	<u>0.5315</u>	<u>0.4718</u>	<u>0.4149</u>	<u>0.493</u>	<u>7101</u>	<u>0.0190</u>	<u>0.0170</u>	<u>0.0151</u>	<u>0.457</u>
<u>6410</u>	<u>0.2735</u>	<u>0.2403</u>	<u>0.2079</u>	<u>0.547</u>	<u>7103</u>	<u>0.7345</u>	<u>0.6379</u>	<u>0.5426</u>	<u>0.524</u>

<u>Class</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>Primary Ratio</u>
<u>7104</u>	<u>0.0205</u>	<u>0.0182</u>	<u>0.0160</u>	<u>0.519</u>
<u>7105</u>	<u>0.0154</u>	<u>0.0136</u>	<u>0.0120</u>	<u>0.533</u>
<u>7106</u>	<u>0.2500</u>	<u>0.2191</u>	<u>0.1892</u>	<u>0.600</u>
<u>7107</u>	<u>0.2839</u>	<u>0.2532</u>	<u>0.2239</u>	<u>0.577</u>
<u>7108</u>	<u>0.1975</u>	<u>0.1735</u>	<u>0.1501</u>	<u>0.609</u>
<u>7109</u>	<u>0.0928</u>	<u>0.0825</u>	<u>0.0726</u>	<u>0.541</u>
<u>7110</u>	<u>0.3250</u>	<u>0.2932</u>	<u>0.2646</u>	<u>0.423</u>
<u>7111</u>	<u>0.2907</u>	<u>0.2544</u>	<u>0.2187</u>	<u>0.481</u>
<u>7112</u>	<u>0.6463</u>	<u>0.5740</u>	<u>0.5051</u>	<u>0.556</u>
<u>7113</u>	<u>0.3631</u>	<u>0.3220</u>	<u>0.2829</u>	<u>0.556</u>
<u>7114</u>	<u>0.6625</u>	<u>0.5837</u>	<u>0.5077</u>	<u>0.597</u>
<u>7115</u>	<u>0.4742</u>	<u>0.4214</u>	<u>0.3714</u>	<u>0.577</u>
<u>7116</u>	<u>0.3565</u>	<u>0.3207</u>	<u>0.2881</u>	<u>0.450</u>
<u>7117</u>	<u>1.0514</u>	<u>0.9386</u>	<u>0.8325</u>	<u>0.517</u>
<u>7118</u>	<u>1.4321</u>	<u>1.2732</u>	<u>1.1231</u>	<u>0.518</u>
<u>7119</u>	<u>1.3731</u>	<u>1.2056</u>	<u>1.0443</u>	<u>0.520</u>
<u>7120</u>	<u>4.7234</u>	<u>4.1252</u>	<u>3.5405</u>	<u>0.519</u>
<u>7121</u>	<u>5.3466</u>	<u>4.8456</u>	<u>4.3981</u>	<u>0.363</u>
<u>7122</u>	<u>0.3330</u>	<u>0.2988</u>	<u>0.2674</u>	<u>0.515</u>
<u>7200</u>	<u>1.4971</u>	<u>1.3085</u>	<u>1.1244</u>	<u>0.475</u>
<u>7201</u>	<u>1.2082</u>	<u>1.0547</u>	<u>0.9054</u>	<u>0.515</u>
<u>7202</u>	<u>0.0229</u>	<u>0.0203</u>	<u>0.0177</u>	<u>0.520</u>
<u>7203</u>	<u>0.0921</u>	<u>0.0837</u>	<u>0.0753</u>	<u>0.598</u>
<u>7204</u>	<u>0.0000</u>	<u>0.0000</u>	<u>0.0000</u>	<u>0.500</u>
<u>7205</u>	<u>0.0000</u>	<u>0.0000</u>	<u>0.0000</u>	<u>0.500</u>
<u>7301</u>	<u>0.5238</u>	<u>0.4764</u>	<u>0.4341</u>	<u>0.481</u>
<u>7302</u>	<u>0.7194</u>	<u>0.6527</u>	<u>0.5934</u>	<u>0.468</u>
<u>7307</u>	<u>0.4636</u>	<u>0.4093</u>	<u>0.3577</u>	<u>0.558</u>
<u>7308</u>	<u>0.2321</u>	<u>0.2086</u>	<u>0.1864</u>	<u>0.569</u>
<u>7309</u>	<u>0.2340</u>	<u>0.2075</u>	<u>0.1821</u>	<u>0.591</u>
<u>7400</u>	<u>1.7216</u>	<u>1.5048</u>	<u>1.2930</u>	<u>0.475</u>

<u>Class</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>Primary Ratio</u>
<u>541</u>	<u>0.0068</u>	<u>0.0061</u>	<u>0.0054</u>	<u>0.453</u>
<u>550</u>	<u>0.0271</u>	<u>0.0242</u>	<u>0.0217</u>	<u>0.415</u>
<u>551</u>	<u>0.0113</u>	<u>0.0102</u>	<u>0.0093</u>	<u>0.392</u>

AMENDATORY SECTION (Amending WSR 18-24-073, filed 11/30/18, effective 1/1/19)

WAC 296-17-890 Table IV.

**Maximum Experience Modifications
For Firms with No Compensable Accidents:
Effective January 1, ((2019)) 2020**

<u>Expected Loss Range</u>	<u>Maximum Experience Modification</u>
((4 - 5,520	0.90
5,521 - 6,740	0.89
6,741 - 7,434	0.88
7,435 - 8,128	0.87
8,129 - 8,822	0.86
8,823 - 9,516	0.85
9,517 - 10,210	0.84
10,211 - 10,904	0.83
10,905 - 11,598	0.82
11,599 - 12,314	0.81
12,315 - 13,061	0.80
13,062 - 13,838	0.79
13,839 - 14,644	0.78
14,645 - 15,481	0.77
15,482 - 16,347	0.76
16,348 - 17,243	0.75
17,244 - 18,170	0.74
18,171 - 19,126	0.73
19,127 - 20,112	0.72
20,113 - 21,128	0.71
21,129 - 22,174	0.70
22,175 - 23,249	0.69
23,250 - 24,355	0.68
24,356 - 25,491	0.67
25,492 - 26,657	0.66
26,658 - 27,852	0.65
27,853 - 29,645	0.64
29,646 - 32,335	0.63
32,336 - 36,370	0.62
36,371 - 42,423	0.61
42,424 and higher	0.60))

**Expected Loss Rates in Dollars Per Sq. Ft.
of Wallboard Installed**

<u>Class</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>Primary Ratio</u>
<u>0540</u>	<u>0.0191</u>	<u>0.0168</u>	<u>0.0135</u>	<u>0.439</u>
<u>0541</u>	<u>0.0077</u>	<u>0.0067</u>	<u>0.0055</u>	<u>0.460</u>
<u>0550</u>	<u>0.0291</u>	<u>0.0254</u>	<u>0.0205</u>	<u>0.412</u>
<u>0551</u>	<u>0.0127</u>	<u>0.0112</u>	<u>0.0090</u>	<u>0.400))</u>

<u>Class</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>Primary Ratio</u>
<u>540</u>	<u>0.0173</u>	<u>0.0155</u>	<u>0.0137</u>	<u>0.458</u>

Expected Loss Range		Maximum Experience Modification	Base Rates Effective January 1, ((2019)) 2020			
			Class	Accident Fund	Stay at Work	Medical Aid Fund
<u>1</u>	=	<u>5.410</u>				
<u>5.411</u>	=	<u>6.605</u>				
<u>6.606</u>	=	<u>7.285</u>	103	2.0919	0.0302	1.0231
<u>7.286</u>	=	<u>7.965</u>	104	1.3892	0.0201	0.6059
<u>7.966</u>	=	<u>8.646</u>	105	1.4318	0.0205	0.8635
<u>8.647</u>	=	<u>9.326</u>	106	3.5957	0.0516	1.9986
<u>9.327</u>	=	<u>10.006</u>	107	1.5485	0.0226	0.5819
<u>10.007</u>	=	<u>10.686</u>	108	1.3892	0.0201	0.6059
<u>10.687</u>	=	<u>11.366</u>	112	0.9820	0.0141	0.5165
<u>11.367</u>	=	<u>12.070</u>	201	2.6488	0.0387	0.8894
<u>12.071</u>	=	<u>12.803</u>	202	3.5049	0.0511	1.2625
<u>12.804</u>	=	<u>13.565</u>	210	1.1804	0.0171	0.5099
<u>13.566</u>	=	<u>14.356</u>	212	1.5704	0.0228	0.6147
<u>14.357</u>	=	<u>15.177</u>	214	2.2702	0.0331	0.8068
<u>15.178</u>	=	<u>16.026</u>	217	1.7453	0.0252	0.8573
<u>16.027</u>	=	<u>16.905</u>	219	1.4411	0.0210	0.5401
<u>16.906</u>	=	<u>17.813</u>	301	1.0307	0.0147	0.6741
<u>17.814</u>	=	<u>18.751</u>	302	3.2940	0.0482	1.0582
<u>18.752</u>	=	<u>19.717</u>	303	3.0785	0.0447	1.2339
<u>19.718</u>	=	<u>20.713</u>	306	1.1483	0.0166	0.5096
<u>20.714</u>	=	<u>21.738</u>	307	1.2493	0.0181	0.5851
<u>21.739</u>	=	<u>22.792</u>	308	0.7056	0.0100	0.5133
<u>22.793</u>	=	<u>23.875</u>	403	2.5748	0.0371	1.3175
<u>23.876</u>	=	<u>24.988</u>	502	1.7616	0.0256	0.7104
<u>24.989</u>	=	<u>26.130</u>	504	2.8685	0.0413	1.4637
<u>26.131</u>	=	<u>27.301</u>	507	3.8754	0.0554	2.3974
<u>27.302</u>	=	<u>29.057</u>	508	1.9789	0.0289	0.7110
<u>29.058</u>	=	<u>31.692</u>	509	1.4534	0.0213	0.4576
<u>31.693</u>	=	<u>35.644</u>	510	3.1185	0.0448	1.7019
<u>35.645</u>	=	<u>41.572</u>	511	2.1777	0.0316	0.9172
<u>41.573</u>	and higher	<u>0.60</u>	512	1.7039	0.0245	0.8826
			513	1.2157	0.0176	0.5875
			514	1.9156	0.0276	1.0069
			516	1.9240	0.0277	0.9643
			517	2.6371	0.0380	1.3025
			518	1.6675	0.0242	0.7124
			519	1.8589	0.0269	0.8183
			521	0.6041	0.0086	0.3859
			601	0.6700	0.0097	0.3297
			602	1.1660	0.0171	0.3454
			603	0.9703	0.0141	0.3670
			604	1.4577	0.0210	0.7867

AMENDATORY SECTION (Amending WSR 18-24-073, filed 11/30/18, effective 1/1/19)

WAC 296-17-895 Industrial insurance accident fund base rates, stay at work and medical aid base rates by class of industry. Industrial insurance accident fund, stay at work and medical aid fund base rates by class of industry shall be as set forth below.

Class	Base Rates Effective January 1, ((2019)) 2020		
	Accident Fund	Stay at Work	Medical Aid Fund
((101	1.5016	0.0218	0.6002

Base Rates Effective January 1, ((2019)) 2020				Base Rates Effective January 1, ((2019)) 2020			
Class	Accident Fund	Stay at Work	Medical Aid Fund	Class	Accident Fund	Stay at Work	Medical Aid Fund
606	0.6662	0.0095	0.4110	2009	0.4623	0.0066	0.3319
607	1.0228	0.0148	0.4967	2101	0.6972	0.0098	0.5303
608	0.5650	0.0082	0.2361	2102	0.9424	0.0135	0.5299
701	2.8875	0.0426	0.6492	2104	0.3494	0.0048	0.3910
803	0.7334	0.0106	0.3773	2105	0.8327	0.0119	0.4784
901	1.6675	0.0242	0.7124	2106	0.6047	0.0086	0.4029
1002	1.1885	0.0172	0.5788	2201	0.3438	0.0049	0.2378
1003	0.9388	0.0135	0.4912	2202	0.8926	0.0128	0.4805
1004	0.6537	0.0095	0.2662	2203	0.5926	0.0084	0.4470
1005	12.2018	0.1773	4.9640	2204	0.3438	0.0049	0.2378
1006	0.2563	0.0037	0.1495	2401	0.6175	0.0089	0.2788
1007	0.4156	0.0060	0.1906	2903	0.8368	0.0118	0.6387
1101	1.4340	0.0207	0.7365	2904	0.9992	0.0144	0.4956
1102	2.4357	0.0355	0.9163	2905	0.6137	0.0088	0.3877
1103	1.4763	0.0213	0.7416	2906	0.5574	0.0079	0.4337
1104	0.8289	0.0118	0.5224	2907	0.5779	0.0082	0.3853
1105	1.0840	0.0156	0.5432	2908	1.2457	0.0176	0.9396
1106	0.3998	0.0056	0.3062	2909	0.4744	0.0067	0.3693
1108	0.6309	0.0090	0.4058	3101	1.0485	0.0151	0.5610
1109	1.9664	0.0283	1.0473	3102	0.4866	0.0070	0.2276
1301	0.8432	0.0122	0.3795	3103	0.5644	0.0081	0.3191
1303	0.4626	0.0066	0.2568	3104	0.8420	0.0121	0.4873
1304	0.0298	0.0004	0.0151	3105	0.8962	0.0127	0.6745
1305	0.6793	0.0098	0.3216	3303	0.4915	0.0070	0.3077
1401	0.2773	0.0039	0.2530	3304	0.7069	0.0100	0.5610
1404	0.9411	0.0135	0.5418	3309	0.5560	0.0079	0.3445
1405	0.9450	0.0136	0.5283	3402	0.6384	0.0091	0.3757
1407	0.6921	0.0099	0.4435	3403	0.2273	0.0033	0.1265
1501	1.1171	0.0162	0.4929	3404	0.5733	0.0082	0.3642
1507	0.7015	0.0100	0.4375	3405	0.4123	0.0059	0.2446
1701	1.0130	0.0146	0.4769	3406	0.3374	0.0048	0.2421
1702	2.4927	0.0365	0.7647	3407	1.0535	0.0152	0.4932
1703	1.4341	0.0209	0.4865	3408	0.2774	0.0040	0.1582
1704	1.0130	0.0146	0.4769	3409	0.1785	0.0025	0.1317
1801	0.6222	0.0090	0.2815	3410	0.1966	0.0028	0.1495
1802	1.0043	0.0144	0.5320	3411	0.7514	0.0109	0.3522
2002	1.1916	0.0171	0.6379	3412	0.9471	0.0137	0.3938
2004	0.7065	0.0101	0.4451	3414	0.9870	0.0142	0.5250
2007	0.9000	0.0128	0.6007	3415	1.0736	0.0155	0.5630
2008	0.4662	0.0067	0.2857	3501	1.4025	0.0201	0.8058

Base Rates Effective January 1, ((2019)) 2020				Base Rates Effective January 1, ((2019)) 2020			
Class	Accident Fund	Stay at Work	Medical Aid Fund	Class	Accident Fund	Stay at Work	Medical Aid Fund
3503	0.3743	0.0053	0.2812	4804	0.6531	0.0091	0.5686
3506	1.1159	0.0161	0.5543	4805	0.4648	0.0065	0.3711
3509	0.4641	0.0066	0.3275	4806	0.1114	0.0015	0.1173
3510	0.4401	0.0062	0.3132	4808	0.5929	0.0084	0.3870
3511	0.9651	0.0138	0.5737	4809	0.4093	0.0058	0.3190
3512	0.4604	0.0065	0.3496	4810	0.2418	0.0034	0.2224
3513	0.6043	0.0085	0.4788	4811	0.4701	0.0065	0.4785
3602	0.1174	0.0017	0.0768	4812	0.5644	0.0080	0.3923
3603	0.6897	0.0098	0.4665	4813	0.2234	0.0031	0.2459
3604	0.8958	0.0127	0.6206	4814	0.1247	0.0017	0.1519
3605	0.7184	0.0103	0.3830	4815	0.2313	0.0031	0.3166
3701	0.4866	0.0070	0.2276	4816	0.3728	0.0051	0.4234
3702	0.5466	0.0078	0.3451	4900	0.2023	0.0029	0.0801
3708	0.8811	0.0126	0.5193	4901	0.0599	0.0009	0.0290
3802	0.2453	0.0035	0.1761	4902	0.1258	0.0018	0.0802
3808	0.5754	0.0083	0.2877	4903	0.2079	0.0030	0.1309
3901	0.1560	0.0022	0.1391	4904	0.0221	0.0003	0.0160
3902	0.5917	0.0084	0.4391	4905	0.4308	0.0060	0.4191
3903	1.2908	0.0182	1.0023	4906	0.1459	0.0021	0.0816
3905	0.1394	0.0019	0.1315	4907	0.0764	0.0011	0.0685
3906	0.5856	0.0083	0.4307	4908	0.1122	0.0016	0.0989
3909	0.3224	0.0045	0.2707	4909	0.0463	0.0006	0.0517
4101	0.3534	0.0051	0.2080	4910	0.6344	0.0091	0.3739
4103	0.7004	0.0100	0.4460	4911	0.0789	0.0011	0.0468
4107	0.2593	0.0037	0.1450	5001	10.9970	0.1592	4.9292
4108	0.1984	0.0028	0.1341	5002	0.8109	0.0117	0.4437
4109	0.2472	0.0035	0.1934	5003	3.0397	0.0443	1.1514
4201	1.1717	0.0171	0.4353	5004	1.0444	0.0149	0.6621
4301	0.9561	0.0134	0.7800	5005	1.2032	0.0174	0.5237
4302	1.0243	0.0145	0.7122	5006	1.9702	0.0287	0.7225
4304	1.1381	0.0159	1.0057	5101	1.4437	0.0210	0.5953
4305	1.7625	0.0256	0.7440	5103	0.9793	0.0139	0.7232
4401	0.5296	0.0075	0.3963	5106	0.9793	0.0139	0.7232
4402	0.9235	0.0132	0.5448	5108	1.0468	0.0150	0.5948
4404	0.5740	0.0082	0.3718	5109	0.8801	0.0128	0.3804
4501	0.2101	0.0030	0.1535	5201	0.4182	0.0060	0.2433
4502	0.0807	0.0012	0.0497	5204	1.3891	0.0202	0.5821
4504	0.1383	0.0019	0.1094	5206	0.6182	0.0089	0.3117
4802	0.4429	0.0062	0.3640	5207	0.1829	0.0026	0.1518
4803	0.3564	0.0049	0.3733	5208	0.9010	0.0129	0.5457

Base Rates Effective January 1, ((2019)) 2020				Base Rates Effective January 1, ((2019)) 2020			
Class	Accident Fund	Stay at Work	Medical Aid Fund	Class	Accident Fund	Stay at Work	Medical Aid Fund
5209	0.8604	0.0124	0.4503	6410	0.4217	0.0060	0.2438
5300	0.1219	0.0017	0.0792	6411	0.0761	0.0011	0.0611
5301	0.0448	0.0006	0.0262	6501	0.1298	0.0019	0.0818
5302	0.0132	0.0002	0.0073	6502	0.0373	0.0005	0.0238
5305	0.0645	0.0009	0.0425	6503	0.1081	0.0016	0.0564
5306	0.0532	0.0008	0.0409	6504	0.3735	0.0052	0.3576
5307	0.9377	0.0136	0.4219	6505	0.1629	0.0022	0.1715
5308	0.1095	0.0015	0.0832	6506	0.1660	0.0024	0.1192
6103	0.1052	0.0015	0.0933	6509	0.3234	0.0045	0.2779
6104	0.5486	0.0078	0.3633	6510	0.6680	0.0097	0.3007
6105	0.5992	0.0086	0.3046	6511	0.3490	0.0049	0.2692
6107	0.1466	0.0020	0.1660	6512	0.1239	0.0018	0.0684
6108	0.3923	0.0055	0.3226	6601	0.2341	0.0033	0.1673
6109	0.1569	0.0023	0.0786	6602	0.6506	0.0092	0.5265
6110	0.7116	0.0102	0.3952	6603	0.3912	0.0056	0.2324
6120	0.4286	0.0062	0.2339	6604	0.1062	0.0015	0.0767
6121	0.4734	0.0068	0.2320	6605	0.3405	0.0049	0.2171
6201	0.5513	0.0079	0.2934	6607	0.1511	0.0021	0.1136
6202	1.0078	0.0144	0.5965	6608	0.9453	0.0138	0.2969
6203	0.1147	0.0016	0.1364	6620	4.3208	0.0621	2.3222
6204	0.1656	0.0023	0.1271	6704	0.1559	0.0022	0.1093
6205	0.2428	0.0034	0.1789	6705	0.7418	0.0103	0.7073
6206	0.2368	0.0034	0.1731	6706	0.3074	0.0043	0.2464
6207	1.4349	0.0204	0.9866	6707	12.2291	0.1710	10.7834
6208	0.2717	0.0038	0.2535	6708	9.0596	0.1238	10.5073
6209	0.3281	0.0046	0.2948	6709	0.3070	0.0043	0.2398
6301	0.1767	0.0026	0.0772	6801	1.1649	0.0170	0.3806
6303	0.0766	0.0011	0.0452	6802	1.0784	0.0154	0.6287
6305	0.1135	0.0016	0.0908	6803	1.0463	0.0154	0.2713
6306	0.4254	0.0061	0.2543	6804	0.3576	0.0051	0.2651
6308	0.0801	0.0011	0.0464	6809	5.3182	0.0735	5.4676
6309	0.2398	0.0034	0.1768	6901	0.0000	0.0000	0.0590
6402	0.3019	0.0042	0.2486	6902	1.3180	0.0191	0.6181
6403	0.1866	0.0026	0.1445	6903	9.5845	0.1392	3.9507
6404	0.3561	0.0050	0.2965	6904	1.6496	0.0240	0.6278
6405	0.7502	0.0108	0.4168	6905	1.1174	0.0162	0.4781
6406	0.1704	0.0024	0.1307	6906	0.0000	0.0000	0.4521
6407	0.3416	0.0048	0.2393	6907	1.2181	0.0174	0.7544
6408	0.7010	0.0101	0.4003	6908	0.5008	0.0072	0.2956
6409	0.9059	0.0130	0.4860	6909	0.1529	0.0022	0.1033

Base Rates Effective January 1, ((2019)) 2020				Base Rates Effective January 1, ((2019)) 2020			
Class	Accident Fund	Stay at Work	Medical Aid Fund	Class	Accident Fund	Stay at Work	Medical Aid Fund
7100	0.0411	0.0006	0.0267	108	1.2604	0.0195	0.5415
7101	0.0357	0.0005	0.0182	112	0.9017	0.0138	0.4801
7103	1.2786	0.0186	0.5242	201	2.9172	0.0454	0.9669
7104	0.0337	0.0005	0.0217	202	3.0964	0.0482	1.0492
7105	0.0248	0.0004	0.0159	210	1.1673	0.0180	0.4971
7106	0.3300	0.0047	0.2474	212	1.2531	0.0194	0.5283
7107	0.3097	0.0043	0.3166	214	2.2923	0.0356	0.8312
7108	0.2293	0.0032	0.1820	217	1.5613	0.0240	0.7752
7109	0.1455	0.0021	0.1044	219	1.2500	0.0193	0.5074
7110	0.4996	0.0072	0.2881	301	1.0292	0.0156	0.6647
7111	0.5866	0.0085	0.2276	302	3.0488	0.0475	1.0082
7112	1.0276	0.0145	0.7606	303	2.6462	0.0409	1.1352
7113	0.4894	0.0069	0.3769	306	1.0127	0.0156	0.4674
7114	0.8853	0.0125	0.7165	307	1.1142	0.0171	0.5669
7115	0.6155	0.0086	0.5105	308	0.6691	0.0101	0.4826
7116	0.6020	0.0086	0.3613	403	2.3195	0.0356	1.1963
7117	1.6310	0.0232	1.0962	502	1.4215	0.0220	0.5891
7118	2.1539	0.0308	1.3329	504	2.4344	0.0373	1.3043
7119	2.1123	0.0304	1.1251	507	3.6057	0.0549	2.1769
7120	7.8824	0.1128	4.7317	508	1.8655	0.0290	0.6737
7121	7.2755	0.1041	4.3794	509	1.3904	0.0217	0.4198
7122	0.4736	0.0067	0.3395	510	2.9710	0.0454	1.6554
7200	2.4920	0.0363	0.9706	511	1.9568	0.0302	0.8544
7201	2.1380	0.0310	0.9560	512	1.5863	0.0243	0.8749
7202	0.0376	0.0005	0.0219	513	1.1969	0.0184	0.5770
7203	0.1198	0.0016	0.1485	514	1.6711	0.0256	0.9076
7204	0.0000	0.0000	0.0000	516	1.8572	0.0285	0.9385
7205	0.0000	0.0000	0.0000	517	2.4678	0.0380	1.1883
7301	0.6481	0.0091	0.5379	518	1.5782	0.0243	0.7018
7302	1.1060	0.0157	0.7676	519	1.6514	0.0254	0.7687
7307	0.5980	0.0085	0.4263	521	0.6497	0.0099	0.4132
7308	0.2933	0.0041	0.2857	601	0.6538	0.0101	0.3184
7309	0.3095	0.0043	0.2614	602	1.0440	0.0163	0.3127
7400	2.8658	0.0417	1.1163))	603	1.0483	0.0163	0.3707
101	1.3901	0.0215	0.5632	604	1.3866	0.0212	0.7452
103	1.8152	0.0279	0.9236	606	0.6672	0.0102	0.4000
104	1.2604	0.0195	0.5415	607	0.9750	0.0150	0.4534
105	1.2880	0.0196	0.8017	608	0.6198	0.0096	0.2319
106	3.3331	0.0507	2.0099	701	2.9172	0.0454	0.9669
107	1.4172	0.0219	0.5720	803	0.7544	0.0116	0.3832

Base Rates Effective January 1, (2019) 2020				Base Rates Effective January 1, (2019) 2020			
Class	Accident Fund	Stay at Work	Medical Aid Fund	Class	Accident Fund	Stay at Work	Medical Aid Fund
<u>901</u>	<u>1.5782</u>	<u>0.0243</u>	<u>0.7018</u>	<u>2106</u>	<u>0.6293</u>	<u>0.0095</u>	<u>0.4255</u>
<u>1002</u>	<u>1.1569</u>	<u>0.0178</u>	<u>0.5510</u>	<u>2201</u>	<u>0.3601</u>	<u>0.0054</u>	<u>0.2514</u>
<u>1003</u>	<u>0.8998</u>	<u>0.0138</u>	<u>0.4696</u>	<u>2202</u>	<u>0.7884</u>	<u>0.0120</u>	<u>0.4422</u>
<u>1004</u>	<u>0.6130</u>	<u>0.0095</u>	<u>0.2480</u>	<u>2203</u>	<u>0.5796</u>	<u>0.0087</u>	<u>0.4391</u>
<u>1005</u>	<u>11.8215</u>	<u>0.1830</u>	<u>4.8087</u>	<u>2204</u>	<u>0.3601</u>	<u>0.0054</u>	<u>0.2514</u>
<u>1006</u>	<u>0.2582</u>	<u>0.0039</u>	<u>0.1505</u>	<u>2401</u>	<u>0.6506</u>	<u>0.0100</u>	<u>0.2806</u>
<u>1007</u>	<u>0.3900</u>	<u>0.0060</u>	<u>0.1912</u>	<u>2903</u>	<u>0.7856</u>	<u>0.0118</u>	<u>0.6281</u>
<u>1101</u>	<u>1.4194</u>	<u>0.0218</u>	<u>0.7283</u>	<u>2904</u>	<u>0.9950</u>	<u>0.0153</u>	<u>0.5089</u>
<u>1102</u>	<u>2.4542</u>	<u>0.0381</u>	<u>0.9397</u>	<u>2905</u>	<u>0.5653</u>	<u>0.0086</u>	<u>0.3696</u>
<u>1103</u>	<u>1.4002</u>	<u>0.0216</u>	<u>0.6559</u>	<u>2906</u>	<u>0.5722</u>	<u>0.0086</u>	<u>0.4623</u>
<u>1104</u>	<u>0.7574</u>	<u>0.0115</u>	<u>0.4848</u>	<u>2907</u>	<u>0.5709</u>	<u>0.0086</u>	<u>0.3926</u>
<u>1105</u>	<u>0.9559</u>	<u>0.0147</u>	<u>0.4765</u>	<u>2908</u>	<u>1.1826</u>	<u>0.0178</u>	<u>0.8704</u>
<u>1106</u>	<u>0.3909</u>	<u>0.0059</u>	<u>0.3031</u>	<u>2909</u>	<u>0.4608</u>	<u>0.0069</u>	<u>0.3789</u>
<u>1108</u>	<u>0.5600</u>	<u>0.0085</u>	<u>0.3779</u>	<u>3101</u>	<u>1.0410</u>	<u>0.0160</u>	<u>0.5449</u>
<u>1109</u>	<u>2.0853</u>	<u>0.0320</u>	<u>1.0587</u>	<u>3102</u>	<u>0.4766</u>	<u>0.0073</u>	<u>0.2167</u>
<u>1301</u>	<u>0.8327</u>	<u>0.0128</u>	<u>0.3889</u>	<u>3103</u>	<u>0.5209</u>	<u>0.0080</u>	<u>0.2957</u>
<u>1303</u>	<u>0.4696</u>	<u>0.0072</u>	<u>0.2558</u>	<u>3104</u>	<u>0.7865</u>	<u>0.0120</u>	<u>0.4881</u>
<u>1304</u>	<u>0.0276</u>	<u>0.0004</u>	<u>0.0140</u>	<u>3105</u>	<u>0.9272</u>	<u>0.0139</u>	<u>0.7000</u>
<u>1305</u>	<u>0.6859</u>	<u>0.0106</u>	<u>0.3195</u>	<u>3303</u>	<u>0.4564</u>	<u>0.0069</u>	<u>0.2946</u>
<u>1401</u>	<u>0.2674</u>	<u>0.0040</u>	<u>0.2479</u>	<u>3304</u>	<u>0.7183</u>	<u>0.0108</u>	<u>0.5462</u>
<u>1404</u>	<u>0.8970</u>	<u>0.0137</u>	<u>0.5108</u>	<u>3309</u>	<u>0.5217</u>	<u>0.0079</u>	<u>0.3405</u>
<u>1405</u>	<u>0.9094</u>	<u>0.0139</u>	<u>0.4886</u>	<u>3402</u>	<u>0.6173</u>	<u>0.0094</u>	<u>0.3702</u>
<u>1407</u>	<u>0.6940</u>	<u>0.0105</u>	<u>0.4395</u>	<u>3403</u>	<u>0.2039</u>	<u>0.0031</u>	<u>0.1142</u>
<u>1501</u>	<u>1.0955</u>	<u>0.0169</u>	<u>0.4840</u>	<u>3404</u>	<u>0.5438</u>	<u>0.0083</u>	<u>0.3440</u>
<u>1507</u>	<u>0.6377</u>	<u>0.0097</u>	<u>0.3929</u>	<u>3405</u>	<u>0.3803</u>	<u>0.0058</u>	<u>0.2260</u>
<u>1701</u>	<u>1.0276</u>	<u>0.0158</u>	<u>0.4808</u>	<u>3406</u>	<u>0.3218</u>	<u>0.0049</u>	<u>0.2253</u>
<u>1702</u>	<u>2.2424</u>	<u>0.0350</u>	<u>0.6752</u>	<u>3407</u>	<u>1.0084</u>	<u>0.0155</u>	<u>0.4910</u>
<u>1703</u>	<u>1.3329</u>	<u>0.0207</u>	<u>0.4779</u>	<u>3408</u>	<u>0.2877</u>	<u>0.0044</u>	<u>0.1569</u>
<u>1704</u>	<u>1.0276</u>	<u>0.0158</u>	<u>0.4808</u>	<u>3409</u>	<u>0.1952</u>	<u>0.0029</u>	<u>0.1449</u>
<u>1801</u>	<u>0.6292</u>	<u>0.0097</u>	<u>0.2741</u>	<u>3410</u>	<u>0.1952</u>	<u>0.0029</u>	<u>0.1449</u>
<u>1802</u>	<u>1.0067</u>	<u>0.0155</u>	<u>0.4386</u>	<u>3411</u>	<u>0.7557</u>	<u>0.0116</u>	<u>0.3468</u>
<u>2002</u>	<u>1.0594</u>	<u>0.0162</u>	<u>0.6050</u>	<u>3412</u>	<u>0.8966</u>	<u>0.0139</u>	<u>0.3769</u>
<u>2004</u>	<u>0.7129</u>	<u>0.0109</u>	<u>0.4301</u>	<u>3414</u>	<u>0.9636</u>	<u>0.0148</u>	<u>0.4915</u>
<u>2007</u>	<u>0.9299</u>	<u>0.0141</u>	<u>0.5727</u>	<u>3415</u>	<u>1.0746</u>	<u>0.0165</u>	<u>0.5717</u>
<u>2008</u>	<u>0.4103</u>	<u>0.0062</u>	<u>0.3041</u>	<u>3501</u>	<u>0.6212</u>	<u>0.0093</u>	<u>0.4691</u>
<u>2009</u>	<u>0.4504</u>	<u>0.0068</u>	<u>0.3254</u>	<u>3503</u>	<u>0.3821</u>	<u>0.0058</u>	<u>0.2660</u>
<u>2101</u>	<u>0.6980</u>	<u>0.0105</u>	<u>0.5359</u>	<u>3506</u>	<u>1.1751</u>	<u>0.0181</u>	<u>0.5804</u>
<u>2102</u>	<u>1.1289</u>	<u>0.0173</u>	<u>0.6211</u>	<u>3509</u>	<u>0.4887</u>	<u>0.0074</u>	<u>0.3329</u>
<u>2104</u>	<u>0.3565</u>	<u>0.0052</u>	<u>0.3915</u>	<u>3510</u>	<u>0.4310</u>	<u>0.0065</u>	<u>0.3101</u>
<u>2105</u>	<u>0.7864</u>	<u>0.0120</u>	<u>0.4385</u>	<u>3511</u>	<u>0.9656</u>	<u>0.0147</u>	<u>0.5936</u>

Base Rates Effective January 1, (2019) 2020				Base Rates Effective January 1, (2019) 2020			
Class	Accident Fund	Stay at Work	Medical Aid Fund	Class	Accident Fund	Stay at Work	Medical Aid Fund
<u>3512</u>	<u>0.4205</u>	<u>0.0063</u>	<u>0.3363</u>	<u>4810</u>	<u>0.2400</u>	<u>0.0036</u>	<u>0.2197</u>
<u>3513</u>	<u>0.5449</u>	<u>0.0082</u>	<u>0.4383</u>	<u>4811</u>	<u>0.5099</u>	<u>0.0075</u>	<u>0.5040</u>
<u>3602</u>	<u>0.1201</u>	<u>0.0018</u>	<u>0.0788</u>	<u>4812</u>	<u>0.5766</u>	<u>0.0087</u>	<u>0.3856</u>
<u>3603</u>	<u>0.6674</u>	<u>0.0101</u>	<u>0.4360</u>	<u>4813</u>	<u>0.2261</u>	<u>0.0033</u>	<u>0.2387</u>
<u>3604</u>	<u>0.8870</u>	<u>0.0134</u>	<u>0.6024</u>	<u>4900</u>	<u>0.1693</u>	<u>0.0026</u>	<u>0.0732</u>
<u>3605</u>	<u>0.6173</u>	<u>0.0094</u>	<u>0.3702</u>	<u>4901</u>	<u>0.0561</u>	<u>0.0009</u>	<u>0.0277</u>
<u>3701</u>	<u>0.4766</u>	<u>0.0073</u>	<u>0.2167</u>	<u>4902</u>	<u>0.1175</u>	<u>0.0018</u>	<u>0.0733</u>
<u>3702</u>	<u>0.4950</u>	<u>0.0075</u>	<u>0.3164</u>	<u>4903</u>	<u>0.2086</u>	<u>0.0032</u>	<u>0.1219</u>
<u>3708</u>	<u>0.7861</u>	<u>0.0120</u>	<u>0.4780</u>	<u>4904</u>	<u>0.0202</u>	<u>0.0003</u>	<u>0.0146</u>
<u>3802</u>	<u>0.2485</u>	<u>0.0038</u>	<u>0.1724</u>	<u>4905</u>	<u>0.4132</u>	<u>0.0061</u>	<u>0.3901</u>
<u>3808</u>	<u>0.5443</u>	<u>0.0083</u>	<u>0.2870</u>	<u>4906</u>	<u>0.1409</u>	<u>0.0022</u>	<u>0.0792</u>
<u>3901</u>	<u>0.1563</u>	<u>0.0023</u>	<u>0.1390</u>	<u>4907</u>	<u>0.0697</u>	<u>0.0010</u>	<u>0.0663</u>
<u>3902</u>	<u>0.5874</u>	<u>0.0089</u>	<u>0.4158</u>	<u>4908</u>	<u>0.1064</u>	<u>0.0016</u>	<u>0.0981</u>
<u>3903</u>	<u>0.4581</u>	<u>0.0069</u>	<u>0.3244</u>	<u>4909</u>	<u>0.0425</u>	<u>0.0006</u>	<u>0.0393</u>
<u>3905</u>	<u>0.1389</u>	<u>0.0021</u>	<u>0.1284</u>	<u>4910</u>	<u>0.6030</u>	<u>0.0092</u>	<u>0.3539</u>
<u>3906</u>	<u>0.5627</u>	<u>0.0085</u>	<u>0.4244</u>	<u>4911</u>	<u>0.0756</u>	<u>0.0012</u>	<u>0.0436</u>
<u>3909</u>	<u>0.3112</u>	<u>0.0046</u>	<u>0.2554</u>	<u>5001</u>	<u>11.0596</u>	<u>0.1704</u>	<u>5.0996</u>
<u>4101</u>	<u>0.3165</u>	<u>0.0048</u>	<u>0.1933</u>	<u>5002</u>	<u>0.7774</u>	<u>0.0119</u>	<u>0.4254</u>
<u>4103</u>	<u>0.6724</u>	<u>0.0102</u>	<u>0.4468</u>	<u>5003</u>	<u>3.1027</u>	<u>0.0482</u>	<u>1.1600</u>
<u>4107</u>	<u>0.2666</u>	<u>0.0041</u>	<u>0.1421</u>	<u>5004</u>	<u>1.1043</u>	<u>0.0167</u>	<u>0.7426</u>
<u>4108</u>	<u>0.1818</u>	<u>0.0027</u>	<u>0.1256</u>	<u>5005</u>	<u>1.2580</u>	<u>0.0195</u>	<u>0.5033</u>
<u>4109</u>	<u>0.2388</u>	<u>0.0036</u>	<u>0.2047</u>	<u>5006</u>	<u>1.8128</u>	<u>0.0281</u>	<u>0.6694</u>
<u>4201</u>	<u>1.2808</u>	<u>0.0199</u>	<u>0.4475</u>	<u>5101</u>	<u>1.3689</u>	<u>0.0212</u>	<u>0.5588</u>
<u>4301</u>	<u>0.9879</u>	<u>0.0148</u>	<u>0.8146</u>	<u>5103</u>	<u>0.9599</u>	<u>0.0145</u>	<u>0.6812</u>
<u>4302</u>	<u>0.9696</u>	<u>0.0147</u>	<u>0.6445</u>	<u>5106</u>	<u>0.9599</u>	<u>0.0145</u>	<u>0.6812</u>
<u>4304</u>	<u>1.1233</u>	<u>0.0167</u>	<u>1.0208</u>	<u>5108</u>	<u>1.0030</u>	<u>0.0153</u>	<u>0.5686</u>
<u>4305</u>	<u>1.5970</u>	<u>0.0246</u>	<u>0.7116</u>	<u>5109</u>	<u>0.7821</u>	<u>0.0120</u>	<u>0.3643</u>
<u>4401</u>	<u>0.4564</u>	<u>0.0069</u>	<u>0.2946</u>	<u>5201</u>	<u>0.3923</u>	<u>0.0060</u>	<u>0.2382</u>
<u>4402</u>	<u>0.8865</u>	<u>0.0135</u>	<u>0.5055</u>	<u>5204</u>	<u>1.3907</u>	<u>0.0215</u>	<u>0.5568</u>
<u>4404</u>	<u>0.5360</u>	<u>0.0081</u>	<u>0.3559</u>	<u>5206</u>	<u>0.5994</u>	<u>0.0092</u>	<u>0.3085</u>
<u>4501</u>	<u>0.2021</u>	<u>0.0030</u>	<u>0.1485</u>	<u>5207</u>	<u>0.1755</u>	<u>0.0026</u>	<u>0.1432</u>
<u>4502</u>	<u>0.0808</u>	<u>0.0012</u>	<u>0.0490</u>	<u>5208</u>	<u>0.8969</u>	<u>0.0137</u>	<u>0.5358</u>
<u>4504</u>	<u>0.1371</u>	<u>0.0021</u>	<u>0.1077</u>	<u>5209</u>	<u>0.8396</u>	<u>0.0129</u>	<u>0.4292</u>
<u>4802</u>	<u>0.4599</u>	<u>0.0069</u>	<u>0.3647</u>	<u>5300</u>	<u>0.1246</u>	<u>0.0019</u>	<u>0.0768</u>
<u>4803</u>	<u>0.3886</u>	<u>0.0057</u>	<u>0.3777</u>	<u>5301</u>	<u>0.0455</u>	<u>0.0007</u>	<u>0.0268</u>
<u>4804</u>	<u>0.6422</u>	<u>0.0096</u>	<u>0.5532</u>	<u>5302</u>	<u>0.0120</u>	<u>0.0002</u>	<u>0.0068</u>
<u>4805</u>	<u>0.4509</u>	<u>0.0067</u>	<u>0.3619</u>	<u>5305</u>	<u>0.0594</u>	<u>0.0009</u>	<u>0.0388</u>
<u>4806</u>	<u>0.1077</u>	<u>0.0016</u>	<u>0.1143</u>	<u>5306</u>	<u>0.0487</u>	<u>0.0007</u>	<u>0.0384</u>
<u>4808</u>	<u>0.6033</u>	<u>0.0092</u>	<u>0.3862</u>	<u>5307</u>	<u>0.9650</u>	<u>0.0149</u>	<u>0.4350</u>
<u>4809</u>	<u>0.3873</u>	<u>0.0058</u>	<u>0.2785</u>	<u>5308</u>	<u>0.1081</u>	<u>0.0016</u>	<u>0.0828</u>

Base Rates Effective January 1, ((2019)) 2020				Base Rates Effective January 1, ((2019)) 2020			
Class	Accident Fund	Stay at Work	Medical Aid Fund	Class	Accident Fund	Stay at Work	Medical Aid Fund
<u>6103</u>	<u>0.1005</u>	<u>0.0015</u>	<u>0.0908</u>	<u>6509</u>	<u>0.2919</u>	<u>0.0043</u>	<u>0.2626</u>
<u>6104</u>	<u>0.4859</u>	<u>0.0073</u>	<u>0.3320</u>	<u>6510</u>	<u>0.6413</u>	<u>0.0099</u>	<u>0.2590</u>
<u>6105</u>	<u>0.6394</u>	<u>0.0098</u>	<u>0.3100</u>	<u>6511</u>	<u>0.3241</u>	<u>0.0049</u>	<u>0.2514</u>
<u>6107</u>	<u>0.1310</u>	<u>0.0019</u>	<u>0.1572</u>	<u>6512</u>	<u>0.1219</u>	<u>0.0019</u>	<u>0.0670</u>
<u>6108</u>	<u>0.3453</u>	<u>0.0051</u>	<u>0.2944</u>	<u>6601</u>	<u>0.2137</u>	<u>0.0032</u>	<u>0.1584</u>
<u>6109</u>	<u>0.1551</u>	<u>0.0024</u>	<u>0.0761</u>	<u>6602</u>	<u>0.6440</u>	<u>0.0097</u>	<u>0.5045</u>
<u>6110</u>	<u>0.6137</u>	<u>0.0094</u>	<u>0.3249</u>	<u>6603</u>	<u>0.3753</u>	<u>0.0057</u>	<u>0.2372</u>
<u>6120</u>	<u>0.4203</u>	<u>0.0064</u>	<u>0.2241</u>	<u>6604</u>	<u>0.1002</u>	<u>0.0015</u>	<u>0.0725</u>
<u>6121</u>	<u>0.4833</u>	<u>0.0074</u>	<u>0.2577</u>	<u>6605</u>	<u>0.3331</u>	<u>0.0051</u>	<u>0.2130</u>
<u>6201</u>	<u>0.5928</u>	<u>0.0091</u>	<u>0.3153</u>	<u>6607</u>	<u>0.1332</u>	<u>0.0020</u>	<u>0.1040</u>
<u>6202</u>	<u>1.0064</u>	<u>0.0153</u>	<u>0.6073</u>	<u>6608</u>	<u>0.8873</u>	<u>0.0138</u>	<u>0.2780</u>
<u>6203</u>	<u>0.1085</u>	<u>0.0016</u>	<u>0.1318</u>	<u>6620</u>	<u>4.1124</u>	<u>0.0629</u>	<u>2.2269</u>
<u>6204</u>	<u>0.1627</u>	<u>0.0024</u>	<u>0.1254</u>	<u>6704</u>	<u>0.1609</u>	<u>0.0024</u>	<u>0.1108</u>
<u>6205</u>	<u>0.2430</u>	<u>0.0037</u>	<u>0.1660</u>	<u>6705</u>	<u>0.7155</u>	<u>0.0106</u>	<u>0.6674</u>
<u>6206</u>	<u>0.2374</u>	<u>0.0036</u>	<u>0.1753</u>	<u>6706</u>	<u>0.2966</u>	<u>0.0044</u>	<u>0.2438</u>
<u>6207</u>	<u>1.3021</u>	<u>0.0197</u>	<u>0.8903</u>	<u>6707</u>	<u>13.6675</u>	<u>0.2035</u>	<u>11.7244</u>
<u>6208</u>	<u>0.2715</u>	<u>0.0040</u>	<u>0.2595</u>	<u>6708</u>	<u>9.5208</u>	<u>0.1385</u>	<u>10.6427</u>
<u>6209</u>	<u>0.3256</u>	<u>0.0048</u>	<u>0.2890</u>	<u>6709</u>	<u>0.3000</u>	<u>0.0045</u>	<u>0.2274</u>
<u>6301</u>	<u>0.1711</u>	<u>0.0026</u>	<u>0.0785</u>	<u>6801</u>	<u>1.0345</u>	<u>0.0161</u>	<u>0.3489</u>
<u>6303</u>	<u>0.0705</u>	<u>0.0011</u>	<u>0.0417</u>	<u>6802</u>	<u>1.0641</u>	<u>0.0163</u>	<u>0.5922</u>
<u>6305</u>	<u>0.1146</u>	<u>0.0017</u>	<u>0.0863</u>	<u>6803</u>	<u>0.9721</u>	<u>0.0152</u>	<u>0.2527</u>
<u>6306</u>	<u>0.4206</u>	<u>0.0064</u>	<u>0.2511</u>	<u>6804</u>	<u>0.3357</u>	<u>0.0050</u>	<u>0.2490</u>
<u>6308</u>	<u>0.0769</u>	<u>0.0012</u>	<u>0.0434</u>	<u>6809</u>	<u>4.7311</u>	<u>0.0696</u>	<u>4.6841</u>
<u>6309</u>	<u>0.2253</u>	<u>0.0034</u>	<u>0.1646</u>	<u>6901</u>	<u>0.0000</u>	<u>0.0000</u>	<u>0.0555</u>
<u>6402</u>	<u>0.3160</u>	<u>0.0047</u>	<u>0.2452</u>	<u>6902</u>	<u>1.2313</u>	<u>0.0189</u>	<u>0.5980</u>
<u>6403</u>	<u>0.1646</u>	<u>0.0025</u>	<u>0.1333</u>	<u>6903</u>	<u>8.6703</u>	<u>0.1342</u>	<u>3.5153</u>
<u>6404</u>	<u>0.3503</u>	<u>0.0052</u>	<u>0.2960</u>	<u>6904</u>	<u>1.6944</u>	<u>0.0262</u>	<u>0.6754</u>
<u>6405</u>	<u>0.7874</u>	<u>0.0121</u>	<u>0.4246</u>	<u>6905</u>	<u>1.2669</u>	<u>0.0196</u>	<u>0.5005</u>
<u>6406</u>	<u>0.1691</u>	<u>0.0025</u>	<u>0.1271</u>	<u>6906</u>	<u>0.0000</u>	<u>0.0000</u>	<u>0.4530</u>
<u>6407</u>	<u>0.3614</u>	<u>0.0055</u>	<u>0.2343</u>	<u>6907</u>	<u>1.1181</u>	<u>0.0170</u>	<u>0.7094</u>
<u>6408</u>	<u>0.7200</u>	<u>0.0110</u>	<u>0.4125</u>	<u>6908</u>	<u>0.4940</u>	<u>0.0075</u>	<u>0.2819</u>
<u>6409</u>	<u>0.8665</u>	<u>0.0133</u>	<u>0.4665</u>	<u>6909</u>	<u>0.1440</u>	<u>0.0022</u>	<u>0.0992</u>
<u>6410</u>	<u>0.4208</u>	<u>0.0064</u>	<u>0.2394</u>	<u>7100</u>	<u>0.0297</u>	<u>0.0005</u>	<u>0.0145</u>
<u>6411</u>	<u>0.0617</u>	<u>0.0009</u>	<u>0.0512</u>	<u>7101</u>	<u>0.0333</u>	<u>0.0005</u>	<u>0.0173</u>
<u>6501</u>	<u>0.1318</u>	<u>0.0020</u>	<u>0.0779</u>	<u>7103</u>	<u>1.2803</u>	<u>0.0198</u>	<u>0.5068</u>
<u>6502</u>	<u>0.0372</u>	<u>0.0006</u>	<u>0.0220</u>	<u>7104</u>	<u>0.0313</u>	<u>0.0005</u>	<u>0.0200</u>
<u>6503</u>	<u>0.1073</u>	<u>0.0016</u>	<u>0.0531</u>	<u>7105</u>	<u>0.0227</u>	<u>0.0003</u>	<u>0.0152</u>
<u>6504</u>	<u>0.3149</u>	<u>0.0046</u>	<u>0.3247</u>	<u>7106</u>	<u>0.3224</u>	<u>0.0049</u>	<u>0.2345</u>
<u>6505</u>	<u>0.1711</u>	<u>0.0025</u>	<u>0.1690</u>	<u>7107</u>	<u>0.3583</u>	<u>0.0053</u>	<u>0.3158</u>
<u>6506</u>	<u>0.1558</u>	<u>0.0024</u>	<u>0.1095</u>	<u>7108</u>	<u>0.2481</u>	<u>0.0037</u>	<u>0.1947</u>

**Base Rates Effective
January 1, ((2019)) 2020**

Class	Accident Fund	Stay at Work	Medical Aid Fund
<u>7109</u>	<u>0.1354</u>	<u>0.0020</u>	<u>0.0936</u>
<u>7110</u>	<u>0.5395</u>	<u>0.0082</u>	<u>0.2966</u>
<u>7111</u>	<u>0.5386</u>	<u>0.0084</u>	<u>0.2017</u>
<u>7112</u>	<u>0.8841</u>	<u>0.0133</u>	<u>0.6604</u>
<u>7113</u>	<u>0.4902</u>	<u>0.0074</u>	<u>0.3574</u>
<u>7114</u>	<u>0.8413</u>	<u>0.0126</u>	<u>0.6699</u>
<u>7115</u>	<u>0.5950</u>	<u>0.0089</u>	<u>0.5084</u>
<u>7116</u>	<u>0.5680</u>	<u>0.0087</u>	<u>0.3371</u>
<u>7117</u>	<u>1.5308</u>	<u>0.0231</u>	<u>1.0653</u>
<u>7118</u>	<u>2.1277</u>	<u>0.0323</u>	<u>1.3439</u>
<u>7119</u>	<u>2.1934</u>	<u>0.0337</u>	<u>1.1100</u>
<u>7120</u>	<u>7.9850</u>	<u>0.1232</u>	<u>3.5577</u>
<u>7121</u>	<u>10.0528</u>	<u>0.1552</u>	<u>4.3895</u>
<u>7122</u>	<u>0.4529</u>	<u>0.0068</u>	<u>0.3540</u>
<u>7200</u>	<u>2.7813</u>	<u>0.0432</u>	<u>0.9789</u>
<u>7201</u>	<u>2.0403</u>	<u>0.0315</u>	<u>0.8739</u>
<u>7202</u>	<u>0.0360</u>	<u>0.0005</u>	<u>0.0206</u>
<u>7203</u>	<u>0.1129</u>	<u>0.0016</u>	<u>0.1343</u>
<u>7204</u>	<u>0.0000</u>	<u>0.0000</u>	<u>0.0000</u>
<u>7205</u>	<u>0.0000</u>	<u>0.0000</u>	<u>0.0000</u>
<u>7301</u>	<u>0.7228</u>	<u>0.0108</u>	<u>0.6014</u>
<u>7302</u>	<u>1.0275</u>	<u>0.0154</u>	<u>0.7680</u>

**Base Rates Effective
January 1, ((2019)) 2020**

Class	Accident Fund	Stay at Work	Medical Aid Fund
<u>7307</u>	<u>0.6326</u>	<u>0.0096</u>	<u>0.4371</u>
<u>7308</u>	<u>0.2835</u>	<u>0.0042</u>	<u>0.2805</u>
<u>7309</u>	<u>0.2922</u>	<u>0.0043</u>	<u>0.2516</u>
<u>7400</u>	<u>3.1985</u>	<u>0.0497</u>	<u>1.1257</u>

AMENDATORY SECTION (Amending WSR 18-24-073, filed 11/30/18, effective 1/1/19)

WAC 296-17-89502 Industrial insurance accident fund, stay at work, medical aid and supplemental pension rates by class of industry for nonhourly rated classifications. The base rates as set forth below are for classifications whose premium rates are based on units other than hours worked.

**Base Rates Effective
January 1, ((2019)) 2020**

Class	Accident Fund	Stay at Work	Medical Aid Fund	Supplemental Pension Fund
((0540	0.0345	0.0005	0.0154	0.0009
0541	0.0125	0.0002	0.0068	0.0009
0550	0.0523	0.0008	0.0229	0.0009
0551	0.0227	0.0003	0.0102	0.0009))
540	0.0302	0.0005	0.0146	0.0010
541	0.0112	0.0002	0.0062	0.0010
550	0.0488	0.0008	0.0219	0.0010
551	0.0202	0.0003	0.0096	0.0010

AMENDATORY SECTION (Amending WSR 18-24-073, filed 11/30/18, effective 1/1/19)

WAC 296-17-89507 Horse racing rates. Horse racing industry industrial insurance accident fund, stay at work fund, medical aid fund, supplemental pension fund and composite rate by class.

Base Rates Effective January 1, ((2019)) 2020

Class	Accident Fund	Stay at Work ((Fund))	Medical Aid Fund	Supplemental Pension Fund	Composite Rate
((6618	80.00*	2.00*	67.00*	1.00*	150.00*
6625	68.10**	1.10**	70.99**	11.20**	151.39**
6626	0.6009***	0.0090***	0.6481***	0.1120***	1.37***
6627	9.0993****	0.1467****	8.0340****	0.8400****	18.12****))
<u>6618</u>	<u>74.00*</u>	<u>1.00*</u>	<u>74.00*</u>	<u>1.00*</u>	<u>150.00*</u>
<u>6625</u>	<u>71.41**</u>	<u>1.23**</u>	<u>73.88**</u>	<u>12.25**</u>	<u>158.77**</u>
<u>6626</u>	<u>0.6126***</u>	<u>0.0105***</u>	<u>0.6744***</u>	<u>0.1225***</u>	<u>1.4200***</u>
<u>6627</u>	<u>9.8330****</u>	<u>0.1700****</u>	<u>8.4680****</u>	<u>0.9190****</u>	<u>19.3900****</u>

*This rate is calculated on a percentage of ownership in a horse or horses.

**This rate is calculated per month.

***This rate is calculated per horse per day.

***This rate is calculated per day.

Note: These rates are not subject to experience rating or retrospective rating.

AMENDATORY SECTION (Amending WSR 18-24-073, filed 11/30/18, effective 1/1/19)

WAC 296-17-920 Assessment for supplemental pension fund. The amount of ~~((56.0))~~ 61.25 mils ~~(((\$0.056))~~ (\$0.06125) shall be retained by each employer from the earnings of each worker for each hour or fraction thereof the worker is employed. The amount of money so retained from the employee shall be matched in an equal amount by each employer, except as otherwise provided in these rules, all such moneys shall be remitted to the department on or before the last day of January, April, July, and October of each year for the preceding calendar quarter, provided self-insured employers shall remit to the department as provided under WAC 296-15-229. All such moneys shall be deposited in the supplemental pension fund.

AMENDATORY SECTION (Amending WSR 18-24-073, filed 11/30/18, effective 1/1/19)

WAC 296-17B-540 Determining loss incurred for each claim. (1) Calculating the initial loss incurred:

For each of your claims, we will multiply the case incurred loss by the appropriate discounted loss development factors to determine the initial loss incurred.

If you have a fatality, we will use ~~((three hundred fifty-seven thousand two hundred))~~ four hundred eighteen thousand dollars ~~(\$418,000)~~ (\$383,700) as the claim's initial incurred loss for the claim, with three hundred ~~((twenty-three thousand))~~ eighty-three thousand seven hundred dollars ~~(\$230,000)~~ (\$383,700) for accident fund incurred loss and thirty-four thousand ~~((two))~~ three hundred dollars ~~(\$34,300)~~ (\$34,300) for the medical aid incurred loss, regardless of the case incurred loss, and before recovery factors if applicable.

(2) Applying the single loss occurrence limit:

The initial loss incurred for a claim will be the amount we use as the loss incurred unless the single loss occurrence limit applies.

The single loss occurrence limit applies when the sum of all initial losses incurred for your claims arising out of a single event is greater than your selected single loss occurrence limit. In that case, each claim's initial loss incurred will be its proportionate share of your single loss occurrence limit.

(3) Applying the expected loss ratio factors:

The preliminary loss incurred for a claim will be the amount of the initial loss incurred, after application of the single loss limit, multiplied by the appropriate expected loss ratio factor. The accident fund and medical aid fund portions of each claim will have separate expected loss ratio factors applied.

AMENDATORY SECTION (Amending WSR 18-24-073, filed 11/30/18, effective 1/1/19)

WAC 296-17B-900 Retrospective rating plans standard premium size ranges.

RETROSPECTIVE RATING STANDARD PREMIUM SIZE RANGES

Effective January 1, ~~((2019))~~ 2020

Size Group Number	Standard Premium Range	
	From:	To:
1	5,430	6,349
2	6,350	7,179
3	7,180	8,079
4	8,080	9,049
5	9,050	10,079
6	10,080	11,189
7	11,190	12,379
8	12,380	13,629
9	13,630	14,969
10	14,970	16,369
11	16,370	17,859
12	17,860	19,459
13	19,460	21,149
14	21,150	22,949
15	22,950	24,829
16	24,830	26,839
17	26,840	28,959
18	28,960	31,219
19	31,220	33,589
20	33,590	36,099
21	36,100	38,789
22	38,790	41,629
23	41,630	44,649
24	44,650	47,859
25	47,860	51,259
26	51,260	54,889
27	54,890	58,749
28	58,750	62,849
29	62,850	67,229
30	67,230	71,909
31	71,910	76,909
32	76,910	82,269
33	82,270	88,009
34	88,010	94,069
35	94,070	100,699
36	100,700	107,899
37	107,900	115,699

Size Group Number	Standard Premium Range		Size Group Number	Standard Premium Range	
	From:	To:		From:	To:
38	115,700	123,999	<u>6</u>	<u>9,780</u>	<u>10,849</u>
39	124,000	132,999	<u>7</u>	<u>10,850</u>	<u>12,009</u>
40	133,000	142,599	<u>8</u>	<u>12,010</u>	<u>13,219</u>
41	142,600	152,999	<u>9</u>	<u>13,220</u>	<u>14,519</u>
42	153,000	164,199	<u>10</u>	<u>14,520</u>	<u>15,879</u>
43	164,200	176,199	<u>11</u>	<u>15,880</u>	<u>17,319</u>
44	176,200	189,299	<u>12</u>	<u>17,320</u>	<u>18,879</u>
45	189,300	203,499	<u>13</u>	<u>18,880</u>	<u>20,519</u>
46	203,500	218,899	<u>14</u>	<u>20,520</u>	<u>22,259</u>
47	218,900	235,499	<u>15</u>	<u>22,260</u>	<u>24,089</u>
48	235,500	253,999	<u>16</u>	<u>24,090</u>	<u>26,029</u>
49	254,000	273,999	<u>17</u>	<u>26,030</u>	<u>28,089</u>
50	274,000	295,899	<u>18</u>	<u>28,090</u>	<u>30,279</u>
51	295,900	320,199	<u>19</u>	<u>30,280</u>	<u>32,579</u>
52	320,200	347,199	<u>20</u>	<u>32,580</u>	<u>35,019</u>
53	347,200	377,499	<u>21</u>	<u>35,020</u>	<u>37,629</u>
54	377,500	411,099	<u>22</u>	<u>37,630</u>	<u>40,379</u>
55	411,100	448,899	<u>23</u>	<u>40,380</u>	<u>43,309</u>
56	448,900	491,899	<u>24</u>	<u>43,310</u>	<u>46,419</u>
57	491,900	540,499	<u>25</u>	<u>46,420</u>	<u>49,719</u>
58	540,500	596,499	<u>26</u>	<u>49,720</u>	<u>53,239</u>
59	596,500	661,099	<u>27</u>	<u>53,240</u>	<u>56,989</u>
60	661,100	736,699	<u>28</u>	<u>56,990</u>	<u>60,959</u>
61	736,700	825,399	<u>29</u>	<u>60,960</u>	<u>65,209</u>
62	825,400	930,599	<u>30</u>	<u>65,210</u>	<u>69,749</u>
63	930,600	1,058,999	<u>31</u>	<u>69,750</u>	<u>74,599</u>
64	1,059,000	1,215,999	<u>32</u>	<u>74,600</u>	<u>79,799</u>
65	1,216,000	1,412,999	<u>33</u>	<u>79,800</u>	<u>85,369</u>
66	1,413,000	1,667,999	<u>34</u>	<u>85,370</u>	<u>91,249</u>
67	1,668,000	2,002,999	<u>35</u>	<u>91,250</u>	<u>97,679</u>
68	2,003,000	2,471,999	<u>36</u>	<u>97,680</u>	<u>104,699</u>
69	2,472,000	3,161,999	<u>37</u>	<u>104,700</u>	<u>112,199</u>
70	3,162,000	4,299,999	<u>38</u>	<u>112,200</u>	<u>120,299</u>
71	4,300,000	6,444,999	<u>39</u>	<u>120,300</u>	<u>128,999</u>
72	6,445,000	11,789,999	<u>40</u>	<u>129,000</u>	<u>138,299</u>
73	11,790,000	30,179,999	<u>41</u>	<u>138,300</u>	<u>148,399</u>
74	30,180,000	and over))	<u>42</u>	<u>148,400</u>	<u>159,299</u>
<u>1</u>	<u>5,270</u>	<u>6,159</u>	<u>43</u>	<u>159,300</u>	<u>170,899</u>
<u>2</u>	<u>6,160</u>	<u>6,959</u>	<u>44</u>	<u>170,900</u>	<u>183,599</u>
<u>3</u>	<u>6,960</u>	<u>7,839</u>	<u>45</u>	<u>183,600</u>	<u>197,399</u>
<u>4</u>	<u>7,840</u>	<u>8,779</u>	<u>46</u>	<u>197,400</u>	<u>212,299</u>
<u>5</u>	<u>8,780</u>	<u>9,779</u>	<u>47</u>	<u>212,300</u>	<u>228,399</u>

Size Group Number	Standard Premium Range	
	From:	To:
<u>48</u>	<u>228,400</u>	<u>246,399</u>
<u>49</u>	<u>246,400</u>	<u>265,799</u>
<u>50</u>	<u>265,800</u>	<u>286,999</u>
<u>51</u>	<u>287,000</u>	<u>310,599</u>
<u>52</u>	<u>310,600</u>	<u>336,799</u>
<u>53</u>	<u>336,800</u>	<u>366,199</u>
<u>54</u>	<u>366,200</u>	<u>398,799</u>
<u>55</u>	<u>398,800</u>	<u>435,399</u>
<u>56</u>	<u>435,400</u>	<u>477,099</u>
<u>57</u>	<u>477,100</u>	<u>524,299</u>
<u>58</u>	<u>524,300</u>	<u>578,599</u>
<u>59</u>	<u>578,600</u>	<u>641,299</u>
<u>60</u>	<u>641,300</u>	<u>714,599</u>
<u>61</u>	<u>714,600</u>	<u>800,599</u>
<u>62</u>	<u>800,600</u>	<u>902,699</u>
<u>63</u>	<u>902,700</u>	<u>1,026,999</u>
<u>64</u>	<u>1,027,000</u>	<u>1,179,999</u>
<u>65</u>	<u>1,180,000</u>	<u>1,370,999</u>
<u>66</u>	<u>1,371,000</u>	<u>1,617,999</u>
<u>67</u>	<u>1,618,000</u>	<u>1,942,999</u>
<u>68</u>	<u>1,943,000</u>	<u>2,397,999</u>
<u>69</u>	<u>2,398,000</u>	<u>3,066,999</u>
<u>70</u>	<u>3,067,000</u>	<u>4,170,999</u>
<u>71</u>	<u>4,171,000</u>	<u>6,251,999</u>
<u>72</u>	<u>6,252,000</u>	<u>11,439,999</u>
<u>73</u>	<u>11,440,000</u>	<u>29,269,999</u>
<u>74</u>	<u>29,270,000</u>	<u>and over</u>

WSR 19-24-031
PERMANENT RULES
DEPARTMENT OF

SOCIAL AND HEALTH SERVICES

(Aging and Long-Term Support Administration)

[Filed November 25, 2019, 12:40 p.m., effective December 26, 2019]

Effective Date of Rule: Thirty-one days after filing.

Purpose: SB 5359 (chapter 458, Laws of 2019) was enacted during the 2019 legislative session. The bill authorizes the department to collect an annual certification fee from certified community residential services and supports providers. The department is creating WAC 388-101-3120 to outline the collection and enforcement of the fees.

Citation of Rules Affected by this Order: New WAC 388-101-3120.

Statutory Authority for Adoption: Chapter 71A.12 RCW; RCW 71A.12.030.

Adopted under notice filed as WSR 19-20-093 on October 1, 2019.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 0, Repealed 0; or Recently Enacted State Statutes: New 1, Amended 0, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 0, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 0, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 0, Amended 0, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 0, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 1, Amended 0, Repealed 0.

Date Adopted: November 21, 2019.

Katherine I. Vasquez
 Rules Coordinator

NEW SECTION

WAC 388-101-3120 Certification fees. The certified community residential services and supports provider must submit an annual certification fee. If the provider fails to pay the annual certification fee, the department may impose remedies outlined in WAC 388-101-4175.

WSR 19-24-032

PERMANENT RULES

DEPARTMENT OF

SOCIAL AND HEALTH SERVICES

(Economic Services Administration)

[Filed November 25, 2019, 12:42 p.m., effective January 1, 2020]

Effective Date of Rule: January 1, 2020.

Purpose: The department is amending WAC 388-478-0015 Need standards for cash assistance to reflect the annual revision of basic need standards for cash assistance effective January 1, 2020.

Citation of Rules Affected by this Order: Amending WAC 388-478-0015.

Statutory Authority for Adoption: RCW 74.04.050, 74.04.055, 74.04.057, 74.04.770, 74.08.090.

Adopted under notice filed as WSR 19-20-037 on September 25, 2019.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 0, Repealed 0; or Recently Enacted State Statutes: New 0, Amended 0, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 0, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 0, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 0, Amended 1, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 0, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 1, Repealed 0.

Date Adopted: November 25, 2019.

Katherine I. Vasquez
Rules Coordinator

AMENDATORY SECTION (Amending WSR 18-22-021, filed 10/26/18, effective 1/1/19)

WAC 388-478-0015 Need standards for cash assistance. The need standards for cash assistance units are:

(1) For assistance units with an obligation to pay shelter costs:

Assistance unit size	Need standard
1	\$ ((1,460)) <u>1,520</u>
2	((1,848)) <u>1,923</u>
3	((2,284)) <u>2,374</u>
4	((2,692)) <u>2,801</u>
5	((3,102)) <u>3,229</u>
6	((3,513)) <u>3,656</u>
7	((4,060)) <u>4,226</u>
8	((4,494)) <u>4,677</u>
9	((4,927)) <u>5,128</u>
10 or more	((5,360)) <u>5,579</u>

(2) For assistance units with shelter provided at no cost:

Assistance unit size	Need standard
1	\$ ((659)) <u>695</u>
2	((833)) <u>880</u>
3	((1,029)) <u>1,086</u>
4	((1,214)) <u>1,281</u>
5	((1,399)) <u>1,477</u>
6	((1,585)) <u>1,672</u>
7	((1,832)) <u>1,933</u>
8	((2,027)) <u>2,139</u>
9	((2,223)) <u>2,346</u>
10 or more	((2,418)) <u>2,552</u>

**WSR 19-24-039
PERMANENT RULES**

**OFFICE OF THE
INSURANCE COMMISSIONER**

[Filed November 26, 2019, 8:25 a.m., effective December 27, 2019]

Effective Date of Rule: Thirty-one days after filing.

Purpose: The purpose of the rules is to implement the requirements regarding reproductive health care and contraception as provided for in RCW 48.43.072, 48.43.073, and 2SSB 5602 (chapter 399, Laws of 2019).

Citation of Rules Affected by this Order: New WAC 284-43-7200, 284-43-7210, 284-43-7220, 284-43-7230, 284-43-7240, 284-43-7250, 284-43-7260, and 284-43-7270; and amending WAC 284-43-5150.

Statutory Authority for Adoption: RCW 48.02.060, 48.43.072, and 48.43.073.

Other Authority: 2SSB 5602 (chapter 399, Laws of 2019).

Adopted under notice filed as WSR 19-19-082 on September 17, 2019.

A final cost-benefit analysis is available by contacting Mandy Weeks-Green, P.O. Box 40260, Olympia, WA 98502, phone 360-725-7041, fax 360-586-2023, TTY 360-586-0241, email mandyw@oic.wa.gov, website www.insurance.wa.gov.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 0, Repealed 0; or Recently Enacted State Statutes: New 8, Amended 1, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 0, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 0, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 0, Amended 0, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 8, Amended 1, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 0, Repealed 0.

Date Adopted: November 26, 2019.

Mike Kreidler
Insurance Commissioner

AMENDATORY SECTION (Amending WSR 16-01-081, filed 12/14/15, effective 12/14/15)

WAC 284-43-5150 Unfair practice relating to health coverage. (1) It is an unfair practice for any health carrier to restrict, exclude, or reduce coverage or benefits under any health plan on the basis of sex. By way of example, a health plan providing generally comprehensive coverage of prescription drugs and prescription devices restricts, excludes, or reduces coverage or benefits on the basis of sex if it fails to provide prescription contraceptive coverage that complies with this regulation.

An example of a plan that provides generally comprehensive coverage of prescription drugs is a plan that covers prescription drugs but excludes some categories such as weight reduction or smoking cessation.

(2)(a) Health plans providing generally comprehensive coverage of prescription drugs and/or prescription devices shall not exclude prescription contraceptives or cover prescription contraceptives on a less favorable basis than other covered prescription drugs and prescription devices. Cover-

age of prescription contraceptives includes coverage for medical services associated with the prescribing, dispensing, delivery, distribution, administration and removal of a prescription contraceptive to the same extent, and on the same terms, as other outpatient services.

(b) Health plans may not impose benefit waiting periods, limitations, or restrictions on prescription contraceptives that are not required or imposed on other covered prescription drugs and prescription devices.

(c) Health plans may not require cost sharing, such as copayments or deductibles, for prescription contraceptives and for services associated with the prescribing, dispensing, delivery, distribution, administration, and removal of the prescription contraceptives ~~((, to the same extent that such cost sharing is required for other covered prescription drugs, devices or services)).~~

(d) Health carriers may use, and health plans may limit coverage to, a closed formulary for prescription contraceptives if they otherwise use a closed formulary, but the formulary shall cover each of the types of prescription contraception as defined in ~~((f))~~ (e) of this subsection.

~~((If a health plan excludes coverage for nonprescription drugs and devices except for those required by law, it may also exclude coverage for nonprescription contraceptive drugs and devices.~~

~~(f))~~ For purposes of subsections (1) and (2) of this section, "prescription contraceptives" include United States Food and Drug Administration (FDA) approved contraceptive drugs, devices, and prescription barrier methods, including contraceptive products declared safe and effective for use as emergency contraception by the FDA.

~~((g) This section applies prospectively to health plans offered, issued, or renewed by a health carrier on or after January 1, 2002.)~~

SUBCHAPTER L

~~((SHORT TERM LIMITED DURATION MEDICAL PLANS))~~ REPRODUCTIVE HEALTH CARE AND CONTRACEPTION

NEW SECTION

WAC 284-43-7200 Purpose and scope. (1) The purpose of this subchapter is to establish uniform regulatory standards for required coverage of contraceptive services and other reproductive health services and supplies, voluntary sterilization, and abortion under RCW 48.43.072 and 48.43.073.

(2) This subchapter applies to all health plans, except as otherwise expressly provided in this subchapter. Health carriers are responsible for compliance with the provisions of this subchapter and are responsible for the compliance of any person or organization acting on behalf of or at the direction of the carrier, or acting pursuant to carrier standards or requirements concerning the coverage of, payment for, or provision of contraceptive services and supplies, voluntary sterilization, and abortion. A carrier may not offer as a defense to a violation of any provision of this subchapter that the violation arose from the act or omission of a participating provider or

facility, network administrator, claims administrator, or other person acting on behalf of or at the direction of the carrier, or acting pursuant to carrier standards or requirements under a contract with the carrier rather than from the direct act or omission of the carrier.

(3) Effective January 1, 2021, except as otherwise provided, this subchapter applies to all student health plans deemed by the insurance commissioner to have a short-term limited purpose or duration, including short-term limited purpose student health plans and guaranteed renewable plans while the covered person is an enrolled student as a regular full-time undergraduate or graduate student at an accredited higher education institution.

NEW SECTION

WAC 284-43-7210 Definitions. (1) "Contraceptive services" means consultations, examinations, procedures, and other health care services to obtain contraceptive supplies or voluntary sterilization. This includes prescribing, dispensing, inserting, delivering, distributing, administering, or removing contraceptive supplies and voluntary sterilization procedures.

(2) "Contraceptive supplies" means all contraceptive drugs, devices, and other products approved by the Federal Food and Drug Administration. This includes over-the-counter contraceptive drugs, devices, and products approved by the Federal Food and Drug Administration.

(3) "Cost-sharing" means any expenditure required of a covered person for covered services or supplies, including applicable taxes. Cost-sharing includes deductibles, coinsurance, copayments, or similar charges. Cost-sharing does not include premiums, balance billing amounts for nonnetwork providers, or spending for noncovered services or supplies.

(4) "Covered person" or "enrollee" has the same meaning as defined in RCW 48.43.005.

(5) "Gender expression" has the same meaning as defined in section 3, chapter 399, Laws of 2019.

(6) "Gender identity" has the same meaning as defined in section 3, chapter 399, Laws of 2019.

(7) "Medical management" or "medical management techniques" has the same meaning as defined in RCW 48.165.010.

(8) "Reproductive health care services" has the same meaning as defined in section 3, chapter 399, Laws of 2019.

(9) "Reproductive system" has the same meaning as defined in section 3, chapter 399, Laws of 2019.

(10) "Well-person preventative visits" has the same meaning as defined in section 3, chapter 399, Laws of 2019.

NEW SECTION

WAC 284-43-7220 Coverage required. A health plan must provide coverage for all services and supplies required under RCW 48.43.072 and 48.43.073. Effective January 1, 2021, a student health plan must also provide coverage for all services and supplies required under RCW 48.43.072.

(1) Required coverage of contraceptive services and supplies includes, but is not limited to:

(a) All prescription and over-the-counter contraceptive drugs, devices, and other products approved by the Federal Food and Drug Administration;

(b) Voluntary sterilization procedures; and

(c) The consultations, examinations, procedures, and medical services that are necessary to prescribe, dispense, insert, deliver, distribute, administer, or remove the drugs, devices, and other products or services in (a) and (b) of this subsection.

(2) A health plan that provides coverage for maternity care or services must also provide a covered person with substantially equivalent coverage to permit the abortion of a pregnancy. For the coverage to be substantially equivalent, a health plan must not apply cost-sharing or coverage limitations differently for abortion and related services than for maternity care and its related services unless the difference provides the enrollee with access to care and treatment commensurate with the enrollee's specific medical needs, without imposing a surcharge or other additional cost to the enrollee beyond normal cost-sharing requirements under the plan.

(3) This subchapter does not diminish or affect any rights or responsibilities provided under RCW 48.43.065.

NEW SECTION

WAC 284-43-7230 Services provided without discrimination, prohibited limitations, and confidentiality.

(1) All services and supplies required under RCW 48.43.072 must be covered without discrimination on the basis of race, color, national origin, sex, sexual orientation, gender expression or identity, marital status, age, citizenship, immigration status, or disability. Health plans and student health plans must ensure that all enrollees have access to these services and supplies regardless of gender or gender identity. This includes, but is not limited to, coverage of any method of over-the-counter contraception without regard to the sex, or gender identity or expression, of the covered person.

(2) Reproductive health care, voluntary sterilization, abortion or contraceptive services or contraceptive supplies provided under a health plan or a student health plan are health care services related to reproductive health and protected by the confidentiality requirements of RCW 48.43.505, WAC 284-04-510, and other relevant statutes and regulations providing for enrollee confidentiality.

NEW SECTION

WAC 284-43-7240 Access to contraceptive services and supplies. (1) Health plans and student health plans must provide covered persons access to sufficient numbers and types of providers and facilities to assure that covered persons are able to access all covered contraceptive services and all Federal Food and Drug Administration approved contraceptive supplies without unreasonable delay or burden.

(2) If a health plan or student health plan limits coverage of contraceptive services and supplies to in-network providers, the carrier must demonstrate that its network for these services and supplies meets the access and adequacy standards set forth in chapter 284-170 WAC.

(3) In any case where the health plan's network or student health plan's network has an absence of or an insufficient number or type of participating providers or facilities to provide a particular covered contraceptive service or supply, including over-the-counter contraceptives, in a timely man-

ner appropriate for the enrollee's condition, the carrier must ensure that the covered person obtains the covered service or supply from a provider or facility within reasonable proximity of the enrollee at no greater cost to the enrollee than if the service or supply were obtained from network providers and facilities. The carrier must satisfy this obligation even if an alternate access delivery request under WAC 284-170-210 has been submitted and is pending approval by the insurance commissioner.

(4) If a health plan or student health plan limits the quantity of covered contraceptive supplies or services, the carrier must have a written process for covered persons to request coverage of additional services or supplies. The process may not impose any restriction or delay on the coverage of contraceptive supplies in violation of RCW 48.43.072, 48.43.195, or any other state or federal law.

(5) Effective January 1, 2021, contraceptive supplies must also be covered when used exclusively for the prevention of sexually transmitted infections.

NEW SECTION

WAC 284-43-7250 Filing requirements. (1) For health plans subject to RCW 48.43.072 and 48.43.073, the carrier must ensure that the health plan forms clearly inform covered persons of their rights to access contraceptive services and supplies, voluntary sterilization and abortion. The health plan forms must clearly inform covered persons how they access these services and supplies.

(2) For student health plans subject to RCW 48.43.072, the carrier must ensure that the plan forms clearly inform covered persons of their rights to access contraceptive services and supplies, and voluntary sterilization. The plan forms must clearly inform covered persons how they access these services and supplies.

(3) A health plan's forms and student health plan's forms must include a detailed description of the plan's benefits provided to covered persons that specifically instructs covered persons where and how they access coverage of contraceptive supplies, including over-the-counter supplies. This information must include:

(a) Whether covered supplies are available from in-network and out-of-network providers; and

(b) How to submit a claim including, at a minimum:

(i) Whether covered persons may purchase covered supplies and seek reimbursement from the carrier;

(ii) How to access and submit any necessary claim forms; and

(iii) Where to send a claim, such as a mailing address or instructions for submitting a claim electronically.

(4) If a health plan or student health plan limits the number of covered over-the-counter contraceptive supplies, the health plan must include with its filing supporting evidence showing that the limitation does not impose any restriction or delay on the coverage of contraceptive supplies in violation of RCW 48.43.072 or any other state or federal law.

(5) If a health plan or student health plan limits the number of covered contraceptive services or supplies, the plan forms must include a detailed description of the plan's benefits that specifically instructs covered persons how to request

coverage of additional contraceptive services or supplies. The process may not impose any restrictions or delays on the coverage or access of contraceptive services or supplies in violation of RCW 48.43.072, or any other state or federal law.

NEW SECTION

WAC 284-43-7260 Deductibles for over-the-counter contraceptives and voluntary male sterilization in HSA qualifying plans. (1) A qualifying health plan and a qualifying student health plan for a health savings account ("HSA-qualifying plan") is subject to all of the requirements under RCW 48.43.072. An HSA-qualifying plan may apply a deductible to coverage of over-the-counter contraceptive supplies or services and voluntary male sterilization only at the minimum level necessary to preserve the enrollee's ability to claim tax exempt contributions and withdrawals from the enrollee's health savings account under Federal Internal Revenue Service laws and regulations.

(2) The individual and family deductibles applied to over-the-counter contraceptive supplies and services and male sterilization under an HSA-qualifying plan must be the minimum deductibles set by the Federal Internal Revenue Service for a plan to be an HSA-qualifying plan under 26 U.S.C. Sec. 223 (c)(2)(A) and other Federal Internal Revenue Service laws, regulations, and guidance. For the 2019 plan year, IRS Bulletin 2018-12 allows HSA-qualifying plans to offer benefits for male sterilization or male contraceptives without a deductible or with a deductible below the standard minimum deductible for the 2019 plan year only. Therefore, for 2019, HSA-qualifying plans sold in this state may decide not to charge any deductible for male sterilization or male contraceptives for the 2019 plan year.

(a) The deductibles, if any, applied to over-the-counter contraceptive services and supplies and male sterilization must accrue to the overall individual and family plan deductibles.

(b) Once the individual and family plan deductibles that may apply to over-the-counter contraceptive services and supplies and male sterilization have been reached, all over-the-counter contraceptive services and supplies and male sterilization must be covered with no cost-sharing, even if the overall plan deductibles have not yet been met.

(c) No person covered under an HSA-qualifying individual plan may be required to pay a higher deductible for over-the-counter contraceptive services and supplies and male sterilization than the minimum individual deductible set by the Federal Internal Revenue Service for a plan to be an HSA-qualifying plan. No person covered under an HSA-qualifying family plan may be required to pay a higher deductible for over-the-counter contraceptive services and supplies and male sterilization than the minimum family deductible set by the Federal Internal Revenue Service for a plan to be an HSA-qualifying plan, even if the applicable plan's family deductible has not yet been met. Example: A plan's family deductible for an HSA-qualifying family plan may be more than the minimum family deductible. However, the deductible applicable to over-the-counter contraceptive supplies and services and male sterilization must be at the

minimum family deductible, which is two thousand seven hundred dollars in 2019.

NEW SECTION

WAC 284-43-7270 Access to prenatal vitamins and breast pumps. Effective January 1, 2021, health plans and student plans are required under RCW 48.43.072 to cover prenatal vitamins for covered persons expecting the birth of a child and breast pumps for covered persons expecting the birth or adoption of a child.

(1) Pursuant to RCW 48.43.072, prenatal vitamins and breast pumps can be subject to copayment, deductibles and other forms of cost sharing, except:

(a) In accordance with the Affordable Care Act and the *Women's Preventative Services Guidelines*, folic acid is currently required to be covered as a preventative service without copayment, deductibles, or other forms of cost-sharing for covered persons. This requirement does not apply to grandfathered plans.

(b) In accordance with the Affordable Care Act and the *Women's Preventative Services Guidelines*, breast pumps are currently required to be covered as a preventative service without copayments, deductibles, or other forms of cost-sharing for covered persons. This requirement does not apply to grandfathered plans.

(2) A prescription can be required to trigger coverage of prenatal vitamins, including folic acid and breast pumps.

SUBCHAPTER M

SHORT-TERM LIMITED DURATION MEDICAL PLANS

WSR 19-24-040

PERMANENT RULES

BUILDING CODE COUNCIL

[Filed November 26, 2019, 9:42 a.m., effective July 1, 2020]

Effective Date of Rule: July 1, 2020.

Purpose: Adoption and amendment of the 2018 Washington State Energy Code, Commercial, chapter 51-11C WAC.

Citation of Rules Affected by this Order: New one hundred thirty-one sections and amending one hundred eighty-seven sections of chapter 51-11C WAC.

Statutory Authority for Adoption: RCW 19.27A.020, 19.27A.025, 19.27A.160.

Other Authority: Chapter 19.27 RCW.

Adopted under notice filed as WSR 19-11-073 on May 16, 2019.

Changes Other than Editing from Proposed to Adopted Version:

1.	Definition: Computer room , corrected typo in acronym; changed the "and" to an "or."
2.	Definition: Door, Garage , added a definition for clarity to differentiate from nonswinging door.
3.	Definition: Door, Nonswinging , added a reference to garage doors.
4.	Definition: Fenestration-Vertical Fenestration , removed reference to undefined term "glazed doors."
5.	Definition: Retrofit, Building Envelope , did not adopt this code change; correct term should be alteration or addition.
6.	Definition: Space Conditioning Category , deleted subjective phrase "from lowest to highest."
7.	C401.2, Application , new section C411, solar readiness, is added to the general prescriptive and outcome-based methods. C410, refrigeration, is also added to the outcome-based path.
8.	Table C402.1.1.3 , nonopaque thermal envelope maximum requirements, as referenced in Section C402.1.1.3 but missing from the CR-102, was added back.
9.	C402.2.4, Below grade walls , C-factor was changed to U-factor, since there are no C-factors in the cited table.
10.	C402.4.1.1, Vertical fenestration maximum area with high performance alternates, the sentence prohibiting the use of high performance alternates with the total building performance option was deleted.
11.	C402.4.1.1.1, Optimized daylighting , missing portions of the section were added.
12.	C402.5.1.2, Building test , the council added back in the allowance for corrective action without retesting for tests that fail by a margin of 0.15 cfm/ft ² or less.
13.	C403.1.1, HVAC TSPR , grammatical change for clarity.
14.	C403.2, System design , section reference correction.
15.	C403.4.3.3.3, Isolation valve , section reference correction.
16.	Table C403.4.4, Variable speed drive requirements for demand-controlled pumps, the chilled water and heat rejection loop pumps value was changed to 7.5 hp to correlate with the requirements in the text in Section C403.2.3.
17.	C403.4.5, Pump isolation , the exception was deleted as it contradicts the intent of the section.
18.	C403.5, Economizers , a requirement that exempt chillers have a minimum COP of 7 was added to exception 7. Two additional exceptions were added to address DOAS systems.
19.	C403.7.6, Energy recovery ventilation systems , clarification of requirements for energy recovery with mechanical cooling. The numbering of exceptions was corrected, and exception 10 was revised to reflect the requirement for energy recovery for R-2 occupancies in Section C403.3.6.
20.	Table C403.7.6(2), Energy recovery requirement (systems operating over 8,000 hr./yr.), included missing ICC values for Climate Zone 5B for 50% to 80% outdoor air.
21.	C403.7.7.2 Laboratory exhaust systems , substituted the term "replacement air" for "makeup air."
22.	C403.8.3, Fan efficiency , exceptions were consolidated, correlated and clarified.
23.	C403.9 Heat rejection and heat recovery equipment , this section was reorganized and renumbered to provide two separate sections: C403.9.1 for heat rejection and C403.9.2 for heat recovery. Redundant language was deleted.
24.	C403.9.2.4, Heat recovery for space heating , clarification as to applicability.
25.	C403.9.2.4.2, Exhaust heat recovery , exceptions were added addressing hazardous exhaust.
26.	C403.9.2.3, Process heat recovery , section was modified to provide additional direction for use with economizer.
27.	C403.9.2.4.4, Water-to-water heat recovery sizing , minor editorial changes.
28.	C404.2.1, High input-rated service water heating systems for other than Group R-1 and R-2 occupancies , this section was modified to move the exception for Group R-1 and R-2 to the title, remove remaining redundant language in the first paragraph, make the second paragraph more generic to avoid any conflicting requirements, clarified requirements in regards to fuel type efficiencies, and added exceptions for backup heating, health-related concerns and district energy.
29.	C404.2.2, High input-rated service water heating systems for Group R-1 and R-2 occupancies , modifications were made to correlate language with the changes made to Section C404.2.1, and for language consistency within the code.
30.	C405.1, General , clarified the application to lighting in dwelling units and added language to address sleeping units. Moved those residential requirements to subsection C405.1.1 and correlated language with the residential energy code.

31.	C405.2.1, Occupant sensor controls , requirements for stairways was clarified; a new exception for classrooms was added.
32.	C405.2.1.4, Occupant sensor control function in parking garages , language for exception 2 was clarified.
33.	C405.2.2.1, Time switch control function , the first sentence was struck since it was redundant to earlier language.
34.	C405.2.3, Manual controls , the language in item 3 was clarified.
35.	Table C405.4.2(1), Interior lighting power allowance—Building area method , there were two options printed in the CR-102. The final adopted version is a hybrid, with values mainly taken from the most recent draft of ASHRAE 90.1, with the LPA from the current energy code retained where the value was lower.
36.	Table C405.4.2(2), Interior lighting power allowance—Space by space method , there were two options printed in the CR-102. The final adopted version is taken from the most recent draft of ASHRAE 90.1. Categories not present in the ASHRAE draft were removed: Audience: in a convention center; beauty salon; parking facility, dedicated ramp; sales area, grocery; fire station: engine room. Atrium categories revert to the previous types. Confinement cell was added. Lounge/breakroom was separated into healthcare and other. The additional allowance for decorative and display lighting was removed.
37.	C405.5.1, Exterior building grounds lighting , the threshold and efficacy for grounds lighting was changed to luminaires over 50 watts having an efficacy of 100 lumens per watt.
38.	C405.7 Dwelling unit electrical energy consumption , in the exception, the word "apartment" was changed to "multi-family."
39.	C405.8 Electric motor efficiency , the extraneous word "high" was removed from exception 5.
40.	C406.1 Efficiency packages , the language was clarified for application to multi-tenant buildings and mixed use buildings.
41.	Table C406.1 , missing footnote c was added to options 10 and 11.
42.	C406.1.1 Tenant spaces , the language was clarified and harmonized with that in Section C406.1. It was also broken into two additional subsections (C406.1.1.1, Applicable envelope and on-site renewables and C406.1.1.2, Applicable HVAC & service water) to help clarify intent and application for tenant spaces and tenant improvement.
43.	C406.2 More efficient HVAC equipment and fan performance , an inaccurate section reference was removed and another was corrected.
44.	C406.3.3 Lamp fraction , the unnecessary phrase "high efficacy" was removed from the statement of the minimum efficacy required for lamps.
45.	C406.4 Enhanced digital lighting controls , this section was reformatted for ease of use, with a new function subsection.
46.	C406.5 On-site renewable energy option , corrected section reference and clarified that this option is also allowable for tenant spaces and additions.
47.	C406.7 High performance DOAS , corrected section reference and clarified that this option is also allowable for tenant spaces and additions.
48.	C406.8 Reduced energy use in service water heating , clarified that this option is also allowable for tenant spaces and additions.
49.	C406.9 High performance service water heating in multifamily buildings , clarified that this option is also allowable for tenant spaces and additions.
50.	C406.11 Reduced air infiltration , clarified that this option is also allowable for tenant spaces and additions.
51.	Table C407.2, Mandatory Compliance Measures for Total Building Performance Method , solar readiness was added to the list of mandatory requirements.
52.	C409.1 General (metering) , fixed section reference; simplified the language.
53.	C501.4.1 U-factor requirements for additions and alterations , replaced the word "retrofit" with the defined word "alteration." Clarified the language in the exception.
54.	C501.4.2 Calculations of mechanical heating and cooling loads for alterations , replaced the word "retrofit" with the defined word "alteration." Clarified the language in the exceptions.
55.	C502.1 General (Additions) , added Section C406 to the list of sections additions must comply with.
56.	C502.2.1 Vertical fenestration , deleted item 1 dealing with skylights since there is no application to this section.

57.	C503.2 Change in space conditioning , duplicative language was removed and remaining language in exceptions was edited for clarity and applicability.
58.	C503.3.2 Vertical fenestration , language edited for clarity and missing modified language was inserted; section was aligned with Section C405.
59.	C503.3.3 Skylight area , language edited for clarity and missing modified language was inserted; section was aligned with Section C405.
60.	Table C503.4 Economizer compliance options for mechanical alterations , language clarifications and reference corrections.
61.	C505.1 General (Change of occupancy or use) , duplicative language was removed and remaining language in exceptions was edited for clarity and applicability.
62.	Reference standards , updated ASHRAE 90.1 to the 2016 edition referenced in the 2018 IECC.
63.	D101 Scope (HVAC TSPR) , clarifications and editorial corrections to language.
64.	F101.3.1 Anticipated building energy use (Outcome based compliance) , vehicle recharging was removed from the list of building energy services.
65.	F101.4.2 Change of occupancy use during monitoring period , the occupancy level target was changed from 85 percent to 50 percent.
66.	F101.4.5 Energy budget liability , this section was removed from the code as it was not consistent with building code general contents for scoping and requirements.
67.	F101.6 Performance bond or financial security , the provision for an option of providing a bond equal to the cost of installing PV was removed.

A final cost-benefit analysis is available by contacting Richard Brown, P.O. Box 41449, Olympia, WA 98504-1449, phone 360-407-9277, email Richard.brown@des.wa.gov, website sbcc.wa.gov.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 9, Repealed 0; or Recently Enacted State Statutes: New 0, Amended 0, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 209, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 0, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 0, Amended 0, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 0, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 218, Repealed 0.

Date Adopted: July 26, 2019.

Doug Orth
Council Chair

Chapter 51-11C WAC

STATE BUILDING CODE ADOPTION AND AMENDMENT OF THE ((2015)) 2018 EDITION OF THE

INTERNATIONAL ENERGY CONSERVATION CODE, COMMERCIAL

AMENDATORY SECTION (Amending WSR 17-17-162, filed 8/23/17, effective 10/1/17)

WAC 51-11C-10100 Section C101—Scope and general requirements.

C101.1 Title. This code shall be known as the *Washington State Energy Code*, and shall be cited as such. It is referred to herein as "this code."

C101.2 Scope. This code applies to *commercial buildings* and the buildings sites and associated systems and equipment. References in this code to Group R shall include Group I-1, Condition 2 assisted living facilities licensed by Washington state under chapter 388-78A WAC and Group I-1, Condition 2 residential treatment facilities licensed by Washington state under chapter 246-337 WAC. Building areas that contain Group R sleeping units, regardless of the number of stories in height, are required to comply with the commercial sections of the energy code.

EXCEPTION: The provisions of this code do not apply to *temporary growing structures* used solely for the commercial production of horticultural plants including ornamental plants, flowers, vegetables, and fruits. A temporary growing structure is not considered a building for the purposes of this code. However, the installation of other than listed, portable mechanical equipment or listed, portable lighting fixtures is not allowed.

C101.3 Intent. This code shall regulate the design and construction of buildings for the use and conservation of energy over the life of each building. This code is intended to provide flexibility to permit the use of innovative approaches and techniques to achieve this objective. This code is not intended to abridge safety, health or environmental requirements contained in other applicable codes or ordinances.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-10140 Section C101.4—Applicability.

C101.4 Applicability. Where, in any specific case, different sections of this code specify different materials, methods of construction or other requirements, the most restrictive shall govern. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall govern.

C101.4.1 Mixed (~~occupancy~~) residential and commercial buildings. Where a building includes both *residential building* and *commercial* (~~occupancies, each occupancy~~) *building portions*, each portion shall be separately considered and meet the applicable provisions of WSEC—Commercial Provisions or WSEC—Residential Provisions.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-10150 Section C101.5—Compliance.

C101.5 Compliance. *Residential buildings* shall meet the provisions of WSEC—Residential Provisions. *Commercial buildings* shall meet the provisions of WSEC—Commercial Provisions.

C101.5.1 Compliance materials. The *code official* shall be permitted to approve specific computer software, worksheets, compliance manuals and other similar materials that meet the intent of this code.

C101.6 Appendices. Appendices A, B, C, and D are included in the adoption of this code. Provisions in Appendices E and F shall not apply unless specifically adopted by the local jurisdiction.

AMENDATORY SECTION (Amending WSR 13-04-056, filed 2/1/13, effective 7/1/13)

WAC 51-11C-10200 Section C102—(~~Alternate materials—Method~~) Alternative materials, design and methods of construction(~~, design or insulating systems~~) and equipment.

C102.1 General. The provisions of this code (~~is~~) are not intended to prevent the (~~use of any material, method of construction, design or insulating system not specifically prescribed herein, provided that such construction, design or insulating system has been approved by the code official as meeting the intent of this code~~) installation of any material, or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alter-

native has been approved. An alternative material, design or method of construction shall be approved where the code official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety. Where the alternative material, design or method of construction is not approved, the code official shall respond in writing, stating the reasons why the alternative was not approved.

AMENDATORY SECTION (Amending WSR 16-24-070, filed 12/6/16, effective 5/1/17)

WAC 51-11C-10300 Section C103—Construction documents.

C103.1 General. Construction documents and other supporting data shall be submitted in one or more sets with each application for a permit. The construction documents shall be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed. Where special conditions exist, the *code official* is authorized to require necessary construction documents to be prepared by a registered design professional.

EXCEPTION: The *code official* is authorized to waive the requirements for construction documents or other supporting data if the *code official* determines they are not necessary to confirm compliance with this code.

C103.2 Information on construction documents. Construction documents shall be drawn to scale upon suitable material. Electronic media documents are permitted to be submitted when *approved* by the *code official*. Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed, and show in sufficient detail pertinent data and features of the building, systems and equipment as herein governed. Details shall include, but are not limited to, as applicable:

1. Insulation materials and their *R*-values.
2. Fenestration *U*-factors and SHGCs.
3. Area-weighted *U*-factor and SHGC calculations.
4. Mechanical system design criteria.
5. Mechanical and service water heating system and equipment types, sizes and efficiencies.
6. Economizer description.
7. Equipment and systems controls.
8. Fan motor horsepower (hp) and controls.
9. Duct sealing, duct and pipe insulation and location.
10. Lighting fixture schedule with wattage and control narrative.
11. Location of daylight zones on floor plan.
12. Air barrier details including all air barrier boundaries and associated square foot calculations on all six sides of the air barrier as applicable.

C103.2.1 Building thermal envelope depiction. The building's thermal envelope shall be represented on the construction documents.

C103.3 Examination of documents. The *code official* shall examine or cause to be examined the accompanying construction documents and shall ascertain whether the construction indicated and described is in accordance with the requirements of this code and other pertinent laws or ordinances.

C103.3.1 Approval of construction documents. When the *code official* issues a permit where construction documents are required, the construction documents shall be endorsed in writing and stamped "Reviewed for Code Compliance." Such *approved* construction documents shall not be changed, modified or altered without authorization from the *code official*. Work shall be done in accordance with the *approved* construction documents.

One set of construction documents so reviewed shall be retained by the *code official*. The other set shall be returned to the applicant, kept at the site of work and shall be open to inspection by the *code official* or a duly authorized representative.

C103.3.2 Previous approvals. This code shall not require changes in the construction documents, construction or designated occupancy of a structure for which a lawful permit has been heretofore issued or otherwise lawfully authorized, and the construction of which has been pursued in good faith within 180 days after the effective date of this code and has not been abandoned.

C103.3.3 Phased approval. The *code official* shall have the authority to issue a permit for the construction of part of an energy conservation system before the construction documents for the entire system have been submitted or *approved*, provided adequate information and detailed statements have been filed complying with all pertinent requirements of this code. The holders of such permit shall proceed at their own risk without assurance that the permit for the entire energy conservation system will be granted.

C103.4 Amended construction documents. Changes made during construction that are not in compliance with the *approved* construction documents shall be resubmitted for approval as an amended set of construction documents.

C103.5 Retention of construction documents. One set of *approved* construction documents shall be retained by the *code official* for a period of not less than 180 days from date of completion of the permitted work, or as required by state or local laws.

C103.6 Building documentation and close out submittal requirements. The construction documents shall specify that the documents described in this section be provided to the building owner or owner's authorized agent within ~~((180))~~ a maximum of 90 days of the date of receipt of the certificate of occupancy.

C103.6.1 Record documents. Construction documents shall be updated by the installing contractor and architect or engineer of record to convey a record of the completed work. Such updates shall include building envelope, mechanical, plumbing, electrical and control drawings red-lined, or redrawn if specified, that show all changes to size, type and

locations of components, equipment and assemblies. Record documents shall include the location and model number of each piece of equipment as installed. The architect, engineer of record or installing contractor is required to provide consolidated record drawings in compliance with this section to the building owner or owner's authorized agent with the timeline specified in Section C103.6.

C103.6.2 Building operations and maintenance information. Required regular maintenance actions for equipment and systems shall be clearly stated on a readily visible label on the equipment. The label shall include the title or publication number for the operation and maintenance manual for that particular model and type of product and the manufacture date or installation date.

C103.6.2.1 Manuals. An operating and maintenance manual shall be provided for each component, device, piece of equipment, and system governed by this code. The manual shall include all of the following:

1. Submittal data indicating all selected options for each piece of equipment and control devices.
2. Manufacturer's operation manuals and maintenance manuals for each device, piece of equipment, and system requiring maintenance, except equipment not furnished as part of the project. Required routine maintenance actions, cleaning and recommended relamping shall be clearly identified.
3. Name and address of at least one service agency.
4. Controls system inspection schedule, maintenance and calibration information, wiring diagrams, schematics, and control sequence descriptions. A schedule for inspecting and recalibrating all lighting controls. Desired or field-determined setpoints shall be permanently recorded on control drawings at control devices or, for digital control systems, on the graphic where settings may be changed.
5. A narrative of how each system is intended to operate, including recommended setpoints. Sequence of operation alone is not acceptable for this requirement.

C103.6.3 Compliance documentation. All energy code compliance forms and calculations shall be delivered in one document to the building owner as part of the project record documents ~~((;))~~ or manuals, or as a standalone document. This document shall include the specific energy code year utilized for compliance determination for each system. NFRC certificates for the installed windows, list of total area for each NFRC certificate, the interior lighting power compliance path (building area, space-by-space) used to calculate the lighting power allowance.

For projects complying with Section C401.2 Item 1, the documentation shall include:

1. The ~~((envelop))~~ envelope insulation compliance path (prescriptive or component performance).
2. All completed code compliance forms, and all compliance calculations including, but not limited to, those required by sections C402.1.5, C403.2.12.1, C405.4, and C405.5.

For projects complying with Section C401.2 Item 2, the documentation shall include:

1. A list of all proposed envelope component types, areas and *U*-values.

2. A list of all lighting area types with areas, lighting power allowance, and installed lighting power density.

3. A list of each HVAC system modeled with the assigned and proposed system type.

4. Electronic copies of the baseline and proposed model input and output file. The input files shall be in a format suitable for rerunning the model and shall not consist solely of formatted reports of the inputs.

C103.6.4 Systems operation training. Training of the maintenance staff for equipment included in the manuals required by Section C103.6.2 shall include at a minimum:

1. Review of manuals and permanent certificate.
2. Hands-on demonstration of all normal maintenance procedures, normal operating modes, and all emergency shut-down and start-up procedures.
3. Training completion report.

AMENDATORY SECTION (Amending WSR 16-24-070, filed 12/6/16, effective 5/1/17)

WAC 51-11C-10400 Section C104—Inspections.

C104.1 General. Construction or work for which a permit is required shall be subject to inspection by the *code official* ~~((or))~~, his or her designated agent, or an *approved agency*, and such construction or work shall remain ~~((accessible and exposed))~~ visible and able to be accessed for inspection purposes until *approved*. Approval as a result of an inspection shall not be construed to be an approval of a violation of the provisions of this code or of other ordinances of the jurisdiction. Inspections presuming to give authority to violate or cancel the provisions of this code or of other ordinances of the jurisdiction shall not be valid. It shall be the duty of the permit applicant to cause the work to remain ~~((accessible and exposed))~~ visible and able to be accessed for inspection purposes. Neither the *code official* nor the jurisdiction shall be liable for expense entailed in the removal or replacement of any material, product, system or building component required to allow inspection to validate compliance with this code.

C104.2 Required inspections. The *code official* ~~((or))~~, his or her designated agent, or an *approved agency*, upon notification, shall make the inspections set forth in Sections C104.2.1 through C104.2.6.

C104.2.1 Footing and foundation ~~((inspection))~~ insulation. Inspections ~~((associated with footings and foundations))~~ shall verify ~~((compliance with the code as to))~~ footing and/or foundation insulation *R*-value, location, thickness, depth of burial and protection of insulation as required by the code ~~((and))~~, *approved* plans and specifications.

C104.2.2 ~~((Insulation and fenestration inspection))~~ Thermal envelope. Inspections shall be made before application of interior finish and shall verify ~~((compliance with the code as to types of insulation and corresponding R-values and their correct location and proper installation; fenestration properties (U-factor, SHGC and VT) and proper installation; and air leakage controls))~~ that envelope components with the correct type of insulation, the R-values, the correct location of insulation, the correct fenestration, the U-factor, SHGC, VT, and

air leakage controls are properly installed as required by the code ~~((and))~~, *approved* plans and specifications, including envelope components in future tenant spaces of multitenant buildings.

C104.2.3 Plumbing ~~((inspection))~~ system. Inspections shall verify ~~((compliance as required by the code and approved plans and specifications as to types of insulation and corresponding R-values and protection, required controls and required heat traps))~~ the type of insulation, the R-values, the protection required, controls, and heat traps as required by the code, *approved* plans and specifications.

C104.2.4 Mechanical ~~((inspection))~~ system. Inspections shall verify ~~((compliance as required by the code and approved plans and specifications as to))~~ the installed HVAC equipment for the correct type and size, ~~((required))~~ controls, duct and piping ~~((system))~~ insulation ~~((and corresponding))~~ *R*-values, duct system and damper air leakage ~~((and required energy recovery and/or economizers))~~, minimum fan efficiency, energy recovery and economizer as required by the code, *approved* plans and specifications.

C104.2.5 Electrical ~~((and lighting inspection))~~ system. Inspections shall verify ~~((compliance as required by the code and approved plans and specifications as to installed))~~ lighting system~~((s))~~ controls, components ~~((and controls))~~, meters, motors and installation of an electric meter for each dwelling unit as required by the code, *approved* plans and specifications.

C104.2.6 Final inspection. The ~~((building shall have a final inspection and not be occupied until approved))~~ final inspection shall include verification of the installation and proper operation of all required building controls, and documentation verifying activities associated with required building commissioning have been conducted in accordance with Section C408.

C104.3 Reinspection. A building shall be reinspected when determined necessary by the *code official*.

C104.4 Approved inspection agencies. The *code official* is authorized to accept reports of *approved* inspection agencies, provided such agencies satisfy the requirements as to qualifications and reliability relevant to the building components and systems they are inspecting.

C104.5 Inspection requests. It shall be the duty of the holder of the permit or their duly authorized agent to notify the *code official* when work is ready for inspection. It shall be the duty of the permit holder to provide access to and means for inspections of such work that are required by this code.

C104.6 Reinspection and testing. Where any work or installation does not pass an initial test or inspection, the necessary corrections shall be made so as to achieve compliance with this code. The work or installation shall then be resubmitted to the *code official* for inspection and testing.

C104.7 Approval. After the prescribed tests and inspections indicate that the work complies in all respects with this code, a notice of approval shall be issued by the *code official*.

C104.7.1 Revocation. The *code official* is authorized to, in writing, suspend or revoke a notice of approval issued under the provisions of this code wherever the certificate is issued in error, or on the basis of incorrect information supplied, or where it is determined that the building or structure, premise, or portion thereof is in violation of any ordinance or regulation or any of the provisions of this code.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-20201 Section C202.1—A.

ABOVE-GRADE WALL. A wall enclosing *conditioned space* that is not a below-grade wall. This includes between-floor spandrels, peripheral edges of floors, roof and basement knee walls, dormer walls, gable end walls, walls enclosing a mansard roof and skylight shafts.

~~((ACCESSIBLE. Admitting close approach as a result of not being guarded by locked doors, elevation or other effective means (see "Readily accessible"-).))~~ ACCESS (TO). That which enables a device, appliance or equipment to be reached by ready access or by a means that first requires the removal or movement of a panel or similar obstruction.

ADDITION. An extension or increase in the *conditioned space* floor area, number of stories, or height of a building or structure.

~~AIR BARRIER. ((Material(s) assembled and joined together to provide a barrier to air leakage through the building envelope. An air barrier may be a single material or a combination of materials-))~~ One or more materials joined together in a continuous manner to restrict or prevent the passage of air through the building thermal envelope and its assemblies.

AIR CURTAIN. A device, installed at the building entrance, that generates and discharges a laminar air stream intended to prevent the infiltration of external, unconditioned air into the conditioned spaces, or the loss of interior, conditioned air to the outside.

ALTERATION. Any construction, retrofit or renovation to an existing structure other than repair or addition ~~((that requires a permit))~~. Also, a change in a building, electrical, gas, mechanical or plumbing system that involves an extension, addition or change to the arrangement, type or purpose of the original installation ~~((that requires a permit))~~.

~~APPROVED. ((Approval by))~~ Acceptable to the code official ~~((as a result of investigation and tests conducted by him or her, or by reason of accepted principles or tests by nationally recognized organizations))~~.

APPROVED AGENCY. An established and recognized agency regularly engaged in conducting tests or furnishing inspection services, or furnishing product certification research reports, when such agency has been *approved* by the *code official*.

ATTIC AND OTHER ROOFS. All other roofs, including roofs with insulation entirely below (inside of) the roof structure (i.e., attics, cathedral ceilings, and single-rafter ceilings), roofs with insulation both above and below the roof structure, and roofs without insulation but excluding roofs with insulation entirely above deck and metal building roofs.

AUTOMATIC. Self-acting, operating by its own mechanism when actuated by some impersonal influence, as, for exam-

ple, a change in current strength, pressure, temperature or mechanical configuration (see "Manual").

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-20202 Section C202.2—B.

BELOW-GRADE WALL. That portion of a wall in the building envelope that is entirely below the finish grade and in contact with the ground.

BLOCK. A generic concept used in energy simulation. It can include one or more thermal zones. It represents a whole building or portion of a building with the same use type served by the same HVAC system type.

BOILER, MODULATING. A boiler that is capable of more than a single firing rate in response to a varying temperature or heating load.

BOILER SYSTEM. One or more boilers, their piping and controls that work together to supply steam or hot water to heat output devices remote from the boiler.

BUBBLE POINT. The refrigerant liquid saturation temperature at a specified pressure.

BUILDING. Any structure used or intended for supporting or sheltering any use or occupancy, including any mechanical systems, service water heating systems and electric power and lighting systems located on the building site and supporting the building.

BUILDING COMMISSIONING. A process that verifies and documents that the ~~((selected))~~ building systems have been ~~((designed,))~~ installed ~~((;))~~ and function according to the ~~((owner's project requirements and))~~ approved construction documents ~~((, and to minimum code requirements))~~.

BUILDING ENTRANCE. Any ~~((door))~~ doorway, set of doors, ~~((doorway,))~~ revolving door, vestibule or other form of portal that is ordinarily used to gain access to the building ~~((from the outside by the public))~~ or to exit from the building by its users and occupants. This does not include doors solely used to directly enter mechanical, electrical and other building utility service equipment rooms, or doors for emergency egress only.

BUILDING SITE. A contiguous area of land that is under the ownership or control of one entity.

BUILDING THERMAL ENVELOPE. The below-grade walls, above-grade walls, floors, ceilings, roofs, and any other building element ~~((s))~~ assemblies that enclose *conditioned space* or provides a boundary between *conditioned space*, *semiheated space* and exempt or unconditioned space.

AMENDATORY SECTION (Amending WSR 16-24-070, filed 12/6/16, effective 5/1/17)

WAC 51-11C-20203 Section C202.3—C.

C-FACTOR (THERMAL CONDUCTANCE). The coefficient of heat transmission (surface to surface) through a building component or assembly, equal to the time rate of heat flow per unit area and the unit temperature difference between the warm side and cold side surfaces (Btu/h ft² x °F) [W/(m² x K)].

CAPTIVE KEY DEVICE. A lighting control that will not release the key that activates the override when the lighting is on.

CAVITY INSULATION. Insulating material located between framing members.

CERTIFIED COMMISSIONING PROFESSIONAL. An individual who is certified by an ANSI/ISO/IEC 17024:2012 accredited organization to lead, plan, coordinate and manage commissioning teams and implement the commissioning ((~~processes~~, or a licensed professional engineer in Washington state)) process.

CHANGE OF OCCUPANCY. A change in the use of a building or a portion of a building that results in any of the following:

1. A change of occupancy classification.
2. A change from one group to another group within an occupancy classification.
3. Any change in use within a group for which there is a change in the application of the requirements of this code.

CIRCULATING HOT WATER SYSTEM. A specifically designed water distribution system where one or more pumps are operated in the service hot water piping to circulate heated water from the water-heating equipment to the fixture supply and back to the water-heating equipment.

CLERESTORY FENESTRATION. See "FENESTRATION."

CLIMATE ZONE. A geographical region based on climatic criteria as specified in this code.

CODE OFFICIAL. The officer or other designated authority charged with the administration and enforcement of this code, or a duly authorized representative.

COEFFICIENT OF PERFORMANCE (COP) - COOLING. The ratio of the rate of heat removal to the rate of energy input, in consistent units, for a complete refrigerating system or some specific portion of that system under designated operating conditions.

COEFFICIENT OF PERFORMANCE (COP) - HEATING. The ratio of the rate of heat removal to the rate of heat delivered to the rate of energy input, in consistent units, for a complete heat pump system, including the compressor and, if applicable, auxiliary heat, under designated operating conditions.

COMMERCIAL BUILDING. For this code, all buildings that are not included in the definition of "Residential buildings."

COMPUTER ROOM. A room whose primary function is to house equipment for the processing and storage of electronic data and that has a design ((~~electronic data~~)) total information technology equipment (ITE) equipment power ((density exceeding)) less than or equal to 20 watts per square foot of conditioned area or a design ITE equipment load less than or equal to 10 kW.

CONDENSING UNIT. A factory-made assembly of refrigeration components designed to compress and liquefy a specific refrigerant. The unit consists of one or more refrigerant compressors, refrigerant condensers (air-cooled, evaporatively cooled, or water-cooled), condenser fans and motors (where used) and factory-supplied accessories.

CONDITIONED FLOOR AREA. The horizontal projection of the floors associated with the *conditioned space*.

CONDITIONED SPACE. An area, room or space that is enclosed within the building thermal envelope and that is directly heated or cooled or that is indirectly heated or cooled. Spaces are indirectly heated or cooled where they communicate through openings with conditioned spaces,

where they are separated from conditioned spaces by uninsulated walls, floors or ceilings, or where they contain uninsulated ducts, piping or other sources of heating or cooling.

((~~CONTINUOUS AIR BARRIER.~~ A combination of materials and assemblies that restrict or prevent the passage of air through the building thermal envelope.))

CONTINUOUS INSULATION (CI). Insulating material that is continuous across all structural members without metal thermal bridges other than fasteners that have a total cross-sectional area not greater than 0.04 percent of the envelope surface through which they penetrate, and service openings. It is installed on the interior or exterior or is integral to any opaque surface of the building envelope.

CONTROLLED PLANT GROWTH ENVIRONMENT. Group F and U buildings or spaces that are specifically controlled to facilitate and enhance plant growth and production by manipulating various indoor ((~~environment~~)) environmental conditions. Technologies include indoor agriculture, cannabis growing, hydroponics, aquaculture and aquaponics. Controlled indoor environment variables include, but are not limited to, temperature, air quality, humidity, and carbon dioxide.

CURTAIN WALL. Fenestration products used to create an external nonload-bearing wall that is designed to separate the exterior and interior environments.

Reviser's note: The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency and appear in the Register pursuant to the requirements of RCW 34.08.040.

AMENDATORY SECTION (Amending WSR 16-24-070, filed 12/6/16, effective 5/1/17)

WAC 51-11C-20204 Section C202.4—D.

DATA ACQUISITION SYSTEM. An electronic system managed by the building owner to collect, tabulate and display metering information.

DATA CENTER. A room or series of rooms that share data center systems whose primary function is to house equipment for the processing and storage of electronic data, which has a design total information technology equipment (ITE) power density exceeding 20 watts per square foot of conditioned area and a total design ITE equipment load greater than 10 kW.

DATA CENTER SYSTEMS. HVAC systems, electrical systems, equipment, or portions thereof used to condition *ITE* or electrical systems in a *data center*.

DAYLIGHT RESPONSIVE CONTROL. A device or system that provides automatic control of electric light levels based on the amount of daylight in a space.

DAYLIGHT ZONE. The portion of the building interior floor area that is illuminated by natural daylight through ((~~sidelight and toplight~~)) sidelit and toplit fenestration.

DECORATIVE APPLIANCE, VENTED. A vented appliance wherein the primary function lies in the aesthetic effect of the flames.

DEMAND CONTROL VENTILATION (DCV). A ventilation system capability that provides for the automatic reduction of outdoor air intake below design rates when the actual occupancy of spaces served by the system is less than design occupancy.

DEMAND RECIRCULATION WATER SYSTEM. A water distribution system ~~((where pumps prime the service hot water piping with heated water upon demand for hot water))~~ having one or more recirculation pumps that pump water from a heated water supply pipe back to the heated water source through a cold water supply pipe.

DOOR, GARAGE. Doors rated by ASMA 105 with a single panel or sectional panels.

DOOR, NONSWINGING. Roll-up, tilt-up, metal coiling and sliding doors, access hatches, and all other doors that are not swinging doors or garage doors with less than or equal to 14 percent glazing.

DOOR, SWINGING. Doors that are hinged on one side and revolving doors.

DUCT. A tube or conduit utilized for conveying air. The air passages of self-contained systems are not to be construed as air ducts.

DUCT SYSTEM. A continuous passageway for the transmission of air that, in addition to ducts, includes duct fittings, dampers, plenums, fans and accessory air-handling equipment and appliances.

DWELLING UNIT. A single unit providing complete independent living facilities for one or more persons, including permanent provisions for living, sleeping, eating, cooking and sanitation.

DX-DEDICATED OUTDOOR AIR SYSTEM UNITS (DX-DOAS UNITS). A type of air-cooled, water-cooled or water source factory assembled product that dehumidifies 100 percent outdoor air to a low dew point and includes reheat that is capable of controlling the supply dry-bulb temperature of the dehumidified air to the designated supply air temperature. This conditioned outdoor air is then delivered directly or indirectly to the conditioned spaces. It may precondition outdoor air by containing an enthalpy wheel, sensible wheel, desiccant wheel, plate heat exchanger, heat pipes, or other heat or mass transfer apparatus.

DYNAMIC GLAZING. Any fenestration product that has the fully reversible ability to change its performance properties, including *U*-factor, SHGC, or VT.

AMENDATORY SECTION (Amending WSR 13-04-056, filed 2/1/13, effective 7/1/13)

WAC 51-11C-20205 Section C202.5—E.

ECONOMIZER, AIR. A duct and damper arrangement and automatic control system that allows a cooling system to supply outside air to reduce or eliminate the need for mechanical cooling during mild or cold weather.

ECONOMIZER, WATER. A system where the supply air of a cooling system is cooled indirectly with water that is itself cooled by heat or mass transfer to the environment without the use of mechanical cooling.

ELECTRICAL LOAD COEFFICIENT (ELC). In a data center, the ratio of the sum of three specific electrical losses (or losses calculated from efficiencies) to the ITE load itself. Specifically, ELC equals the sum of the incoming (to ITE) electrical service losses, UPS losses, and ITE distribution losses all divided by the peak ITE load. The design ELC is calculated at the full load design condition with active redundant equipment engaged, and the annual ELC is calculated the same

way because it is assumed that ITE runs constantly at full power all year.

ENCLOSED SPACE. A volume surrounded by solid surfaces such as walls, floors, roofs, and operable devices such as doors and operable windows.

END USE CATEGORY. A load or group of loads that consume energy in a common or similar manner.

ENERGY ANALYSIS. A method for estimating the annual energy use of the *proposed design* and *standard reference design* based on estimates of energy use.

ENERGY COST. The total estimated annual cost for purchased energy for the building functions regulated by this code, including applicable demand charges.

ENERGY RECOVERY VENTILATION SYSTEM. Systems that employ air-to-air heat exchangers to recover energy from exhaust air for the purpose of preheating, precooling, humidifying or dehumidifying outdoor ventilation air prior to supplying the air to a space, either directly or as part of an HVAC system.

ENERGY SIMULATION TOOL. An *approved* software program or calculation-based methodology that projects the annual energy use of a building.

ENERGY SOURCE METER. A meter placed at the source of the incoming energy that measures the energy delivered to the whole building or metered space.

ENTRANCE DOOR. A vertical fenestration product((s)) used for occupant ingress, egress and access in nonresidential buildings including, but not limited to, exterior entrances ((that utilize)) utilizing latching hardware and automatic closers and ((contain)) containing over 50 percent ((glass)) glazing specifically designed to withstand heavy ((use and possibly abuse)) duty usage.

EQUIPMENT ROOM. A space that contains either electrical equipment, mechanical equipment, machinery, water pumps or hydraulic pumps that are a function of the building's services.

EXTERIOR WALL. Walls including both above-grade walls and below-grade walls.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-20206 Section C202.6—F.

FAN BRAKE HORSEPOWER (BHP). The horsepower delivered to the fan's shaft. Brake horsepower does not include the mechanical drive losses (belts, gears, etc.).

FAN EFFICIENCY GRADE (FEG). A numerical rating identifying the fan's aerodynamic ability to convert shaft power, or impeller power in the case of a direct-driven fan, to air power.

FAN SYSTEM BHP. The sum of the fan brake horsepower of all fans that are required to operate at fan system design conditions to supply air from the heating or cooling source to the *conditioned space(s)* and return it to the source or exhaust it to the outdoors.

FAN SYSTEM DESIGN CONDITIONS. Operating conditions that can be expected to occur during normal system operation that result in the highest supply fan airflow rate to conditioned spaces served by the system, other than during air economizer operation.

FAN SYSTEM MOTOR NAMEPLATE HP. The sum of the motor nameplate horsepower of all fans that are required to operate at design conditions to supply air from the heating or cooling source to the *conditioned space(s)* and return it to the source or exhaust it to the outdoors.

FENESTRATION. Products classified as either skylights or vertical fenestration (~~(or skylights)~~).

SKYLIGHTS. Glass or other transparent or translucent glazing material installed at a slope of less than 60 degrees (91.05 rad) from horizontal, including unit skylights, tubular daylighting devices and glazing materials in solariums, sunrooms, roofs and sloped walls.

VERTICAL FENESTRATION. Windows (~~((fixed or moveable))~~) that are fixed or operable, ((glazed)) doors((;)) with more than 50 percent glazed area and glazed block ((and combination opaque/glazed doors)) composed of glass or other transparent or translucent glazing materials and installed at a slope (~~((of at least))~~) not less than 60 degrees (91.05 rad) from horizontal. Opaque areas such as spandrel panels are not considered vertical fenestration.

CLERESTORY FENESTRATION. An upper region of vertical fenestration provided for the purpose of admitting daylight beyond the perimeter of a space. The entire clerestory fenestration assembly is installed at a height greater than 8 feet above the finished floor.

FENESTRATION AREA. Total area of the fenestration measured using the rough opening, and including the glazing, sash and frame.

FENESTRATION PRODUCT, FIELD-FABRICATED. A fenestration product whose frame is made at the construction site of standard dimensional lumber or other materials that were not previously cut, or otherwise formed with the specific intention of being used to fabricate a fenestration product or exterior door. Field fabricated does not include site-built fenestration.

FENESTRATION PRODUCT, SITE-BUILT. A fenestration designed to be made up of field-glazed or field-assembled units using specific factory cut or otherwise factory-formed framing and glazing units. Examples of site-built fenestration include storefront systems, curtain walls, and atrium roof systems.

F-FACTOR. The perimeter heat loss factor for slab-on-grade floors (Btu/h x ft x °F) [W/(m x K)].

FLOOR AREA, NET. The actual occupied area not including unoccupied accessory areas such as corridors, stairways, toilet rooms, mechanical rooms and closets.

FURNACE ELECTRICITY RATIO. The ratio of furnace electricity use to total furnace energy computed as ratio = $(3.412 \times E_{AE}) / 1000 \times E_F + 3.412 \times E_{AE}$ where E_{AE} (average annual auxiliary electrical consumption) and E_F (average annual fuel energy consumption) are defined in Appendix N to Subpart B of Part 430 of Title 10 of the Code of Federal Regulations and E_F is expressed in millions of Btus per year.

Reviser's note: The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency and appear in the Register pursuant to the requirements of RCW 34.08.040.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-20207 Section C202.7—G.

GENERAL LIGHTING. Lighting that provides a substantially uniform level of illumination throughout an area. General lighting shall not include lighting that provides a dissimilar level of illumination to serve a specific application or decorative feature within such area.

~~((GENERAL PURPOSE ELECTRIC MOTOR (SUBTYPE I). A motor that is designed in standard ratings with either of the following:~~

~~1. Standard operating characteristics and standard mechanical construction for use under usual service conditions, such as those specified in NEMA MG1, paragraph 14.02, "Usual Service Conditions," and without restriction to a particular application or type of application.~~

~~2. Standard operating characteristics or standard mechanical construction for use under unusual service conditions, such as those specified in NEMA MG1, paragraph 14.03, "Unusual Service Conditions," or for a particular type of application, and that can be used in most general purpose applications.~~

~~General purpose electric motors (Subtype I) are constructed in NEMA T frame sizes or IEC metric equivalent, starting at 143T.~~

~~GENERAL PURPOSE ELECTRIC MOTOR (SUBTYPE II). A motor incorporating the design elements of a general purpose electric motor (Subtype I) that is configured as one of the following:~~

~~1. A U-frame motor.~~

~~2. A Design C motor.~~

~~3. A close-coupled pump motor.~~

~~4. A footless motor.~~

~~5. A vertical, solid-shaft, normal-thrust motor (as tested in a horizontal configuration).~~

~~6. An 8-pole motor (900 rpm).~~

~~7. A polyphase motor with voltage of not more than 600 volts (other than 230 or 460 volts).))~~

GREENHOUSE. A permanent structure or a thermally isolated area of a building that maintains a specialized sunlit environment that is used exclusively for, and is essential to, the cultivation, protection or maintenance of plants. Greenhouses are those that are erected for a period of 180 days or more.

GROUP R. Buildings or portions of buildings that contain any of the following occupancies as established in the *International Building Code*:

1. Group R-1.

2. Group R-2 where located more than three stories in height above grade plane.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-20208 Section C202.8—H.

HEAT TRAP. An arrangement of piping and fittings, such as elbows, or a commercially available heat trap that prevents thermosiphoning of hot water during standby periods.

HEAT TRAP, PIPE CONFIGURED. A pipe configured heat trap is either, as applicable:

1. A device specifically designed for the purpose or an arrangement of tubing that forms a loop of 360 degrees; or

2. Piping that from the point of connection to the water heater (inlet or outlet) includes a length of piping directed downward before connection to the vertical piping of the supply water or hot-water distribution system.

HEATED SLAB-ON-GRADE FLOOR. Slab-on-grade floor construction in which the heating elements, hydronic tubing, or hot air distribution system is in contact with, or placed within or under, the slab.

HEATED WATER CIRCULATION SYSTEM. A water distribution system having one or more recirculation pumps that pump water from a heated water source through a dedicated hot water circulation pipe or piping system.

HIGH SPEED DOOR. A nonswinging door used primarily to facilitate vehicular access or material transportation, with a minimum opening rate of 32 inches (813 mm) per second, a minimum closing rate of 24 inches (610 mm) per second and that includes an automatic-closing device.

HISTORIC BUILDINGS. Buildings that are listed in or eligible for listing in the National Register of Historic Places, or designated as historic under an appropriate state or local law.

HUMIDISTAT. A regulatory device, actuated by changes in humidity, used for automatic control of relative humidity.

HVAC TOTAL SYSTEM PERFORMANCE RATIO (HVAC TSPR). The ratio of the sum of a building's annual heating and cooling load in thousands of Btus to the sum of annual carbon emissions in pounds from energy consumption of the building HVAC systems. Carbon emissions shall be calculated by multiplying site energy consumption by the carbon emission factors from Table C407.1.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-20209 Section C202.9—I.

IEC DESIGN H MOTOR. An electric motor that meets all of the following:

1. It is an induction motor designed for use with three-phase power.

2. It contains a cage rotor.

3. It is capable of direct-on-line starting.

4. It has 4, 6 or 8 poles.

5. It is rated from 0.4 kW to 1600 kW at a frequency of 60 Hz.

IEC DESIGN N MOTOR. An electric motor that meets all of the following:

1. It is an inductor motor designed for use with three-phase power.

2. It contains a cage rotor.

3. It is capable of direct-on-line starting.

4. It has 2, 4, 6 or 8 poles.

5. It is rated from 0.4 kW to 1600 kW at a frequency of 60 Hz.

INFILTRATION. The uncontrolled inward air leakage into a building caused by the pressure effects of wind or the effect of differences in the indoor and outdoor air density or both.

INFORMATION TECHNOLOGY EQUIPMENT (ITE). ITE includes computers, data storage, servers and network/communications equipment.

INSULATION ENTIRELY ABOVE DECK. A roof with all insulation:

1. Installed above (outside of) the roof structure; and

2. Continuous (i.e., uninterrupted by framing members).

INTEGRATED ENERGY EFFICIENCY RATIO (IEER). A single-number figure of merit expressing cooling part-load EER efficiency for unitary air-conditioning and heat pump equipment on the basis of weighted operation at various load capacities for the equipment.

INTEGRATED PART LOAD VALUE (IPLV). A single number figure of merit based on part-load EER, COP, or kW/ton expressing part-load efficiency for air conditioning and heat pump equipment on the basis of weighted operation at various load capacities for equipment.

INTEGRATED SEASONAL COEFFICIENT OF PERFORMANCE (ISCOP). A seasonal efficiency number that is a combined value based on the formula listed in AHRI Standard 920 of the two COP values for the heating season of a DX-DOAS unit water or air source heat pump, expressed in W/W.

INTEGRATED SEASONAL MOISTURE REMOVAL EFFICIENCY (ISMRE). A seasonal efficiency number that is a combined value based on the formula listed in AHRI Standard 920 of the four dehumidification moisture removal efficiency (MRE) ratings required for DX-DOAS units, expressed in lb. of moisture/kWh.

ISOLATION DEVICES. Devices that isolate HVAC zones so they can be operated independently of one another. Isolation devices include separate systems, isolation dampers and controls providing shutoff at terminal boxes.

AMENDATORY SECTION (Amending WSR 17-10-062, filed 5/2/17, effective 6/2/17)

WAC 51-11C-20212 Section C202.12—L.

LABELED. Equipment, materials or products to which have been affixed a label, seal, symbol or other identifying mark of a nationally recognized testing laboratory, (~~(inspection)~~) approved agency or other organization concerned with product evaluation that maintains periodic inspection of the production of the above-labeled items and whose labeling indicates either that the equipment, material or product meets identified standards or has been tested and found suitable for a specified purpose.

LINER SYSTEM (LS). A system that includes the following:

1. A continuous vapor barrier liner membrane that is installed below the purlins and that is uninterrupted by framing members.

2. An uncompressed, unfaced insulation resting on top of the liner membrane and located between the purlins.

For multilayer installations, the last rated *R*-value of insulation is for unfaced insulation draped over purlins and then compressed when the metal roof panels are attached.

LISTED. Equipment, materials, products or services included in a list published by an organization acceptable to the *code official* and concerned with evaluation of products or services that maintains periodic inspection of production of *listed* equipment or materials or periodic evaluation of services and whose listing states either that the equipment, material, product or service meets identified standards or has been tested and found suitable for a specified purpose.

LOW-SLOPED ROOF. A roof having a slope less than 2 units vertical in 12 units horizontal.

LOW-VOLTAGE DRY-TYPE DISTRIBUTION TRANSFORMER. A transformer that is air-cooled, does not use oil as a coolant, has an input voltage less than or equal to 600 volts and is rated for operation at a frequency of 60 hertz.

LOW-VOLTAGE LIGHTING. A lighting system consisting of an isolating power supply, the low voltage luminaires, and associated equipment that are all identified for the use. ~~((The output circuits of the power supply operate at 30 volts (42.4 volts peak) or less under all load conditions.))~~

LUMINAIRE. A complete lighting unit consisting of a lamp or lamps together with the housing designed to distribute the light, position and protect the lamps, and connect the lamps to the power supply.

LUMINAIRE-LEVEL LIGHTING CONTROL. A lighting system consisting of one or more ~~((luminaire(s) each with))~~ luminaires where each luminaire has embedded lighting control logic, occupancy and ambient light sensors, ~~((local or central wireless networking capabilities.))~~ and local override switching capability, where required. Each luminaire shall also have wireless networking capabilities to detect and share information with other luminaires to adjust to occupancy and/or daylight in the space.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-20213 Section C202.13—M.

MANUAL. Capable of being operated by personal intervention (see "Automatic").

MASS TRANSFER DECK SLAB EDGE. That portion of the above-grade wall made up of the concrete slab where it extends past the footprint of the floor above, and there is space (conditioned or unconditioned) below the slab. The area of the slab edge shall be defined as the thickness of the slab multiplied by the perimeter of the edge condition. Examples of this condition include, but are not limited to, the transition from an above-grade structure to a below-grade structure or the transition from a tower to a podium. Cantilevered balconies do not meet this definition.

MECHANICAL COOLING. Reducing the temperature of a gas or liquid by using vapor compression, absorption, desiccant dehumidification combined with evaporative cooling, or another energy-driven thermodynamic cycle. Indirect or direct evaporative cooling alone is not considered mechanical cooling.

MECHANICAL HEATING. Raising the temperature of a gas or liquid by use of fossil fuel burners, electric resistance heaters, heat pumps, or other systems that require energy to operate.

MECHANICAL LOAD COEFFICIENT (MLC). In a data center, the ratio of the cooling system's net use of energy to that of the ITE. The design MLC is calculated for a local peak weather condition (stipulated in ASHRAE Standard 90.4) and equals the sum of all active cooling equipment input power, divided by total power into the ITE. The annual MLC is calculated using hourly TMY3 weather data for the data center's location and equals the sum of all energy flowing into the cooling system to respond to that weather, minus any energy successfully recovered to avoid any new energy use.

all divided by the energy flowing into the ITE during the same period.

METAL BUILDING ROOF. A roof that:

1. Is constructed with a metal, structural, weathering surface;
2. Has no ventilated cavity; and
3. Has the insulation entirely below deck (i.e., does not include composite concrete and metal deck construction nor a roof framing system that is separated from the superstructure by a wood substrate) and whose structure consists of one or more of the following configurations:
 - a. Metal roofing in direct contact with the steel framing members;
 - b. Metal roofing separated from the steel framing members by insulation;
 - c. Insulated metal roofing panels installed as described in a or b.

METAL BUILDING WALL. A wall whose structure consists of metal spanning members supported by steel structural members (i.e., does not include spandrel glass or metal panels in curtain wall systems).

METER. A device that measures the flow of energy.

MICROCELL. A wireless communication facility consisting of an antenna that is either: (a) Four (4) feet in height and with an area of not more than 580 square inches; or (b) if a tubular antenna, no more than four (4) inches in diameter and no more than six (6) feet in length; and the associated equipment cabinet that is six (6) feet or less in height and no more than 48 square feet in floor area.

AMENDATORY SECTION (Amending WSR 13-04-056, filed 2/1/13, effective 7/1/13)

WAC 51-11C-20214 Section C202.14—N.

NAMEPLATE HORSEPOWER. The nominal motor ~~((horsepower))~~ output power rating stamped on the motor nameplate.

NEMA DESIGN A MOTOR. A squirrel-cage motor that meets all of the following:

1. It is designed to withstand full-voltage starting and developing locked-rotor torque as shown in paragraph 12.38.1 of NEMA MG 1.
2. It has pull-up torque not less than the values shown in paragraph 12.40.1 of NEMA MG 1.
3. It has breakdown torque not less than the values shown in paragraph 12.39.1 of NEMA MG 1.
4. It has a locked-rotor current higher than the values shown in paragraph 12.35.1 of NEMA MG 1 for 60 Hz and paragraph 12.35.2 of NEMA MG 1 for 50 Hz.
5. It has a slip at rated load of less than 5 percent for motors with fewer than 10 poles.

NEMA DESIGN B MOTOR. A squirrel-cage motor that meets all of the following:

1. It is designed to withstand full-voltage starting.
2. It develops locked-rotor, breakdown and pull-up torques adequate for general application as specified in Sections 12.38, 12.39 and 12.40 of NEMA MG 1.
3. It draws locked-rotor current not to exceed the values shown in paragraph 12.35.1 of NEMA MG 1 for 60 Hz and paragraph 12.35.2 of NEMA MG 1 for 50 Hz.

4. It has a slip at rated load of less than 5 percent for motors with fewer than 10 poles.

NEMA DESIGN C MOTOR. A squirrel-cage motor that meets all of the following:

1. It is designed to withstand full-voltage starting and developing locked-rotor torque for high-torque applications up to the values shown in paragraph 12.38.2 of NEMA MG 1 (incorporated by reference; see Sec. 431.15).

2. It has pull-up torque not less than the values shown in paragraph 12.40.2 of NEMA MG 1.

3. It has breakdown torque not less than the values shown in paragraph 12.39.2 of NEMA MG 1.

4. It has a locked-rotor current not to exceed the values shown in paragraph 12.35.1 of NEMA MG 1 for 60 Hz and paragraph 12.35.2 of NEMA MG 1 for 50 Hz.

5. It has a slip at rated load of less than 5 percent.

NETWORKED GUEST ROOM CONTROL SYSTEM. A control system, accessible from the front desk or other central location associated with a Group R-1 building, that is capable of identifying the occupancy status of each guest room according to a timed schedule, and is capable of controlling HVAC in each hotel and motel guest room separately.

NONSTANDARD PART LOAD VALUE (NPLV). A single-number part-load efficiency figure of merit calculated and referenced to conditions other than IPLV conditions, for units that are not designed to operate at ARI standard rating conditions.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-20215 Section C202.15—O.

OCCUPANT SENSOR CONTROL. An automatic control device or system that detects the presence or absence of people within an area and causes lighting, equipment or appliances to be regulated accordingly.

ON-SITE RENEWABLE ENERGY. Energy derived from solar radiation, wind, waves, tides, landfill gas, biogas, biomass, or the internal heat of the earth. The energy system providing on-site renewable energy shall be located on the project site.

OPAQUE DOOR. A door that is not less than 50 percent opaque in surface area.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-20216 Section C202.16—P.

PERSONAL WIRELESS SERVICE FACILITY. A wireless communication facility (WCF), including a microcell, which is a facility for the transmission and/or reception of radio frequency signals and which may include antennas, equipment shelter or cabinet, transmission cables, a support structure to achieve the necessary elevation, and reception and/or transmission devices or antennas.

POWERED ROOF/WALL VENTILATORS. A fan consisting of a centrifugal or axial impeller with an integral driver in a weather-resistant housing and with a base designed to fit, usually by means of a curb, over a wall or roof opening.

POWER-OVER-ETHERNET LIGHTING (POE). Lighting sources powered by DC current utilizing Ethernet cables.

PROPOSED DESIGN. A description of the proposed building used to estimate annual energy use and carbon emissions from energy consumption for determining compliance based on total building performance and HVAC total performance ratio.

PUBLIC LAVATORY FAUCET. A lavatory faucet that is not intended for private use as defined by the *Uniform Plumbing Code* and that is supplied with both potable cold and hot water.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-20218 Section C202.18—R.

RADIANT HEATING SYSTEM. A heating system that transfers heat to objects and surfaces within a conditioned space, primarily by infrared radiation.

~~((**READILY ACCESSIBLE.** Capable of being reached quickly for operation, renewal or inspection without requiring those to whom ready access is requisite to climb over or remove obstacles or to resort to portable ladders or access equipment (see "*Accessible*").))~~ **READY ACCESS (TO).** That which enables a device, appliance or equipment to be directly reached, without requiring the removal or movement of any panel or similar obstruction.

REFRIGERANT DEW POINT. The refrigerant vapor saturation temperature at a specified pressure.

REFRIGERATED WAREHOUSE COOLER. An enclosed storage space that has a total chilled storage area of 3,000 ft² or greater and is designed to maintain a temperature of greater than 32°F but less than 55°F.

REFRIGERATED WAREHOUSE FREEZER. An enclosed storage space that has a total chilled storage area of 3,000 ft² or greater and is designed to maintain a temperature at or below 32°F.

REFRIGERATION SYSTEM, LOW TEMPERATURE. Systems for maintaining food product in a frozen state in refrigeration applications.

REFRIGERATION SYSTEM, MEDIUM TEMPERATURE. Systems for maintaining food product above freezing in refrigeration applications.

REGISTERED DESIGN PROFESSIONAL. An individual who is registered or licensed to practice their respective design profession as defined by the statutory requirements of the professional registration laws of the state or jurisdiction in which the project is to be constructed.

REPAIR. The reconstruction or renewal of any part of an existing building.

REPLACEMENT AIR. Outdoor air that is used to replace air removed from a building through an exhaust system. Replacement air may be derived from one or more of the following: Make-up air, supply air, transfer air and infiltration. However, the ultimate source of all replacement air is outdoor air. When replacement air exceeds exhaust, the result is exfiltration.

REROOFING. The process of recovering or replacing an existing roof covering. See "Roof Recover" and "Roof Replacement."

RESIDENTIAL BUILDING. For this code, includes detached one- and two-family dwellings and multiple single-family

dwellings (townhouses) as well as Group R-2(~~(, R-3 and R-4)) and R-3~~ buildings three stories or less in height above grade plane.

ROOF ASSEMBLY. A system designed to provide weather protection and resistance to design loads. The system consists of a roof covering and roof deck or a single component serving as both the roof covering and the roof deck. A roof assembly includes the roof covering, underlayment, roof deck, insulation, vapor retarder and interior finish. See also *attic and other roofs, metal building roof, roof with insulation entirely above deck and single-rafter roof.*

ROOF RECOVER. The process of installing an additional *roof covering* over a prepared existing *roof covering* without removing the existing *roof covering*.

ROOF REPAIR. Reconstruction or renewal of any part of an existing roof for the purposes of its maintenance.

ROOF REPLACEMENT. The process of removing the existing roof covering, repairing any damaged substrate and installing a new *roof covering*.

ROOFTOP MONITOR. A raised section of a roof containing vertical fenestration along one or more sides.

R-VALUE (THERMAL RESISTANCE). The inverse of the time rate of heat flow through a body from one of its bounding surfaces to the other surface for a unit temperature difference between the two surfaces, under steady state conditions, per unit area ($h \cdot \text{ft}^2 \cdot ^\circ\text{F}/\text{Btu}$) [$\text{m}^2 \cdot \text{K}/\text{W}$].

Reviser's note: The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency and appear in the Register pursuant to the requirements of RCW 34.08.040.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-20219 Section C202.19—S.

SATURATED-CONDENSING TEMPERATURE. The saturation temperature corresponding to the measured refrigerant pressure at the condenser inlet for single component and azeotropic refrigerants, and the arithmetic average of the dew point and *bubble point* temperatures corresponding to the refrigerant pressure at the condenser entrance for zeotropic refrigerants.

~~((SCREW LAMP HOLDERS. A lamp base that requires a screw-in type lamp, such as a compact fluorescent, incandescent, or tungsten halogen bulb.))~~

SEMI-HEATED SPACE. An enclosed space within a building, including adjacent connected spaces separated by an uninsulated component (e.g., basements, utility rooms, garages, corridors), which:

1. Is heated but not cooled, and has ~~((a maximum))~~ an installed heating system output capacity ~~((of))~~ greater than or equal to 3.4 Btu/(h-ft²) but not greater than 8 Btu/(h-ft²);

2. Is not a walk-in or warehouse cooler or freezer space.

SENSIBLE RECOVERY EFFECTIVENESS. Change in the dry-bulb temperature of the outdoor air supply divided by the difference between the outdoor air and return air dry-bulb temperatures, expressed as a percentage, governed by AHRI Standard 1060.

SERVICE WATER HEATING. Heating water for domestic or commercial purposes other than space heating and process requirements.

SIDELIT. See Section C405.2.4.2.

SINGLE-RAFTER ROOF. A roof where the roof above and the ceiling below are both attached to the same wood rafter and where insulation is located in the space between these wood rafters.

SKYLIGHT. See "Fenestration."

SLAB BELOW GRADE. Any portion of a slab floor in contact with the ground which is more than 24 inches below the final elevation of the nearest exterior grade.

SLAB-ON-GRADE FLOOR. That portion of a slab floor of the building envelope that is in contact with the ground and that is either above grade or is less than or equal to 24 inches below the final elevation of the nearest exterior grade.

SLEEPING UNIT. A room or space in which people sleep, which can also include permanent provisions for living, eating, and either sanitation or kitchen facilities but not both. Such rooms and spaces that are also part of a dwelling unit are not *sleeping units*.

SMALL ELECTRIC MOTOR. A general purpose, alternating current, single speed induction motor.

SMALL BUSINESS. Any business entity (including a sole proprietorship, corporation, partnership or other legal entity) which is owned and operated independently from all other businesses, which has the purpose of making a profit, and which has fifty or fewer employees.

SOLAR HEAT GAIN COEFFICIENT (SHGC). The ratio of the solar heat gain entering the space through the fenestration assembly to the incident solar radiation. Solar heat gain includes directly transmitted solar heat and absorbed solar radiation which is then reradiated, conducted or convected into the space.

SPACE CONDITIONING CATEGORY. Categories are based on the allowed peak space conditioning output capacity per square foot of conditioned floor area, or the design set point temperature, for a building or space. Space conditioning categories include: Low energy, semi-heated, conditioned, refrigerated walk-in and warehouse coolers, and refrigerated walk-in and warehouse freezers.

STANDARD REFERENCE DESIGN. A version of the *proposed design* that meets the minimum requirements of this code and is used to determine the maximum annual energy use requirement and carbon emissions from energy consumption for compliance based on total building performance and HVAC total system performance ratio.

STEEL-FRAMED WALL. A wall with a cavity (insulated or otherwise) whose exterior surfaces are separated by steel framing members (i.e., typical steel stud *walls* and curtain *wall systems*).

STOREFRONT. A ~~((nonresidential))~~ system of doors and windows mullied as a composite fenestration structure that has been designed to resist heavy use. *Storefront* systems include, but are not limited to, exterior fenestration systems that span from the floor level or above to the ceiling of the same story on commercial buildings, with or without mullied windows and doors.

SUBSYSTEM METER. A meter placed downstream of the energy supply meter that measures the energy delivered to a load or a group of loads.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-20220 Section C202.20—T.

TEMPORARY GROWING STRUCTURE. A temporary growing structure has sides and roof covered with polyethylene, polyvinyl or similar flexible synthetic material and is used to provide plants with either frost protection or increased heat retention. Temporary structures are those that are erected for a period of less than 180 days.

THERMOSTAT. An automatic control device used to maintain temperature at a fixed or adjustable set point.

TIME SWITCH CONTROL. An automatic control device or system that controls lighting or other loads, including switching off, based on time schedules.

TOPLIT. See Section C405.2.4.3.

TUBULAR DAYLIGHTING DEVICE (TDD). A nonoperable skylight device primarily designed to transmit daylight from a roof surface to an interior ceiling surface via a tubular conduit. The device consists of an exterior glazed weathering surface, a light transmitting tube with a reflective inside surface and an interior sealing device, such as a translucent ceiling panel.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-20222 Section C202.22—V.

VARIABLE REFRIGERANT FLOW SYSTEM. An engineered direct-expansion (DX) refrigerant system that incorporates a common condensing unit, at least one variable capacity compressor, a distributed refrigerant piping network to multiple indoor fan heating and cooling units each capable of individual zone temperature control, through integral zone temperature control devices and a common communications network. Variable refrigerant flow utilizes three or more steps of control on common interconnecting piping.

VENTILATION. The natural or mechanical process of supplying conditioned or unconditioned air to, or removing such air from, any space.

VENTILATION AIR. That portion of supply air that comes from outside (outdoors) plus any recirculated air that has been treated to maintain the desired quality of air within a designated space.

VERTICAL FENESTRATION. See "FENESTRATION."

VISIBLE TRANSMITTANCE [VT]. The ratio of visible light entering the space through the fenestration product assembly to the incident visible light, visible transmittance, includes the effects of glazing material and frame and is expressed as a number between 0 and 1. For skylights, VT shall be measured and rated in accordance with NFRC 202.

VISIBLE TRANSMITTANCE - ANNUAL [VT-ANNUAL]. The ratio of visible light entering the space through the fenestration product assembly to the incident visible light during the course of a year, visible transmittance, which includes the effects of glazing material, frame, and light well or tubular conduit, and is expressed as a number between 0 and 1. For tubular daylighting devices, VT-annual shall be measured and rated in accordance with NFRC 203.

VOLTAGE DROP. A decrease in voltage caused by losses in the wiring system that connect the power source to the load.

Reviser's note: The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency and appear in the Register pursuant to the requirements of RCW 34.08.040.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-30310 Section 303.1—Identification.

C303.1 Identification. Materials, systems and equipment shall be identified in a manner that will allow a determination of compliance with the applicable provisions of this code.

C303.1.1 Building thermal envelope insulation. An *R*-value identification mark shall be applied by the manufacturer to each piece of *building thermal envelope* insulation 12 inches (305 mm) or greater in width. Alternately, the insulation installers shall provide a certification listing the type, manufacturer and *R*-value of insulation installed in each element of the *building thermal envelope*. For blown or sprayed insulation (fiberglass and cellulose), the initial installed thickness, settled thickness, settled *R*-value, installed density, coverage area and number of bags installed shall be *listed* on the certification. For sprayed polyurethane foam (SPF) insulation, the installed thickness of the areas covered and *R*-value of installed thickness shall be *listed* on the certification. For insulated siding, the *R*-value shall be labeled on the product's package and shall be listed on the certification. The insulation installer shall sign, date and post the certification in a conspicuous location on the job site.

EXCEPTION: For roof insulation installed above the deck, the *R*-value shall be labeled as required by the material standards specified in Table 1508.2 of the *International Building Code*.

C303.1.1.1 Blown or sprayed roof/ceiling insulation. The thickness of blown-in or sprayed fiberglass and cellulose roof/ceiling insulation (~~((fiberglass or cellulose))~~) shall be written in inches (mm) on markers (~~((that are installed at least one))~~) for every 300 square feet (28 m²) of attic area throughout the attic space. The markers shall be affixed to the trusses or joists and marked with the minimum initial installed thickness with numbers of not less than 1 inch (25 mm) in height. Each marker shall face the attic access opening. Spray polyurethane foam thickness and installed *R*-value shall be *listed* on certification provided by the insulation installer.

C303.1.2 Insulation mark installation. Insulating materials shall be installed such that the manufacturer's *R*-value mark is readily observable upon inspection.

C303.1.3 Fenestration product rating. *U*-factors of fenestration (~~((products (windows, doors and skylights)))~~) shall be determined (~~((in accordance with NFRC 100.~~

EXCEPTION: Where required, garage door *U*-factors shall be determined in accordance with either NFRC 100 or ANSI/DASMA 105-.)

as follows:

1. For windows, doors and skylights, *U*-factor ratings shall be determined in accordance with NFRC 100.

2. Where required for garage doors and rolling doors, *U*-factor ratings shall be determined in accordance with either NFRC 100 or ANSI/DASMA 105.

U-factors shall be determined by an accredited, independent laboratory, and labeled and certified by the manufacturer.

Products lacking such a labeled *U*-factor shall be assigned a default *U*-factor from Table C303.1.3(1), C303.1.3(2) or C303.1.3(4). The solar heat gain coefficient (SHGC) and *visible transmittance* (VT) of glazed fenestration products (windows, glazed doors and skylights) shall be determined in accordance with NFRC 200 by an accredited, independent laboratory, and labeled and certified by the manufacturer. Products lacking such a labeled SHGC or VT shall be assigned a default SHGC or VT from Table C303.1.3(3).

EXCEPTION: Units without NFRC ratings produced by a small business may be assigned default *U*-factors from Table C303.1.3(5) for vertical fenestration.

C303.1.4 Insulation product rating. The thermal resistance (*R*-value) of insulation shall be determined in accordance with the U.S. Federal Trade Commission *R*-value rule (C.F.R. Title 16, Part 460) in units of h x ft² x °F/Btu at a mean temperature of 75°F (24°C).

C303.1.4.1 Insulated siding. The thermal resistance (*R*-Value) shall be determined in accordance with ASTM C1363. Installation for testing shall be in accordance with the manufacturer's installation instructions.

C303.1.5 Spandrel panels in glass curtain walls. Table C303.1.5 provides default *U*-factors for the spandrel section of glass and other curtain wall systems. Design factors that affect performance are the type of framing, the type of spandrel panel and the *R*-value of insulation. Four framing conditions are considered in the table. The first is the common case where standard aluminum mullions are used. Standard mullions provide a thermal bridge through the insulation, reducing its effectiveness. The second case is for metal framing members that have a thermal break. A thermal break frame uses a urethane or other nonmetallic element to separate the metal exposed to outside conditions from the metal that is exposed to interior conditions. The third case is for structural glazing or systems where there are no exposed mullions on the exterior. The fourth case is for the condition where there is no framing or the insulation is continuous and uninterrupted by framing. The columns in the table can be used for any specified level of insulation between framing members installed in framed curtain walls or spandrel panels.

C303.1.5.1 Window wall application. Where "window wall" or similar assembly that is discontinuous at intermediate slab edges is used, the slab edge *U*-value shall be as listed in Appendix Table A103.3.7.1(3) or as determined using an approved calculation.

C303.1.5.2 Table value assumptions. In addition to the spandrel panel assembly, the construction assembly *U*-factors assume an air gap between the spandrel panel (with an *R*-value of 1.39) and one layer of 5/8-inch gypsum board (with an *R*-value of 0.56) that provides the interior finish. The gypsum board is assumed to span between the window sill and a channel at the floor. For assemblies that differ from these

assumptions, custom *U*-factors can be calculated to account for any amount of continuous insulation or for unusual construction assemblies using Equations 3-1, 3-2 or 3-3 where appropriate. Spandrel panel *U*-factors for assemblies other than those covered by Table C303.1.5 or Equations 3-1 through 3-3 may be determined using an alternate approved methodology. Equations 3-1 through 3-3 do not calculate the value of any insulation inboard of the curtain wall assembly.

Aluminum without Thermal Break

(Equation 3-1)

$$U_{\text{overall}} = \left[(R_{\text{gypsum}} + R_{\text{airgap}}) + \left[\frac{1}{0.2798 + \left(\frac{1}{R_{\text{addinsulation}} + \left(\frac{1}{U_{\text{centerofglass}}} \right)} \right)} \right] \right]$$

Aluminum with Thermal Break

(Equation 3-2)

$$U_{\text{overall}} = \left[(R_{\text{gypsum}} + R_{\text{airgap}}) + \left[\frac{1}{0.1808 + \left(\frac{1}{R_{\text{addinsulation}} + \left(\frac{0.8874}{U_{\text{centerofglass}}} \right)} \right)} \right] \right]$$

Structural Glazing

(Equation 3-3)

$$U_{\text{overall}} = \left[(R_{\text{gypsum}} + R_{\text{airgap}}) + \left[\frac{1}{0.1151 + \left(\frac{1}{R_{\text{addinsulation}} + \left(\frac{0.9487}{U_{\text{centerofglass}}} \right)} \right)} \right] \right]$$

Reviser's note: The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency and appear in the Register pursuant to the requirements of RCW 34.08.040.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-303131 Table C303.1.3(1)—Default glazed ((fenestration)) window, glass door and skylight *U*-factors.

Table C303.1.3(1)

Default Glazed ((Fenestration)) Window, Glass Door and Skylight *U*-Factors

FRAME TYPE	Window and Glass Door		SKY-LIGHT
	SINGLE PANE	DOUBLE PANE	
Metal	1.20	0.80	See Table C303.1.3(4)
Metal with Thermal Break	1.10	0.65	

FRAME TYPE	<u>Window and Glass Door</u>		SKY-LIGHT
	SINGLE PANE	DOUBLE PANE	
Nonmetal or Metal Clad	0.95	0.55	
Glazed Block	0.60		

AMENDATORY SECTION (Amending WSR 13-04-056, filed 2/1/13, effective 7/1/13)

WAC 51-11C-303132 Table C303.1.3(2)—Default door *U*-factors.

**Table C303.1.3(2)
Default Opaque Door *U*-Factors
See Appendix A, Section A107**

NEW SECTION

WAC 51-11C-30315 Table C303.1.5—*U*-factors for spandrel panels and glass curtain walls.

**Table C303.1.5
U-Factors for Spandrel Panels and Glass Curtain Walls**

Frame Type	Spandrel Panel		Rated R-Value of Insulation Between Framing Members							
			None A	R-4 B	R-7 C	R-10 D	R-15 E	R-20 F	R-25 G	R-30 H
Aluminum without Thermal Break	Single glass pane, stone or metal panel	1	0.360	0.242	0.222	0.212	0.203	0.198	0.195	0.193
	Double glass with no low-e coatings	2	0.297	0.233	0.218	0.209	0.202	0.197	0.194	0.192
	Triple or low-e glass	3	0.267	0.226	0.214	0.207	0.200	0.196	0.194	0.192
Aluminum with Thermal Break	Single glass pane, stone or metal panel	4	0.350	0.211	0.186	0.173	0.162	0.155	0.151	0.149
	Double glass with no low-e coatings	5	0.278	0.200	0.180	0.170	0.160	0.154	0.151	0.148
	Triple or low-e glass	6	0.241	0.191	0.176	0.167	0.159	0.153	0.150	0.148
Structural Glazing	Single glass pane, stone or metal panel	7	0.354	0.195	0.163	0.147	0.132	0.123	0.118	0.114
	Double glass with no low-e coatings	8	0.274	0.180	0.156	0.142	0.129	0.122	0.117	0.114
	Triple or low-e glass	9	0.231	0.169	0.150	0.138	0.127	0.121	0.116	0.113
No Framing, or Insulation is Continuous	Single glass pane, stone or metal panel	10	0.360	0.148	0.102	0.078	0.056	0.044	0.036	0.031
	Double glass with no low-e coatings	11	0.297	0.136	0.097	0.075	0.054	0.043	0.035	0.030
	Triple or low-e glass	12	0.267	0.129	0.093	0.073	0.053	0.042	0.035	0.030

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-30320 Section C303.2—Installation.

C303.2 Installation. Materials, systems and equipment shall be installed in accordance with the manufacturer's instructions and the *International Building Code*.

C303.2.1 Protection of exposed foundation insulation.

Insulation applied to the exterior of basement walls, crawl-space walls and the perimeter of slab-on-grade floors shall have a rigid, opaque and weather-resistant protective covering to prevent the degradation of the insulation's thermal performance. The protective covering shall cover the exposed exterior insulation and extend not less than 6 inches (153 mm) below grade.

C303.2.2 Multiple layers of continuous insulation. Where two or more layers of continuous insulation board are used in a construction assembly, the continuous insulation boards shall be installed in accordance with Section C303.2. Where the continuous insulation board manufacturer's instructions do not address installation of two or more layers, the edge joints between each layer of continuous insulation boards shall be staggered.

AMENDATORY SECTION (Amending WSR 13-04-056, filed 2/1/13, effective 7/1/13)

WAC 51-11C-30330 (~~(Section C303.3—Maintenance information.)~~) **Reserved.**

~~((C303.3 Maintenance information. Maintenance instructions shall be furnished for equipment and systems that require preventive maintenance. Required regular maintenance actions shall be clearly stated and incorporated on a readily accessible label. The label shall include the title or publication number for the operation and maintenance manual for that particular model and type of product.))~~

AMENDATORY SECTION (Amending WSR 16-24-070, filed 12/6/16, effective 5/1/17)

WAC 51-11C-40100 Section C401—General.

C401.1 Scope. The provisions in this chapter are applicable to commercial buildings and their building sites.

C401.2 Application. Commercial buildings shall comply with one of the following:

1. The requirements of Sections C402, C403, C404, C405, C406, C408, C409 (~~and~~), C410, and C411.

2. The requirements of Section C407(~~, C408, C409, C410, C402.5, C403.2, C404, C405.2, C405.3, C405.4, C405.6 and C405.7. The building energy consumption shall be equal to or less than 87, 90, or 93 percent of the standard reference design building, depending on the option selected per Section C407.3.~~).

3. When adopted by the local jurisdiction, the requirements of Appendix F, Outcome-Based Energy Budget, Sections C408, C409, C410, C411 and any specific sections in Table C407.2 as determined by the local jurisdiction. The Proposed Total UA of the proposed building shall be no more than 20 percent higher than the Allowed Total UA as defined in Section C402.1.5.

C401.2.1 Application to existing buildings. Work on existing buildings shall comply with Chapter 5 in addition to the applicable provisions of Chapter 4.

AMENDATORY SECTION (Amending WSR 16-24-070, filed 12/6/16, effective 5/1/17)

WAC 51-11C-40210 Section C402.1—General (Prescriptive).

C402.1 General (~~((Prescriptive))~~). Building thermal envelope assemblies for buildings that are intended to comply with the code on a prescriptive basis, in accordance with the

compliance path described in Item 1 of Section C401.2, shall comply with the following:

1. The opaque portions of the building thermal envelope shall comply with the specific insulation requirements of Section C402.2 and the thermal requirements of either the *R*-value based method of Section C402.1.3, the *U*-, *C*- and *F*-factor based method of Section C402.1.4, or the component performance alternative of Section C402.1.5.

2. Fenestration in building envelope assemblies shall comply with Section C402.4, or the component performance alternative of Section C402.1.5.

3. Air leakage of building envelope assemblies shall comply with Section C402.5.

AMENDATORY SECTION (Amending WSR 16-24-070, filed 12/6/16, effective 5/1/17)

WAC 51-11C-40211 Section C402.1.1—Low energy buildings.

C402.1.1 Low energy buildings, semi-heated buildings and greenhouses. Low energy buildings shall comply with Section C402.1.1.1. Semi-heated buildings and spaces shall comply with Section C402.1.1.2. Greenhouses shall comply with Section C402.1.1.3.

C402.1.1.1 Low energy buildings. The following buildings, or portions thereof, separated from the remainder of the building by *building thermal envelope* assemblies complying with this code shall be exempt from all thermal envelope provision of this code:

1. Those that are heated and/or cooled with a peak design rate of energy usage less than 3.4 Btu/h × ft² (10.7 W/m²) or 1.0 watt/ft² (10.7 W/m²) of floor area for space conditioning purposes.

2. Those that do not contain *conditioned space*.

3. (~~Greenhouses where cooling does not include a condensing unit and that are isolated from any other conditioned space.~~

4.) Unstaffed equipment shelters or cabinets used solely for personal wireless service facilities.

~~((C402.1.1.1) C402.1.1.2 Semi-heated buildings and spaces.~~ The building envelope of *semi-heated* buildings, or portions thereof, shall comply with the same requirements as that for conditioned spaces in Section C402, except as modified by this section. The total installed output capacity of mechanical space conditioning systems serving a semi-heated building or space shall comply with Section C202. Building envelope assemblies separating conditioned space from *semi-heated space* shall comply with exterior envelope insulation requirements. *Semi-heated spaces* heated by mechanical systems that do not include electric resistance heating equipment are not required to comply with the opaque wall insulation provisions of Section C402.2.3 for walls that separate *semi-heated* spaces from the exterior or low energy spaces. *Semi-heated spaces* shall be calculated separately from other conditioned spaces for compliance purposes. Opaque walls in *semi-heated* spaces shall be calculated as fully code compliant opaque walls for both the target and proposed for the Target UA calculations for Component Performance compliance per Section C402.1.5, and for the

Standard Reference Design for Total Building Performance compliance per Section C407. The capacity of heat trace temperature maintenance systems complying with Section C404.7.2 that are provided for freeze protection of piping and equipment only shall not be included in the total installed output capacity of mechanical space conditioning systems.

EXCEPTION: Building or space may comply as semi-heated when served by one or more of the following system alternatives:

1. Electric infrared heating equipment for localized heating applications.
2. Heat pumps with cooling capacity permanently disabled, as preapproved by the jurisdiction.

C402.1.1.3 Greenhouses. Greenhouse structures or areas that comply with all of the following shall be exempt from the building envelope requirements of this code:

1. Exterior opaque envelope assemblies comply with Sections C402.2 and C402.4.4.

EXCEPTION: Low energy greenhouses that comply with Section C402.1.1.1.

2. Interior partition building thermal envelope assemblies that separate the *greenhouse* from conditioned space complying with Sections C402.2, C402.4.3 and C402.4.4.

3. Nonopaque envelope assemblies complying with the thermal envelope requirements in Table C402.1.1.3. The *U*-factor for the nonopaque roof shall be for the roof assembly or a roof that includes the assembly and an internal curtain system.

EXCEPTION: Unheated *greenhouses*.

4. No mechanical cooling is provided.

5. For heated *greenhouses*, heating is provided by a radiant heating system, a condensing natural gas-fired or condensing propane-fired heating system, or a heat pump with cooling capacity permanently disabled as preapproved by the jurisdiction.

Table C402.1.1.3

Non-Opaque Thermal Envelope Maximum Requirements

Component <i>U</i>-Factor BTU/h-ft²-°F	Climate Zone 5 and Marine 4
<u>Non-opaque roof</u>	<u>0.5</u>
<u>Non-opaque SEW wall</u>	<u>0.7</u>
<u>Non-opaque N wall</u>	<u>0.6</u>

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40212 Section C402.1.2—Equipment buildings.

C402.1.2 Equipment buildings. Buildings that comply with all of the following shall be exempt from the building thermal envelope provisions of this code:

1. Are separate buildings with floor area no more than 500 square feet (50 m²).

2. Are intended to house electronic equipment with installed equipment power totaling at least 7 watts per square foot (75 W/m²) and not intended for human occupancy.

3. Are served by mechanical cooling and heating systems sized in accordance with Sections C403.1.2 and C403.3.1.

4. Have a heating system capacity not greater than 17,000 Btu/hr (5 kW) and a heating thermostat set point that is restricted to not more than 50°F (10°C).

((4-)) 5. Have an average wall and roof *U*-factor less than 0.200.

EXCEPTION: Where the cooling and heating system is a heat pump, the heating capacity is allowed to exceed 17,000 Btu/h provided the heat pump cooling efficiency is at least 15 percent better than the requirements in Table C403.3.2(2).

C402.1.2.1 Standalone elevator hoistways. Elevator hoistways that comply with all of the following shall be exempt from the building thermal envelope and envelope air barrier provisions of this code:

1. Are separate from any other conditioned spaces in the building (do not serve or open into any conditioned, semi-heated or indirectly conditioned space).

2. Have heating and/or cooling equipment sized only to serve the expected elevator loads with thermostat setpoints restricted to heating to no higher than 40°F and cooling to no lower than 95°F.

3. Have an area weighted average wall, roof and floor (where applicable) *U*-factor of less than or equal to 0.20. Calculations must include any floor-slab-edges that penetrate the hoistway and thus are considered part of the above-grade walls.

AMENDATORY SECTION (Amending WSR 16-24-070, filed 12/6/16, effective 5/1/17)

WAC 51-11C-402121 Table C402.1.3—Opaque thermal envelope assembly *R*-value requirements.

Table C402.1.3

Opaque Thermal Envelope Insulation Component Minimum Requirements, *R*-value Method^{a,(b)} i

CLIMATE ZONE	5 AND MARINE 4	
	All Other	Group R
Roofs		
Insulation entirely above deck	R-38ci	R-38ci
Metal buildings ^b	R-25 + R-11 LS	R-25 + R-11 LS
Attic and other	R-49	R-49
Walls, Above Grade		
Mass ^b	R-9.5ci ^c	R-13.3ci
<u>Mass transfer deck slab edge</u>	<u>R-5</u>	<u>R-5</u>
Metal buildings	R-19ci <u>or</u> R-13 + 13ci	R-19ci <u>or</u> R-13 + 13ci

CLIMATE ZONE	5 AND MARINE 4	
	All Other	Group R
Steel framed	R-13 + R-10ci	R-19 + R-8.5ci
Wood framed and other	R-21 int or R-15 + 5ci std	((R-21 int)) R-13 + 7.5ci std or R-20 + 3.8ci std or R-25 std
Walls, Below Grade		
Below-grade wall ^{d,h}	Same as above grade	Same as above grade
Floors		
Mass ^f	R-30ci	R-30ci
Joist/framing	R-30 ^e	R-30 ^e
Slab-on-Grade Floors		
Unheated slabs	R-10 for 24" below	R-10 for 24" below
Heated slabs	R-10 perimeter & under entire slab	R-10 perimeter & under entire slab
Opaque Doors^g		
Nonswinging	R-4.75	R-4.75

For SI: 1 inch = 25.4 mm. ci = Continuous insulation. NR = No requirement.

LS = Liner system—A continuous membrane installed below the purlins and uninterrupted by framing members. Uncompressed, unfaced insulation rests on top of the membrane between the purlins.

a Assembly descriptions can be found in Chapter 2 and Appendix A.

b Where using R-value compliance method, a thermal spacer block with minimum thickness of 1/2-inch and minimum R-value of R-3.5 shall be provided, otherwise use the U-factor compliance method in Table C402.1.4.

c Exception: Integral insulated concrete block walls complying with ASTM C90 with all cores filled and meeting both of the following:

1. At least 50 percent of cores must be filled with vermiculite or equivalent fill insulation; and
2. The building thermal envelope encloses one or more of the following uses: Warehouse (storage and retail), gymnasium, auditorium, church chapel, arena, kennel, manufacturing plant, indoor swimming pool, pump station, water and waste water treatment facility, storage facility, storage area, motor vehicle service facility. Where additional uses not listed (such as office, retail, etc.) are contained within the building, the exterior walls that enclose these areas may not utilize this exception and must comply with the appropriate mass wall R-value from Table C402.1.3/U-factor from Table C402.1.4.

d Where heated slabs are below grade, they shall comply with the insulation requirements for heated slabs.

e Steel floor joist systems shall be insulated to R-38 + R-10ci.

f "Mass floors" shall include floors weighing not less than:

1. 35 pounds per square foot of floor surface area; or
2. 25 pounds per square foot of floor surface area where the material weight is not more than 120 pounds per cubic foot.

g Not applicable to garage doors. See Table C402.1.4.

h Peripheral edges of intermediate concrete floors are included in the above-grade mass wall category and therefore must be insulated as above-grade mass walls unless they meet the definition of Mass Transfer Deck Slab Edge. The area of the peripheral edges of concrete floors shall be defined as the thickness of the slab multiplied by the perimeter length of the edge condition. See Table A103.3.7.2 for typical default U-factors for above-grade slab edges and footnote e for typical conditions of above-grade slab edges.

i For roof, wall or floor assemblies where the proposed assembly would not be continuous insulation, an alternate nominal R-value compliance option for assemblies with isolated metal penetrations of otherwise continuous insulation is:

Assemblies with continuous insulation (see definition)	Alternate option for assemblies with metal penetrations, greater than 0.04% but less than 0.08%	Alternate option for assemblies with metal penetrations, greater than or equal to 0.08% but less than 0.12%
R-9.5ci	R-11.9ci	R-13ci
R-11.4ci	R-14.3ci	R-15.7ci
R-13.3ci	R-16.6ci	R-18.3ci
R-15.2ci	R-19.0ci	R-21ci
R-30ci	R-38ci	R-42ci
R-38ci	R-48ci	R-53ci
R-13 + R-7.5ci	R-13 + R-9.4ci	R-13 + R-10.3ci
R-13 + R-10ci	R-13 + R-12.5ci	R-13 + R-13.8ci
R-13 + R-12.5ci	R-13 + R-15.6ci	R-13 + R-17.2ci
R-13 + R-13ci	R-13 + R-16.3ci	R-13 + R-17.9ci

Assemblies with continuous insulation (see definition)	Alternate option for assemblies with metal penetrations, greater than 0.04% but less than 0.08%	Alternate option for assemblies with metal penetrations, greater than or equal to 0.08% but less than 0.12%
R-19 + R-8.5ci	R-19 + R-10.6ci	R-19 + R-11.7ci
R-19 + R-14ci	R-19 + R-17.5ci	R-19 + R-19.2ci
R-19 + R-16ci	R-19 + R-20ci	R-19 + R-22ci
R-20 + R-3.8ci	R-20 + R-4.8ci	R-20 + R-5.3ci
R-21 + R-5ci	R-21 + R-6.3ci	R-21 + R-6.9ci

This alternate nominal *R*-value compliance option is allowed for projects complying with all of the following:

1. The ratio of the cross-sectional area, as measured in the plane of the surface, of metal penetrations of otherwise continuous insulation to the opaque surface area of the assembly is greater than 0.0004 (0.04%), but less than 0.0012 (0.12%).
2. The metal penetrations of otherwise continuous insulation are isolated or discontinuous (e.g., brick ties or other discontinuous metal attachments, offset brackets supporting shelf angles that allow insulation to go between the shelf angle and the primary portions of the wall structure). No continuous metal elements (e.g., metal studs, z-girts, z-channels, shelf angles) penetrate the otherwise continuous portion of the insulation.
3. Building permit drawings shall contain details showing the locations and dimensions of all the metal penetrations (e.g., brick ties or other discontinuous metal attachments, offset brackets, etc.) of otherwise continuous insulation. In addition, calculations shall be provided showing the ratio of the cross-sectional area of metal penetrations of otherwise continuous insulation to the overall opaque wall area.

For other cases where the proposed assembly is not continuous insulation, see Section C402.1.4 for determination of *U*-factors for assemblies that include metal other than screws and nails.

AMENDATORY SECTION (Amending WSR 16-13-089, filed 6/15/16, effective 7/16/16)

WAC 51-11C-40213 Section C402.1.3—Insulation component *R*-value method.

C402.1.3 Insulation component *R*-value-based method. *Building thermal envelope* opaque assemblies shall ~~((meet))~~ comply with the requirements of Section C402.2 based on the climate zone specified in Chapter 3. For opaque portions of the *building thermal envelope* intended to comply on an insulation component *R*-value basis, the *R*-values for insulation ~~((in framing areas, where required, and for continuous insulation, where required,))~~ shall not be less than that specified in Table C402.1.3. Commercial buildings or portions of commercial buildings enclosing Group R occupancies shall use the *R*-values from the "Group R" column of Table C402.1.3. Commercial buildings or portions of commercial buildings enclosing occupancies other than Group R shall use the *R*-values from the "All other" column of Table C402.1.3. ~~((The thermal resistance or *R*-value of the insulating material installed in, or continuously on, below-grade exterior walls of the building envelope required in accordance with Table C402.1.3 shall extend to the lowest floor of the conditioned space enclosed by the below-grade wall. Doors having less than 50 percent opaque glass area shall be considered opaque~~

~~doors. Opaque swinging doors shall comply with the Table C402.1.4 and opaque nonswinging doors shall comply with Table C402.1.3 or C402.1.4.))~~

AMENDATORY SECTION (Amending WSR 16-24-070, filed 12/6/16, effective 5/1/17)

WAC 51-11C-40214 Section C402.1.4—Assembly *U*-factor, *C*-factor, or *F*-factor-based method.

C402.1.4 Assembly *U*-factor, *C*-factor, or *F*-factor-based method. Building thermal envelope opaque assemblies shall meet the requirements of Section C402.2 based on the climate zone specified in Chapter 3. Building thermal envelope opaque assemblies intended to comply on an assembly *U*-, *C*-, or *F*-factor basis shall have a *U*-, *C*-, or *F*-factor not greater than that specified in Table C402.1.4. Commercial buildings or portions of commercial buildings enclosing Group R occupancies shall use the *U*-, *C*-, or *F*-factor from the "Group R" column of Table C402.1.4. Commercial buildings or portions of commercial buildings enclosing occupancies other than Group R shall use the *U*-, *C*-, or *F*-factor from the "All other" column of Table C402.1.4. ~~((The *C*-factor for the below-grade exterior walls of the building envelope, as required in accordance with Table C402.1.4, shall extend to the level of the lowest conditioned floor. Opaque swinging doors shall comply with Table C402.1.4 and opaque nonswinging doors shall comply with Table C402.1.3 or C402.1.4.))~~ The *U*-factors for typical construction assemblies are included in Appendix A. These values shall be used for all calculations. Where proposed construction assemblies are not represented in Appendix A, values shall be calculated in accordance with the ASHRAE *Handbook—Fundamentals* using the framing factors listed in Appendix A where applicable and shall include the thermal bridging effects of framing materials.

C402.1.4.1 Thermal resistance of cold-formed steel stud walls. *U*-factors of walls with cold-formed steel studs shall be permitted to be determined in accordance with Equation 4-1:

Equation 4-1:

$$U = 1/[R_s + (ER)]$$

Where:

- R*_s = The cumulative *R*-value of the wall components along the path of heat transfer, excluding the cavity insulation and steel studs.
- E**R* = The effective *R*-value of the cavity insulation with steel studs.

Reviser's note: The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency and appear in the Register pursuant to the requirements of RCW 34.08.040.

AMENDATORY SECTION (Amending WSR 16-24-070, filed 12/6/16, effective 5/1/17)

WAC 51-11C-402141 Table C402.1.4—Opaque thermal envelope requirements, *U*-factor method.

Table C402.1.4

Opaque Thermal Envelope Requirements^{a,f}

CLIMATE ZONE	5 AND MARINE 4	
	All Other	Group R
Roofs		
Insulation entirely above deck	U-0.027	U-0.027
Metal buildings	U-0.031	U-0.031
Attic and other	U-0.021	U-0.021
Joist or single rafter	U-0.027	U-0.027
Walls, Above Grade		
Mass ^g	U-0.104 ^d	U-0.078
Mass transfer deck slab edge	U-0.20	U-0.20
Metal building	U-0.052	U-0.052
Steel framed	U-0.055	U-0.055
Wood framed and other	U-0.054	((U-0.054)) <u>U-0.051</u>
Walls, Below Grade		
Below-grade wall ^{b,g}	Same as above grade	Same as above grade
Floors		
Mass ^e	U-0.031	U-0.031
Joist/framing	U-0.029	U-0.029
Slab-on-Grade Floors		
Unheated slabs	F-0.54	F-0.54
Heated slabs ^e	F-0.55	F-0.55
Opaque Doors		
Swinging door	U-0.37	U-0.37
Nonswinging door	U-0.34	U-0.34
Garage door <14% glazing	<u>U-0.31</u>	<u>U-0.31</u>

- a Use of opaque assembly *U*-factors, *C*-factors, and *F*-factors from Appendix A is required unless otherwise allowed by Section C402.1.4.
- b Where heated slabs are below grade, they shall comply with the *F*-factor requirements for heated slabs.
- c Heated slab *F*-factors shall be determined specifically for heated slabs. Unheated slab factors shall not be used.
- d Exception: Integral insulated concrete block walls complying with ASTM C90 with all cores filled and meeting both of the following:

- 1. At least 50 percent of cores must be filled with vermiculite or equivalent fill insulation; and
- 2. The building thermal envelope encloses one or more of the following uses: Warehouse (storage and retail), gymnasium, auditorium, church chapel, arena, kennel, manufacturing plant, indoor swimming pool, pump station, water and waste water treatment facility, storage facility, storage area, motor vehicle service facility. Where additional uses not listed (such as office, retail, etc.) are contained within the building, the exterior walls that enclose these areas may not utilize this exception and must comply with the appropriate mass wall *R*-value from Table C402.1.3/*U*-factor from Table C402.1.4.

- e "Mass floors" shall include floors weighing not less than:
 - 1. 35 pounds per square foot of floor surface area; or
 - 2. 25 pounds per square foot of floor surface area where the material weight is not more than 120 pounds per cubic foot.
- f Opaque assembly *U*-factors based on designs tested in accordance with ASTM C1363 shall be permitted. The *R*-value of continuous insulation shall be permitted to be added or subtracted from the original test design.
- g Peripheral edges of intermediate concrete floors are included in the above-grade mass wall category and therefore must be insulated as above-grade mass walls unless they meet the definition of Mass Transfer Deck Slab Edge. The area of the peripheral edges of concrete floors shall be defined as the thickness of the slab multiplied by the perimeter length of the edge condition. See Table A103.3.7.2 for typical default *U*-factors for above-grade slab edges and footnote ^e for typical conditions of above-grade slab edges.

AMENDATORY SECTION (Amending WSR 16-24-070, filed 12/6/16, effective 5/1/17)

WAC 51-11C-40220 Section C402.2—Specific insulation requirements.

C402.2 Specific building thermal envelope insulation requirements ((Prescriptive)). Insulation in building thermal envelope opaque assemblies shall comply with Sections C402.2.1 through C402.2.6 and Table C402.1.3.

Where this section refers to installing insulation levels as specified in Section C402.1.3, assemblies complying with Section C402.1.4 and buildings complying with Section C402.1.5 are allowed to install alternate levels of insulation so long as the *U*-factor of the insulated assembly is less than or equal to the *U*-factor required by the respective path.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40221 Section C402.2.1—((Multiple layers of continuous insulation)) Roof assembly.

C402.2.1 ((Multiple layers of continuous insulation. Where two or more layers of continuous insulation board are used in a construction assembly, the continuous insulation boards shall be installed in accordance with Section C303.2. If the continuous insulation board manufacturer's installation instructions do not address installation of two or more layers, the edge joints between each layer of continuous insulation boards shall be staggered.)) Roof assembly. The minimum thermal resistance (*R*-value) of the insulating material installed either between the roof framing or continuously on the roof assembly shall be as specified in Table C402.1.3, based on construction materials used in the roof assembly. Continuous insulation board shall be installed in not less than

2 layers and the edge joints between each layer of insulation shall be staggered. Insulation installed on a suspended ceiling with removable ceiling tiles shall not be considered part of the minimum thermal resistance of the roof insulation.

EXCEPTIONS:

1. Continuously insulated roof assemblies where the thickness of insulation varies 1 inch (25 mm) or less and where the area-weighted U -factor is equivalent to the same assembly with the R -value specified in Table C402.1.3.
2. Where tapered insulation is used with insulation entirely above deck, those roof assemblies shall show compliance on a U -factor basis per Section C402.1.4. The effective U -factor shall be determined through the use of Tables A102.2.6(1), A102.2.6(2) and A102.2.6(3).
3. Two layers of insulation are not required where insulation tapers to the roof deck, such as at roof drains. At roof drains, the immediate 24 inch by 24 inch plan area around each roof drain has a minimum insulation requirement of R -13, but otherwise is permitted to be excluded from the roof insulation area-weighted calculations.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-402211 (~~Reserved~~) Skylight curbs.

C402.2.1.1 Skylight curbs. Skylight curbs shall be insulated to the level of roofs with insulation entirely above deck or R -5, whichever is less.

EXCEPTION: Unit skylight curbs included as a component of a skylight listed and labeled in accordance with NFRC 100 shall not be required to be insulated.

C402.2.1.2 Rooftop HVAC equipment curbs. Structural curbs installed to support rooftop HVAC equipment are allowed to interrupt the above roof insulation. The area under the HVAC equipment inside of the equipment curb shall be insulated to a minimum of R -13 in all locations where there are not roof openings for ductwork. The annular space between the roof opening and the ductwork shall be sealed to maintain the building air barrier. The plan-view area of the HVAC equipment curb shall be excluded from the prescriptive roof insulation requirements or the area-weighted component performance calculations.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40222 (~~Section C402.2.2—Roof assembly~~) Reserved.

~~(C402.2.2 Roof assembly. The minimum thermal resistance (R -value) of the insulating material installed either between the roof framing or continuously on the roof assembly shall be as specified in Table C402.1.3, based on construction materials used in the roof assembly. Skylight curbs shall be insulated to the level of roofs with insulation entirely above deck or R -5, whichever is less.~~

EXCEPTIONS:

1. Continuously insulated roof assemblies where the thickness of insulation varies 1 inch (25 mm) or less and where the area-weighted U -factor is equivalent to the same assembly with the R -value specified in Table C402.1.3.
2. Where tapered insulation is used with insulation entirely above deck, those roof assemblies shall show compliance on a U -factor basis per Section C402.1.4. The effective U -factor shall be determined through the use of Tables A102.2.6(1), A102.2.6(2) and A102.2.6(3).
3. Unit skylight curbs included as a component of a skylight listed and labeled in accordance with NFRC 100 shall not be required to be insulated.

~~Insulation installed on a suspended ceiling with removable ceiling tiles shall not be considered part of the minimum thermal resistance of the roof insulation.)~~

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40223 Section C402.2.3—Above-grade walls.

C402.2.3 (~~Thermal resistance of~~) Above-grade walls. The minimum thermal resistance (R -value) of materials installed in the wall cavity between the framing members and continuously on the walls shall be as specified in Table C402.1.3, based on framing type and construction materials used in the wall assembly. The R -value of integral insulation installed in concrete masonry units (CMU) shall not be used in determining compliance with Table C402.1.3 except as otherwise noted in the table. In determining compliance with Table C402.1.4, the use of the U -factor of concrete masonry units with integral insulation shall be permitted.

"Mass walls" (~~shall include walls~~) where used as a component in the thermal envelope of a building shall comply with one of the following:

1. (~~Weighing~~) Weigh not less than 35 psf (170 kg/m²) of wall surface area.
2. (~~Weighing~~) Weigh not less than 25 psf (120 kg/m²) of wall surface area where the material weight is not more than 120 pounds per cubic foot (pcf) (1,900 kg/m³).
3. (~~Having~~) Have a heat capacity exceeding 7 Btu/ft² x °F (144 kJ/m² x K).
4. (~~Having~~) Have a heat capacity exceeding 5 Btu/ft² x °F (103 kJ/m² x K) where the material weight is not more than 120 pcf (1900 kg/m³).

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40224 Section C402.2.4—Below-grade walls.

C402.2.4 (~~Thermal resistance of~~) Below-grade walls. The (~~minimum thermal resistance~~) R -value(~~)~~ of the insulating material installed in, or continuously on, the below-grade walls shall be (~~as specified~~) in accordance with Table C402.1.3. The U -factor or R -value required shall extend to the level of the lowest floor of the conditioned space enclosed by the below-grade wall.

AMENDATORY SECTION (Amending WSR 16-13-089, filed 6/15/16, effective 7/16/16)

WAC 51-11C-40225 Section C402.2.5—Floors.

C402.2.5 Floors. The thermal properties (component *R*-values or assembly *U*- or *F*-factors) of floor assemblies over outdoor air or unconditioned space shall be as specified in Table C402.1.3 or C402.1.4 based on the construction materials used in the floor assembly. Floor framing cavity insulation or structural slab insulation shall be installed to maintain permanent contact with the underside of the subfloor decking or structural slabs.

"Mass floors" where used as a component of the thermal envelope of a building shall provide one of the following weights:

1. 35 pounds per square foot of floor surface area;
2. 25 pounds per square foot of floor surface area where the material weight is not more than 120 pounds per cubic foot.

EXCEPTIONS:

1. The floor framing cavity insulation or structural slab insulation shall be permitted to be in contact with the top side of sheathing or continuous insulation installed on the bottom side of floor assemblies where combined with insulation that meets or exceeds the minimum *R*-value in Table C402.1.3 for "Metal framed" or "Wood framed and other" values for "Walls, Above Grade" and extends from the bottom to the top of all perimeter floor framing or floor assembly members.
2. Insulation applied to the underside of concrete floor slabs shall be permitted an air space of not more than 1 inch where it turns up and is in contact with the underside of the floor under walls associated with the *building thermal envelope*.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40227 ((Reserved.)) Airspaces. Where the thermal properties of airspaces are used to comply with this code in accordance with Section C401.2, such airspaces shall be enclosed in an unventilated cavity constructed to minimize airflow into and out of the enclosed airspace. Airflow shall be deemed minimized where the enclosed airspace is located on the interior side of the continuous air barrier and is bounded on all sides by building components.

EXCEPTION: The thermal resistance of airspaces located on the exterior side of the continuous air barrier and adjacent to and behind the exterior wall covering material shall be determined in accordance with ASTM C1363 modified with an airflow entering the bottom and exiting the top of the airspace at a minimum air movement rate of not less than 70 mm/sec.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40228 Section C402.2.8—Insulation of radiant heating systems.

C402.2.8 Insulation of radiant heating systems. *Radiant heating system* panels, and their associated components that are installed in interior or exterior assemblies shall be insu-

lated ((with a minimum of)) to an *R*-value of not less than $R-3.5$ ($((0.62 \text{ m}^2/\text{K} \times W))$) on all surfaces not facing the space being heated. *Radiant heating system* panels that are installed in the *building thermal envelope* shall be separated from the exterior of the building or unconditioned or exempt spaces by not less than the *R*-value of insulation installed in the opaque assembly in which they are installed or the assembly shall comply with Section C402.1.4.

EXCEPTION: Heated slabs on grade insulated in accordance with Section C402.2.6.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40230 Section C402.4—Fenestration ((Prescriptive)).

C402.3 Reserved.

C402.4 Fenestration ((Prescriptive)). Fenestration shall comply with Sections C402.4 through C402.4.4 and Table C402.4. Daylight responsive controls shall comply with this section and Section C405.2.4.1.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-402300 Table C402.4—Building envelope requirements—Fenestration.

Table C402.4

Building Envelope Fenestration Maximum *U*-factor and SHGC Requirements

((CLIMATE ZONE	5 AND MARINE 4	
Vertical Fenestration		
<i>U</i> factor		
Nonmetal framing (all) ^a	0.30	
Metal framing (fixed) ^b	0.38	
Metal framing (operable) ^c	0.40	
Metal framing (entrance doors) ^d	0.60	
SHGC		
Orientation	SEW	N
PF < 0.2	0.40	0.53
0.2 < PF < 0.5	0.48	0.58
PF > 0.5	0.64	0.64
Skylights		
<i>U</i> factor	0.50	
SHGC	0.35))	

CLIMATE ZONE	5 AND MARINE 4	
<u>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>		
<u>Fixed^b U-factor</u>	<u>U-0.38</u>	
<u>Operable^c U-factor</u>	<u>U-0.40</u>	
<u>Entrance doors^d</u>		
<u>U-factor</u>	<u>U-0.60</u>	
<u>U-factor for all other vertical fenestration</u>		
<u>U-factor</u>	<u>U-0.30</u>	
<u>SHGC for all vertical fenestration</u>		
<u>Orientation^{e,f}</u>	<u>SEW</u>	<u>N</u>
<u>PF < 0.2</u>	<u>0.38</u>	<u>0.51</u>
<u>0.2 < PF < 0.5</u>	<u>0.46</u>	<u>0.56</u>
<u>PF > 0.5</u>	<u>0.61</u>	<u>0.61</u>
<u>Skylights</u>		
<u>U-factor</u>	<u>U-0.50</u>	
<u>SHGC</u>	<u>0.35</u>	

((NR = No requirement.))

^a ("Nonmetal framing" includes framing materials other than metal, with or without metal reinforcing or cladding)) U-factor and SHGC shall be rated in accordance with NFRC 100.

^b ("Metal framing" includes metal framing, with or without thermal break.) "Fixed" includes curtain wall, storefront, picture windows, and other fixed windows.

^c ("Metal framing" includes metal framing, with or without thermal break.) "Operable" includes openable fenestration products other than "entrance doors."

^d ("Metal framing" includes metal framing, with or without thermal break.) "Entrance door" includes glazed swinging entrance doors. Other doors which are not entrance doors, including sliding glass doors, are considered "operable."

^e "N" indicates vertical fenestration oriented within 30 degrees of true north. "SEW" indicates orientations other than "N."

^f Fenestration that is entirely within the conditioned space or is between conditioned and other enclosed space is exempt from solar heat gain coefficient requirements and not included in the SHGC calculation.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40231 Section C402.4.1—Maximum area.

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 skylight area shall not exceed 5 percent of the total building gross roof area (skylight-to-roof ratio).

For buildings with more than one space conditioning category, compliance with the maximum allowed window-to-wall ratio and skylight-to-roof ratio shall be demonstrated

separately for each space conditioning category. Interior partition ceiling, wall, fenestration and floor areas that separate space conditioning areas shall not be applied to the window-to-wall ratio and skylight-to-roof ratio calculations.

C402.4.1.1 ((Increased)) Vertical fenestration maximum area with ((daylight responsive controls. A maximum of 40 percent of the gross above-grade wall area shall be permitted to be vertical fenestration for the purpose of prescriptive compliance with Section C402.1.4 or for the component performance alternative in Section C402.1.5, provided all of the following requirements are met:

1. In buildings not greater than two stories above grade, ~~no~~) **high performance alternates.** For buildings that comply with Section C402.4.1.1.1 or C402.4.1.1.2, the total building vertical fenestration area is permitted to exceed 30 percent but shall not exceed 40 percent of the gross above grade wall area for the purpose of prescriptive compliance with Section C402.1.4.

When determining compliance using the component performance alternative in accordance with Section C402.1.5, the total building vertical fenestration area allowed in Equation 4-2 is 40 percent of the above grade wall area for buildings that comply with the vertical fenestration alternates described in this section.

C402.4.1.1.1 Optimized daylighting. All of the following requirements shall be met:

1. Not less than 50 percent of the total conditioned floor area in the building is within a daylight zone that includes daylight responsive controls complying with Section C405.2.4.1.

2. ((In buildings three or more stories above grade, not less than 25 percent of the net floor area is within a daylight zone.)

3. Daylight responsive controls complying with Section C405.2.4.1 are installed in daylight zones.

4.) Visible transmittance (VT) of all vertical fenestration in the building is greater than or equal to 1.1 times the required solar heat gain coefficient (SHGC) in accordance with Section C402.4, or 0.50, whichever is greater. It shall be permitted to demonstrate compliance based on the area weighted average VT being greater than or equal to the area weighted average of the minimum VT requirements.

EXCEPTION: Fenestration that is outside the scope of NFRC 200 is not required to comply with Item ((4)) 2.

~~((C402.4.1.2 Reserved.~~

~~C402.4.1.3 Increased vertical fenestration area with))~~
C402.4.1.1.2 High-performance fenestration. ((The vertical fenestration area (not including opaque doors and opaque spandrel panels) is permitted to exceed 30 percent but shall not exceed 40 percent of the gross above-grade wall area, for the purpose of prescriptive compliance with Section C402.1.3 provided that each of the following conditions are met:

1. The vertical fenestration shall have)) All of the following requirements shall be met:

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

a. ~~((Nonmetal framing (all) = 0.28))~~ 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) = 0.34

b. ~~((Metal framing (fixed) = 0.34))~~ 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

c. ~~((Metal framing (operable) = 0.36))~~ Entrance doors = 0.60

d. ~~((Metal framing (entrance doors) = 0.60))~~ U-factor for all other vertical fenestration = 0.28

2. The SHGC of the vertical fenestration shall be less than or equal to 0.35, adjusted for projection factor in compliance with C402.4.3.

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.

~~((The compliance path described in this section is not permitted to be used for the total building performance compliance path in Section C407. The compliance path described in this section is permitted to be used for the component performance alternative in Section C402.1.5, provided that the requirements of Section C402.1.5 are met.~~

~~C402.4.1.4 Increased vertical fenestration area with high performance mechanical systems.~~ ~~The vertical fenestration area (not including opaque doors and opaque spandrel panels) is permitted to exceed 30 percent but shall not exceed 40 percent of the gross above-grade wall area, for the purpose of prescriptive compliance with Section C402.1.4 or for the component performance alternative in Section C402.1.5, provided that the mechanical system complies with all require-~~

~~ments of Section C403.6 Dedicated outdoor air systems (DOAS) without utilizing the exceptions to Section C403.6. This increased glazing fraction is not permitted to be used to establish the reference case for the Total Building Performance compliance path in Section C407.))~~

AMENDATORY SECTION (Amending WSR 16-24-070, filed 12/6/16, effective 5/1/17)

WAC 51-11C-40232 Section C402.4.2—Minimum skylight fenestration area.

C402.4.2 Minimum skylight fenestration area. For ~~((single story buildings only, in an))~~ buildings with single story enclosed spaces greater than 2,500 square feet (232 m²) in floor area(;) that are directly under a roof ((with not less than 75 percent of the ceiling area with)) and have a ceiling height greater than 15 feet (4572 mm)((, and used as an) for no less than 75 percent of the ceiling area, these single-story spaces shall be provided with skylights and daylight responsive controls in accordance with Section C405.2.4. Space types required to comply with this provision include office, lobby, atrium, concourse, corridor, gymnasium/exercise center, convention center, automotive service, manufacturing, nonrefrigerated warehouse, retail store, distribution/sorting area, transportation, ((or workshop, skylights)) and workshop. Skylights in these spaces are required to provide a total ((toplight daylight)) toplit zone area not less than ((half)) 50 percent of the floor area and shall provide one of the following:

1. A minimum ratio of skylight area to ~~((toplight daylight))~~ toplit zone area under skylights of not less than 3 percent where all skylights have a VT of at least 0.40 as determined in accordance with Section C303.1.3.

2. A minimum skylight effective aperture of at least 1 percent determined in accordance with Equation 4-5.

$$\text{Skylight Effective Aperture} = (0.85 \times \text{Skylight Area} \times \text{Skylight VT} \times \text{WF}) / ((\text{Daylight zone under skylight})) \text{ Toplit zone}$$

(Equation 4-5)

Where:

- Skylight area = Total fenestration area of skylights.
- Skylight VT = Area weighted average visible transmittance of skylights.
- WF = Area weighted average well factor, where well factor is 0.9 if light well depth is less than 2 feet (610 mm), or 0.7 if light well depth is 2 feet (610 mm) or greater, or 1.0 for tubular daylighting devices (TDD) with VT-annual ratings measured in accordance with NFRC 203.

Light well depth = Measure vertically from the underside of the lowest point of the skylight glazing to the ceiling plane under the skylight.

- EXCEPTIONS:
- 1. Skylights above daylight zones of enclosed spaces are not required in:
 - ((+)) 1.1. Reserved.
 - ((2-)) 1.2. Spaces where the designed *general lighting* power densities are less than 0.5 W/ft² (5.4 W/m²) and at least 10 percent lower than the lighting power allowance in Section C405.4.2.
 - ((3-)) 1.3. Areas where it is documented that existing structures or natural objects block direct beam sunlight on at least half of the roof over the enclosed area for more than 1,500 daytime hours per year between 8 a.m. and 4 p.m.

((4-)) 1.4. Spaces where the daylight zone under rooftop monitors is greater than 50 percent of the enclosed space floor area.

((5-)) 1.5. Spaces where the total floor area minus the ((sidelight daylight)) *sidelit zone* area is less than 2,500 square feet (232 m²), and where the lighting in the daylight zone is controlled in accordance with Section C405.2.3.1.

2. The skylight effective aperture, calculated in accordance with Equation 4-5, is permitted to be 0.66 percent in lieu of 1 percent if the *VT-annual* of the skylight or *TDD*, as measured by NFRC 203, is greater than 38 percent.

C402.4.2.1 Lighting controls in daylight zones under skylights. Daylight responsive controls complying with Section C405.2.4.1 shall be provided to control all electric lights within ((daylight)) *toplit* zones.

C402.4.2.2 Haze factor. Skylights in office, storage, automotive service, manufacturing, nonrefrigerated warehouse, retail store, and distribution/sorting area spaces shall have a glazing material or diffuser with a haze factor greater than 90 percent when tested in accordance with ASTM D 1003.

EXCEPTION: Skylights designed and installed to exclude direct sunlight entering the occupied space by the use of fixed or automated baffles, or the geometry of skylight and light well.

C402.4.2.3 Daylight zones. Daylight zones referenced in Sections C402.4.1.1 through C402.4.2.2 shall comply with Section C405.2.4.2 and C405.2.4.3, as applicable. Daylight zones shall include *toplit zones* and *sidelit zones*.

AMENDATORY SECTION (Amending WSR 16-24-070, filed 12/6/16, effective 5/1/17)

WAC 51-11C-40234 Section C402.4.4—Doors.

C402.4.4 Doors. Opaque *swinging* doors shall comply with ((the applicable requirements for doors as specified in Tables C402.1.3 and C402.1.4 and)) Table C402.1.4. Opaque non-swinging doors shall comply with Table C402.1.3. Opaque doors shall be considered part of the gross area of above grade walls that are part of the *building thermal envelope*. Other doors shall comply with the provisions of Section C402.4.3 for vertical fenestration and the entire door area, including the frame, shall be considered part of the fenestration area of the building thermal envelope.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40240 Section C402.5—Air leakage-thermal envelope.

C402.5 Air leakage-thermal envelope ((Mandatory)). The thermal envelope of buildings shall comply with Sections C402.5.1 through C402.5.8.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40241 Section C402.5.1—Air barriers.

C402.5.1 Air barriers. A continuous air barrier shall be provided throughout the building thermal envelope. The air barriers shall be permitted to be located on the inside or outside of the building envelope, located within the assemblies composing the envelope, or any combination thereof. The air barrier shall comply with Sections C402.5.1.1 and C402.5.1.2.

C402.5.1.1 Air barrier construction. The *continuous air barrier* shall be constructed to comply with the following:

1. The air barrier shall be continuous for all assemblies that are the thermal envelope of the building and across the joints and assemblies.

2. Air barrier joints and seams shall be sealed, including sealing transitions in places and changes in materials. The joints and seals shall be securely installed in or on the joint for its entire length so as not to dislodge, loosen or otherwise impair its ability to resist positive and negative pressure from wind, stack effect and mechanical ventilation.

3. Penetrations of the air barrier shall be caulked, gasketed or otherwise sealed in a manner compatible with the construction materials and location. Sealing shall allow for expansion, contraction and mechanical vibration. Joints and ((seals)) seams associated with penetrations shall be sealed in the same manner or taped ((or covered with moisture vapor-permeable wrapping material)). Sealing materials shall be ((appropriate to the construction materials being sealed and shall be)) securely installed around the penetration so as not to dislodge, loosen or otherwise impair the penetrations' ability to resist positive and negative pressure from wind, stack effect, and mechanical ventilation. Sealing of concealed fire sprinklers, where required, shall be in a manner that is recommended by the manufacturer. Caulking or other adhesive sealants shall not be used to fill voids between fire sprinkler cover plates and walls or ceilings.

4. Recessed lighting fixtures shall comply with Section C402.5.8. Where similar objects are installed which penetrate the air barrier, provisions shall be made to maintain the integrity of the air barrier.

5. Construction documents shall contain a diagram showing the building's pressure boundary in plan(s) and section(s) and a calculation of the area of the pressure boundary to be considered in the test.

C402.5.1.2 Building test. The completed building shall be tested and the air leakage rate of the *building envelope* shall not exceed ((0.40)) 0.25 cfm/ft² at a pressure differential of 0.3 inches water gauge (2.0 L/s • m² at 75 Pa) at the upper 95 percent confidence interval in accordance with ASTM E 779 or an equivalent method approved by the code official. A report that includes the tested surface area, floor area, air by volume, stories above grade, and leakage rates shall be submitted to the building owner and the Code Official. If the tested rate exceeds that defined here by up to 0.15 cfm/ft², a visual inspection of the air barrier shall be conducted and any leaks noted shall be sealed to the extent practicable. An additional report identifying the corrective actions taken to seal air leaks shall be submitted to the building owner and the Code Official and any further requirement to meet the leakage air rate will be waived. If the tested rate exceeds 0.40 cfm/ft², corrective actions must be made and the test completed again. A test above 0.40 cfm/ft² will not be accepted.

1. Test shall be accomplished using either (1) both pressurization and depressurization or (2) pressurization alone, but not depressurization alone. The test results shall be plotted against the corrected P in accordance with Section 9.4 of ASTM E 779.

2. The test pressure range shall be from 25 Pa to 80 Pa per Section 8.10 of ASTM E 779, but the upper limit shall not be less than 50 Pa, and the difference between the upper and lower limit shall not be less than 25 Pa.

3. If the pressure exponent n is less than 0.45 or greater than 0.85 per Section 9.6.4 of ASTM E 779, the test shall be rerun with additional readings over a longer time interval.

C402.5.1.2.1 Building test for mixed-use buildings. Where a building is three or fewer stories above grade plane and contains both commercial and residential uses, the air barrier of the R-2 and R-3 occupancy areas of the building is permitted to be separately tested according to Section R402.4.1.2. Alternatively, it is permissible to test the air barrier of the entire building according to Section C402.5.1.2, provided that the tested air leakage rate does not exceed the rate specified in Section C402.5.1.2.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40243 Section C402.5.3—Rooms containing fuel-burning appliances.

C402.5.3 Rooms containing fuel-burning appliances. Where ~~((open))~~ combustion air ~~((ducts provide combustion air to open combustion))~~ is supplied through openings in an exterior wall to a room or space containing a space conditioning fuel-burning appliance~~((s, the appliances and combustion air openings))~~, one of the following shall apply:

1. The room or space containing the appliance shall be located outside of the building thermal envelope ~~((or enclosed in a room))~~.

2. The room or space containing the appliance shall be enclosed and isolated from conditioned spaces inside the building thermal envelope. Such rooms shall ~~((be sealed and insulated in accordance with the envelope requirements of))~~ comply with all of the following:

2.1. The walls, floor and ceiling that separate the enclosed room or space from the conditioned spaces shall be insulated to be at least equivalent to the insulation requirement of below grade walls as specified in Table C402.1.3 or C402.1.4~~((, where))~~.

2.2. The walls, floors and ceilings ~~((shall meet the minimum of the below grade wall R-value requirement.))~~ that separate the enclosed room or space from conditioned spaces be sealed in accordance with Section C402.5.1.1.

2.3. The doors into the enclosed room or space shall be fully gasketed~~((, and any))~~.

2.4. Water lines and ducts in the enclosed room or space shall be insulated in accordance with Section C403. ~~((The combustion))~~

2.5. Where the air duct supplying combustion air to the enclosed room or space passes through conditioned space, the duct shall be insulated~~((, where it passes through conditioned space, to a minimum of))~~ to an R-value of not less than R-8.

EXCEPTION~~((S))~~: ~~((1. Direct vent appliances with both intake and exhaust pipes installed continuous to the outside.~~

2.)) Fireplaces and stoves complying with Sections 901 through 905 of the *International Mechanical Code*, and Section 2111.13 of the *International Building Code*.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40244 Section C402.5.4—Doors and access openings.

C402.5.4 Doors and access openings to shafts, chutes, stairways, and elevator lobbies. Doors and access openings from conditioned space to shafts, chutes, stairways and elevator lobbies shall be gasketed, weatherstripped or sealed.

EXCEPTIONS: 1. Door openings required to comply with Section ~~((715- or 715.4))~~ 716 of the *International Building Code*.

2. Doors and door openings required to comply with UL 1784 by the *International Building Code*.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40245 Section C402.5.5—Air intakes, exhaust openings, stairways and shafts.

C402.5.5 Air intakes, exhaust openings, stairways and shafts. Stairway enclosures, elevator shaft vents and other outdoor air intakes and exhaust openings integral to the building envelope shall be provided with dampers in accordance with Section ~~((C403.2.4.3))~~ C403.7.9.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40246 Section C402.5.6—Loading dock weatherseals.

C402.5.6 Loading dock weatherseals. Cargo door~~((s))~~ openings and loading dock door~~((s))~~ openings shall be equipped with weatherseals ~~((to))~~ that restrict infiltration ~~((when))~~ and provide direct contact along the top and sides of vehicles that are parked in the doorway.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40247 Section C402.5.7—Vestibules.

C402.5.7 Vestibules. All building entrances shall be protected with an enclosed vestibule, with all doors opening into and out of the vestibule equipped with self-closing devices. Vestibules shall be designed so that in passing through the vestibule it is not necessary for the interior and exterior doors to open at the same time. The installation of one or more revolving doors in the building entrance shall not eliminate the requirement that a vestibule be provided on any doors adjacent to revolving doors. For the purposes of this section, "building entrances" shall include exit-only doors in buildings where separate doors for entering and exiting are provided.

Interior and exterior doors shall have a minimum distance between them of not less than 7 feet. The exterior envelope of conditioned vestibules shall comply with the requirements for a conditioned space. Either the interior or exterior envelope of unconditioned vestibules shall comply with the requirements for a conditioned space. The building lobby is not considered a vestibule.

EXCEPTION: Vestibules are not required for the following:

1. Doors not intended to be used as building entrances.
2. Unfinished ground-level space greater than 3,000 square feet (298 m²) if a note is included on the permit documents at each exterior entrance to the space stating "Vestibule required at time of tenant build-out if entrance serves a space greater than 3,000 square feet in area."
3. Doors opening directly from a *sleeping unit* or dwelling unit.
4. Doors between ~~((a))~~ an enclosed space smaller than 3,000 square feet (298 m²) in area and the exterior of the building or the building entrance lobby, where those doors do not comprise one of the primary building entrance paths to the remainder of the building. The space must be enclosed and separated without transfer air paths from the primary building entrance paths. If there are doors between the space and the primary entrance path, then the doors shall be equipped with self-closing devices so the space acts as a vestibule for the primary building entrance.
5. Revolving doors.
6. Doors used primarily to facilitate vehicular movement or material handling and adjacent personnel doors.
7. In buildings less than 3 stories above grade or in spaces that do not directly connect with the building elevator lobby, doors that have an air curtain with a velocity of not less than 6.56 feet per second (2 m/s) at the floor that have been tested in accordance with ANSI/AMCA 220 and installed in accordance with the manufacturer's instructions. Manual or automatic controls shall be provided that will operate the air curtain with the opening and closing of the door. Air curtains and their controls shall comply with Section C408.2.3.
8. Building entrances in buildings that are less than four stories above grade and less than 10,000 ft² in area.
9. Elevator doors in parking garages provided that the elevators have an enclosed lobby at each level of the garage.
10. Entrances to semi-heated spaces.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40310 Section C403.1—General.

C403.1 General. Mechanical systems and equipment serving heating, cooling, ventilating, and other needs shall comply with ~~((Section C403.2 and shall comply with Sections C403.3 and C403.4 based on the equipment and systems provided))~~ 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 and not otherwise regulated by ((C403.2.3, Tables C403.2.3)) Section C403.3.2, Tables C403.3.2 (1) through ((10)) (12) inclusive, ((C403.2.4.5, C403.2.4.6, C403.2.7, C403.2.9, C403.5.4)) Sections C403.7.8, C403.9.5, C403.10.3, C403.11.2, C403.11.3, C404.2, Table C404.2, C405.8 and C410. ((Data center)) Computer room HVAC equipment is not covered by this exception.

2. Data center systems are exempt from Sections C403.4 and C403.5.

C403.1.1 HVAC total system performance ratio (HVAC TSPR). For systems serving office, retail, library, and education occupancies and buildings, which are subject to the requirements of Section C403.3.5 without exceptions, the HVAC total system performance ratio (HVAC TSPR) of the proposed design HVAC system shall be more 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.

EXCEPTIONS: 1. Buildings with conditioned floor area less than 5,000 square feet.
2. HVAC systems using district heating water, chilled water or steam.
3. HVAC systems not included in Table D601.11.1.
4. 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.
5. HVAC systems served by heating water plants that include air to water or water to water heat pumps.
6. Underfloor air distribution HVAC systems.
7. Space conditioning systems that do not include mechanical cooling.
8. Alterations to existing buildings that do not substantially replace the entire HVAC system.
9. HVAC systems meeting all the requirements of the standard reference design HVAC system in Table D602.11, Standard Reference Design HVAC Systems.

C403.1.2 Calculation of heating and cooling loads. Design loads associated with heating, ventilating and air conditioning of the building shall be determined in accordance with the procedures described in ANSI/ASHRAE/ACCA Standard 183 or by an approved equivalent computational procedure, using the design parameters specified in Chapter 3. Heating and cooling loads shall be adjusted to account for load reductions that are achieved where energy recovery systems are utilized in the HVAC system in accordance with the ASHRAE HVAC Systems and Equipment Handbook by an approved equivalent computational procedure.

C403.1.3 Data centers. Data center systems shall comply with Sections 6 and 8 of ASHRAE Standard 90.4 with the following changes:

1. Replace design MLC in ASHRAE Standard 90.4 Table 6.2.1.1 "Maximum Design Mechanical Load Component (Design MLC)" with the following per the applicable climate zone:

Zone 4C Design MLC = 0.22 Zone 5B Design MLC = 0.24

2. Replace annualized MLC values of Table 6.2.1.2 "Maximum Annualized Mechanical Load Component (Annualized MLC)" in ASHRAE Standard 90.4 with the following per applicable climate zone:

Zone 4C Annual MLC = 0.18 Zone 5B Annual MLC = 0.17

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40320 Section C403.2—(~~Provisions applicable to all mechanical~~) System(s) design.

C403.2 (~~Provisions applicable to all mechanical systems (Mandatory)~~) System design. Mechanical systems (~~and equipment serving the building heating, cooling or ventilating needs~~) shall be designed to comply with Sections C403.2.1 (~~through C403.2.13~~) and C403.2.2. Where elements of a building's mechanical systems are addressed in Sections C403.3 through C403.13, such elements shall comply with the applicable provisions of those sections.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40321 Section C403.2.1—(~~Calculation of heating and cooling loads~~) Zone isolation.

C403.2.1 (~~Calculation of heating and cooling loads.~~ Design loads associated with heating, ventilating and air conditioning of the building shall be determined in accordance with the procedures described in ANSI/ASHRAE/ACCA Standard 183 or by an approved equivalent computational procedure, using the design parameters specified in Chapter 3. Heating and cooling loads shall be adjusted to account for load reductions that are achieved where energy recovery systems are utilized in the HVAC system in accordance with the ASHRAE HVAC Systems and Equipment Handbook by an approved equivalent computational procedure.) **Zone isolation required.** HVAC systems serving zones that are intended to operate or be occupied nonsimultaneously shall be divided into isolation areas. Zones may be grouped into a single isolation area provided it does not exceed 25,000 square feet (2323 m²) of conditioned floor area nor include more than one floor. Each isolation area shall be equipped with isolation devices and controls configured to automatically shut off the supply of conditioned air and outdoor air to and exhaust air from the isolation area. Each isolation area shall be controlled independently by a device meeting the requirements of Section C403.4.2.2. Central systems and plants shall be provided with controls and devices that will allow system and equipment operation for any length of time while serving only the smallest isolation area served by the system or plant.

EXCEPTIONS: 1. Exhaust air and outdoor air connections to isolation areas where the fan system to which they connect is not greater than 5,000 cfm (2360 L/s).

2. Exhaust airflow from a single isolation area of less than 10 percent of the design airflow of the exhaust system to which it connects.

3. Isolation areas intended to operate continuously or intended to be inoperative only when all other isolation areas in a *zone* are inoperative.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40322 Section C403.2.2—(~~Equipment and systems sizing~~) Ventilation and exhaust.

C403.2.2 (~~Equipment and system sizing.~~ The output capacity of heating and cooling equipment shall be no greater than that of the smallest available equipment size that exceeds the loads calculated in accordance with Section C403.2.1. A single piece of equipment providing both heating and cooling shall satisfy this provision for one function with the capacity for the other function as small as possible, within available equipment options.

EXCEPTIONS: 1. Required standby equipment and systems provided with controls and devices that allow such systems or equipment to operate automatically only when the primary equipment is not operating.
2. Multiple units of the same equipment type with combined capacities exceeding the design load and provided with controls that are configured to sequence the operation of each unit based on load.)

Ventilation and exhaust.

C403.2.2.1 Ventilation. Ventilation, either natural or mechanical, shall be provided in accordance with Chapter 4 of the *International Mechanical Code*. Where mechanical ventilation is provided, the system shall be configured to provide no greater than 150 percent of the minimum outdoor air required by Chapter 4 of the *International Mechanical Code* or other applicable code or standard, whichever is greater.

EXCEPTIONS: 1. The mechanical system may supply outdoor air at rates higher than the limit above when it is used for particulate or VOC dilution, economizer, night flushing, dehumidification, pressurization, exhaust make-up, or other process air delivery. Outdoor air shall be reduced to the minimum ventilation rates when not required for the preceding uses.
2. Air systems supplying Group R-1, R-2 or I-2 occupancies.
3. Alterations that replace less than half of the total heating and cooling capacity of the system.
4. Systems with energy recovery complying with the requirements of Section C403.7.6.1 that utilize sensible only active chilled beams for space cooling without any additional zonal fan power. Active chilled beams shall be permitted to utilize the increased outdoor airflow to increase space sensible capacity and to maintain space latent cooling loads without additional controls to reduce the outdoor airflow to each zone.

C403.2.2.2 Exhaust. Exhaust shall be provided in accordance with Chapters 4 and 5 of the *International Mechanical Code*. Where exhaust is provided, the system shall be configured to provide no greater than 150 percent of the minimum exhaust air required by Chapters 4 and 5 of the *International*

Mechanical Code or other applicable code or standard, whichever is greater.

- EXCEPTIONS:
1. The mechanical system may exhaust air at rates higher than the limit above when it is used for particulate or VOC dilution, economizer, night flushing, dehumidification, pressure equalization, relief, or other process exhaust air requirements. Outdoor air and exhaust air shall be reduced to the minimum ventilation rates when not required for the preceding uses.
 2. Domestic range hood exhaust in Group R occupancies.
 3. Exhaust from Group I occupancies.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40323 Section C403.2.3—((HVAC equipment performance requirements)) Variable flow capacity.

C403.2.3 ((HVAC equipment performance requirements. Equipment shall meet the minimum efficiency requirements of Tables C403.2.3(1), C403.2.3(2), C403.2.3(3), C403.2.3(4), C403.2.3(5), C403.2.3(6), C403.2.3(7), C403.2.3(8) and C403.2.3(9) when tested and rated in accordance with the applicable test procedure. Plate-type liquid-to-liquid heat exchangers shall meet the minimum requirements of Table C403.2.3(10). 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.

Gas-fired and oil-fired forced air furnaces with input ratings $\geq 225,000$ Btu/h (65 kW) and all unit heaters shall also have an intermittent ignition or interrupted device (IID), and have either mechanical draft (including power venting) or a flue damper. A vent damper is an acceptable alternative to a flue damper for furnaces where combustion air is drawn from the conditioned space. All furnaces with input ratings $\geq 225,000$ Btu/h (65 kW), including electric furnaces, that are not located within the conditioned space shall have jacket losses not exceeding 0.75 percent of the input rating.

Chilled water plants and buildings with more than 500 tons total capacity shall not have more than 100 tons provided by air-cooled chillers.

- EXCEPTIONS:
1. Where the designer demonstrates that the water quality at the building site fails to meet manufacturer's specifications for the use of water-cooled equipment.
 2. Air-cooled chillers with minimum efficiencies at least 10 percent higher than those listed in Table C403.2.3(7).
 3. Replacement of existing equipment.

C403.2.3.1 Water-cooled centrifugal chilling packages. Equipment not designed for operation at AHRI Standard 550/590 test conditions of 44°F (7°C) leaving chilled water temperature and 2.4 gpm/ton evaporator fluid flow and 85°F

(29°C) entering condenser water temperature with 3 gpm/ton (0.054 L/s • kW) condenser water flow shall have maximum full-load kW/ton (FL) and *part-load* ratings adjusted using Equations 4-7 and 4-8.

$$FL_{adj} = FL/K_{adj}$$

(Equation 4-7)

$$PLV_{adj} = IPLV/K_{adj}$$

(Equation 4-8)

Where:

$$K_{adj} = A \times B$$

FL = Full-load kW/ton values as specified in Table C403.2.3(7)

FL_{adj} = Maximum full-load kW/ton rating, adjusted for nonstandard conditions

IPLV = Value as specified in Table C403.2.3(7)

PLV_{adj} = Maximum NPLV rating, adjusted for nonstandard conditions

$$A = 0.00000014592 \times (\text{LIFT})^4 - 0.0000346496 \times (\text{LIFT})^3 + 0.00314196 \times (\text{LIFT})^2 - 0.147199 \times \text{LIFT} + 3.9302$$

$$B = 0.0015 \times L_{vg}^{Evap} (\text{°F}) + 0.934$$

$$\text{LIFT} = L_{vg}^{Cond} - L_{vg}^{Evap}$$

L_{vg}^{Cond} = Full-load condenser leaving fluid temperature (°F)

L_{vg}^{Evap} = Full-load evaporator leaving temperature (°F)

The FL_{adj} and PLV_{adj} values are only applicable for centrifugal chillers meeting all of the following full-load design ranges:

1. Minimum evaporator leaving temperature: 36°F.
2. Maximum condenser leaving temperature: 115°F.
3. LIFT is not less than 20°F (11.1°C) and not greater than 80°F (44.4°C).

C403.2.3.2 Positive displacement (air- and water-cooled) chilling packages. Equipment with a leaving fluid temperature higher than 32°F (0°C) and water-cooled positive displacement chilling packages with a condenser leaving fluid temperature below 115°F (46°C) shall meet the requirements of Table C403.2.3(7) when tested or certified with water at standard rating conditions, in accordance with the referenced test procedure.

C403.2.3.3 Packaged electric heating and cooling equipment. Packaged electric equipment providing both heating and cooling with a total cooling capacity greater than 6,000 Btu/h shall be a heat pump.

EXCEPTION: Unstaffed equipment shelters or cabinets used solely for personal wireless service facilities.

C403.2.3.4 Humidification. If an air economizer is required on a cooling system for which humidification equipment is to be provided to maintain minimum indoor humidity levels, then the humidifier shall be of the adiabatic type (direct evaporative media or fog atomization type):

- EXCEPTIONS:
1. Health care facilities licensed by the state where chapter 246-320 or 246-330 WAC requires steam injection humidifiers in duct work downstream of final filters.
 2. Systems with water economizer.
 3. 100% outside air systems with no provisions for air recirculation to the central supply fan.
 4. Nonadiabatic humidifiers cumulatively serving no more than 10% of a building's air economizer capacity as measured in cfm. This refers to the system cfm serving rooms with stand-alone or duct-mounted humidifiers.)

Variable flow capacity. For fan and pump motors 7.5 hp and greater including motors in or serving custom and packaged air handlers serving variable air volume fan systems, constant volume fans, heating and cooling hydronic pumping systems, pool and service water pumping systems, domestic water

pressure-booster systems, cooling tower fan, and other pump or fan motors where variable flows are required, there shall be:

1. Variable speed drives; or
2. Other controls and devices that will result in fan and pump motor demand of no more than 30 percent of design wattage at 50 percent of design air volume for fans when static pressure set point equals 1/3 the total design static pressure, and 50 percent of design water flow for pumps, based on manufacturer's certified test data. Variable inlet vanes, throttling valves (dampers), scroll dampers or bypass circuits shall not be allowed.

- EXCEPTION:
- Variable speed devices are not required for motors that serve:
1. Fans or pumps in packaged equipment where variable speed drives are not available as a factory option from the equipment manufacturer.
 2. Fans or pumps that are required to operate only for emergency fire-life-safety events (e.g., stairwell pressurization fans, elevator pressurization fans, fire pumps, etc.).

AMENDATORY SECTION (Amending WSR 17-10-062, filed 5/2/17, effective 6/2/17)

WAC 51-11C-403231 Table ((~~C403.2.3~~) C403.3.2(1))—Minimum efficiency requirements—Electrically operated unitary air conditioners and condensing units.

**Table ((~~C403.2.3~~) C403.3.2(1))A
Minimum Efficiency Requirements—Electrically Operated Unitary Air Conditioners and Condensing Units**

Equipment Type	Size Category	Heating Section Type	Subcategory or Rating Condition	Minimum Efficiency	Test Procedure ^A
Air conditioners, air cooled	< 65,000 Btu/h ^b	All	Split System	13.0 SEER	AHRI 210/240
			Single Package	14.0 SEER	
Through-the-wall (air cooled)	≤ 30,000 Btu/h ^b	All	Split system	12.0 SEER	
			Single Package	12.0 SEER	
Small duct high velocity, air cooled	< 65,000 Btu/h ^b	All	Split system	11.0 SEER	AHRI 210/240
Air conditioners, air cooled	≥ 65,000 Btu/h and < 135,000 Btu/h	Electric Resistance (or None)	Split System and Single Package	11.2 EER 12.9 IEER	
		All other	Split System and Single Package	11.0 EER 12.7 IEER	
	≥ 135,000 Btu/h and < 240,000 Btu/h	Electric Resistance (or None)	Split System and Single Package	11.0 EER 12.4 IEER	
		All other	Split System and Single Package	10.8 EER 12.2 IEER	
	≥ 240,000 Btu/h and < 760,000 Btu/h	Electric Resistance (or None)	Split System and Single Package	10.0 EER 11.6 IEER	
		All other	Split System and Single Package	9.8 EER 11.4 IEER	
≥ 760,000 Btu/h	Electric Resistance (or None)	Split System and Single Package	9.7 EER 11.2 IEER		
	All other	Split System and Single Package	9.5 EER 11.6 IEER		

Equipment Type	Size Category	Heating Section Type	Subcategory or Rating Condition	Minimum Efficiency	Test Procedure ^A		
Air conditioners, water cooled	< 65,000 Btu/h ^b	All	Split System and Single Package	12.1 EER 12.3 IEER	AHRI 210/240		
	≥ 65,000 Btu/h and < 135,000 Btu/h	Electric Resistance (or None)	Split System and Single Package	12.1 EER 13.9 IEER	AHRI 210/240		
		All other	Split System and Single Package	11.9 EER 13.7 IEER			
	≥ 135,000 Btu/h and < 240,000 Btu/h	Electric Resistance (or None)	Split System and Single Package	12.5 EER 13.9 IEER			
		All other	Split System and Single Package	12.3 EER 13.7 IEER			
	≥ 240,000 Btu/h and < 760,000 Btu/h	Electric Resistance (or None)	Split System and Single Package	12.4 EER 13.6 IEER			
		All other	Split System and Single Package	12.2 EER 13.4 IEER			
	≥ 760,000 Btu/h	Electric Resistance (or None)	Split System and Single Package	12.2 EER 13.5 IEER			
		All other	Split System and Single Package	12.0 EER 13.3 IEER			
	Air conditioners, evaporatively cooled	< 65,000 Btu/h ^b	All	Split System and Single Package		12.1 EER 12.3 IEER	AHRI 210/240
		≥ 65,000 Btu/h and < 135,000 Btu/h	Electric Resistance (or None)	Split System and Single Package		12.1 EER 12.3 IEER	AHRI 340/360
			All other	Split System and Single Package		11.9 EER 12.1 IEER	
≥ 135,000 Btu/h and < 240,000 Btu/h		Electric Resistance (or None)	Split System and Single Package	12.0 EER 12.2 IEER			
		All other	Split System and Single Package	11.8 EER 12.0 IEER			
≥ 240,000 Btu/h and < 760,000 Btu/h		Electric Resistance (or None)	Split System and Single Package	11.9 EER 12.1 IEER			
		All other	Split System and Single Package	11.7 EER 11.9 IEER			
≥ 760,000 Btu/h		Electric Resistance (or None)	Split System and Single Package	11.7 EER 11.9 EER			
		All other	Split System and Single Package	11.5 EER 11.7 EER			
Condensing units, air cooled		≥ 135,000 Btu/h			10.5 EER 11.8 IEER	AHRI 365	
Condensing units, water cooled		≥ 135,000 Btu/h			13.5 EER 14.0 IEER		
Condensing units, evaporatively cooled		≥ 135,000 Btu/h			13.5 EER 14.0 IEER		

For SI: 1 British thermal unit per hour = 0.2931 W.

- a Chapter ((6)) 12 of the referenced standard contains a complete specification of the referenced test procedure, including the reference year version of the test procedure.
- b Single-phase, air-cooled air conditioners less than 65,000 Btu/h are regulated by NAECA. SEER values are those set by NAECA.

**Table ((C403.2.3)) C403.3.2(1)B
Minimum Efficiency Requirements—Electrically Operated Variable Refrigerant Flow Air Conditioners**

Equipment Type	Size Category	Heating Section Type	Subcategory or Rating Condition	Minimum Efficiency	Test Procedure
VRF Air Conditioners, Air Cooled	< 65,000 Btu/h	All	VRF Multi-Split System	13.0 SEER	AHRI 1230

Equipment Type	Size Category	Heating Section Type	Subcategory or Rating Condition	Minimum Efficiency	Test Procedure
	≥ 65,000 Btu/h and < 135,000 Btu/h	Electric Resistance (or none)	VRF Multi-Split System	11.2 EER ((13.1 IEER (before 1/1/2017))) 15.5 IEER ((as of 1/1/2017))	
	≥ 135,000 Btu/h and < 240,000 Btu/h	Electric Resistance (or none)	VRF Multi-Split System	11.0 EER ((12.9 IEER (before 1/1/2017))) 14.9 IEER ((as of 1/1/2017))	
	≥ 240,000 Btu/h	Electric Resistance (or none)	VRF Multi-split System	10.0 EER ((11.6 IEER (before 1/1/2017))) 13.9 IEER ((as of 1/1/2017))	

Table ~~((C403.2.3))~~ C403.3.2(1)C

Minimum Efficiency Requirements—Electrically Operated Variable Refrigerant Flow Air-to-Air and Applied Heat Pumps

Equipment Type	Size Category	Heating Section Type	Subcategory or Rating Condition	Minimum Efficiency	Test Procedure
VRF Air Cooled (cooling mode)	< 65,000 Btu/h	All	VRF Multi-Split System	13.0 SEER	AHRI 1230
	≥ 65,000 Btu/h and < 135,000 Btu/h	Electric Resistance (or none)	VRF Multi-Split System	11.0 EER ((12.9 IEER (before 1/1/2017))) 14.6 IEER ((as of 1/1/2017))	
	≥ 65,000 Btu/h and < 135,000 Btu/h	Electric Resistance (or none)	VRF Multi-Split System with Heat Recovery	10.8 EER ((12.7 IEER (before 1/1/2017))) 14.4 IEER ((as of 1/1/2017))	
	≥ 135,000 Btu/h and < 240,000 Btu/h	Electric Resistance (or none)	VRF Multi-Split System	10.6 EER ((12.3 IEER (before 1/1/2017))) 13.9 IEER ((as of 1/1/2017))	
	≥ 135,000 Btu/h and < 240,000 Btu/h	Electric Resistance (or none)	VRF Multi-Split System with Heat Recovery	10.4 EER ((12.1 IEER (before 1/1/2017))) 13.7 IEER ((as of 1/1/2017))	

Equipment Type	Size Category	Heating Section Type	Subcategory or Rating Condition	Minimum Efficiency	Test Procedure
	≥ 240,000 Btu/h	Electric Resistance (or none)	VRF Multi-Split System	9.5 EER ((11.0 IEER (before 1/1/2017))) 12.7 IEER ((as of 1/1/2017)))	
	≥ 240,000 Btu/h	Electric Resistance (or none)	VRF Multi-Split System with Heat Recovery	9.3 EER ((10.8 IEER (before 1/1/2017))) 12.5 IEER ((as of 1/1/2017)))	
VRF Water Source (cooling mode)	< 65,000 Btu/h	All	VRF Multi-Split System <i>86°F entering water</i>	12.0 EER <u>16.0 IEER</u>	AHRI 1230
	< 65,000 Btu/h	All	VRF Multi-Split System with Heat Recovery <i>86°F entering water</i>	11.8 EER <u>15.8 IEER</u>	
	≥ 65,000 Btu/h and < 135,000 Btu/h	All	VRF Multi-Split System <i>86°F entering water</i>	12.0 EER <u>16.0 IEER</u>	
	≥ 65,000 Btu/h and < 135,000 Btu/h	All	VRF Multi-Split System with Heat Recovery <i>86°F entering water</i>	11.8 EER <u>15.8 IEER</u>	
	≥ 135,000 Btu/h and < <u>240,000 Btu/h</u>	All	VRF Multi-Split System <i>86°F entering water</i>	10.0 EER <u>14.0 IEER</u>	
	≥ 135,000 Btu/h and < <u>240,000 Btu/h</u>	All	VRF Multi-Split System with Heat Recovery <i>86°F entering water</i>	9.8 EER <u>13.8 IEER</u>	
	≥ <u>240,000 Btu/h</u>	<u>All</u>	<u>VRF Multi-Split System</u> <i>86°F entering water</i>	<u>12.0 IEER</u>	
	≥ <u>240,000 Btu/h</u>	<u>All</u>	<u>VRF Multi-Split System with Heat Recovery</u> <i>86°F entering water</i>	<u>11.8 IEER</u>	
VRF Groundwater Source (cooling mode)	< 135,000 Btu/h	All	VRF Multi-Split System <i>59°F entering water</i>	16.2 EER	AHRI 1230
	< 135,000 Btu/h	All	VRF Multi-Split System with Heat Recovery <i>59°F entering water</i>	16.0 EER	

Equipment Type	Size Category	Heating Section Type	Subcategory or Rating Condition	Minimum Efficiency	Test Procedure
	≥ 135,000 Btu/h	All	VRF Multi-Split System <i>59°F entering water</i>	13.8 EER	
	≥ 135,000 Btu/h	All	VRF Multi-Split System with Heat Recovery <i>59°F entering water</i>	13.6 EER	
VRF Ground Source (cooling mode)	< 135,000 Btu/h	All	VRF Multi-Split System <i>77°F entering water</i>	13.4 EER	AHRI 1230
	< 135,000 Btu/h	All	VRF Multi-Split System with Heat Recovery <i>77°F entering water</i>	13.2 EER	
	≥ 135,000 Btu/h	All	VRF Multi-Split System <i>77°F entering water</i>	11.0 EER	
	≥ 135,000 Btu/h	All	VRF Multi-Split System with Heat Recovery <i>77°F entering water</i>	10.8 EER	
VRF Air Cooled (heating mode)	< 65,000 Btu/h (cooling capacity)	—	VRF Multi-Split System	7.7 HSPF	AHRI 1230
	≥ 65,000 Btu/h and < 135,000 Btu/h (cooling capacity)	—	VRF Multi-Split System <i>47°F db/43°F wb outdoor air</i> <i>17°F db/15°F wb outdoor air</i>	3.3 COP 2.25 COP	
	≥ 135,000 Btu/h (cooling capacity)	—	VRF Multi-Split System <i>47°F db/43°F wb outdoor air</i> <i>17°F db/15°F wb outdoor air</i>	3.2 COP 2.05 COP	
VRF Water Source (heating mode)	< 135,000 Btu/h (cooling capacity)	—	VRF Multi-Split System <i>68°F entering water</i>	((4.2)) <u>4.3</u> COP	AHRI 1230
	≥ 135,000 Btu/h and < <u>240,000 Btu/h</u> (cooling capacity)	—	VRF Multi-Split System <i>68°F entering water</i>	((3.9)) <u>4.0</u> COP	
	≥ <u>240,000 Btu/h</u> (cooling capacity)	==	VRF Multi-Split System <i>68°F entering water</i>	<u>3.9</u> COP	
VRF Groundwater Source (heating mode)	< 135,000 Btu/h (cooling capacity)	—	VRF Multi-Split System <i>50°F entering water</i>	3.6 COP	AHRI 1230

Equipment Type	Size Category	Heating Section Type	Subcategory or Rating Condition	Minimum Efficiency	Test Procedure
	≥ 135,000 Btu/h (cooling capacity)	—	VRF Multi-Split System 50°F entering water	3.3 COP	
VRF Ground Source (heating mode)	< 135,000 Btu/h (cooling capacity)	—	VRF Multi-Split System 32°F entering water	3.1 COP	AHRI 1230
	≥ 135,000 Btu/h (cooling capacity)	—	VRF Multi-Split System 32°F entering water	2.8 COP	

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-403232 Table ((~~C403.2.3~~) C403.3.2(2)—Minimum efficiency requirements—Electrically operated unitary and applied heat pumps.

**Table ((~~C403.2.3~~) C403.3.2(2)
Minimum Efficiency Requirements—Electrically Operated Unitary and Applied Heat Pumps**

Equipment Type	Size Category	Heating Section Type	Subcategory or Rating Condition	Minimum Efficiency	Test Procedure ^a
Air cooled (cooling mode)	< 65,000 Btu/h ^b	All	Split System	14.0 SEER	AHRI 210/240
			Single Packaged	14.0 SEER	
Through-the-wall, air cooled (cooling mode)	≤ 30,000 Btu/h ^b	All	Split System	12.0 SEER	
			Single Packaged	12.0 SEER	
Small duct high velocity, air cooled	< 65,000 Btu/h ^b	All	Split System	11.0 SEER	
Air cooled (cooling mode)	≥ 65,000 Btu/h and < 135,000 Btu/h	Electric Resistance (or None)	Split System and Single Package	11.0 EER 12.2 IEER	AHRI 340/360
		All Other	Split System and Single Package	10.8 EER 12.0 IEER	
	≥ 135,000 Btu/h and < 240,000 Btu/h	Electric Resistance (or None)	Split System and Single Package	10.6 EER 11.6 IEER	
		All Other	Split System and Single Package	10.4 EER 11.4 IEER	
	≥ 240,000 Btu/h	Electric Resistance (or None)	Split System and Single Package	9.5 EER 10.6 IEER	
		All Other	Split System and Single Package	9.3 EER 10.4 IEER	
Water ((source) to air, water loop (cooling mode)	< 17,000 Btu/h	All	86°F entering water	12.2 EER	ISO 13256-1
	≥ 17,000 Btu/h and < 65,000 Btu/h	All	86°F entering water	13.0 EER	
	≥ 65,000 Btu/h and < 135,000 Btu/h	All	86°F entering water	13.0 EER	
Water to air, ground water ((source)) (cooling mode)	< 135,000 Btu/h	All	59°F entering water	18.0 EER	
((Ground water source)) Brine to air, ground loop (cooling mode)	< 135,000 Btu/h	All	77°F entering water	14.1 EER	
((Water source)) Water to water, water loop (cooling mode)	< 135,000 Btu/h	All	86°F entering water	10.6 EER	ISO 13256-2
Water to water, ground water (cooling mode)	≤ 135,000 Btu/h	All	59°F entering water	16.3 EER	
((Ground water source)) Brine to water, ground loop (cooling mode)	< 135,000 Btu/h	All	77°F entering fluid	12.1 EER	
Air cooled (heating mode)	< 65,000 Btu/h ^b	—	Split System	8.2 HSPF	AHRI 210/240

Equipment Type	Size Category	Heating Section Type	Subcategory or Rating Condition	Minimum Efficiency	Test Procedure ^a
		—	Single Package	8.0 HSPF	
Through-the-wall, (air cooled, heating mode)	≤ 30,000 Btu/hb (cooling capacity)	—	Split System	7.4 HSPF	
		—	Single Package	7.4 HSPF	
Small-duct high velocity (air cooled, heating mode)	< 65,000 Btu/h ^b	—	Split System	6.8 HSPF	
Air cooled (heating mode)	≥ 65,000 Btu/h and < 135,000 Btu/h (cooling capacity)	—	47°F db/43°F wb Outdoor Air	3.3 COP	AHRI 340/360
			17°F db/15°F wb Outdoor Air	2.25 COP	
	≥ 135,000 Btu/h (cooling capacity)	—	47°F db/43°F wb Outdoor Air	3.2 COP	
			17°F db/15°F wb Outdoor Air	2.05 COP	
Water ((source) to air, water loop (heating mode)	< 135,000 Btu/h (cooling capacity)	—	68°F entering water	4.3 COP	ISO 13256-1
Water to air, ground water ((source)) (heating mode)	< 135,000 Btu/h (cooling capacity)	—	50°F entering water	3.7 COP	
((Ground source)) Brine to air, ground loop (heating mode)	< 135,000 Btu/h (cooling capacity)	—	32°F entering fluid	3.2 COP	
((Water source)) Water to water, water loop (heating mode)	< 135,000 Btu/h (cooling capacity)	—	68°F entering water	3.7 COP	ISO 13256-2
		—	50°F entering water	3.1 COP	
((Ground source)) Brine to water, ground loop (heating mode)	< 135,000 Btu/h (cooling capacity)	—	32°F entering fluid	2.5 COP	

For SI: 1 British thermal unit per hour = 0.2931 W, °C = [(°F) - 32]/1.8.

- a Chapter ((6)) 12 of the referenced standard contains a complete specification of the referenced test procedure, including the reference year version of the test procedure.
- b Single-phase, air-cooled air conditioners less than 65,000 Btu/h are regulated by NAECA. SEER values are those set by NAECA.

Reviser's note: The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency and appear in the Register pursuant to the requirements of RCW 34.08.040.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-403233 Table ((C403.2.3)) C403.3.2(3)—Minimum efficiency requirements—Electrically operated PTAC, PTHP, SPVAC, SPVHP, room air conditioners.

Table ((C403.2.3)) C403.3.2(3)

Minimum Efficiency Requirements—Electrically Operated Packaged Terminal Air Conditioners, Packaged Terminal Heat Pumps, Single-Package Vertical Air Conditioners, Single-Package Vertical Heat Pumps, Room Air Conditioners and Room Air-Conditioner Heat Pumps

Equipment Type	Size Category (Input)	Subcategory or Rating Condition	Minimum Efficiency		Test Procedure ^a
PTAC (cooling mode) new construction	All Capacities	95°F db outdoor air		14.0 - (0.300 × Cap/1000) EER	AHRI 310/380
PTAC (cooling mode) replacements ^b	All Capacities	95°F db outdoor air		10.9 - (0.213 × Cap/1000) EER	
PTHP (cooling mode) new construction	All Capacities	95°F db outdoor air		14.0 - (0.300 × Cap/1000) EER	
PTHP (cooling mode) replacements ^b	All Capacities	95°F db outdoor air		10.8 - (0.213 × Cap/1000) EER	
PTHP (heating mode) new construction	All Capacities	—		3.7 - (0.052 × Cap/1000) COP	

Equipment Type	Size Category (Input)	Subcategory or Rating Condition	Minimum Efficiency		Test Procedure ^a
PTHP (heating mode) replacements ^b	All Capacities	—		2.9 - (0.026 × Cap/1000) COP	
SPVAC (cooling mode)	< 65,000 Btu/h	95°F db/75°F wb outdoor air		((10.0)) <u>11.0 EER</u>	AHRI 390
	≥ 65,000 Btu/h and < 135,000 Btu/h	95°F db/75°F wb outdoor air		((10.0)) <u>11.0 EER</u>	
	≥ 135,000 Btu/h and < 240,000 Btu/h	95°F db/75°F wb outdoor air		((10.0)) <u>11.0 EER</u>	
SPVHP (cooling mode)	< 65,000 Btu/h	95°F db/75°F wb outdoor air		((10.0)) <u>11.0 EER</u>	
	≥ 65,000 Btu/h and < 135,000 Btu/h	95°F db/75°F wb outdoor air		((10.0)) <u>11.0 EER</u>	
	≥ 135,000 Btu/h and < 240,000 Btu/h	95°F db/75°F wb outdoor air		((10.0)) <u>11.0 EER</u>	
SPVHP (heating mode)	<65,000 Btu/h	47°F db/43°F wb outdoor air		((3.0)) <u>3.3 COP</u>	AHRI 390
	≥ 65,000 Btu/h and < 135,000 Btu/h	47°F db/43°F wb outdoor air		((3.0)) <u>3.3 COP</u>	
	≥ 135,000 Btu/h and < 240,000 Btu/h	47°F db/43°F wb outdoor air		((3.0)) <u>3.3 COP</u>	
Room air conditioners, with louvered sides	< 6,000 Btu/h	—		((9.7 SEER)) <u>11.0 CEER</u>	ANSI/AHA-MRAC-1
	≥ 6,000 Btu/h and < 8,000 Btu/h	—		((9.7 SEER)) <u>11.0 CEER</u>	
	≥ 8,000 Btu/h and < 14,000 Btu/h	—		((9.8 EER)) <u>10.9 CEER</u>	
	≥ 14,000 Btu/h and < 20,000 Btu/h	—		((9.7 SEER)) <u>10.7 CEER</u>	
	≥ 20,000 Btu/h and < 25,000 Btu/h	—		<u>9.4 CEER</u>	
	≥ ((20,000)) <u>25,000</u> Btu/h	—		((8.5 EER)) <u>9.0 CEER</u>	
Room air conditioners, without louvered sides	((< 8,000 Btu/h)) < 6,000 Btu/h	—		((9.0 EER)) <u>10.0 CEER</u>	
	≥ 6,000 Btu/h and < 8,000 Btu/h	—		<u>10.0 CEER</u>	
	≥ 8,000 Btu/h and < 11,000 Btu/h	—		<u>9.6 CEER</u>	
	≥ ((8,000)) <u>11,000</u> Btu/h and < ((20,000)) <u>14,000</u> Btu/h	—		((8.5 EER)) <u>9.5 CEER</u>	
	> 14,000 Btu/h and < 20,000 Btu/h	—		<u>9.3 CEER</u>	
	≥ 20,000 Btu/h	—		((8.5 EER)) <u>9.4 CEER</u>	
Room air-conditioner heat pumps with louvered sides	< 20,000 Btu/h	—		((9.0 EER)) <u>9.8 CEER</u>	
	≥ 20,000 Btu/h	—		((8.5 EER)) <u>9.3 CEER</u>	
Room air-conditioner heat pumps without louvered sides	< 14,000 Btu/h	—		((8.5 EER)) <u>9.3 CEER</u>	
	≥ 14,000 Btu/h	—		((8.0 EER)) <u>8.7 CEER</u>	
Room air conditioner casement only	All capacities	—		((8.7 EER)) <u>9.5 CEER</u>	

Equipment Type	Size Category (Input)	Subcategory or Rating Condition	Minimum Efficiency		Test Procedure ^a
Room air conditioner casement-slider	All capacities	—		((9-5 EER)) 10.4 CEER	

For SI: 1 British thermal unit per hour = 0.2931 W, °C = [(°F) - 32]/1.8.

"Cap" = The rated cooling capacity of the product in Btu/h. If the unit's capacity is less than 7000 Btu/h, use 7000 Btu/h in the calculation. If the unit's capacity is greater than 15,000 Btu/h, use 15,000 Btu/h in the calculations.

- a Chapter ((6)) 12 of the referenced standard contains a complete specification of the referenced test procedure, including the referenced year version of the test procedure.
- b Replacement unit shall be factory labeled as follows: "MANUFACTURED FOR NONSTANDARD SIZE APPLICATIONS ONLY; NOT TO BE INSTALLED IN NEW STANDARD PROJECTS" or "MANUFACTURED FOR REPLACEMENT APPLICATIONS ONLY; NOT TO BE INSTALLED IN NEW CONSTRUCTION PROJECTS."
Replacement efficiencies apply only to units with existing sleeves less than 16 inches (406 mm) in height and less than 42 inches (1067 mm) in width.

Reviser's note: The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency and appear in the Register pursuant to the requirements of RCW 34.08.040.

AMENDATORY SECTION (Amending WSR 13-04-056, filed 2/1/13, effective 7/1/13)

WAC 51-11C-403234 Table ((C403.2.3)) C403.3.2(4)—Minimum efficiency requirements—Warm air furnaces and unit heaters.

Table ((403.2.3)) 403.3.2(4)

Warm Air Furnaces and Combination Warm Air Furnaces/Air-Conditioning Units, Warm Air Duct Furnaces and Unit Heaters, Minimum Efficiency Requirements

Equipment Type	Size Category (Input)	Subcategory or Rating Condition	Minimum Efficiency ^{d, e}	Test Procedure ^a
Warm air furnaces, gas fired	< 225,000 Btu/h	—	((78)) 80% AFUE or 80% E_t^c	DOE 10 C.F.R. Part 430 or ANSI Z21.47
	≥ 225,000 Btu/h	Maximum capacity ^c	80% E_t^f	ANSI Z21.47
Warm air furnaces, oil fired	< 225,000 Btu/h	—	((78)) 83% AFUE or 80% E_t^c	DOE 10 C.F.R. Part 430 or UL 727
	≥ 225,000 Btu/h	Maximum capacity ^b	81% E_t^g	UL 727
Warm air duct furnaces, gas fired	All capacities	Maximum capacity ^b	80% E_c	ANSI Z83.8
Warm air unit heaters, gas fired	All capacities	Maximum capacity ^b	80% E_c	ANSI Z83.8
Warm air unit heaters, oil fired	All capacities	Maximum capacity ^b	80% E_c	UL 731

For SI: 1 British thermal unit per hour = 0.2931 W.

- a Chapter ((6)) 12 of the referenced standard contains a complete specification of the referenced test procedure, including the referenced year version of the test procedure.
- b Minimum and maximum ratings as provided for and allowed by the unit's controls.
- c Combination units not covered by the National Appliance Energy Conservation Act of 1987 (NAECA) (3-phase power or cooling capacity greater than or equal to 65,000 Btu/h [19 kW]) shall comply with either rating.

^d E_t = Thermal efficiency. See test procedure for detailed discussion.

^e E_c = Combustion efficiency (100% less flue losses). See test procedure for detailed discussion.

^f E_c = Combustion efficiency. Units must also include an IID, have jackets not exceeding 0.75 percent of the input rating, and have either power venting or a flue damper. A vent damper is an acceptable alternative to a flue damper for those furnaces where combustion air is drawn from the conditioned space.

^g E_t = Thermal efficiency. Units must also include an IID, have jacket losses not exceeding 0.75 percent of the input rating, and have either power venting or a flue damper. A vent damper is an acceptable alternative to a flue damper for those furnaces where combustion air is drawn from the conditioned space.

Reviser's note: The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency and appear in the Register pursuant to the requirements of RCW 34.08.040.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-403235 Table ((~~C403.2.3~~) C403.3.2(5))—Minimum efficiency requirements—Gas- and oil-fired boilers.

**Table ((~~C403.2.3~~) C403.3.2(5))
Minimum Efficiency Requirements—Gas- and Oil-Fired Boilers**

Equipment Type ^a	Subcategory or Rating Condition	Size Category (Input)	Minimum Efficiency	Test Procedure
Boilers, hot water	Gas-fired	< 300,000 Btu/h ^{d,e}	82% AFUE	10 C.F.R. Part 430
		≥ 300,000 Btu/h and ≤ 2,500,000 Btu/h ^b	80% E_t	10 C.F.R. Part 431
		> 2,500,000 Btu/h ^a	82% E_c	
	Oil-fired ^c	< 300,000 Btu/h ^e	84% AFUE	10 C.F.R. Part 430
		≥ 300,000 Btu/h and ≤ 2,500,000 Btu/h ^b	82% E_t	10 C.F.R. Part 431
		> 2,500,000 Btu/h ^a	84% E_c	
Boilers, steam	Gas-fired	< 300,000 Btu/h ^d	80% AFUE	10 C.F.R. Part 430
	Gas-fired - All, except natural draft	≥ 300,000 Btu/h and ≤ 2,500,000 Btu/h ^b	79% E_t	10 C.F.R. Part 431
		> 2,500,000 Btu/h ^a	79% E_t	
	Gas-fired-natural draft	≥ 300,000 Btu/h and ≤ 2,500,000 Btu/h ^b	((77) 79% E_t)	
		> 2,500,000 Btu/h ^a	((77) 79% E_t)	
	Oil-fired ^c	< 300,000 Btu/h	82% AFUE	10 C.F.R. Part 430
		≥ 300,000 Btu/h and ≤ 2,500,000 Btu/h ^b	81% E_t	10 C.F.R. Part 431
		> 2,500,000 Btu/h ^a	81% E_t	

For SI: 1 British thermal unit per hour = 0.2931 W.

E_c = Combustion efficiency (100 percent less flue losses).

E_t = Thermal efficiency. See referenced standard document for detailed information.

- a These requirements apply to boilers with rated input of 8,000,000 Btu/h or less that are not packaged boilers and to all packaged boilers. Minimum efficiency requirements for boilers cover all capacities of packaged boilers.
- b Maximum capacity minimum and maximum ratings as provided for and allowed by the unit's controls.
- c Includes oil-fired (residual).
- d Boilers shall not be equipped with a constant burning ignition pilot.
- e A boiler not equipped with a tankless domestic water heating coil shall be equipped with an automatic means for adjusting the temperature of the water such that an incremental change in inferred heat load produces a corresponding incremental change in the temperature of the water supplied.

AMENDATORY SECTION (Amending WSR 13-04-056, filed 2/1/13, effective 7/1/13)

WAC 51-11C-403236 Table ((~~C403.2.3~~) C403.3.2(6))—Reserved.

Table ((~~C403.2.3~~) C403.3.2(6))
Reserved

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-403237 Table ((~~C403.2.3~~) C403.3.2(7))—Minimum efficiency requirements—Water chilling packages.

**Table ((~~C403.2.3~~) C403.2(7))
Minimum Efficiency Requirements—Water Chilling Packages^a**

Equipment Type	Size Category	Units	((As of 1/1/2015 ^b))				Test Procedure ^c
			Path A		Path B		
			Full Load	IPLV	Full Load	IPLV	
Air-cooled chillers	< 150 tons	EER	≥ 10.100	≥ 13.700	≥ 9.700	≥ 15.800	AHRI 550/590
	≥ 150 tons	EER	≥ 10.100	≥ 14.000	≥ 9.700	≥ 16.100	
Air cooled without condenser, electrically operated	All capacities	EER	Air-cooled chillers without condensers shall be rated with matching condensers and comply with the air-cooled chiller efficiency requirements				
((Water cooled, electrically operated, reciprocating	All capacities	kW/ton	Reciprocating units shall comply with water-cooled positive displacement efficiency requirements))				
Water cooled, electrically operated, positive displacement	< 75 tons	kW/ton	≤ 0.750	≤ 0.600	≤ 0.780	≤ 0.500	
	≥ 75 tons and < 150 tons	kW/ton	≤ 0.720	≤ 0.560	≤ 0.750	≤ 0.490	
	≥ 150 tons and < 300 tons	kW/ton	≤ 0.660	≤ 0.540	≤ 0.680	≤ 0.440	
	≥ 300 tons and < 600 tons	kW/ton	≤ 0.610	≤ 0.520	≤ 0.625	≤ 0.410	
	≥ 600 tons	kW/ton	≤ 0.560	≤ 0.500	≤ 0.585	≤ 0.380	
Water cooled, electrically operated, centrifugal	< 150 tons	kW/ton	≤ 0.610	≤ 0.550	≤ 0.695	≤ 0.440	
	≥ 150 tons and < 300 tons	kW/ton	≤ 0.610	≤ 0.550	≤ 0.695	≤ 0.400	
	≥ 300 tons and < 400 tons	kW/ton	≤ 0.560	≤ 0.520	≤ 0.595	≤ 0.390	
	≥ 400 tons	kW/ton	≤ 0.560	≤ 0.500	≤ 0.585	≤ 0.380	
Air cooled, absorption single effect	All capacities	COP	≥ 0.600	NR	NA	NA	AHRI 560
Water cooled, absorption single effect	All capacities	COP	≥ 0.700	NR	NA	NA	
Absorption double effect, indirect fired	All capacities	COP	≥ 1.000	≥ 1.050	NA	NA	
Absorption double effect, direct fired	All capacities	COP	≥ 1.000	≥ 1.000	NA	NA	

For SI: 1 ton = 3517 W, 1 British thermal unit per hour = 0.2931 W, °C = [(°F) - 32]/1.8.

NA = Not applicable, not to be used for compliance;

NR = No requirement.

- a The centrifugal chiller equipment requirements, after adjustment in accordance with Section ((~~C403.2.3.1~~) C403.2.2 or Section ((~~C403.2.3.2~~) C403.2.3), do not apply to chillers used in low-temperature applications where the design leaving fluid temperature is less than 36°F. The requirements do not apply to positive displacement chillers with leaving fluid temperatures less than or equal to 32°F. The requirements do not apply to absorption chillers with design leaving fluid temperatures less than 40°F.
- b Compliance with this standard can be obtained by meeting the minimum requirements of Path A or B. However, both the full load and IPLV shall be met to fulfill the requirements of Path A or B.
- c Chapter ((6)) 12 of the referenced standard contains a complete specification of the referenced test procedure, including the referenced year version of the test procedure.

Reviser's note: The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency and appear in the Register pursuant to the requirements of RCW 34.08.040.

AMENDATORY SECTION (Amending WSR 17-10-062, filed 5/2/17, effective 6/2/17)

WAC 51-11C-403238 Table ((~~C403.2.3~~) C403.3.2(8))—Minimum efficiency requirements—Heat rejection equipment.

**Table ((~~C403.2.3~~) C403.3.2(8))
Minimum Efficiency Requirements—Heat Rejection Equipment**

Equipment Type ^a	Total System Heat Rejection Capacity at Rated Conditions	Subcategory or Rating Condition	Performance Required ^{b,c,d,g,h}	Test Procedure ^{e,f}
Propeller or axial fan open circuit cooling towers	All	95°F Entering Water 85°F Leaving Water 75°F Entering wb	≥ ((38.2) <u>40.2</u>) gpm/hp	CTI ATC-105 and CTI STD-201 <u>RS</u>
Centrifugal fan open circuit cooling towers	All	95°F Entering Water 85°F Leaving Water 75°F Entering wb	≥ 20.0 gpm/hp	CTI ATC-105 and CTI STD-201 <u>RS</u>
Propeller or axial fan closed circuit cooling towers	All	102°F Entering Water 90°F Leaving Water 75°F Entering wb	≥ ((14.0) <u>16.1</u>) gpm/hp	CTI ATC-105S and CTI STD-201 <u>RS</u>
Centrifugal closed circuit cooling towers	All	102°F Entering Water 90°F Leaving Water 75°F Entering wb	≥ 7.0 gpm/hp	CTI ATC-105S and CTI STD-201 <u>RS</u>
Propeller or axial fan evaporative condensers	All	R-507A Test Fluid 165°F Entering Gas Temperature 105°F Condensing Temperature 75°F Entering wb	≥ 157,000 Btu/h • hp	CTI ATC-106
Propeller or axial fan evaporative condensers	All	Ammonia Test Fluid 140°F Entering Gas Temperature 96.3°F Condensing Temperature 75°F Entering wb	≥ 134,000 Btu/h • hp	CTI ATC-106
Centrifugal fan evaporative condensers	All	R-507A Test Fluid 165°F Entering Gas Temperature 105°F Condensing Temperature 75°F Entering wb	≥ 135,000 Btu/h • hp	CTI ATC-106
Centrifugal fan evaporative condensers	All	Ammonia Test Fluid 140°F Entering Gas Temperature 96.3°F Condensing Temperature 75°F Entering wb	≥ 110,000 Btu/h • hp	CTI ATC-106
Air cooled condensers	All	125°F Condensing Temperature R-22 Test Fluid 190°F Entering Gas Temperature 15°F Subcooling 95°F Entering db	≥ 176,000 Btu/h • hp	AHRI 460

For SI: °C = [(°F) - 32]/1.8, L/s • kW = (gpm/hp)/(11.83), COP = (Btu/h • hp)/(2550.7).

db = dry-bulb temperature, °F;

wb = wet-bulb temperature, °F.

- a The efficiencies and test procedures for both open and closed circuit cooling towers are not applicable to hybrid cooling towers that contain a combination of wet and dry heat exchange sections.
- (*) For purposes of this table, open circuit cooling tower performance is defined as the water flow rating of the tower at the thermal rating condition ((~~listed in Table 403.2.3(8)~~)) divided by the fan nameplate rated motor power.
- c For purposes of this table, closed circuit cooling tower performance is defined as the water flow rating of the tower at the thermal rating condition ((~~listed in Table 403.2.3(8)~~)) divided by the sum of the fan nameplate rated motor power and the spray pump nameplate rated motor power.
- d For purposes of this table, air cooled condenser performance is defined as the heat rejected from the refrigerant divided by the fan nameplate rated motor power.
- e Chapter ((6)) 12 of the referenced standard contains a complete specification of the referenced test procedure, including the referenced year version of the test procedure.
- f Where a certification program exists for a covered product, and it includes provisions for verification and challenge of equipment efficiency ratings, then the product shall be listed in the certification program, or, where a certification program exists for a covered product, and it includes provisions for verification and challenge of equipment efficiency ratings, but the product is not listed in the existing certification program, the ratings shall be verified by an independent laboratory test report.

- g Cooling towers shall comply with the minimum efficiency listed in the table for that specific type of tower with the capacity effect of any project-specific accessories and/or options included in the capacity of the cooling tower.
- h For purposes of this table, evaporative condenser performance is defined as the heat rejected at the specified rating condition in the table, divided by the sum of the fan motor nameplate power and the integral spray pump nameplate power.
- i Requirements for evaporative condensers are listed with ammonia (R-717) and R-507A as test fluids in this table. Evaporative condensers intended for use with halocarbon refrigerants other than R-507A must meet the minimum efficiency requirements listed above with R-507A as the test fluid.

Reviser's note: The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency and appear in the Register pursuant to the requirements of RCW 34.08.040.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-403239 Table ((~~C403.2.3~~) C403.3.2(9) and Table ((~~C403.2.3~~) C403.3.2(10)—Minimum efficiency requirements.

**Table ((~~C403.2.3~~) C403.3.2(9))
Minimum Efficiency Requirements—Air Conditioners and Condensing Units Serving Computer Rooms**

((Equipment Type	Net Sensible Cooling Capacity*	Minimum SCOP-127^b Efficiency Downflow units/Upflow units	Test Procedure
Air conditioners, air cooled	< 65,000 Btu/h (< 19 kW)	2.20/2.09	ANSI/ASHRAE 127
	≥ 65,000 Btu/h and < 240,000 Btu/h (19 kW and < 70 kW)	2.10/1.99	
	≥ 240,000 Btu/h (≥ 70 kW)	1.90/1.79	
Air conditioners, water cooled	< 65,000 Btu/h (< 19 kW)	2.60/2.49	ANSI/ASHRAE 127
	≥ 65,000 Btu/h and < 240,000 Btu/h (≥ 19 kW and < 70 kW)	2.50/2.39	
	≥ 240,000 Btu/h (≥ 70 kW)	2.40/2.29	
Air conditioners, water cooled with fluid econo- mizer	< 65,000 Btu/h (< 19 kW)	2.55/2.44	ANSI/ASHRAE 127
	≥ 65,000 Btu/h and < 240,000 Btu/h (≥ 19 kW and < 70 kW)	2.45/2.34	
	≥ 240,000 Btu/h (≥ 70 kW)	2.35/2.24	
Air conditioners, glycol cooled (rated at 40% propyl- ene glycol)	< 65,000 Btu/h (< 19 kW)	2.50/2.39	ANSI/ASHRAE 127
	≥ 65,000 Btu/h and < 240,000 Btu/h (≥ 19 kW and < 70 kW)	2.15/2.04	
	≥ 240,000 Btu/h (≥ 70 kW)	2.10/1.99	
Air conditioners, glycol cooled (rated at 40% propyl- ene glycol) with fluid econo- mizer	< 65,000 Btu/h (< 19 kW)	2.45/2.34	ANSI/ASHRAE 127
	≥ 65,000 Btu/h and < 240,000 Btu/h (≥ 19 kW and < 70 kW)	2.10/1.99	
	≥ 240,000 Btu/h (≥ 70 kW)	2.05/1.94	

^a Net sensible cooling capacity: The total gross cooling capacity less the latent cooling less the energy to the air movement system. (Total Gross – Latent – Fan Power.)

- b Sensible coefficient of performance (SCOP-127): A ratio calculated by dividing the net sensible cooling capacity in watts by the total power input in watts (excluding reheaters and humidifiers) at conditions defined in ASHRAE Standard 127. The net sensible cooling capacity is the gross sensible capacity minus the energy dissipated into the cooled space by the fan system.))

<u>Equipment Type</u>	<u>Net Sensible Cooling Capacity</u>	<u>Standard Model</u>	<u>Minimum Net Sensible COP_c</u>			<u>Test Procedure</u>
			<u>Return Air Dry-Bulb Temperature/Dew-Point Temperature</u>			
			<u>Class 1</u>	<u>Class 2</u>	<u>Class 3</u>	
			<u>75°F/52° F</u>	<u>85°F/52° F</u>	<u>95°F/52° F</u>	
<u>Air cooled</u>	<u>< 65,000 Btu/h</u>	<u>Downflow unit</u> <u>Upflow unit - Ducted</u> <u>Upflow unit - Unducted</u> <u>Horizontal-flow unit</u>	<u>2.09</u>	<u>2.30</u> <u>2.10</u>	<u>2.45</u>	<u>AHRI 1360</u>
	<u>> 65,000 Btu/h and < 240,000 Btu/h</u>	<u>Downflow unit</u> <u>Upflow unit - Ducted</u> <u>Upflow unit - Unducted</u> <u>Horizontal-flow unit</u>	<u>1.99</u>	<u>2.20</u> <u>2.05</u>	<u>2.35</u>	
	<u>≥ 240,000 Btu/h</u>	<u>Downflow unit</u> <u>Upflow unit - Ducted</u> <u>Upflow unit - Unducted</u> <u>Horizontal-flow unit</u>	<u>1.79</u>	<u>2.00</u> <u>1.85</u>	<u>2.15</u>	
<u>Water cooled</u>	<u>< 65,000 Btu/h</u>	<u>Downflow unit</u> <u>Upflow unit - Ducted</u> <u>Upflow unit - Unducted</u> <u>Horizontal-flow unit</u>	<u>2.25</u>	<u>2.50</u> <u>2.30</u>	<u>2.70</u>	<u>AHRI 1360</u>
	<u>> 65,000 Btu/h and < 240,000 Btu/h</u>	<u>Downflow unit</u> <u>Upflow unit - Ducted</u> <u>Upflow unit - Unducted</u> <u>Horizontal-flow unit</u>	<u>2.15</u>	<u>2.40</u> <u>2.20</u>	<u>2.60</u>	
	<u>≥ 240,000 Btu/h</u>	<u>Downflow unit</u> <u>Upflow unit - Ducted</u> <u>Upflow unit - Unducted</u> <u>Horizontal-flow unit</u>	<u>2.05</u>	<u>2.25</u> <u>2.10</u>	<u>2.45</u>	

Equipment Type	Net Sensible Cooling Capacity	Standard Model	Minimum Net Sensible COP_c			Test Procedure
			Return Air Dry-Bulb Temperature/Dew-Point Temperature			
			Class 1	Class 2	Class 3	
			75°F/52° F	85°F/52° F	95°F/52° F	
<u>Water cooled with fluid economizer</u>	<u>< 65,000 Btu/h</u>	<u>Downflow unit</u>	<u>2.20</u>	<u>2.45</u>	<u>2.60</u>	<u>AHRI 1360</u>
		<u>Upflow unit - Ducted</u>		<u>2.25</u>		
		<u>Upflow unit - Unducted</u>				
	<u>> 65,000 Btu/h and < 240,000 Btu/h</u>	<u>Horizontal-flow unit</u>				
		<u>Downflow unit</u>	<u>2.10</u>	<u>2.35</u>	<u>2.55</u>	
		<u>Upflow unit - Ducted</u>		<u>2.15</u>		
	<u>Upflow unit - Unducted</u>					
	<u>> 240,000 Btu/h</u>	<u>Horizontal-flow unit</u>				
		<u>Downflow unit</u>	<u>2.00</u>	<u>2.20</u>	<u>2.40</u>	
<u>Upflow unit - Ducted</u>		<u>2.05</u>				
<u>Upflow unit - Unducted</u>						
<u>Glycol cooled</u>	<u>< 65,000 Btu/h</u>	<u>Horizontal-flow unit</u>	<u>2.00</u>	<u>2.30</u>	<u>2.40</u>	<u>AHRI 1360</u>
		<u>Downflow unit</u>		<u>2.10</u>		
		<u>Upflow unit - Ducted</u>				
	<u>> 65,000 Btu/h and < 240,000 Btu/h</u>	<u>Upflow unit - Unducted</u>				
		<u>Downflow unit</u>	<u>1.85</u>	<u>2.05</u>	<u>2.15</u>	
		<u>Upflow unit - Ducted</u>		<u>1.85</u>		
	<u>Upflow unit - Unducted</u>					
	<u>> 240,000 Btu/h</u>	<u>Horizontal-flow unit</u>				
		<u>Downflow unit</u>	<u>1.75</u>	<u>1.95</u>	<u>2.10</u>	
<u>Upflow unit - Ducted</u>		<u>1.80</u>				
<u>Upflow unit - Unducted</u>						
<u>Glycol cooled with fluid economizer</u>	<u>< 65,000 Btu/h</u>	<u>Horizontal-flow unit</u>	<u>2.00</u>	<u>2.25</u>	<u>2.35</u>	<u>AHRI 1360</u>
		<u>Downflow unit</u>		<u>2.10</u>		
		<u>Upflow unit - Ducted</u>				
	<u>> 65,000 Btu/h and < 240,000 Btu/h</u>	<u>Upflow unit - Unducted</u>				
		<u>Downflow unit</u>	<u>1.75</u>	<u>1.95</u>	<u>2.10</u>	
		<u>Upflow unit - Ducted</u>		<u>1.80</u>		
	<u>Upflow unit - Unducted</u>					
	<u>> 240,000 Btu/h</u>	<u>Horizontal-flow unit</u>				
		<u>Downflow unit</u>	<u>1.70</u>	<u>1.90</u>	<u>2.10</u>	
<u>Upflow unit - Ducted</u>		<u>1.80</u>				
<u>Upflow unit - Unducted</u>						
		<u>Horizontal-flow unit</u>				

Table ((~~C403.2.3~~) C403.3.2(10))

Minimum Efficiency Requirements—Heat Transfer Equipment

Equipment Type	Subcategory	Minimum Efficiency	Test Procedure ^a
Liquid-to-liquid heat exchangers	Plate type	NR	AHRI 400

NR = No requirement.

^aChapter ((6)) 12 of the referenced standard contains a complete specification of the referenced test procedure, including the referenced year version of the test procedure.

Table C403.3.2(11)

Minimum Efficiency Requirements: Electrically Operated DX-DOAS Units, Single-package and Remote Condenser, Without Energy Recovery

<u>EQUIPMENT TYPE</u>	<u>SUBCATEGORY OR RATING CONDITION</u>	<u>MINIMUM EFFICIENCY</u>	<u>TEST PROCEDURE</u>
<u>Air cooled (dehumidification mode)</u>		<u>4.0 ISMRE</u>	<u>AHRI 920</u>
<u>Air source heat pumps (dehumidification mode)</u>		<u>4.0 ISMRE</u>	<u>AHRI 920</u>
<u>Water cooled (dehumidification mode)</u>	<u>Cooling tower condenser water</u>	<u>4.9 ISMRE</u>	<u>AHRI 920</u>
	<u>Chilled water</u>	<u>6.0 ISMRE</u>	
<u>Air source heat pump (heating mode)</u>		<u>2.7 ISCOP</u>	<u>AHRI 920</u>
<u>Water source heat pump (dehumidification mode)</u>	<u>Ground source, closed loop</u>	<u>4.8 ISMRE</u>	<u>AHRI 920</u>
	<u>Ground-water source</u>	<u>5.0 ISMRE</u>	
	<u>Water source</u>	<u>4.0 ISMRE</u>	
<u>Water source heat pump (heating mode)</u>	<u>Ground source, closed loop</u>	<u>2.0 ISCOP</u>	<u>AHRI 920</u>
	<u>Ground-water source</u>	<u>3.2 ISCOP</u>	
	<u>Water source</u>	<u>3.5 ISCOP</u>	

Table C403.3.2(12)

Minimum Efficiency Requirements: Electrically Operated DX-DOAS Units, Single-package and Remote Condenser, with Energy Recovery

<u>EQUIPMENT TYPE</u>	<u>SUBCATEGORY OR RATING CONDITION</u>	<u>MINIMUM EFFICIENCY</u>	<u>TEST PROCEDURE</u>
<u>Air cooled (dehumidification mode)</u>		<u>5.2 ISMRE</u>	<u>AHRI 920</u>
<u>Air source heat pumps (dehumidification mode)</u>		<u>5.2 ISMRE</u>	<u>AHRI 920</u>
<u>Water cooled (dehumidification mode)</u>	<u>Cooling tower condenser water</u>	<u>5.3 ISMRE</u>	<u>AHRI 920</u>
	<u>Chilled water</u>	<u>6.6 ISMRE</u>	
<u>Air source heat pump (heating mode)</u>		<u>3.3 ISCOP</u>	<u>AHRI 920</u>
<u>Water source heat pump (dehumidification mode)</u>	<u>Ground source, closed loop</u>	<u>5.2 ISMRE</u>	<u>AHRI 920</u>
	<u>Ground-water source</u>	<u>5.8 ISMRE</u>	
	<u>Water source</u>	<u>4.8 ISMRE</u>	
<u>Water source heat pump (heating mode)</u>	<u>Ground source, closed loop</u>	<u>3.8 ISCOP</u>	<u>AHRI 920</u>
	<u>Ground-water source</u>	<u>4.0 ISCOP</u>	
	<u>Water source</u>	<u>4.8 ISCOP</u>	

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40324 ((Section C403.2.4—HVAC system controls:)) Reserved.

~~((C403.2.4 HVAC system controls. HVAC systems shall be provided with controls as defined in this section and shall be capable of and configured to implement all required control functions in this code.))~~

AMENDATORY SECTION (Amending WSR 16-24-070, filed 12/6/16, effective 5/1/17)

WAC 51-11C-403241 ((Section C403.2.4.1—Thermostatic controls:)) Reserved.

~~((C403.2.4.1 Thermostatic controls. The supply of heating and cooling energy to each zone shall be controlled by individual thermostatic controls capable of responding to temperature within the zone. Controls in the same zone or in neighboring zones connected by openings larger than 10 percent of the floor area of either zone shall not allow for simultaneous heating and cooling. At a minimum, each floor of a building shall be considered as a separate zone. Controls on systems required to have economizers and serving single zones shall have multiple cooling stage capability and activate the economizer when appropriate as the first stage of cooling. See Section C403.3.1 for further economizer requirements. Where humidification or dehumidification or both is provided, at least one humidity control device shall be provided for each humidity control system.~~

- EXCEPTIONS:
1. Independent perimeter systems that are designed to offset only building envelope heat losses or gains or both serving one or more perimeter zones also served by an interior system provided:
 - 1.1. The perimeter system includes at least one thermostatic control zone for each building exposure having exterior walls facing only one orientation (within ± 45 degrees) (0.8 rad) for more than 50 contiguous feet (15,240 mm);
 - 1.2. The perimeter system heating and cooling supply is controlled by a thermostat located within the zones served by the system; and
 - 1.3. Controls are configured to prevent the perimeter system from operating in a different heating or cooling mode from the other equipment within the zones or from neighboring zones connected by openings larger than 10 percent of the floor area of either zone.
 2. Any interior zone open to a perimeter zone shall have setpoints and deadbands coordinated to that cooling in the interior zone shall not operate while the perimeter zone is in heating until the interior zone temperature is 5°F (2.8°C) higher than the perimeter zone temperature, unless the interior and perimeter zones are separated by a partition whose permanent openings are smaller than 10 percent of the perimeter zone floor area.

~~**C403.2.4.1.1 Heat pump supplementary heat.** Unitary air cooled heat pumps shall include microprocessor controls that minimize supplemental heat usage during start up, set up, and defrost conditions. These controls shall anticipate need for heat and use compression heating as the first stage of heat. Controls shall indicate when supplemental heating is being~~

~~used through visual means (e.g., LED indicators). Heat pumps equipped with supplementary heaters shall be installed with controls that prevent supplemental heater operation above 40°F.~~

EXCEPTION: Packaged terminal heat pumps (PTHPs) of less than 2 tons (24,000 Btu/hr) cooling capacity provided with controls that prevent supplementary heater operation above 40°F.

~~**C403.2.4.1.2 Deadband.** Where used to control both heating and cooling, zone thermostatic controls shall be configured to provide a temperature range or deadband of at least 5°F (2.8°C) within which the supply of heating and cooling energy to the zone is shut off or reduced to a minimum.~~

EXCEPTIONS:

1. Thermostats requiring manual changeover between heating and cooling modes.
2. Occupancies or applications requiring precision indoor temperature control as approved by the code official.

~~**C403.2.4.1.3 Setpoint overlap restriction.** Where a zone has a separate heating and a separate cooling thermostatic control located within the zone, a limit switch, mechanical stop or direct digital control system with software programming shall be configured to prevent the heating set point from exceeding the cooling setpoint and to maintain a deadband in accordance with Section C403.2.4.1.2.))~~

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-403242 ((Section C403.2.4.2—Off-hour controls:)) Reserved.

~~((C403.2.4.2 Off hour controls. For all occupancies other than Group R, each zone shall be provided with thermostatic setback controls that are controlled by either an automatic time clock or programmable control system.~~

EXCEPTIONS:

1. Zones that will be operated continuously.
2. Zones with a full HVAC load demand not exceeding 6,800 Btu/h (2 kW) and having a readily accessible manual shutoff switch.

~~**C403.2.4.2.1 Thermostatic setback.** Thermostatic setback controls shall be configured to set back or temporarily operate the system to maintain zone temperatures down to 55°F (13°C) or up to 85°F (29°C).~~

~~**C403.2.4.2.2 Automatic setback and shutdown.** Automatic time clock or programmable controls shall be capable of starting and stopping the system for seven different daily schedules per week and retaining their programming and time setting during a loss of power for at least 10 hours. Additionally, the controls shall have a manual override that allows temporary operation of the system for up to 2 hours; a manually operated timer configured to operate the system for up to 2 hours; or an occupancy sensor.~~

~~**C403.2.4.2.3 Automatic start capabilities.** Automatic start controls shall be provided for each HVAC system. The controls shall be capable of automatically adjusting the daily start time of the HVAC system in order to bring each space to the desired occupied temperature immediately prior to scheduled occupancy.))~~

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-403243 ((Section C403.2.4.3—Shutoff dampers.)) Reserved.

~~((C403.2.4.3 Shutoff dampers. Outdoor air supply, exhaust openings and relief outlets and stairway and shaft vents shall be provided with Class I motorized dampers.~~

Return air openings used for airside economizer operation shall be equipped with Class I motorized dampers.

Class I dampers shall have a maximum leakage rate of 4 cfm/ft² (20.3 L/s x m²) at 1.0 inch water gauge (w.g.) (249 Pa) when tested in accordance with AMCA 500D and shall be labeled by an approved agency for such purpose.

EXCEPTION: Motorized dampers on return air openings in unitary packaged equipment that have the minimum leakage rate available from the manufacturer shall be deemed to comply.

Outdoor air intake and exhaust dampers shall be installed with automatic controls configured to close when the systems or spaces served are not in use or during unoccupied period warm-up and setback operation, unless the systems served require outdoor or exhaust air in accordance with the *International Mechanical Code* or the dampers are opened to provide intentional economizer cooling.

Stairway and shaft vent dampers shall be installed with automatic controls configured to open upon the activation of any fire alarm initiating device of the building's fire alarm system or the interruption of power to the damper.

EXCEPTIONS: 1. Gravity (nonmotorized) dampers shall be permitted to be used as follows:

- 1.1. Relief dampers serving systems less than 5,000 cfm total supply shall be permitted in buildings less than three stories in height.
- 1.2. Gravity (nonmotorized) dampers in Group R occupancies where the design outdoor air intake or exhaust capacity does not exceed 400 cfm (189 L/s).

2. Combustion air intakes.

Gravity (nonmotorized) dampers shall have an air leakage rate not greater than 20 cfm/ft² (101.6 L/s x m²) where not less than 24 inches (610 mm) in either dimension and 40 cfm/ft² (203.2 L/s x m²) where less than 24 inches (610 mm) in either dimension. The rate of air leakage shall be determined at 1.0 inch water gauge (249 Pa) when tested in accordance with AMCA 500D for such purpose. The dampers shall be labeled by an approved agency. Gravity dampers for ventilation air intakes shall be protected from direct exposure to wind.)

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-403244 ((Section C403.2.4.4—Zone isolation.)) Reserved.

~~((C403.2.4.4 Zone isolation. HVAC systems serving zones that are over 25,000 square feet (2323 m²) in floor area or that span more than one floor and are designed to operate or be occupied nonsimultaneously shall be divided into isolation areas. Each isolation area shall be equipped with isolation~~

devices and controls configured to automatically shut off the supply of conditioned air and outdoor air to and exhaust air from the isolation area. Each isolation area shall be controlled independently by a device meeting the requirements of Section C403.2.4.2.2. Central systems and plants shall be provided with controls and devices that will allow system and equipment operation for any length of time while serving only the smallest isolation area served by the system or plant.

EXCEPTIONS: 1. Exhaust air and outdoor air connections to isolation areas where the fan system to which they connect is not greater than 5,000 cfm (2360 L/s).

2. Exhaust airflow from a single isolation area of less than 10 percent of the design airflow of the exhaust system to which it connects.

3. Isolation areas intended to operate continuously or intended to be inoperative only when all other isolation areas in a zone are inoperative.)

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-403245 ((Section C403.2.4.5—Snow-melt and freeze protection controls.)) Reserved.

~~((C403.2.4.5 Snow and ice melt system controls. Snow and ice melting systems, supplied through energy service to the building, shall include automatic controls configured to shut off the system when the pavement temperature is above 50°F (10°C) and no precipitation is falling and an automatic or manual control that is configured to shutoff when the outdoor temperature is above 40°F (4°C) so that the potential for snow or ice accumulation is negligible.~~

~~**C403.2.4.6 Freeze protection system controls.** Freeze protection systems, such as heat tracing of outdoor piping and heat exchangers, including self-regulating heat tracing, shall include automatic controls configured to shut off the systems when outdoor air temperatures are above 40°F (4°C) or when the conditions of the protected fluid will prevent freezing.)~~

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-403246 ((Section C403.2.4.7—Economizer fault detection and Section C403.2.4.8—Combustion heating equipment controls.)) Reserved.

~~((C403.2.4.7 Economizer fault detection and diagnostics (FDD). Air-cooled unitary direct expansion units with a cooling capacity of 54,000 Btu/h or greater listed in Tables C403.2.3(1) through C403.2.3(3) that are equipped with an economizer in accordance with Section C403.3 shall include a fault detection and diagnostics (FDD) system complying with the following:~~

1. The following temperature sensors shall be permanently installed to monitor system operation:
 - 1.1. Outside air.
 - 1.2. Supply air.
 - 1.3. Return air.
2. Temperature sensors shall have an accuracy of ±2°F (1.1°C) over the range of 40°F to 80°F (4°C to 26.7°C).

3. Refrigerant pressure sensors, where used, shall have an accuracy of ± 3 percent of full scale.

4. The unit controller shall be configured to provide system status by indicating the following:

4.1. Free cooling available.

4.2. Economizer enabled.

4.3. Compressor enabled.

4.4. Heating enabled.

4.5. Mixed air low limit cycle active.

4.6. The current value of each sensor.

5. The unit controller shall be capable of manually initiating each operating mode so that the operation of compressors, economizers, fans and the heating system can be independently tested and verified.

6. The unit shall be configured to report faults to a fault management application accessible by day-to-day operating or service personnel or annunciated locally on zone thermostats.

7. The FDD system shall be configured to detect the following faults:

7.1. Air temperature sensor failure/fault.

7.2. Not economizing when the unit should be economizing.

7.3. Economizing when the unit should not be economizing.

7.4. Damper not modulating.

7.5. Excess outdoor air.

C403.2.4.8 Combustion heating equipment controls.

Combustion heating equipment with a capacity over 225,000 Btu/h shall have modulating or staged combustion control.

EXCEPTIONS: 1. Boilers.
2. Radiant heaters.))

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-403247 ((Sections C403.2.4.9 through C403.2.4.11—Group R controls:)) Reserved.

~~((C403.2.4.9 Group R-1 hotel/motel guest rooms. For hotel and motel guest rooms, a minimum of one of the following control technologies shall be required in hotels/motels with over 50 guest rooms such that the space temperature would automatically setback (winter) or set up (summer) by no less than 5°F (3°C) when the occupant is not in the room:~~

1. Controls that are activated by the room occupant via the primary room access method—Key, card, deadbolt, etc.

2. Occupancy sensor controls that are activated by the occupant's presence in the room.

C403.2.4.10 Group R-2 and R-3 dwelling units. The primary space conditioning system within each dwelling unit shall be provided with at least one programmable thermostat for the regulation of space temperature. The thermostat shall allow for, at a minimum, a 5-2 programmable schedule (weekdays/weekends) and be capable of providing at least two programmable setback periods per day.

Each additional system provided within the dwelling unit shall be provided with at least one adjustable thermostat for the regulation of temperature.

EXCEPTIONS: 1. Systems controlled by an occupant sensor that is configured to shut the system off when no occupant is sensed for a period of up to 30 minutes.

2. Systems controlled solely by a manually operated timer configured to operate the system for no more than two hours.

3. Ductless heat pumps.

Each thermostat shall be capable of being set by adjustment or selection of sensors and configured as follows: When used to control heating only: 55°F to 75°F; when used to control cooling only: 70°F to 85°F; all other: 55°F to 85°F with an adjustable deadband of not less than 10°F.

C403.2.4.11 Group R-2 sleeping units. The primary space conditioning system within each sleeping unit shall be provided with at least one programmable thermostat for the regulation of space temperature. The thermostat shall allow for, at a minimum, a 5-2 programmable schedule (weekdays/weekends) and be capable of providing at least two programmable setback periods per day.

Each additional system provided within the sleeping unit shall be provided with at least one adjustable thermostat for the regulation of temperature.

EXCEPTIONS: 1. Systems controlled by an occupant sensor that is configured to shut the system off when no occupant is sensed for a period of up to 30 minutes.

2. Systems controlled solely by a manually operated timer configured to operate the system for no more than two hours.

3. Zones with a full HVAC load demand not exceeding 3,400 Btu/h (1 kW) and having a readily accessible manual shutoff switch.

4. Ductless heat pumps.

Each thermostat shall be capable of being set by adjustment or selection of sensors and configured as follows: When used to control heating only: 55°F to 75°F; when used to control cooling only: 70°F to 85°F; all other: 55°F to 85°F with an adjustable deadband of not less than 10°F.))

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-403248 ((Section C403.2.4.12—Direct digital control systems:)) Reserved.

~~((C403.2.4.12 Direct digital control systems. Direct digital control (DDC) shall be required as specified in Sections C403.2.4.12.1 through C403.2.4.12.3.~~

C403.2.4.12.1 DDC applications. DDC shall be provided in the applications and qualifications listed in Table C403.2.4.12.1.

C403.2.4.12.2 DDC controls. Where DDC is required by Section C403.2.4.12.1, the DDC system shall be capable of all of the following, as required to provide the system and zone control logic required in Sections C403.2, C403.3, and C403.4:

1. Monitoring zone and system demand for fan pressure, pump pressure, heating and cooling.

2. Transferring zone and system demand information from zones to air distribution system controllers and from air distribution systems to heating and cooling plant controllers.

C403.2.4.12.3 DDC display. Where DDC is required by Section C403.2.12.1 for new buildings, the DDC system shall be capable of trending and graphically displaying input and output points.

**Table C403.2.4.12.1
DDC Applications and Qualifications**

Building Status	Application	Qualifications
New building	Air-handling system and all zones served by the system	All air-handling systems in buildings with building cooling capacity greater than 780,000 Btu/h
	Air-handling system and all zones served by the system	Individual systems supplying more than three zones and with fan system bhp of 10 hp and larger
	Chilled-water plant and all coils and terminal units served by the system	Individual plants supplying more than three zones and with design cooling capacity of 300,000 Btu/h and larger
	Hot-water plant and all coils and terminal units served by the system	Individual plants supplying more than three zones and with design heating capacity of 300,000 Btu/h and larger
Alteration or addition	Zone terminal unit such as VAV box	Where existing zones served by the same air-handling, chilled-water, or hot-water system have DDC
	Air-handling system or fan-coil	Where existing air-handling system(s) and fan-coil(s) served by the same chilled or hot-water plant have DDC
	New air-handling system and all new zones served by the system	Individual systems with fan system bhp of 10 hp and larger and supplying more than three zones and more than 75% of zones are new
	New or upgraded chilled-water plant	Where all chillers are new and plant design cooling capacity is 300,000 Btu/h and larger
	New or upgraded hot-water plant	Where all boilers are new and plant design heating capacity is 300,000 Btu/h and larger))

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-403249 ((Section C403.2.5 — Hot water boiler controls.)) Reserved.

((C403.2.5 Hot water boiler outdoor temperature setback control. Hot water boilers that supply heat to the building through one or two pipe heating systems shall have an outdoor setback control that lowers the boiler water temperature based on the outdoor temperature.))

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40325 ((Section C403.2.6 — Ventilation.)) Reserved.

((C403.2.6 Ventilation. Ventilation, either natural or mechanical, shall be provided in accordance with Chapter 4 of the *International Mechanical Code*. Where mechanical ventilation is provided, the system shall be configured to provide no greater than 150 percent of the minimum outdoor air required by Chapter 4 of the *International Mechanical Code* or other applicable code or standard, whichever is greater.

- EXCEPTIONS:**
1. The mechanical system may supply outdoor air at rates higher than the limit above when it is used for particulate or VOC dilution, economizer, night flushing, dehumidification, pressurization, exhaust make-up, or other process air delivery. Outdoor air shall be reduced to the minimum ventilation rates when not required for the preceding uses.
 2. Air systems supplying Group R-1, R-2 or I-2 occupancies.
 3. Alterations that replace less than half of the total heating and cooling capacity of the system.
 4. Systems with energy recovery complying with the requirements of Section C403.5.1.)

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-403252 ((Section C403.2.6.2 — Demand control ventilation.)) Reserved.

((C403.2.6.2 Demand controlled ventilation. Demand control ventilation (DCV) shall be provided for spaces larger than 500 square feet (50 m²) and with an occupant load greater than or equal to 25 people per 1000 square feet (93 m²) of floor area (as established in Table 403.3.1.1 of the *International Mechanical Code*) and served by systems with one or more of the following:

1. An air-side economizer;
2. Automatic modulating control of the outdoor air damper; or
3. A design outdoor airflow greater than 3,000 cfm (1416 L/s).

EXCEPTION: Demand control ventilation is not required for systems and spaces as follows:

1. Systems with energy recovery complying with Section C403.5.1.
2. Multiple-zone systems without direct digital control of individual zones communicating with a central control panel.
3. System with a design outdoor airflow less than 750 cfm (354 L/s).
4. Spaces where the supply airflow rate minus any makeup or outgoing transfer air requirement is less than 1,200 cfm (566 L/s).
5. Ventilation provided for process loads only.
6. Spaces with one of the following occupancy categories (as defined by the *International Mechanical Code*): Correctional cells, day care sickrooms, science labs, barbers, beauty and nail salons, and bowling alley seating.)

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-403253 ((Section C403.2.6.3 Occupancy sensors.)) Reserved.

~~((C403.2.6.3 Occupancy sensors. Classrooms, gyms, auditoriums and conference rooms larger than 500 square feet of floor area shall have occupancy sensor control that will either close outside air dampers or turn off serving equipment when the space is unoccupied except where equipped with another means to automatically reduce outside air intake below design rates when spaces are partially occupied.))~~

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-403254 ((Section C403.2.6.4 Loading dock and parking garage ventilation system controls.)) Reserved.

~~((C403.2.6.4 Enclosed loading dock and parking garage exhaust ventilation system control. Mechanical ventilation systems for enclosed loading docks and parking garages shall be designed to exhaust the airflow rates (maximum and minimum) determined in accordance with the *International Mechanical Code*.~~

~~Ventilation systems shall be equipped with a control device that operates the system automatically by means of carbon monoxide detectors applied in conjunction with nitrogen dioxide detectors. Controllers shall be configured to shut off fans or modulate fan speed to 50 percent or less of design capacity, or intermittently operate fans less than 20 percent of the occupied time or as required to maintain acceptable contaminant levels in accordance with the *International Mechanical Code* provisions.~~

~~Gas sensor controllers used to activate the exhaust ventilation system shall stage or modulate fan speed upon detection of specified gas levels. All equipment used in sensor~~

~~controlled systems shall be designed for the specific use and installed in accordance with the manufacturer's recommendations. The system shall be arranged to operate automatically by means of carbon monoxide detectors applied in conjunction with nitrogen dioxide detectors. Garages and loading docks shall be equipped with a controller and a full array of carbon monoxide (CO) sensors set to maintain levels of carbon monoxide below 35 parts per million (ppm). Additionally, a full array of nitrogen dioxide detectors shall be connected to the controller set to maintain the nitrogen dioxide level below the OSHA standard for eight hour exposure. Spacing and location of the sensors shall be installed in accordance with manufacturer recommendations.~~

C403.2.6.4.1 System activation devices for enclosed loading docks. Ventilation systems for enclosed loading docks shall be activated by one of the following:

1. Gas sensors installed in accordance with the *International Mechanical Code*; or
2. Occupant detection sensors used to activate the system that detects entry into the loading area along both the vehicle and pedestrian pathways.

C403.2.6.4.2 System activation devices for enclosed parking garages. Ventilation systems for enclosed parking garages shall be activated by gas sensors.

EXCEPTION: A parking garage ventilation system having a total design capacity under 8,000 cfm may use occupant sensors.)

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40326 ((Section C403.2.7 Exhaust systems.)) Reserved.

~~((C403.2.7 Exhaust systems.~~

~~C403.2.7.1 Kitchen exhaust systems. Replacement air introduced directly into the exhaust hood cavity shall not be greater than 10 percent of the hood exhaust airflow rate. Conditioned supply air delivered to any space shall not exceed the greater of the following:~~

1. The ventilation rate required to meet the space heating or cooling load.
2. The hood exhaust flow minus the available transfer air from adjacent space where available transfer air is considered that portion of outdoor ventilation air not required to satisfy other exhaust needs, such as restrooms, and not required to maintain pressurization of adjacent spaces.

~~Where total kitchen hood exhaust airflow rate is greater than 2,000 cfm each hood shall be a factory built commercial exhaust hood listed by a nationally recognized testing laboratory in compliance with UL 710. Each hood shall have a maximum exhaust rate as specified in Table C403.2.7.1 and shall comply with one of the following:~~

1. Not less than 50 percent of all replacement air shall be transfer air that would otherwise be exhausted.
2. Demand ventilation systems on not less than 75 percent of the exhaust air that are configured to provide not less than a 50 percent reduction in exhaust and replacement air system airflow rates, including controls necessary to modu-

late airflow in response to appliance operation and to maintain full capture and containment of smoke, effluent and combustion products during cooking and idle.

3. Listed energy recovery devices with a sensible heat recovery effectiveness of not less than 40 percent on not less than 50 percent of the total exhaust airflow.

Where a single hood, or hood section, is installed over appliances with different duty ratings, the maximum allow-

able flow rate for the hood or hood section shall be based on the requirements for the highest appliance duty rating under the hood or hood section.

- EXCEPTIONS:
1. Where not less than 75 percent of all the replacement air is transfer air that would otherwise be exhausted.
 2. Certified grease extractor hoods that require a face velocity no greater than 60 fpm.

**Table C403.2.7.1
Maximum Net Exhaust Flow Rate,
CFM Per Linear Foot of Hood Length**

TYPE OF HOOD	LIGHT DUTY EQUIPMENT	MEDIUM DUTY EQUIPMENT	HEAVY DUTY EQUIPMENT	EXTRA HEAVY DUTY EQUIPMENT
Wall-mounted canopy	140	210	280	385
Single island	280	350	420	490
Double island (per side)	175	210	280	385
Eyebrow	175	175	NA	NA
Backshelf/pass-over	210	210	280	NA

For SI: 1 cfm = 0.4719 L/s; 1 foot = 305 mm

NA = Not allowed.

C403.2.7.2 Laboratory exhaust systems. Buildings with laboratory exhaust systems having a total exhaust rate greater than 5,000 cfm (2360 L/s) shall include heat recovery systems to precondition makeup air from laboratory exhaust. The heat recovery system shall be capable of increasing the outside air supply temperature at design heating conditions by 25°F (13.9°C). A provision shall be made to bypass or control the heat recovery system to permit air economizer operation as required by Section C403.3.

- EXCEPTIONS:
1. Variable air volume laboratory exhaust and room supply systems configured to reduce exhaust and make-up air volume to 50 percent or less of design values; or
 2. Direct make-up (auxiliary) air supply equal to at least 75 percent of the exhaust rate, heated no warmer than 2°F (1.1°C) below room set point, cooled to no cooler than 3°F (1.7°C) above room set point, no humidification added, and no simultaneous heating and cooling used for dehumidification control; or
 3. Combined energy reduction method: VAV exhaust and room supply system configured to reduce exhaust and makeup air volumes and a heat recovery system to precondition makeup air from laboratory exhaust that when combined will produce the same energy reduction as achieved by a heat recovery system with a 50 percent sensible recovery effectiveness as required above. For calculation purposes, the heat recovery component can be assumed to include the maximum design supply airflow rate at design conditions. The combined energy reduction (Q_{ER}) shall meet the following:

$$Q_{ER} \geq Q_{MIN}$$

$$Q_{MIN} = CFM_S \cdot (T_R - T_O) \cdot 1.1 \cdot 0.6$$

$$Q_{ER} = CFM_S \cdot (T_R - T_O) \cdot 1.1(A + B)/100$$

Where:

$$Q_{MIN} = \text{Energy recovery at 60 percent sensible effectiveness (Btu/h)}$$

- Q_{ER} = Combined energy reduction (Btu/h)
- CFM_S = The maximum design supply airflow rate to conditioned spaces served by the system in cubic feet per minute
- T_R = Space return air dry bulb at winter design conditions
- T_O = Outdoor air dry bulb at winter design conditions
- A = Percentage that the exhaust and makeup air volumes can be reduced from design conditions
- B = Percentage sensible heat recovery effectiveness))

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40327 ((Section C403.2.8 — Duct and plenum insulation and sealing:)) Reserved.

((C403.2.8 Duct and plenum insulation and sealing:

C403.2.8.1 Ducts, shafts and plenums conveying outdoor air from the exterior of the building to the mechanical system shall meet all air leakage and building envelope insulation requirements of Section C402, plus building envelope vapor control requirements from the *International Building Code*, extending continuously from the building exterior to an automatic shutoff damper or heating or cooling equipment. For the purposes of building envelope insulation requirements, duct surfaces shall meet the requirements for metal framed walls per Table C402.1.4. Duct surfaces included as part of the building envelope shall not be used in the calculation of maximum glazing area as described in Section C402.4.1.

- EXCEPTIONS:
1. Outside air ducts serving individual supply air units with less than 2,800 cfm of total supply air capacity, provided these are insulated to R-7.
 2. Unheated equipment rooms with combustion air louvers, provided they are isolated from conditioned space at sides, top and bottom of the room with R-11 nominal insulation.

C403.2.8.2 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. 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. Where the design temperature difference between the interior and exterior of the duct or plenum does not exceed 15°F (8°C).

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 of R-3.3 insulation.

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

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

C403.2.8.3 Duct construction. Ductwork shall be constructed and erected in accordance with the *International Mechanical Code*.

C403.2.8.3.1 Low pressure duct systems. All longitudinal and transverse joints, seams and connections of supply and return ducts operating at a static pressure less than or equal to 2 inches water gauge (w.g.) (500 Pa) shall be securely fastened and sealed with welds, gaskets, masties (adhesives), mastic plus embedded fabric systems or tapes installed in accordance with the manufacturer's installation instructions. Pressure classifications specific to the duct system shall be clearly indicated on the construction documents in accordance with the *International Mechanical Code*.

- EXCEPTION: Continuously welded and locking type longitudinal joints and seams on ducts operating at static pressures less than 2 inches water gauge (w.g.) (500 Pa) pressure classification.

C403.2.8.3.2 Medium pressure duct systems. All ducts and plenums designed to operate at a static pressure greater than 2 inches water gauge (w.g.) (500 Pa) but less than 3 inches w.g. (750 Pa) shall be insulated and sealed in accordance with Section C403.2.7. Pressure classifications specific to the duct system shall be clearly indicated on the construction documents in accordance with the *International Mechanical Code*.

C403.2.8.3.3 High pressure duct systems. Ducts designed to operate at static pressures in excess of 3 inches water gauge (w.g.) (750 Pa) shall be insulated and sealed in accordance with Section C403.2.8. In addition, ducts and plenums shall be leak tested in accordance with the SMACNA *HVAC Air Duct Leakage Test Manual* and shown to have a rate of air leakage (*CL*) less than or equal to 4.0 as determined in accordance with Equation 4-9.

(Equation 4-9)

$$CL = F/P0.65$$

Where:

- F* = The measured leakage rate in cfm per 100 square feet of duct surface.
- P* = The static pressure of the test.

Documentation shall be furnished by the designer demonstrating that representative sections totaling at least 25 percent of the duct area have been tested and that all tested sections meet the requirements of this section.))

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40328 ((Section C403.2.9 Piping insulation.)) Reserved.

((C403.2.9 Piping insulation. All piping serving as part of a heating or cooling system shall be thermally insulated in accordance with Table C403.2.9.

- EXCEPTIONS:
1. Factory-installed piping within HVAC equipment tested and rated in accordance with a test procedure referenced by this code.
 2. Factory-installed piping within room fan coils and unit ventilators tested and rated according to AHRI 440 (except that the sampling and variation provisions of Section 6.5 shall not apply) and 840, respectively.
 3. Piping that conveys fluids that have a design operating temperature range between 60°F (15°C) and 105°F (41°C).
 4. Piping that conveys fluids that have not been heated or cooled through the use of fossil fuels or electric power.
 5. Strainers, control valves, and balancing valves associated with piping 1 inch (25 mm) or less in diameter.
 6. Direct-buried piping that conveys fluids at or below 60°F (15°C).

C403.2.9.1 Protection of piping insulation. Piping insulation exposed to weather shall be protected from damage, including that due to sunlight, moisture, equipment maintenance and wind, and shall provide shielding from solar radiation that can cause degradation of the material. Adhesives tape shall not be permitted.))

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-403281 ((Table C403.2.9 Minimum pipe insulation thickness.)) Reserved.

((Table C403.2.9

Minimum Pipe Insulation Thickness (thickness in inches)*

Fluid Operating Temperature Range and Usage (°F)	Insulation Conductivity		Nominal Pipe or Tube Size (inches)				
	Conductivity Btu • in. / (h • ft ² • °F) ^b	Mean Rating Temperature, °F	< 1	1 to < 1 1/2	1 1/2 to < 4	4 to < 8	≥ 8
> 350	0.32 – 0.34	250	4.5	5.0	5.0	5.0	5.0
251 – 350	0.29 – 0.32	200	3.0	4.0	4.5	4.5	4.5
201 – 250	0.27 – 0.30	150	2.5	2.5	2.5	3.0	3.0
141 – 200	0.25 – 0.29	125	1.5	1.5	2.0	2.0	2.0
105 – 140	0.21 – 0.28	100	1.0	1.0	1.5	1.5	1.5
40 – 60	0.21 – 0.27	75	0.5	0.5	1.0	1.0	1.0
< 40	0.20 – 0.26	75	0.5	1.0	1.0	1.0	1.5

- a For piping smaller than 1 1/2 inch (38 mm) and located in partitions within *conditioned spaces*, reduction of these thicknesses by 1 inch (25 mm) shall be permitted (before thickness adjustment required in footnote b) but not to a thickness less than 1 inch (25 mm).
- b For insulation outside the stated conductivity range, the minimum thickness (T) shall be determined as follows:

$$T = r \{ (1 + t/r)^{K/k} - 1 \}$$

Where:

- T = Minimum insulation thickness,
- r = Actual outside radius of pipe,
- t = Insulation thickness listed in the table for applicable fluid temperature and pipe size,
- K = Conductivity of alternate material at mean rating temperature indicated for the applicable fluid temperature (Btu • in/h • ft² • °F) and
- k = The upper value of the conductivity range listed in the table for the applicable fluid temperature.

- e For direct-buried heating and hot water system piping, reduction of these thicknesses by 1 1/2 inches (38 mm) shall be permitted (before thickness adjustment required in footnote b but not to thicknesses less than 1 inch (25 mm).)

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40329 ((Section C403.2.10 Mechanical system commissioning and completion requirements.)) Reserved.

((C403.2.10 Mechanical systems commissioning and completion requirements. Mechanical systems shall be commissioned and completed in accordance with Section C408.))

AMENDATORY SECTION (Amending WSR 17-10-062, filed 5/2/17, effective 6/2/17)

WAC 51-11C-403291 ((Section C403.2.11 Air system design and control.)) Reserved.

((C403.2.11 Air system design and control. Each HVAC system having a total fan system motor nameplate horsepower (hp) exceeding 5 horsepower (hp) (3.7 kW) shall comply with the provisions of Sections C403.2.11.1 through C403.2.11.3.

The air flow requirements of Section C403.2.11.5 shall apply to all fan motors. Group R occupancy exhaust fans shall also comply with Section C403.2.11.4.

C403.2.11.1 Allowable fan motor horsepower. Each HVAC system at fan system design conditions shall not exceed the allowable *fan system motor nameplate hp* (Option 1) or *fan system bhp* (Option 2) as shown in Table C403.2.11.1(1). This includes supply fans, exhaust fans,

return/relief fans, and fan-powered terminal units associated with systems providing heating or cooling capability. Single *zone* variable air volume systems shall comply with the constant volume fan power limitation.

- EXCEPTIONS:
1. Hospital, vivarium and laboratory systems that utilize flow control devices on exhaust or return to maintain space pressure relationships necessary for occupant health and safety or environmental control shall be permitted to use variable volume fan power limitation.
 2. Individual exhaust fans with motor nameplate horsepower of 1 hp or less are exempt from allowable fan motor horsepower requirements.

C403.2.11.2 Motor nameplate horsepower. For each fan, the selected fan motor shall be no larger than the first available motor size greater than the brake horsepower (bhp). The fan brake horsepower (bhp) shall be indicated on the design documents to allow for compliance verification by the *code official*.

- EXCEPTIONS:
1. For fans less than 6 bhp (4413 W), where the first available motor larger than the brake horsepower has a nameplate rating within 50 percent of the bhp, selection of the next larger nameplate motor size is allowed.
 2. For fans 6 bhp (4413 W) and larger, where the first available motor larger than the bhp has a nameplate rating within 30 percent of the bhp, selection of the next larger nameplate motor size is allowed.
 3. For fans used only in *approved* life safety applications such as smoke evacuation.

C403.2.11.3 Fan efficiency. Fans shall have a fan efficiency grade (FEG) of 67 or higher based on manufacturers' certified data, as defined by AMCA 205. The total efficiency of the fan at the design point of operation shall be within 15 percentage points of the maximum total efficiency of the fan.

- EXCEPTION:
- The following fans are not required to have a fan efficiency grade:
 1. Fans of 5 hp (3.7 kW) or less as follows:
 - 1.1. Single fan with a motor nameplate horsepower of 5 hp (3.7 kW) or less, unless Exception 1.2. applies.
 - 1.2. Multiple fans in series or parallel that have a combined motor nameplate horsepower of 5 hp (3.7 kW) or less and are operated as the functional equivalent of a single fan.
 2. Fans that are part of equipment covered under Section C403.2.3.
 3. Fans included in an equipment package certified by an approved agency for air or energy performance.
 4. Powered wall/roof ventilators.
 5. Fans outside the scope of AMCA 205.
 6. Fans that are intended to operate only during emergency conditions.

C403.2.11.4 Group R occupancy exhaust fan efficacy. The Group R occupancies of the building shall be provided with ventilation that meets the requirements of the *International Mechanical Code*, as applicable, or with other approved means of ventilation. Mechanical ventilation system fans with 400 cfm or less in capacity shall meet the efficacy requirements of Table C403.2.11.4.

- EXCEPTIONS:
- 1. Group R heat recovery ventilator and energy recovery ventilator fans that are less than 400 cfm.
 - 2. Where whole house ventilation fans are integrated with forced-air systems that are tested and listed HVAC equipment, they shall be powered by an electronically commutated motor where required by Section C405.8.
 - 3. Domestic clothes dryer booster fans, domestic range hood exhaust fans, and domestic range booster fans that operate intermittently.

C403.2.11.5 Fan airflow control. Each cooling system listed in Table C403.2.11.5 shall be designed to vary the indoor fan airflow as a function of load and shall comply with the following requirements:

1. Direct expansion (DX) and chilled water cooling units that control the capacity of the mechanical cooling directly based on space temperature shall have not fewer than two stages of fan control. Low or minimum speed shall not be greater than 66 percent of full speed. At low or minimum speed, the fan system shall draw not more than 40 percent of the fan power at full fan speed. Low or minimum speed shall be used during periods of low cooling load and ventilation-only operation.
2. Other units including DX cooling units and chilled water units that control the space temperature by modulating the airflow to the space shall have modulating fan control. Minimum speed shall be not greater than 50 percent of full speed. At minimum speed, the fan system shall draw no more than 30 percent of the power at full fan speed. Low or minimum speed shall be used during periods of low cooling load and ventilation-only operation.

3. Units that include an airside economizer in accordance with Section C403.3 shall have not fewer than two speeds of fan control during economizer operation.

- EXCEPTIONS:
1. Modulating fan control is not required for chilled water and evaporative cooling units with fan motors of less than 1 hp (0.746 kW) where the units are not used to provide ventilation air and the indoor fan cycles with the load.
 2. Where the volume of outdoor air required to comply with the ventilation requirements of the *International Mechanical Code* at low speed exceeds the air that would be delivered at the minimum speed defined in this section, the minimum speed shall be selected to provide the required ventilation air.)

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-403292 ((Tables for Section C403.2.11.)) Reserved.

((Table C403.2.11.1(1) Fan Power Limitation

	Limit	Constant Volume	Variable Volume
Option 1: Fan system motor nameplate hp	Allowable nameplate motor hp	$hp \leq CFM_g \times 0.0011$	$hp \leq CFM_g \times 0.0015$
Option 2: Fan system bhp	Allowable fan system bhp	$bhp \leq CFM_g \times 0.00094 + A$	$bhp \leq CFM_g \times 0.0013 + A$

For SI: 1 cfm = 0.471 L/s, 1 bhp = 735.5 W, 1 hp = 745.5 W.

Where:

- CFM_g = The maximum design supply airflow rate to conditioned spaces served by the system in cubic feet per minute.
- hp = The maximum combined motor nameplate horsepower.
- bhp = The maximum combined fan brake horsepower.
- A = Sum of $[PD \times CFM_D / 4131]$

Where:

- PD = Each applicable pressure drop adjustment from Table C403.2.10.1(2) in w.e.
- CFM_D = The design airflow through each applicable device from Table C403.2.10.1(2) in cubic feet per minute.

Table C403.2.11.1(2) Fan Power Limitation Pressure Drop Adjustment

Device	Adjustment
Credits	
Fully ducted return and/or exhaust air systems	0.5 inch w.e. (2.15 inches w.e. for laboratory and vivarium systems)
Return and/or exhaust airflow control devices	0.5 inch w.e.

Device	Adjustment
Credits	
Exhaust filters, scrubbers, or other exhaust treatment	The pressure drop of device calculated at fan system design condition
Particulate filtration credit: MERV 9 – 12	0.5 inch w.e.
Particulate filtration credit: MERV 13 – 15	0.9 inch w.e.
Particulate filtration credit: MERV 16 and greater and electronically enhanced filters	Pressure drop calculated at 2x clean filter pressure drop at fan system design condition
Carbon and other gas-phase air cleaners	Clean filter pressure drop at fan system design condition
Biosafety cabinet	Pressure drop of device at fan system design condition
Energy recovery device, other than coil runaround loop	(2.2 × energy recovery effectiveness) – 0.5 inch w.e. for each airstream
Coil runaround loop	0.6 inch w.e. for each airstream

Device	Adjustment
Credits	
Evaporative humidifier/cooler in series with another cooling coil	Pressure drop of device at fan system design conditions
Sound attenuation section (fans serving spaces with design background noise goals below NC35)	0.15 inch w.e.
Exhaust system serving fume hoods	0.35 inch w.e.
Laboratory and vivarium exhaust systems in high-rise buildings	0.25 inch w.e./100 feet of vertical duct exceeding 75 feet
Deductions	
Systems without central cooling device	-0.6 inch w.e.
Systems without central heating device	-0.3 inch w.e.
Systems with central electric resistance heat	-0.2 inch w.e.

For SI: 1 inch w.e. = 249 Pa, 1 inch = 25.4 mm.
w.e. = water column.

Table C403.2.11.4
Mechanical Ventilation System Fan Efficiency

Fan Location	Air Flow Rate Minimum (cfm)	Minimum Efficiency (cfm/watt)	Air Flow Rate Maximum (cfm)
Exhaust fan: Bathroom, utility room, whole-house	10	1.4 cfm/watt	<90
Exhaust fan: Bathroom, utility room, whole-house	90	2.8 cfm/watt	Any

Table C403.2.11.5
Fan Control

Cooling System Type	Fan Motor Size	Mechanical Cooling Capacity
DX-cooling	Any	≥ 65,000 Btu/h
Chilled water and evaporative cooling	≥ 5 hp	Any
	≥ 1/4 hp	Any))

Reviser's note: The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency and appear in the Register pursuant to the requirements of RCW 34.08.040.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-403293 ((Section C403.2.12 Heating outside a building.)) Reserved.

((C403.2.12 Heating outside a building. Systems installed to provide heat outside a building shall be radiant systems.

Such heating systems shall be controlled by an occupancy sensing device or a timer switch, so that the system is automatically deenergized when no occupants are present.))

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-403294 ((Section C403.2.13 System criteria.)) Reserved.

~~((C403.2.13 Variable flow capability. For fan and pump motors 7.5 hp and greater including motors in or serving custom and packaged air handlers serving variable air volume fan systems, constant volume fans, heating and cooling hydronic pumping systems, pool and service water pumping systems, domestic water pressure boosting systems, cooling tower fan, and other pump or fan motors where variable flows are required, there shall be:~~

1. Variable speed drives; or
2. Other controls and devices that will result in fan and pump motor demand of no more than 30 percent of design wattage at 50 percent of design air volume for fans when static pressure set point equals 1/3 the total design static pressure, and 50 percent of design water flow for pumps, based on manufacturer's certified test data. Variable inlet vanes, throttling valves (dampers), scroll dampers or bypass circuits shall not be allowed.

EXCEPTION: Variable speed devices are not required for motors that serve:

1. Fans or pumps in packaged equipment where variable speed drives are not available as a factory option from the equipment manufacturer.
2. Fans or pumps that are required to operate only for emergency fire-life-safety events (e.g., stairwell pressurization fans, elevator pressurization fans, fire pumps, etc.).

~~C403.2.13.1 Heat rejection equipment. The requirements of this section apply to heat rejection equipment used in comfort cooling systems such as air-cooled condensers, open cooling towers, closed-circuit cooling towers, and evaporative condensers.~~

EXCEPTION: Heat rejection devices included as an integral part of equipment listed in Tables C403.2.3(1) through C403.2.3(3).

Heat rejection equipment shall have a minimum efficiency performance not less than values specified in Table C403.2.3(8). These requirements apply to all propeller, axial fan and centrifugal fan cooling towers. Table C403.2.3(8) specifies requirements for air-cooled condensers that are within rating conditions specified within the table.

~~C403.2.13.1.1 Variable flow controls. Cooling tower fans 7.5 hp and greater shall have control devices that vary flow by controlling the leaving fluid temperature or condenser temperature/pressure of the heat rejection device.~~

~~C403.2.13.1.2 Limitation on centrifugal fan cooling towers. Open cooling towers with a combined rated capacity of 1,100 gpm and greater at 95°F condenser water return, 85°F condenser water supply and 75°F outdoor wet bulb temperature shall meet the energy efficiency requirement for axial fan open circuit cooling towers.~~

EXCEPTION: Open circuit cooling towers that are ducted (inlet or discharge) or have external sound attenuation that requires external static pressure capability.))

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-403295 ((Section C403.2.14 Electric motor efficiency.)) Reserved.

~~((C403.2.14 Electric motor efficiency. Electric motors, including fractional hp motors, shall comply with the provisions of Section C405.8.))~~

AMENDATORY SECTION (Amending WSR 16-13-089, filed 6/15/16, effective 7/16/16)

WAC 51-11C-40330 Section C403.3—((Economizers)) Equipment selection.

C403.3 ((Economizers (Prescriptive)). Air economizers shall be provided on all new systems including those serving computer server rooms, electronic equipment, radio equipment, and telephone switchgear. Economizers shall comply with Sections C403.3.1 through C403.3.4.

- EXCEPTIONS:
1. Systems complying with Section C403.6 Dedicated-outdoor air systems (DOAS) with year-round cooling loads from lights and equipment of less than 5 watts per square foot.
 2. Unitary or packaged systems serving one zone with dehumidification that affect other systems so as to increase the overall building energy consumption. New humidification equipment shall comply with Section C403.2.3.4.
 3. Unitary or packaged systems serving one zone where the cooling efficiency meets or exceeds the efficiency requirements in Table C403.3.
 4. Water-cooled refrigeration equipment serving chilled beams and chilled ceiling space cooling systems only which are provided with a water economizer meeting the requirements of Section C403.3.4.
 5. Systems complying with all of the following criteria:
 - 5.1. Consist of multiple water source heat pumps connected to a common water loop;
 - 5.2. Have a minimum of 60 percent air economizer;
 - 5.3. Have water source heat pumps with an EER at least 15 percent higher for cooling and a COP at least 15 percent higher for heating than that specified in Section C403.2.3;
 - 5.4. Where provided, have a central boiler or furnace efficiency of 90 percent minimum for units up to 199,000 Btu/h; and
 - 5.5. Provide heat recovery with a minimum 50 percent heat recovery effectiveness as defined in Section C403.5 to preheat the outside air supply.
 6. For Group R occupancies, cooling units installed outdoors or in a mechanical room adjacent to outdoors with a total cooling capacity less than 20,000 Btu/h and other cooling units with a total cooling capacity less than 54,000 Btu/h provided that these are high-efficiency cooling equipment with IEER, SEER, and EER values more than 15 percent higher than minimum efficiencies listed in Tables C403.2.3 (1) through (3), in the appropriate size category, using the same test procedures. Equipment shall be listed in the appropriate certification program to qualify for this exception. For split systems, compliance is based on the cooling capacity of individual fan coil units.

7. Variable refrigerant flow (VRF) systems, multiple-zone split-system heat pumps, consisting of multiple, individually metered indoor units with multi-speed fan-motors, served on a single common refrigeration circuit with an exterior reverse-cycle heat pump with variable-speed compressor(s) and variable-speed condenser fan(s). These systems shall also be capable of providing simultaneous heating and cooling operation, where recovered energy from the indoor units operating in one mode can be transferred to one or more indoor units operating in the other mode, and shall serve at least 20-percent internal (no perimeter wall within 12') and 20-percent perimeter zones (as determined by conditioned floor area) and the outdoor unit shall be at least 65,000-Btu/h in total capacity. Systems utilizing this exception shall have 50-percent heat recovery effectiveness as defined by Section C403.5 on the outside air. For the purposes of this exception, dedicated server rooms, electronic equipment rooms or telecom switch rooms are not considered perimeter zones.

8. Equipment used to cool *Controlled Plant Growth Environments* provided these are high-efficiency cooling equipment with SEER, EER and IEER values a minimum of 20-percent greater than the values listed in Tables C403.2.3 (1), (3) and (7).

9. Equipment used to cool any spaces with year-round cooling loads from lights and equipment of greater than 5 watts per square foot, where it can be demonstrated through calculations, to the satisfaction of the *code official*, that the heat rejection load of the equipment will be recovered and used for on-site space heating or service-water heating demands such that the energy use of the building is decreased in comparison to a baseline of the same equipment provided with an air economizer complying with Section C403.3.

10. Equipment used to cool any dedicated server room, electronic equipment room or telecom switch room provided the system complies with Option a, b or c in the table below. The total capacity of all systems without economizers shall not exceed 240,000 Btu/h per building or 10-percent of its air economizer capacity, whichever is greater. This exception shall not be used for Total Building Performance.

	Equipment Type	Higher Equipment Efficiency	Part Load Control	Economizer
Option a	Tables C403.2.3(1) and C403.2.3(2) ^a	+15% ^b	Required over 85,000 Btu/h ^c	None Required
Option b	Tables C403.2.3(1) and C403.2.3(2) ^a	+5% ^d	Required over 85,000 Btu/h ^c	Waterside Economizer ^e
Option c	ASHRAE Standard 127 ^f	+0% ^g	Required over 85,000 Btu/h ^c	Waterside Economizer ^e

Notes for Exception 10:

- ^aFor a system where all of the cooling equipment is subject to the AHRI standards listed in Tables C403.2.3(1) and C403.2.3(2), the system shall comply with all of the following (note that if the system contains any cooling equipment that exceeds the capacity limits in Table C403.2.3(1) or C403.2.3(2), or if the system contains any cooling equipment that is not included in Table C403.2.3(1) or C403.2.3(2), then the system is not allowed to use this option):
- ^bThe cooling equipment shall have an EER value and an IPLV value that is a minimum of 15 percent greater than the value listed in Tables C403.2.3(1) and C403.2.3(2).
- ^cFor units with a total cooling capacity over 85,000 Btu/h, the system shall utilize part-load capacity control schemes that are able to modulate to a part-load capacity of 50 percent of the load or less that results in the compressor operating at the same or higher EER at part loads than at full load (e.g., minimum of two stages of compressor unloading such as cylinder unloading, two-stage scrolls, dual tandem scrolls, but hot gas bypass is not credited as a compressor unloading system).
- ^dThe cooling equipment shall have an EER value and an IPLV value that is a minimum of 5 percent greater than the value listed in Tables C403.2.3(1) and C403.2.3(2).
- ^eThe system shall include a water economizer in lieu of air economizer. Water economizers shall meet the requirements of C403.3.1 and C403.3.2 and be capable of providing the total concurrent cooling load served by the connected terminal equipment lacking airside economizer, at outside air temperatures of 50°F dry-bulb/45°F wet-bulb and below. For this calculation, all factors including solar and internal load shall be the same as those used for peak load calculations, except for the outside temperatures. The equipment shall be served by a dedicated condenser water system unless a nondedicated condenser water system exists that can provide appropriate water temperatures during hours when waterside economizer cooling is available.
- ^fFor a system where all cooling equipment is subject to ASHRAE Standard 127.
- ^gThe cooling equipment subject to the ASHRAE Standard 127 shall have an EER value and an IPLV value that is equal or greater than the value listed in Tables C403.2.3(1) and C403.2.3(2) when determined in accordance with the rating conditions ASHRAE Standard 127 (i.e., not the rating conditions in AHRI Standard 210/240 or 340/360). This information shall be provided by an independent third party.

**Table C403.3
Equipment Efficiency Performance
Exception for Economizers**

Climate Zones	Efficiency Improvement ^a
4C	64%
5B	59%

^a If a unit is rated with an IPLV, IEER or SEER then to eliminate the required air or water economizer, the minimum cooling efficiency of the HVAC unit must be increased by the percentage shown. If the HVAC unit is only rated with a full-load metric like EER or COP cooling, then these must be increased by the percentage shown.)

Equipment selection. Heating and cooling equipment installed in mechanical systems shall be sized in accordance with Section C403.3.1 and shall not be less efficient in the use of energy than as specified in Section C403.3.2.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40331 Section C403.3.1—(~~Integrated economizer control~~) Equipment and system sizing.

C403.3.1 (~~Integrated economizer control.~~ Economizer systems shall be integrated with the mechanical cooling system and be configured to provide partial cooling even where additional mechanical cooling is required to provide the remainder of the cooling load. Controls shall not be capable of creating a false load in the mechanical cooling system by limiting or disabling the economizer or any other means, such as hot gas bypass, except at the lowest stage of mechanical cooling:

Units that include an air economizer shall comply with the following:

1. Unit controls shall have the mechanical cooling capacity control interlocked with the air economizer controls such that the outdoor air damper is at the 100 percent open position when mechanical cooling is on and the outdoor air damper does not begin to close to prevent coil freezing due to minimum compressor run time until the leaving air temperature is less than 45°F (7°C).

2. Direct expansion (DX) units with cooling capacity 65,000 Btu/h (19 kW) or greater of rated capacity shall comply with the following:

2.1. DX units that control the capacity of the mechanical cooling directly based on occupied space temperature shall have not fewer than two stages of mechanical cooling capacity:

2.2. Other DX units, including those that control space temperature by modulating the airflow to the space, shall be in accordance with Table C403.3.1.

**Table C403.3.1
DX Cooling Stage Requirements for Modulating Airflow Units**

RATING CAPACITY	MINIMUM NUMBER OF MECHANICAL COOLING STAGES	MINIMUM COMPRESSOR DISPLACEMENT ^a
≥ 65,000 Btu/h and < 240,000 Btu/h	3 stages	≤ 35% of full load
≥ 240,000 Btu/h	4 stages	≤ 25% full load

For SI: ¹ British thermal unit per hour = 0.2931 W.

^aFor *mechanical cooling* stage control that does not use variable compressor displacement, the percent displacement shall be equivalent to the mechanical cooling capacity reduction evaluated at the full load rating conditions for the compressor.)

Equipment and system sizing. The output capacity of heating and cooling equipment shall be not greater than that of the smallest available equipment size that exceeds the loads calculated in accordance with Section C403.1.2. A single piece of equipment providing both heating and cooling shall satisfy this provision for one function with the capacity for the other function as small as possible, within available equipment options.

- EXCEPTIONS:
1. Required standby equipment and systems provided with controls and devices that allow such systems or equipment to operate automatically only when the primary equipment is not operating.
 2. Multiple units of the same equipment type with combined capacities exceeding the design load and provided with controls that are configured to sequence the operation of each unit based on load.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40332 Section C403.3.2—(~~Economizer heating system impact~~) HVAC equipment performance requirements.

C403.3.2 ((Economizer heating system impact. HVAC system design and economizer controls shall be such that economizer operation does not increase building heating energy use during normal operation.

EXCEPTION: Economizers on VAV systems that cause zone level heating to increase due to a reduction in supply air temperature.)

HVAC equipment performance requirements. Equipment shall meet the minimum efficiency requirements of Tables C403.3.2(1) through C403.3.2(12) when tested and rated in accordance with the applicable test procedure. Plate-type liquid-to-liquid heat exchangers shall meet the minimum requirements of Table C403.3.2(10). 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.

Gas-fired and oil-fired forced air furnaces with input ratings $\geq 225,000$ Btu/h (65 kW) and all unit heaters shall also have an intermittent ignition or interrupted device (IID), and have either mechanical draft (including power venting) or a flue damper. A vent damper is an acceptable alternative to a flue damper for furnaces where combustion air is drawn from the conditioned space. All furnaces with input ratings $\geq 225,000$ Btu/h (65 kW), including electric furnaces, that are not located within the conditioned space shall have jacket losses not exceeding 0.75 percent of the input rating.

C403.3.2.1 Chillers. Chilled water plants and buildings with more than 500 tons total capacity shall not have more than 100 tons provided by air-cooled chillers.

- EXCEPTIONS:
1. Where the designer demonstrates that the water quality at the building site fails to meet manufacturer's specifications for the use of water-cooled equipment.
 2. Air-cooled chillers with minimum efficiencies at least 10 percent higher than those listed in Table C403.3.2(7).
 3. Replacement of existing air-cooled chiller equipment.
 4. Air-to-water heat pump units that are configured to provide both heating and cooling and that are rated in accordance with AHRI 550/590. Where the air-to-water heat pumps are designed for a maximum supply leaving water temperature of less than 140°F, the efficiency rating will be calculated and reported at the maximum unit leaving water temperature for this test condition.

C403.3.2.2 Water-cooled centrifugal chilling package. Equipment not designed for operation at AHRI Standard 550/590 test conditions of 44°F (7°C) leaving chilled-water temperature and 2.4 gpm/ton evaporator fluid flow and 85°F (29°C) entering condenser water temperature with 3 gpm/ton (0.054 L/s • kW) condenser water flow shall have maximum full-load kW/ton (FL) and *part-load* ratings adjusted using Equations 4-7 and 4-8.

$$FL_{adj} \equiv FL/K_{adj}$$

(Equation 4-7)

$$PLV_{adj} \equiv IPLV/K_{adj}$$

(Equation 4-8)

Where:

$$K_{adj} \equiv A \times B$$

$$FL \equiv \text{Full-load kW/ton values as specified in Table C403.3.2(7)}$$

$$FL_{adj} \equiv \text{Maximum full-load kW/ton rating, adjusted for nonstandard conditions}$$

$$IPLV \equiv \text{Value as specified in Table C403.3.2(7)}$$

$$PLV_{adj} \equiv \text{Maximum NPLV rating, adjusted for nonstandard conditions}$$

$$A \equiv \frac{0.00000014592 \times (\text{LIFT})^4 - 0.0000346496 \times (\text{LIFT})^3 + 0.00314196 \times (\text{LIFT})^2 - 0.147199 \times \text{LIFT} + 3.9302}{}$$

$$B \equiv \frac{0.0015 \times L_{vg}^{Evap} (\text{°F}) + 0.934}{}$$

$$\text{LIFT} \equiv L_{vg}^{Cond} - L_{vg}^{Evap}$$

$$L_{vg}^{Cond} \equiv \text{Full-load condenser leaving fluid temperature (°F)}$$

$$L_{vg}^{Evap} \equiv \text{Full-load evaporator leaving temperature (°F)}$$

The FL_{adj} and PLV_{adj} values are only applicable for centrifugal chillers meeting all of the following full-load design ranges:

1. Minimum evaporator leaving temperature: 36°F.
2. Maximum condenser leaving temperature: 115°F.
3. LIFT is not less than 20°F (11.1°C) and not greater than 80°F (44.4°C).

C403.3.2.3 Positive displacement (air- and water-cooled) chilling packages. Equipment with a leaving fluid temperature higher than 32°F (0°C) and water-cooled positive displacement chilling packages with a condenser leaving fluid temperature below 115°F (46°C) shall meet the requirements of Table C403.3.2(7) when tested or certified with water at standard rating conditions, in accordance with the referenced test procedure.

C403.3.2.4 Packaged electric heating and cooling equipment. Packaged electric equipment providing both heating and cooling with a total cooling capacity greater than 6,000 Btu/h shall be a heat pump.

EXCEPTION: Unstaffed equipment shelters or cabinets used solely for personal wireless service facilities.

C403.3.2.5 Humidification. If an air economizer is required on a cooling system for which humidification equipment is to be provided to maintain minimum indoor humidity levels, then the humidifier shall be of the adiabatic type (direct evaporative media or fog atomization type).

- EXCEPTIONS:
1. Health care facilities licensed by the state where chapter 246-320 or 246-330 WAC requires steam injection humidifiers in duct work downstream of final filters.
 2. Systems with water economizer.
 3. 100 percent outside air systems with no provisions for air recirculation to the central supply fan.
 4. Nonadiabatic humidifiers cumulatively serving no more than 10 percent of a building's air economizer capacity as measured in cfm. This refers to the system cfm serving rooms with stand alone or duct mounted humidifiers.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40333 Section C403.3.3—(~~Air economizers~~) Hot gas bypass.

C403.3.3 (~~Air economizers.~~ Air economizers shall comply with Sections C403.3.3.1 through C403.3.3.5.

C403.3.3.1 Design capacity. Air economizer systems shall be configured to modulate *outdoor air* and return air dampers to provide up to 100 percent of the design supply air quantity as *outdoor air* for cooling.

C403.3.3.2 Control signal. Economizer controls and dampers shall be configured to sequence the dampers with the mechanical cooling equipment and shall not be controlled by only mixed air temperature. Air economizers on systems with cooling capacity greater than 65,000 Btu/h shall be configured to provide partial cooling even when additional mechanical cooling is required to meet the remainder of the cooling load.

EXCEPTION: The use of mixed air temperature limit control shall be permitted for systems that are both controlled from space temperature (such as single zone systems) and having cooling capacity less than 65,000 Btu/h.

C403.3.3.3 High limit shutoff. Air economizers shall be configured to automatically reduce *outdoor air* intake to the design minimum *outdoor air* quantity when *outdoor air* intake will no longer reduce cooling energy usage. High limit shutoff control types for specific climates shall be chosen from Table C403.3.3.3. High limit shutoff control settings for these control types shall be those specified in Table C403.3.3.3.

**Table C403.3.3.3
High limit Shutoff Control Setting for Air Economizers^b**

Device Type	Climate Zone	Required High Limit (economizer off when):	
		Equation	Description
Fixed dry-bulb	4C, 5B	$T_{OA} > 75^{\circ}\text{F}$	Outdoor air temperature exceeds 75°F
Differential dry-bulb	4C, 5B	$T_{OA} > T_{RA}$	Outdoor air temperature exceeds return air temperature
Fixed enthalpy with fixed dry-bulb temperatures	All	$h_{OA} > 28 \text{ Btu/lb}^a$ or $T_{OA} > 75^{\circ}\text{F}$	Outdoor air enthalpy exceeds 28 Btu/lb of dry air ^a or outdoor air temperature exceeds 75°F
Differential enthalpy with fixed dry-bulb temperature	All	$h_{OA} > h_{RA}$ or $T_{OA} > 75^{\circ}\text{F}$	Outdoor air enthalpy exceeds return air enthalpy or outdoor air temperature exceeds 75°F

For SI: $^{\circ}\text{C} = (^{\circ}\text{F} - 32) \times 5/9$, 1 Btu/lb = 2.33 kJ/kg.

^aAt altitudes substantially different than sea level, the fixed enthalpy limit shall be set to the enthalpy value at 75°F and 50 percent relative humidity. As an example, at approximately 6,000 feet elevation the fixed enthalpy limit is approximately 30.7 Btu/lb.

^bDevices with selectable setpoints shall be capable of being set to within 2°F and 2 Btu/lb of the setpoint listed.

~~C403.3.3.4 Relief of excess outdoor air.~~ Systems shall be capable of relieving excess *outdoor air* during air economizer operation to prevent over-pressurizing the building. The relief air outlet shall be located to avoid recirculation into the building.

~~C403.3.3.5 Economizer dampers.~~ Return, exhaust/relief and outdoor air dampers used in economizers shall comply with Section C403.2.4.3.)) Hot gas bypass limitation. Cooling systems shall not use hot gas bypass or other evaporator pressure control systems unless the system is designed with multiple steps of unloading or continuous capacity modulation. The capacity of the hot gas bypass shall be limited as indicated in Table C403.3.3, as limited by Section C403.5.1.

Table C403.3.3

Maximum Hot Gas Bypass Capacity

<u>Rated Capacity</u>	<u>Maximum Hot Gas Bypass Capacity (% of total capacity)</u>
< 240,000 Btu/h	50
≥ 240,000 Btu/h	25

For SI: 1 British thermal unit per hour = 0.2931 W.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

~~WAC 51-11C-40334 Section C403.3.4—((Water side economizers))~~ Boiler turndown.

~~C403.3.4 ((Water side economizers.~~ Water side economizers shall comply with Sections C403.3.4.1 and C403.3.4.2.

~~C403.3.4.1 Design capacity.~~ Water economizer systems shall be capable of cooling supply air by indirect evaporation and providing up to 100 percent of the expected system cooling load at *outdoor air* temperatures of 50°F dry bulb (10°C dry bulb)/45°F wet bulb (7.2°C wet bulb) and below.

EXCEPTION: Systems where dehumidification requirements cannot be met using outdoor air temperatures of 50°F dry bulb (10°C dry bulb)/45°F wet bulb (7.2°C wet bulb) and where 100 percent of the expected system cooling load at 45°F dry bulb (7.2°C dry bulb)/40°F wet bulb (4.5°C wet bulb) is met with evaporative water economizers.

~~C403.3.4.2 Maximum pressure drop.~~ Precooling coils and water-to-water heat exchangers used as part of a water econ-

omizer system shall either have a waterside pressure drop of less than 15 feet (4572 mm) of water or a secondary loop shall be created so that the coil or heat exchanger pressure drop is not seen by the circulating pumps when the system is in the normal cooling (noneconomizer) mode.)) Boiler turndown. Boiler systems with design input of greater than 1,000,000 Btu/h (293 kW) shall comply with the turndown ratio specified in Table C403.3.4.

The system turndown requirement shall be met through the use of multiple single input boilers, one or more *modulating boilers* or a combination of single input and modulating boilers.

Table C403.3.4
Boiler Turndown

<u>Boiler System Design Input (Btu/h)</u>	<u>Minimum Turndown Ratio</u>
≥ 1,000,000 and less than or equal to 5,000,000	3 to 1
≥ 5,000,000 and less than or equal to 10,000,000	4 to 1
≥ 10,000,000	5 to 1

NEW SECTION

WAC 51-11C-40335 Section C403.3.5—Dedicated outdoor air systems.

C403.3.5 Dedicated outdoor air systems (DOAS). For buildings with occupancies as shown in Table C403.3.5, outdoor air shall be provided to each occupied space by a dedicated outdoor air system (DOAS) which delivers 100 percent outdoor air without requiring operation of the heating and cooling system fans for ventilation air delivery.

- EXCEPTIONS:
1. Occupied spaces that are not ventilated by a mechanical ventilation system and are only ventilated by a natural ventilation system per Section 402 of the *International Mechanical Code*.
 2. High efficiency variable air volume (VAV) systems complying with Section C403.6.10 for occupancy classifications other than Groups A-1, A-2 and A-3 as specified in Table C403.3.5, and high efficiency VAV systems comply with Section C403.12 for occupancy classification Groups A-1, A-2 and A-3 as specified in Table C403.3.5. This exception shall not be used as a substitution for a DOAS per Section C406.6.

Table C403.3.5

Occupancy Classifications Requiring DOAS

<u>Occupancy Classification^a</u>	<u>Inclusions</u>	<u>Exempted</u>
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

Occupancy Classification ^a	Inclusions	Exempted
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
E, M	All occupancies included	

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

C403.3.5.1 Energy recovery ventilation with DOAS. The DOAS shall include *energy recovery ventilation*. The energy recovery system shall have a 60 percent minimum sensible recovery effectiveness or have 50 percent enthalpy recovery effectiveness in accordance with Section C403.7.6.1. For DOAS having a total fan system motor nameplate hp less than 5 hp, total combined fan power shall not exceed 1 W/cfm of outdoor air. For DOAS having a total fan system motor hp greater than or equal to 5 hp, refer to fan power limitations of Section C403.8.1. This fan power restriction applies to each dedicated outdoor air unit in the permitted project, but does not include the fan power associated with the zonal heating/cooling equipment. The airflow rate thresholds for energy recovery requirements in Tables C403.7.6.1(1) and C403.7.6.1(2) do not apply.

EXCEPTIONS:

1. Occupied spaces with all of the following characteristics: Complying with Section C403.7.6.1, served by equipment less than 5000 cfm, with an average occupant load greater than 25 people per 1000 square feet (93 m²) of floor area (as established in Table 403.3.1.1 of the *International Mechanical Code*) that include demand control ventilation configured to reduce outdoor air by at least 50 percent below design minimum ventilation rates when the actual occupancy of the space served by the system is less than the design occupancy.
2. Systems installed for the sole purpose of providing makeup air for systems exhausting toxic, flammable, paint, or corrosive fumes or dust, dryer exhaust, or commercial kitchen hoods used for collecting and removing grease vapors and smoke.

C403.3.5.2 Heating/cooling system fan controls. Heating and cooling equipment fans, heating and cooling circulation pumps, and terminal unit fans shall cycle off and terminal unit primary cooling air shall be shut off when there is no call for heating or cooling in the zone.

EXCEPTION: Fans used for heating and cooling using less than 0.12 watts per cfm may operate when space temperatures are within the setpoint deadband (Section C403.4.1.2) to provide destratification and air mixing in the space.

C403.3.5.3 Decoupled DOAS supply air. The DOAS supply air shall be delivered directly to the occupied space or downstream of the terminal heating and/or cooling coils.

EXCEPTIONS:

1. Active chilled beam systems.
2. Sensible only cooling terminal units with pressure independent variable airflow regulating devices limiting the DOAS supply air to the greater of latent load or minimum ventilation requirements.
3. Terminal heating and/or cooling units that comply with the low fan power allowance requirements in the exception of Section C403.3.5.2.

C403.3.5.4 Impracticality. Where the code official determines that full compliance with all the requirements of Sections C403.3.5.1 and C403.3.5.2 would be impractical, it is permissible to provide an approved alternate means of compliance that achieves a comparable level of energy efficiency. For the purposes of this section, impractical means that an HVAC system complying with Section C403.3.5 cannot effectively be utilized due to an unusual use or configuration of the building.

NEW SECTION

WAC 51-11C-40336 Section C403.3.6—Ventilation for Group R-2 occupancy.

C403.3.6 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 percent sensible recovery effectiveness shall provide outdoor air directly to all habitable space. 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.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40340 Section C403.4—(~~Hydronic and multiple zone~~) HVAC system(~~s~~) controls.

C403.4 (~~Hydronic and multiple zone~~) HVAC system controls (~~and equipment prescriptive~~). ~~Hydronic and multiple zone HVAC system controls and equipment shall comply with this section.~~

~~For buildings with a total equipment cooling capacity of 300 tons and above, the equipment shall comply with one of the following:~~

1. ~~No one unit shall have a cooling capacity of more than 2/3 of the total installed cooling equipment capacity;~~
2. ~~The equipment shall have a variable speed drive; or~~

3. ~~The equipment shall have multiple compressors),~~ HVAC systems shall be provided with controls in accordance with Sections C403.4.1 through C403.4.11 and shall be capable of and configured to implement all required control functions in this code.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40341 ((Reserved)) Section C403.4.1—Thermostatic controls.

C403.4.1 Thermostatic controls. The supply of heating and cooling energy to each *zone* shall be controlled by individual thermostatic controls capable of responding to temperature within the *zone*. Controls in the same zone or in neighboring zones connected by openings larger than 10 percent of the floor area of either zone shall not allow for simultaneous heating and cooling. At a minimum, each floor of a building shall be considered as a separate zone. Controls on systems required to have economizers and serving single zones shall have multiple cooling stage capability and activate the economizer when appropriate as the first stage of cooling. See Section C403.5 for further economizer requirements. Where humidification or dehumidification or both is provided, at least one humidity control device shall be provided for each humidity control system.

- EXCEPTIONS:**
1. Independent perimeter systems that are designed to offset only building envelope heat losses or gains or both serving one or more perimeter *zones* also served by an interior system provided:
 - 1.1. The perimeter system includes at least one thermostatic control *zone* for each building exposure having exterior walls facing only one orientation (within +/-45 degrees) (0.8 rad) for more than 50 contiguous feet (15,240 mm);
 - 1.2. The perimeter system heating and cooling supply is controlled by a thermostat located within the *zones* served by the system; and
 - 1.3. Controls are configured to prevent the perimeter system from operating in a different heating or cooling mode from the other equipment within the *zones* or from neighboring zones connected by openings larger than 10 percent of the floor area of either zone.
 2. Any interior zone open to a perimeter zone shall have setpoints and deadbands coordinated so that cooling in the interior zone shall not operate while the perimeter zone is in heating until the interior zone temperature is 5°F (2.8°C) higher than the perimeter zone temperature, unless the interior and perimeter zones are separated by a partition whose permanent openings are smaller than 10 percent of the perimeter zone floor area.
 3. Dedicated outdoor air units that provide ventilation air, make-up air or replacement air for exhaust systems are permitted to be controlled based on supply air temperature. The supply air temperature shall be controlled to a maximum of 65°F (18.3°C) in heating and a minimum of 72°F (22°C) in cooling unless the supply air temperature is being reset based on the status of cooling or heating in the zones served or it being reset based on outdoor air temperature.

C403.4.1.1 Heat pump supplementary heat. Unitary air cooled heat pumps shall include microprocessor controls that

minimize supplemental heat usage during start-up, set-up, and defrost conditions. These controls shall anticipate need for heat and use compression heating as the first stage of heat. Controls shall indicate when supplemental heating is being used through visual means (e.g., LED indicators). Heat pumps equipped with supplementary heaters shall be installed with controls that prevent supplemental heater operation above 40°F (4.4°C).

EXCEPTION: Packaged terminal heat pumps (PTHPs) of less than 2 tons (24,000 Btu/hr) cooling capacity provided with controls that prevent supplementary heater operation above 40°F (4.4°C).

C403.4.1.2 Deadband. Where used to control both heating and cooling, zone thermostatic controls shall be configured to provide a temperature range or deadband of at least 5°F (2.8°C) within which the supply of heating and cooling energy to the zone is shut off or reduced to a minimum.

- EXCEPTIONS:**
1. Thermostats requiring manual changeover between heating and cooling modes.
 2. Occupancies or applications requiring precision in indoor temperature control as approved by the code official.

C403.4.1.3 Setpoint overlap restriction. Where a *zone* has a separate heating and a separate cooling thermostatic control located within the zone, a limit switch, mechanical stop or direct digital control system with software programming shall be configured to prevent the heating setpoint from exceeding the cooling setpoint and to maintain a deadband in accordance with Section C403.4.1.2.

C403.4.1.4 Heated or cooled vestibules. The heating system for heated vestibules and air curtains with integral heating shall be provided with controls configured to shut off the source of heating when the outdoor air temperature is greater than 45°F (7°C). Vestibule heating and cooling systems shall be controlled by a thermostat located in the vestibule configured to limit heating to a temperature not greater than 60°F (16°C) and cooling to a temperature not less than 85°F (29°C).

- EXCEPTIONS:**
1. Control of heating or cooling provided by transfer air that would otherwise be exhausted.
 2. Vestibule heating only systems are permitted to be controlled without an outdoor air temperature lockout when controlled by a thermostat located in the vestibule configured to limit heating to a temperature not greater than 45°F (7°C) where required for freeze protection of piping and sprinkler heads located in the vestibule.

C403.4.1.5 Hot water boiler outdoor temperature setback control. Hot water boilers that supply heat to the building through one- or two-pipe heating systems shall have an outdoor setback control that lowers the boiler water temperature based on the outdoor temperature.

C403.4.1.6 Door switches for HVAC system thermostatic control. Doors that open to the outdoors from a conditioned space must have controls configured to do the following once doors have been open for 5 minutes:

1. Disable the mechanical heating to the zone or reset the space heating temperature setpoint to 55°F or less within 5 minutes of the door open enable signal.

2. Disable the mechanical cooling to the zone or reset the space cooling temperature setpoint to 85°F or more within 5 minutes of the door open enable signal.

EXCEPTIONS: 1. Building entrances with vestibules.
2. Alterations to existing buildings.
3. Loading docks.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40342 Section ((~~C403.4.1~~ Fan))
C403.4.2—Off-hour controls.

~~((C403.4.1 Multiple zone system fan control. Controls shall be provided for fans in accordance with Sections C403.4.1.1 through C403.4.1.2.~~

~~**C403.4.1.1 Static pressure sensor location.** Static pressure sensors used to control VAV fans shall be located such that the controller setpoint is no greater than 1.2 inches w.e. (2099 Pa). Where this results in one or more sensors being located downstream of major duct splits, not less than one sensor shall be located on each major branch to ensure that static pressure can be maintained in each branch.~~

EXCEPTION: Systems complying with Section C403.4.1.2.

~~**C403.4.1.2 Set points for direct digital control.** For systems with direct digital control of individual zones reporting to the central control panel, the static pressure setpoint shall be reset based on the zone requiring the most pressure. In such cases, the set point is reset lower until one zone damper is nearly wide open. The direct digital controls shall be capable of monitoring zone damper positions or shall have an alternative method of indicating the need for static pressure that is configured to provide all of the following:~~

- ~~1. Automatically detecting any zone that excessively drives the reset logic.~~
- ~~2. Generating an alarm to the system operational location.~~
- ~~3. Allowing an operator to readily remove one or more zones from the reset algorithm.)~~

~~**C403.4.2 Off-hour controls.** For all occupancies other than Group R, each zone shall be provided with thermostatic setback controls that are controlled by either an automatic time clock or programmable control system.~~

EXCEPTIONS: 1. Zones that will be operated continuously.
2. Zones with a full HVAC load demand not exceeding 6,800 Btu/h (2 kW) and having a manual shutoff switch located with ready access.

C403.4.2.1 Thermostatic setback. Thermostatic setback controls shall be configured to set back or temporarily operate the system to maintain zone temperatures down to 55°F (13°C) or up to 85°F (29°C).

C403.4.2.2 Automatic setback and shutdown. Automatic time clock or programmable controls shall be capable of starting and stopping the system for seven different daily schedules per week and retaining their programming and time setting during a loss of power for at least 10 hours. Additionally, the controls shall have a manual override that allows temporary operation of the system for up to 2 hours; a manu-

ally operated timer configured to operate the system for up to 2 hours; or an occupancy sensor.

C403.4.2.3 Automatic start and stop. Automatic start and stop controls shall be provided for each HVAC system. The automatic start controls shall be configured to automatically adjust the daily start time of the HVAC system in order to bring each space to the desired occupied temperature immediately prior to scheduled occupancy. The automatic stop controls shall be configured to reduce the HVAC system's heating temperature setpoint and increase the cooling temperature setpoint by at least 2°F (1.1°C) before scheduled unoccupied periods based upon the thermal lag and acceptable drift in space temperature that is within comfort limits. At a minimum, the controls shall be a function of the space temperature, occupied and unoccupied temperatures, and the amount of time prior to scheduled occupancy.

C403.4.2.4 Exhaust system off-hour controls. For all occupancies other than Group R, exhaust systems serving spaces within the conditioned envelope shall be controlled by either an automatic time clock, thermostatic controls or programmable control system to operate on the same schedule as the HVAC systems providing their make-up air.

EXCEPTIONS: 1. Exhaust systems requiring continuous operation.
2. Exhaust systems that are controlled by occupancy sensor control configured with automatic on and automatic shutoff within 15 minutes after occupants have left the space.

C403.4.2.5 Transfer and destratification fan system off-hour controls. For all occupancies other than Group R, transfer fan or mixing fan systems serving spaces within the conditioned envelope shall be controlled by either an automatic time clock, thermostatic controls or programmable control system to operate on the same schedule as the associated HVAC systems.

EXCEPTION: Transfer fan and destratification fan systems that are controlled by occupancy sensor control configured with manual on and automatic shutoff within 15 minutes after occupants have left the space.

AMENDATORY SECTION (Amending WSR 16-13-089, filed 6/15/16, effective 7/16/16)

WAC 51-11C-40343 Section ((~~C403.4.2~~)) C403.4.3—Hydronic systems controls.

~~((C403.4.2))~~ **C403.4.3 Hydronic systems controls.** The heating of fluids that have been previously mechanically cooled and the cooling of fluids that have been previously mechanically heated shall be limited in accordance with Sections ((~~C403.4.2.1~~)) C403.4.3.1 through ((~~C403.4.2.3~~)) C403.4.3.3. Hydronic heating systems comprised of multiple-packaged boilers and designed to deliver conditioned water or steam into a common distribution system shall include automatic controls configured to sequence operation of the boilers. Hydronic heating systems comprised of a single boiler and greater than 500,000 Btu/h (146,550 W) input design capacity shall include either a multi-staged or modulating burner.

~~((C403.4.2.1))~~ **C403.4.3.1 Three-pipe system.** Hydronic systems that use a common return system for both hot water and chilled water are prohibited.

~~((C403.4.2.2))~~ **C403.4.3.2 Two-pipe changeover system.** Systems that use a common distribution system to supply both heated and chilled water shall be designed to allow a dead band between changeover from one mode to the other of at least 15°F (8.3°C) outside air temperatures; be designed to and provided with controls that will allow operation in one mode for at least 4 hours before changing over to the other mode; and be provided with controls that allow heating and cooling supply temperatures at the changeover point to be no more than 30°F (16.7°C) apart.

~~((C403.4.2.3))~~ **C403.4.3.3 Hydronic (water loop) heat pump systems.** Hydronic heat pump systems shall comply with Sections ~~((C403.4.2.3.1))~~ **C403.4.3.3.1** through ~~((C403.4.2.3.3))~~ **C403.4.3.3.3.**

~~((C403.4.2.3.1))~~ **C403.4.3.3.1 Temperature dead band.** Hydronic heat pumps connected to a common heat pump water loop with central devices for heat rejection and heat addition shall have controls that are configured to provide a heat pump water supply temperature dead band of at least 20°F (11.1°C) between initiation of heat rejection and heat addition by the central devices.

EXCEPTION: Where a system loop temperature optimization controller is installed and can determine the most efficient operating temperature based on real time conditions of demand and capacity, dead bands of less than 20°F (11°C) shall be permitted.

~~((C403.4.2.3.2))~~ **C403.4.3.3.2 Heat rejection.** ~~((Heat rejection equipment shall comply with Sections C403.4.2.3.2.1 and C403.4.2.3.2.2.))~~ The following shall apply to hydronic water loop heat pump systems:

1. Where a closed-circuit cooling tower is used directly in the heat pump loop, an automatic valve shall be installed to bypass the flow of water around the closed-circuit cooling tower, except for the minimum flow necessary for freeze protection. Flow controls for freeze protection shall not allow water through the closed-circuit cooling tower when outdoor temperatures are above the freezing point of the glycol/water solution, i.e., 32°F (0°C) for 100 percent water applications and 18°F (-7.8°C) for 20 percent by mass propylene glycol solution.

2. Where an open-circuit cooling tower is used directly in the heat pump loop, an automatic valve shall be installed to bypass all heat pump water flow around the open-circuit cooling tower.

3. Where an open-circuit cooling tower is used in conjunction with a separate heat exchanger to isolate the open-circuit cooling tower from the heat pump loop, heat loss shall be controlled by shutting down the circulation pump on the cooling tower loop.

EXCEPTION: Where it can be demonstrated that a heat pump system will be required to reject heat throughout the year.

~~((C403.4.2.3.2.1 Climate Zone 4.~~ For Climate Zone 4:

~~1. If a closed-circuit cooling tower is used directly in the heat pump loop, either an automatic valve shall be installed to~~

~~bypass all but a minimal flow of water around the tower, or lower leakage positive closure dampers shall be provided.~~

~~2. If an open-circuit tower is used directly in the heat pump loop, an automatic valve shall be installed to bypass all heat pump water flow around the tower.~~

~~3. If an open or closed-circuit cooling tower is used in conjunction with a separate heat exchanger to isolate the cooling tower from the heat pump loop, then heat loss shall be controlled by shutting down the circulation pump on the cooling tower loop.~~

~~C403.4.2.3.2.2 Climate Zone 5.~~ For Climate Zone 5, if an open or closed-circuit cooling tower is used, then a separate heat exchanger shall be provided to isolate the cooling tower from the heat pump loop, and heat loss shall be controlled by shutting down the circulation pump on the cooling tower loop and providing an automatic valve to stop the flow of fluid.

~~C403.4.2.3.3))~~ **C403.4.3.3.3 Isolation valve.** Each hydronic heat pump on the hydronic system having a total pump system power exceeding 10 horsepower (hp) (7.5 kW) shall have a two-way (but not three-way) valve. For the purposes of this section, pump system power is the sum of the nominal power demand (i.e., nameplate horsepower at nominal motor efficiency) of motors of all pumps that are required to operate at design conditions to supply fluid from the heating or cooling source to all heat transfer devices (e.g., coils, heat exchanger) and return it to the source. This converts the system into a variable flow system and, as such, the primary circulation pumps shall comply with the variable flow requirements in Section ~~((C403.4.2.6.~~

~~C403.4.2.4 Part load controls.~~ Hydronic systems greater than or equal to 300,000 Btu/h (88 kW) in design output capacity supplying heated or chilled water to comfort conditioning systems shall include controls that are configured to:

~~1. Automatically reset the supply water temperatures in response to varying building heating and cooling demand using coil valve position, zone return water temperature or outdoor air temperature. The temperature shall be reset by not less than 25 percent of the design supply to return water temperature difference.~~

EXCEPTION: Hydronic systems serving hydronic heat pumps.

~~2. Automatically vary fluid flow for hydronic systems with a combined motor capacity of 3 hp or larger with three or more control valves or other devices by reducing the system design flow rate by not less than 50 percent by designed valves that modulate or step open and close, or pumps that modulate or turn on and off as a function of load.~~

~~3. Automatically vary pump flow on chilled water systems and heat rejection loops serving water-cooled unitary air conditioners with a combined motor capacity of 3 hp or larger by reducing pump design flow by not less than 50 percent utilizing adjustable speed drives on pumps, or multiple staged pumps where not less than one-half of the total pump horsepower is capable of being automatically turned off. Pump flow shall be controlled to maintain one control valve nearly wide open or to satisfy the minimum differential pressure.~~

EXCEPTIONS: 1. Supply water temperature reset for chilled water systems supplied by off-site district chilled water or chilled water from ice storage systems.

2. Minimum flow rates other than 50 percent as required by the equipment manufacturer for proper operation of equipment where using flow bypass or end-of-line 3-way valves.

3. Variable pump flow on dedicated equipment circulation pumps where configured in primary/secondary design to provide the minimum flow requirements of the equipment manufacturer for proper operation of equipment.

C403.4.2.5 Boiler turndown. *Boiler systems* with design input of greater than 1,000,000 Btu/h (293 kW) shall comply with the turndown ratio specified in Table C403.4.2.5.

The system turndown requirement shall be met through the use of multiple single input boilers, one or more *modulating boilers* or a combination of single input and modulating boilers.

**Table C403.4.2.5
Boiler Turndown**

Boiler System Design Input (Btu/h)	Minimum Turndown Ratio
≥ 1,000,000 and less than or equal to 5,000,000	3 to 1
> 5,000,000 and less than or equal to 10,000,000	4 to 1
> 10,000,000	5 to 1

C403.4.2.6 Pump isolation. Chilled water plants including more than one chiller shall be capable of and configured to reduce flow automatically through the chiller plant when a chiller is shut down and automatically shut off flow to chillers that are shut down. Chillers piped in series for the purpose of increased temperature differential shall be considered as one chiller.

EXCEPTION: Chillers that are piped in series for the purpose of increased temperature differential.

Boiler plants including more than one boiler shall be capable of and configured to reduce flow automatically through the boiler plant when a boiler is shut down.

C403.4.2.7 Variable flow controls. Individual pumps required by this code to have variable speed control shall be controlled in one of the following manners:

1. For systems having a combined pump motor horsepower less than or equal to 20 hp (15 kW) and without direct digital control of individual coils, pump speed shall be a function of either:

- 1.1. Required differential pressure; or
- 1.2. Reset directly based on zone hydronic demand, or other zone load indicators; or
- 1.3. Reset directly based on pump power and pump differential pressure.

2. For systems having a combined pump motor horsepower that exceeds 20 hp (15 kW) or smaller systems with direct digital control, pump speed shall be a function of either:

- 2.1. The static pressure set point as reset based on the valve requiring the most pressure; or

2.2. ~~Directly controlled based on zone hydronic demand~~) C403.4.6.

AMENDATORY SECTION (Amending WSR 17-10-062, filed 5/2/17, effective 6/2/17)

WAC 51-11C-40344 Section ((C403.4.3—Heat rejection equipment)) C403.4.4—Part load controls.

~~((C403.4.3 Heat rejection equipment.~~ Heat rejection equipment such as air-cooled condensers, dry coolers, open-circuit cooling towers, closed-circuit cooling towers and evaporative condensers used for comfort cooling applications shall comply with this section.

EXCEPTION: Heat rejection devices where energy usage is included in the equipment efficiency ratings listed in Tables C403.2.3(1)A, C403.2.3(1)B, C403.2.3(1)C, C403.2.3(2), C403.2.3(3), C403.2.3(7) and C403.2.3(9).

C403.4.3.1 Fan speed control. The fan speed shall be controlled as provided in Sections C403.4.3.1.1 and C403.4.3.1.2.

C403.4.3.1.1 Fan motors not less than 7.5 hp. Each fan powered by a motor of 7.5 hp (5.6 kW) or larger shall have controls that automatically change the fan speed to control the leaving fluid temperature or condensing temperature/pressure of the heat rejection device.

C403.4.3.1.2 Multiple cell heat rejection equipment. Multiple cell heat rejection equipment with variable speed fan drives shall be controlled in both of the following manners:

1. To operate the maximum number of fans allowed that comply with the manufacturer's requirements for all system components;

2. So all fans can operate at the same fan speed required for the instantaneous cooling duty, as opposed to staged (on/off) operation. Minimum fan speed shall be the minimum allowable speed of the fan drive system in accordance with the manufacturer's recommendations.

C403.4.3.2 Limitation on centrifugal fan open circuit cooling towers. Centrifugal fan open-circuit cooling towers with a combined rated capacity of 1,100 gpm (4164 L/m) or greater at 95°F (35°C) condenser water return, 85°F (29°C) condenser water supply, and 75°F (24°C) outdoor air wet-bulb temperature shall meet the energy efficiency requirement for axial fan open-circuit cooling towers listed in Table C403.2.3(8).

EXCEPTION: Centrifugal open-circuit cooling towers that are designed with inlet or discharge ducts or require external sound attenuation.

C403.4.3.3 Tower flow turndown. Open-circuit cooling towers used on water-cooled chiller systems that are configured with multiple or variable speed condenser water pumps shall be designed so that all open-circuit cooling tower cells can be run in parallel with the larger of the flow that is produced by the smallest pump at its minimum expected flow rate or at 50 percent of the design flow for the cell.)

C403.4.4 Part load controls. Hydronic systems greater than or equal to 300,000 Btu/h (88 kW) in design output capacity

supplying heated or chilled water to comfort conditioning systems shall include controls that are configured to:

1. Automatically reset the supply-water temperatures in response to varying building heating and cooling demand using coil valve position, zone-return water temperature or outdoor air temperature. The temperature shall be reset by not less than 25 percent of the design supply-to-return water temperature difference.

EXCEPTION: Hydronic systems serving hydronic heat pumps.

2. Automatically vary fluid flow for hydronic systems with a combined pump motor capacity of 2 hp or larger with three or more control valves or other devices by reducing the system design flow rate by not less than 50 percent or the maximum reduction allowed by the equipment manufacturer for proper operation of equipment by valves that modulate or step open and close, or pumps that modulate or turn on and off as a function of load.

3. Automatically vary pump flow on heating water systems, chilled-water systems and heat rejection loops serving water-cooled unitary air conditioners as follows:

3.1 Where pumps operate continuously or operate based on a time schedule, pumps with nominal output motor power of 2 hp or more shall have a variable speed drive.

3.2 Where pumps have automatic direct digital control configured to operate pumps only when zone heating or cooling is required, a variable speed drive shall be provided for pumps with motors having the same or greater nominal output power indicated in Table C403.4.4 based on the climate zone and system served.

4. Where variable speed drive is required by Item 3 of this section, pump motor power input shall be not more than 30 percent of design wattage at 50 percent of the design water flow. Pump flow shall be controlled to maintain one control valve nearly wide open or to satisfy the minimum differential pressure.

- EXCEPTIONS:
1. Supply-water temperature reset is not required for chilled-water systems supplied by off-site district chilled water or chilled water from ice storage systems.
 2. Variable pump flow is not required on dedicated coil circulation pumps where needed for freeze protection.
 3. Variable pump flow is not required on dedicated equipment circulation pumps where configured in primary/secondary design to provide the minimum flow requirements of the equipment manufacturer for proper operation of equipment.
 4. Variable speed drives are not required on heating water pumps where more than 50 percent of annual heat is generated by an electric boiler.

Table C403.4.4

Variable Speed Drive (VSD) Requirements for Demand-Controlled Pumps

<u>Climate Zones 4c, 5b</u>	<u>VSD Required for Motors with Rated Output of at Least</u>
<u>Heating water pumps</u>	≥ 7.5 hp
<u>Chilled water and heat rejection loop pumps</u>	≥ 7.5 hp

AMENDATORY SECTION (Amending WSR 16-13-089, filed 6/15/16, effective 7/16/16)

WAC 51-11C-40345 Section ((C403.4.4—Requirements for mechanical systems serving multiple zones)) C403.4.5—Pump isolation.

((C403.4.4 Requirements for mechanical systems serving multiple zones. Sections C403.4.4.1 through C403.4.4.4 shall apply to mechanical systems serving multiple zones. Supply air systems serving multiple zones shall be VAV systems which, during periods of occupancy, are designed and configured to reduce primary air supply to each zone to one of the following before reheating, recooling or mixing takes place:

1. Thirty percent of the maximum supply air to each zone:
2. Three hundred cfm (142 L/s) or less where the maximum flow rate is less than 10 percent of the total fan system supply airflow rate.
3. The minimum ventilation requirements of Chapter 4 of the *International Mechanical Code*.
4. Any higher rate that can be demonstrated to reduce overall system annual energy use by offsetting reheat/recool energy losses through a reduction in outdoor air intake for the system, as approved by the code official.
5. The airflow rates to comply with applicable codes or accreditation standards such as pressure relationships or minimum air change rates.

- EXCEPTION: The following define where individual zones or where entire air distribution systems are exempted from the requirement for VAV control:
1. Zones or supply air systems where at least 75 percent of the energy for reheating or for providing warm air in mixing systems is provided from a site-recovered or site-solar energy source.
 2. Zones where special humidity levels are required to satisfy process needs.
 3. Zones with a peak supply air quantity of 300 cfm (142 L/s) or less and where the flow rate is less than 10 percent of the total fan system supply airflow rate.
 4. Zones without DDC for which the volume of air that is reheated, re-cooled or remixed is less than the larger of the following:
 - 4.1. 30 percent of the zone design peak supply rate.
 - 4.2. The outdoor airflow rate required to meet the ventilation requirements of Chapter 4 of the *International Mechanical Code* for the zone.
 - 4.3. Any higher rate that can be demonstrated, to the satisfaction of the code official, to reduce overall system annual energy usage by offsetting reheat/recool energy losses through a reduction in outdoor air intake for the system.
 - 4.4. The airflow rate required to comply with applicable codes or accreditation standards, such as pressure relationships or minimum air change rates.
 5. Zones with DDC that comply with all of the following:
 - 5.1. The airflow rate in dead band between heating and cooling does not exceed the larger of the following:
 - 5.1.1. 20 percent of the zone design peak supply rate.

5.1.2. The outdoor air flow rate required to meet the ventilation requirements of Chapter 4 of the *International Mechanical Code* for the zone.

5.1.3. Any higher rate that can be demonstrated, to the satisfaction of the code official, to reduce overall system annual energy usage by offsetting reheat/recool energy losses through a reduction in outdoor air intake for the system.

5.1.4. The airflow rate required to comply with applicable codes or accreditation standards, such as pressure relationships or minimum air change rates.

5.2. The airflow rate that is reheated, re-cooled, or mixed shall be less than 50 percent of the zone design peak supply rate.

5.3. The first stage of heating consists of modulating the zone supply air temperature setpoint up to a maximum setpoint while the airflow is maintained at the dead band flow rate.

5.4. The second stage of heating consists of modulating the airflow rate from the dead band flow rate up to the heating maximum flow rate.

6. *Zones* or supply air systems with thermostatic and humidistatic controls capable of operating in sequence the supply of heating and cooling energy to the *zones* and which are configured to prevent reheating, re-cooling, mixing or simultaneous supply of air that has been previously cooled, either mechanically or through the use of economizer systems, and air that has been previously mechanically heated.

C403.4.4.1 Single duct variable air volume (VAV) systems, terminal devices. Single duct VAV systems shall use terminal devices capable of and configured to reduce the supply of primary supply air before reheating or re-cooling takes place.

C403.4.4.2 Dual duct and mixing VAV systems, terminal devices. Systems that have one warm air duct and one cool air duct shall use terminal devices which are capable of and configured to reduce the flow from one duct to a minimum before mixing of air from the other duct takes place.

C403.4.4.3 Multiple zone VAV system ventilation optimization control. Multiple zone VAV systems with direct digital control of individual zone boxes reporting to a central control panel shall have automatic controls configured to reduce outdoor air intake flow below design rates in response to changes in system ventilation efficiency (E_v) as defined by the *International Mechanical Code*.

EXCEPTIONS:

1. VAV systems with zonal transfer fans that recirculate air from other zones without directly mixing it with outdoor air, dual-duct dual-fan VAV systems, and VAV systems with fan-powered terminal units.
2. Systems having exhaust air energy recovery complying with Section C403.5.
3. Systems where total design exhaust airflow is more than 70 percent of total design outdoor air intake flow requirements.

C403.4.4.4 Supply air temperature reset controls. Multiple zone HVAC systems shall include controls that automatically reset the supply air temperature in response to representative building loads, or to outdoor air temperature. The controls shall be capable of resetting the supply air temperature

at least 25 percent of the difference between the design supply air temperature and the design room air temperature.

EXCEPTIONS:

1. Systems that prevent reheating, re-cooling or mixing of heated and cooled supply air.
2. Seventy-five percent of the energy for reheating is from site-recovered or site solar energy sources.
3. Zones with peak supply air quantities of 300 cfm (142 L/s) or less.)

C403.4.5 Pump isolation. Chilled water plants including more than one chiller shall be capable of and configured to reduce flow automatically through the chiller plant when a chiller is shut down and automatically shut off flow to chillers that are shut down. Chillers piped in series for the purpose of increased temperature differential shall be considered as one chiller.

Boiler systems including more than one boiler shall be capable of and configured to reduce flow automatically through the boiler system when a boiler is shut down.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40346 ((Reserved-)) Section C403.4.6—Variable flow controls.

C403.4.6 Variable flow controls. Individual pumps required by this code to have variable speed control shall be controlled in one of the following manners:

1. For systems having a combined pump motor horsepower less than or equal to 20 hp (15 kW) and without direct digital control of individual coils, pump speed shall be a function of either:

1.1. Required differential pressure; or

1.2. Reset directly based on zone hydronic demand, or other zone load indicators; or

1.3. Reset directly based on pump power and pump differential pressure.

1.4. Reset directly by an integral controller based on the relationship between variable speed controller frequency and power.

2. For systems having a combined pump motor horsepower that exceeds 20 hp (15 kW) or smaller systems with direct digital control, pump speed shall be a function of either:

2.1. The static pressure set point as reset based on the valve requiring the most pressure; or

2.2. Directly controlled based on zone hydronic demand.

2.3. Reset directly by an integral controller based on the relationship between variable speed controller frequency and power.

AMENDATORY SECTION (Amending WSR 17-10-062, filed 5/2/17, effective 6/2/17)

WAC 51-11C-40347 Section ((C403.4.6—Hot gas bypass limitation)) C403.4.7—Combustion heating equipment controls.

((C403.4.6 Hot gas bypass limitation. Cooling systems shall not use hot gas bypass or other evaporator pressure control systems unless the system is designed with multiple steps

of unloading or continuous capacity modulation. The capacity of the hot gas bypass shall be limited as indicated in Table C403.4.6, as limited by Section C403.3.1.

**Table C403.4.6
Maximum Hot Gas Bypass Capacity**

Rated Capacity	Maximum Hot Gas Bypass Capacity (% of total capacity)
≤ 240,000 Btu/h	50
> 240,000 Btu/h	25

For SI: 1 British thermal unit per hour = 0.2931 W.)

C403.4.7 Combustion heating equipment controls. Combustion heating equipment with a capacity over 225,000 Btu/h shall have modulating or staged combustion control.

- EXCEPTIONS:
1. Boilers.
 2. Radiant heaters.

C403.4.7.1 Combustion decorative vented appliance, combustion fireplace and fire pit controls. Combustion decorative vented appliances, combustion fireplaces and fire pits shall be equipped with local controls to limit operation to a maximum duration of one hour without override hold capability or shall be controlled by occupancy sensor control configured with manual on and automatic shutoff within 15 minutes after occupants have left the space.

NEW SECTION

WAC 51-11C-40348 Sections C403.4.8 through C403.4.10—Group R requirements.

C403.4.8 Group R-1 hotel/motel guestrooms. See Section C403.7.4.

C403.4.9 Group R-2 and R-3 dwelling units. The primary space conditioning system within each dwelling unit shall be provided with at least one programmable thermostat for the regulation of space temperature. The thermostat shall allow for, at a minimum, a 5-2 programmable schedule (week-days/weekends) and be capable of providing at least two programmable setback periods per day.

Each additional system provided within the dwelling unit shall be provided with at least one adjustable thermostat for the regulation of temperature.

- EXCEPTIONS:
1. Systems controlled by an occupant sensor that is configured to shut the system off when no occupant is sensed for a period of up to 30 minutes.
 2. Systems controlled solely by a manually operated timer configured to operate the system for no more than 2 hours.
 3. Ductless heat pumps.

Each thermostat shall be capable of being set by adjustment or selection of sensors and configured as follows:

1. When used to control heating only: 55°F to 75°F.
2. When used to control cooling only: 70°F to 85°F.

3. All other: 55°F to 85°F with an adjustable deadband configured to at least 5°F in accordance with Section C403.4.1.2.

C403.4.10 Group R-2 sleeping units. The primary space conditioning system within each sleeping unit shall be provided with at least one programmable thermostat for the regulation of space temperature. The thermostat shall allow for, at a minimum, a 5-2 programmable schedule (week-days/weekends) and be capable of providing at least two programmable setback periods per day.

Each additional system provided within the sleeping unit shall be provided with at least one adjustable thermostat for the regulation of temperature.

- EXCEPTIONS:
1. Systems controlled by an occupant sensor that is configured to shut the system off when no occupant is sensed for a period of up to 30 minutes.
 2. Systems controlled solely by a manually operated timer configured to operate the system for no more than 2 hours.
 3. Zones with a full HVAC load demand not exceeding 3,400 Btu/h (1 kW) and having a manual shutoff switch located with ready access.
 4. Ductless heat pumps.

Each thermostat shall be capable of being set by adjustment or selection of sensors and configured as follows:

1. When used to control heating only: 55°F to 75°F.
2. When used to control cooling only: 70°F to 85°F.
3. All other: 55°F to 85°F with an adjustable deadband configured to at least 5°F in accordance with Section C403.4.1.2.

NEW SECTION

WAC 51-11C-40349 Section C403.4.11—DDC systems.

C403.4.11 Direct digital control systems. Direct digital control (DDC) shall be required as specified in Sections C403.4.11.1 through C403.4.11.3.

C403.4.11.1 DDC applications. DDC shall be provided in the applications and qualifications listed in Table C403.4.11.1.

C403.4.11.2 DDC controls. Where DDC is required by Section C403.4.11.1, the DDC system shall be capable of all of the following, as required to provide the system and zone control logic required in Sections C403.2, C403.5, C403.6.8 and C403.4.3:

1. Monitoring zone and system demand for fan pressure, pump pressure, heating and cooling.
2. Transferring zone and system demand information from zones to air distribution system controllers and from air distribution systems to heating and cooling plant controllers.

C403.4.11.3 DDC display. Where DDC is required by Section C403.4.11.1 for new buildings, the DDC system shall be capable of trending and graphically displaying input and output points.

**Table C403.4.11.1
DDC Applications and Qualifications**

Building Status	Application	Qualifications
New building	Air-handling system and all zones served by the system	All air-handling systems in buildings with building cooling capacity greater than 780,000 Btu/h
	Air-handling system and all zones served by the system	Individual systems supplying more than three zones and with fan system bhp of 10 hp and larger
	Chilled-water plant and all coils and terminal units served by the system	Individual plants supplying more than three zones and with design cooling capacity of 300,000 Btu/h and larger
	Hot-water plant and all coils and terminal units served by the system	Individual plants supplying more than three zones and with design heating capacity of 300,000 Btu/h and larger
Alteration or addition	Zone terminal unit such as VAV box	Where existing zones served by the same air-handling, chilled-water, or hot-water system have DDC
	Air-handling system or fan coil	Where existing air-handling system(s) and fan coil(s) served by the same chilled- or hot-water plant have DDC
	New air-handling system and all new zones served by the system	Individual systems with fan system bhp of 10 hp and larger and supplying more than three zones and more than 75 percent of zones are new
	New or upgraded chilled-water plant	Where all chillers are new and plant design cooling capacity is 300,000 Btu/h and larger
	New or upgraded hot-water plant	Where all boilers are new and plant design heating capacity is 300,000 Btu/h and larger

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40350 Section C403.5—(~~Energy recovery~~) Economizers.

C403.5 (~~Energy recovery~~).

~~**C403.5.1 Energy recovery ventilation systems.** Any system with minimum outside air requirements at design conditions greater than 5,000 cfm or any system where the system's supply airflow rate exceeds the value listed in Tables C403.5.1(1) and C403.5.1(2), based on the climate zone and percentage of outdoor airflow rate at design conditions, shall include an energy recovery system. Table C403.5.1(1) shall be used for all ventilation systems that operate less than 8,000 hours per year, and Table C403.5.1(2) shall be used for all ventilation systems that operate 8,000 hours or more per year. The energy recovery system shall have the capability to provide a change in the enthalpy of the outdoor air supply of not less than 50 percent of the difference between the outdoor air and return air enthalpies, at design conditions. Where an air economizer is required, the energy recovery system shall include a bypass or controls which permit operation of the economizer as required by Section C403.3. Where a single room or space is supplied by multiple units, the aggregate ventilation (cfm) of those units shall be used in applying this requirement. The return/exhaust air stream temperature for heat recovery device selection shall be 70°F (21°C) at 30 percent relative humidity, or as calculated by the registered design professional.~~

EXCEPTION: An energy recovery ventilation system shall not be required in any of the following conditions:

1. Where energy recovery systems are restricted per Section 514 of the *International Mechanical Code* to sensible energy, recovery shall comply with one of the following:
 - 1.1. Kitchen exhaust systems where they comply with Section C403.2.7.1.
 - 1.2. Laboratory fume hood systems where they comply with Exception 2 of Section C403.5.1.
 - 1.3. Other sensible energy recovery systems with the capability to provide a change in dry bulb temperature of the outdoor air supply of not less than 50 percent of the difference between the outdoor air and the return air dry bulb temperatures, at design conditions.
2. Laboratory fume hood systems that include at least one of the following features and also comply with Section C403.2.7.2:
 - 2.1. Variable air volume hood exhaust and room supply systems configured to reduce exhaust and makeup air volume to 50 percent or less of design values.
 - 2.2. Direct makeup (auxiliary) air supply equal to at least 75 percent of the exhaust rate, heated no warmer than 2°F (1.1°C) above room setpoint, cooled to no cooler than 3°F (1.7°C) below room setpoint, no humidification added, and no simultaneous heating and cooling used for dehumidification control.
3. Systems serving spaces that are heated to less than 60°F (15.5°C) and are not cooled.
4. Where more than 60 percent of the outdoor air heating energy is provided from site-recovered or site solar energy.

- 5. Systems exhausting toxic, flammable, paint or corrosive fumes or dust.
- 6. Cooling energy recovery in Climate Zones 3C, 4C, 5B, 5C, 6B, 7 and 8.
- 7. Systems requiring dehumidification that employ energy recovery in series with the cooling coil.
- 8. Multiple-zone systems where the supply airflow rate is less than the values specified in Tables C403.5.1 (1) and (2), for the corresponding percent of outdoor air. Where a value of NR is listed, energy recovery shall not be required.
- 9. Systems serving Group R dwelling or sleeping units where the largest source of air exhausted at a single location at the building exterior is less than 25 percent of the design outdoor air flow rate.

Table C403.5.1(1)
Energy Recovery Requirement
(Ventilation systems operating less than 8,000 hours per year)

Percent (%) Outdoor Air at Full Design Airflow Rate								
Climate zone	≥ 10% and < 20%	≥ 20% and < 30%	≥ 30% and < 40%	≥ 40% and < 50%	≥ 50% and < 60%	≥ 60% and < 70%	≥ 70% and < 80%	≥ 80%
Design Supply Fan Airflow Rate (cfm)								
4C, 5B	NR	NR	NR	NR	NR	NR	≥ 5000	≥ 5000

NR = Not required.

Table C403.5.1(2)
Energy Recovery Requirement
(Ventilation systems operating not less than 8,000 hours per year)

Percent (%) Outdoor Air at Full Design Airflow Rate								
Climate zone	≥ 10% and < 20%	≥ 20% and < 30%	≥ 30% and < 40%	≥ 40% and < 50%	≥ 50% and < 60%	≥ 60% and < 70%	≥ 70% and < 80%	≥ 80%
Design Supply Fan Airflow Rate (cfm)								
4C	NR	≥ 19500	≥ 9000	≥ 5000	≥ 4000	≥ 3000	≥ 1500	≥ 0
5B	≥ 2500	≥ 2000	≥ 1000	≥ 500	≥ 0	≥ 0	≥ 0	≥ 0

NR = Not required.

C403.5.2 Condensate systems. On-site steam heating systems shall have condensate water heat recovery. On-site includes a system that is located within or adjacent to one or more buildings within the boundary of a contiguous area or campus under one ownership and which serves one or more of those buildings.

Buildings using steam generated off-site with steam heating systems which do not have condensate water recovery shall have condensate water heat recovery.

C403.5.3 Condenser heat recovery. Facilities having food service, meat or deli departments and having 500,000 Btu/h or greater of remote refrigeration condensers shall have condenser waste heat recovery from freezers and coolers and shall use the waste heat for service water heating, space heating or for dehumidification reheat. Facilities having a gross conditioned floor area of 40,000 ft² or greater and 1,000,000 Btu/h or greater of remote refrigeration shall have condenser waste heat recovery from freezers and coolers and shall use the waste heat for service water heating, and either for space

heating or for dehumidification reheat for maintaining low space humidity.

C403.5.4 Heat recovery for service water heating. Condenser heat recovery shall be installed for heating or reheating of service hot water provided the facility operates 24 hours a day, the total installed heat capacity of water cooled systems exceeds 1,500,000 Btu/hr of heat rejection, and the design service water heating load exceeds 250,000 Btu/hr.

The required heat recovery system shall have the capacity to provide the smaller of:

1. Sixty percent of the peak heat rejection load at design conditions; or
2. The preheating required to raise the peak service hot water draw to 85°F (29°C).

EXCEPTIONS: 1. Facilities that employ condenser heat recovery for space heating or reheat purposes with a heat recovery design exceeding 30 percent of the peak water-cooled condenser load at design conditions.

2. Facilities that provide 60 percent of their service water heating from site solar or site recovered energy or from other sources;))

Economizers. Air economizers shall be provided on all new cooling systems including those serving computer server rooms, electronic equipment, radio equipment, and telephone switchgear. Economizers shall comply with Sections C403.5.1 through C403.5.5.

- EXCEPTIONS:**
1. Cooling systems not installed outdoors nor in a mechanical room adjacent to outdoors and installed in conjunction with DOAS complying with Section C403.3.5 and serving only spaces with year-round cooling loads from lights and equipment of less than 5 watts per square foot.
 2. Unitary or packaged systems serving one zone with dehumidification that affect other systems so as to increase the overall building energy consumption. New humidification equipment shall comply with Section C403.3.2.5.
 3. Unitary or packaged systems serving one zone where the cooling efficiency meets or exceeds the efficiency requirements in Table C403.5.
 4. Equipment serving chilled beams and chilled ceiling space cooling systems only which are provided with a water economizer meeting the requirements of Section C403.5.4.
 5. For Group R occupancies, cooling units installed outdoors or in a mechanical room adjacent to outdoors with a total cooling capacity less than 20,000 Btu/h and other cooling units with a total cooling capacity less than 54,000 Btu/h provided that these are high-efficiency cooling equipment with IEER, CEER, SEER, and EER values more than 15 percent higher than minimum efficiencies listed in Tables C403.3.2 (1) through (3), in the appropriate size category, using the same test procedures. Equipment shall be listed in the appropriate certification program to qualify for this exception. For split systems, compliance is based on the cooling capacity of individual fan coil units.
 6. Equipment used to cool *Controlled Plant Growth Environments* provided these are high-efficiency cooling equipment with SEER, EER and IEER values a minimum of 20 percent greater than the values listed in Tables C403.3.2 (1), (3) and (7).

7. Equipment serving a space with year-round cooling loads from lights and equipment of 5 watts per square foot or greater complying with the following criteria:
 - 7.1. Equipment serving the space utilizes chilled water as the cooling source; and
 - 7.2. The chilled water plant includes a condenser heat recovery system that meets the requirements of Section C403.9.5 or the building and water-cooled system meets the following requirements:
 - 7.2.1. A minimum of 90 percent (capacity-weighted) of the building space heat is provided by hydronic heating water.
 - 7.2.2. Chilled water plant includes a heat recovery chiller or water-to-water heat pump capable of rejecting heat from the chilled water system to the hydronic heating equipment capacity.
 - 7.2.3. Heat recovery chillers shall have a minimum COP of 7.0 when providing heating and cooling water simultaneously.
8. Water-cooled equipment served by systems meeting the requirements of Section C403.9.2.4 Condenser heat recovery.
9. Equipment used to cool any dedicated server room, electronic equipment room or telecom switch room provided the system complies with option a, b, or c in the table below. The total cooling capacity of all fan systems without economizers shall not exceed 240,000 Btu/h per building or 10 percent of its air economizer capacity, whichever is greater. This exception shall not be used for total building performance.
10. Dedicated outdoor air systems that include energy recovery as required by Section C403.7.6 but do not include mechanical cooling.
11. Dedicated outdoor air systems not required by Section C403.7.6 to include energy recovery that modulate the supply airflow to provide only the minimum outdoor air required by Section C403.2.2.1 for ventilation, exhaust air make-up, or other process air delivery.

	<u>Equipment Type</u>	<u>Higher Equipment Efficiency</u>	<u>Part-Load Control</u>	<u>Economizer</u>
<u>Option a</u>	<u>Tables C403.3.2(1) and C403.3.2(2)^a</u>	<u>+15%^b</u>	<u>Required over 85,000 Btu/h^c</u>	<u>None Required</u>
<u>Option b</u>	<u>Tables C403.3.2(1) and C403.3.2(2)^a</u>	<u>+5%^d</u>	<u>Required over 85,000 Btu/h^c</u>	<u>Waterside Economizer^e</u>
<u>Option c</u>	<u>ASHRAE Standard 127^f</u>	<u>+0%^g</u>	<u>Required over 85,000 Btu/h^c</u>	<u>Waterside Economizer^e</u>

Notes for Exception 9:

- ^aFor a system where all of the cooling equipment is subject to the AHRI standards listed in Tables C403.3.2(1) and C403.3.2(2), the system shall comply with all of the following (note that if the system contains any cooling equipment that exceeds the capacity limits in Table C403.3.2(1) or C403.3.2(2), or if the system contains any cooling equipment that is not included in Table C403.3.2(1) or C403.3.2(2), then the system is not allowed to use this option).
- ^bThe cooling equipment shall have an EER value and an IPLV value that is a minimum of 15 percent greater than the value listed in Tables C403.3.2(1) and C403.3.2(2).
- ^cFor units with a total cooling capacity over 85,000 Btu/h, the system shall utilize part-load capacity control schemes that are able to modulate to a part-load capacity of 50 percent of the load or less that results in the compressor operating at the same or higher EER at part loads than at full load (e.g., minimum of two-stages of compressor unloading such as cylinder unloading, two-stage scrolls, dual tandem scrolls, but hot gas bypass is not credited as a compressor unloading system).
- ^dThe cooling equipment shall have an EER value and an IPLV value that is a minimum of 5 percent greater than the value listed in Tables C403.3.2(1) and C403.3.2(2).
- ^eThe system shall include a water economizer in lieu of air economizer. Water economizers shall meet the requirements of C403.5.1 and C403.5.2 and be capable of providing the total concurrent cooling load served by the connected terminal equipment lacking airside economizer, at outside air temperatures of 50°F dry-bulb/45°F wet-bulb and below. For this calculation, all factors including solar and internal load shall be the same as those used for peak load calculations, except for the outside temperatures. The equipment shall be served by a dedicated condenser water system unless a nondedicated condenser water system exists that can provide appropriate water temperatures during hours when waterside economizer cooling is available.
- ^fFor a system where all cooling equipment is subject to ASHRAE Standard 127.
- ^gThe cooling equipment subject to the ASHRAE Standard 127 shall have an EER value and an IPLV value that is equal to or greater than the value listed in Tables C403.3.2(1) and C403.3.2(2) when determined in accordance with the rating conditions ASHRAE Standard 127 (i.e., not the rating conditions in AHRI Standard 210/240 or 340/360). This information shall be provided by an independent third party.

**Table C403.5
Equipment Efficiency Performance
Exception for Economizers**

<u>Climate Zones</u>	<u>Efficiency Improvement^a</u>
4C	64%

<u>Climate Zones</u>	<u>Efficiency Improvement^a</u>
5B	59%

^aIf a unit is rated with an IPLV, IEER or SEER then to eliminate the required air or water economizer, the minimum cooling efficiency of the HVAC unit must be increased by the percentage shown. If the HVAC unit is only rated with a full load metric like EER or COP cooling, then these must be increased by the percentage shown.

NEW SECTION

WAC 51-11C-40351 Section C403.5.1—Integrated economizer control.

C403.5.1 Integrated economizer control. Economizer systems shall be integrated with the mechanical cooling system and be configured to provide partial cooling even where additional mechanical cooling is required to provide the remainder of the cooling load. Controls shall not be capable of creating a false load in the mechanical cooling system by limiting or disabling the economizer or any other means, such as hot gas bypass, except at the lowest stage of mechanical cooling.

Units that include an air economizer shall comply with the following:

1. Unit controls shall have the mechanical cooling capacity control interlocked with the air economizer controls such that the outdoor air damper is at the 100 percent open position when mechanical cooling is on and the outdoor air damper does not begin to close to prevent coil freezing due to minimum compressor run time until the leaving air temperature is less than 45°F (7°C).

2. Direct expansion (DX) units with cooling capacity 65,000 Btu/h (19 kW) or greater of rated capacity shall comply with the following:

2.1. DX units that control the capacity of the mechanical cooling directly based on occupied space temperature shall have not fewer than two stages of mechanical cooling capacity.

2.2. Other DX units, including those that control space temperature by modulating the airflow to the space, shall be in accordance with Table C403.5.1.

**Table C403.5.1
DX Cooling Stage Requirements for Modulating Airflow Units**

Rating Capacity	Minimum Number of Mechanical Cooling Stages	Minimum Compressor Displacement^a
≥ 65,000 Btu/h and < 240,000 Btu/h	3 stages	≤ 35% of full load
≥ 240,000 Btu/h	4 stages	≤ 25% full load

For SI: 1 British thermal unit per hour = 0.2931 W.

^aFor *mechanical cooling* stage control that does not use variable compressor displacement, the percent displacement shall be equivalent to the mechanical cooling capacity reduction evaluated at the full load rating conditions for the compressor.

NEW SECTION

WAC 51-11C-40352 Section C403.5.2—Economizer heating system impact.

C403.5.2 Economizer heating system impact. HVAC system design and economizer controls shall be such that economizer operation does not increase building heating energy use during normal operation.

EXCEPTION: Economizers on VAV systems that cause *zone* level heating to increase due to a reduction in supply air temperature.

NEW SECTION

WAC 51-11C-40353 Section C403.5.3—Air economizers.

C403.5.3 Air economizers. Air economizers shall comply with Sections C403.5.3.1 through C403.5.3.5.

C403.5.3.1 Design capacity. Air economizer systems shall be configured to modulate *outdoor air* and return air dampers to provide up to 100 percent of the design supply air quantity as *outdoor air* for cooling.

C403.5.3.2 Control signal. Economizer controls and dampers shall be configured to sequence the dampers with the mechanical cooling equipment and shall not be controlled by only mixed air temperature. Air economizers on systems with cooling capacity greater than 65,000 Btu/h shall be configured to provide partial cooling even when additional mechanical cooling is required to meet the remainder of the cooling load.

EXCEPTION: The use of mixed air temperature limit control shall be permitted for systems that are both controlled from space temperature (such as single *zone* systems) and having cooling capacity less than 65,000 Btu/h.

C403.5.3.3 High-limit shutoff. Air economizers shall be configured to automatically reduce *outdoor air* intake to the design minimum *outdoor air* quantity when *outdoor air* intake will no longer reduce cooling energy usage. High-limit shutoff control types for specific climates shall be chosen from Table C403.5.3.3. High-limit shutoff control settings for these control types shall be those specified in Table C403.5.3.3.

**Table C403.5.3.3
High-Limit Shutoff Control Setting for Air Economizers^b**

Device Type	Required High Limit (Economizer off when):		Required High Limit For Cycling Fans ^c (Economizer off when):	
	Equation	Description	Equation	Description
Fixed dry-bulb	$T_{OA} > 75^{\circ}\text{F}$	Outdoor air temperature exceeds 75°F	$T_{OA} > 70^{\circ}\text{F}$	Outdoor air temperature exceeds 70°F
Differential dry-bulb	$T_{OA} > T_{RA}$	Outdoor air temperature exceeds return air temperature	$T_{OA} > (T_{RA} - 5)$	Outdoor air temperature exceeds return air temperature - 5
Fixed enthalpy with fixed dry-bulb temperatures	$h_{OA} > 28 \text{ Btu/lb}^a$ or $T_{OA} > 75^{\circ}\text{F}$	Outdoor air enthalpy exceeds 28 Btu/lb of dry air ^a or outdoor air temperature exceeds 75°F	$h_{OA} > 26 \text{ Btu/lb}^a$ or $T_{OA} > 70^{\circ}\text{F}$	Outdoor air enthalpy exceeds 26 Btu/lb of dry air ^d or outdoor air temperature exceeds 70°F
Differential enthalpy with fixed dry-bulb temperature	$h_{OA} > h_{RA}$ or $T_{OA} > 75^{\circ}\text{F}$	Outdoor air enthalpy exceeds return air enthalpy or outdoor air temperature exceeds 75°F	$h_{OA} > (h_{RA} - 2)$ or $T_{OA} > 70^{\circ}\text{F}$	Outdoor air enthalpy exceeds return air enthalpy or outdoor air temperature exceeds 70°F

For SI: °C = (°F - 32) × 5/9, 1 Btu/lb = 2.33 kJ/kg.

^aAt altitudes substantially different than sea level, the fixed enthalpy limit shall be set to the enthalpy value at 75°F and 50 percent relative humidity. As an example, at approximately 6,000 feet elevation the fixed enthalpy limit is approximately 30.7 Btu/lb.

^bDevices with selectable setpoints shall be capable of being set to within 2°F and 2 Btu/lb of the setpoint listed.

^cWhere fans cycle on only to provide heating and cooling, limits are adjusted lower to compensate for fan energy use in economizer mode.

^dFor cycling fans at altitudes substantially different than sea level, the fixed enthalpy limit shall be set to the enthalpy value at 70°F and 50 percent relative humidity.

C403.5.3.4 Relief of excess outdoor air. Systems shall be capable of relieving excess *outdoor air* during air economizer operation to prevent over-pressurizing the building. The relief air outlet shall be located to avoid recirculation into the building.

C403.5.3.5 Economizer dampers. Return, exhaust/relief and outdoor air dampers used in economizers shall comply with Section C403.7.9.

NEW SECTION**WAC 51-11C-40354 Section C403.5.4—Waterside economizers.**

C403.5.4 Waterside economizers. Waterside economizers shall comply with Sections C403.5.4.1 and C403.5.4.2.

C403.5.4.1 Design capacity. Water economizer systems shall be capable of cooling supply air by indirect evaporation and providing up to 100 percent of the expected system cooling load at *outdoor air* temperatures of 50°F dry-bulb (10°C dry-bulb)/45°F wet-bulb (7.2°C wet-bulb) and below.

EXCEPTION: Systems where dehumidification requirements cannot be met using outdoor air temperatures of 50°F dry-bulb (10°C dry-bulb)/45°F wet-bulb (7.2°C wet-bulb) and where 100 percent of the expected system cooling load at 45°F dry-bulb (7.2°C dry-bulb)/40°F wet-bulb (4.5°C wet-bulb) is met with evaporative water economizers.

C403.5.4.2 Maximum pressure drop. Precooling coils and water-to-water heat exchangers used as part of a water economizer system shall either have a waterside pressure drop of less than 15 feet (4572 mm) of water or a secondary loop shall be created so that the coil or heat exchanger pressure drop is not seen by the circulating pumps when the system is in the normal cooling (noneconomizer) mode.

NEW SECTION**WAC 51-11C-40355 Section C403.5.5—Economizer fault detection and diagnostics.**

C403.5.5 Economizer fault detection and diagnostics (FDD). Air-cooled unitary direct-expansion units with a cooling capacity of 54,000 Btu/h or greater listed in Tables C403.3.2(1) through C403.3.2(3) that are equipped with an economizer in accordance with Section C403.5 shall include a fault detection and diagnostics (FDD) system complying with the following:

1. The following temperature sensors shall be permanently installed to monitor system operation:
 - 1.1. Outside air.
 - 1.2. Supply air.
 - 1.3. Return air.
2. Temperature sensors shall have an accuracy of $\pm 2^\circ\text{F}$ (1.1°C) over the range of 40°F to 80°F (4°C to 26.7°C).
3. Refrigerant pressure sensors, where used, shall have an accuracy of ± 3 percent of full scale.
4. The unit controller shall be configured to provide system status by indicating the following:
 - 4.1. Free cooling available.
 - 4.2. Economizer enabled.
 - 4.3. Compressor enabled.
 - 4.4. Heating enabled.
 - 4.5. Mixed air low limit cycle active.
 - 4.6. The current value of each sensor.
5. The unit controller shall be capable of manually initiating each operating mode so that the operation of compressors, economizers, fans and the heating system can be independently tested and verified.
6. The unit shall be configured to report faults to a fault management application available for access by day-to-day

operating or service personnel or annunciated locally on zone thermostats.

7. The FDD system shall be configured to detect the following faults:

- 7.1. Air temperature sensor failure/fault.
- 7.2. Not economizing when the unit should be economizing.
- 7.3. Economizing when the unit should not be economizing.
- 7.4. Damper not modulating.
- 7.5. Excess outdoor air.

AMENDATORY SECTION (Amending WSR 17-10-062, filed 5/2/17, effective 6/2/17)

WAC 51-11C-40360 Section C403.6—(~~Dedicated outdoor air systems (DOAS)~~) Requirements for mechanical systems serving multiple zones.

C403.6 (~~Dedicated outdoor air systems (DOAS)~~ (This section is optional until June 30, 2017, and becomes prescriptive as of July 1, 2017)). For office, retail, education, libraries and fire stations. Outdoor air shall be provided to each occupied space by a dedicated outdoor air system (DOAS) which delivers 100 percent outdoor air without requiring operation of the heating and cooling system fans for ventilation air delivery.

EXCEPTIONS:

1. Occupied spaces that are not ventilated by a mechanical ventilation system and are only ventilated by a natural ventilation system per Section 402 of the *International Mechanical Code*.
2. High efficiency variable air volume (VAV) systems complying with Section C403.7. This exception shall not be used as a substitution for a DOAS per Section C406.6 or as a modification to the requirements for the Standard Reference Design per Section C407.

C403.6.1 Energy recovery ventilation with DOAS. The DOAS shall include *energy recovery ventilation* that complies with the minimum energy recovery efficiency and energy recovery bypass requirements, where applicable, of Section C403.5.1.

EXCEPTIONS:

1. Occupied spaces under the threshold of Section C403.5 with an average occupant load greater than 25 people per 1000 square feet (93 m²) of floor area (as established in Table 403.3.1.1 of the *International Mechanical Code*) that include demand control ventilation configured to reduce outdoor air by at least 50% below design minimum ventilation rates when the actual occupancy of the space served by the system is less than the design occupancy.
2. Systems installed for the sole purpose of providing makeup air for systems exhausting toxic, flammable, paint, or corrosive fumes or dust, dryer exhaust, or commercial kitchen hoods used for collecting and removing grease vapors and smoke.

C403.6.2 Heating/cooling system fan controls. Heating and cooling equipment fans, heating and cooling circulation pumps, and terminal unit fans shall cycle off and terminal unit primary cooling air shall be shut off when there is no call for heating or cooling in the zone.

EXCEPTION: Fans used for heating and cooling using less than 0.12-watts per cfm may operate when space temperatures are within the setpoint deadband (Section C403.2.4.1.2) to provide destratification and air mixing in the space.

C403.6.3 Impracticality. Where the code official determines that full compliance with all the requirements of Sections C403.6.1 and C403.6.2 would be impractical, it is permissible to provide an approved alternate means of compliance that achieves a comparable level of energy efficiency. For the purposes of this section, impractical means that an HVAC system complying with Section C403.6 cannot effectively be utilized due to an unusual use or configuration of the building.

C403.7 High efficiency variable air volume (VAV) systems. For HVAC systems subject to the requirements of Section C403.6 but utilizing Exception 2 of that section, a high efficiency VAV system may be provided without a separate parallel DOAS when the system is designed, installed, and configured to comply with all of the following criteria (this exception shall not be used as a substitution for a DOAS per Section C406.6 or as a modification to the requirements for the Standard Reference Design per Section C407):

1. The VAV systems are provided with airside economizer per Section 403.3 without exceptions.

2. A direct digital control (DDC) system is provided to control the VAV air handling units and associated terminal units per Section C403.2.4.12 regardless of sizing thresholds of Table C403.2.4.12.1.

3. Multiple-zone VAV systems with a minimum outdoor air requirement of 2,500 cfm (1180 L/s) or greater shall be equipped with a device capable of measuring outdoor airflow intake under all load conditions. The system shall be capable of increasing or reducing the outdoor airflow intake based on feedback from the VAV terminal units as required by Section C403.4.4.3, without exceptions, and Section C403.2.6.2 demand controlled ventilation.

4. Multiple-zone VAV systems with a minimum outdoor air requirement of 2,500 cfm (1180 L/s) or greater shall be equipped with a device capable of measuring supply airflow to the VAV terminal units under all load conditions.

5. In addition to meeting the zone isolation requirements of C403.2.4.4 a single VAV air handling unit shall not serve more than 50,000 square feet (2323 m²) unless a single floor is greater than 50,000 square feet (2323 m²) in which case the air handler is permitted to serve the entire floor.

6. The primary maximum cooling air for the VAV terminal units serving interior cooling load driven zones shall be sized for a supply air temperature that is a minimum of 5°F greater than the supply air temperature for the exterior zones in cooling.

7. Air terminal units with a minimum primary airflow setpoint of 50% or greater of the maximum primary airflow setpoint shall be sized with an inlet velocity of no greater than 900 feet per minute.

8. DDC systems be designed and configured per the guidelines set by high performance sequences of operation for HVAC systems (ASHRAE GPC-36, RP-1455).

9. Allowable fan motor horsepower shall not exceed 90% of the allowable HVAC fan system bhp (Option 2) as defined by Section C403.2.11.1.

10. All fan powered VAV terminal units (series or parallel) shall be provided with electronically commutated motors. The DDC system shall be configured to vary the speed of the motor as a function of the heating and cooling load in the space. Minimum speed shall not be greater than 66% of design airflow required for the greater of heating or cooling operation. Minimum speed shall be used during periods of low heating and cooling operation and ventilation only operation.

EXCEPTION: For series fan powered terminal units where the volume of primary air required to deliver the ventilation requirements at minimum speed exceeds the air that would be delivered at the speed defined above, the minimum speed setpoint shall be configured to exceed the value required to provide the required ventilation air.

11. Fan powered VAV terminal units shall only be permitted at perimeter zones with an envelope heating load requirement. All other VAV terminal units shall be single duct terminal units.

12. When in occupied heating or in occupied deadband between heating and cooling all fan powered VAV terminal units shall be configured to reset the primary air supply setpoint, based on the VAV air handling unit outdoor air wet fraction, to the minimum ventilation airflow required per *International Mechanical Code* without utilizing the exceptions 2, 3, or 4 of Section C403.4.4.

13. Spaces that are larger than 150 square feet (14 m²) and with an occupant load greater than or equal to 25 people per 1000 square feet (93 m²) of floor area (as established in Table 403.3.1.1 of the *International Mechanical Code*) shall be provided with all of the following features:

13.1. A dedicated VAV terminal unit capable of controlling the space temperature and minimum ventilation shall be provided.

13.2. Demand control ventilation (DCV) shall be provided that utilizes a carbon dioxide sensor to reset the ventilation setpoint of the VAV terminal unit from the design minimum to design maximum ventilation rate as required by Chapter 4 of the *International Mechanical Code*.

13.3. Occupancy sensors shall be provided that are configured to reduce the minimum ventilation rate to zero and setback room temperature setpoints by a minimum of 5°F, for both cooling and heating, when the space is unoccupied.

14. Dedicated server rooms, electronic equipment rooms, telecom rooms, or other similar spaces with cooling loads greater than 5 watts/sf shall be provided with separate, independent HVAC systems to allow the VAV air handlers to turn off during unoccupied hours in the office space and to allow the supply air temperature reset to occur.

EXCEPTION: The VAV air handling unit and VAV terminal units may be used for secondary backup cooling when there is a failure of the primary HVAC system.

Additionally, server rooms, electronic equipment rooms, telecom rooms, or other similar spaces shall be provided with airside economizer per Section 403.3 without using the exceptions to Section C403.3.

EXCEPTION: Heat recovery per exception 9 of Section 403.3 may be in lieu of airside economizer for the separate, independent HVAC system.

15. HVAC system central heating or cooling plant will include a minimum of one of the following options:

15.1. VAV terminal units with hydronic heating coils 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 90%, air-to-water heat pumps or heat recovery chillers.

15.2. Chilled water VAV air handling units connected to systems with chilled water generation equipment with IPLV values more than 25% higher than the minimum part load efficiencies listed in Table C403.2.3(7), in the appropriate size category, using the same test procedures. Equipment shall be listed in the appropriate certification program to qualify. The smallest chiller or compressor in the central plant shall not exceed 20% of the total central plant cooling capacity or the chilled water system shall include thermal storage sized for a minimum of 20% of the total central cooling plant capacity.

16. The DDC system shall include a fault detection and diagnostics (FDD) system complying with the following:

16.1. The following temperature sensors shall be permanently installed to monitor system operation:

16.1.1. Outside air.

16.1.2. Supply air.

16.1.3. Return air.

16.2. Temperature sensors shall have an accuracy of $\pm 2^\circ\text{F}$ (1.1°C) over the range of 40°F to 80°F (4°C to 26.7°C).

16.3. The VAV air handling unit controller shall be configured to provide system status by indicating the following:

16.3.1. Free cooling available.

16.3.2. Economizer enabled.

16.3.3. Compressor enabled.

16.3.4. Heating enabled.

16.3.5. Mixed air low limit cycle active.

16.3.6. The current value of each sensor.

16.4. The VAV air handling unit controller shall be capable of manually initiating each operating mode so that the operation of compressors, economizers, fans and the heating system can be independently tested and verified.

16.5. The VAV air handling unit shall be configured to report faults to a fault management application accessible by day-to-day operating or service personnel or annunciated locally on zone thermostats.

16.6. The VAV terminal unit shall be configured to report if the VAV inlet valve has failed by performing the following diagnostic check at a maximum interval of once a month:

16.6.1. Command VAV terminal unit primary air inlet valve closed and verify that primary airflow goes to zero.

16.6.2. Command VAV terminal unit primary air inlet valve to design airflow and verify that unit is controlling to within 10% of design airflow.

16.7. The VAV terminal unit shall be configured to report and trend when the zone is driving the following VAV air handling unit reset sequences. The building operator shall have the capability to exclude zones used in the reset

sequences from the DDC control system graphical user interface:

16.7.1. Supply air temperature setpoint reset to lowest supply air temperature setpoint for cooling operation.

16.7.2. Supply air duct static pressure setpoint reset for the highest duct static pressure setpoint allowable.

16.8. The FDD system shall be configured to detect the following faults:

16.8.1. Air temperature sensor failure/fault.

16.8.2. Not economizing when the unit should be economizing.

16.8.3. Economizing when the unit should not be economizing.

16.8.4. Outdoor air or return air damper not modulating.

16.8.5. Excess outdoor air.

16.8.6 VAV terminal unit primary air valve failure.))

Requirements for mechanical systems serving multiple zones. Sections C403.6.1 through C403.6.10 shall apply to mechanical systems serving multiple zones.

C403.6.1 Variable air volume (VAV) and multiple zone systems. Supply air systems serving multiple zones shall be VAV systems that have zone controls configured to reduce the volume of air that is reheated, recooled or mixed in each *zone* to one of the following:

1. Twenty percent of the zone design peak supply for systems with DDC and 30 percent of the maximum supply air for other systems.

2. Systems with DDV where items 2.1 through 2.3 apply.

2.1. The airflow rate in the deadband between heating and cooling does not exceed 20 percent of the zone design peak supply rate or higher allowed rates under Items 3, 4, or 5 of this section.

2.2. The first stage of heating modulates the zone supply air temperature setpoint up to a maximum setpoint while the airflow is maintained at the deadband flow rate.

2.3. The second stage of heating modulates the airflow rate from the deadband flow rate up to the heating maximum flow rate that is less than 50 percent of the zone design peak supply rate.

3. The outdoor airflow rate required to meet the minimum ventilation requirements of Chapter 4 of the *International Mechanical Code*.

4. Any higher rate that can be demonstrated to reduce overall system annual energy use by offsetting reheat/recool energy losses through a reduction in outdoor air intake for the system, as *approved* by the code official.

5. The airflow rates to comply with applicable codes or accreditation standards such as pressure relationships or minimum air change rates.

EXCEPTION: The following individual *zones* or entire air distribution systems are exempted from the requirement for VAV control:

1. *Zones* or supply air systems where not less than 75 percent of the energy for reheating or for providing warm air in mixing systems is provided from a site-recovered source, including condenser heat.

2. Systems that prevent reheating, recooling, mixing or simultaneous supply of air that has been previously cooled, either mechanically or through the use of economizer systems, and air that has been previously mechanically heated.
3. Ventilation systems comply with Section C403.3.5, DOAS, with ventilation rates comply with Section C403.2.2.

C403.6.2 Single duct variable air volume (VAV) systems, terminal devices. Single duct VAV systems shall use terminal devices capable of and configured to reduce the supply of primary supply air before reheating or recooling takes place.

C403.6.3 Dual duct and mixing VAV systems, terminal devices. Systems that have one warm air duct and one cool air duct shall use terminal devices which are capable of and configured to reduce the flow from one duct to a minimum before mixing of air from the other duct takes place.

C403.6.4 Supply-air temperature reset controls. Multiple zone HVAC systems shall include controls that automatically reset the supply-air temperature in response to representative building loads, or to outdoor air temperature. The controls shall be configured to reset the supply air temperature at least 25 percent of the difference between the design supply-air temperature and the design room air temperature.

- EXCEPTIONS:
1. Systems that prevent reheating, recooling or mixing of heated and cooled supply air.
 2. Seventy-five percent of the energy for reheating is from a site-recovered source.
 3. Zones with peak supply air quantities of 300 cfm (142 L/s) or less.

C403.6.5 Multiple-zone VAV system ventilation optimization control. Multiple-zone VAV systems with direct digital control of individual zone boxes reporting to a central control panel shall have automatic controls configured to reduce outdoor air intake flow below design rates in response to changes in system ventilation efficiency (E_v) as defined by the *International Mechanical Code*.

- EXCEPTIONS:
1. VAV systems with zonal transfer fans that recirculate air from other zones without directly mixing it with outdoor air, dual-duct dual-fan VAV systems, and VAV systems with fan-powered terminal units.
 2. Systems where total design exhaust airflow is more than 70 percent of total design outdoor air intake flow requirements.

C403.6.6 Parallel-flow fan-powered VAV air terminal control. Parallel-flow fan-powered VAV air terminals shall have automatic controls configured to:

1. Turn off the terminal fan except when space heating is required or where required for ventilation.
2. Turn on the terminal fan as the first stage of heating before the heating coil is activated.
3. During heating for warmup or setback temperature control, either:
 - 3.1. Operate the terminal fan and heating coil without primary air.
 - 3.2. Reverse the terminal damper logic and provide heating from the central air handler by primary air.

C403.6.7 Hydronic and multiple-zone HVAC system controls and equipment. Hydronic and multiple-zone HVAC system controls and equipment shall comply with this section.

For buildings with a total equipment cooling capacity of 300 tons and above, the equipment shall comply with one of the following:

1. No one unit shall have a cooling capacity of more than 2/3 of the total installed cooling equipment capacity;
2. The equipment shall have a variable speed drive; or
3. The equipment shall have multiple compressors.

C403.6.8 Set points for direct digital control. For systems with direct digital control of individual zones reporting to the central control panel, the static pressure setpoint shall be reset based on the zone requiring the most pressure. In such cases, the set point is reset lower until one zone damper is nearly wide open. The direct digital controls shall be capable of monitoring zone damper positions or shall have an alternative method of indicating the need for static pressure that is configured to provide all of the following:

1. Automatically detecting any zone that excessively drives the reset logic.
2. Generating an alarm to the system operational location.
3. Allowing an operator to readily remove one or more zones from the reset algorithm.

C403.6.9 Static pressure sensor location. Static pressure sensors used to control VAV fans shall be located such that the controller setpoint is no greater than 1.2 inches w.c. (2099 Pa). Where this results in one or more sensors being located downstream of major duct splits, not less than one sensor shall be located on each major branch to ensure that static pressure can be maintained in each branch.

EXCEPTION: Systems complying with Section C403.6.8.

NEW SECTION

WAC 51-11C-403610 Section C403.6.10—High efficiency VAV systems.

C403.6.10 High efficiency variable air volume (VAV) systems. For HVAC systems subject to the requirements of Section C403.3.5 but utilizing Exception 2 of that section, a high efficiency multiple-zone VAV system may be provided without a separate parallel DOAS when the system is designed, installed, and configured to comply with all of the following criteria (this exception shall not be used as a substitution for a DOAS per Section C406.6):

1. Each VAV system must serve a minimum of 3,000 square feet (278.7 m²) and have a minimum of five VAV zones.
2. The VAV systems are provided with airside economizer per Section C403.5 without exceptions.
3. A direct-digital control (DDC) system is provided to control the VAV air handling units and associated terminal units per Section C403.4.11 regardless of sizing thresholds of Table C403.4.11.1.
4. Multiple-zone VAV systems with a minimum outdoor air requirement of 2,500 cfm (1180 L/s) or greater shall be

equipped with a device capable of measuring outdoor airflow intake under all load conditions. The system shall be capable of increasing or reducing the outdoor airflow intake based on feedback from the VAV terminal units as required by Section C403.6.5, without exceptions, and Section C403.7.1 demand controlled ventilation.

5. Multiple-zone VAV systems with a minimum outdoor air requirement of 2,500 cfm (1180 L/s) or greater shall be equipped with a device capable of measuring supply airflow to the VAV terminal units under all load conditions.

6. In addition to meeting the zone isolation requirements of C403.2.1 a single VAV air handling unit shall not serve more than 50,000 square feet (2323 m²) unless a single floor is greater than 50,000 square feet (2323 m²) in which case the air handler is permitted to serve the entire floor.

7. The primary maximum cooling air for the VAV terminal units serving interior cooling load driven zones shall be sized for a supply air temperature that is a minimum of 5°F greater than the supply air temperature for the exterior zones in cooling.

8. Air terminal units with a minimum primary airflow setpoint of 50 percent or greater of the maximum primary airflow setpoint shall be sized with an inlet velocity of no greater than 900 feet per minute.

9. Allowable fan motor horsepower shall not exceed 90 percent of the allowable HVAC *fan system bhp* (Option 2) as defined by Section C403.8.1.1.

10. All fan powered VAV terminal units (series or parallel) shall be provided with electronically commutated motors. The DDC system shall be configured to vary the speed of the motor as a function of the heating and cooling load in the space. Minimum speed shall not be greater than 66 percent of design airflow required for the greater of heating or cooling operation. Minimum speed shall be used during periods of low heating and cooling operation and ventilation-only operation.

EXCEPTION: For series fan powered terminal units where the volume of primary air required to deliver the ventilation requirements at minimum speed exceeds the air that would be delivered at the speed defined above, the minimum speed setpoint shall be configured to exceed the value required to provide the required ventilation air.

11. Fan-powered VAV terminal units shall only be permitted at perimeter zones with an envelope heating load requirement. All other VAV terminal units shall be single duct terminal units.

EXCEPTION: Fan powered VAV terminal units are allowed at interior spaces with an occupant load greater than or equal to 25 people per 1000 square feet of floor area (as established in Table 403.3.1.1 of the *International Mechanical Code*) with demand control ventilation in accordance with Section C403.7.1.

12. When in occupied heating or in occupied deadband between heating and cooling all fan powered VAV terminal units shall be configured to reset the primary air supply setpoint, based on the VAV air handling unit outdoor air vent fraction, to the minimum ventilation airflow required per *International Mechanical Code*.

13. Spaces that are larger than 150 square feet (14 m²) and with an occupant load greater than or equal to 25 people

per 1000 square feet (93 m²) of floor area (as established in Table 403.3.1.1 of the *International Mechanical Code*) shall be provided with all of the following features:

13.1. A dedicated VAV terminal unit capable of controlling the space temperature and minimum ventilation shall be provided.

13.2. Demand control ventilation (DCV) shall be provided that utilizes a carbon dioxide sensor to reset the ventilation setpoint of the VAV terminal unit from the design minimum to design maximum ventilation rate as required by Chapter 4 of the *International Mechanical Code*.

13.3. Occupancy sensors shall be provided that are configured to reduce the minimum ventilation rate to zero and setback room temperature setpoints by a minimum of 5°F, for both cooling and heating, when the space is unoccupied.

14. Dedicated data centers, computer rooms, electronic equipment rooms, telecom rooms, or other similar spaces with cooling loads greater than 5 watts/sf shall be provided with separate cooling systems to allow the VAV air handlers to turn off during unoccupied hours in the office space and to allow the supply air temperature reset to occur.

EXCEPTION: The VAV air handling unit and VAV terminal units may be used for secondary backup cooling when there is a failure of the primary HVAC system.

Additionally, computer rooms, electronic equipment rooms, telecom rooms, or other similar spaces shall be provided with airside economizer in accordance with Section 403.5 without using the exceptions to Section C403.5.

EXCEPTION: Heat recovery per Exception 9 of Section C403.5 may be in lieu of airside economizer for the separate, independent HVAC system.

15. HVAC system central heating or cooling plant will include a minimum of one of the following options:

15.1. VAV terminal units with hydronic heating coils 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 90 percent, air-to-water heat pumps or heat recovery chillers.

15.2. Chilled water VAV air handling units connected to systems with chilled water generation equipment with IPLV values more than 25 percent higher than the minimum part load efficiencies listed in Table C403.3.2(7), in the appropriate size category, using the same test procedures. Equipment shall be listed in the appropriate certification program to qualify. The smallest chiller or compressor in the central plant shall not exceed 20 percent of the total central plant cooling capacity or the chilled water system shall include thermal storage sized for a minimum of 20 percent of the total central cooling plant capacity.

16. The DDC system shall include a fault detection and diagnostics (FDD) system complying with the following:

16.1. The following temperature sensors shall be permanently installed to monitor system operation:

16.1.1. Outside air.

16.1.2. Supply air.

16.1.3. Return air.

16.2. Temperature sensors shall have an accuracy of $\pm 2^\circ\text{F}$ (1.1°C) over the range of 40°F to 80°F (4°C to 26.7°C).

16.3. The VAV air handling unit controller shall be configured to provide system status by indicating the following:

- 16.3.1. Free cooling available.
- 16.3.2. Economizer enabled.
- 16.3.3. Compressor enabled.
- 16.3.4. Heating enabled.
- 16.3.5. Mixed air low limit cycle active.
- 16.3.6. The current value of each sensor.

16.4. The VAV air handling unit controller shall be capable of manually initiating each operating mode so that the operation of compressors, economizers, fans and the heating system can be independently tested and verified.

16.5. The VAV air handling unit shall be configured to report faults to a fault management application accessible by day-to-day operating or service personnel or annunciated locally on zone thermostats.

16.6. The VAV terminal unit shall be configured to report if the VAV inlet valve has failed by performing the following diagnostic check at a maximum interval of once a month:

16.6.1. Command VAV terminal unit primary air inlet valve closed and verify that primary airflow goes to zero.

16.6.2. Command VAV terminal unit primary air inlet valve to design airflow and verify that unit is controlling to within 10 percent of design airflow.

16.7. The VAV terminal unit shall be configured to report and trend when the zone is driving the following VAV air handling unit reset sequences. The building operator shall have the capability to exclude zones used in the reset sequences from the DDC control system graphical user interface:

16.7.1. Supply air temperature setpoint reset to lowest supply air temperature setpoint for cooling operation.

16.7.2. Supply air duct static pressure setpoint reset for the highest duct static pressure setpoint allowable.

16.8. The FDD system shall be configured to detect the following faults:

- 16.8.1. Air temperature sensor failure/fault.
- 16.8.2. Not economizing when the unit should be economizing.
- 16.8.3. Economizing when the unit should not be economizing.
- 16.8.4. Outdoor air or return air damper not modulating.
- 16.8.5. Excess outdoor air.
- 16.8.6. VAV terminal unit primary air valve failure.

NEW SECTION

WAC 51-11C-4037 Section C403.7—Ventilation and exhaust systems.

C403.7 Ventilation and exhaust systems. In addition to other requirements of Section C403 applicable to the provisions 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.

NEW SECTION

WAC 51-11C-40371 Section C403.7.1—Demand control ventilation.

C403.7.1 Demand control ventilation. Demand control ventilation (DCV) shall be provided for spaces larger than 500 square feet (50 m²) and with an occupant load greater than or equal to 25 people per 1000 square feet (93 m²) of floor area (as established in Table 403.3.1.1 of the *International Mechanical Code*) and served by systems with one or more of the following:

1. An air-side economizer;
2. Automatic modulating control of the outdoor air damper; or
3. A design outdoor airflow greater than 3,000 cfm (1416 L/s).

EXCEPTION: Demand control ventilation is not required for systems and spaces as follows:

1. Systems with energy recovery complying with Section C403.7.6.1 or C403.3.5.1. This exception is not available for space types located within the "inclusions" column of Groups A-1 and A-3 occupancy classifications of Table C403.3.5.
2. Multiple-zone systems without direct digital control of individual zones communicating with a central control panel.
3. System with a design outdoor airflow less than 750 cfm (354 L/s).
4. Spaces where the supply airflow rate minus any makeup or outgoing transfer air requirement is less than 1,200 cfm (566 L/s).
5. Ventilation provided for process loads only.
6. Spaces with one of the following occupancy categories (as defined by the *International Mechanical Code*): Correctional cells, daycare sickrooms, science labs, barbers, beauty and nail salons, and bowling alley seating.

NEW SECTION

WAC 51-11C-40372 Section C403.7.2—Occupancy sensors.

C403.7.2 Occupancy sensors. Classrooms, gyms, auditoriums, conference rooms, and other spaces with an occupant load greater than or equal to 25 people per 1000 square feet (93 m²) of floor area (as established in Table 403.3.1.1 of the *International Mechanical Code*) that are larger than 500 square feet of floor area shall have occupancy sensor control that will either close outside air dampers, close ventilation supply dampers or turn off ventilation equipment when the space is unoccupied except where equipped with another means to automatically reduce outside air intake below design rates when spaces are partially occupied.

- EXCEPTIONS:
1. Spaces with one of the following occupancy categories (as defined by the *International Mechanical Code*):
 - 1.1. Correctional cells.
 - 1.2. Daycare sickrooms.
 - 1.3. Science labs.
 - 1.4. Barbers.
 - 1.5. Beauty and nail salons.
 - 1.6. Bowling alley seating.

2. When the space is unoccupied during occupied building hours, a ventilation rate equal to or less than the zone outdoor airflow as defined in Section 403.3.1.1.1 of the *International Mechanical Code* with a zone population of zero.

NEW SECTION

WAC 51-11C-40373 Section C403.7.3—Ventilation air heating control.

C403.7.3 Ventilation air heating control. Units that provide ventilation air to multiple zones and operate in conjunction with zone heating and cooling systems shall not use heating or heat recovery to warm supply air to a temperature greater than 60°F (16°C) when representative building loads or outdoor air temperature indicate that the majority of zones require cooling.

NEW SECTION

WAC 51-11C-40374 Section C403.7.4—HVAC serving guestrooms.

C403.7.4 Automatic control of HVAC systems serving guestrooms. In Group R-1 buildings containing more than 50 guestrooms, each guestroom shall be provided with controls complying with the provisions of Sections C403.7.4.1 and C403.7.4.2. Card key controls comply with these requirements.

C403.7.4.1 Temperature setpoint controls. Controls shall be provided on each HVAC system that are capable of and configured to automatically raise the cooling setpoint and lower the heating setpoint by not less than 4°F (2°C) from the occupant setpoint within 30 minutes after the occupants have left the guestroom. The controls shall be capable of and configured to automatically raise the cooling setpoint to not lower than 80°F (27°C) and lower the heating setpoint to not higher than 60°F (16°C) when the guestroom is unrented or has been continuously unoccupied for over 16 hours or a networked guestroom control system indicates that the guestroom is unrented and the guestroom is unoccupied for more than 30 minutes. A networked guestroom control system that is capable of returning the thermostat setpoints to default occupied setpoints 60 minutes prior to the time a guestroom is scheduled to be occupied is not precluded by this section. Cooling that is capable of limiting relative humidity with a setpoint not lower than 65 percent relative humidity during unoccupied periods is not precluded by this section

C403.7.4.2 Ventilation controls. Controls shall be provided on each HVAC system that are capable of and configured to automatically turn off the ventilation and exhaust fans within 30 minutes of the occupants leaving the guestroom or isolation devices shall be provided to each guestroom that are capable of automatically shutting off the supply of outdoor air to and exhaust air from the guestroom.

EXCEPTION: Guestroom ventilation systems are not precluded from having an automatic daily preoccupancy purge cycle that provides daily outdoor air ventilation during unrented periods at the design ventilation rate for 60 minutes, or at a rate and duration equivalent to one air change.

NEW SECTION

WAC 51-11C-40375 Section C403.7.5—Loading dock and parking garage ventilation system controls.

C403.7.5 Enclosed loading dock and parking garage exhaust ventilation system controls. Mechanical ventilation systems for enclosed loading docks and parking garages shall be designed to exhaust the airflow rates (maximum and minimum) determined in accordance with the *International Mechanical Code*.

Ventilation systems shall be equipped with a control device that operates the system automatically by means of carbon monoxide detectors applied in conjunction with nitrogen dioxide detectors. Controllers shall be configured to shut off fans or modulate fan speed to 50 percent or less of design capacity, or intermittently operate fans less than 20 percent of the occupied time or as required to maintain acceptable contaminant levels in accordance with the *International Mechanical Code* provisions.

Gas sensor controllers used to activate the exhaust ventilation system shall stage or modulate fan speed upon detection of specified gas levels. All equipment used in sensor controlled systems shall be designed for the specific use and installed in accordance with the manufacturer's recommendations. The system shall be arranged to operate automatically by means of carbon monoxide detectors applied in conjunction with nitrogen dioxide detectors. Garages and loading docks shall be equipped with a controller and a full array of carbon monoxide (CO) sensors set to maintain levels of carbon monoxide below 35 parts per million (ppm). Additionally, a full array of nitrogen dioxide detectors shall be connected to the controller set to maintain the nitrogen dioxide level below the OSHA standard for eight hour exposure.

Spacing and location of the sensors shall be installed in accordance with manufacturer recommendations.

C403.7.5.1 System activation devices for enclosed loading docks. Ventilation systems for enclosed loading docks shall be activated by one of the following:

1. Gas sensors installed in accordance with the *International Mechanical Code*; or
2. Occupant detection sensors used to activate the system that detects entry into the loading area along both the vehicle and pedestrian pathways.

C403.7.5.2 System activation devices for enclosed parking garages. Ventilation systems for enclosed parking garages shall be activated by gas sensors.

EXCEPTION: A parking garage ventilation system having a total design capacity under 8,000 cfm may use occupant sensors.

NEW SECTION

WAC 51-11C-40376 Section C403.7.6—Energy recovery ventilation systems.

C403.7.6 Energy recovery ventilation systems. Any system with minimum outside air requirements at design conditions greater than 5,000 cfm or any system where the system's supply airflow rate exceeds the value listed in Tables C403.7.6(1) and C403.7.6(2), based on the climate zone and percentage of outdoor airflow rate at design conditions, shall include

an energy recovery system. Table C403.7.6(1) shall be used for all ventilation systems that operate less than 8,000 hours per year, and Table C403.7.6(2) shall be used for all ventilation systems that operate 8,000 hours or more per year. The energy recovery system shall have the capability to provide a change in the enthalpy of the outdoor air supply of not less than 50 percent of the difference between the outdoor air and return air enthalpies, at design conditions. Where an air economizer is required, the energy recovery system shall include a bypass of the energy recovery media for both the outdoor air and exhaust air or return air dampers and controls which permit operation of the air economizer as required by Section C403.5. Where a single room or space is supplied by multiple units, the aggregate ventilation (cfm) of those units shall be used in applying this requirement. The return/exhaust air stream temperature for heat recovery device selection shall be 70°F (21°C) at 30 percent relative humidity, or as calculated by the registered design professional.

EXCEPTION: An energy recovery ventilation system shall not be required in any of the following conditions:

1. Where energy recovery systems are restricted per Section 514 of the *International Mechanical Code* to sensible energy, recovery shall comply with one of the following:
 - 1.1. Kitchen exhaust systems where they comply with Section C403.7.7.1.
 - 1.2. Laboratory fume hood systems where they comply with Exception 2 of Section C403.7.6.
 - 1.3. Other sensible energy recovery systems with the capability to provide a change in dry-bulb temperature of the outdoor air supply of not less than 50 percent of the difference between the outdoor air and the return air dry-bulb temperatures, at design conditions.

2. Laboratory fume hood systems that include at least one of the following features and also comply with Section C403.7.7.2:

- 2.1. Variable-air-volume hood exhaust and room supply systems configured to reduce exhaust and makeup air volume to 50 percent or less of design values.
- 2.2. Direct makeup (auxiliary) air supply equal to at least 75 percent of the exhaust rate, heated no warmer than 2°F (1.1°C) above room setpoint, cooled to no cooler than 3°F (1.7°C) below room setpoint, no humidification added, and no simultaneous heating and cooling used for dehumidification control.
3. Systems serving spaces that are heated to less than 60°F (15.5°C) and are not cooled.
4. Where more than 60 percent of the outdoor air heating energy is provided from site-recovered energy.
5. Systems exhausting toxic, flammable, paint or corrosive fumes or dust.
6. Cooling energy recovery.
7. Systems requiring dehumidification that employ energy recovery in series with the cooling coil.
8. Multiple-zone systems where the supply airflow rate is less than the values specified in Tables C403.7.6 (1) and (2), for the corresponding percent of outdoor air. Where a value of NR is listed, energy recovery shall not be required.
9. Equipment which meets the requirements of Section C403.9.2.4.
10. Systems serving Group R-1 and R-3 dwelling or sleeping units where the largest source of air exhausted at a single location at the building exterior is less than 25 percent of the design outdoor air flow rate.

**Table C403.7.6(1)
Energy Recovery Requirement
(Ventilation systems operating less than 8,000 hours per year)**

Percent (%) Outdoor Air at Full Design Airflow Rate								
Climate zone	≥ 10% and < 20%	≥ 20% and < 30%	≥ 30% and < 40%	≥ 40% and < 50%	≥ 50% and < 60%	≥ 60% and < 70%	≥ 70% and < 80%	≥ 80%
Design Supply Fan Airflow Rate (cfm)								
4C, 5B	NR	NR	NR	NR	NR	NR	≥ 5000	≥ 5000

NR = Not required.

**Table C403.7.6(2)
Energy Recovery Requirement
(Ventilation systems operating not less than 8,000 hours per year)**

Percent (%) Outdoor Air at Full Design Airflow Rate								
Climate zone	≥ 10% and < 20%	≥ 20% and < 30%	≥ 30% and < 40%	≥ 40% and < 50%	≥ 50% and < 60%	≥ 60% and < 70%	≥ 70% and < 80%	≥ 80%
Design Supply Fan Airflow Rate (cfm)								
4C	NR	≥ 19500	≥ 9000	≥ 5000	≥ 4000	≥ 3000	≥ 1500	≥ 120
5B	≥ 2500	≥ 2000	≥ 1000	≥ 500	≥ 140	≥ 120	≥ 100	≥ 80

NR = Not required.

NEW SECTION

WAC 51-11C-40377 Section C403.7.7—Exhaust systems.

C403.7.7 Exhaust systems.

C403.7.7.1 Kitchen exhaust systems.

C403.7.7.1.1 Replacement air. Replacement air introduced directly into the exhaust hood cavity shall not be greater than 10 percent of the hood exhaust airflow rate.

C403.7.7.1.2 Kitchen exhaust hood certification and maximum airflow. Where a kitchen or kitchen/dining facility has

a total kitchen hood exhaust airflow rate that is greater than 2,000 cfm, each hood shall be a factory built commercial exhaust hood listed by a nationally recognized testing laboratory in compliance with UL 710 and each hood shall have a maximum exhaust rate as specified in Table C403.7.7.1.2. Where a single hood, or hood section, is installed over appliances with different duty ratings, the maximum allowable flow rate for the hood or hood section shall be based on the requirements for the highest appliance duty rating under the hood or hood section.

EXCEPTION: Type II dishwasher exhaust hoods that have an exhaust airflow of 1000 cfm or less.

**Table C403.7.7.1.2
Maximum Net Exhaust Flow Rate,
CFM Per Linear Foot of Hood Length**

Type of Hood	Light-duty Equipment	Medium-duty Equipment	Heavy-duty Equipment	Extra-heavy-duty Equipment
Wall-mounted canopy	140	210	280	385
Single island	280	350	420	490
Double island (per side)	175	210	280	385
Eyebrow	175	175	NA	NA
Backshelf/pass-over	210	210	280	NA

For SI: 1 cfm = 0.4719 L/s; 1 foot = 305 mm

NA = Not allowed

C403.7.7.1.3 Kitchen exhaust hood system. Where a kitchen or kitchen/dining facility has a total kitchen hood exhaust airflow rate greater than 2000 cfm, it shall comply with one of the following:

1. Not less than 50 percent of all replacement air shall be transfer air that would otherwise be exhausted.

2. Demand ventilation systems on not less than 75 percent of the total exhaust hood airflow that are configured to provide not less than a 50 percent reduction in exhaust and replacement air system airflow rates, including controls necessary to modulate airflow in response to appliance operation and to maintain full capture and containment of smoke, effluent and combustion products during cooking and idle.

3. Listed energy recovery devices with a sensible heat recovery effectiveness of not less than 40 percent on not less than 50 percent of the total exhaust hood airflow.

- EXCEPTIONS:
- Where not less than 75 percent of all the replacement air is transfer air that would otherwise be exhausted.
 - UL 710 listed exhaust hoods that have a design maximum exhaust airflow rate no greater than 250 cfm per linear foot of hood that serve kitchen or kitchen/dining facilities with a total kitchen hood exhaust airflow rate less than 5000 cfm.
 - Type II dishwasher exhaust hoods that have an exhaust airflow of 1000 cfm or less.

C403.7.7.2 Laboratory exhaust systems. Buildings with laboratory exhaust systems having a total exhaust rate greater than 5,000 cfm (2360 L/s) shall include heat recovery systems to precondition replacement air from laboratory exhaust. The heat recovery system shall be capable of increasing the outside air supply temperature at design heat-

ing conditions by 25°F (13.9°C). A provision shall be made to bypass or control the heat recovery system to permit air economizer operation as required by Section C403.5.

- EXCEPTIONS:
- Variable air volume laboratory exhaust and room supply systems configured to reduce exhaust and makeup air volume to 50 percent or less of design values; or
 - Direct makeup (auxiliary) air supply equal to at least 75 percent of the exhaust rate, heated no warmer than 2°F (1.1°C) below room setpoint, cooled to no cooler than 3°F (1.7°C) above room setpoint, no humidification added, and no simultaneous heating and cooling used for dehumidification control; or
 - Combined energy reduction method: VAV exhaust and room supply system configured to reduce exhaust and makeup air volumes and a heat recovery system to precondition makeup air from laboratory exhaust that when combined will produce the same energy reduction as achieved by a heat recovery system with a 50 percent sensible recovery effectiveness as required above. For calculation purposes, the heat recovery component can be assumed to include the maximum design supply airflow rate at design conditions. The combined energy reduction (Q_{ER}) shall meet the following:

$$Q_{ER} \geq Q_{MIN}$$

$$Q_{MIN} = CFM_S \cdot (T_R - T_O) \cdot 1.1 \cdot 0.6$$

$$Q_{ER} = CFM_S \cdot (T_R - T_O) \cdot 1.1(A + B)/100$$

Where:

$$Q_{MIN} = \text{Energy recovery at 60 percent sensible effectiveness (Btu/h)}$$

$$Q_{ER} = \text{Combined energy reduction (Btu/h)}$$

- CFM_S = The maximum design supply airflow rate to conditioned spaces served by the system in cubic feet per minute
- T_R = Space return air dry-bulb at winter design conditions
- T_O = Outdoor air dry-bulb at winter design conditions
- A = Percentage that the exhaust and makeup air volumes can be reduced from design conditions
- B = Percentage sensible heat recovery effectiveness

C403.7.7.3 Transfer air. Conditioned supply air delivered to any space with mechanical exhaust shall not exceed the greater of:

1. The supply flow required to meet the space heating or cooling load;
2. The ventilation rate required by the authority having jurisdiction, the facility environmental health and safety department, or Section C403.2.2; or
3. The mechanical exhaust flow minus the available transfer air from conditioned spaces or return air plenums that at their closest point are within 15 feet of each other on the same floor that are not in different smoke or fire compartments. Available transfer air is that portion of outdoor ventilation air that:
 - 3.1. Is not required to satisfy other exhaust needs;
 - 3.2. Is not required to maintain pressurization of other spaces; and
 - 3.3. Is transferable according to applicable codes and standards and per the *International Mechanical Code*.

- EXCEPTIONS:
1. Laboratories classified as biosafety level 3 or higher.
 2. Vivarium spaces.
 3. Spaces that are required by applicable codes and standards to be maintained at positive pressure relative to adjacent spaces. For spaces taking this exception, any transferable air that is not directly transferred shall be made available to the associated air-handling unit and shall be used whenever economizer or other options do not save more energy.
 4. Spaces where the demand for transfer air may exceed the available transfer airflow rate and where the spaces have a required negative pressure relationship. For spaces taking this exception, any transferable air that is not directly transferred shall be made available to the associated air-handling unit and shall be used whenever economizer or other options do not save more energy.

NEW SECTION

WAC 51-11C-40378 Section C403.7.8—Shutoff dampers.

C403.7.8 Shutoff dampers. Mechanical openings shall be provided with shutoff dampers in accordance with Sections C403.7.8.1 through C403.7.8.4.

C403.7.8.1 Shutoff dampers for building isolation. Outdoor air supply, exhaust openings and relief outlets and stair-

way and elevator hoistway shaft vents shall be provided with Class I motorized dampers. See Sections C403.10.1 and C403.10.2 for ductwork insulation requirements upstream and downstream of the shutoff damper.

- EXCEPTIONS:
1. Gravity (nonmotorized) dampers shall be permitted in lieu of motorized dampers as follows:
 - 1.1. Relief dampers serving systems less than 5,000 cfm total supply shall be permitted in buildings less than three stories in height.
 - 1.2. Gravity (nonmotorized) dampers where the design outdoor air intake or exhaust capacity does not exceed 400 cfm.
 - 1.3. Systems serving areas which require continuous operation for 24/7 occupancy schedules.
 2. Shutoff dampers are not required in:
 - 2.1. Combustion air intakes.
 - 2.2. Systems serving areas which require continuous operation in animal hospitals, kennels and pounds, laboratories, and Group H, I and R occupancies.
 - 2.3. Subduct exhaust systems or other systems that are required to operate continuously by the *International Mechanical Code*.
 - 2.4. Type I grease exhaust systems or other systems where dampers are prohibited by the *International Mechanical Code* to be in the airstream.
 - 2.5. Unconditioned stairwells or unconditioned elevator hoistway shafts that are only connected to unconditioned spaces.

C403.7.8.2 Shutoff dampers for return air. Return air openings used for airside economizer operation shall be equipped with Class I motorized dampers.

C403.7.8.3 Damper leakage rating. Class 1 dampers shall have a maximum leakage rate of 4 cfm/ft² (20.3 L/s x m²) at 1.0 inch water gauge (w.g.) (249 Pa) when tested in accordance with AMCA 500D and shall be labeled by an approved agency for such purpose. Gravity (nonmotorized) dampers shall have an air leakage rate not greater than 20 cfm/ft² where not less than 24 inches (610 mm) in either dimension and 40 cfm/ft² where less than 24 inches in either dimension. The rate of air leakage shall be determined at 1.0 inch w.g. (249 Pa) when tested in accordance with AMCA 500D for such purpose. The dampers shall be labeled by an approved agency. Gravity dampers for ventilation air intakes shall be protected from direct exposure to wind.

- EXCEPTIONS:
1. Gravity (nonmotorized) dampers are not required to be tested to verify the air leakage rating when installed in exhaust systems where the exhaust capacity does not exceed 400 cfm and the gravity damper is provided with a gasketed seal.
 2. Motorized dampers on return air openings in unitary packaged equipment that have the minimum leakage rate available from the manufacturer.

C403.7.8.4 Damper actuation. Outdoor air intake, relief and exhaust shutoff dampers shall be installed with automatic controls configured to close when the systems or spaces served are not in use or during unoccupied period warm-up and setback operation, unless the systems served require outdoor or exhaust air in accordance with the *International Mechanical Code* or the dampers are opened to provide

intentional economizer cooling. Stairway and elevator hoistway shaft vent dampers shall be installed with automatic controls configured to open upon the activation of any fire alarm initiating device of the building's fire alarm system or the interruption of power to the damper.

NEW SECTION

WAC 51-11C-4038 Section C403.8—Fan and fan controls.

C403.8 Fan and fan controls. Fans in HVAC systems shall comply with Sections C403.8.1 through C403.8.5.1.

The airflow requirements of Section C403.8.5.1 shall apply to all fan motors. Group R occupancy exhaust fans shall also comply with Section C403.8.4.

C403.8.1 Allowable fan motor horsepower. Each HVAC system having a total fan system motor nameplate horsepower exceeding 5 hp (3.7 kW) at fan system design conditions shall not exceed the allowable *fan system motor nameplate hp* (Option 1) or *fan system bhp* (Option 2) as shown in Table C403.8.1(1). This includes supply fans, exhaust fans, return/relief fans, and fan-powered VAV air terminal units associated with systems providing heating or cooling capability. Single *zone* variable-air-volume systems shall comply with the constant volume fan power limitation. Zone heating and/or cooling terminal units installed in conjunction with a dedicated outdoor air system (DOAS) shall be evaluated as separate HVAC systems for allowable fan motor horsepower.

- EXCEPTIONS:
1. Hospital, vivarium and laboratory systems that utilize flow control devices on exhaust or return to maintain space pressure relationships necessary for occupant health and safety or environmental control shall be permitted to use variable volume fan power limitation.
 2. Individual exhaust fans with motor nameplate horsepower of 1 hp or less are exempt from allowable fan motor horsepower requirements.

**Table C403.8.1(1)
Fan Power Limitation**

	Limit	Constant Volume	Variable Volume
Option 1: Fan system motor nameplate hp	Allowable nameplate motor hp	$hp \leq CFM_S \times 0.0011$	$hp \leq CFM_S \times 0.0015$
Option 2: Fan system bhp	Allowable fan system bhp	$bhp \leq CFM_S \times 0.00094 + A$	$bhp \leq CFM_S \times 0.0013 + A$

For SI: 1 cfm = 0.471 L/s. 1 bhp = 735.5 W, 1 hp = 745.5 W.

Where:

- CFM_S = The maximum design supply airflow rate to conditioned spaces served by the system in cubic feet per minute.
- hp = The maximum combined motor nameplate horsepower.
- bhp = The maximum combined fan brake horsepower.
- A = Sum of $[PD \times CFM_D / 4131]$

Where:

- PD = Each applicable pressure drop adjustment from Table C403.8.1(2) in. w.c.
- CFM_D = The design airflow through each applicable device from Table C403.8.1(2) in cubic feet per minute.

**Table C403.8.1(2)
Fan Power Limitation Pressure Drop Adjustment**

Device	Adjustment
Credits	
Return air or exhaust system required by code or accreditation standards to be fully ducted, or systems required to maintain air pressure differentials between adjacent rooms	0.5 inch w.c. (2.15 inches w.c. for laboratory and vivarium systems)
Return and/or exhaust air flow control devices	0.5 inch w.c.
Exhaust filters, scrubbers, or other exhaust treatment	The pressure drop of device calculated at fan system design condition
Particulate filtration credit: MERV 9 - 12	0.5 inch w.c.
Particulate filtration credit: MERV 13 - 15	0.9 inch w.c.
Particulate filtration credit: MERV 16 and greater and electronically enhanced filters	Pressure drop calculated at 2x clean filter pressure drop at fan system design condition
Carbon and other gas-phase air cleaners	Clean filter pressure drop at fan system design condition
Biosafety cabinet	Pressure drop of device at fan system design condition
Energy recovery device, other than coil runaround loop	For each airstream (2.2 × energy recovery effectiveness - 0.5) inch w.c.
Coil runaround loop	0.6 inch w.c. for each airstream
Evaporative humidifier/cooler in series with another cooling coil	Pressure drop of device at fan system design conditions
Sound attenuation section (fans serving spaces with design background noise goals below NC35)	0.15 inch w.c.
Exhaust system serving fume hoods	0.35 inch w.c.
Laboratory and vivarium exhaust systems in high-rise buildings	0.25 inch w.c./100 feet of vertical duct exceeding 75 feet

Device	Adjustment
Deductions	
Systems without central cooling device	-0.6 inch w.c
Systems without central heating device	-0.3 inch w.c.
Systems with central electric resistance heat	-0.2 inch w.c.

For SI: 1 inch w.c. = 249 Pa, 1 inch = 25.4 mm.
w.c. = water column.

C403.8.2 Motor nameplate horsepower. For each fan, the selected fan motor shall be no larger than the first available motor size greater than the brake horsepower (bhp). The fan brake horsepower (bhp) shall be indicated on the design documents to allow for compliance verification by the *code official*.

- EXCEPTIONS:
1. For fans less than 6 bhp (4413 W), where the first available motor larger than the brake horsepower has a nameplate rating within 50 percent of the bhp, selection of the next larger nameplate motor size is allowed.
 2. For fans 6 bhp (4413 W) and larger, where the first available motor larger than the bhp has a nameplate rating within 30 percent of the bhp, selection of the next larger nameplate motor size is allowed.
 3. For fans used only in *approved* life safety applications such as smoke evacuation.
 4. Fans with motor nameplate horsepower less than 1 hp are exempt from this section.

C403.8.3 Fan efficiency. Fans shall have a fan efficiency grade (FEG) of 67 or higher based on manufacturers' certified data, as defined by AMCA 205. The total efficiency of the fan at the design point of operation shall be within 15 percentage points of the maximum total efficiency of the fan.

- EXCEPTION:
- The following fans are not required to have a fan efficiency grade:
1. Individual fans with a motor nameplate horsepower of 5 hp (3.7 kW) or less that are not part of a group operated as the functional equivalent of a single fan.
 2. Multiple fans in series or parallel that have a combined motor nameplate horsepower of 5 hp (3.7 kW) or less and are operated as the functional equivalent of a single fan.
 3. Fans that are part of equipment covered under Section C403.3.2.
 4. Fans included in an equipment package certified by an *approved agency* for air or energy performance.
 5. Powered wall/roof ventilators.
 6. Fans outside the scope of AMCA 205.
 7. Fans that are intended to operate only during emergency conditions.

C403.8.4 Group R occupancy exhaust fan efficacy. The Group R occupancies of the building shall be provided with ventilation that meets the requirements of the *International Mechanical Code*, as applicable, or with other approved means of ventilation. Mechanical ventilation system fans

with 400 cfm or less in capacity shall meet the efficacy requirements of Table C403.8.4.

- EXCEPTIONS:
1. Group R heat recovery ventilator and energy recovery ventilator fans that are less than 400 cfm.
 2. Where whole house ventilation fans are integrated with forced-air systems that are tested and listed HVAC equipment, provided they are powered by an electronically commutated motor where required by Section C405.8.
 3. Domestic clothes dryer booster fans, domestic range hood exhaust fans, and domestic range booster fans that operate intermittently.

Table C403.8.4
Group R Exhaust Fan Efficacy

Fan Location	Air Flow Rate Minimum (cfm)	Minimum Efficacy (cfm/watt)	Air Flow Rate Maximum (cfm)
Exhaust fan: Bathroom, utility room, whole house	10	2.8	< 90
Exhaust fan: Bathroom, utility room, whole house	90	3.5	Any
In-line (single-port and multi-port) fans	Any	3.8	Any

C403.8.5 Fan controls. Controls shall be provided for fans in accordance with Section C403.8.5.1 and as required for specific systems provided in Section C403.

C403.8.5.1 Fan airflow control. Each cooling system listed in Table C403.8.5.1 shall be designed to vary the indoor fan airflow as a function of load and shall comply with the following requirements:

1. Direct expansion (DX) and chilled water cooling units that control the capacity of the mechanical cooling directly based on space temperature shall have not fewer than two stages of fan control. Low or minimum speed shall not be greater than 66 percent of full speed. At low or minimum speed, the fan system shall draw not more than 40 percent of the fan power at full fan speed. Low or minimum speed shall be used during periods of low cooling load and ventilation-only operation.
2. Other units including DX cooling units and chilled water units that control the space temperature by modulating the airflow to the space shall have modulating fan control. Minimum speed shall be not greater than 50 percent of full speed. At minimum speed, the fan system shall draw no more than 30 percent of the power at full fan speed. Low or minimum speed shall be used during periods of low cooling load and ventilation-only operation.
3. Units that include an airside economizer in accordance with Section C403.5 shall have not fewer than two speeds of fan control during economizer operation.

- EXCEPTIONS:
1. Modulating fan control is not required for chilled water and evaporative cooling units with fan motors of less than 1 hp (0.746 kW) where the units are not used to provide ventilation air and the indoor fan cycles with the load.

2. Where the volume of outdoor air required to comply with the ventilation requirements of the *International Mechanical Code* at low speed exceeds the air that would be delivered at the minimum speed defined in Section C403.8.5, the minimum speed shall be selected to provide the required ventilation air.

**Table C403.8.5.1
Fan Control**

Cooling System Type	Fan Motor Size	Mechanical Cooling Capacity
DX cooling	Any	≥ 42,000 Btu/h
Chilled water and evaporative cooling	≥ 1/4 hp	Any

Reviser's note: The bracketed material preceding the section above was supplied by the code reviser's office.

NEW SECTION

WAC 51-11C-4039 Section C403.9—Heat rejection and heat recovery equipment.

C403.9 Heat rejection and heat recovery equipment.

C403.9.1 Heat rejection equipment. Heat rejection equipment, including air-cooled condensers, dry coolers, open-circuit cooling towers, closed-circuit cooling towers and evaporative condensers, shall comply with this section.

EXCEPTION: Heat rejection devices where energy usage is included in the equipment efficiency ratings listed in Tables C403.3.2(1)A, C403.3.2(1)B, C403.3.2(1)C, C403.3.2(2), C403.3.2(3), C403.3.2(7) and C403.3.2(9).

Heat rejection equipment shall have a minimum efficiency performance not less than values specified in Table C403.3.2(8).

C403.9.1.1 Fan speed control. Each fan powered by an individual motor or array of motors with a connected power, including the motor service factor, totaling 5 hp (3.7 kW) or more shall have controls and devices configured to automatically modulate the fan speed to control the leaving fluid temperature or condensing temperature and pressure of the heat rejection device. Fan motor power input shall be not more than 30 percent of design wattage at 50 percent of the design airflow.

EXCEPTIONS:

1. Fans serving multiple refrigerant or fluid cooling circuits.
2. Condenser fans serving flooded condensers.

C403.9.1.2 Multiple-cell heat rejection equipment. Multiple-cell heat rejection equipment with variable speed fan drives shall be controlled to operate the maximum number of fans allowed that comply with the manufacturer's requirements for all system components and so that all fans can operate at the same fan speed required for the instantaneous cooling duty, as opposed to staged (on/off) operation. The minimum fan speed shall be the minimum allowable speed of the fan drive system in accordance with the manufacturer's recommendations.

C403.9.1.3 Limitation on centrifugal fan open-circuit cooling towers. Centrifugal fan open-circuit cooling towers with a combined rated capacity of 1,100 gpm (4164 L/m) or greater at 95°F (35°C) condenser water return, 85°F (29°C) condenser water supply, and 75°F (24°C) outdoor air wet-bulb temperature shall meet the energy efficiency requirement for axial fan open-circuit cooling towers listed in Table C403.3.2(8).

C403.9.1.4 Tower flow turndown. Open-circuit cooling towers used on water-cooled chiller systems that are configured with multiple- or variable-speed condenser water pumps shall be designed so that all open circuit cooling tower cells can be run in parallel with the larger of the flow that is produced by the smallest pump at its minimum expected flow rate or at 50 percent of the design flow for the cell.

C403.9.2 Heat recovery.

C403.9.2.1 Heat recovery for service water heating. Condenser heat recovery shall be installed for heating or reheating of service hot water provided the facility operates 24 hours a day, the total installed heat capacity of water cooled systems exceeds 1,500,000 Btu/hr of heat rejection, and the design service water heating load exceeds 250,000 Btu/hr.

The required heat recovery system shall have the capacity to provide the smaller of:

1. Sixty percent of the peak heat rejection load at design conditions; or
2. The preheating required to raise the peak service hot water draw to 85°F (29°C).

EXCEPTIONS:

1. Facilities that employ condenser heat recovery for space heating or reheat purposes with a heat recovery design exceeding 30 percent of the peak water-cooled condenser load at design conditions.
2. Facilities that provide 60 percent of their service water heating from site solar or site recovered energy or from other sources.

C403.9.2.2 Steam condensate systems. On-site steam heating systems shall have condensate water heat recovery. On-site includes a system that is located within or adjacent to one or more buildings within the boundary of a contiguous area or campus under one ownership and which serves one or more of those buildings.

Buildings using steam generated off-site with steam heating systems which do not have condensate water recovery shall have condensate water recovery.

C403.9.2.3 Refrigeration condenser heat recovery. Facilities having food service, meat or deli departments and having 500,000 Btu/h or greater of remote refrigeration condensers shall have condenser waste heat recovery from freezers and coolers and shall use the waste heat for service water heating, space heating or for dehumidification reheat. Facilities having a gross conditioned floor area of 40,000 ft² or greater and 1,000,000 Btu/h or greater of remote refrigeration shall have condenser waste heat recovery from freezers and coolers and shall use the waste heat for service water heating, and either for space heating or for dehumidification reheat for maintaining low space humidity.

C403.9.2.4 Heat recovery for space heating. A water-source condenser heat recovery system meeting the requirements of Sections C403.9.2.4.1 through C403.9.2.4.4 shall be installed to serve space and ventilation heating systems in new buildings and additions meeting the following criteria:

1. The facility operates greater than 70 hours per week.
2. The sum of all heat rejection equipment capacity serving the new building or addition exceeds 1,500,000 Btu/hr.
3. The sum of zone minimum airflows in all zones with zone reheat coils divided by the conditioned floor area served by those systems is at least 0.45 cfm per square foot.

EXCEPTION: Systems complying with Section C403.3.5 Dedicated outdoor air systems.

C403.9.2.4.1 Water-to-water heat recovery. Ninety percent (90%) of the total building space and ventilation heating system design load shall be served by systems that include heat recovery chiller or water-to-water heat pump equipment capable of rejecting heat from the cooling loop to the space and ventilation heating loop as the first stage of heating.

C403.9.2.4.2 Exhaust heat recovery. Heat shall be recovered by the heat recovery system from 90 percent of the total building exhaust airflow. The maximum leaving air temperature of exhaust air after heat recovery shall be 55°F dry-bulb when operating at full capacity in heat recovery mode.

- EXCEPTIONS:
1. Where energy recovery systems are restricted by Section 514 of the International Mechanical Code to sensible energy, those systems shall not be included in the calculation of total building exhaust airflow.
 2. Exhaust air systems handling contaminated airstreams that are regulated by applicable codes or accreditation standards and pose a health risk to maintenance personnel to maintain heat recovery devices, those systems shall not be included in the calculation of total building exhaust airflow.

C403.9.2.4.3 Process heat recovery. Spaces with year-round cooling loads from lights and equipment of 5 watts and greater per square foot shall be served by water-cooled equipment. Cooling loops serving the water-cooled equipment shall be served by water source heat recovery systems meeting the requirements of Section C403.9.2.4.1. If such spaces

are provided with an air or water economizer, the economizer controls shall be configured with an override signal from the building automation system to disable economizer operation during heat recovery mode.

C403.9.2.4.4 Water-to-water heat recovery sizing. The minimum total combined capacity of heat recovery chillers or water-to-water heat pumps shall match the total combined capacity of installed equipment sized to meet the requirements of Sections C403.9.2.4.2 and C403.9.2.4.3.

NEW SECTION

WAC 51-11C-40391 Section C403.10—Construction of HVAC system elements.

C403.10 Construction of HVAC system elements. Ducts, plenums, piping and other elements that are part of an HVAC system shall be constructed and insulated in accordance with Sections C403.10.1 through C403.10.3.1.

C403.10.1 Duct and plenum insulation and sealing.

C403.10.1.1 Ducts conveying outdoor air. Ducts, shafts and plenums conveying outdoor air from the exterior of the building to the mechanical system shall meet all air leakage and building envelope insulation requirements of Section C402, plus building envelope vapor control requirements from the *International Building Code*, extending continuously from the building exterior to an automatic shutoff damper or heating or cooling equipment. For the purposes of building envelope insulation requirements, duct surfaces shall be insulated with the minimum insulation values in Table C403.10.1.1. Duct surfaces included as part of the building envelope shall not be used in the calculation of maximum glazing area as described in Section C402.4.1.

- EXCEPTIONS:
1. Outdoor air ducts serving individual supply air units with less than 2,800 cfm of total supply air capacity, provided these are insulated to the minimum insulation values in Table C403.10.1.1.
 2. Unheated equipment rooms with combustion air louvers, provided they are isolated from conditioned space at sides, top and bottom of the room with R-11 nominal insulation.

**Table C403.10.1.1
Outdoor Air Ductwork Insulation**

Duct system	Duct Location and Use	Climate Zone	Airflow	Minimum Installed Duct Insulation R-value ^{a,b}	Notes
Outdoor Air	Inside conditioned space and upstream of automatic shutoff damper	4C and 5B	≥ 2800 CFM	R-16	See Section C403.10.1.1 for additional requirements
Outdoor Air	Inside conditioned space and downstream of automatic shutoff damper to HVAC unit or room	4C	≥ 2800 CFM	R-8	

Duct system	Duct Location and Use	Climate Zone	Airflow	Minimum Installed Duct Insulation R-value ^{a,b}	Notes
Outdoor Air	Inside conditioned space and downstream of automatic shutoff damper to HVAC unit or room	5B	≥ 2800 CFM	R-12	
Outdoor Air	Inside conditioned space	4C and 5B	≤ 2800 CFM	R-7	See Exception 1 to Section C403.10.1.1 for additional details

^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.

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. 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:

- Where located within equipment.
- 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) 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.

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

Duct System	Duct Location and Use	Climate Zone	Minimum Installed Duct Insulation R-value ^{a,b}	Notes
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 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	

^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.

C403.10.2 Duct construction. Ductwork shall be constructed and erected in accordance with the *International Mechanical Code*.

C403.10.2.1 Low-pressure duct systems. Longitudinal and transverse joints, seams and connections of supply and return ducts operating at a static pressure less than or equal to 2 inches water gauge (w.g.) (500 Pa) shall be securely fastened and sealed with welds, gaskets, mastics (adhesives), mastic-plus embedded-fabric systems or tapes installed in accordance with the manufacturer's installation instructions. Pressure classifications specific to the duct system shall be clearly indicated on the construction documents in accordance with the *International Mechanical Code*.

EXCEPTION: Continuously welded and locking-type longitudinal joints and seams on ducts operating at static pressures less than 2 inches water gauge (w.g.) (500 Pa) pressure classification.

C403.10.2.2 Medium-pressure duct systems. Ducts and plenums designed to operate at a static pressure greater than 2 inches water gauge (w.g.) (500 Pa) but less than 3 inches w.g. (750 Pa) shall be insulated and sealed in accordance with Section C403.10.1. Pressure classifications specific to the duct system shall be clearly indicated on the construction documents in accordance with the *International Mechanical Code*.

C403.10.2.3 High-pressure duct systems. Ducts designed to operate at static pressures equal to or greater than 3 inches water gauge (w.g.) (750 Pa) shall be insulated and sealed in accordance with Section C403.10.1. In addition, ducts and plenums shall be leak-tested in accordance with the *SMACNA HVAC Air Duct Leakage Test Manual* and shown to have a rate of air leakage (*CL*) less than or equal to 4.0 as determined in accordance with Equation 4-9.

(Equation 4-9)

$$CL = F/P0.65$$

Where:

F = The measured leakage rate in cfm per 100 square feet of duct surface.

P = The static pressure of the test.

Documentation shall be furnished by the designer demonstrating that representative sections totaling at least 25 percent of the duct area have been tested and that all tested sections meet the requirements of this section.

C403.10.3 Piping insulation. All piping serving as part of a heating or cooling system shall be thermally insulated in accordance with Table C403.10.3.

- EXCEPTIONS:
1. Factory-installed piping within HVAC equipment tested and rated in accordance with a test procedure referenced by this code.
 2. Factory-installed piping within room fan-coils and unit ventilators tested and rated according to AHRI 440 (except that the sampling and variation provisions of Section 6.5 shall not apply) and 840, respectively.
 3. Piping that conveys fluids that have a design operating temperature range between 60°F (15°C) and 105°F (41°C).
 4. Piping that conveys fluids that have not been heated or cooled through the use of fossil fuels or electric power.
 5. Strainers, control valves, and balancing valves associated with piping 1 inch (25 mm) or less in diameter.
 6. Direct buried piping that conveys fluids at or below 60°F (15°C).

**Table C403.10.3
Minimum Pipe Insulation Thickness (thickness in inches)^a**

Fluid Operating Temperature Range and Usage (°F)	Insulation Conductivity		Nominal Pipe or Tube Size (inches)				
	Conductivity Btu • in. / (h • ft ² • °F) ^b	Mean Rating Temperature, °F	< 1	1 to < 1-1/2	1-1/2 to < 4	4 to < 8	≥ 8
> 350	0.32 - 0.34	250	4.5	5.0	5.0	5.0	5.0
251 - 350	0.29 - 0.32	200	3.0	4.0	4.5	4.5	4.5
201 - 250	0.27 - 0.30	150	2.5	2.5	2.5	3.0	3.0
141 - 200	0.25 - 0.29	125	1.5	1.5	2.0	2.0	2.0
105 - 140	0.21 - 0.28	100	1.0	1.0	1.5	1.5	1.5
40 - 60	0.21 - 0.27	75	0.5	0.5	1.0	1.0	1.0
< 40	0.20 - 0.26	75	0.5	1.0	1.0	1.0	1.5

^a For piping smaller than 1-1/2 inch (38 mm) and located in partitions within *conditioned spaces*, reduction of these thicknesses by 1 inch (25 mm) shall be permitted (before thickness adjustment required in footnote b) but not to a thickness less than 1 inch (25 mm).

^b For insulation outside the stated conductivity range, the minimum thickness (T) shall be determined as follows:

$$T = r\{(1 + t/r)^{K/k} - 1\}$$

Where:

T = Minimum insulation thickness.

r = Actual outside radius of pipe.

t = Insulation thickness listed in the table for applicable fluid temperature and pipe size.

K = Conductivity of alternate material at mean rating temperature indicated for the applicable fluid temperature (Btu × in/h × ft² × °F).

k = The upper value of the conductivity range listed in the table for the applicable fluid temperature.

^c For direct-buried heating and hot water system piping, reduction of these thicknesses by 1-1/2 inches (38 mm) shall be permitted (before thickness adjustment required in footnote b) but not to thicknesses less than 1 inch (25 mm).

C403.10.3.1 Protection of piping insulation. Piping insulation exposed to weather shall be protected from damage, including that due to sunlight, moisture, equipment maintenance and wind, and shall provide shielding from solar radiation that can cause degradation of the material. Adhesives tape shall not be permitted.

NEW SECTION

WAC 51-11C-40392 Section C403.11—Mechanical systems outside the building envelope.

C403.11 Mechanical systems located outside of the building thermal envelope. Mechanical systems providing heat outside of the thermal envelope of a building shall comply with Sections C403.11.1 through C403.11.3.

C403.11.1 Heating outside a building. Systems installed to provide heat outside a building shall be radiant systems.

Such heating systems shall be controlled by an occupancy sensing device or a timer switch, so that the system is automatically deenergized when no occupants are present.

C403.11.2 Snow- and ice-melt system controls. Snow- and ice-melting systems, supplied through energy service to the building, shall include automatic controls configured to shut off the system when the pavement temperature is above 50°F (10°C) and no precipitation is falling and an automatic control that is configured to shutoff when the outdoor tempera-

ture is above 40°F (4°C) so that the potential for snow or ice accumulation is negligible.

C403.11.3 Freeze protection system controls. Freeze protection systems, such as heat tracing of outdoor piping and heat exchangers, including self-regulating heat tracing, shall include automatic controls configured to shut off the systems when outdoor air temperatures are above 40°F (4°C) or when the conditions of the protected fluid will prevent freezing.

NEW SECTION

WAC 51-11C-40393 Section C403.12—High efficiency single zone VAV systems.

C403.12 High efficiency single-zone variable air volume (VAV) systems. For HVAC systems subject to the requirements of Section C403.3.5 but utilizing Exception 2 of that section, a high efficiency single-zone VAV system may be provided without a separate parallel DOAS when the system is designed, installed, and configured to comply with all of the following criteria (this exception shall not be used as a substitution for a DOAS per Section C406.6 or as a modification to the requirements for the *Standard Reference Design* in accordance with Section C407):

1. The single-zone VAV system is provided with airside economizer in accordance with Section C403.3 without exceptions.

2. A direct-digital control (DDC) system is provided to control the system as a single zone in accordance with Section C403.4.11 regardless of sizing thresholds of Table C403.4.11.1.

3. Single-zone VAV systems with a minimum outdoor air requirement of 1,000 cfm (472 L/s) or greater shall be equipped with a device capable of measuring outdoor airflow intake under all load conditions. The system shall be capable of increasing or reducing the outdoor airflow intake based on Section C403.7.1 demand controlled ventilation.

4. Allowable fan motor horsepower shall not exceed 90 percent of the allowable HVAC fan system bhp (Option 2) as defined by Section C403.8.1.1.

5. Each single-zone VAV system shall be designed to vary the supply fan airflow as a function of heating and cooling load and minimum fan speed shall not be more than the greater of:

5.1. 30 percent of peak design airflow; or

5.2. The required ventilation flow assuming no occupants.

6. Spaces that are larger than 150 square feet (14 m²) and with an occupant load greater than or equal to 25 people per 1000 square feet (93 m²) of floor area (as established in Table 403.3.1.1 of the *International Mechanical Code*) shall be provided with all of the following features:

6.1. Demand control ventilation (DCV) shall be provided that utilizes a carbon dioxide sensor to reset the ventilation setpoint of the single-zone VAV system from the design minimum to design maximum ventilation rate as required by Chapter 4 of the *International Mechanical Code*.

6.2. Occupancy sensors shall be provided that are configured to reduce the minimum ventilation rate to zero and set-

back room temperature setpoints by a minimum of 5°F, for both cooling and heating, when the space is unoccupied.

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.

7.2. Single-zone VAV air handling units with a chilled water coil connected to systems with chilled water generation equipment with IPLV values more than 25 percent higher than the minimum part load efficiencies listed in Table C403.3.2(7), in the appropriate size category, using the same test procedures. Equipment shall be listed in the appropriate certification program to qualify. The smallest chiller or compressor in the central plant shall not exceed 20 percent of the total central plant cooling capacity or the chilled water system shall include thermal storage sized for a minimum of 20 percent of the total central cooling plant capacity.

7.3. Single-zone VAV air handling units with DX cooling, heat pump heating or gas-fired furnace shall comply with the following requirements as applicable:

7.3.1. Have a DX cooling coil with cooling part load efficiency that is a minimum of 15 percent higher than the minimum SEER or IEER listed in Tables C403.3.2(1) and C403.3.2(2).

7.3.2. Have a gas-fired furnace with a thermal efficiency, E_t , of not less than 90 percent or heat pump with a minimum heating HSPF or COP efficiency that are a minimum of 10 percent higher than the minimum heating efficiency in Tables C403.3.2(1) and C403.3.2(2).

7.3.3. Heating coils or burner output shall be modulating or have a minimum of 2 stages with the first stage being less than 50 percent of total heating capacity. Cooling coils shall be modulating or have a minimum of 2 stages with the first stage being less than 50 percent of the total cooling capacity.

8. The DDC system shall include a fault detection and diagnostics (FDD) system complying with the following:

8.1. The following temperature sensors shall be permanently installed to monitor system operation:

8.1.1. Outside air.

8.1.2. Supply air.

8.1.3. Return air.

8.2. Temperature sensors shall have an accuracy of $\pm 2^\circ\text{F}$ (1.1°C) over the range of 40°F to 80°F (4°C to 26.7°C).

8.3. The single-zone VAV air handling unit controller shall be configured to provide system status by indicating the following:

8.3.1. Free cooling available.

8.3.2. Economizer enabled.

8.3.3. Compressor enabled.

8.3.4. Heating enabled.

8.3.5. Mixed air low limit cycle active.

8.3.6. The current value of each sensor.

8.4. The single-zone VAV air handling unit controller shall be capable of manually initiating each operating mode

so that the operation of compressors, economizers, fans and the heating system can be independently tested and verified.

8.5. The single-zone VAV air handling unit shall be configured to report faults to a fault management application accessible by day-to-day operating or service personnel or unannounced locally on zone thermostats.

8.6. The FDD system shall be configured to detect the following faults:

8.6.1. Air temperature sensor failure/fault.

8.6.2. Not economizing when the unit should be economizing.

8.6.3. Economizing when the unit should not be economizing.

8.6.4. Outdoor air or return air damper not modulating.

8.6.5. Excess outdoor air.

C403.13 Commissioning. Mechanical systems shall be commissioned in accordance with Section C408.

AMENDATORY SECTION (Amending WSR 13-04-056, filed 2/1/13, effective 7/1/13)

WAC 51-11C-40400 Section C404—Service water heating ((Mandatory)) and pressure-booster systems.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40402 Section C404.2—Service water-heating equipment performance efficiency.

C404.2 Service water-heating equipment performance efficiency. Water-heating equipment and hot water storage tanks shall meet the requirements of Table C404.2. 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. Water-heating equipment ((also)) intended to be used to provide space heating shall meet the applicable provisions of Table C404.2.

C404.2.1 High input-rated service water heating systems for other than Group R-1 and R-2 occupancies. ((Gas-fired water-heating equipment installed in new buildings shall be in compliance with this section. Where a singular piece of water-heating equipment serves the entire building and the input rating of the equipment is 1,000,000 Btu/h (293 kW) or greater, such equipment shall have a thermal efficiency, E_t , of not less than 90 percent.

Where multiple pieces of water-heating equipment serve the building and)) In new buildings where the combined input rating of the water-heating equipment installed in a building is equal or greater than 1,000,000 Btu/h (293 kW) ((or greater)), the combined input-capacity-weighted-average ((thermal efficiency, E_t , shall not be less than 90 percent)) efficiency of water-heating equipment shall be no less than the following for each water heating fuel source:

1. Electric: A rated COP of not less than 2.0. For air-source heat pump equipment, the COP rating will be reported at the design leaving heat pump water temperature with an enter air temperature of 60°F (15.6°C) or less.

2. Fossil Fuel: A rated E_t of not less than 90 percent as determined by the applicable test procedure in Table C404.2.

((EXCEPTIONS: 1. Where 25 percent of the annual service water-heating requirement is provided by site-solar or site-recovered energy, the minimum thermal efficiency requirements of this section shall not apply.
2. The input rating of water heaters installed in individual dwelling units shall not be required to be included in the total input rating of service water-heating equipment for a building.
3. The input rating of water heaters with an input rating of not greater than 100,000 Btu/h (29.3 kW) shall not be required to be included in the total input rating of service water-heating equipment for a building.))

EXCEPTIONS:

1. Where not less than 25 percent of the annual service water-heating requirement is provided from any of the following sources:
 - 1.1. Renewable energy generated on-site that is not being used to satisfy another requirement of this code; or
 - 1.2. Site-recovered energy that is not being used to satisfy other requirements of this code.
2. Redundant equipment intended to only operate during equipment failure or periods of extended maintenance.
3. Electric resistance heated systems installed as part of an alteration where the water heating equipment is installed at the grade level in a building with a height of four stories or greater.
4. Hot water heat exchangers used to provide service water heating from a district utility (steam, heating hot water).
5. Water heaters provided as an integral part of equipment intended to only heat or boost the heat of water used by that equipment.
6. For electric heat systems, supplemental water heaters not meeting this criteria that function as auxiliary heating only when the outdoor temperature is below 32°F (0°C) or when a defrost cycle is required are not required to have a rated COP of 2.0. Such systems shall be sized and configured to lock out electric resistance or fossil fuel heating from operation when the outdoor temperature is above 32°F (0°C) unless the system is in defrost operation.

C404.2.2 High input-rated service water heating system for Group R-1 and R-2 occupancies. In new buildings with over 1,000,000 Btu/h installed service water heating capacity serving Group R-1 and R-2 occupancies, at least 25 percent of annual water heating energy shall be provided from any combination of the following water heating sources:

1. Renewable energy generated on-site that is not being used to satisfy other requirements of this code; or
2. Site-recovered energy that is not being used to satisfy other requirements of this code.

EXCEPTION: Compliance with this section is not required if the combined input-capacity-weighted average equipment rating for each service water heating fuel source type is not less than the following:

1. Electric Resistance: An electric resistance water heater with a rating of 105 percent of the rated efficiency of Table C404.2.

2. Electric Heat Pump (10 C.F.R. Part 430): A heat pump water heater rated in accordance with 10 C.F.R. Part 430 with a rating of 105 percent of the rated efficiency of Table C404.2.

3. Electric Heat Pump (not listed in accordance with 10 C.F.R. Part 430): A heat pump water heater not rated in accordance with 10 C.F.R. Part 430 shall have a COP of not less than 2.0. For air-source heat pump equipment the COP rating will be reported at the design leaving heat pump water temperature with an entering air temperature of 60°F (15.6°C) or less. Supplemental water heaters not meeting the above criteria that function as auxiliary heating only when the outdoor temperature is below 32°F (0°C) or when a defrost cycle is required are not required to have a rated COP of 2.0. Such systems shall be sized and configured to lock out electric resistance or fossil fuel heating from operation when the outdoor temperature is above 32°F (0°C) unless the system is in defrost operation.

4. Fossil Fuels: A rated E_t of not less than 90 percent as determined by the applicable test procedures in Table C404.2.

5. Hot water heat exchangers used to provide service water heating from a district utility (steam, heating hot water).

AMENDATORY SECTION (Amending WSR 16-13-089, filed 6/15/16, effective 7/16/16)

WAC 51-11C-404021 Table C404.2—Minimum performance of water-heating equipment.

**Table C404.2
Minimum Performance of Water-Heating Equipment**

Equipment Type	Size Category (input)	Subcategory or Rating Condition	Performance Required ^{a, b}	Test Procedure
Storage water heaters, electric	≤ 12 kW ^d	((Resistance)) Tabletop ^e > 20 gal and > 120 gal	0.93 - 0.00132V, EF	DOE 10 C.F.R. Part 430
		Resistance > 20 gal and ≤ 55 gal	0.960 - 0.0003V, EF	
		Grid-enabled ^f > 75 gal and ≤ 120 gal	1.06 - 0.00168V, EF	
	((≤ 24 amps and ≤ 250 volts	Heat pump	0.93 - 0.00132V, EF	DOE 10 C.F.R. Part 430))
	> 12 kW ^d	Resistance	(0.3 + 27)/V _m , %/h ^g	Section G.2 of ANSI Z21.10.3
	≤ 24 amps and ≤ 250 volts	Heat pump	2.057 - 0.00113V, EF	DOE 10 C.F.R. Part 430
Instantaneous water heaters, electric	All	Resistance	0.93 - 0.00132V, EF	DOE 10 C.F.R. Part 430
Storage water heaters, gas	≤ 75,000 Btu/h	≥ 20 gal and ≤ 55 gal	((0.67 - 0.0019V, EF)) 0.675 - 0.0015V, EF	DOE 10 C.F.R. Part 430
		> 55 gal and ≤ 100 gal	0.8012 - 0.00078V, EF	
	> 75,000 Btu/h	< 4,000 Btu/h/gal	80% E _t (Q/800 + 110√V) SL, Btu/h	Section G.1 and G.2 of ANSI Z21.10.3
Instantaneous water heaters, gas	> 50,000 Btu/h and < 200,000 Btu/h	≥ 4,000 (Btu/h)/gal and < 2 gal	((0.62)) 0.82 - 0.0019V, EF	DOE 10 C.F.R. Part 430
	≥ 200,000 Btu/h ^c	≥ 4,000 Btu/h/gal and < 10 gal	80% E _t	Section G.1 and G.2 of ANSI Z21.10.3
	≥ 200,000 Btu/h	≥ 4,000 Btu/h/gal and ≥ 10 gal	80% E _t (Q/800 + 110√V) SL, Btu/h	
Storage water heaters, oil	≤ 105,000 Btu/h	≥ 20 gal	((0.59)) 0.68 - 0.0019V, EF	DOE 10 C.F.R. Part 430
	> 105,000 Btu/h	< 4,000 Btu/h/gal	78% E _t (Q/800 + 110√V) SL, Btu/h	Section G.1 and G.2 of ANSI Z21.10.3

Equipment Type	Size Category (input)	Subcategory or Rating Condition	Performance Required ^{a, b}	Test Procedure
Instantaneous water heaters, oil	≤ 210,000 Btu/h	≥ 4,000 Btu/h/gal and < 2 gal	0.59 - 0.0019V, EF	DOE 10 C.F.R. Part 430
	> 210,000 Btu/h	≥ 4,000 Btu/h/gal and < 10 gal	80% E _t	Section G.1 and G.2 of ANSI Z21.10.3
	> 210,000 Btu/h	≥ 4,000 Btu/h/gal and ≥ 10 gal	78% E _t (Q/800 + 110√V) SL, Btu/h	
Hot water supply boilers, gas and oil	≥ 300,000 Btu/h and < 12,500,000 Btu/h	≥ 4,000 Btu/h/gal and < 10 gal	80% E _t	Section G.1 and G.2 of ANSI Z21.10.3
Hot water supply boilers, gas	≥ 300,000 Btu/h and < 12,500,000 Btu/h	≥ 4,000 Btu/h/gal and ≥ 10 gal	80% E _t (Q/800 + 110√V) SL, Btu/h	
Hot water supply boilers, oil	≥ 300,000 Btu/h and < 12,500,000 Btu/h	≥ 4,000 Btu/h/gal and > 10 gal	78% E _t (Q/800 + 110√V) SL, Btu/h	
Pool heaters, gas and oil	All	—	((78)) 82% E _t	ASHRAE 146
Heat pump pool heaters	All	—	4.0 COP	AHRI 146
Unfired storage tanks	All	—	Minimum insulation requirement R-12.5 (h • ft ² • °F)/Btu	(none)

For SI: °C = [(°F) - 32]/1.8, 1 British thermal unit per hour = 0.2931 W, 1 gallon = 3.785 L, 1 British thermal unit per hour per gallon = 0.078 W/L.

^aEnergy factor (EF) and thermal efficiency (E_t) are minimum requirements. In the EF equation, V is the rated volume in gallons.

^bStandby loss (SL) is the maximum Btu/h based on a nominal 70°F temperature difference between stored water and ambient requirements. In the SL equation, Q is the nameplate input rate in Btu/h. In the SL equation for electric water heaters, V is the rated volume in gallons and V_m is the measured volume in gallons. In the SL equation for oil and gas water heaters and boilers, V is the rated volume in gallons.

^cInstantaneous water heaters with input rates below 200,000 Btu/h shall comply with these requirements if the water heater is designed to heat water to temperatures 180°F or higher.

^dElectric water heaters with an input rating of 12 kW (40,950 Btu/h) or less that are designed to heat water to temperatures of 180°F or greater shall comply with the requirements for electric water heaters that have an input rating greater than 12 kW (40,950 Btu/h).

^eA tabletop water heater is a water heater that is enclosed in a rectangular cabinet with a flat top surface not more than three feet (0.91 m) in height.

^fA grid-enabled water heater is an electric resistance water heater that meets all of the following:

1. Has a rated storage tank volume of more than 75 gallons.
2. Is manufactured on or after April 16, 2015.
3. Is equipped at the point of manufacture with an activation lock.
4. Bears a permanent label applied by the manufacturer that complies with all of the following:
 - 4.1. Is made of material not adversely affected by water.
 - 4.2. Is attached by means of nonwater soluble adhesive.
 - 4.3. Advises purchasers and end-users of the intended and appropriate use of the product with the following notice printed in 16.5 point Arial narrow bold font: "IMPORTANT INFORMATION: This water heater is intended only for use as a part of an electric thermal storage or demand response program. It will not provide adequate hot water unless enrolled in such a program and activated by your utility company or another program operator. Confirm the availability of a program in your local area before purchasing or installing this product."

^g%/h is the energy consumed to replace the heat loss from the tank while on standby, expressed as a percentage of the total energy in the stored water per hour.

Reviser's note: The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency and appear in the Register pursuant to the requirements of RCW 34.08.040.

AMENDATORY SECTION (Amending WSR 13-04-056, filed 2/1/13, effective 7/1/13)

WAC 51-11C-40404 Section C404.4—Heat traps.

C404.4 Heat traps for hot water storage tanks. (~~Water heating equipment not supplied with integral heat traps and serving noncirculating systems shall be provided with heat traps on the supply and discharge piping associated with the equipment.~~) Storage tank-type water heaters and hot water storage tanks that have vertical water pipes connecting to the inlet and outlet of the tank shall be provided with integral heat traps at those inlets and outlets or shall have pipe-config-

ured heat traps in the piping connected to those inlets and outlets. Tank inlets and outlets associated with solar water heating system circulation loops shall not be required to have heat traps.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40407 Section C404.7—Heated-water circulating and temperature maintenance systems.

C404.7 Heated-water circulating and temperature maintenance systems. Heated-water circulation systems shall be

in accordance with Section C404.7.1. Heat trace temperature maintenance systems shall be in accordance with Section C404.7.2. Controls for hot water storage shall be in accordance with Section C404.7.3. Automatic controls, temperature sensors and pumps shall be ~~((*accessible*))~~ in a location with *access*. Manual controls shall be ~~((*readily accessible*))~~ in a location with *ready access*.

C404.7.1 Circulation systems. Heated-water circulation systems shall be provided with a circulation pump. The system return pipe shall be a dedicated return pipe ~~((or a cold water supply pipe))~~. Gravity and thermo-syphon circulation systems shall be prohibited. Controls ~~((for circulating hot water system pumps))~~ shall start the pump based on the identification of a demand for hot water within the occupancy. ~~((The controls shall))~~

C404.7.1.1 Single riser systems. Where the circulation system serves only a single domestic hot water riser or zone, the following controls shall be provided:

1. Control to automatically turn off the pump when the water in the circulation loop is at the ~~((desired temperature and when there is no demand for hot water))~~ supply temperature and shall not turn the pump back on until the temperature is a minimum of 10°F lower than the supply temperature or have controls equipped with automatic time switches or other controls that can be set to switch off the pump during unoccupied hours when hot water is not required.

2. Control shall be equipped with manual switch or other controls that can be used to turn off the pump during extended periods when hot water is not required.

C404.7.1.2 Multiple riser systems. Where the circulation system serves multiple domestic hot water risers or piping zones, controls shall be provided such that they can be set to switch off the pump during extended periods when hot water is not required. System shall include means for balancing the flow rate through each individual hot water supply riser or piping zone.

C404.7.2 Heat trace systems. Electric heat trace systems shall comply with IEEE 515.1. Controls for such systems shall be able to automatically adjust the energy input to the heat tracing to maintain the desired water temperature in the piping in accordance with the times when heated water is used in the occupancy. Heat trace shall be arranged to be turned off automatically when there is no hot water demand.

C404.7.3 Controls for hot water storage. The controls on pumps that circulate water between a water heater and a heated-water storage tank shall limit operation of the pump from heating cycle startup to not greater than 5 minutes after the end of the cycle.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40408 Section C404.8—Demand recirculation controls.

C404.8 Demand recirculation controls. ~~((A water distribution system having one or more recirculation pumps that pump water from a heated-water supply pipe back to the~~

~~heated-water source through a cold-water supply pipe shall be a))~~ Demand recirculation water systems ~~((Pumps))~~ shall have controls that comply with both of the following:

1. The controls shall start the pump upon receiving a signal from the action of a user of a fixture or appliance, sensing the presence of a user of a fixture or sensing the flow of hot or tempered water to a fixture fitting or appliance.

2. The controls shall limit the temperature of the water entering the cold-water piping to not greater than 104°F (40°C).

AMENDATORY SECTION (Amending WSR 14-24-122, filed 12/3/14, effective 1/3/15)

WAC 51-11C-40409 Section C404.9—Domestic hot water meters.

C404.9 Domestic hot water meters. Each individual dwelling unit in a Group R-2 occupancy with central service domestic hot water systems shall be provided with a domestic hot water meter to allow for domestic hot water billing based on actual domestic hot water usage.

EXCEPTION: Dwelling units in other than Group R-2 multi-family and live/work units are not required to provide domestic hot water metering at each dwelling unit where domestic hot water is metered separately for each of the following building end uses:

1. Dwelling units.
2. Sleeping units.
3. Commercial kitchens.
4. Central laundries.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40410 Section C404.11—Pools and spas.

C404.11 Energy consumption of pools and permanent spas ~~((*mandatory*))~~. The energy consumption of pools and permanent spas shall be controlled by the requirements in Sections C404.11.1 through C404.11.4.

C404.11.1 Heaters. Heat pump pool heaters shall have a minimum COP of 4.0 determined in accordance with ASHRAE Standard 146. Other pool heating equipment shall comply with the applicable efficiencies in Section C404.2.

The electric power to all heaters shall be controlled by ~~((a readily accessible))~~ an on-off switch that is an integral part of the heater, mounted on the exterior of the heater, or external to and within 3 feet of the heater in a location with *ready access*. Operation of such switch shall not change the setting of the heater thermostat. Such switches shall be in addition to a circuit breaker for the power to the heater. Gas-fired heaters shall not be equipped with constant burning pilot lights.

C404.11.2 Time switches. Time switches or other control method that can automatically turn off and on heaters and pump motors according to a preset schedule shall be installed for heaters and pump motors. Heaters and pump motors that

have built-in time switches shall be in compliance with this section.

- EXCEPTIONS:
1. Where public health standards require 24-hour pump operation.
 2. Pumps that operate solar- and waste-heat-recovery pool heating systems.

C404.11.3 Covers. Heated pools and permanent spas shall be provided with a vapor-retardant cover on or at the water surface. Pools heated to more than 90°F shall have a pool cover with a minimum insulation value of R-12, and the sides and bottom of the pool shall also have a minimum insulation value of R-12.

C404.11.4 Heat recovery. Heated indoor swimming pools, spas or hot tubs with water surface area greater than 200 square feet shall provide for energy conservation by an exhaust air heat recovery system that heats ventilation air, pool water or domestic hot water. The heat recovery system shall be configured to decrease the exhaust air temperature at design heating conditions (80°F indoor) by 36°F (10°C).

- EXCEPTION:
- Pools, spas or hot tubs that include system(s) that provide equivalent recovered energy on an annual basis through one of the following methods:
1. ((Renewable energy;)) Solar water heating systems not claimed in Section C406.5 or C407;
 2. Dehumidification heat recovery;
 3. Waste heat recovery; or
 4. A combination of these system sources capable of and configured to ((provided)) provide at least 70 percent of the heating energy required over an operating season.

C404.12 Energy consumption of portable spas ((mandatory)). The energy consumption of electric-powered portable spas shall be controlled by the requirements of APSP 14.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40413 Section C404.13—Service ((water heating system commissioning and completion requirements)) water pressure-booster systems.

C404.13 Service ((water heating system commissioning and completion requirements. Service water heating systems, swimming pool water heating systems, spa water heating systems and the controls for those systems shall be commissioned and completed in accordance with Section C408)) water pressure-booster systems. Service water pressure-booster systems shall be designed and configured such that the following apply:

1. One or more pressure sensors shall be used to vary pump speed and/or start and stop pumps. The sensors shall either be located near the critical fixtures that determine the pressure required, or logic shall be employed that adjusts the setpoint to simulate operations of remote sensors.
2. No devices shall be installed for the purpose of reducing the pressure of all of the water supplied by any booster system pump or booster system, except for safety devices.
3. Booster system pumps shall not operate when there is no service water flow except to refill hydro-pneumatic tanks.

4. System pump motors 7.5 hp and greater shall be provided with variable flow capacity in accordance with Section C403.2.3.

C404.14 Commissioning. Service water heating systems shall be commissioned in accordance with Section C408.

AMENDATORY SECTION (Amending WSR 19-02-089, filed 1/2/19, effective 7/1/19)

WAC 51-11C-40215 Section C402.1.5—Component performance alternative.

C402.1.5 Component performance alternative. Building envelope values and fenestration areas determined in accordance with Equation 4-2 shall be permitted in lieu of compliance with the *U*-factors and *F*-factors in Table C402.1.4 and C402.4 and the maximum allowable fenestration areas in Section C402.4.1.

For buildings with more than one space conditioning category, component performance compliance shall be demonstrated separately for each space conditioning category. Interior partition ceilings, walls, fenestration and floors that separate space conditioning areas shall be applied to the component performance calculations for the space conditioning category with the highest level of space conditioning.

Equation 4-2

$$((A + B + C + D) \leq \text{Zero})$$

Where:

A = Sum of the (UA Dif) values for each distinct assembly type of the building thermal envelope, other than slabs on grade

$$UA \text{ Dif} = UA \text{ Proposed} - UA \text{ Table}$$

$$UA \text{ Proposed} = \text{Proposed } U\text{-value} \times \text{Proposed Area}$$

$$UA \text{ Table} = (U\text{-factor from Table C402.1.4 or C402.4}) \times \text{Area}$$

B = Sum of the (FL Dif) values for each distinct slab-on-grade perimeter condition of the building thermal envelope

$$FL \text{ Dif} = FL \text{ Proposed} - FL \text{ Table}$$

$$FL \text{ Proposed} = \text{Proposed } F\text{-value} \times \text{Proposed Perimeter length}$$

$$FL \text{ Table} = (F\text{-factor specified in Table C402.1.4}) \times \text{Proposed Perimeter length}$$

The maximum allowed prescriptive vertical fenestration area, identified as "Vertical Fenestration Area allowed" in factor CA below, is the gross above-grade wall area times either:

1. 30%
2. 40% if the building complies with Section C402.4.1.1 or Section C402.4.1.4; or

- 3. 40% if the *U*-values used in calculating *A* for vertical fenestration are taken from Section C402.4.1.3 rather than Table C402.4

$$\text{Sum UA-Table} = \text{Sum of UA-Table and FL-Table for each distinct envelope assembly})$$

Where the proposed vertical fenestration area is less than or equal to the Vertical Fenestration Area allowed, the value of *C* (Excess Vertical Glazing Value) shall be zero. Otherwise:

$$C = (CA \times UV) - (CA \times U_{\text{Wall}}), \text{ but not less than zero}$$

$CA = (\text{Proposed Vertical Fenestration Area}) - (\text{Vertical Fenestration Area allowed})$
 $UAW = \text{Sum of the (UA table) values for each above-grade wall assembly}$
 $U_{\text{Wall}} = UAW / (\text{sum of proposed wall area} + CA)$
 $UAV = \text{Sum of the (UA Table) values for each vertical fenestration assembly}$
 $UV = UAV / \text{Total Vertical Fenestration Area allowed}$

Where the proposed skylight area is less than or equal to the skylight area allowed by Section C402.4.1, the value of *D* (Excess Skylight Value) shall be zero. Otherwise:

$$D = (DA \times US) - (DA \times U_{\text{Roof}}), \text{ but not less than zero}$$

$DA = (\text{Proposed Skylight Area}) - (\text{Allowable Skylight Area from Section C402.4.1})$
 $UAR = \text{Sum of the (UA Table) values for each roof assembly}$
 $U_{\text{Roof}} = UAR / (\text{sum of proposed roof area} + DA)$
 $UAS = \text{Sum of the (UA Table) values for each skylight assembly}$
 $US = UAS / \text{the Allowable Skylight Area from Section C402.4.1}$

Where required by other sections of the code Proposed Total Envelope UA and Allowed Total Envelope UA shall be calculated as:

$\text{Proposed Total Envelope UA} = \text{Sum of UA Proposed and FL Proposed for each distinct envelope assembly}$
 $\text{Allowed Total Envelope UA} = \text{Sum UA Table} - C - D$

Where:

Proposed Total UA < Allowable Total UA

Where:

- Proposed Total UA** = UA-glaz-prop + UA sky-prop + UA-opaque-prop + FL-slab-prop
- Allowable Total UA** = UA-glaz-allow + UA-glaz-excess + UA sky-allow + UA-sky-excess + UA-opaque-allow + FL-slab-allow
- UA-glaz-prop** = Sum of (proposed *U*-value x proposed area) for each distinct vertical fenestration type, up to code maximum area
- UA-sky-prop** = Sum of (proposed *U*-value x proposed area) for each distinct skylight type, up to the code maximum area
- UA-opaque-prop** = Sum of (proposed *U*-value x proposed area) for each distinct opaque thermal envelope type
- FL-slab-prop** = Sum of (proposed *F*-value x proposed length) for each distinct slab on grade perimeter assembly
- UA-glaz-allow** = Sum of (code maximum vertical fenestration *U*-value from Table C402.4, or Section C402.4.1.1.2 if applicable, x proposed area) for each distinct vertical fenestration type, not to exceed the code maximum area¹
- UA-glaz-excess** = *U*-value for the proposed wall type from Table C402.4² x vertical fenestration area in excess of the code maximum area
- UA-sky-allow** = Sum of (code maximum skylight *U*-value from Table C402.4 x proposed area) for each distinct skylight type proposed, not to exceed the code maximum area

- UA-sky-excess** ≡ U-value for the proposed roof type from Table C402.4³ x skylight area in excess of the code maximum area
- UA-opaque-allow** ≡ Code maximum opaque envelope U-value from Table C402.1.4 for each opaque door, wall, roof, and floor assembly x proposed area
- FL-slab-allow** ≡ Code maximum F-value for each slab-on-grade perimeter assembly x proposed length

Notes:

- ¹ Where multiple vertical fenestration types are proposed and the code maximum area is exceeded, the U-value shall be the average Table C402.1.4 U-value weighted by the proposed vertical fenestration area of each type.
- ² Where multiple wall types are proposed the U-value shall be the average Table C402.1.4 U-value weighted by the proposed above grade wall area of each type.
- ³ Where multiple roof types are proposed the U-value shall be the average Table C402.1.4 U-value weighted by the proposed roof area of each type.

C402.1.5.1 Component U-factors. The U-factors for typical construction assemblies are included in Chapter 3 and Appendix A. These values shall be used for all calculations. Where proposed construction assemblies are not represented in Chapter 3 or Appendix A, values shall be calculated in accordance with the ASHRAE *Handbook—Fundamentals*, using the framing factors listed in Appendix A.

For envelope assemblies containing metal framing, the U-factor shall be determined by one of the following methods:

1. Results of laboratory measurements according to acceptable methods of test.
2. ASHRAE *Handbook—Fundamentals* where the metal framing is bonded on one or both sides to a metal skin or covering.
3. The zone method as provided in ASHRAE *Handbook—Fundamentals*.
4. Effective framing/cavity R-values as provided in Appendix A.

When return air ceiling plenums are employed, the roof/ceiling assembly shall:

- a. For thermal transmittance purposes, not include the ceiling proper nor the plenum space as part of the assembly; and
- b. For gross area purposes, be based upon the interior face of the upper plenum surface.

5. Tables in ASHRAE 90.1 Normative Appendix A.

6. Calculation method for steel-framed walls in accordance with Section C402.1.4.1 and Table C402.1.4.1.

C402.1.5.2 SHGC rate calculations. Fenestration SHGC values for individual components and/or fenestration are permitted to exceed the SHGC values in Table C402.4 and/or the maximum allowable fenestration areas in Section C402.4.1

where the proposed values result in SHGCA_p less than SHGCA_t as determined by Equations 4-3 and 4-4.

Equation 4-3—((Target SHGCA_t Equation C402-3 Target SHGCA_t)) SHGC Rate Calculations

$$((SHGCA_t - SHGC_{ogt}(A_{ogt}) + SHGC_{vgt} - (A_{vgt} + A_{vgmt} + A_{vgmot} + A_{vgdt}))$$

Where:

- SHGCA_t = The target combined solar heat gain of the target fenestration area.
- SHGC_{ogt} = The solar heat gain coefficient for skylight fenestration found in Table C402.4.
- A_{ogt} = The target skylight area.
- SHGC_{vgt} = The solar heat gain coefficient for vertical fenestration found in Table C402.4 which corresponds to the proposed total fenestration area as a percentage of gross exterior wall.
- A_{vgt} = The target vertical fenestration area with nonmetal framing.
- A_{vgmt} = The target vertical fenestration area with fixed metal framing.
- A_{vgmot} = The target vertical fenestration area with operable metal framing.
- A_{vgdt} = The proposed vertical fenestration area of entrance doors.

NOTE: The vertical fenestration area does not include opaque doors and opaque spandrel panels.)

Proposed Total SHGCxA ≤ 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
- 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, not to exceed the code maximum area

- SHGCxA-sky-allow ≡ Sum of (code maximum skylight SHGC from Table C402.4x proposed area) for each distinct skylight type, not to exceed the code maximum area

If the proposed vertical fenestration area does not exceed the Vertical Fenestration Area allowed, the target area for each vertical fenestration type shall equal the proposed area. If the proposed vertical fenestration area exceeds the Vertical Fenestration Area allowed, the target area of each vertical fenestration element shall be reduced in the base envelope design by the same percentage and the net area of each above-grade wall type increased proportionately by the same percentage so that the total vertical fenestration area is exactly equal to the Vertical Fenestration Area allowed.

If the proposed skylight area does not exceed the Allowable Skylight Area from Section C402.4.1, the target area shall equal the proposed area. If the proposed skylight area exceeds the Allowable Skylight Area from Section C402.4.1, the area of each skylight element shall be reduced in the base envelope design by the same percentage and the net area of each roof type increased proportionately by the same percentage so that the total skylight area is exactly equal to the allowed percentage per Section C402.3.1 of the gross roof area.

**((Equation 4-4
Proposed SHGCA_p**

$$SHGCA_p = SHGC_{og}A_{eg} + SHGC_{vg}A_{vg}$$

Where:

SHGCA_t = **The combined proposed solar heat gain of the proposed fenestration area.**

SHGC_{og} = **The solar heat gain coefficient of the skylights.**

A_{eg} = **The skylight area.**

SHGC_{vg} = **The solar heat gain coefficient of the vertical fenestration.**

A_{vg} = **The vertical fenestration area.**

NOTE: **The vertical fenestration area does not include opaque doors and opaque spandrel panels.))**

AMENDATORY SECTION (Amending WSR 19-02-089, filed 1/2/19, effective 7/1/19)

WAC 51-11C-40406 Section C404.6—Pipe insulation.

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 ((~~C403.2.9~~) C403.10.3). 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 ((~~C403.2.9~~) C403.10.3) or the heat trace manufacturer's instructions. Tubular pipe insulation shall be installed in accordance with the insulation manufacturer's instructions. Pipe insulation shall be continuous, including through hangers and supports, such that thermal bridging is prevented, except where the piping passes through a framing member. The minimum insulation thickness requirements of this section shall not supersede any greater insulation thickness requirements necessary for the protection of piping from freezing temperatures or the protection of personnel against external surface temperatures on the 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 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 C404.6.

AMENDATORY SECTION (Amending WSR 19-02-089, filed 1/2/19, effective 7/1/19)

WAC 51-11C-50300 Section C503—Alterations.

C503.1 General. Alterations to any building or structure shall comply with the requirements of Section C503 and the code for new construction. Alterations to an existing building, building system or portion thereof shall conform to the provisions of this code as they relate to new construction without requiring the unaltered portions of the existing building or building system to comply with this code. Alterations shall be such that the existing building or structure is no less conforming with the provisions of this code than the existing building or structure was prior to the alteration. ((~~Alterations~~

to an existing building, building system or portion thereof shall conform to the provisions of this code as they relate to new construction without requiring the unaltered portions of the existing building or building system to comply with this code. Alterations shall not create an unsafe or hazardous condition or overload existing building systems.)

EXCEPTION: The following alterations need not comply with the requirements for new construction provided the energy use of the building is not increased:

1. Storm windows installed over existing fenestration.
2. Surface applied window film installed on existing single pane fenestration assemblies to reduce solar heat gain provided the code does not require the glazing fenestration to be replaced.
3. Existing ceiling, wall or floor cavities exposed during construction provided that these cavities are insulated to full depth with insulation having a minimum nominal value of R-3.0 per inch installed per Section C402.
4. Construction where the existing roof, wall or floor cavity is not exposed.
5. *Roof recover.*
6. *Air barriers* shall not be required for *roof recover* and roof replacement where the *alterations* or renovations to the building do not include *alterations*, renovations or *repairs* to the remainder of the building envelope.
7. Replacement of existing doors that separate conditioned space from the exterior shall not require the installation of a vestibule or revolving door, provided however that an existing vestibule that separates a conditioned space from the exterior shall not be removed.

C503.2 Change in space conditioning. Any ~~((nonconditioned))~~ low energy space in accordance with Section C402.1.1.1 that is altered to become *conditioned space* or *semi-heated space* shall be ~~((required to be))~~ brought into full compliance with this code. Any semi-heated space in accordance with Section C402.1.1.2 that is altered to become conditioned space shall be required to be brought into full compliance with this code.

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.

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.

EXCEPTION: ~~((Where the component performance building envelope option in Section C402.1.5 is used to comply with this Section, the Proposed Total Envelope UA is allowed to be up to 110 percent of the Allowed Total Envelope UA. Where the total building performance option in Section C407 is used to comply with this section, the annual energy consumption of the proposed design is allowed to be 110 percent of the annual energy consumption otherwise allowed by Section C407.3.))~~

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:

1. Where the component performance alternative in Section C402.1.5 is used to demonstrate compliance with this Section, the Proposed Total UA is allowed to be up to 110 percent of the Allowable Total UA. This exception may be applied to the project area alone, or to the existing building and project area combined as a whole building.

2. 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 be applied to the project area alone, or to the existing building and project area combined as a whole building.

C503.3 Building envelope. New building envelope assemblies that are part of the alteration shall comply with Sections C402.1 through C402.5 as applicable.

EXCEPTION: Air leakage testing is not required for alterations and repairs, unless the project includes a change in space conditioning according to Section C503.2 or a change of occupancy or use according to Section C505.1.

C503.3.1 Roof replacement. *Roof replacements* shall comply with Table C402.1.3 or C402.1.4 where the existing roof assembly is part of the *building thermal envelope* and contains insulation entirely above the roof deck.

C503.3.2 Vertical fenestration. The addition of *vertical fenestration* that results in a total building vertical fenestration area less than or equal to that specified in Section C402.4.1 shall comply with Section C402.4. ~~((Alterations))~~ The addition of vertical fenestration that result in a total building vertical fenestration area greater than specified in Section C402.4.1 shall comply with one of the following:

1. Vertical fenestration alternate ~~((per))~~ in accordance with Section C402.1.3 for the new vertical fenestration added.

2. Vertical fenestration alternate ~~((per))~~ in accordance with Section C402.4.1.1 for the area adjacent to the new vertical fenestration added.

3. Existing building and alteration area are combined to demonstrate compliance with the component performance ~~((option with target area adjustment per))~~ alternate in accordance with Section C402.1.5 ~~((or the))~~ for the whole building. The Proposed Total UA is allowed to be up to 110 percent of the Allowed Total UA.

4. Total building performance ~~((option))~~ in accordance with Section C407 for the whole building. The 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 in accordance with Section C407.3.

EXCEPTION: Additional envelope upgrades are included in the project so the addition of vertical fenestration does not cause a reduction in overall building energy efficiency, as approved by the code official.

C503.3.2.1 Application to replacement fenestration products. Where some or all of an existing *fenestration* unit is replaced with a new *fenestration* product, including sash and glazing, the replacement *fenestration* unit shall meet the

applicable requirements for *U*-factor and *SHGC* in Table C402.4.

EXCEPTION: An area-weighted average of the *U*-factor of replacement fenestration products being installed in the building for each fenestration product category listed in Table C402.4 shall be permitted to satisfy the *U*-factor requirements for each fenestration product category listed in Table C402.4. Individual fenestration products from different product categories listed in Table C402.4 shall not be combined in calculating the area-weighted average *U*-factor.

C503.3.3 Skylight area. The addition of *skylights* that results in a total building skylight area less than or equal to that specified in Section C402.4.1 shall comply with Section C402.4. (~~(Alterations)~~) The addition of *skylights* that results in a total building skylight area greater than that specified in Section C402.4.1 shall comply with one of the following:

1. Existing building and alteration area are combined to demonstrate compliance with the component performance (~~(option)~~) alternative with target area adjustment (~~(per)~~) in accordance with Section C402.1.5 (~~(or the)~~) for the whole building. The Proposed Total UA is allowed to be up to 110 percent of the Allowed Total UA.

2. Total building performance (~~(option)~~) in accordance with Section C407 for the whole building. The 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 in accordance with Section C407.3.

EXCEPTION: Additional envelope upgrades are included in the project so the addition of skylights does not cause a reduction in overall building energy efficiency, as approved by the code official.

C503.4 Mechanical systems. Those parts of systems which are altered or replaced shall comply with Section C403. Additions or alterations shall not be made to an existing mechanical system that will cause the existing mechanical system to become out of compliance.

EXCEPTIONS:

- Existing mechanical systems which are altered or where parts of the systems are replaced are not required to be modified to comply with Section (~~(C403.6)~~) C403.3.5 as long as mechanical cooling capacity is not added to (~~(the)~~) a system that did not have cooling capacity prior to the alteration.
- Alternate mechanical system designs that are not in full compliance with this code may be approved when the code official determines that existing building constraints including, but not limited to, available mechanical space, limitations of the existing structure, or proximity to adjacent air intakes or exhausts makes full compliance impractical. Alternate designs shall include additional energy saving strategies not prescriptively required by this code for the scope of the project including, but not limited to, demand control ventilation, energy recovery, or increased mechanical cooling or heating equipment efficiency above that required by Tables C403.3.2(1) through C403.3.2(12).

3. Only those components of existing HVAC systems that are altered or replaced shall be required to meet the requirements of Section C403.8.1. Allowable fan motor horsepower. Components replaced or altered shall not exceed the fan power limitation pressure drop adjustment values in Table C403.8.1(2) at design conditions. Section C403.8.1 does not require the removal and replacement of existing system ductwork.

C503.4.1 New mechanical systems. All new mechanical systems in existing buildings, including packaged unitary equipment and packaged split systems, shall comply with Section C403.

C503.4.2 Addition of cooling capacity. Where mechanical cooling is added to a space that was not previously cooled, the mechanical system shall comply with either Section (~~(C403.6 or C403.3)~~) C403.3.5 or C403.5.

EXCEPTIONS:

- (~~Alternate designs that are not in full compliance with this code may be approved when the code official determines that existing building constraints including, but not limited to, available mechanical space, limitations of the existing structure, or proximity to adjacent air intakes/exhausts make full compliance impractical. Alternate designs shall provide alternate energy savings strategies including, but not limited to, Demand Control Ventilation or increased mechanical cooling or heating efficiency above that required by Tables C403.2.3(1) through C403.2.3(10).~~)
- Qualifying small equipment: (~~This exception shall not be used for unitary cooling equipment installed outdoors or in a mechanical room adjacent to the outdoors. This exception is allowed to be used for other~~) Economizers are not required for cooling units and split systems serving one zone with a total cooling capacity rated in accordance with Section (~~(C403.2.3)~~) C403.3.2 of less than 33,000 Btu/h (hereafter referred to as qualifying small systems) provided that these are high-efficiency cooling equipment with SEER and EER values more than 15 percent higher than minimum efficiencies listed in Tables (~~(C403.2.3)~~) C403.3.2 (1) through (3), in the appropriate size category, using the same test procedures. Equipment shall be listed in the appropriate certification program to qualify for this exception. The total capacity of all qualifying small equipment without economizers shall not exceed 72,000 Btu/h per building, or 5 percent of (~~(its)~~) the building total air economizer capacity, whichever is greater. (~~That~~)

Notes and exclusions for Exception 1:

1.1. The portion of the equipment serving Group R occupancies is not included in determining the total capacity of all units without economizers in a building.

1.2. Redundant units are not counted in the capacity limitations.

1.3. This exception shall not be used for the initial tenant improvement of a shell-and-core (~~(permit)~~) building or space, or for (~~(the initial tenant improvement or for)~~) Total Building Performance in accordance with Section C407.

(~~(3-)~~) 1.4. This exception shall not be used for unitary cooling equipment installed outdoors or in a mechanical room adjacent to the outdoors.

2. Chilled water terminal units connected to systems with chilled water generation equipment with IPLV values more than 25 percent higher than minimum part load equipment efficiencies listed in Table ((C403.2.3)) C403.3.2(7), in the appropriate size category, using the same test procedures. Equipment shall be listed in the appropriate certification program to qualify for this exception. The total capacity of all systems without economizers shall not exceed 480,000 Btu/h per building, or 20 percent of ((its)) the building total air economizer capacity, whichever is greater. ((That))

Notes and exclusions for Exception 2:

2.1. The portion of the equipment serving Group R occupancy is not included in determining the total capacity of all units without economizers in a building.

2.2. This exception shall not be used for the initial ((permit (this includes any initial permit for the space including, but not limited to, the shell and core permit, built-to-suit permit, and tenant improvement permit) or for Total Building Performance Method)) tenant improvement of a shell-and-core building or space, or for total building performance in accordance with Section C407.

C503.4.3 Alterations or replacement of existing cooling systems. Alterations to, or replacement of, existing mechanical cooling systems shall not decrease the building total econ-

omizer capacity unless the system complies with either Section ((C403.2.6 or C403.3. In addition, for existing mechanical cooling systems that do not comply with either Section C403.2.6 or C403.3, including both the individual unit size limits)) C403.3.5 or C403.5. System alterations or replacement shall comply with Table C503.4 when the individual cooling unit capacity and the ((total)) building total capacity ((limits on units)) of all cooling equipment without economizer(;; other alterations shall comply with Table C503.4) do not comply with Section C403.3.5 or C403.5.

C503.4.4 Controls for cooling equipment replacement.

When space cooling equipment is replaced, controls shall comply with all requirements under Section ((C403.6)) C403.3.5 and related subsections ((or provide for integrated operation with economizer in accordance with Section C403.3.1)), and Section C403.5.1 for integrated economizer control.

C503.4.5 Cooling equipment relocation. Existing equipment currently in use may be relocated within the same floor or same tenant space if removed and reinstalled within the same permit.

**Table C503.4
Economizer Compliance Options for Mechanical Alterations**

	Option A	Option B (alternate to A)	Option C (alternate to A)	Option D (alternate to A)
Unit Type	Any alteration with new or replacement equipment	Replacement unit of the same type with the same or smaller output capacity	Replacement unit of the same type with a larger output capacity	New equipment added to existing system or replacement unit of a different type
1. Packaged Units	Efficiency: min.(([†])) ^a Economizer: ((C403.3 ²)) C403.5 ^b	Efficiency: min.(([†])) ^a Economizer: ((C403.3 ^{2,3})) C403.5 ^b	Efficiency: min.(([†])) ^a Economizer: ((C403.3 ^{2,3})) C403.5 ^b	Efficiency: min.(([†])) ^a Economizer: ((C403.3 ^{2,4})) C403.5 ^b
2. Split Systems	Efficiency: min.(([†])) ^a Economizer: ((C403.3 ²)) C403.5 ^b	For units ≤ 60,000 Btuh, comply with two of two measures: 1. Efficiency: + ((10/5% ⁵)) 10% ⁶ 2. Economizer: shall not decrease existing economizer capability	((Only for new)) For units ((< 54,000)) ≤ 60,000 Btuh replacing unit installed prior to 1991 (([†])) comply with at least one of two(([†])) measures: 1. Efficiency: + ((10/5% ⁵)) 10% ⁶ 2. Economizer: 50%((⁶)) ^f	Efficiency: min.(([†])) ^a Economizer: ((C403.3 ^{2,4})) C403.5 ^b
		For all other capacities: Efficiency: min. ^a Economizer: C403.5 ^b	((For units > 54,000 Btuh or any units installed after 1991: Option A)) For all other capacities: Efficiency: min. ^a Economizer: C403.5 ^b	
3. Water Source Heat Pump	Efficiency: min.(([†])) ^a Economizer: ((C403.3 ²)) C403.5 ^b	((two of three): Efficiency: + 10/5% ⁵) For units ≤ 72,000 Btuh, comply with at least two of three measures: 1. Efficiency: +10% ⁶ 2. Flow control valve((⁷)) ^g 3. Economizer: 50%((⁶)) ^f	((three of three): Efficiency: + 10/5% ⁵) For units ≤ 72,000 Btuh, comply with at least three of three measures: 1. Efficiency: +10% ⁶ 2. Flow control valve((⁷)) ^g 3. Economizer: 50%((⁶)) ^f (except for certain pre-1991 systems((⁸)) ^d)	Efficiency: min.(([†])) ^a Economizer: ((C403.3 ^{2,4})) C403.5 ^b (except for certain pre-1991 systems((⁸)) ^d)

	Option A	Option B (alternate to A)	Option C (alternate to A)	Option D (alternate to A)
Unit Type	Any alteration with new or replacement equipment	Replacement unit of the same type with the same or smaller output capacity	Replacement unit of the same type with a larger output capacity	New equipment added to existing system or replacement unit of a different type
		For all other capacities: Efficiency: min. ^a Economizer: C403.5 ^b	For all other capacities: Efficiency: min. ^a Economizer: C403.5 ^b	
4. ((Hydronic)) Water Economizer using Air-Cooled Heat Rejection Equipment (Dry Cooler)	Efficiency: min.(([†])) ^a Economizer: ((C403.3 ²)) C403.5 ^b	Efficiency: + ((10/5% ⁵)) 5% ^d Economizer: shall not decrease existing economizer capacity	((Option A)) Efficiency: min. ^a Economizer: C403.5 ^b	Efficiency: min.(([†])) ^a Economizer: ((C403.3 ^{2/4})) C403.5 ^b
5. Air-Handling Unit (including fan coil units) where the system has an air-cooled chiller	Efficiency: min.(([†])) ^a Economizer: ((C403.3 ²)) C403.5 ^b	Economizer: shall not decrease existing economizer capacity	((Option A)) Efficiency: min. ^a Economizer: C403.5 ^b (except for certain pre-1991 systems(⁸)) ^d)	((Option A)) Efficiency: min. ^a Economizer: C403.5 ^b (except for certain pre-1991 systems(⁸)) ^d)
6. Air-Handling Unit (including fan coil units) and Water-cooled Process Equipment, where the system has a water-cooled chiller ¹⁰	Efficiency: min.(([†])) ^a Economizer: ((C403.3 ²)) C403.5 ^b	Economizer: shall not decrease existing economizer capacity	((Option A)) Efficiency: min. ^a Economizer: C403.5 ^b (except for certain pre-1991 systems(⁸)) ^d and certain ((1991-2004)) 1991-2016 systems(⁹) ⁱ)	Efficiency: min.(([†])) ^a Economizer: ((C403.3 ^{2/4})) C403.5 ^b (except for certain pre-1991 systems(⁸)) ^d and certain ((1991-2015)) 1991-2016 systems(⁹) ⁱ)
7. Cooling Tower	Efficiency: min.(([†])) ^a Economizer: ((C403.3 ²)) C403.5 ^b	No requirements	((Option A)) Efficiency: min. ^a Economizer: C403.5 ^b	((Option A)) Efficiency: min. ^a Economizer: C403.5 ^b
8. Air-Cooled Chiller	Efficiency: min.(([†])) ^a Economizer: ((C403.3 ²)) C403.5 ^b	Efficiency: + ((5% ¹¹)) 10% ^k Economizer: shall not decrease existing economizer capacity	Efficiency ((two of two)); Comply with two of two measures: ((1)) 1. + 10%((¹²)) ^{k,l} and ((2)) 2. Multistage compressor(s) Economizer: shall not decrease existing economizer capacity	Efficiency: min.(([†])) ^a Economizer: ((C403.3 ^{2/4})) C403.5 ^b
9. Water-Cooled Chiller	Efficiency: min.(([†])) ^a Economizer: ((C403.3 ²)) C403.5 ^b	Efficiency ((one of two)); Comply with at least one of two measures: ((1)) 1. Part load IPLV + ((10% ¹³)) 15% ^m or ((2)) 2. Plate frame heat exchanger(¹⁵) ⁿ Economizer: shall not decrease existing economizer capacity	Efficiency ((two of two)); Comply with two of two measures: ((1)) 1. Part load IPLV + 15%((¹⁴ and (2)) ⁿ) 2. Plate-frame heat exchanger(¹⁵) ⁿ Economizer: shall not decrease existing economizer capacity	Efficiency: min.(([†])) ^a Economizer: ((C403.3 ^{2/4})) C403.5 ^b
((10. Boiler	Efficiency: min. ¹ Economizer: C403.3 ²	Efficiency: + 8% ¹⁶ Economizer: shall not decrease existing economizer capacity	Efficiency: + 8% ¹⁶ Economizer: shall not decrease existing economizer capacity	Efficiency: min. ¹ Economizer: C403.3 ^{2/4})

([†]) Minimum equipment efficiency shall comply with Section ((C403.2.3)) C403.3.2 and Tables ((C403.2.3)) C403.3.2(1) through ((C403.2.3(10)) C403.3.3.2(12).

(²) ((System and building shall comply)) All separate new equipment and replacement equipment shall have air economizer complying with Section ((C403.3)) C403.5 ((f))including both the individual unit size limits and the total building capacity limits on units without economizer((h)). It is acceptable to comply using one of the exceptions to Section ((C403.3 or C504.3.4)) C403.5.

(²) All equipment replaced in an existing building shall have air economizer complying with Section C403.3 unless both the individual unit size and the total capacity of units without air economizer in the building is less than that allowed in Exception 2 to Section C503.4.

⁴ All separate new equipment added to an existing building shall have air economizer complying with Section C403.3 unless both the individual unit size and the total capacity of units without air economizer in the building is less than that allowed in Exception 3 to Section C503.4.)

^e Reserved.

- ^d Equipment shall have a capacity-weighted average cooling system efficiency that is 5% better than the requirements in Tables C403.3.2(1) and C403.3.2(2) (1.05 x values in Tables C403.3.2(1) and C403.3.2(2)).
- ⁽⁵⁾ Equipment shall have a capacity-weighted average cooling system efficiency that is 10% better than the requirements in Tables C403.3.2(1)A and C403.3.2(2) (1.10 x values in Tables C403.3.2(1)A and C403.3.2(2)).
- ^(a) For units with a cooling capacity below 54,000 Btuh, a minimum of 10% greater than the requirements in Tables C403.2.3(1) and C403.2.3(2).
- ^b For units with a cooling capacity of 54,000 Btuh and greater, a minimum of 5% greater than the requirements in Tables C403.2.3(1) and C403.2.3(2).)
- ⁽⁶⁾ Minimum of 50% air economizer that is ducted in a fully enclosed path directly to every heat pump unit in each zone, except that ducts may terminate within 12 inches of the intake to an HVAC unit provided that they are physically fastened so that the outside air duct is directed into the unit intake. If this is an increase in the amount of outside air supplied to this unit, the outside air supply system shall be configured to provide this additional outside air and be equipped with economizer control.
- ⁽⁷⁾ Water-source heat pump systems shall have a flow control valve to eliminate flow through the heat pumps that are not in operation ((with)) and variable speed pumping control complying with Section ((C403.4.2)) C403.4.3 for that heat pump.
 - When the total capacity of all units with flow control valves exceeds 15% of the total system capacity, a variable frequency drive shall be installed on the main loop pump.
 - As an alternate to this requirement, ((have a)) the capacity-weighted average cooling system efficiency ((that is 5% greater)) shall be 5% better than the requirements in ((note 5)) footnote ^e for water-source heat pumps (i.e., a minimum of ((15%/10%)) 15% greater than the requirements in Table((s C403.2.3(1) and C403.2.3(2))) C403.3.2(2)).
- ⁽⁸⁾ Systems installed prior to 1991 without fully utilized capacity are allowed to comply with Option B, provided that the individual unit cooling capacity does not exceed 90,000 Btuh.)
- ^h Water economizer equipment shall have a capacity-weighted average cooling system efficiency that is 10% better than the requirements in Tables C403.3.2(8) and C403.3.2(9) (1.10 x values in Tables C403.3.2(8) and C403.3.2(9)).
- ⁽⁹⁾ Air economizer is not required for systems installed with water economizer plate and frame heat exchanger complying with previous codes between 1991 and June 2016, provided that the total fan coil load does not exceed the existing or added capacity of the heat exchangers.
- ⁽¹⁰⁾ For water-cooled process equipment where the manufacturers specifications require colder temperatures than available with waterside economizer, that portion of the load is exempt from the economizer requirements.
- ⁽¹¹⁾ The air-cooled chiller shall have an IPLV efficiency that is a minimum of ((5%)) 10% greater than the IPLV requirements in EER in Table ((C403.2.3(7)) C403.3.2(7)(1.10 x IPLV values in EER in Table C403.3.2(7)).
- ⁽¹²⁾ The air-cooled chiller shall ((:)) be multistage with a minimum of two compressors.
 - ^(a) Have an IPLV efficiency that is a minimum of 10% greater than the IPLV requirements in Table C403.2.3(7); and
 - ^b Be multistage with a minimum of two compressors.
- ⁽¹³⁾ The water-cooled chiller shall have ((an)) full load and part load IPLV efficiency that is a minimum of ((40%)) 5% greater than the IPLV requirements in Table C403.2.3(7).
- ⁽¹⁴⁾ The water-cooled chiller shall have an IPLV ((efficiency)) value that is a minimum of 15% ((greater)) lower than the IPLV requirements in Table C403.2.3(7) (1.15 x IPLV values in Table C403.3.2(7)). Water-cooled centrifugal chillers designed for nonstandard conditions shall have an NPLV value that is at least 15% lower than the adjusted maximum NPLV rating in kW per ton defined in Section C403.3.2.1 (1.15 x NPLV).
- ⁽¹⁵⁾ Economizer cooling shall be provided by adding a plate-frame heat exchanger on the waterside with a capacity that is a minimum of 20% of the chiller capacity at standard AHRI rating conditions.
- ⁽¹⁶⁾ The replacement boiler shall have an efficiency that is a minimum of 8% higher than the value in Table C403.2.3(5), except for electric boilers.)
- ^p Reserved.
- ^q Systems installed prior to 1991 without fully utilized capacity are allowed to comply with Option B, provided that the individual unit cooling capacity does not exceed 90,000 Btuh.

C503.5 Service hot water systems. New service hot water systems that are part of the alteration shall comply with Section C404.

C503.6 Lighting, controlled receptacles and motors. Alterations or the addition of lighting, electric receptacles and motors shall comply with Sections C503.6.1 through C503.6.6.

C503.6.1 Luminaire additions and alterations. Alterations that add or replace 50 percent or more of the luminaires in a space enclosed by walls or ceiling-height partitions, replace 50 percent or more of parking garage luminaires, or replace 50 percent or more of the total installed wattage of exterior luminaires shall comply with Sections C405.4 and C405.5. Where less than 50 percent of the fixtures in an interior space enclosed by walls or ceiling-height partitions or in a parking

garage are ((new)) added or replaced, or less than 50 percent of the installed exterior wattage is ((altered)) replaced, the installed lighting wattage shall be maintained or reduced.

C503.6.2 Rewiring and recircuiting. Where new wiring is being installed to serve added fixtures and/or fixtures are being relocated to a new circuit, controls shall comply with Sections C405.2.1, C405.2.3, C405.2.4, C405.2.5, C405.2.7((-C405.3)), and as applicable C408.3. ((In addition, office areas less than 300 ft² enclosed by walls or ceiling-height partitions, and all meeting and conference rooms, and all school classrooms, shall be equipped with occupancy sensors that comply with Section C405.2.1 and C408.3.)) New lighting control devices shall comply with the requirements of Section C405.2.

C503.6.3 New or moved lighting panel. Where a new lighting panel (or a moved lighting panel) with all new raceway and conductor wiring from the panel to the fixtures is being installed, controls shall also comply with ~~((the other))~~, in addition to the requirements of Section C503.6.2, all remaining requirements in Sections C405.2 and C408.3.

C503.6.4 Newly-created rooms. Where new walls or ceiling-height partitions are added to an existing space and create a new enclosed space, but the lighting fixtures are not being changed, other than being relocated, the new enclosed space shall have controls that comply with Sections C405.2.1, C405.2.2, C405.2.3, C405.2.4, C405.2.5 and C408.3.

C503.6.5 Motors. Those motors which are altered or replaced shall comply with Section C405.8.

C503.6.6 Controlled receptacles. Where electric receptacles are added or replaced, controlled receptacles shall be provided in accordance with Section C405.10.

EXCEPTIONS:

1. Where an alteration project impacts an area smaller than 5,000 square feet, controlled receptacles are not required.
2. Where existing systems furniture or partial-height relocatable office cubical partitions are reconfigured or relocated within the same area, controlled receptacles are not required in the existing systems furniture or office cubicle partitions.
3. Where new or altered receptacles meet the exception to Section C405.10, they are not required to be controlled receptacles or be located within 12 inches of non-controlled receptacles.

C503.7 Refrigeration systems. Those parts of systems which are altered or replaced shall comply with Section C410. Additions or alterations shall not be made to an existing refrigerated space or system that will cause the existing mechanical system to become out of compliance. All new refrigerated spaces or systems in existing buildings, including refrigerated display cases, shall comply with Section C410.

AMENDATORY SECTION (Amending WSR 19-02-089, filed 1/2/19, effective 7/1/19)

WAC 51-11C-50500 Section C505—Change of occupancy or use.

C505.1 General. Spaces undergoing a change in occupancy shall be brought up to full compliance with this code in the following cases:

1. Any space that is converted from an F, S or U occupancy to an occupancy other than F, S or U.
2. Any space that is converted to a Group R dwelling unit or portion thereof, from another use or occupancy.
3. Any Group R dwelling unit or portion thereof permitted prior to July 1, 2002, that is converted to a commercial use or occupancy.

~~((Where the use in a space changes from one use in Table C405.4.2 (1) or (2) to another use in Table C405.4.2 (1) or (2), the installed lighting wattage shall comply with Section C405.4.~~

EXCEPTION: Where the component performance alternative in Section C402.1.5 is used to comply with this section, the Proposed Total Envelope UA is allowed to be up to 110 percent of the Allowed Total Envelope UA. Where the total building performance option in Section C407 is used to comply with this section, the annual energy consumption of the proposed design is allowed to be 110 percent of the annual energy consumption otherwise allowed by Section C407.3.))

A change in occupancy 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.

EXCEPTION: Buildings or spaces that were permitted prior to the 2009 WSEC may comply with this section as follows:

1. Where the component performance alternative in Section C402.1.5 is used to demonstrate compliance with this section, the Proposed Total UA is allowed to be up to 110 percent of the Allowable Total UA. This exception may be applied to the project area alone, or to the existing building and project area combined as a whole building.
2. Where total building performance in 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 110 percent of the annual carbon emissions from energy consumption allowed by Section C407.3. This exception may be applied to the project area alone, or to the existing building and project area combined as a whole building.

Where the use in a space changes from one use in Table C405.4.2 (1) or (2) to another use in Table C405.4.2 (1) or (2), the installed lighting wattage shall comply with Section C405.4.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40501 Section C405.1—General.

C405.1 General ~~((**mandatory**))~~. This section covers lighting system controls, the maximum lighting power for interior and exterior applications, electrical energy consumption, vertical and horizontal transportation systems, and minimum efficiencies for motors and transformers.

~~((EXCEPTION: Dwelling units within commercial buildings shall not be required to comply with Sections C405.2 through C405.6 provided that they comply with Section R404.1.))~~

Dwelling units within multifamily buildings shall comply with Sections C405.1.1 and C405.7. All other dwelling units in dormitory, hotel and other residential occupancies that are not classified as multifamily residential occupancies shall comply with Section C405.2.5 and Section C405.1.1 or Section C405.4. Sleeping units shall comply with Section C405.2.5 and Section C405.1.1 or Section C405.4.

Lighting installed in walk-in coolers, walk-in freezers, refrigerated warehouse coolers and refrigerated warehouse freezers shall comply with the lighting requirements of Section C410.2.

Transformers, uninterruptable power supplies, motors and electrical power processing equipment in data center sys-

tems shall comply with Section 8 of ASHRAE Standard 90.4 in addition to this code.

C405.1.1 Dwelling and sleeping unit lighting efficacy. No less than 90 percent of the lamps serving *dwelling units* or *sleeping units* shall be provided by light emitting diodes (LED), T-8 or smaller diameter linear fluorescent lamps, or other lamps with a minimum efficacy of 65 lumens per watt.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40502 Section C405.2—Electrical power and lighting systems.

C405.2 Lighting controls ~~((**mandatory**))~~. Lighting systems shall be provided with controls ~~((as specified in Sections C405.2.1 through C405.2.8))~~ that comply with one of the following:

1. Lighting controls as specified in Sections C405.2.1 through C405.2.8.

2. Luminaire level lighting controls (LLC) and lighting controls as specified in Sections C405.2.1, C405.2.3 and C405.2.5. The LLC luminaire shall be independently configured to:

2.1. Monitor occupant activity to brighten or dim lighting when occupied or unoccupied, respectively.

2.2. Monitor ambient light, both electric and daylight, and brighten or dim artificial light to maintain desired light level.

2.3. For each control strategy, configuration and reconfiguration of performance parameters including: Bright and dim setpoints, timeouts, dimming fade rates, sensor sensitivity adjustments, and wireless zoning configuration.

EXCEPTION: Except for specific application controls required by Section C405.2.5, lighting controls are not required for the following:

1. Areas designated as security or emergency areas that are required to be continuously lighted.

2. ~~((Interior exit stairways, interior exit ramps, and exit passageways-))~~ Means of egress illumination serving the exit access that does not exceed 0.02 watts per square foot of building area.

3. Emergency egress lighting that is normally off.

4. Industrial or manufacturing process areas, as may be required for production and safety.

~~((5. Luminaire-level lighting controls that control interior lighting. The LLC luminaire shall be independently configured to:~~

~~5.1. Monitor occupant activity to brighten or dim its lighting when occupied or unoccupied, respectively.~~

~~5.2. Monitor ambient light (both electric light and daylight) and brighten or dim electric light to maintain desired light level.~~

~~5.3. Configuration and reconfiguration of performance parameters, including bright and dim setpoints, timeouts, dimming fade rates, sensor sensitivity adjustments, and wireless zoning configurations, for each control strategy.~~

~~5.4. Meet the operational and commissioning requirements of Sections C405.2.1, C405.2.2, C405.2.3, C405.2.4 and C408.)~~

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-405021 Section C405.2.1—Occupant sensor controls.

C405.2.1 Occupant sensor controls. Occupant sensor controls shall be installed to control lights in the following space types:

1. Classrooms/lecture/training rooms.
2. Conference/meeting/multipurpose rooms.
3. Copy/print rooms.
4. Lounges/breakrooms.
5. ~~((Employee lunch and break rooms.))~~ Enclosed offices.

~~((Private offices-))~~ Open plan office areas.

7. Restrooms.

8. Storage rooms.

9. ~~((Janitorial closets.~~

~~10-))~~ Locker rooms.

~~((4-))~~ 10. Other spaces 300 square feet (28 m²) or less that are enclosed by floor-to-ceiling height partitions.

~~((2-))~~ 11. Warehouse((s-)) storage areas.

12. Enclosed fire rated stairways.

13. Service corridors.

14. Covered parking areas.

Occupant sensor controls in warehouse storage areas, corridors, and library stacks, shall comply with Section C405.2.1.2. Occupant sensor controls in fire rated stairways shall comply with Section C405.2.1.5. Occupant sensor controls in open plan office areas shall comply with Section C405.2.1.3. Occupant sensor controls in covered parking areas shall comply with Section C405.2.1.4. Occupant sensor controls for all other spaces shall comply with Section C405.2.1.1.

EXCEPTIONS:

1. Corridors in manufacturing facilities.
2. General lighting and task lighting in shop and laboratory classrooms.
3. Digital timer switch controls may be provided in lieu of occupant sensor controls in the following space types in under 300 square feet: Copy/print rooms, storage rooms, and janitorial closets. Digital timer switches shall comply with the following:
 - 3.1. Turn lights on or off with operation of a button, switch or other manual means.
 - 3.2. Automatically turn lights off within 15 minutes of the lights being turned on. The means for setting the time delay shall not be visible on the front of the switch.
 - 3.3. The switch shall provide both audible and visual indication of impending time-out of the switch. Audible and visual indication shall be given at least once within 5 minutes of time-out of the switch. Visual indication shall consist of turning the lights momentarily off, and then back on.

C405.2.1.1 Occupant sensor control function. Occupant sensor controls shall comply with all of the following:

1. They shall be configured to automatically turn off lights within ((30)) 20 minutes of all occupants leaving the space.

2. They shall be manual on or (~~controlled~~) configured to automatically turn the lighting on to not more than 50 percent power.

EXCEPTION: Full automatic-on controls shall be permitted to control lighting in public corridors, stairways, restrooms, primary building entrances areas and lobbies, and areas where manual-on operation would endanger the safety or security of the room or building occupants.

3. They shall incorporate a manual control to allow occupants to turn lights off.

C405.2.1.2 Occupant sensor control function in warehouses~~(-In warehouses, the lighting in aiseways and open areas shall be controlled with occupant sensors that automatically reduce lighting power by not less than 50 percent when the areas are unoccupied. The occupancy sensor shall control lighting in each aisleway independently, and shall not control lighting beyond the aisleway being controlled by the sensor))~~, **storage areas and service corridors.** Occupant sensor controls shall be configured to comply with all of the following:

1. Automatically reduce lighting power by not less than 50 percent within 20 minutes of all occupants leaving the area.

2. Control lighting in each aisleway and corridor independently, and shall not control lighting beyond the aisleway or corridor being controlled by the sensor.

3. Automatically turn lighting off within 20 minutes of all occupants leaving the space, or comply with Section C405.2.2 to turn lighting off when the building is vacant.

4. Restore lighting to full power when occupants enter the space.

C405.2.1.3 Occupant sensor control function in open plan office areas. Occupant sensor controls in open plan office spaces less than 300 square feet (28 m²) in area shall comply with Section C405.2.1.1. Occupant sensor controls in all other open plan office spaces shall be configured to comply with all of the following:

1. General lighting is controlled separately in control zones with floor areas not greater than 600 square feet (55 m²) within the open plan office space.

2. Automatically turn off general lighting in all control zones within 20 minutes after all occupants have left the open plan office space.

3. General lighting power in each control zone is reduced by not less than 80 percent of the full zone general lighting power within 20 minutes of all occupants leaving that control zone. Control functions that switch control zone lights completely off when the zone is unoccupied meet this requirement.

4. Daylight responsive control activate open plan office space general lighting or control zone general lighting only when occupancy for the same area is detected.

C405.2.1.4 Occupant sensor control function in parking garages. Occupant sensor controls shall be configured to comply with all of the following:

1. Lighting power of each luminaire shall be automatically reduced by a minimum of 30 percent when there is no vehicle or pedestrian activity detected within a lighting zone

for 20 minutes. Lighting zones for this requirement shall be no larger than 3,600 square feet.

Exceptions:

1.1. Lighting in daylight transition zones and ramps without parking.

1.2. Covered parking garages with a total lighting power less than 0.07 watts per square foot.

2. Where time switch controls in accordance with Section C405.2.2 are not installed, the occupant sensor shall automatically turn all the lighting off within 20 minutes of all occupants leaving the space and restore lighting to full power when occupants enter the space.

C405.2.1.5 Occupant sensor control function in enclosed fire rated stairways. Occupant sensor controls shall be configured to automatically reduce lighting power by not less than 50 percent when no occupants have been detected in the stairway for a period not exceeding 20 minutes and restore lighting to full power when occupants enter the stairway. All portions of stairways shall remain illuminated to meet the requirements of Section 1009 of the *International Building Code* when the lighting power is reduced.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-405022 Section C405.2.2—Time switch controls.

C405.2.2 Time switch controls. Each area of the building that is not provided with *occupant sensor controls* (~~complying with Section C405.2.1.1~~) or digital timer switch controls complying with Section (~~C405.2.6~~) C405.2.1 shall be provided with time switch controls complying with Section C405.2.2.1.

EXCEPTION: Where a manual control provides light reduction in accordance with Section (~~C405.2.2.2, automatic~~) C405.2.3.1, time switch controls shall not be required for the following:

1. (~~Sleeping units.~~)

2. (~~Spaces where patient care is directly provided.~~)

3. (~~Spaces where an automatic shutoff would endanger occupant safety or security.~~)

4. (~~Lighting intended for continuous operation.~~)

5. (~~Shop and laboratory classrooms.~~)

C405.2.2.1 Time switch control function. (~~Each space provided with time switch controls shall also be provided with a manual control for light reduction in accordance with Section C405.2.2.2~~) Time switch controls shall comply with the following:

1. Have a minimum 7 day clock.

2. Be capable of being set for 7 different day types per week.

3. Incorporate an automatic holiday "shut-off" feature, which turns off all controlled lighting loads for at least 24 hours and then resumes normally scheduled operations.

4. Have program back-up capabilities, which prevent the loss of program and time settings for at least 10 hours, if power is interrupted.

5. Include an override switching device that complies with the following:

5.1. The override switch shall be a manual control.

5.2. The override switch, when initiated, shall permit the controlled lighting to remain on for not more than 2 hours.

5.3. Any individual override switch shall control the lighting for an area not larger than 5,000 square feet (465 m²).

6. Time switch controls are allowed to automatically turn on lighting to full power in corridors, lobbies, restrooms, storage rooms less than 50 square feet, and medical areas of health care facilities. In all other spaces, time switch controls are allowed to automatically turn on the lighting to not more than 50 percent power.

- EXCEPTIONS:
1. Within ((malls, arcades, auditoriums, single tenant retail spaces, industrial facilities and arenas)) mall concourses, auditoriums, sales areas, manufacturing facilities and sports arenas:
 - 1.1. The time limit shall be permitted to be greater than 2 hours provided the ((override)) switch is a captive key device.
 - 1.2. The area controlled by the override switch ((is permitted to be greater than)) shall not be limited to 5,000 square feet (465 m²), ((but shall not be greater)) provided that such area is less than 20,000 square feet (1860 m²). ((2- Where provided with manual control, the following areas are not required to have light reduction control:
 - 2.1. Spaces that have only one luminaire with a rated power of less than 100 watts.
 - 2.2. Spaces that use less than 0.6 watts per square foot (6.5 W/m²).
 - 2.3. Corridors, equipment rooms, public lobbies, electrical or mechanical rooms.

~~**C405.2.2.2 Light reduction controls.** Spaces required to have light reduction controls shall have a manual control that allows the occupant to reduce the connected lighting load in a reasonably uniform illumination pattern by at least 50 percent. Lighting reductions shall be achieved by one of the following *approved* methods:~~

- ~~1. Controlling all lamps or luminaires.~~
- ~~2. Dual switching of alternate rows of luminaires, alternate luminaires or alternate lamps.~~
- ~~3. Switching the middle lamp luminaires independently of the outer lamps.~~
- ~~4. Switching each luminaire or each lamp.~~

EXCEPTION: ~~Light reduction controls are not required in daylight zones with *daylight responsive controls* complying with Section C405.2.4.)~~

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-405023 Section C405.2.3—Manual controls.

C405.2.3 Manual controls. All lighting shall have manual controls ((for lights shall comply)) complying with the following:

1. They shall be ((readily accessible)) in a location with *ready access* to occupants.
2. They shall be located where the controlled lights are visible, or shall identify the area served by the lights and indicate their status.

3. Each control device shall control an area no larger than a single room, or 2,500 square feet, whichever is less, if the room area is less than or equal to 10,000 square feet, or one-quarter of the room area or 10,000 square feet, whichever is less, if the room area is greater than 10,000 square feet.

- EXCEPTIONS:
1. A manual control may be installed in a remote location for the purpose of safety or security provided each remote control device has an indicator pilot light as part of or next to the control device and the light is clearly labeled to identify the controlled lighting.
 2. Restrooms.

C405.2.3.1 Light reduction controls. Manual controls shall be configured to provide light reduction control that allows the occupant to reduce the connected lighting load between 30 and 70 percent. Lighting reductions shall be achieved by one of the following *approved* methods:

1. Controlling all lamps or luminaires.
2. Dual switching of alternate rows of luminaires, alternate luminaires or alternate lamps.
3. Switching the middle lamp luminaires independently of the outer lamps.
4. Switching each luminaire or each lamp.

- EXCEPTIONS:
1. Light reduction controls are not required in daylight zones with *daylight responsive controls* complying with Section C405.2.4.
 2. Where provided with manual control, the following areas are not required to have light reduction control:
 - 2.1. Spaces that have only one luminaire with a rated power of less than 100 watts.
 - 2.2. Spaces that use less than 0.6 watts per square foot (6.5 W/m²).
 - 2.3. Lighting in corridors, lobbies, electrical rooms, restrooms, storage rooms, airport concourse baggage areas, dwelling and sleeping rooms, and mechanical rooms.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-405024 Section C405.2.4—Daylight responsive controls.

C405.2.4 Daylight responsive controls. *Daylight responsive controls* complying with Section C405.2.4.1 shall be provided to control the lighting within *daylight zones* in the following spaces:

1. ~~((Sidelight daylight))~~ *Sidelit* zones as defined in Section C405.2.4.2 with more than two *general lighting* fixtures within the combined primary and secondary ((~~sidelight daylight~~)) *sidelit* zones.
2. ~~((Toplight daylight))~~ *Toplit* zones as defined in Section C405.2.4.3 with more than two general lighting fixtures within the daylight zone.

- EXCEPTION: *Daylight responsive controls* are not required for the following:
1. Spaces in health care facilities where patient care is directly provided.
 2. ~~((Dwelling units and sleeping units.~~
 - 3.)) Lighting that is required to have specific application control in accordance with Section C405.2.4.

~~((4. Sidelight daylight))~~ 3. *Sidelit* zones on the first floor above grade in Group A-2 and Group M occupancies.
~~((5.))~~ 4. Daylight zones where the total proposed lighting power density is less than 35 percent of the lighting power allowance per Section C405.4.2.

C405.2.4.1 Daylight responsive controls function. Where required, daylight responsive controls shall be provided within each space for control of lights in that space and shall comply with all of the following:

1. Lights in primary ~~((sidelight daylight))~~ *sidelit* zones shall be controlled independently of lights in secondary ~~((sidelight daylight))~~ *sidelit* zones in accordance with Section C405.2.4.2.

EXCEPTION: Spaces enclosed by walls or ceiling height partitions with no more than three general lighting fixtures may have combined daylight zone control of primary and secondary daylight zones provided *uniform illumination* can be achieved.

2. Lights in ~~((toplight daylight))~~ *toplit* zones in accordance with Section C405.2.4.3 shall be controlled independently of lights in ~~((sidelight daylight))~~ *sidelit* zones in accordance with Section C405.2.4.2.

3. *Daylight responsive controls* within each space shall be configured so that they can be calibrated from within that space by authorized personnel.

4. Calibration mechanisms shall be ~~((readily accessible))~~ in a location with ready access.

5. *Daylight responsive controls* shall be configured to completely shut off all controlled lights in that zone.

6. Lights in ~~((sidelight daylight))~~ *sidelit* zones in accordance with Section C405.2.4.2 facing different cardinal orientations (i.e., within 45 degrees of due north, east, south, west) shall be controlled independently of each other.

EXCEPTION: Up to two light fixtures in each space are permitted to be controlled together with lighting in a daylight zone facing a different cardinal orientation.

7. Incorporate time-delay circuits to prevent cycling of light level changes of less than three minutes.

8. The maximum area a single *daylight responsive control* device serves shall not exceed 2,500 square feet (232 m²).

9. Occupant override capability of daylight dimming controls is not permitted, other than a reduction of light output from the level established by the daylighting controls.

C405.2.4.1.1 Dimming. *Daylight responsive controls* shall be configured to automatically reduce the power of *general lighting* in the daylight zone in response to available daylight, while maintaining *uniform illumination* in the space through one of the following methods:

1. Continuous dimming using dimming ballasts/dimming drivers and daylight-sensing controls. The system shall reduce lighting power continuously to less than 15 percent of rated power at maximum light output.

2. Stepped dimming using multi-level switching and daylight-sensing controls. The system shall provide a minimum of two steps of uniform illumination between 0 percent and 100 percent of rated power at maximum light output. Each step shall be in equal increments of power, plus or minus 10 percent.

General lighting within daylight zones in offices, classrooms, laboratories and library reading rooms shall use the continuous dimming method. Stepped dimming is not allowed as a method of daylight zone control in these spaces.

C405.2.4.2 ((Sidelight daylight)) Sidelit zone. The ~~((sidelight daylight))~~ *sidelit* zone is the floor area adjacent to vertical fenestration which complies with the following:

1. Where the *fenestration* is located in a wall, the ~~((sidelight daylight))~~ *sidelit* zone includes the primary and secondary daylight zones. The primary daylight zone shall extend laterally to the nearest full height wall, or up to 1.0 times the height from the floor to the top of the *fenestration*, and longitudinally from the edge of the fenestration to the nearest full height wall, or up to 2 feet (610 mm), whichever is less, as indicated in Figure C405.2.4.2(1). The secondary daylight zone begins at the edge of the primary daylight zone and extends laterally to the nearest full height wall, or up to 2.0 times the height from the floor to the top of the fenestration, whichever is less, as indicated in Figure C405.2.4.2(1).

2. ~~((Where the fenestration is located in a rooftop monitor, the sidelight daylight zone shall extend laterally to the nearest obstruction that is taller than 0.7 times the ceiling height, or up to 1.0 times the height from the floor to the bottom of the fenestration, whichever is less, and longitudinally from the edge of the fenestration to the nearest obstruction that is taller than 0.7 times the ceiling height, or up to 0.25 times the height from the floor to the bottom of the fenestration, whichever is less, as indicated in Figures C405.2.4.2(2) and C405.2.4.2(3).))~~

3.)) Where *clerestory fenestration* is located in a wall, the ~~((sidelight daylight))~~ *sidelit* zone includes a lateral area twice the depth of the clerestory fenestration height, projected upon the floor at a 45 degree angle from the center of the clerestory fenestration. The longitudinal width of the ~~((daylight))~~ *sidelit* zone is calculated the same as for fenestration located in a wall. Where the 45 degree angle is interrupted by an obstruction greater than 0.7 times the ceiling height, the ~~((daylight))~~ *sidelit* zone shall remain the same lateral area but be located between the clerestory and the obstruction, as indicated in Figure C405.2.4.2((4)) (2).

((4.)) 3. If the rough opening area of a vertical fenestration assembly is less than 10 percent of the calculated primary ~~((daylight))~~ *sidelit* zone area for this fenestration, it does not qualify as a ~~((daylight))~~ *sidelit* zone.

~~((5. Where located in existing buildings,))~~ 4. The visible transmittance of the fenestration is no less than 0.20.

~~((6.))~~ 5. In parking garages with floor area adjacent to perimeter wall openings, the ~~((daylight))~~ *sidelit* zone shall include the area within 20 feet of any portion of a perimeter wall that has a net opening to wall ratio of at least 40 percent.

Figure C405.2.4.2(1)

((Daylight)) Sidelit Zone Adjacent to Fenestration in a Wall

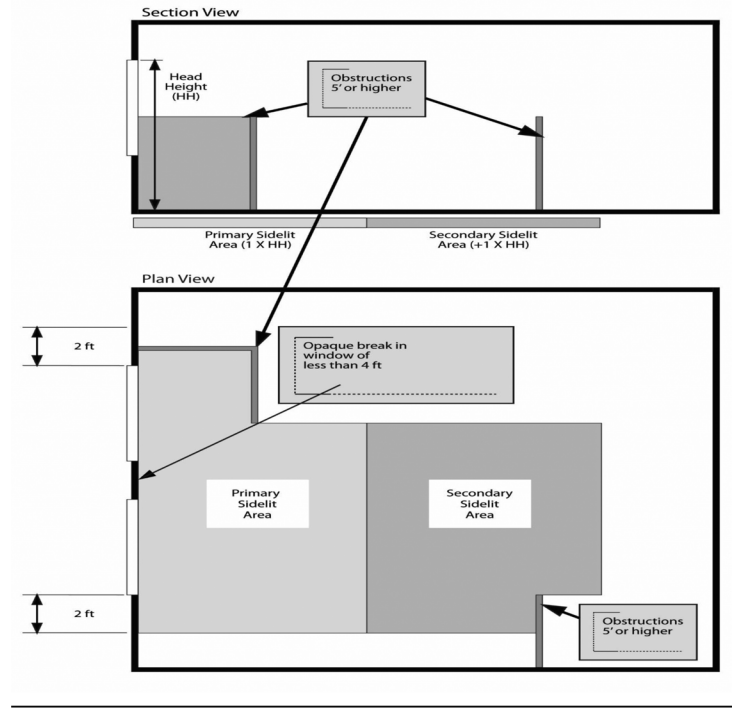
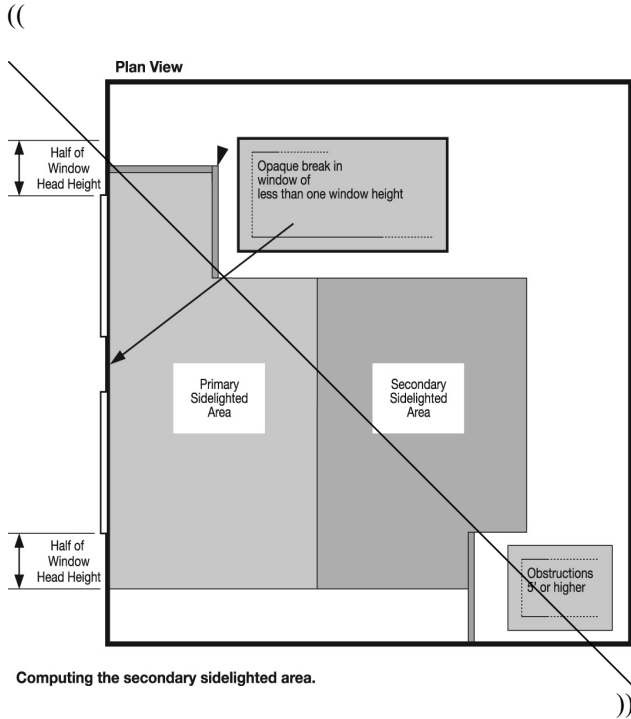


Figure C405.2.4.2(2)

((Daylight Zone Under a Rooftop Monitor

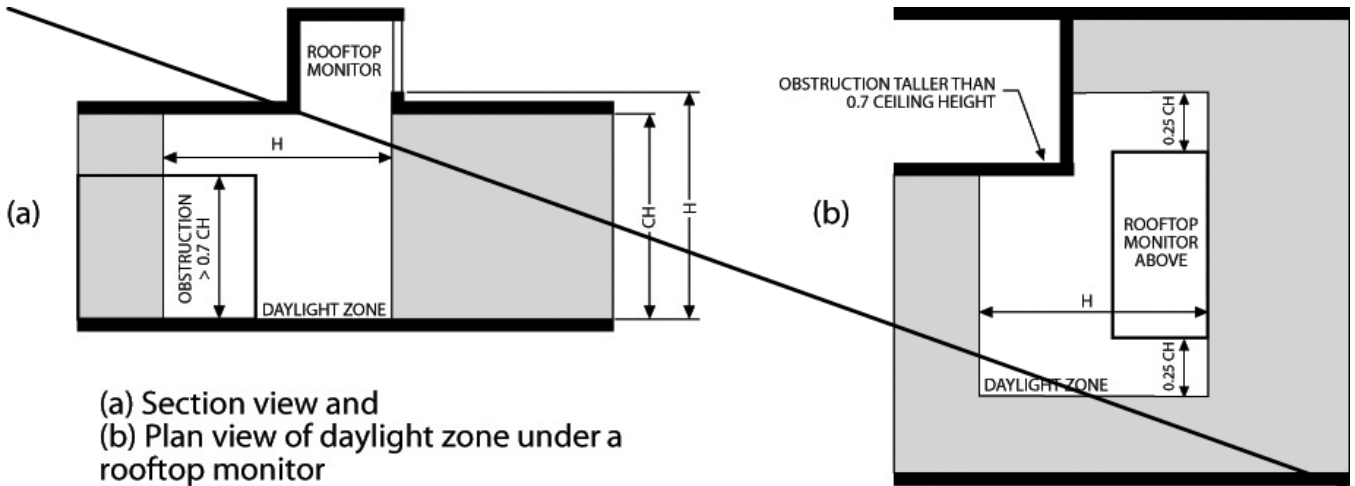


Figure C405.2.4.2(3)
Daylight Zone Under a Sloped Rooftop Monitor

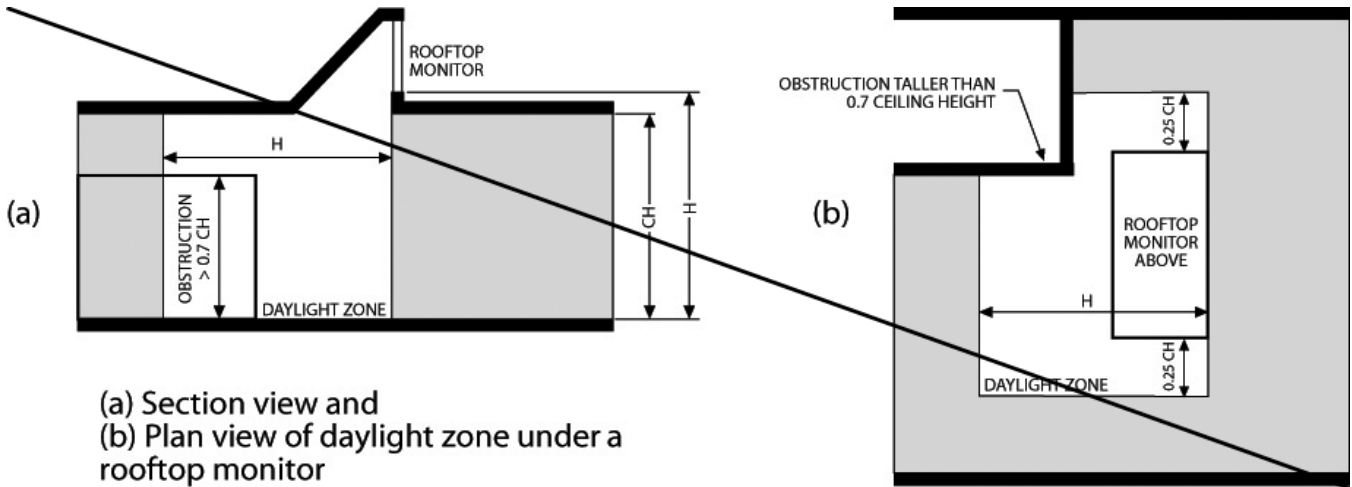
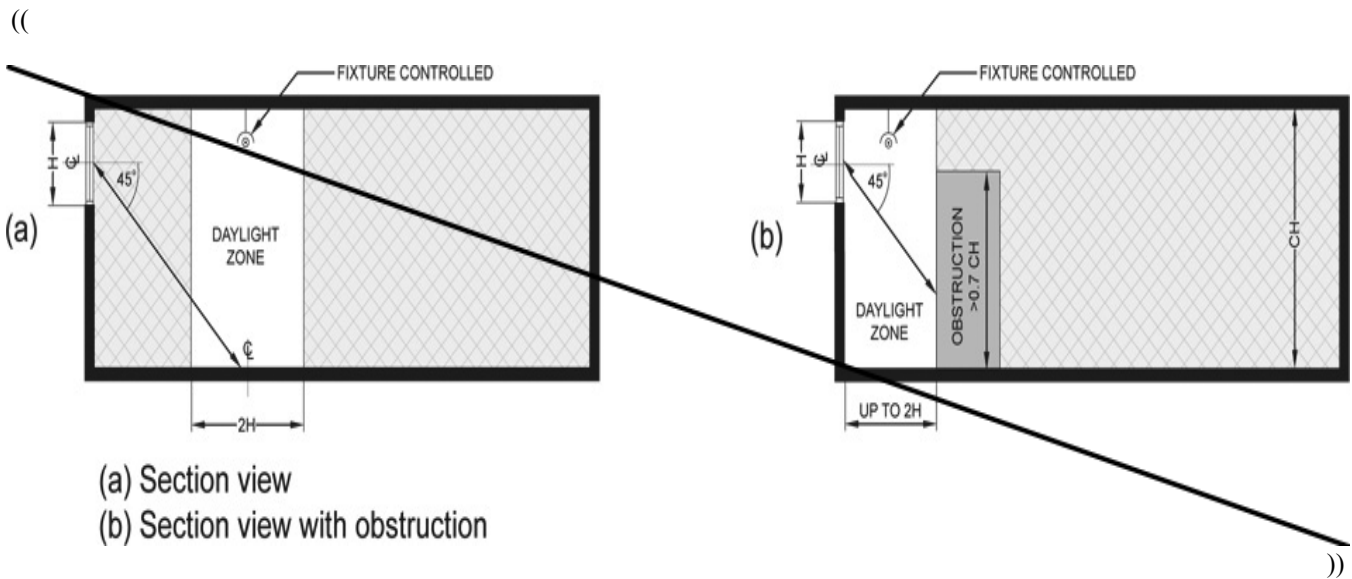
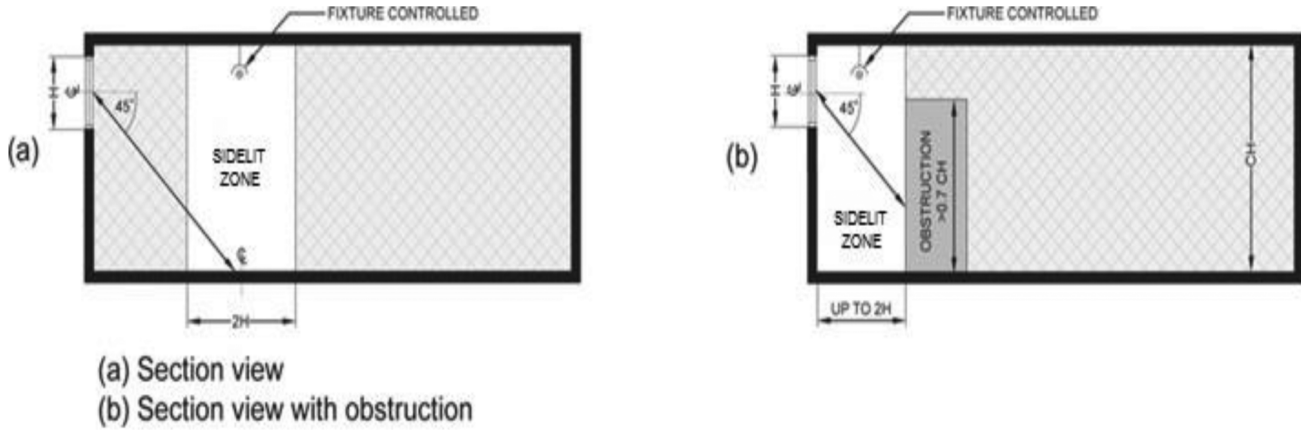


Figure C405.2.4.2(4)
Daylight) Sidelit Zone Adjacent to Clerestory Fenestration in a Wall





C405.2.4.3 ((Toplight daylight)) *Toplit zone.* The ((toplight daylight)) *toplit zone* is the floor area underneath a roof fenestration assembly which complies with the following:

1. The ((toplight daylight)) *toplit zone* shall extend laterally and longitudinally beyond the edge of the roof *fenestration* assembly to the nearest obstruction that is taller than 0.7 times the ceiling height, or up to 0.7 times the ceiling height, whichever is less, as indicated in Figure C405.2.4.3(1).

2. Where the fenestration is located in a rooftop monitor, the *toplit zone* shall extend laterally to the nearest obstruction that is taller than 0.7 times the ceiling height, or up to 1.0 times the height from the floor to the bottom of the fenestration, whichever is less, and longitudinally from the edge of the fenestration to the nearest obstruction that is taller than 0.7 times the ceiling height, or up to 0.25 times the height from the floor to the bottom of the fenestration, whichever is less, as indicated in Figures C405.2.4.3(2) and C405.2.4.3(3).

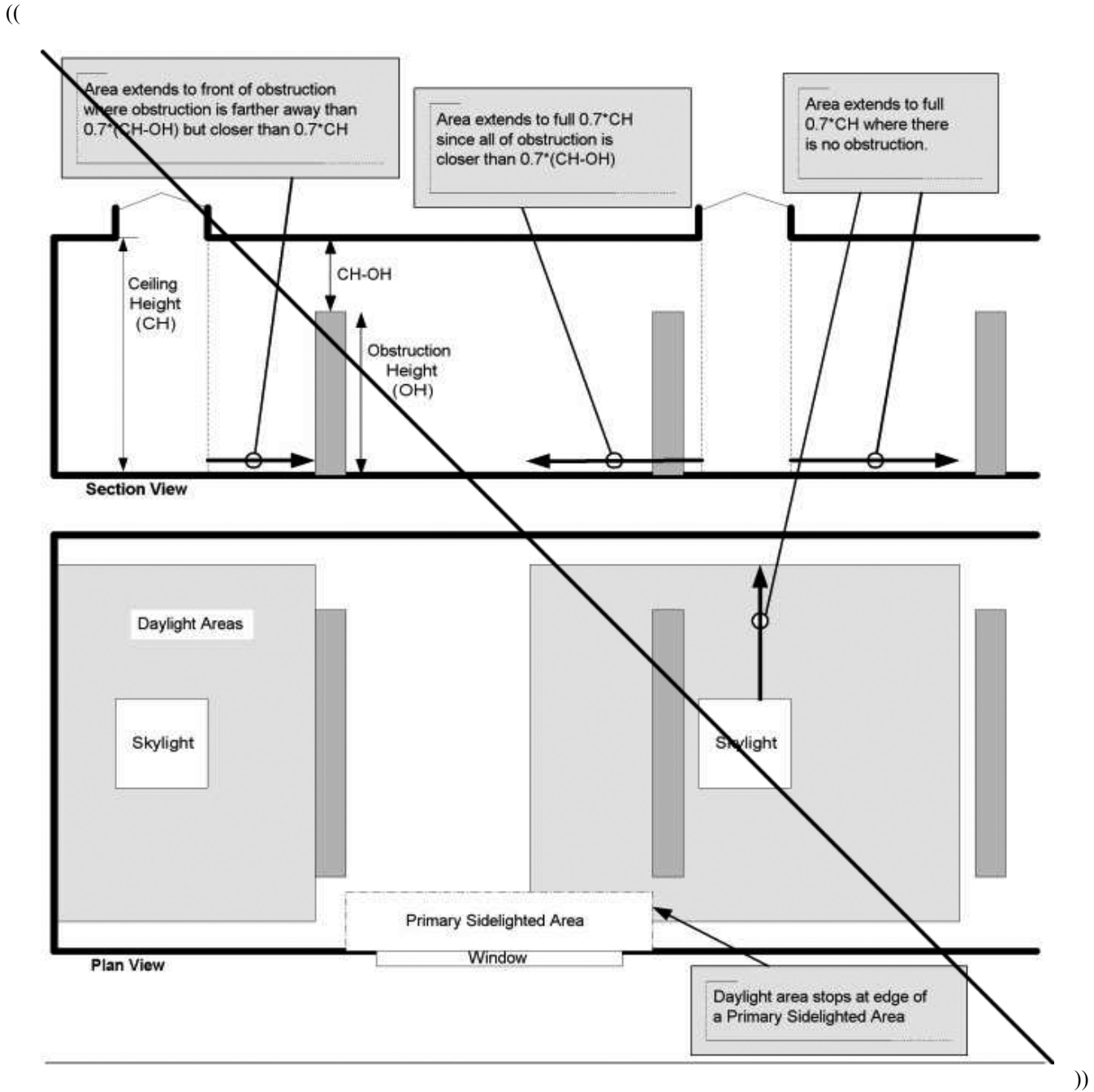
3. Where ((toplight daylight)) *toplit zones* overlap with ((sidelight daylight)) *sidelit zones*, lights within the overlapping area shall be assigned to the ((toplight daylight)) *toplit zone*.

~~(3. Where located in existing buildings,)~~ 4. The product of the *visible transmittance* of the roof *fenestration* assembly and the area of the rough opening of the roof fenestration assembly, divided by the area of the ((daylight)) *toplit zone* is no less than 0.008.

~~(4.)~~ 5. Where located under atrium fenestration, the ((daylight)) *toplit zone* shall include the bottom floor area directly beneath the atrium fenestration, and the top floor directly under the atrium fenestration, as indicated in Figure C405.2.4.3((2))

(4). The ((daylight)) *toplit zone* area at the top floor is calculated the same as for a ((toplight daylight)) *toplit zone*. Intermediate levels below the top floor that are not directly beneath the atrium are not included.

Figure C405.2.4.3(1)
((Daylight)) Toplit Zone Under a Rooftop Fenestration Assembly



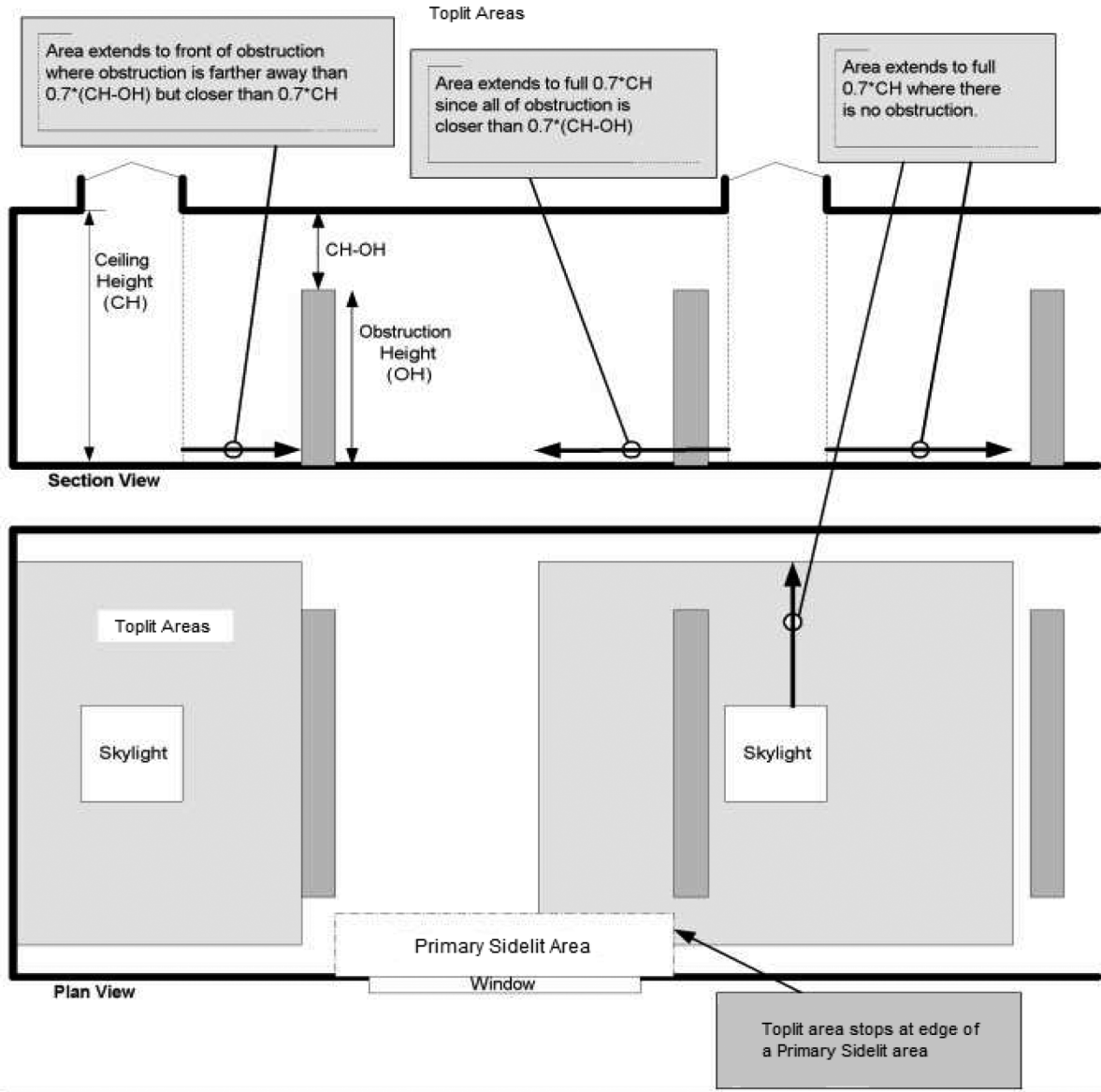


Figure C405.2.4.3(2)
Toplit Zone Under a Rooftop Monitor

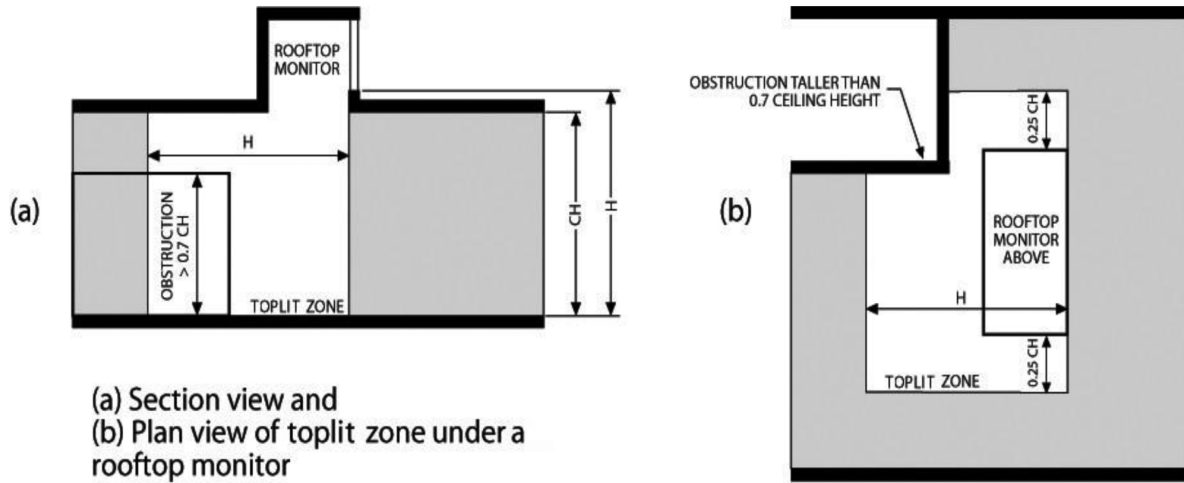


Figure C405.2.4.3(3)
Toplit Zone Under a Sloped Rooftop Monitor

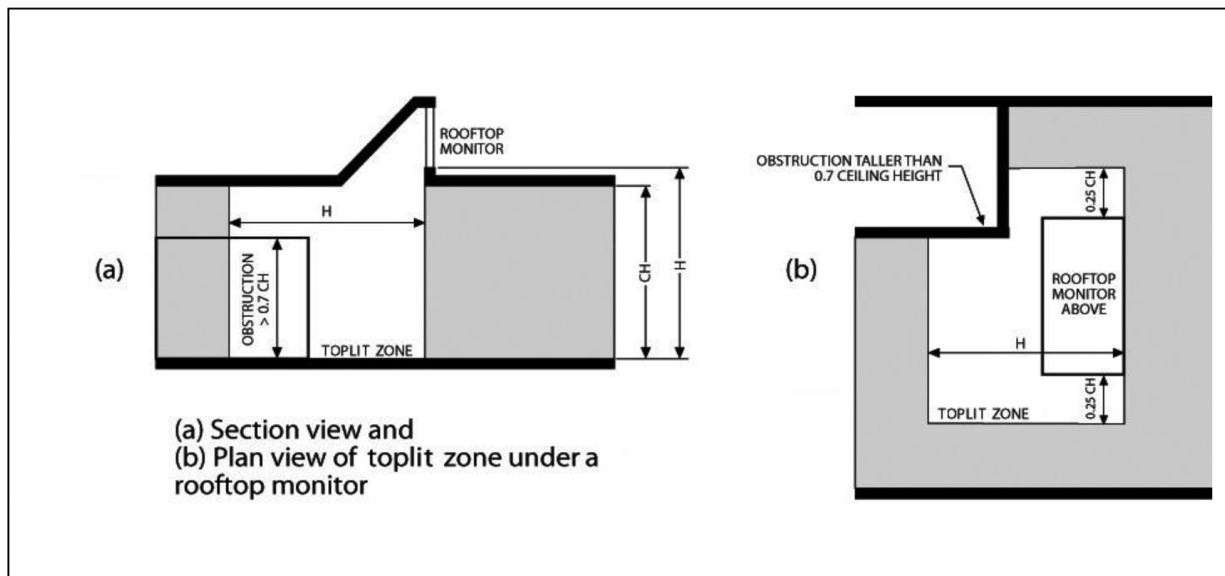
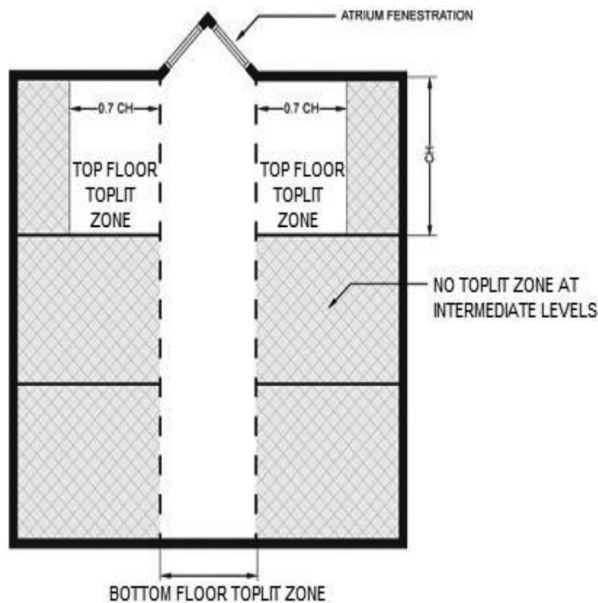
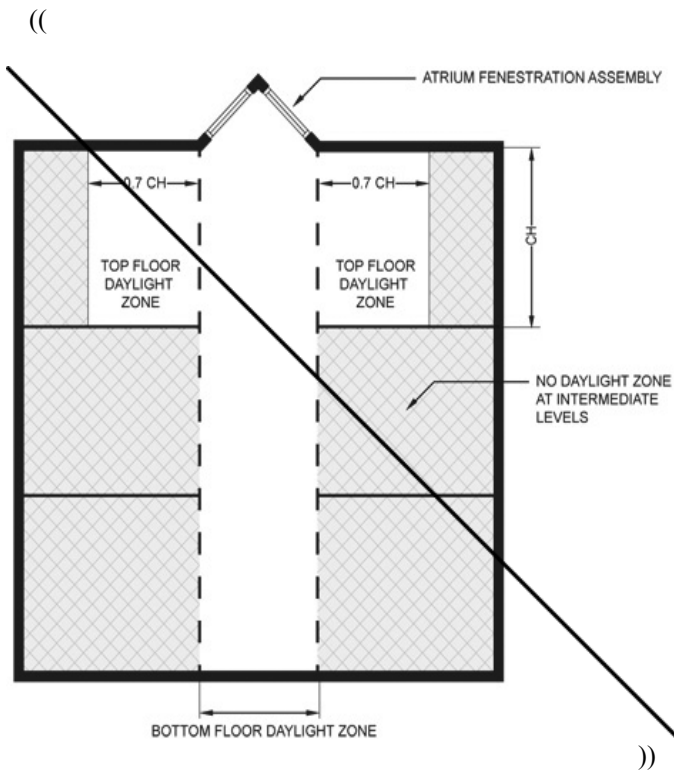


Figure C405.2.4.3((2)) (4)

~~((Daylight))~~ **Toplit Zone Under Atrium Fenestration**



C405.2.5 Additional lighting controls. Specific application lighting shall be provided with controls, in addition to controls required by other sections, for the following:

1. ~~((Display and accent light shall be controlled by a dedicated control that is independent of the controls for other lighting within the room or space.~~

2. ~~Lighting in cases used for display case purposes shall be controlled by a dedicated control that is independent of the controls for other lighting within the room or space.~~

3. ~~Hotel and motel sleeping units and guest suites))~~ The following lighting shall be controlled by an occupant sensor complying with Section C405.2.1.1 or a time switch control complying with Section C405.2.2.1. In addition, a manual control shall be provided to control such lighting separately from the general lighting in the space:

1.1. Display and accent.

1.2. Lighting in display cases.

1.3. Supplemental task lighting, including permanently installed under-shelf or under-cabinet lighting.

1.4. Lighting equipment that is for sale or demonstration in lighting education.

2. Sleeping units shall have control device(s) or systems configured to automatically switch off all permanently installed luminaires and switched receptacles within 20 minutes after all occupants ~~((leave the room))~~ have left the unit.

EXCEPTIONS: 1. Lighting and switched receptacles controlled by ((eap- tive key systems)) card key controls.

2. Spaces where patient care is directly provided.

~~((4. Supplemental task lighting, including permanently installed under shelf or under cabinet lighting, shall be automatically shut off whenever that space is unoccupied and shall have a control device integral to the luminaires or be controlled by a wall-mounted control device provided that the control device is readily accessible.~~

5-)) 3. Permanently installed luminaires within dwelling units shall be provided with controls complying with either Section C405.2.1.1 or C405.2.2.2.

4. Lighting for nonvisual applications, such as plant growth 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, whichever is larger.

~~((6. Lighting equipment that is for sale or for demonstra- tions in lighting education shall be controlled by a dedicated control that is independent of the controls for other lighting within the room or space.~~

7-)) 5. Luminaires serving the exit access and providing means of egress illumination required by Section 1006.1 of the International Building Code, including luminaires that function as both normal and emergency means of egress illumination shall be controlled by a combination of listed emer- gency relay and occupancy sensors, or signal from another building control system, that automatically shuts off the lighting when the areas served by that illumination are unoc- cupied.

EXCEPTION: Means of egress illumination serving the exit access that does not exceed 0.02 watts per square foot of building area is exempt from this requirement.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-405025 Section C405.2.5—Additional lighting controls.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-405026 Section C405.2.6—(~~Digital timer switch~~) Exterior lighting controls.

~~((C405.2.6 Digital timer switch controls. For each of the following space types, when under 300 square feet, digital timer switch controls may be provided in lieu of occupancy sensor controls:~~

1. Copy/print rooms.
2. Storage rooms.
3. Janitorial closets.

~~**C405.2.6.1 Digital timer switch function.** Digital timer switches shall comply with the following:~~

1. Turn lights on or off with operation of a button, switch or other manual means.
2. Automatically turn lights off within 15 minutes of the lights being turned on. The means for setting the time delay shall not be visible on the front of the switch.
3. The switch shall provide both audible and visual indication of impending time-out of the switch. Audible and visual indication shall be given at least once within five minutes of time-out of the switch. Visual indication shall consist of turning the lights momentarily off, and then back on.))

C405.2.6 Exterior lighting controls. Exterior lighting systems shall be provided with controls that comply with Sections C405.2.6.1 through C405.2.6.4. Decorative lighting systems shall comply with Sections C405.2.6.1, C405.2.6.2, and C405.2.6.4.

EXCEPTIONS:

1. Lighting for covered vehicle entrances or exits from buildings or parking structures where required for safety, security or eye adaption.
2. Lighting controlled from within dwelling units.

C405.2.6.1 Daylight shutoff. Lights shall be configured to automatically turn off when daylight is present and satisfies the lighting needs.

C405.2.6.2 Façade and landscape lighting shutoff. Building façade and landscaping lighting shall be configured to automatically shutoff for a minimum of 6 hours per night or from not later than 1 hour after business closing to not earlier than 1 hour before business opening, whichever is less.

EXCEPTION: Areas where an automatic shutoff would endanger safety or security.

C405.2.6.3 Lighting setback. Lighting that is not controlled in accordance with Section C405.2.6.2 shall be controlled so that the total wattage of such lighting is automatically reduced by not less than 30 percent by selectively switching off or dimming luminaires at one of the following times:

1. From not later than 12 midnight to 6 a.m.
2. From not later than 1 hour after business closing to not earlier than 1 hour before business opening.
3. During any period when no activity has been detected for 15 minutes or more.

C405.2.6.4 Exterior time-switch control functions. Time-switch controls for exterior lighting shall comply with the following:

1. They shall have a clock capable of being programmed for not fewer than 7 days.

2. They shall be capable of being set for 7 different day types per week.

3. They shall incorporate an automatic holiday setback feature.

4. They shall have program backup capabilities that prevent the loss of program and time settings for a period of at least 10 hours in the event that power is interrupted.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-405027 ((Section C405.2.7 Exterior lighting controls.)) Reserved.

~~((C405.2.7 Exterior lighting controls. Lighting for exterior applications other than emergency lighting that is intended to be automatically off during building operation, lighting specifically required to meet health and life safety requirements or decorative gas lighting systems shall:~~

1. Be provided with a control that automatically turns off the lighting as a function of available daylight.

2. Where lighting the building façade or landscape, the lighting shall have controls that automatically shut off the lighting as a function of dawn/dusk and a set opening and closing time.

3. Where not covered in Item 2, the lighting shall have controls configured to automatically reduce the connected lighting power by at least 30 percent from no later than 12 midnight to 6 a.m. or from one hour after business closing to one hour before business opening or during any period when no activity has been detected for a time of no longer than 15 minutes.

Time switches shall be capable of retaining programming and the time setting for at least 10 hours without power.

EXCEPTION: Lighting for covered vehicle entrances or exits from buildings or parking structures where required for safety, security or eye adaption.))

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-405028 Section C405.2.8—Area controls.

C405.2.8 Area controls. The maximum lighting power that may be controlled from a single switch or automatic control device shall not exceed that which is provided by a 20 ampere circuit loaded to not more than 80 percent. A master control may be installed provided the individual switches retain their capability to function independently. Circuit breakers may not be used as the sole means of switching.

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

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40504 ((Section C405.3 Exit signs.)) Reserved.

~~((C405.3 Exit signs (mandatory). Internally illuminated exit signs shall not exceed 5 watts per side.))~~

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40505 Section C405.4—Interior lighting power requirements.

C405.4 Interior lighting power requirements ~~((prescriptive))~~. A building complies with this section if its total connected interior lighting power calculated under Section C405.4.1 is no greater than the interior lighting power allowance calculated under Section C405.4.2.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-405051 Section C405.4.1—Total connected interior lighting power.

C405.4.1 Total connected interior lighting power. The total connected interior lighting power shall be determined in accordance with Equation 4-10.

$$TCLP = [(SL + LV + LTPB) LVL + BLL + TRK + POE + \text{Other}]$$

(Equation 4-10)

Where:

TCLP = Total connected lighting power (watts).

~~((SL = Labeled wattage of luminaires for screw-in lamps.~~

~~LV = Wattage of the transformer supplying low-voltage lighting.~~

~~LTPB = Wattage of line-voltage lighting tracks and plug-in busways as the specified wattage of the luminaires but at least 50 W/lin. ft., or the wattage limit of the system's circuit breaker, or the wattage limit of other permanent current limiting devices on the system.)) LVL = For luminaires with lamps connected directly to building power, such as line voltage lamps, the rated wattage of the lamp, which must be minimum 60 lumens/watt.~~

BLL = For luminaires incorporating a ballast or transformer, the rated input wattage of the ballast or transformer when operating the lamp.

TRK = For lighting track, cable conductor, rail conductor and plug-in busway systems that allow the addition and relocation of luminaires without rewiring. The wattage shall be one of the following:

1. The specified wattage of the luminaires, but not less than 16 W/lin. ft. (52 W/lin. m).

2. The wattage limit of the permanent current limiting devices protecting the system.

3. The wattage limit of the transformer supplying the system.

POE = For other modular lighting systems served with power supplied by a driver, power supply for transformer including, but not limited to, low-voltage lighting systems, the wattage of the system shall be the maximum rated input wattage of the driver, power supply or transformer published in the manufacturer's catalogs, as specified by UL 2108 or 8750. For power-over-Ethernet lighting systems, power pro-

vided to installed nonlighting devices may be subtracted from the total power rating of the power-over-Ethernet systems.

Other = The wattage of all other luminaires and lighting sources not covered above and associated with interior lighting verified by data supplied by the manufacturer or other approved sources.

- ~~((EXCEPTIONS: 1. The connected power associated with the following lighting equipment is not included in calculating total connected lighting power:~~
- ~~1.1. Professional sports arena playing field lighting.~~
 - ~~1.2. Emergency lighting automatically off during normal building operation.~~
 - ~~1.3. Lighting in spaces specifically designed for use by occupants with special lighting needs including the visually impaired and other medical and age-related issues.~~
 - ~~1.4. Casino gaming areas.~~
 - ~~1.5. General area lighting power in industrial and manufacturing occupancies dedicated to the inspection or quality control of goods and products.~~
 - ~~1.6. Lighting in sleeping units, provided that the lighting complies with Section R404.1.~~
 - ~~1.7. Mirror lighting in dressing rooms.~~
 - ~~2. Lighting equipment used for the following shall be exempt provided that it is in addition to general lighting and is controlled by an independent control device:~~
 - ~~2.1. Task lighting for medical and dental purposes.~~
 - ~~2.2. Display lighting for exhibits in galleries, museums and monuments.~~
 - ~~3. Lighting for theatrical purposes, including performance, stage, film production and video production.~~
 - ~~4. Lighting for photographic processes.~~
 - ~~5. Lighting integral to equipment or instrumentation and is installed by the manufacturer.~~
 - ~~6. Task lighting for plant growth or maintenance where the lamp efficacy is not less than 90 lumens per watt.~~
 - ~~7. Advertising signage or directional signage.~~
 - ~~8. In restaurant buildings and areas, lighting for food warming or integral to food preparation equipment.~~
 - ~~9. Lighting equipment that is for sale.~~
 - ~~10. Lighting demonstration equipment in lighting education facilities.~~
 - ~~11. Lighting approved because of safety or emergency considerations, inclusive of exit lights.~~
 - ~~12. Lighting integral to both open and glass-enclosed refrigerator and freezer cases.~~
 - ~~13. Lighting in retail display windows, provided the display area is enclosed by ceiling-height partitions.~~
 - ~~14. Furniture-mounted supplemental task lighting that is controlled by automatic shutoff.~~
 - ~~15. Lighting used for aircraft painting.))~~

The connected power associated with the following lighting equipment is not included in calculating total connected lighting power.

1. Television broadcast lighting for playing areas in sports arenas.

2. Emergency lighting automatically off during normal building operation.

3. Lighting in spaces specifically designed for use by occupants with special lighting needs including those with visual impairment and other medical and age-related issues.

- 4. Casino gaming areas.
- 5. General area lighting power in industrial and manufacturing occupancies dedicated to the inspection or quality control of goods and products.
- 6. Mirror lighting in dressing rooms.
- 7. Task lighting for medical and dental purposes that is in addition to general lighting and controlled by an independent control device.
- 8. Display lighting for exhibits in galleries, museums and monuments that is in addition to general lighting and controlled by an independent control device.
- 9. Lighting for theatrical purposes, including performance, stage, film production and video production.
- 10. Lighting for photographic processes.
- 11. Lighting integral to equipment or instrumentation and installed by the manufacturer.
- 12. Task lighting for plant growth or maintenance where the lamp efficacy is not less than 90 lumens per watt.
- 13. Advertising signage or directional signage.
- 14. Lighting for food warming.
- 15. Lighting equipment that is for sale.
- 16. Lighting demonstration equipment in lighting education facilities.
- 17. Lighting approved because of safety considerations.
- 18. Lighting in retail display windows, provided the display area is enclosed by ceiling-height partitions.
- 19. Furniture mounted supplemental task lighting that is controlled by automatic shutoff.
- 20. Exit signs.
- 21. Lighting used for aircraft painting.

Reviser's note: The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency and appear in the Register pursuant to the requirements of RCW 34.08.040.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-405052 Section C405.4.2—Interior lighting power requirements.

C405.4.2 Interior lighting power allowance. The total interior lighting power allowance (watts) is determined according to Table C405.4.2(1) using the Building Area Method, or Table C405.4.2(2) using the Space-by-Space Method, for all areas of the building covered in this permit.

C405.4.2.1 Building area method. For the Building Area Method, the interior lighting power allowance is the floor area for each building area type listed in Table C405.4.2(1) times the value from Table C405.4.2(1) for that area. For the purposes of this method, an "area" shall be defined as all contiguous spaces that accommodate or are associated with a single building area type as listed in Table C405.4.2(1). Where this method is used to calculate the total interior lighting power for an entire building, each building area type shall be treated as a separate area.

C405.4.2.2 Space-by-Space Method. For the Space-by-Space Method, the interior lighting power allowance is determined by multiplying the floor area of each space times the value for the space type in Table C405.4.2(2) that most closely represents the proposed use of the space, and then

summing the lighting power allowances for all spaces. Tradeoffs among spaces are permitted.

Each area enclosed by partitions that are 80 percent of the ceiling height or taller shall be considered a separate space and assigned the appropriate space type from Table C405.4.2(2). If a space has multiple functions where more than one space type is applicable, that space shall be broken up into smaller subspaces, each using their own space type. Any of these subspaces that are smaller in floor area than 20 percent of the enclosed space and less than 1,000 square feet need not be broken out separately.

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 and automatically controlled separately from the general lighting, to be turned off during nonbusiness hours. 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 4-11.

(Equation 4-11)

$$\text{Additional Interior Lighting Power Allowance} = 500 \text{ watts} + (\text{Retail Area } 1 \times ((0.6)) \text{ } 0.45 \text{ W/ft}^2) + (\text{Retail Area } 2 \times ((0.6)) \text{ } 0.45 \text{ W/ft}^2) + (\text{Retail Area } 3 \times ((1.4)) \text{ } 1.05 \text{ W/ft}^2) + (\text{Retail Area } 4 \times ((2.5)) \text{ } 1.87 \text{ W/ft}^2).$$

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 is *approved* by the code official.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-405053 Table C405.4.2(1)—Interior lighting power allowances—Building area method.

Table C405.4.2(1)

Interior Lighting Power Allowances—Building Area Method

((Building Area Type	LPD (w/ft²)
Automotive facility	0.64
Convention center	0.81
Court house	0.81

((Building Area Type	LPD (w/ft²)
Dining: Bar lounge/leisure	0.79
Dining: Cafeteria/fast food	0.72
Dining: Family	0.71
Dormitory	0.46
Exercise center	0.67
Fire station	0.54
Gymnasium	0.75
Health care clinic	0.70
Hospital	0.84
Hotel/motel	0.70
Library	0.94
Manufacturing facility	0.89
Motion picture theater	0.61
Multifamily	0.41
Museum	0.80
Office	0.66
Parking garage	0.16
Penitentiary	0.65
Performing arts theater	1.00
Police station	0.70
Post office	0.70
Religious building	0.80
Retail	1.01
School/university	0.70
Sports arena	0.62
Town hall	0.71
Transportation	0.56
Warehouse	0.40
Workshop	0.95))

<u>Building Area Type</u>	<u>LPD (w/ft²)</u>
<u>Automotive facility</u>	<u>0.64</u>
<u>Convention center</u>	<u>0.64</u>
<u>Court house</u>	<u>0.79</u>
<u>Dining: Bar lounge/leisure</u>	<u>0.79</u>
<u>Dining: Cafeteria/fast food</u>	<u>0.72</u>
<u>Dining: Family</u>	<u>0.71</u>
<u>Dormitory^{a,b}</u>	<u>0.46</u>
<u>Exercise center</u>	<u>0.67</u>
<u>Fire station^a</u>	<u>0.54</u>
<u>Gymnasium</u>	<u>0.75</u>
<u>Health care clinic</u>	<u>0.70</u>
<u>Hospital^a</u>	<u>0.84</u>
<u>Hotel/motel^{a,b}</u>	<u>0.56</u>

<u>Building Area Type</u>	<u>LPD (w/ft²)</u>
<u>Library</u>	<u>0.83</u>
<u>Manufacturing facility</u>	<u>0.82</u>
<u>Motion picture theater</u>	<u>0.44</u>
<u>Multifamily^c</u>	<u>0.41</u>
<u>Museum</u>	<u>0.55</u>
<u>Office</u>	<u>0.64</u>
<u>Parking garage</u>	<u>0.14</u>
<u>Penitentiary</u>	<u>0.65</u>
<u>Performing arts theater</u>	<u>0.84</u>
<u>Police station</u>	<u>0.66</u>
<u>Post office</u>	<u>0.65</u>
<u>Religious building</u>	<u>0.67</u>
<u>Retail</u>	<u>0.84</u>
<u>School/university</u>	<u>0.70</u>
<u>Sports arena</u>	<u>0.62</u>
<u>Town hall</u>	<u>0.69</u>
<u>Transportation</u>	<u>0.50</u>
<u>Warehouse</u>	<u>0.40</u>
<u>Workshop</u>	<u>0.91</u>

- a 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.
- b 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.
- c Dwelling units are excluded. Neither the area of the dwelling units nor the wattage of lighting in the dwelling units is counted.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-405054 Table C405.4.2(2)—Interior lighting power allowances—Space-by-space method.

Table C405.4.2(2)

Interior Lighting Power Allowances—Space-by-Space Method

<u>((Common Space-by-Space Types*</u>	<u>LPD^a (w/ft²)</u>
Atrium—First 40 feet in height ^e	0.02 per ft. ht.
Atrium—Above 40 feet in height ^e	0.03 + 0.02 per ft. in total height
Audience/seating area—Permanent	
In an auditorium	0.50
In a convention center	0.66
In a gymnasium	0.34
In a motion picture theater	0.91
In a penitentiary	0.22
In a performing arts theater	1.94

((Common Space by Space Types*	LPD^d (w/ft²)
In a religious building	1.22
In a sports arena	0.34
Otherwise	0.34
Banking activity area	0.81
Breakroom (see Lounge/breakroom)	
Classroom/lecture hall/training room	
In a penitentiary	1.07
Otherwise	1.00
Conference/meeting/multipurpose	0.98
Copy/print room	0.58
Corridor	
In a facility for the visually impaired (and not used primarily by the staff) ^b	0.74
In a hospital	0.63
In a manufacturing facility	0.33
Otherwise	0.53
Courtroom	1.38
Computer room	1.37
Dining area	
In a penitentiary	0.77
In a facility for the visually impaired (and not used primarily by the staff) ^b	1.52
In a bar/lounge or leisure dining	0.86
In a family dining area	0.71
Otherwise	0.52
Electrical/mechanical	0.76
Emergency vehicle garage	0.45
Food preparation	0.79
Guest room	0.38
Laboratory	
In or as a classroom	1.02
Otherwise	1.45
Laundry/washing area	0.48
Loading dock, interior	0.38
Lobby ^e	
In a facility for the visually impaired (and not used primarily by the staff) ^b	1.44
For an elevator	0.51
In a hotel	0.85
In a motion picture theater	0.42

((Common Space by Space Types*	LPD^d (w/ft²)
In a performing arts theater	1.60
Otherwise	0.72
Locker room	0.60
Lounge/breakroom	
In a health care facility	0.74
Otherwise	0.58
Office ^f	
Enclosed	0.89
Open plan	0.78
Parking area, interior	0.15
Pharmacy area	0.91
Restroom	
In a facility for the visually impaired (and not used primarily by the staff) ^b	0.97
Otherwise	0.78
Sales area	1.27
Seating area, general	0.43
Stairway (see space containing stairway)	
Stairwell	0.55
Storage room	0.50
Vehicular maintenance	0.54
Workshop	1.27

Building Specific Space by Space Types^g	
Building Specific Space by Space Types	LPD^d (w/ft²)
Automotive – (See Vehicular maintenance, above)	
Convention center – Exhibit space	1.16
Dormitory living quarters	0.30
Facility for the visually impaired ^b	
In a chapel (and not used primarily by the staff) ^b	1.77
In a recreation room (and not used primarily by the staff) ^b	1.93
Fire stations – Sleeping quarters	0.18
Engine rooms	0.45
Gymnasium/fitness center	
In an exercise area	0.58
In a playing area	0.96
Health care facility	
In an exam/treatment room	1.33
In an imaging room	1.06

Building Specific Space-by-Space Types*	
Building Specific Space-by-Space Types	LPD^a (w/ft²)
In a medical supply room	0.59
In a nursery	0.70
In a nurse's station	0.57
In an operating room	1.51
In a patient room	0.50
In a physical therapy room	0.73
In a recovery room	0.92
Library^f	
In a reading area	0.74
In the stacks	1.37
Manufacturing facility	
In a detailed manufacturing area	1.03
In an equipment room	0.59
In an extra high bay area (greater than 50-foot floor-to-ceiling height)	0.84
In a high bay area (25–50-foot floor-to-ceiling height)	0.98
In a low bay (<25-foot floor-to-ceiling height)	0.95
Museum	
In a general exhibition area	0.84
In a restoration room	0.82
Performing arts theater dressing/fitting room	0.32
Post office – Sorting area	0.75
Religious buildings	
In a fellowship hall	0.51
In a worship/pulpit/choir area	1.22
Retail facilities	
In a dressing/fitting room	0.57
In a mall concourse	0.88
Sports arena – Playing area	
For a Class 1 facility	2.41
For a Class 2 facility	1.54
For a Class 3 facility	0.96
For a Class 4 facility	0.58
Transportation	
In a baggage/carousel area	0.42
In an airport concourse	0.29
At a terminal ticket counter	0.64

Building Specific Space-by-Space Types*	
Building Specific Space-by-Space Types	LPD^a (w/ft²)
Warehouse – Storage area	
For medium to bulky palletized items	0.46
For smaller, hand-carried items	0.76))

Common Space-by-Space Types^a	LPD (w/ft²)
<u>Atrium - Less than 20 feet in height</u>	<u>0.39</u>
<u>Atrium - 20 to 40 feet in height</u>	<u>0.48</u>
<u>Atrium - Above 40 feet in height</u>	<u>0.60</u>
Audience/seating area - Permanent	
<u>In an auditorium</u>	<u>0.61</u>
<u>In a gymnasium</u>	<u>0.23</u>
<u>In a motion picture theater</u>	<u>0.27</u>
<u>In a penitentiary</u>	<u>0.67</u>
<u>In a performing arts theater</u>	<u>1.16</u>
<u>In a religious building</u>	<u>0.72</u>
<u>In a sports arena</u>	<u>0.33</u>
<u>Otherwise</u>	<u>0.23</u>
Banking activity area^a	<u>0.61</u>
Breakroom (see lounge/breakroom)	
Classroom/lecture hall/training room	
<u>In a penitentiary</u>	<u>0.89</u>
<u>Otherwise</u>	<u>0.71^m</u>
Computer room, data center	<u>0.94</u>
Conference/meeting/multipurpose	<u>0.97</u>
Confinement cell	<u>0.70</u>
Copy/print room	<u>0.31</u>
Corridor	
<u>In a facility for the visually impaired (and not used primarily by the staff)^b</u>	<u>0.71</u>
<u>In a hospital</u>	<u>0.71</u>
<u>In a manufacturing facility</u>	<u>0.41</u>
<u>Otherwise^c</u>	<u>0.41</u>
Courtroom^c	<u>1.20</u>
Dining area	
<u>In a penitentiary</u>	<u>0.42</u>
<u>In a facility for the visually impaired (and not used primarily by the staff)^b</u>	<u>1.27</u>
<u>In a bar/lounge or leisure dining^a</u>	<u>0.86</u>

Common Space-by-Space Types^a	LPD (w/ft²)
<u>In cafeteria or fast food dining</u>	<u>0.40</u>
<u>In a family dining area^a</u>	<u>0.60</u>
<u>Otherwise</u>	<u>0.43</u>
<u>Electrical/mechanical</u>	<u>0.43</u>
<u>Emergency vehicle garage</u>	<u>0.52</u>
<u>Food preparation</u>	<u>1.09</u>
<u>Guest room^{a,b}</u>	<u>0.41</u>
<u>Laboratory</u>	
<u>In or as a classroom</u>	<u>1.11</u>
<u>Otherwise</u>	<u>1.33</u>
<u>Laundry/washing area</u>	<u>0.53</u>
<u>Loading dock, interior</u>	<u>0.88</u>
<u>Lobby^c</u>	
<u>In a facility for the visually impaired (and not used primarily by the staff)^b</u>	<u>1.69</u>
<u>For an elevator</u>	<u>0.65</u>
<u>In a hotel</u>	<u>0.51</u>
<u>In a motion picture theater</u>	<u>0.23</u>
<u>In a performing arts theater</u>	<u>1.25</u>
<u>Otherwise</u>	<u>0.84</u>
<u>Locker room</u>	<u>0.52</u>
<u>Lounge/breakroom^a</u>	
<u>In a health care facility^a</u>	<u>0.42</u>
<u>Otherwise^a</u>	<u>0.59</u>
<u>Office</u>	
<u>Enclosed < 250</u>	<u>0.74</u>
<u>Enclosed > 250</u>	<u>0.66</u>
<u>Open plan</u>	<u>0.61</u>
<u>Parking area, interior</u>	<u>0.15</u>
<u>Pharmacy area</u>	<u>1.66</u>
<u>Restroom</u>	
<u>In a facility for the visually impaired (and not used primarily by the staff)^b</u>	<u>1.26</u>
<u>Otherwise^a</u>	<u>0.63</u>
<u>Sales area</u>	<u>1.05</u>
<u>Seating area, general</u>	<u>0.23</u>
<u>Stairway (see space containing stairway)</u>	
<u>Stairwell^a</u>	<u>0.49</u>
<u>Storage room</u>	
<u>< 50 ft²</u>	<u>0.51</u>
<u>50-100 ft²</u>	<u>0.38</u>

Common Space-by-Space Types^a	LPD (w/ft²)
<u>All other storage</u>	<u>0.38</u>
<u>Vehicular maintenance</u>	<u>0.60</u>
<u>Workshop</u>	<u>1.26</u>
Building Specific Space-by-Space Types^a	LPD (w/ft²)
<u>Automotive (see vehicular maintenance)</u>	
<u>Convention center - Exhibit space</u>	<u>0.61</u>
<u>Dormitory living quarters^{a,b}</u>	<u>0.50</u>
<u>Facility for the visually impaired^b</u>	
<u>In a chapel (and not used primarily by the staff)^b</u>	<u>0.70</u>
<u>In a recreation room (and not used primarily by the staff)^b</u>	<u>1.77</u>
<u>Fire stations^a</u>	
<u>Sleeping quarters</u>	<u>0.23</u>
<u>Gymnasium/fitness center</u>	
<u>In an exercise area</u>	<u>0.90</u>
<u>In a playing area</u>	<u>0.85</u>
<u>Health care facility</u>	
<u>In an exam/treatment room</u>	<u>1.40</u>
<u>In an imaging room</u>	<u>0.94</u>
<u>In a medical supply room</u>	<u>0.62</u>
<u>In a nursery</u>	<u>0.92</u>
<u>In a nurse's station</u>	<u>1.17</u>
<u>In an operating room</u>	<u>2.26</u>
<u>In a patient room^a</u>	<u>0.68</u>
<u>In a physical therapy room</u>	<u>0.91</u>
<u>In a recovery room</u>	<u>1.25</u>
<u>Library</u>	
<u>In a reading area^a</u>	<u>0.31</u>
<u>In the stacks</u>	<u>1.10</u>
<u>Manufacturing facility</u>	
<u>In a detailed manufacturing area</u>	<u>0.80</u>
<u>In an equipment room</u>	<u>0.76</u>
<u>In an extra high bay area (greater than 50-foot floor-to-ceiling height)</u>	<u>1.42</u>
<u>In a high bay area (25 - 50-foot floor-to-ceiling height)</u>	<u>1.24</u>
<u>In a low bay (< 25-foot floor-to-ceiling height)</u>	<u>0.86</u>
<u>Museum</u>	

<u>Building Specific Space-by-Space Types^a</u>	<u>LPD (w/ft²)</u>
<u>In a general exhibition area</u>	<u>0.31</u>
<u>In a restoration room</u>	<u>1.10</u>
<u>Performing arts theater dressing/fitting room</u>	<u>0.41</u>
<u>Post office - Sorting area</u>	<u>0.76</u>
<u>Religious buildings</u>	
<u>In a fellowship hallⁿ</u>	<u>0.54</u>
<u>In a worship/pulpit/choir areaⁿ</u>	<u>0.85</u>
<u>Retail facilities</u>	
<u>In a dressing/fitting room</u>	<u>0.51</u>
<u>In a mall concourse</u>	<u>0.82</u>
<u>Sports arena - Playing area</u>	
<u>For a Class 1 facilityⁱ</u>	<u>2.94</u>
<u>For a Class 2 facilityⁱ</u>	<u>2.01</u>
<u>For a Class 3 facility^k</u>	<u>1.30</u>
<u>For a Class 4 facility^l</u>	<u>0.86</u>
<u>Transportation</u>	
<u>In a baggage/carousel area</u>	<u>0.39</u>
<u>In an airport concourse</u>	<u>0.25</u>
<u>At a terminal ticket counter^a</u>	<u>0.51</u>
<u>Warehouse - Storage area</u>	
<u>For medium to bulky palletized items</u>	<u>0.33</u>
<u>For smaller, hand-carried items</u>	<u>0.69</u>

For SI: 1 foot = 304.8 mm, 1 watt per square foot = 11 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 ((ⁿ)) facility for the visually impaired((ⁿ)) 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 For spaces in which lighting is specified to be installed in addition to, and controlled separately from, the general lighting for the purpose of highlighting art or exhibits, provided that the additional lighting power shall not exceed 0.5 W/ft² of such spaces.
- d ((The watts per square foot may be increased by 2 percent per foot of ceiling height above 20 feet, unless specifically directed otherwise by subsequent footnotes.)) Reserved.
- e ((Footnote d may not be used for these occupancy types.)) Reserved.
- f ((The watts per square foot may be increased by 2 percent per foot of ceiling height above 9 feet. Footnote d may not be used for these occupancy types.)) Reserved.
- g 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.
- h 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.

- i Class I facilities consist of professional facilities; and semiprofessional, collegiate or club facilities with seating for 5,000 or more spectators.
- i Class II facilities consist of collegiate and semiprofessional facilities with seating for fewer than 5,000 spectators; club facilities with seating between 2,000 and 5,000 spectators; and amateur league and high school facilities with seating for more than 2,000 spectators.
- k Class III facilities consist of club, amateur league and high school facilities with seating for 2,000 or fewer spectators.
- l Class IV facilities consist of elementary school and recreational facilities; and amateur league and high school facilities without provisions for spectators.
- m For classrooms, additional lighting power allowance of 4.50 W/linear foot of white or chalk boards for directional lighting dedicated to white or chalk boards.
- n Additional lighting power allowance of 0.30 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 used in a decorative manner that does not serve as display lighting or general lighting.
- o For scientific laboratories, additional lighting power allowance of 0.35 W/ft² for specialized task work - lighting that provides for small-scale, cognitive or fast performance visual tasks, lighting required for operating specialized equipment associated with pharmaceutical/laboratorial activities.
- p For offices, additional lighting power allowance of 0.20 W/ft² for portable lighting, which includes under shelf or furniture-mounted supplemental task lighting qualifies when controlled by a time clock or an occupancy sensor.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40506 Section C405.5—Exterior lighting.

C405.5 Exterior lighting ((~~mandatory~~)) power requirements. ((Where the power for exterior lighting is supplied through the energy service to the building, all exterior lighting shall comply with Sections C405.5.1 and C405.5.2.

EXCEPTION: Where *approved* because of historical, safety, signage or emergency considerations.))

The total connected exterior lighting power calculated in accordance with Section C405.5.2 shall not be greater than the exterior lighting power allowance calculated in accordance with Section C405.5.3.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-405061 Section C405.5.1—Exterior building grounds lighting.

C405.5.1 Exterior building grounds lighting. All exterior building grounds luminaires that operate at greater than ((400)) 50 watts shall have a minimum efficacy of ((80)) 100 lumens per watt unless the luminaire is controlled by a motion sensor or qualifies for one of the exceptions under Section C405.5.2.

EXCEPTIONS: 1. Solar-powered lamps not connected to any electrical source.

- 2. Luminaires controlled by a motion sensor.
- 3. Luminaires that qualify for one of the exceptions under Section C405.5.2.

- 14. Lighting that is controlled from within dwelling units, where the lighting complies with Section R404.1.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-405062 Section C405.5.2—Exterior building lighting power.

C405.5.2 Total connected exterior building lighting power. The total exterior connected lighting power ((allowance for all exterior building applications is the sum of the base site allowance plus the individual allowances for areas that are to be illuminated and are permitted in Table C405.5.2(2) for the applicable lighting zone. Tradeoffs are allowed only among exterior lighting applications listed in Table C405.5.2(2), Tradable Surfaces section. The lighting zone for the building exterior is determined from Table C405.5.2(1) unless otherwise specified by the local jurisdiction)) shall be the total maximum rated wattage of all lighting that is powered through the energy service for the building.

EXCEPTION: Lighting used for the following ((exterior)) applications ((is exempt where equipped with a control device independent of the control of the nonexempt lighting)) shall not be included:

- 1. Lighting approved because of safety considerations;
- 2. Emergency lighting automatically off during normal business operation;
- 3. Exit signs;
- 4. Specialized signal, directional and marker lighting associated with transportation;
- ((2.)) 5. Advertising signage or directional signage;
- ((3.)) 6. Integral to equipment or instrumentation and is installed by its manufacturer;
- ((4.)) 7. Theatrical purposes, including performance, stage, film production and video production;
- ((5.)) 8. Athletic playing areas;
- ((6.)) 9. Temporary lighting;
- ((7.)) 10. Industrial production, material handling, transportation sites and associated storage areas;
- ((8.)) 11. Theme elements in theme/amusement parks; ((and
- 9.)) 12. Lighting integrated within or used to highlight features of art, public monuments and ((registered historic landmark structures or buildings)) the national flag;
- 13. Lighting for water features and swimming pools; and

C405.5.3 Exterior lighting power allowance. The total exterior lighting power allowance is the sum of the base site allowance plus the individual allowances for areas that are to be illuminated by lighting that is powered through the energy service for the building. Lighting power allowances are as specified in Table C405.5.3(2). The lighting zone for the building exterior is determined in accordance with Table C405.5.3(1) unless otherwise specified by the code official.

C405.5.3.1 Additional exterior lighting power. Any increase in the exterior lighting power allowance is limited to the specific lighting applications indicated in Table C405.5.3(3). The additional power shall be used only for the luminaires that are serving these applications and shall not be used for any other purpose.

C405.5.4 Gas lighting. Gas-fired lighting appliances shall not be equipped with continuously burning pilot ignition systems.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-405063 Table ((C405.5.2)) C405.5.3(1)—Exterior lighting zones.

**Table ((C405.5.2)) C405.5.3(1)
Exterior Lighting Zones**

Lighting Zone	Description
1	Developed areas of national parks, state parks, forest land, and rural areas
2	Areas predominantly consisting of residential zoning, neighborhood business districts, light industrial with limited nighttime use and residential mixed use areas
3	All other areas not classified as lighting zone 1, 2, or 4
4	High-activity commercial districts in major metropolitan areas as designated by the local land use planning authority

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-405064 Table ((C405.5.2)) C405.5.3(2)—Individual lighting power allowances for building exteriors.

**Table ((C405.5.2)) C405.5.3(2)
((Individual)) Lighting Power Allowances for Building Exteriors**

	((Lighting Zones			
	Zone 1	Zone 2	Zone 3	Zone 4
Base Site Allowance (Base allowance is usable in tradable or nontradable surfaces.)	500 W	600 W	750 W	1300 W
Tradable Surfaces	Uncovered Parking Areas			

		((Lighting Zones			
		Zone 1	Zone 2	Zone 3	Zone 4
(Lighting power densities for uncovered parking areas, building grounds, building entrances and exits, canopies and overhangs and outdoor sales areas are tradable.)	Parking areas and drives	0.04 W/ft ²	0.06 W/ft ²	0.08 W/ft ²	0.10 W/ft ²
	Building Grounds				
	Walkways less than 10 feet wide	0.7 W/linear foot	0.7 W/linear foot	0.8 W/linear foot	1.0 W/linear foot
	Walkways 10 feet wide or greater, plaza areas, special feature areas	0.14 W/ft ²	0.14 W/ft ²	0.16 W/ft ²	0.2 W/ft ²
	Stairways	0.75 W/ft ²	1.0 W/ft ²	1.0 W/ft ²	1.0 W/ft ²
	Pedestrian tunnels	0.15 W/ft ²	0.15 W/ft ²	0.2 W/ft ²	0.3 W/ft ²
	Building Entrances and Exits				
	Main entries	20 W/linear foot of door width	20 W/linear foot of door width	30 W/linear foot of door width	30 W/linear foot of door width
	Other doors	20 W/linear foot of door width	20 W/linear foot of door width	20 W/linear foot of door width	20 W/linear foot of door width
	Entry canopies	0.25 W/ft ²	0.25 W/ft ²	0.4 W/ft ²	0.4 W/ft ²
	Sales Canopies				
	Free standing and attached	0.6 W/ft ²	0.6 W/ft ²	0.8 W/ft ²	1.0 W/ft ²
	Outdoor Sales				
Open areas (including vehicle sales lots)	0.25 W/ft ²	0.25 W/ft ²	0.5 W/ft ²	0.7 W/ft ²	
Street frontage for vehicle sales lots in addition to "open area" allowance	No Allowance	10 W/linear foot	10 W/linear foot	30 W/linear foot	
Nontradable Surfaces (Lighting power density calculations for the following applications can be used only for the specific application and cannot be traded between surfaces or with other exterior lighting. The following allowances are in addition to any allowance otherwise permitted in the "Tradable Surfaces" section of this table.)	Building facades	No allowance	0.075 W/ft ² of gross above-grade wall area	0.113 W/ft ² of gross above-grade wall area	0.150 W/ft ² of gross above-grade wall area
	Automated teller machines and night depositories	270 W per location plus 90 W per additional ATM per location	270 W per location plus 90 W per additional ATM per location	270 W per location plus 90 W per additional ATM per location	270 W per location plus 90 W per additional ATM per location
	Entrances and gatehouse inspection stations at guarded facilities	0.75 W/ft ² of covered and uncovered area	0.75 W/ft ² of covered and uncovered area	0.75 W/ft ² of covered and uncovered area	0.75 W/ft ² of covered and uncovered area
	Loading areas for law enforcement, fire, ambulance and other emergency service vehicles	0.5 W/ft ² of covered and uncovered area	0.5 W/ft ² of covered and uncovered area	0.5 W/ft ² of covered and uncovered area	0.5 W/ft ² of covered and uncovered area
	Drive-up windows/doors	400 W per drive-through	400 W per drive-through	400 W per drive-through	400 W per drive-through
	Parking near 24-hour retail entrances	800 W per main entry	800 W per main entry	800 W per main entry	800 W per main entry))

	Lighting Zones			
	Zone 1	Zone 2	Zone 3	Zone 4
Base Site Allowance	350 W	400 W	500 W	900 W
Uncovered Parking Areas				
Parking areas and drives	0.03 W/ft ²	0.04 W/ft ²	0.06 W/ft ²	0.08 W/ft ²

	Lighting Zones			
	Zone 1	Zone 2	Zone 3	Zone 4
Building Grounds				
Walkways and ramps less than 10 feet wide	0.5 W/linear foot	0.5 W/linear foot	0.6 W/linear foot	0.7 W/linear foot

	Lighting Zones			
	Zone 1	Zone 2	Zone 3	Zone 4
Walkways and ramps 10 feet wide or greater, plaza areas, special feature areas	0.10 W/ft ²	0.10 W/ft ²	0.11 W/ft ²	0.14 W/ft ²
Dining areas	0.65 W/ft ²	0.65 W/ft ²	0.75 W/ft ²	0.95 W/ft ²
Stairways	0.6 W/ft ²	0.7 W/ft ²	0.7 W/ft ²	0.7 W/ft ²
Pedestrian tunnels	0.12 W/ft ²	0.12 W/ft ²	0.14 W/ft ²	0.21 W/ft ²
Landscaping	0.03 W/ft ²	0.04 W/ft ²	0.04 W/ft ²	0.04 W/ft ²
Building Entrances and Exits				
Pedestrian and vehicular entrances and exits	14 W/linear foot of opening	14 W/linear foot of opening	21 W/linear foot of opening	21 W/linear foot of opening
Entry canopies	0.2 W/ft ²	0.25 W/ft ²	0.4 W/ft ²	0.4 W/ft ²
Loading docks	0.35 W/ft ²	0.35 W/ft ²	0.35 W/ft ²	0.35 W/ft ²
Sales Canopies				
Free standing and attached	0.4 W/ft ²	0.4 W/ft ²	0.6 W/ft ²	0.7 W/ft ²
Outdoor Sales				
Open areas (including vehicle sales lots)	0.2 W/ft ²	0.2 W/ft ²	0.35 W/ft ²	0.5 W/ft ²
Street frontage for vehicle sales lots in addition to "open area" allowance	No Allowance	7 W/linear foot	7 W/linear foot	21 W/linear foot

For SI: 1 foot = 304.8 mm, 1 watt per square foot = W/0.0929 m²

Table C405.5.3(3)

Individual Lighting Power Allowances for Building Exteriors

	Lighting Zones			
	Zone 1	Zone 2	Zone 3	Zone 4
Building facades	No allowance	0.075 W/ft ² of gross above-grade wall area	0.113 W/ft ² of gross above-grade wall area	0.150 W/ft ² of gross above-grade wall area
Automated teller machines and night depositories	135W per location plus 45W per additional ATM per location			
Entrances and gatehouse inspection stations at guarded facilities	0.5 W/ft ²			
Loading areas for law enforcement, fire, ambulance and other emergency service vehicles	0.35 W/ft ²			

	Lighting Zones			
	Zone 1	Zone 2	Zone 3	Zone 4
Drive-up windows/doors	200 W per drive-through			
Parking near 24-hour retail entrances	400 W per main entry			

AMENDATORY SECTION (Amending WSR 17-10-062, filed 5/2/17, effective 6/2/17)

WAC 51-11C-40507 Section C405.6—Electrical energy consumption.

C405.6 Electrical transformers ((Mandatory)). Low-voltage dry-type distribution electric transformers shall meet the minimum efficiency requirements of Table C405.6 as tested and rated in accordance with the test procedure listed in DOE 10 C.F.R. 431. The efficiency shall be verified through certification under an approved certification program or, where no certification program exists, the equipment efficiency ratings shall be supported by data furnished by the transformer manufacturer.

EXCEPTION: The following transformers are exempt:

1. Transformers that meet the Energy Policy Act of 2005 exclusions based on the DOE 10 C.F.R. 431 definition of special purpose applications.
2. Transformers that meet the Energy Policy Act of 2005 exclusions that are not to be used in general purpose applications based on information provided in DOE 10 C.F.R. 431.
3. Transformers that meet the Energy Policy Act of 2005 exclusions with multiple voltage taps where the highest tap is ((at least)) not less than 20 percent more than the lowest tap.
4. Drive transformers.
5. Rectifier transformers.
6. Auto-transformers.
7. Uninterruptible power system transformers.
8. Impedance transformers.
9. Regulating transformers.
10. Sealed and nonventilating transformers.
11. Machine tool transformer.
12. Welding transformer.
13. Grounding transformer.
14. Testing transformer.

Table C405.6
Minimum Nominal Efficiency Levels For 10 C.F.R. 431
Low Voltage Dry-Type Distribution Transformers

Single Phase Transformers		Three Phase Transformers	
kVA^a	Efficiency (%)^b	kVA^a	Efficiency (%)^b
15	97.70	15	((97.0)) 97.89
25	98.00	30	((97.5)) 98.23
37.5	98.20	45	((97.7)) 98.40
50	98.30	75	((98.0)) 98.60

Single Phase Transformers		Three Phase Transformers	
75	98.50	112.5	((98.2)) 98.74
100	98.60	150	((98.3)) 98.83
167	98.70	225	((98.5)) 98.94
250	98.80	300	((98.6)) 99.02
333	98.90	500	((98.7)) 99.14
		750	((98.8)) 99.23
		1000	((98.9)) 99.28

a kiloVolt-Amp rating.

b Nominal efficiencies shall be established in accordance with the DOE 10 C.F.R. 431 test procedure for low voltage dry-type transformers.

C405.7 Dwelling unit electrical energy consumption ((Mandatory)). Each dwelling unit located in a Group R-2 building shall have a separate electrical meter. A utility tenant meter meets this requirement. See Section C409 for additional requirements for energy metering and energy consumption management.

EXCEPTION: Dwelling units in other than Group R-2 multi-family and live/work units are not required to provide a separate electrical metering at each dwelling unit where electrical usage is metered separately for each of the following building end uses:

1. Dwelling units.
2. Sleeping units.
3. Commercial kitchens.
4. Central laundries.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40508 Section C405.8—Electric motors.

C405.8 Electric motor efficiency ((mandatory)). 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 C.F.R. 431. The efficiency shall be verified through certifica-

~~((Table C405.8(1))~~

Minimum Nominal Full load Efficiency for 60 Hz NEMA General Purpose Electric Motors (Subtype I) Rated 600 Volts or Less (Random Wound)*

NUMBER OF POLES▶	OPEN DRIP PROOF MOTORS			TOTALLY ENCLOSED FAN COOLED MOTORS		
	2	4	6	2	4	6
SYNCHRONOUS SPEED (RPM)▶	3600	1800	1200	3600	1800	1200
MOTOR HORSEPOWER▼						
1	77.0	85.5	82.5	77.0	85.5	82.5
1.5	84.0	86.5	86.5	84.0	86.5	87.5
2	85.5	86.5	87.5	85.5	86.5	88.5
3	85.5	89.5	88.5	86.5	89.5	89.5
5	86.5	89.5	89.5	88.5	89.5	89.5
7.5	88.5	91.0	90.2	89.5	91.7	91.0

tion under an approved certification program or, where no certification program exists, the equipment efficiency ratings 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. Components sets of an electric motor.
3. Liquid-cooled electric motors.
4. Submersible electric motors.
5. Inverter-only electric motors.

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 C.F.R. 431. These motors shall also have the means to adjust motor speed for either balancing or remote control. Belt-driven fans may use sheave adjustments 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 C403.2.3 and Tables C403.2.3(1) through C403.2.3(10) 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. Fan motors that are 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 ((high)) efficacy requirements of Section ((C403.2.11.4)) 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.

NUMBER OF POLES▶	OPEN DRIP PROOF MOTORS			TOTALLY ENCLOSED FAN COOLED MOTORS		
	2	4	6	2	4	6
SYNCHRONOUS SPEED (RPM)▶	3600	1800	1200	3600	1800	1200
MOTOR HORSEPOWER▼						
10	89.5	91.7	91.7	90.2	91.7	91.0
15	90.2	93.0	91.7	91.0	92.4	91.7
20	91.0	93.0	92.4	91.0	93.0	91.7
25	91.7	93.6	93.0	91.7	93.6	93.0
30	91.7	94.1	93.6	91.7	93.6	93.0
40	92.4	94.1	94.1	92.4	94.1	94.1
50	93.0	94.5	94.1	93.0	94.5	94.1
60	93.6	95.0	94.5	93.6	95.0	94.5
75	93.6	95.0	94.5	93.6	95.4	94.5
100	93.6	95.4	95.0	94.1	95.4	95.0
125	94.1	95.4	95.0	95.0	95.4	95.0
150	94.1	95.8	95.4	95.0	95.8	95.8
200	95.0	95.8	95.4	95.4	96.2	95.8
250	95.0	95.8	95.4	95.8	96.2	95.8
300	95.4	95.8	95.4	95.8	96.2	95.8
350	95.4	95.8	95.4	95.8	96.2	95.8
400	95.8	95.8	95.8	95.8	96.2	95.8
450	95.8	96.2	96.2	95.8	96.2	95.8
500	95.8	96.2	96.2	95.8	96.2	95.8

*Nominal efficiencies shall be established in accordance with DOE 10 C.F.R. 431.

Table C405.8(2)
Minimum Nominal Full-load Efficiency of General Purpose Electric Motors (Subtype II) And All Design B Motors Greater Than 200 Horsepower*

NUMBER OF POLES▶	OPEN DRIP PROOF MOTORS				TOTALLY ENCLOSED FAN COOLED MOTORS			
	2	4	6	8	2	4	6	8
SYNCHRONOUS SPEED (RPM)▶	3600	1800	1200	900	3600	1800	1200	900
MOTOR HORSEPOWER▼								
1	NR	82.5	80.0	74.0	75.5	82.5	80.0	74.0
1.5	82.5	84.0	84.0	75.5	82.5	84.0	85.5	77.0
2	84.0	84.0	85.5	85.5	84.0	84.0	86.5	82.5
3	84.0	86.5	86.5	86.5	85.5	87.5	87.5	84.0
5	85.5	87.5	87.5	87.5	87.5	87.5	87.5	85.5
7.5	87.5	88.5	88.5	88.5	88.5	89.5	89.5	85.5
10	88.5	89.5	90.2	89.5	89.5	89.5	89.5	88.5
15	89.5	91.0	90.2	89.5	90.2	91.0	90.2	88.5
20	90.2	91.0	91.0	90.2	90.2	91.0	90.2	89.5
25	91.0	91.7	91.7	90.2	91.0	92.4	91.7	89.5
30	91.0	92.4	92.4	91.0	91.0	92.4	91.7	91.0
40	91.7	93.0	93.0	91.0	91.7	93.0	93.0	91.0
50	92.4	93.0	93.0	91.7	92.4	93.0	93.0	91.7

NUMBER OF POLES▶	OPEN DRIP-PROOF MOTORS				TOTALLY ENCLOSED FAN-COOLED MOTORS			
	2	4	6	8	2	4	6	8
SYNCHRONOUS SPEED (RPM)▶	3600	1800	1200	900	3600	1800	1200	900
MOTOR HORSEPOWER▼								
60	93.0	93.6	93.6	92.4	93.0	93.6	93.6	91.7
75	93.0	94.1	93.6	93.6	93.0	94.1	93.6	93.0
100	93.0	94.1	94.1	93.6	93.6	94.5	94.1	93.0
125	93.6	94.5	94.1	93.6	94.5	94.5	94.1	93.6
150	93.6	95.0	94.5	93.6	94.5	95.0	95.0	93.6
200	94.5	95.0	94.5	93.6	95.0	95.0	95.0	94.1
250	94.5	95.4	95.4	94.5	95.4	95.0	95.0	94.5
300	95.0	95.4	95.4	NR	95.4	95.4	95.0	NR
350	95.0	95.4	95.4	NR	95.4	95.4	95.0	NR
400	95.4	95.4	NR	NR	95.4	95.4	NR	NR
450	95.8	95.8	NR	NR	95.4	95.4	NR	NR
500	95.8	95.8	NR	NR	95.4	95.8	NR	NR

*Nominal efficiencies shall be established in accordance with DOE 10 C.F.R. 431.

—NR— No requirement.)

Table C405.8(1)

Minimum Nominal Full-load Efficiency for NEMA Design A, NEMA Design B and IEC Design N Motors (Excluding Fire Pump) Electric Motors at 60 Hz^{ab}

Motor horsepower (Standard kilowatt equivalent)	Nominal full-load efficiency (%) as of June 1, 2016							
	2 pole		4 pole		6 pole		8 pole	
	Enclosed	Open	Enclosed	Open	Enclosed	Open	Enclosed	Open
1 (0.75)	77.0	77.0	85.5	85.5	82.5	82.5	75.5	75.5
1.5 (1.1)	84.0	84.0	86.5	86.5	87.5	86.5	78.5	77.5
2 (1.5)	85.5	85.5	86.5	86.5	88.5	87.5	84.0	86.5
3 (2.2)	86.5	85.5	89.5	89.5	89.5	88.5	85.5	87.5
5 (3.7)	88.5	86.5	89.5	89.5	89.5	89.5	86.5	88.5
7.5 (5.5)	89.5	88.5	91.7	91.0	91.0	90.2	86.5	89.5
10 (7.5)	90.2	89.5	91.7	91.7	91.0	91.7	89.5	90.2
15 (11)	91.0	90.2	92.4	93.0	91.7	91.7	89.5	90.2
20 (15)	91.0	91.0	93.0	93.0	91.7	92.4	90.2	91.0
25 (18.5)	91.7	91.7	93.6	93.6	93.0	93.0	90.2	91.0
30 (22)	91.7	91.7	93.6	94.1	93.0	93.6	91.7	91.7
40 (30)	92.4	92.4	94.1	94.1	94.1	94.1	91.7	91.7
50 (37)	93.0	93.0	94.5	94.5	94.1	94.1	92.4	92.4
60 (45)	93.6	93.6	95.0	95.0	94.5	94.5	92.4	93.0
75 (55)	93.6	93.6	95.4	95.0	94.5	94.5	93.6	94.1
100 (75)	94.1	93.6	95.4	95.4	95.0	95.0	93.6	94.1
125 (90)	95.0	94.1	95.4	95.4	95.0	95.0	94.1	94.1
150 (110)	95.0	94.1	95.8	95.8	95.8	95.4	94.1	94.1
200 (150)	95.4	95.0	96.2	95.8	95.8	95.4	94.5	94.1
250 (186)	95.8	95.0	96.2	95.8	95.8	95.8	95.0	95.0

Motor horsepower (Standard kilowatt equivalent)	Nominal full-load efficiency (%) as of June 1, 2016							
	2 pole		4 pole		6 pole		8 pole	
	Enclosed	Open	Enclosed	Open	Enclosed	Open	Enclosed	Open
300 (224)	95.8	95.4	96.2	95.8	95.8	95.8		
350 (261)	95.8	95.4	96.2	95.8	95.8	95.8		
400 (298)	95.8	95.8	96.2	95.8				
450 (336)	95.8	96.2	96.2	96.2				
500 (373)	95.8	96.2	96.2	96.2				

- a Nominal efficiencies shall be established in accordance with DOE 10 C.F.R. 431.
- b For purposes of determining the required minimum nominal full-load efficiency of an electric motor that has a horsepower or kilowatt rating between two horsepower or two kilowatt ratings listed in this table, each such motor shall be deemed to have a listed horsepower or kilowatt rating, determined as follows:
 - 1. A horsepower at or above the midpoint between the two consecutive horsepowers shall be rounded up to the higher of the two horsepowers.

- 2. A horsepower below the midpoint between the two consecutive horsepowers shall be rounded down to the lower of the two horsepowers.
- 3. A kilowatt rating shall be directly converted from kilowatts to horsepower using the formula 1 kW = (1/0.746) horsepower. The conversion should be calculated to three significant decimal places, and the resulting horsepower shall be rounded in accordance with 1 or 2, whichever applies.

Table C405.8(2)
Minimum Nominal Full-load Efficiency for NEMA Design C and IEC Design H Motors at 60 Hz^{a,b}

Motor horsepower (Standard kilowatt equivalent)	Nominal full-load efficiency (%) as of June 1, 2016					
	4 pole		6 pole		8 pole	
	Enclosed	Open	Enclosed	Open	Enclosed	Open
1 (0.75)	85.5	85.5	82.5	82.5	75.5	75.5
1.5 (1.1)	86.5	86.5	87.5	86.5	78.5	77.5
2 (1.5)	86.5	86.5	88.5	87.5	84.0	86.5
3 (2.2)	89.5	89.5	89.5	88.5	85.5	87.5
5 (3.7)	89.5	89.5	89.5	89.5	86.5	88.5
7.5 (5.5)	91.7	91.0	91.0	90.2	86.5	89.5
10 (7.5)	91.7	91.7	91.0	91.7	89.5	90.2
15 (11)	92.4	93.0	91.7	91.7	89.5	90.2
20 (15)	93.0	93.0	91.7	92.4	90.2	91.0
25 (18.5)	93.6	93.6	93.0	93.0	90.2	91.0
30 (22)	93.6	94.1	93.0	93.6	91.7	91.7
40 (30)	94.1	94.1	94.1	94.1	91.7	91.7
50 (37)	94.5	94.5	94.1	94.1	92.4	92.4
60 (45)	95.0	95.0	94.5	94.5	92.4	93.0
75 (55)	95.4	95.0	94.5	94.5	93.6	94.1
100 (75)	95.4	95.4	95.0	95.0	93.6	94.1
125 (90)	95.4	95.4	95.0	95.0	94.1	94.1
150 (110)	95.8	95.8	95.8	95.4	94.1	94.1
200 (150)	96.2	95.8	95.8	95.4	94.5	94.1

NR - No requirement.

- a Nominal efficiencies shall be established in accordance with DOE 10 C.F.R. 431.

- b For purposes of determining the required minimum nominal full-load efficiency of an electric motor that has a horsepower or kilowatt rating between two horsepower or two kilowatt ratings listed in this table, each such motor shall be deemed to have a listed horsepower or kilowatt rating, determined as follows:

1. A horsepower at or above the midpoint between the two consecutive horsepower shall be rounded up to the higher of the two horsepower.
2. A horsepower below the midpoint between the two consecutive horsepower shall be rounded down to the lower of the two horsepower.
3. A kilowatt rating shall be directly converted from kilowatts to horsepower using the formula $1 \text{ kW} = (1/0.746) \text{ horsepower}$. The conversion should be calculated to three significant decimal places, and the resulting horsepower shall be rounded in accordance with 1 or 2, whichever applies.

Table C405.8(3)

Minimum Average Full Load Efficiency for Polyphase Small Electric Motors^a

OPEN MOTORS			
NUMBER OF POLES =>	2	4	6
SYNCHRONOUS SPEED (RPM) ==>	3600	1800	1200
MOTOR HORSEPOWER ▾			
0.25	65.6	69.5	67.5
0.33	69.5	73.4	71.4
0.50	73.4	78.2	75.3
0.75	76.8	81.1	81.7
1	77.0	83.5	82.5
1.5	84.0	86.5	83.8
2	85.5	86.5	N/A
3	85.5	86.9	N/A

^a Average full load efficiencies shall be established in accordance with 10 C.F.R. 431.

Table C405.8(4)

Minimum Average Full Load Efficiency For Capacitor-start Capacitor-run and Capacitor-start Induction-run Small Electric Motors^a

OPEN MOTORS			
NUMBER OF POLES =>	2	4	6
SYNCHRONOUS SPEED (RPM) ==>	3600	1800	1200
MOTOR HORSEPOWER ▾			
0.25	66.6	68.5	62.2
0.33	70.5	72.4	66.6
0.50	72.4	76.2	76.2
0.75	76.2	81.8	80.2
1	80.4	82.6	81.1
1.5	81.5	83.8	N/A
2	82.9	84.5	N/A
3	84.1	N/A	N/A

^a Average full load efficiencies shall be established in accordance with 10 C.F.R. 431.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40509 Section C405.9—Vertical and horizontal transportation systems.

C405.9 Vertical and horizontal transportation systems and equipment. Vertical and horizontal transportation systems and equipment shall comply with this section.

C405.9.1 Elevator cabs. For the luminaires in each elevator cab, not including signals and displays, the sum of the lumens divided by the sum of the watts shall be no less than 35 lumens per watt. Ventilation fans in elevators that do not have their own air conditioning system shall not consume more than 0.33 watts/cfm at the maximum rated speed of the fan. Controls shall be provided that will deenergize ventilation fans and lighting systems when the elevator is stopped, unoccupied and with its doors closed for over 15 minutes.

C405.9.2 Escalators and moving walks. Escalators and moving walks shall comply with ASME A17.1/CSA B44 and shall have automatic controls configured to reduce speed to the minimum permitted speed in accordance with ASME A17.1/CSA B44 or applicable local code when not conveying passengers.

EXCEPTION: A ((power factor controller)) variable voltage drive system that reduces operating voltage in response to light loading conditions may be provided in place of the variable speed function.

C405.9.2.1 Regenerative drive. An escalator designed either for one-way down operation only or for reversible operation shall have a variable frequency regenerative drive that supplies electrical energy to the building electrical system when the escalator is loaded with passengers whose combined weight exceeds 750 pounds.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40510 Section C405.10—Controlled receptacles.

C405.10 Controlled receptacles. At least 50 percent of all 125 volt 15- and 20-ampere receptacles installed in private offices, open offices, conference rooms, rooms used primarily for printing and/or copying functions, break rooms, individual workstations and classrooms, including those installed in modular partitions and modular office workstation systems, shall be controlled as required by this section. In rooms larger than 200 square feet (19 m²), a controlled receptacle shall be located within 72 inches (1.8 m) of each uncontrolled receptacle. Controlled receptacles shall be visibly differentiated from standard receptacles and shall be controlled by one of the following automatic control devices:

1. An occupant sensor that turns receptacle power off when no occupants have been detected for a maximum of 20 minutes.
2. A time-of-day operated control device that turns receptacle power off at specific programmed times and can be programmed separately for each day of the week. The control device shall be configured to provide an independent

schedule for each portion of the building not to exceed 5,000 square feet (465 m²) and not to exceed one full floor. The device shall be capable of being overridden for periods of up to two hours by a timer (~~(accessible)~~) in a location with access to occupants. Any individual override switch shall control the controlled receptacles for a maximum area of 5,000 square feet (465 m²). Override switches for controlled receptacles are permitted to control the lighting within the same area.

EXCEPTION: Receptacles designated for specific equipment requiring 24-hour operation, for building maintenance functions, or for specific safety or security equipment are not required to be controlled by an automatic control device and are not required to be located within 72 inches (1.8 m) of a controlled receptacle.

AMENDATORY SECTION (Amending WSR 16-24-070, filed 12/6/16, effective 5/1/17)

~~WAC 51-11C-40511 ((Electrical power and lighting systems commissioning and completion requirements.))~~ Section C405.11—Voltage drop in feeders and branch circuits. ~~((Electrical power and lighting systems shall be commissioned and completed in accordance with Section C408.))~~ Voltage drop in feeders and branch circuits. The total voltage drop across the combination of feeders and branch circuits shall not exceed five percent.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

~~WAC 51-11C-40512 ((Reserved.))~~ Section C405.12—Electrical commissioning.

C405.12 Commissioning. Controlled receptacles and lighting systems shall be commissioned in accordance with Section C408.

AMENDATORY SECTION (Amending WSR 13-04-056, filed 2/1/13, effective 7/1/13)

~~WAC 51-11C-40513 ((Section C405.13—Electrical power and lighting systems commissioning and completion requirements.))~~ Reserved.

~~((C405.13 Electrical power and lighting systems commissioning and completion requirements. Electrical power and~~

~~lighting systems shall be commissioned and completed in accordance with Section C408.))~~

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

~~WAC 51-11C-40600 Section C406—((Additional) Efficiency packages ((options)).)~~

~~C406.1 ((Requirements. Buildings shall comply with no less than two of the following:~~

- ~~1. More efficient HVAC performance in accordance with Section C406.2.~~
- ~~2. Reduced lighting power in accordance with Section C406.3.~~
- ~~3. Enhanced lighting controls in accordance with Section C406.4.~~
- ~~4. On-site supply of renewable energy in accordance with Section C406.5.~~
- ~~5. Provision of a dedicated outdoor air system for certain HVAC equipment in accordance with Section C406.6.~~
- ~~6. High efficiency service water heating in accordance with Section C406.7.~~
- ~~7. Enhanced envelope performance in accordance with Section C406.8.~~
- ~~8. Reduced air infiltration in accordance with Section C406.9.))~~

Additional energy efficiency credit requirements. New buildings and changes in space conditioning, change of occupancy and building additions in accordance with Chapter 5 shall comply with sufficient packages from Table C406.1 so as to achieve a minimum number of 6 credits. Each area shall be permitted to apply for different packages provided all areas in the building comply with the requirements for 6 credits. Areas included in the same permit within mixed use buildings shall be permitted to demonstrate compliance by an area weighted average number of credits by building occupancy achieving a minimum number of 6 credits.

- EXCEPTIONS:
1. Low energy spaces in accordance with Section C402.1.1.1 and equipment buildings in accordance with Section C402.1.2 shall comply with sufficient packages from Table C406.1 to achieve a minimum number of 3 credits.
 2. Building additions that have less than 1,000 square feet of conditioned floor area shall comply with sufficient packages from Table C406.1 to achieve a minimum number of 3 credits.

**Table C406.1
Efficiency Package Credits**

Code Section	Commercial Building Occupancy					
	Group R-1	Group R-2	Group B	Group E	Group M	All Other
	Additional Efficiency Credits					
<u>1. More efficient HVAC performance in accordance with Section C406.2</u>	<u>2.0</u>	<u>3.0</u>	<u>3.0</u>	<u>2.0</u>	<u>1.0</u>	<u>2.0</u>
<u>2. Reduced lighting power: Option 1 in accordance with Section C406.3.1</u>	<u>1.0</u>	<u>1.0</u>	<u>2.0</u>	<u>2.0</u>	<u>3.0</u>	<u>2.0</u>

Code Section	Commercial Building Occupancy					
	Group R-1	Group R-2	Group B	Group E	Group M	All Other
	Additional Efficiency Credits					
3. Reduced lighting power: Option 2 in accordance with Section C406.3.2 ^a	2.0	3.0	4.0	4.0	6.0	4.0
4. Enhanced lighting controls in accordance with Section C406.4	NA	NA	1.0	1.0	1.0	1.0
5. On-site supply of renewable energy in accordance with C406.5	3.0	3.0	3.0	3.0	3.0	3.0
6. Dedicated outdoor air system in accordance with Section C406.6 ^b	4.0	4.0	4.0	NA	NA	4.0
7. High performance dedicated outdoor air system in accordance with Section C406.7	4.0	4.0	4.0	4.0	4.0	4.0
8. High-efficiency service water heating in accordance with Sections C406.8.1 and C406.8.2	4.0	5.0	NA	NA	NA	8.0
9. High performance service water heating in multi-family buildings in accordance with Section C406.9	7.0	8.0	NA	NA	NA	NA
10. Enhanced envelope performance in accordance with Section C406.10 ^c	3.0	6.0	3.0	3.0	3.0	4.0
11. Reduced air infiltration in accordance with Section C406.11 ^c	1.0	2.0	1.0	1.0	1.0	1.0
12. Enhanced commercial kitchen equipment in accordance with Section C406.12	5.0	NA	NA	NA	5.0	5.0 (Group A-2 only)

- ^a Projects using this option may not use Item 2.
- ^b This option is not available to buildings subject to the prescriptive requirements of Section C403.3.5.
- ^c Buildings or building areas that are exempt from the thermal envelope requirements in accordance with Sections C402.1.1 and C402.1.2, do not qualify for this package.

C406.1.1 Tenant spaces. (~~Tenant spaces shall comply with Section C406.2, C406.3, C406.4, C406.6 or C406.7, where applicable.~~) Initial tenant improvement shall comply with sufficient packages from Table C406.1 so as to achieve a minimum number of six credits. In buildings with multiple tenant spaces, each tenant space is permitted to apply for different packages provided all areas in the building comply with the requirement for six credits.

C406.1.1.1 Applicable envelope and on-site renewable energy credits. Where an entire building or building addition complies with Section C406.5, (~~C406.8 or C406.9~~) C406.10 or C406.11, under an initial tenant improvement permit, tenant spaces within the building (~~shall be deemed to comply with this section.~~) qualify for the number of credits assigned to the occupancy type of the tenant space in accordance with Table C406.1.

C406.1.1.2 Applicable HVAC and service water heating credits. Where HVAC and service water heating systems and services are installed and comply with Section C406.2 or C406.8 under an initial tenant improvement permit, those systems and services shall be considered a part of the tenant space. Tenant spaces qualify for the credits assigned to the occupancy type of the tenant space in accordance with Table C406.1 if the tenant space includes the distribution system and equipment that the central HVAC systems or service water heating systems were designed to support.

EXCEPTION: Previously occupied tenant spaces in existing buildings that comply with this code in accordance with Section C501.

AMENDATORY SECTION (Amending WSR 16-13-089, filed 6/15/16, effective 7/16/16)

WAC 51-11C-40602 Section C406.2—HVAC option.

C406.2 More efficient HVAC equipment and fan performance. (~~Buildings shall comply with Sections C406.2.1 through C406.2.3.~~) No less than 90 percent of the total HVAC capacity serving the total conditioned floor area of the entire building, building addition or tenant space in accordance with Section C406.1.1 shall comply with Sections

C406.2.1 through C406.2.3. For systems required to comply with Section C403.1.1, HVAC total system performance ratio, exceed the minimum requirement by 10 percent.

EXCEPTION: In low energy spaces complying with Section C402.1.1 and semi-heated spaces complying with Section C402.1.1.2, no less than 90 percent of the installed heating capacity is provided by electric infrared or gas-fired radiant heating equipment for localized heating applications. Stand-alone supply, return and exhaust fans shall comply with Section C406.2.3.

C406.2.1 HVAC system selection. ~~((No less than 90 percent of the total HVAC capacity serving the building shall be provided by equipment that is))~~ Equipment installed shall be types that are listed in Tables C403.2.3(1) through C403.2.3((9)) (12) or a combination thereof. Electric resistance heating does not meet this requirement.

EXCEPTION: ((Air-to-water heat pumps or heat recovery chillers are also permitted to be utilized for Option C406.2:))
Allowed equipment not listed in Tables C403.2.3(1) through C403.2.3(12):

1. Air-to-water heat pumps.
2. Heat recovery chillers.

C406.2.2 Minimum equipment efficiency. Equipment shall exceed the minimum efficiency requirements listed in Tables C403.2.3(1) through C403.2.3((9)) (12) by 15 percent, in addition to the requirements of Section C403. Where multiple performance requirements are provided, the equipment shall exceed all requirements by 15 percent.

EXCEPTIONS:

1. Equipment that is larger than the maximum capacity range indicated in Tables C403.2.3(1) through C403.2.3((9)) (12) shall utilize the values listed for the largest capacity equipment for the associated equipment type shown in the table.
2. Equipment that complies with the exception to Section C406.2.1 is not required to comply with the minimum equipment efficiency requirement.
3. Compliance may be demonstrated by calculating a total weighted average percentage for all heating and cooling equipment combined. All equipment shall have efficiency that is no less than 5 percent better than the minimum required efficiency in Table C403.2.3(1) through C403.2.3(12), and the resulting weighted average percentage for all equipment performance requirements shall exceed 15 percent. Calculation shall include heating and cooling capacities for all equipment, percentage better or worse than minimum required efficiency per Tables C403.2.3(1) through C403.2.3(12) for each performance requirement (SEER, EER/IEER, COP, HSPF, E_p, E_c, and AFUE), and the total weighted average efficiency percentage.
4. Hot water boilers with input capacity greater than 2,500,000 Btu/h shall be considered to comply with this section with a minimum thermal efficiency of 95 percent E_t in accordance with the test procedure in 10 C.F.R. Part 431.

C406.2.3 Minimum fan efficiency. Stand-alone supply, return and exhaust fans designed for operating with motors over 750 watts (1 hp) shall have ~~((an energy))~~ a fan efficiency ((classification)) grade of not less than FEG 71 as defined in AMCA 205. The total efficiency of the fan at the design point of operation shall be within 10 percentage points of either the

maximum total efficiency of the fan or the static efficiency of the fan.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40603 Section C406.3—LPA option.

C406.3 Reduced lighting power. ~~((Buildings shall comply with Sections C406.3.1 and, where applicable, C406.3.2:))~~ Interior lighting within the whole building, building addition or tenant space shall comply with Section C406.3.1 or Section C406.3.2. Dwelling units and sleeping units within the building shall comply with Section C406.3.3.

C406.3.1 Reduced lighting power ((density)) Option 1. The total connected interior lighting power ((watts) of the building)) calculated in accordance with Section C405.4.1 shall be ~~((75))~~ 90 percent or less of the lighting power values specified in Table C405.4.2(1) times the floor area for the building types, or ((by using 75)) 90 percent or less of the total interior lighting power allowance calculated ((by the Space by Space Method)) in accordance with Section C405.4.2.

C406.3.2 Reduced lighting power Option 2. The total connected interior lighting power calculated in accordance with Section C405.4.1 shall be 80 percent or less of the lighting power values specified in Table C405.4.2(1) times the floor area of the building types, or 80 percent or less of the total interior lighting power allowance calculated in accordance with Section C405.4.2.

C406.3.3 Lamp fraction. ~~((Not))~~ No less than 95 percent ((of the interior lighting power (watts) from lamps in)) permanently installed light fixtures in dwelling units and sleeping units shall be provided by lamps with a minimum efficacy of ~~((60))~~ 65 lumens per watt.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40604 Section C406.4—Lighting controls option.

C406.4 Enhanced digital lighting controls. ~~((Interior lighting shall be located, scheduled and operated in accordance with Section C405.2 and))~~ No less than 90 percent of the total installed interior lighting power within the whole building, building addition or tenant space shall ((be configured with the following enhanced control functions:)) comply with Section C406.4.1.

C406.4.1 Lighting controls function. Interior lighting shall be located, scheduled and operated in accordance with Section C405.2, and shall be configured with the following enhanced control functions:

1. Luminaires shall be configured for continuous dimming.
2. Each luminaire shall be individually addressed.

EXCEPTIONS TO:

1. Multiple luminaires mounted on no more than 12 linear feet of a single lighting track and addressed as a single luminaire.

2. Multiple linear luminaires that are ganged together to create the appearance of a single longer fixture and addressed as a single luminaire, where the total length of the combined luminaires is not more than 12 feet.

~~((3. Not more than eight luminaires within a *daylight zone* are permitted to be controlled by a single *daylight responsive control*.~~

4. Luminaires shall be controlled by a digital control system configured with the following capabilities:

4.1. Scheduling and illumination levels of individual luminaires and groups of luminaires are capable of being reconfigured through the system.

4.2. Load shedding.

4.3. In open and enclosed offices, the illumination level of overhead general illumination luminaires are configured to be individually adjusted by occupants.

4.4. Occupancy sensors and daylight responsive controls are capable of being reconfigured through the system.

5. Construction documents shall include submittal of a Sequence of Operations, including a specification outlining each of the functions required by this section.))

3. No more than eight luminaires within a *daylight zone* are permitted to be controlled by a single *daylight responsive control*.

4. Luminaires shall be controlled by a digital control system configured with the following capabilities:

4.1. Scheduling and illumination levels of individual luminaires and groups of luminaires are capable of being reconfigured through the system.

4.2. Load shedding.

4.3. In open and enclosed offices, the illumination level of overhead general illumination luminaires are configured to be individually adjusted by occupants.

4.4. Occupancy sensors and daylight responsive controls are capable of being reconfigured through the system.

5. Construction documents shall include submittal of a Sequence of Operations, including a specification outlining each of the functions required by this section.

AMENDATORY SECTION (Amending WSR 16-24-070, filed 12/6/16, effective 5/1/17)

WAC 51-11C-40605 Section C406.5—On-site renewable energy option.

C406.5 On-site renewable energy. ~~((Buildings))~~ A whole building, building addition or tenant space shall be provided with on-site renewable energy systems with an annual energy production per square foot ((of conditioned floor area of the building of not)) of no less than the value specified in Table C406.5 based on the total conditioned floor area of the whole building. The on-site renewable used in this option shall be separate from on-site renewables used as part of Section C406.8 or used to qualify for any exception in this code.

Table C406.5

On-Site Renewable Energy System Rating (per square foot)

Building Area Type	kBtu/year	kWh/year
Assembly	1.8	0.53

Building Area Type	kBtu/year	kWh/year
Dining	10.7	3.14
Hospital	3.6	1.06
Hotel/Motel	2.0	0.59
Multifamily residential	0.50	0.15
Office	0.82	0.24
Other	2.02	0.59
Retail	1.31	0.38
School/University	1.17	0.34
Supermarket	5.0	1.47
Warehouse	0.43	0.13

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40606 Section C406.6—DOAS option.

C406.6 Dedicated outdoor air system (DOAS). Not less than 90(~~(%)~~) percent of the ~~((building))~~ total conditioned floor area of the whole building, building addition or tenant space, excluding floor area of unoccupied spaces that do not require ventilation per the *International Mechanical Code*, shall be served by DOAS installed in accordance with Section ~~((C403.6))~~ C403.3.5. This option is not available to ~~((both))~~ buildings subject to ~~((and not subject to))~~ the prescriptive requirements of Section ~~((C403.6))~~ C403.3.5.

AMENDATORY SECTION (Amending WSR 16-24-070, filed 12/6/16, effective 5/1/17)

WAC 51-11C-40607 Section C406.7—~~((Service water heating))~~ High performance dedicated outdoor air system option.

C406.7 ~~((Reduced energy use in service water heating.~~ Buildings shall comply with Sections C406.7.1 and C406.7.2.

C406.7.1 Building type. Not less than 90 percent of the conditioned floor area shall be of the following types:

1. Group R-1: Boarding houses, hotels or motels.
2. Group I-2: Hospitals, psychiatric hospitals and nursing homes.
3. Group A-2: Restaurants and banquet halls or buildings containing food preparation areas.
4. Group F: Laundries.
5. Group R-2: Buildings with residential occupancies.
6. Group A-3: Health clubs and spas.
7. Buildings with a service hot water load of 10 percent or more of total building energy loads, as shown with an energy analysis as described in Section C407.

C406.7.2 Load fraction. Not less than 60 percent of the annual building service hot water heating energy use, or not less than 100 percent of the annual building service hot water heating energy use in buildings subject to the requirements of Section C403.5.4, shall be provided by one or more of the following:

1. Service hot water system delivering heating requirements using heat pump technology with a minimum COP of 3.0.

2. Waste heat recovery from service hot water, heat recovery chillers, building equipment, process equipment, a combined heat and power system, or other *approved* system.

3. Solar water heating systems.)) **High performance dedicated outdoor air system (DOAS).** A whole building, building addition or tenant space which includes a DOAS complying with Section C406.6 shall also provide minimum sensible effectiveness of heat recovery of 80 percent and DOAS total combined fan power less than 0.5 W/cfm of outdoor air. For the purpose of this section, total combined fan power includes all supply, exhaust, recirculation and other fans utilized for the purpose of ventilation.

AMENDATORY SECTION (Amending WSR 19-02-089, filed 1/2/19, effective 7/1/19)

WAC 51-11C-40608 Section C406.8—((Envelope) Service water heating option.

C406.8 ((Enhanced envelope performance. The Proposed Total Envelope UA of the building thermal envelope shall be 15 percent lower than the Allowed Total Envelope UA for a building of identical configuration and fenestration area in accordance with Section C402.1.5 and Equation 4-2.))

Reduced energy use in service water heating. Buildings with service hot water heating equipment shall comply with Sections C406.8.1 and C406.8.2.

C406.8.1 Building or area type. Not less than 90 percent of the conditioned floor area of the whole building, building addition or tenant space shall be of the following types:

1. Group R-1: Boarding houses, hotels, or motels.
2. Group I-2: Hospitals, psychiatric hospitals, and nursing homes.
3. Group A-2: Restaurants and banquet halls or buildings containing food preparation areas.
4. Group F: Laundries.
5. Group R-2.
6. Group A-3: Health clubs and spas.
7. Buildings with a service hot water load of 10 percent or more of total building energy loads, as shown with an energy analysis as described in Section C407 or as shown through alternate service hot water load calculations showing a minimum service water energy use of 15 k/Btu per square foot per year, as approved by the building official.

C406.8.2 Load fraction. Not less than 60 percent of the annual service hot water heating energy use, or not less than 100 percent of the annual service hot water heating energy use with water-cooled systems subject to the requirements of Section C403.9.5 or qualifying for one of its exceptions, shall be provided by one or more of the following:

1. Service hot water system delivering heating requirements using heat pump technology with a minimum COP of 3.0. For air-source equipment, the COP rating will be reported at the design leaving heat pump water temperature with an entering air temperature of 60°F (15.6°C) or lower. For water-source equipment, the COP rating will be reported

at the design leaving load water temperature with an entering water temperature of 74°F (23.3°C) or lower.

2. Waste heat recovery from service hot water, heat recovery chillers, building equipment, process equipment, or other *approved* system. Qualifying heat recovery must be above and beyond heat recovery required by other sections of this code.

3. On-site renewable energy water-heating systems.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40609 Section C406.9—((Air infiltration) High performance service water heating in multi-family option.

~~((C406.9 Reduced air infiltration.~~ Air infiltration shall be verified by whole building pressurization testing conducted in accordance with ASTM E779 or ASTM E1827 by an independent third party. The measured air leakage rate of the building envelope shall not exceed 0.25 cfm/ft² (2.0 L/s·m²) under a pressure differential of 0.3 in. water (75 Pa), with the calculated surface area being the sum of the above and below grade building envelope. A report that includes the tested surface area, floor area, air by volume, stories above grade, and leakage rates shall be submitted to the code official and the building owner.

EXCEPTION: Where the conditioned floor area of the building is not less than 250,000 ft² (25,000 m²), air leakage testing shall be permitted to be conducted on representative above grade sections of the building provided the conditioned floor area of tested areas is no less than 25 percent of the conditioned floor area of the building and are tested in accordance with this section.))

C406.9 High performance service water heating in multi-family buildings. For a whole building, building addition or tenant space with not less than 90 percent of the conditioned floor area being Group R-2 occupancy, not less than 90 percent of the annual building service hot water energy use shall be provided by a heat pump system with a minimum COP of 3.0. This efficiency package is allowed to be taken in addition to Section C406.8.2.

NEW SECTION

WAC 51-11C-40610 Section C406.10—Envelope option.

C406.10 Enhanced envelope performance. The Proposed Total UA of the thermal envelope of the whole building or building addition shall be 15 percent lower than the Allowable Total UA for an area of identical configuration and fenestration area in accordance with Section C402.1.5 and Equation 4-2.

NEW SECTION

WAC 51-11C-40611 Section C406.11—Air infiltration option.

C406.11 Reduced air infiltration. Measured air infiltration of the total conditioned floor area of the whole building, fully

isolated building addition or tenant space shall comply with Section C406.11.1.

C406.11.1 Air leakage testing and verification. Air infiltration shall be verified by whole building pressurization testing conducted in accordance with ASTM E779 or ASTM E1827 by an independent third party. The measured air leakage rate of the *building envelope* shall not exceed 0.17 cfm/ft² under a pressure differential of 0.3 in. water (75 Pa), with the calculated surface area being the sum of the above and below grade *building envelope*. A report that includes the tested surface area, floor area, air by volume, stories above grade, and leakage rates shall be submitted to the code official and the building owner.

EXCEPTION: Where the *conditioned floor area* of the building is not less than 250,000 ft² (25,000 m²), air leakage testing shall be permitted to be conducted on representative above grade sections of the building provided the *conditioned floor area* of tested areas is no less than 25 percent of the *conditioned floor area* of the building and are tested in accordance with this section.

NEW SECTION

WAC 51-11C-40612 Section C406.12—Commercial kitchen option.

C406.12 Enhanced commercial kitchen equipment. For buildings or areas designated as Group A-2, or facilities whose primary business type involves the use of a commercial kitchen with at least one gas or electric fryer, all fryers, dishwashers, steam cookers and ovens shall comply with all of the following:

1. Achieve the ENERGY STAR label in accordance with the specifications current as of January 1, 2018.
2. Be installed prior to the issuance of the certificate of occupancy.
3. Have the ENERGY STAR qualified model number listed on the construction documents submitted for permitting.

AMENDATORY SECTION (Amending WSR 13-04-056, filed 2/1/13, effective 7/1/13)

WAC 51-11C-40701 Section C407.1—Scope.

C407.1 Scope. This section establishes criteria for compliance using total building performance. All systems and loads shall be included in determining the total building performance including, but not limited to: Heating systems, cooling systems, service water heating, fan systems, lighting power, receptacle loads and process loads.

EXCEPTION: Energy used to recharge or refuel vehicles that are used for on-road and off-site transportation purposes.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40702 Section C407.2—Mandatory requirements.

C407.2 Mandatory requirements. Compliance with this section requires ((that the criteria of Sections C402.5,

C403.2, C404 and C405 be met)) 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. 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 the same in both the proposed building and the *standard reference design* and shall comply with the requirements of this code.

Table C407.2

Mandatory Compliance Measures for Total Building Performance Method

<u>Section</u>	<u>Title</u>	<u>Comments</u>
<u>Envelope</u>		
<u>C402.5</u>	<u>Air leakage</u>	
<u>Mechanical</u>		
<u>C403.1.2</u>	<u>Calculation of heating and cooling loads</u>	
<u>C403.1.3</u>	<u>Data centers</u>	
<u>C403.2</u>	<u>System design</u>	
<u>C403.3.1</u>	<u>Equipment and system sizing</u>	
<u>C403.3.2</u>	<u>HVAC equipment performance requirements</u>	
<u>C403.3.6</u>	<u>Ventilation for Group R occupancy</u>	
<u>C403.4</u>	<u>HVAC system controls</u>	
<u>C403.4.1</u>	<u>Thermostatic controls</u>	<u>Except for C403.4.1.4</u>
<u>C403.4.2</u>	<u>Off-hour controls</u>	<u>Except for Group R</u>
<u>C403.4.7</u>	<u>Combustion heating equipment controls</u>	
<u>C403.4.8</u>	<u>Group R-1 hotel/motel guestrooms</u>	<u>See Section C403.7.6</u>
<u>C403.4.9</u>	<u>Group R-2 and R-3 dwelling units</u>	
<u>C403.4.10</u>	<u>Group R-2 sleeping units</u>	
<u>C403.4.11</u>	<u>Direct digital control systems</u>	

<u>Section</u>	<u>Title</u>	<u>Comments</u>
<u>C403.5.5</u>	<u>Economizer fault detection and diagnostics (FDD)</u>	
<u>C403.7</u>	<u>Ventilation and exhaust systems</u>	<u>Except for C403.7.6</u>
<u>C403.8</u>	<u>Fan and fan controls</u>	
<u>C403.9.1.1</u>	<u>Variable flow controls</u>	<u>For cooling tower fans ≥ 7.5 hp</u>
<u>C403.9.1.2</u>	<u>Limitation on centrifugal fan cooling towers</u>	<u>For open cooling towers</u>
<u>C403.10</u>	<u>Construction of HVAC elements</u>	
<u>C403.11</u>	<u>Mechanical systems located outside of the building thermal envelope</u>	
<u>Service Water Heating</u>		
<u>C404</u>	<u>Service water heating</u>	
<u>Lighting and Electrical</u>		
<u>C405.1</u>	<u>General</u>	
<u>C405.2</u>	<u>Lighting controls</u>	
<u>C405.3</u>	<u>Exit signs</u>	
<u>C405.4</u>	<u>Interior lighting power</u>	
<u>C405.5</u>	<u>Exterior building lighting power</u>	
<u>C405.6</u>	<u>Electrical transformers</u>	
<u>C405.7</u>	<u>Dwelling unit energy consumption</u>	
<u>C405.8</u>	<u>Electric motor efficiency</u>	
<u>C405.9</u>	<u>Vertical and horizontal transportation</u>	
<u>C405.10</u>	<u>Controlled receptacles</u>	
<u>C405.11</u>	<u>Voltage drop in feeders</u>	
<u>Other Requirements</u>		
<u>C407</u>	<u>Total building performance</u>	
<u>C408</u>	<u>System commissioning</u>	
<u>C409</u>	<u>Energy metering</u>	
<u>C410</u>	<u>Refrigeration requirements</u>	
<u>C411</u>	<u>Solar readiness</u>	

C407.3 Performance-based compliance. Compliance ((based on total building performance requires that a proposed building (*proposed design*) be shown to have an annual energy consumption based on site energy expressed in Btu and Btu per square foot of *conditioned floor area* that complies with one of the following three options:

1. Is less than or equal to 87 percent of the annual energy consumption of the *standard reference design*.

2. Is less than or equal to 90 percent of the annual energy consumption of the *standard reference design* and the project complies with one additional energy efficiency package option in Section C406. The *standard reference design* shall include the selected Section C406 additional efficiency package option unless the option selected is DOAS per Section C406.6. For office, retail, education, libraries and fire stations that comply with the DOAS requirements in Section C403.6 with or without exceptions, the *standard reference design* shall select the HVAC system per Table C407.5.1(2). Other building occupancy types that comply with the DOAS requirements in Section C403.6 shall select the *standard reference design* for the HVAC system from Table C407.5.1(3).

3. Is less than or equal to 93 percent of the annual energy consumption of the *standard reference design* and the project complies with two additional efficiency package options in Section C406. The *standard reference design* shall include the selected Section C406 additional efficiency package option unless the option selected is DOAS per Section C406.6. For office, retail, education, libraries and fire stations that comply with the DOAS requirements in Section C403.6 with or without exceptions, the *standard reference design* shall select the HVAC system per Table C407.5.1(2). Other building occupancy types that comply with the DOAS requirements in Section C403.6 shall select the *standard reference design* for the HVAC system from Table C407.5.1(3-)) with this section requires compliance with ASHRAE Standard 90.1 Appendix G, Performance Rating Method, in accordance with Standard 90.1 Section 4.2.1 with the following modifications:

1. The mandatory requirements of Section G1.2.1a of Standard 90.1 are not required to be met.

2. The reduction in annual carbon emissions of the proposed building design associated with on-site renewable energy shall not be more than 3 percent of the total carbon emissions of the baseline building design.

3. References to energy cost in Section 4.2.1.1 and Appendix G shall be replaced by carbon emissions calculated by multiplying site energy consumption by the carbon emission factor from Table C407.3(1).

4. The building performance factors in Table C4.2.1.1 shall be replaced with those in Table C407.3(2).

C407.3.1 Limits on nonmandatory measures. The Proposed Total UA of the proposed building shall be no more than 20 percent higher than the Allowed Total UA as defined in Section C402.1.5.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40703 Section C407.3—Performance-based compliance.

AMENDATORY SECTION (Amending WSR 13-04-056, filed 2/1/13, effective 7/1/13)

WAC 51-11C-40704 Section C407.4—((Documentation)) Reserved.

~~((C407.4 Documentation. Documentation verifying that the methods and accuracy of compliance software tools conform to the provisions of this section shall be provided to the code official.~~

~~**C407.4.1 Compliance report.** Building permit submittals shall include a report that documents that the *proposed design* has annual energy consumption less than or equal to the annual energy consumption of the *standard reference design*. The compliance documentation shall include the following information:~~

1. Address of the building;
2. An inspection checklist documenting the building component characteristics of the *proposed design* as listed in Table C407.5.1(1). The inspection checklist shall show the estimated annual energy consumption for both the *standard reference design* and the *proposed design*;
3. Name of individual completing the compliance report; and
4. Name and version of the compliance software tool.

~~**C407.4.2 Additional documentation.** The code official shall be permitted to require the following documents:~~

1. Documentation of the building component characteristics of the *standard reference design*;
2. Thermal zoning diagrams consisting of floor plans showing the thermal zoning scheme for *standard reference design* and *proposed design*;
3. Input and output report(s) from the energy analysis simulation program containing the complete input and output files, as applicable. The output file shall include energy use totals and energy use by energy source and end use served, total hours that space conditioning loads are not met and any errors or warning messages generated by the simulation tool as applicable;
4. An explanation of any error or warning messages appearing in the simulation tool output; and
5. A certification signed by the builder providing the building component characteristics of the *proposed design* as given in Table C407.5.1(1).))

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40705 Section C407.5—(~~Calculation procedure~~) Reserved.

~~((C407.5 Calculation procedure. Except as specified by this section, the *standard reference design* and *proposed design* shall be configured and analyzed using identical methods and techniques.~~

~~**C407.5.1 Building specifications.** The *standard reference design* and *proposed design* shall be configured and analyzed as specified by Table C407.5.1(1). Table C407.5.1(1) shall include by reference all notes contained in Table C402.1.4.~~

~~**C407.5.2 Thermal blocks.** The *standard reference design* and *proposed design* shall be analyzed using identical thermal blocks as specified in Section C407.5.2.1, C407.5.2.2 or C407.5.2.3.~~

~~**C407.5.2.1 HVAC zones designed.** Where HVAC *zones* are defined on HVAC design drawings, each HVAC *zone* shall be modeled as a separate thermal block.~~

~~EXCEPTION: Different HVAC *zones* shall be allowed to be combined to create a single thermal block or identical thermal blocks to which multipliers are applied provided:~~

1. The space use classification is the same throughout the thermal block.
2. All HVAC *zones* in the thermal block that are adjacent to glazed exterior walls face the same orientation or their orientations are within 45 degrees (0.79 rad) of each other.
3. All of the *zones* are served by the same HVAC system or by the same kind of HVAC system.

~~**C407.5.2.2 HVAC zones not designed.** Where HVAC *zones* have not yet been designed, thermal blocks shall be defined based on similar internal load densities, occupancy, lighting, thermal and temperature schedules, and in combination with the following guidelines:~~

~~1. Separate thermal blocks shall be assumed for interior and perimeter spaces. Interior spaces shall be those located more than 15 feet (4572 mm) from an exterior wall. Perimeter spaces shall be those located closer than 15 feet (4572 mm) from an exterior wall.~~

~~2. Separate thermal blocks shall be assumed for spaces adjacent to glazed exterior walls: A separate *zone* shall be provided for each orientation, except orientations that differ by no more than 45 degrees (0.79 rad) shall be permitted to be considered to be the same orientation. Each *zone* shall include floor area that is 15 feet (4572 mm) or less from a glazed perimeter wall, except that floor area within 15 feet (4572 mm) of glazed perimeter walls having more than one orientation shall be divided proportionately between *zones*.~~

~~3. Separate thermal blocks shall be assumed for spaces having floors that are in contact with the ground or exposed to ambient conditions from *zones* that do not share these features.~~

~~4. Separate thermal blocks shall be assumed for spaces having exterior ceiling or roof assemblies from *zones* that do not share these features.~~

~~**C407.5.2.3 Multifamily residential buildings.** Residential spaces shall be modeled using one thermal block per space except that those facing the same orientations are permitted to be combined into one thermal block. Corner units and units with roof or floor loads shall only be combined with units sharing these features.~~

~~**C407.5.3 Equipment efficiencies.** All HVAC equipment in the standard reference design shall be modeled at the minimum efficiency levels, both part load and full load, in accordance with Section C403.2.3. Chillers shall use Path A efficiencies as shown in Table C403.2.3(7). Where efficiency ratings include supply fan energy, the efficiency rating shall be adjusted to remove the supply fan energy. For Baseline Systems HVAC Systems 3, 4, 6, 8, 9, 10 and 11, calculate the minimum COP_{nfcooling} and COP_{nfheating} using the equation for the applicable performance rating as indicated in Tables C403.2.3(1) through C403.2.3(3). Where a full and part load efficiency rating is provided in Tables C403.2.3(1) through C403.2.3(3), use Equation 4-12.~~

(Equation 4-12)

$$COP_{nfcooling} = 7.84E-8 \times EER \times Q + 0.338 \times EER$$

$$COP_{nfcooling} = -0.0076 \times SEER^2 + 0.3796 \times SEER$$

$$COP_{nfheating} = 1.48E-7 \times COP_{47} \times Q + 1.062 \times COP_{47} \text{ (applies to heat pump heating efficiencies only)}$$

$$COP_{nfheating} = -0.0296 \times HSPF^2 + 0.7134 \times HSPF$$

Where:

$COP_{nfcooling}$ = The packaged HVAC equipment cooling energy efficiency.

$COP_{nfheating}$ = The packaged HVAC equipment heating energy efficiency.

Q = The AHRI-rated cooling capacity in Btu/h.

EER, SEER, COP and HSPF shall be at AHRI test conditions. Fan energy shall be modeled separately according to Table C407.5.1(1).))

AMENDATORY SECTION (Amending WSR 16-24-070, filed 12/6/16, effective 5/1/17)

WAC 51-11C-407051 Tables ((C407.5.1(1) Specifications for the standard reference and proposed design)) for Section C407.5—Carbon emissions factors and building performance factors.

((Table C407.5.1(1)

Specifications for the Standard Reference and Proposed Designs

Building Component Characteristics	Standard Reference Design	Proposed Design
Space use classification	Same as proposed	The space use classification shall be chosen in accordance with Table C405.4.2 for all areas of the building covered by this permit. Where the space use classification for a building is not known, the building shall be categorized as an office building.
Roofs	Type: Insulation entirely above deck Gross area: Same as proposed U factor: From Table C402.1.4 Solar absorptance: 0.75 Emittance: 0.90	As proposed As proposed As proposed As proposed As proposed
Walls, above-grade	Type: Mass wall if proposed wall is mass; otherwise steel-framed wall Gross area: Same as proposed U factor: From Table C402.1.4 Solar absorptance: 0.75 Emittance: 0.90	As proposed As proposed As proposed As proposed As proposed
Walls, below-grade	Type: Mass wall Gross area: Same as proposed U Factor: From Table C402.1.4 with insulation layer on interior side of walls	As proposed As proposed As proposed
Floors, above-grade	Type: Joist/framed floor Gross area: Same as proposed U factor: From Table C402.1.4	As proposed As proposed As proposed
Floors, slab on-grade	Type: Unheated F factor: From Table C402.1.4	As proposed As proposed
Opaque Doors	Type: Swinging Area: Same as proposed U factor: From Table C402.1.4	As proposed As proposed As proposed

Building Component Characteristics	Standard Reference Design	Proposed Design
<p>Vertical Fenestration Other than opaque doors</p>	<p>Area</p> <p>1. The proposed vertical fenestration area; where the proposed vertical fenestration area is less than 30 percent of above-grade wall area.</p> <p>2. 30 percent of above-grade wall area; where the proposed vertical fenestration area is 30 percent or more of the above-grade wall area.</p> <p><i>U</i>-factor: From Table C402.4 for the same framing material as proposed</p> <p>SHGC: From Table C402.4 except that for climates with no requirement (NR) SHGC = 0.40 shall be used</p> <p>External shading and PF: None</p>	<p>As proposed</p> <p>As proposed</p> <p>As proposed</p>
<p>Skylights</p>	<p>Area</p> <p>1. The proposed skylight area; where the proposed skylight area is less than 3 percent of gross area of roof assembly.</p> <p>2. 3 percent of gross area of roof assembly; where the proposed skylight area is 3 percent or more of gross area of roof assembly.</p> <p><i>U</i>-factor: From Table C402.4</p> <p>SHGC: From Table C402.4 except that for climates with no requirement (NR) SHGC = 0.40 shall be used</p>	<p>As proposed</p> <p>As proposed</p>
<p>Air leakage</p>	<p>For infiltration, the air leakage rate as determined below shall be modeled at 100% when the building fan system is off, and at 25% when the building fan system is on, unless otherwise approved by the building official for unusually pressurized buildings. Per PNNL Report 18898, Infiltration Modeling Guidelines for Commercial Building Energy Analysis, the building air leakage rates as determined in accordance with Section C402.5.1.2 at 0.30 in. w.g. (75 Pa) shall be converted for modeling in annual energy analysis programs by being multiplied by 0.112 unless other multipliers are approved by the building official (e.g., a tested air leakage of 0.40 cfm/ft² of total building envelope area at 0.30 in. w.g. (75 Pa) would be calculated at 0.045 cfm/ft² of building envelope area). The calculated infiltration rate shall be normalized to the input required by the modeling software.</p>	<p>The Proposed Design air leakage rate shall be the same as the Standard Design.</p>
<p>Lighting, interior</p>	<p>The interior lighting power shall be determined in accordance with Table C405.4.2. As proposed when the occupancy of the space is not known.</p> <p>Automatic lighting controls (e.g., programmable controls or automatic controls for daylight utilization) shall be modeled in <i>the standard reference design</i> as required by Section C405.</p>	<p>As proposed; where the occupancy of the space is not known, the lighting power density shall be based on the space classification as offices in Table C405.4.2(1).</p>

Building Component Characteristics	Standard Reference Design	Proposed Design
Lighting, exterior	The lighting power shall be determined in accordance with Table C405.5.2(2). Areas and dimensions of tradable and nontradable surfaces shall be the same as proposed.	As proposed
Internal gains	Same as proposed	Receptacle, motor and process loads shall be modeled and estimated based on the space use classification. All end-use load components within and associated with the building shall be modeled to include, but not be limited to, the following: Exhaust fans, parking garage ventilation fans, exterior building lighting, swimming pool heaters and pumps, elevators, escalators, refrigeration equipment and cooking equipment.
Schedules	Same as proposed	Operating schedules shall include hourly profiles for daily operation and shall account for variations between weekdays, weekends, holidays and any seasonal operation. Schedules shall model the time dependent variations in occupaney, illumination, receptacle loads, thermostat settings, mechanical ventilation, HVAC equipment availability, service hot water usage and any process loads. The schedules shall be typical of the proposed building type as determined by the designer and approved by the jurisdiction.
Outdoor airflow rates	Same as proposed, or no higher than those allowed by Section C403.2.6 (without exception 1), whichever is less. Demand control ventilation: Shall be modeled as required by Section C403.6 including reduction to the minimum ventilation rate when unoccupied.	As proposed, in accordance with Section C403.2.6. As proposed
Heating systems	Fuel type: Same as proposed design Equipment type ^a : From Tables C407.5.1(2), C407.5.1(3), and C407.5.1(4) Efficiency: From Tables C403.2.3(2), C403.2.3(3), C403.2.3(4) and C403.2.3(5) Preheat coils: For HVAC system numbers 1 through 4, a preheat coil shall be modeled controlled to a fixed setpoint 20°F less than the design room heating temperature setpoint.	As proposed As proposed As proposed

Building Component Characteristics	Standard Reference Design	Proposed Design
	<p>Capacity^b: Sized proportionally to the capacities in the proposed design based on sizing runs, i.e., the ratio between the capacities used in the annual simulations and the capacities determined by the sizing runs shall be the same for both the proposed design and <i>standard reference design</i>, and shall be established such that no smaller number of unmet heating load hours and no larger heating capacity safety factors are provided than in the proposed design.</p> <p>Weather conditions used in sizing runs to determine <i>standard reference design</i> equipment capacities may be based either on hourly historical weather files containing typical peak conditions or on design days developed using 99.6% heating design temperatures and 1% dry-bulb and 1% wet-bulb cooling design temperatures.</p>	<p>As proposed</p>
<p>Cooling systems</p>	<p>Fuel type: Same as proposed design</p> <p>Equipment type^c: From Tables C407.5.1(2), C407.5.1(3), and C407.5.1(4)</p> <p>Efficiency: From Tables C403.2.3(1), C403.2.3(2) and C403.2.3(3). Chillers shall use Path A efficiency.</p> <p>Capacity^b: Sized proportionally to the capacities in the proposed design based on sizing runs, i.e., the ratio between the capacities used in the annual simulations and the capacities determined by the sizing runs shall be the same for both the proposed design and <i>standard reference design</i>, and shall be established such that no smaller number of unmet cooling load hours and no larger cooling capacity safety factors are provided than in the proposed design.</p> <p>Economizer^d: In accordance with Section C403.3. The high limit shutoff shall be a dry-bulb switch with a setpoint as determined by Table C403.3.3.3.</p>	<p>As proposed</p> <p>As proposed</p> <p>As proposed</p> <p>As proposed</p> <p>As proposed</p>
<p>Energy recovery</p>	<p><i>Standard reference design</i> systems shall be modeled where required in Section C403.5.</p>	<p>As proposed</p>
<p>Fan systems</p>	<p>Airflow rate: System design supply airflow rates for the <i>standard reference design</i> shall be based on a supply air to room air temperature difference of 20°F or the required ventilation air or makeup air, whichever is greater. If return or relief fans are specified in the proposed design, the <i>standard reference design</i> shall also be modeled with fans serving the same functions and sized for the <i>standard reference design</i> system supply fan air quantity less the minimum outdoor air, or 90% of the supply fan air quantity, whichever is larger.</p>	<p>As proposed</p>

Building Component Characteristics	Standard Reference Design	Proposed Design
	<p>Motor brake horsepower: System fan electrical power for supply, return, exhaust, and relief (excluding power to fan-powered VAV boxes) shall be calculated using the following formulas:</p> <p>For systems 5, 7, 8 and 10 in Table C407.5.1(4), $P_{fan} = CFM_s \times 0.3$</p> <p>For all other systems, including DOAS, $P_{fan} = bhp \times 746 / \text{Fan Motor Efficiency}$</p> <p>Where:- P_{fan} = Electric power to fan motor (watts) bhp = Brake horsepower of <i>standard reference design</i> fan motor from Table C403.2.12.1(1) – Option 2 Fan motor = The efficiency from Tables C405.8(1) through C405.8(4) for the efficiency next motor size greater than the bhp using the enclosed motor at 1800 rpm CFM_s = The <i>standard reference design</i> system maximum design supply fan airflow rate in cfm.</p>	<p>As proposed</p>
<p>On-site renewable energy</p>	<p>No on-site renewable energy shall be modeled in the <i>standard reference design</i>.</p>	<p>As proposed</p>
<p>Shading from adjacent structures/terrain</p>	<p>Same as proposed.</p>	<p>For the <i>standard reference design</i> and the proposed building, shading by permanent structures and terrain shall be taken into account for computing energy consumption whether or not these features are located on the building site. A permanent fixture is one that is likely to remain for the life of the proposed design.</p>
<p>Service water heating</p>	<p>Fuel type: Same as proposed</p> <p>Efficiency: From Table C404.2 and per Section C404.2.1</p> <p>Capacity: Same as proposed</p> <p>Demand: Same as proposed</p>	<p>As proposed</p> <p>As proposed</p> <p>Service hot water energy consumption shall be calculated explicitly based upon the volume of service hot water required and the entering makeup water and the leaving service hot water temperatures. Entering water temperatures shall be estimated based upon the location. Leaving temperatures shall be based upon the end-use requirements.</p> <p>Service water loads and usage shall be the same for both the <i>standard reference design</i> and the proposed design and shall be documented by the calculation procedures recommended by the manufacturer's specifications or generally accepted engineering methods.</p>

Building Component Characteristics	Standard Reference Design	Proposed Design
	Where no service water hot water system exists or is specified in the proposed design, no service hot water heating shall be modeled. Drain water heat recovery: Not required.	As proposed As proposed Drain water heat recovery modeling shall take into account manufacturer's rated efficiencies per C404.9, quantity of connected drains, the proportional flow rates between the waste stream and the preheated stream. Reductions in service water heating energy use for drain water heat recovery shall be demonstrated by calculations.

- ^a Where no heating system exists or has been specified, the heating system shall be modeled as fossil fuel. The system characteristics shall be identical in both the standard reference design and proposed design.
- ^b The ratio between the capacities used in the annual simulations and the capacities determined by sizing runs shall be the same for both the standard reference design and proposed design.
- ^c Where no cooling system exists or no cooling system has been specified, the cooling system shall be modeled as an air-cooled single-zone system, one unit per thermal zone. The system characteristics shall be identical in both the standard reference design and proposed design.
- ^d If an economizer is required in accordance with Section C403.3 and where no economizer exists or is specified in the proposed design, then an air economizer shall be provided in the standard reference design in accordance with Section C403.3.)

**Table C407.3(1)
Carbon Emissions Factors**

Type	CO2e (lb/unit)	Unit
Electricity	0.70	kWh
Natural Gas	11.7	Therm
Oil	19.2	Gallon
Propane	10.5	Gallon
Other ^a	195.00	mmBtu
On-site renewable energy	0.00	

^a District energy systems may use alternative emissions factors supported by calculations approved by the *code official*.

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

Building Area Type	Building Performance Factor
Multifamily	0.58
Healthcare/hospital	0.54
Hotel/motel	0.64
Office	0.56
Restaurant	0.70
Retail	0.47
School	0.36
Warehouse	0.48
All others	0.54

AMENDATORY SECTION (Amending WSR 16-24-070, filed 12/6/16, effective 5/1/17)

WAC 51-11C-407052 ((Table C407.5.1(2)/(3) — HVAC systems map.)) Reserved.

((Table C407.5.1(2)

HVAC Systems Map for Buildings Governed by Section C403.6^d

Condenser Cooling Source^a	Heating System Classification^b	Standard Reference Design HVAC System Type
Water/ground	Electric resistance	System 5
	Heat pump	System 6
	Fossil fuel	System 7
Air/none	Electric resistance	System 9
	Heat pump	System 9

Condenser Cooling Source*	Heating System Classification^b	Standard Reference Design HVAC System Type
	Fossil fuel	System 11

- ^a Select "water/ground" if the proposed design system condenser is water or evaporatively cooled; select "air/none" if the condenser is air cooled. Closed-circuit dry coolers shall be considered air cooled. Systems utilizing district cooling shall be treated as if the condenser water type were "water." If no mechanical cooling is specified or the mechanical cooling system in the proposed design does not require heat rejection, the system shall be treated as if the condenser water type were "Air." For proposed designs with ground-source or groundwater-source heat pumps, the standard reference design HVAC system shall be water-source heat pump (System 6).
- ^b Systems utilizing district heating (steam or hot water) or district cooling and systems with no heating capability shall be treated as if the heating system type were "fossil fuel" for the purpose of Standard Reference Design HVAC system selection. Otherwise, select the path that corresponds to the proposed design heat source: Electric resistance, heat pump (including air source and water source), or fuel-fired. For systems with mixed fuel heating sources, the system or systems that use the secondary heating source type (the one with the smallest total installed output capacity for the spaces served by the system) shall be modeled identically in the standard reference design and the primary heating source type shall be used to determine *standard reference design* HVAC system type.
- ^c Reserved.
- ^d This table covers those building types required by Section C403.6 to install Dedicated Outdoor Air Systems: Office, retail, education, libraries and fire stations.

**Table C407.5.1(3)
HVAC Systems Map for All Other Buildings**

Condenser Cooling Source*	Heating System Classification^b	Standard Reference Design HVAC System Type^c		
		Single-Zone Residential System	Single-Zone Nonresidential System	All-Other
Water/ground	Electric resistance	System 5	System 5	System 1
	Heat pump	System 6	System 6	System 6
	Fossil fuel	System 7	System 7	System 2
Air/none	Electric resistance	System 8	System 9	System 3
	Heat pump	System 8	System 9	System 3
	Fossil fuel	System 10	System 11	System 4

- ^a Select "water/ground" if the proposed design system condenser is water or evaporatively cooled; select "air/none" if the condenser is air cooled. Closed-circuit dry coolers shall be considered air cooled. Systems utilizing district cooling shall be treated as if the condenser water type were "water." If no mechanical cooling is specified or the mechanical cooling system in the proposed design does not require heat rejection, the system shall be treated as if the condenser water type were "Air." For proposed designs with ground-source or groundwater-source heat pumps, the standard reference design HVAC system shall be water-source heat pump (System 6).
- ^b Systems utilizing district heating (steam or hot water) or district cooling and systems with no heating capability shall be treated as if the heating system type were "fossil fuel" for the purpose of Standard Reference Design HVAC system selection. Otherwise, select the path that corresponds to the proposed design heat source: Electric resistance, heat pump (including air source and water source), or fuel-fired. For systems with mixed fuel heating sources, the system or systems that use the secondary heating source type (the one with the smallest total installed output capacity for the spaces served by the system) shall be modeled identically in the standard reference design and the primary heating source type shall be used to determine *standard reference design* HVAC system type.
- ^c Select the *standard reference design* HVAC system category: The system under "single-zone Group R system" shall be selected if the HVAC system in the proposed design is a single-zone system and serves a residential space. The system under "single-zone other than Group R system" shall be selected if the HVAC system in the proposed design is a single-zone system and serves other than Group R spaces. The system under "all other" shall be selected for all other cases:))

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-407053 ((Table C407.5.1(4) — Specifications for the standard reference design HVAC system description.)) Reserved.

((Table C407.5.1(4)
Specifications for the Standard Reference Design HVAC System Descriptions

System No.	System Type	Fan Control	Cooling Type	Heating Type
1	Variable air volume with parallel fan powered boxes ^a	VAV ^d	Chilled water ^e	Electric resistance
2	Variable air volume with reheat ^b	VAV ^d	Chilled water ^e	Hot water fossil fuel boiler ^f
3	Packaged variable air volume with parallel fan powered boxes ^a	VAV ^d	Direct expansion ^e	Electric resistance
4	Packaged variable air volume with reheat ^b	VAV ^d	Direct expansion ^e	Hot water fossil fuel boiler ^f
5	Two pipe fan coil	Constant volume ^{h,j}	Chilled water ^e	Electric resistance
6	Water source heat pump	Constant volume ^{h,j}	Direct expansion ^e	Electric heat pump and boiler ^e
7 ^k	Four pipe fan coil	Constant volume ^{h,j}	Chilled water ^e	Hot water fossil fuel boiler ^f
8 ^k	Packaged terminal heat pump	Constant volume ^{h,j}	Direct expansion ^e	Electric heat pump ^h
9 ^k	Packaged rooftop heat pump	Constant volume ^{h,j}	Direct expansion ^e	Electric heat pump ^h
10 ^k	Packaged terminal air conditioner	Constant volume ^{h,j}	Direct expansion	Hot water fossil fuel boiler ^f
11 ^k	Packaged rooftop air conditioner	Constant volume ^{h,j}	Direct expansion	Fossil fuel furnace

For SI: 1 foot = 304.8 mm, 1 cfm/ft² = 0.0004719, 1 Btu/h = 0.293/W, °C = [(°F) - 32]/1.8].

- a. ~~VAV with parallel boxes:~~ Fans in parallel VAV fan-powered boxes shall be sized for 50 percent of the peak design flow rate and shall be modeled with 0.35 W/efm fan power. Minimum volume setpoints for fan-powered boxes shall be equal to the minimum rate for the space required for ventilation consistent with Section C403.4.4, Exception 4. Supply air temperature shall be reset based on zone demand. Design airflow rates shall be sized for the maximum reset supply air temperature. The air temperature for cooling shall be reset higher by 5°F under the minimum cooling load conditions.
- b. ~~VAV with reheat:~~ Minimum volume setpoints for VAV reheat boxes shall be 0.4 cfm/ft² of floor area. Supply air temperature shall be reset based on zone demand. Design airflow rates shall be sized for the maximum reset supply air temperature. The air temperature for cooling shall be reset higher by 5°F under the minimum cooling load conditions.
- e. ~~Direct expansion:~~ The fuel type for the cooling system shall match that of the cooling system in the proposed design.
- d. ~~VAV:~~ When the proposed design system has a supply, return or relief fan motor horsepower (hp) requiring variable flow controls as required by Section C403.2.11.5, the corresponding fan in the VAV system of the standard reference design shall be modeled assuming a variable speed drive. For smaller fans, a forward curved centrifugal fan with inlet vanes shall be modeled. If the proposed design's system has a direct digital control system at the zone level, static pressure setpoint reset based on zone requirements in accordance with Section C403.4.1 shall be modeled.

- e **Chilled water:** For systems using purchased chilled water, the chillers are not explicitly modeled. Otherwise, the standard reference design's chiller plant shall be modeled with chillers having the number as indicated in Table C407.5.1(5) as a function of standard reference building chiller plant load and type as indicated in Table C407.5.1(6) as a function of individual chiller load. Where chiller fuel source is mixed, the system in the standard reference design shall have chillers with the same fuel types and with capacities having the same proportional capacity as the proposed design's chillers for each fuel type. Chilled water supply temperature shall be modeled at 44°F design supply temperature and 56°F return temperature. Piping losses shall not be modeled in either building model. Chilled water supply water temperature shall be reset in accordance with Section C403.4.2.4. Pump system power for each pumping system shall be the same as the proposed design; if the proposed design has no chilled water pumps, the standard reference design pump power shall be 22 W/gpm (equal to a pump operating against a 75-foot head, 65-percent combined impeller and motor efficiency). The chilled water system shall be modeled as primary-only variable flow with flow maintained at the design rate through each chiller using a bypass. Chilled water pumps shall be modeled as riding the pump curve or with variable-speed drives when required in Section C403.4.2.4. The heat rejection device shall be an axial fan cooling tower with variable speed fans if required in Section C403.4.3. Condenser water design supply temperature shall be 85°F or 10°F approach to design wet-bulb temperature, whichever is lower, with a design temperature rise of 10°F. The tower shall be controlled to maintain a 70°F leaving water temperature where weather permits, floating up to leaving water temperature at design conditions. Pump system power for each pumping system shall be the same as the proposed design; if the proposed design has no condenser water pumps, the standard reference design pump power shall be 19 W/gpm (equal to a pump operating against a 60-foot head, 60-percent combined impeller and motor efficiency). Each chiller shall be modeled with separate condenser water and chilled water pumps interlocked to operate with the associated chiller.
- f **Fossil fuel boiler:** For systems using purchased hot water or steam, the boilers are not explicitly modeled. Otherwise, the boiler plant shall use the same fuel as the proposed design and shall be natural draft. The standard reference design boiler plant shall be modeled with a single boiler if the standard reference design plant load is 600,000 Btu/h and less and with two equally sized boilers for plant capacities exceeding 600,000 Btu/h. Boilers shall be staged as required by the load. Hot water supply temperature shall be modeled at 180°F design supply temperature and 130°F return temperature. Piping losses shall not be modeled in either building model. Hot water supply water temperature shall be reset in accordance with Section C403.4.2.4. Pump system power for each pumping system shall be the same as the proposed design; if the proposed design has no hot water pumps, the standard reference design pump power shall be 19 W/gpm (equal to a pump operating against a 60-foot head, 60-percent combined impeller and motor efficiency). The hot water system shall be modeled as primary only with continuous variable flow. Hot water pumps shall be modeled as riding the pump curve or with variable speed drives when required by Section C403.4.2.4.
- g **Electric heat pump and boiler:** Water source heat pumps shall be connected to a common heat pump water loop controlled to maintain a heating setpoint of 60°F and cooling setpoint of 90°F. Heat rejection from the loop shall be provided by an axial fan closed-circuit evaporative fluid cooler with variable speed fans if required in Section C403.4.2.1 or C403.2.13. Heat addition to the loop shall be provided by a boiler that uses the same fuel as the proposed design and shall be natural draft. If no boilers exist in the proposed design, the standard reference building boilers shall be fossil fuel. The standard reference design boiler plant shall be modeled with a single boiler if the standard reference design plant load is 600,000 Btu/h or less and with two equally sized boilers for plant capacities exceeding 600,000 Btu/h. Boilers shall be staged as required by the load. Piping losses shall not be modeled in either building model. Pump system power shall be the same as the proposed design; if the proposed design has no pumps, the standard reference design pump power shall be 22 W/gpm, which is equal to a pump operating against a 75-foot head, with a 65-percent combined impeller and motor efficiency. Loop flow shall be variable with flow shutoff at each heat pump when its compressor cycles off as required by Section C403.4.2.3. Loop pumps shall be modeled as riding the pump curve or with variable speed drives when required by Section C403.4.2.4.
- h **Electric heat pump:** Electric air source heat pumps shall be modeled with electric auxiliary heat and an outdoor air thermostat. The system shall be controlled to energize auxiliary heat only when outdoor air temperature is less than 40°F. The air source heat pump shall be modeled to continue to operate while auxiliary heat is energized. The air source heat pump shall be modeled to operate down to a minimum outdoor air temperature of 35°F for System No. 8 or 0°F for System No. 9. If the Proposed Design utilizes the same system type as the Standard Design (PTHP or PSZ-HP), the Proposed Design shall be modeled with the same minimum outdoor air temperature for heat pump operation as the Standard Design. For temperatures below the stated minimum outdoor air temperatures, the electric auxiliary heat shall be controlled to provide the full heating load.
- i **Constant volume:** For building types governed by Section C403.6, fans shall be controlled to cycle with load; i.e., fan operation cycled on calls for heating and cooling. If the fan is modeled as cycling and the fan energy is included in the energy efficiency rating of the equipment, fan energy shall not be modeled explicitly. For all other buildings, fans shall be controlled in the same manner as in the proposed design; i.e., fan operation whenever the space is occupied or fan operation cycled on calls for heating and cooling. If the fan is modeled as cycling and the fan energy is included in the energy efficiency rating of the equipment, fan energy shall not be modeled explicitly.
- j **Fan speed control:** Fans shall operate as one- or two-speed as required by Section C403.2.11.5, regardless of the fan speed control used in the proposed building.
- k **Outside air:** For building types governed by Section C403.6, outside air shall be supplied by a separate dedicated outside air system (DOAS) operating in parallel with terminal equipment. The terminal equipment fan system cycle calls for heating and cooling. DOAS shall include an Energy Recovery Ventilation System with a minimum effectiveness in accordance with Section C403.5.)

Reviser's note: The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency and appear in the Register pursuant to the requirements of RCW 34.08.040.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-407054 ((~~Table C407.5.1(5) Number of chillers.~~) Reserved.)

((~~Table C407.5.1(5) Number of Chillers~~)

Total Chiller Plant Capacity	Number of Chillers
≤ 300 tons	1
> 300 tons, < 600 tons	2, sized equally

Total Chiller Plant Capacity	Number of Chillers
≥ 600 tons	2 minimum, with chillers added so that no chiller is larger than 800 tons, all sized equally

For SI: 1 ton = 3517 W.)

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-407055 ((~~Table C407.5.1(6) — Water chiller types.~~)) **Reserved.**

((~~Table C407.5.1(6) Water Chiller Types~~))

Individual Chiller Plant Capacity	Electric Chiller Type	Fossil Fuel Chiller Type
≤ 100 tons	Water-cooled Reciprocating	Single-effect absorption, direct fired
> 100 tons, < 300 tons	Water-cooled Screw	Double-effect absorption, direct-fired
≥ 300 tons	Water-cooled Centrifugal	Double-effect absorption, direct-fired

For SI: 1 ton = 3517 W.)

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40706 Section C407.6—((~~Calculation software tool~~)) **Reserved.**

((~~C407.6 Calculation software tools.~~ Calculation procedures used to comply with this section shall be software tools capable of calculating the annual energy consumption of all building elements that differ between the *standard reference design* and the *proposed design* and shall include the following capabilities:

1. Building operation for a full calendar year (8,760 hours);
2. Climate data for a full calendar year (8,760 hours) and shall reflect *approved* coincident hourly data for temperature, solar radiation, humidity and wind speed for the building location;
3. Ten or more thermal zones;
4. Thermal mass effects;
5. Hourly variations in occupancy, illumination, receptacle loads, thermostat settings, mechanical ventilation, HVAC equipment availability, service hot water usage and any process loads;
6. Part-load performance curves for mechanical equipment;
7. Capacity and efficiency correction curves for mechanical heating and cooling equipment.

8. Printed *code official* inspection checklist listing each of the *proposed design* component characteristics from Table C407.5.1(1) determined by the analysis to provide compliance, along with their respective performance ratings (e.g., *R*-value, *U*-factor, SHGC, HSPF, AFUE, SEER, EF, etc.);

9. Air-side economizers with integrated control;

10. *Standard reference design* characteristics specified in Table C407.5.1(1).

C407.6.1 Specific approval. Performance analysis tools meeting the applicable subsections of Section C407 and tested according to ASHRAE Standard 140 shall be permitted to be *approved*. Tools are permitted to be *approved* based on meeting a specified threshold for a jurisdiction. The *code official* shall be permitted to approve tools for a specified application or limited scope.

C407.6.2 Input values. Where calculations require input values not specified by Sections C402, C403, C404 and C405, those input values shall be taken from an *approved* source.

C407.6.3 Exceptional calculation methods. Where the *simulation program* does not model a design, material, or device of the *proposed design*, an Exceptional Calculation Method shall be used where approved by the *code official*. Where there are multiple designs, materials, or devices that the *simulation program* does not model, each shall be calculated separately and Exceptional Savings determined for each. The total Exceptional Savings shall not constitute more than half of the difference between the *baseline building performance* and the *proposed building performance*. Applications for approval of an exceptional method shall include:

1. Step-by-step documentation of the Exceptional Calculation Method performed detailed enough to reproduce the results;
2. Copies of all spreadsheets used to perform the calculations;
3. A sensitivity analysis of *energy* consumption when each of the input parameters is varied from half to double the value assumed;
4. The calculations shall be performed on a time step basis consistent with the *simulation program* used;
5. The *Performance Rating* calculated with and without the Exceptional Calculation Method.)

AMENDATORY SECTION (Amending WSR 16-24-070, filed 12/6/16, effective 5/1/17)

WAC 51-11C-40801 Section C408.1—General.

C408.1 General. A building commissioning process led by a *certified commissioning professional* and *functional testing requirements* shall be completed for mechanical ((~~and refrigeration~~)) systems in Section((s)) C403 ((~~and C410~~)); service water heating systems in Section C404((~~electrical power~~)); controlled receptacle and lighting control systems in Section C405 ((~~and~~)); 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 ((C408.6)) C408.7 may be excluded from the commissioning process.

1. Mechanical systems are exempt from the commissioning process where the building's total mechanical equipment capacity is less than 240,000 Btu/h cooling capacity and less than 300,000 Btu/h heating 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 no pools or permanent spas.

3. Lighting control systems are exempt from the commissioning process in buildings where both the total installed lighting load is less than 20 kW and the lighting load controlled by occupancy sensors or automatic daylighting controls is less than 10 kW.

4. Refrigeration systems are exempt from the commissioning process in buildings if they are limited to self-contained units.

C408.1.1 Commissioning in construction documents.

Construction documents ~~((notes))~~ shall clearly indicate provisions for commissioning ~~((and completion requirements in accordance with this section and are permitted to refer to specifications for further requirements))~~ process. The construction documents shall minimally include the following:

1. A narrative description of the activities that will be accomplished during the commissioning process. At a minimum, the commissioning process is required to include:

1.1. Development and execution of the commissioning plan, including all subsections of Section C408.1.2;

1.2. The *certified commissioning professional's* review of the building documentation and close out submittals in accordance with Section C103.6; and

1.3. The commissioning report in accordance with Section C408.1.3.

2. Roles, responsibilities, and required qualifications of the *certified commissioning professional*.

3. A listing of the specific equipment, appliances, or systems to be tested.

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. ~~((Items 1 through 4 shall be included with the construction documents, and items 5 through 8 shall be submitted prior to the first mechanical inspection. For projects where no mechanical inspection is required, items 5 through 8 shall be submitted prior to the first electrical inspection.))~~

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 schedule of activities including systems testing and balancing, functional performance testing, and verification of the building documentation requirements in Section C103.6.))~~

4. Where the certified commissioning professional is an employee of one of the registered design professionals of record or an employee or subcontractor of the project contractor, an In-House Commissioning Disclosure and Conflict Management Plan shall be submitted with the commissioning plan. This plan shall disclose the certified commissioning professional's contractual relationship with other team members and provide a conflict management plan demonstrating that the certified commissioning professional is free to identify any issues discovered and report directly to the owner.

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

~~((6. Functions to be tested.~~

~~7. Conditions under which the test will be performed.~~

~~8. Measurable criteria for performance.))~~

C408.1.2.1 In-house commissioning disclosure and conflict management plan.

Where the certified commissioning professional's contract or employment is other than directly with the building owner, an in-house commissioning disclosure and conflict management plan shall be a part of the commissioning process. A copy shall be included in the commissioning plan. This plan shall disclose the certified commissioning professional's contractual relationship with other team members and provide a conflict management plan demonstrating that the certified commissioning professional is free to identify any issues discovered and report directly to the owner.

C408.1.2.2 Functional performance testing.

Functional performance testing shall be conducted for mechanical systems in Sections C403; service water heating systems in Section C404; controlled receptacles and lighting control systems in Section C405; equipment, appliances, systems installed to comply with Section C406 or C407; energy metering in Section C409; and refrigeration systems in Section C410. Written procedures which clearly describe the individual systematic test procedures, the expected system response or acceptance criteria for each procedure, the actual response or findings, and any pertinent discussion shall be followed. This testing shall include control systems which will be tested to document that control devices, components, equipment, and systems are calibrated and adjusted to operate in accordance with approved construction documents. Testing shall affirm the conditions required within Sections C408.2 through C408.7 under system testing.

C408.1.2.3 Functional performance testing - Sampling.

For projects with 7 or fewer similar systems, each system shall be tested. For projects with more than 7 systems, testing shall be done for each unique combination of control types. Where multiples of each unique combination of control types exist, no fewer than 20 percent of each combination shall be tested unless the code official or design professional requires a higher percentage to be tested. Where 30 percent or more of the tested system fail, all remaining identical combinations shall be tested.

C408.1.2.4 Deficiencies. Deficiencies found during testing shall be resolved including corrections and retesting.

C408.1.3 ((Final)) Commissioning report. A ((final)) 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, ((service water heating and)) 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.

EXCEPTION: Deferred tests which cannot be performed at the time of report preparation due to climatic conditions.

C408.1.4. Commissioning process completion requirements. Prior to the final mechanical, plumbing and electrical inspections or obtaining a certificate of occupancy, the *certified commissioning professional* ((or approved agency)) shall provide evidence of ((systems)) building commissioning ((and completion)) in accordance with the provisions of this section.

((Copies of all documentation shall be given to the owner and made available to the code official upon request in accordance with Section C408.1.4.3.

C408.1.4.1 Commissioning progress report for code compliance. A preliminary report of commissioning test procedures and results shall be completed and certified by the *certified commissioning professional* or *approved agency* and provided to the building owner or owner's authorized agent. The report shall be organized with mechanical, lighting, ser-

vice water heating and metering findings in separate sections to allow independent review. The report shall be identified as "Preliminary Commissioning Report" and shall identify:

1. ~~Itemization of deficiencies found during testing required by this code that have not been corrected at the time of report preparation.~~
2. ~~Deferred tests that cannot be performed at the time of report preparation because of climatic conditions, with anticipated date of completion.~~
3. ~~Climatic conditions required for performance of the deferred tests.~~
4. ~~Status of the project's record documents, manuals and systems operation training with respect to requirements in Section C103.6.~~

C408.1.4.2 Acceptance of report.) C408.1.4.1 Commissioning compliance. Buildings, or portions thereof, shall not be considered acceptable for a final inspection pursuant to Section ((C104.2)) C104.2.6 until the *code official* has received a letter of transmittal from the building owner acknowledging that the building owner or owner's authorized agent has received the ((Preliminary)) Commissioning Report. Completion of ((the)) Commissioning Compliance Checklist (Figure ((C408.1.4.2)) C408.1.4.1) is deemed to satisfy this requirement. Phased acceptance of the Commissioning Compliance Checklist for portions of the work specific to the trade that is being inspected is permissible where accepted by the code official and where the certified commissioning professional remains responsible for completion of the commissioning process. If there are unresolved deficiencies when the final inspection is scheduled, the Commissioning Report shall be submitted and shall describe the unresolved deficiencies.

((C408.1.4.3)) **C408.1.4.2 Copy of report.** The *code official* shall be permitted to require that a copy of the Preliminary Commissioning Report be made available for review by the *code official*.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-408012 Figure ((C408.1.4.2)) C408.1.4.1—Commissioning compliance checklist.

**Figure ((C408.1.4.2)) C408.1.4.1
Commissioning Compliance Checklist**

((Project Information	Project Name:
	Project Address:
	Certified Commissioning Professional:
	Certifying Body:
Commissioning Plan (Section 408.1.2)	☐ Commissioning Plan was used during construction
Commissioned Systems (Section C408.2, C408.3, C408.4 and C408.6)	☐ Mechanical Systems were included in the Commissioning Process (Section C408.2) Building mechanical systems have been tested to demonstrate the installation and operation of components, systems and system-to-system interfacing relationships in accordance with approved plans and specifications ☐ There are unresolved deficiencies with the mechanical systems. These are described in the Preliminary Commissioning Report submitted to the owner. The following items are not in compliance with the energy code:

	<p><input type="checkbox"/> Electrical Power or Lighting Systems were included in the Commissioning Process (Section C408.4) Electrical power and automatic lighting controls have been tested to demonstrate the installation and operation of components, systems and system-to-system interfacing relationships in accordance with approved plans and specifications</p> <p><input type="checkbox"/> There are unresolved deficiencies with the electrical power and/or automatic lighting controls. These are described in the Preliminary Commissioning Report submitted to the owner. The following items are not in compliance with the energy code:</p>
	<p><input type="checkbox"/> Service Water Heating Systems were included in the Commissioning Process (Section C408.5) Service water heating systems have been tested to demonstrate that control devices, components, equipment and systems are calibrated, adjusted and operate in accordance with approved plans and specifications</p> <p><input type="checkbox"/> There are unresolved deficiencies with the service water heating systems. These are described in the Preliminary Commissioning Report submitted to the owner. The following items are not in compliance with the energy code:</p>
	<p><input type="checkbox"/> Additional Systems included in the Commissioning Process (Section C408.5) <input type="checkbox"/> There are unresolved deficiencies with systems required by Section C406 or Section C407. These are described in the Preliminary Commissioning Report submitted to the owner. The following items are not in compliance with the energy code:</p>
	<p><input type="checkbox"/> Metering Systems were included in the Commissioning Process (Section C408.6) Energy source meters, energy end-use meters, the energy metering data acquisition system and required display are calibrated, adjusted and operate to minimally meet code requirements</p> <p><input type="checkbox"/> There are unresolved deficiencies with the metering system. These are described in the Preliminary Commissioning Report submitted to the owner. The following items are not in compliance with the energy code:</p>
<p>Supporting Documents (Section C103.6)</p>	<p><input type="checkbox"/> Manuals, record documents and training have been completed or are scheduled</p> <ul style="list-style-type: none"> • System documentation has been provided to the owner or scheduled date: • Record documents have been submitted to owner or scheduled date: • Training has been completed or scheduled date:
<p>Preliminary Commissioning Report (Section C408.1.4.1)</p>	<p><input type="checkbox"/> Preliminary Commissioning Report submitted to owner and includes items below</p> <ul style="list-style-type: none"> <input type="checkbox"/> Itemization of deficiencies found during testing that are part of the energy code and that have not been corrected at the time of report preparation <input type="checkbox"/> Deferred tests, which cannot be performed at the time of report preparation, with anticipated date of completion <input type="checkbox"/> Status of the project's record documents, manuals and systems operation training with respect to requirements in Section C103.6
<p>Certification</p>	<p><input type="checkbox"/> I hereby certify that all requirements for Commissioning have been completed in accordance with the Washington State Energy Code, including all items above</p> <p style="text-align: center;">_____ Building Owner or Owner's Authorized Agent</p> <p style="text-align: right;">_____ Date))</p>

<p>Project Information</p>	<p><u>Project Name:</u></p>
	<p><u>Project Address:</u></p>
	<p><u>Certified Commissioning Professional:</u></p>
	<p><u>Type of ISO Certification and Number:</u></p>
<p><u>Supporting Documents</u></p>	<p><input type="checkbox"/> <u>Manuals, record documents and training have been completed or are scheduled</u> (Section C103.6)</p> <ul style="list-style-type: none"> • <u>Building operations and maintenance information (C103.6.2) have been submitted to the owner or scheduled date:</u> • <u>Manuals (C103.6.2.1) have been submitted to the owner or scheduled date:</u> • <u>Compliance documentation (C103.6.3) has been provided to the owner or scheduled date:</u> • <u>System operation training (C103.6.4) has been provided to the owner or scheduled date:</u>
<p><u>Commissioning Plan</u></p>	<p><input type="checkbox"/> <u>Commissioning Plan was used during construction</u> (Section C408.1.2)</p>

<u>Commissioning Report</u>	<input type="checkbox"/> Commissioning Report has been submitted (Section C408.1.3)
<u>Commissioned Systems</u>	<input type="checkbox"/> Mechanical Systems were included in the commissioning process (Section C408.2) <ul style="list-style-type: none"> <input type="checkbox"/> Testing, adjusting and balancing is complete (Section C408.2.2). <input type="checkbox"/> There are unresolved deficiencies with the mechanical systems. These are described in the attached Commissioning Report submitted to the owner.
	<input type="checkbox"/> Service Water Heating Systems were included in the commissioning process (Section C408.3) <ul style="list-style-type: none"> <input type="checkbox"/> There are unresolved deficiencies with the service water heating systems. These are described in the attached Commissioning Report submitted to the owner.
	<input type="checkbox"/> Controlled receptacles and lighting control systems were included in the commissioning process (Section C408.4) <ul style="list-style-type: none"> <input type="checkbox"/> There are unresolved deficiencies with the electrical power and/or automatic lighting controls. These are described in the attached Commissioning Report submitted to the owner.
	<input type="checkbox"/> Additional Systems included in the commissioning process (Section C408.5) <ul style="list-style-type: none"> <input type="checkbox"/> There are unresolved deficiencies with systems required by Section C406 or Section C407. These are described in the attached Commissioning Report submitted to the owner.
	<input type="checkbox"/> Metering Systems were included in the commissioning process (Section C408.6) <ul style="list-style-type: none"> <input type="checkbox"/> There are unresolved deficiencies with the metering system. These are described in the attached Commissioning Report submitted to the owner.
	<input type="checkbox"/> Refrigeration Systems were included in the commissioning process (Section C408.7) <ul style="list-style-type: none"> <input type="checkbox"/> There are unresolved deficiencies with the systems required by Section C410. These are described in the attached Commissioning Report submitted to the owner.
<u>Certification</u>	<input type="checkbox"/> I hereby certify that all requirements for Section C408 System Commissioning have been completed in accordance with the Washington State Energy Code, including all items above.
	<div style="display: flex; justify-content: space-between; border-top: 1px solid black; border-bottom: 1px solid black; padding: 5px 0;"> Certified Commissioning Professional Date </div> <input type="checkbox"/> I hereby certify that all requirements for Section C408 System Commissioning have been completed in accordance with the Washington State Energy Code, including all items above.
<div style="display: flex; justify-content: space-between;"> Building Owner or Owner's Authorized Agent Date </div>	

AMENDATORY SECTION (Amending WSR 16-24-070, filed 12/6/16, effective 5/1/17)

WAC 51-11C-40802 Section C408.2—Mechanical systems commissioning.

C408.2 Mechanical and refrigeration systems commissioning. Mechanical and refrigeration equipment and controls subject to Sections C403 and C410 shall be included in the commissioning process required by Section C408.1. The commissioning process shall minimally include all energy code requirements for which the code states that equipment or controls shall "be capable of" or "configured to" perform specific functions.

EXCEPTION: Mechanical systems are exempt from the commissioning process where the ((building's)) installed total mechanical equipment capacity is less than 240,000 Btu/h cooling capacity and less than 300,000 Btu/h heating capacity.

C408.2.1 Reserved.

C408.2.2 Systems adjusting and balancing. HVAC systems shall be balanced in accordance with generally accepted engineering standards. Air and water flow rates shall be measured and adjusted to deliver final flow rates within the tolerances provided in the project specifications. Test and balance activities shall include air system and hydronic system balancing.

C408.2.2.1 Air systems balancing. Each supply air outlet and zone terminal device shall be equipped with means for air balancing in accordance with the requirements of Chapter 6 of the *International Mechanical Code*. Discharge dampers used for air system balancing are prohibited on constant volume fans and variable volume fans with motors 10 hp (18.6 kW) and larger. Air systems shall be balanced in a manner to first minimize throttling losses then, for fans with system power of greater than 1 hp (0.74 kW), fan speed shall be adjusted to meet design flow conditions.

EXCEPTION: Fans with fan motors of 1 hp (0.74 kW) or less.

C408.2.2.2 Hydronic systems balancing. Individual hydronic heating and cooling coils shall be equipped with means for balancing and measuring flow. Hydronic systems shall be proportionately balanced in a manner to first minimize throttling losses, then the pump impeller shall be trimmed or pump speed shall be adjusted to meet design flow conditions. Each hydronic system shall have either the capability to measure pressure across the pump, or test ports at each side of each pump.

EXCEPTION: The following equipment is not required to be equipped with means for balancing or measuring flow:

1. Pumps with pump motors of 5 hp (3.7 kW) or less.
2. Where throttling results in no greater than five percent of the nameplate horsepower draw above that required if the impeller were trimmed.

C408.2.3 ((Functional performance)) System testing. Functional performance testing ((specified in Sections C408.2.3.1 through C408.2.3.3 shall be conducted. Written procedures which clearly describe the individual systematic test procedures, the expected systems' response or acceptance criteria for each procedure, the actual response or findings, and any pertinent discussion shall be followed. Testing shall affirm operation during actual or simulated winter and summer design conditions and during full outside air conditions.

C408.2.3.1 Equipment. Equipment functional performance testing) shall demonstrate the ((installation and operation of)) components, systems, and system-to-system interfacing relationships are installed and operate in accordance with approved ((plans and specifications such that operation, function, and maintenance serviceability for each of the commissioned systems is confirmed)) construction documents. Testing shall include ((all modes and)) the sequence of operation, ((including)) and be conducted under full-load, part-load and the following ((emergency)) conditions:

1. All modes as described in the *sequence of operation*;
2. Redundant or *automatic* back-up mode;
3. Performance of alarms; and
4. Mode of operation upon a loss of power and restoration of power.

~~((C408.2.3.2 Controls. HVAC control systems shall be tested to document that control devices, components, equipment, and systems are calibrated and adjusted and operate in accordance with approved plans and specifications. Sequences of operation shall be functionally tested to document they operate in accordance with approved plans and specifications.~~

~~C408.2.3.3 Economizers. Air economizers shall undergo a functional test to determine that they operate in accordance with manufacturer's specifications.))~~

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

**WAC 51-11C-40803 Section C408.3—((Lighting))
Service water heating systems commissioning.**

~~((C408.3 Electrical power and lighting systems commissioning. Electrical power and lighting systems subject to Section C405 shall be included in the commissioning process required by Section C408.1. The commissioning process shall minimally include all energy code requirements for which the code requires specific daylight responsive controls, "control functions," and where the code states that equipment shall be "configured to" perform specific functions.~~

EXCEPTION: Lighting control systems are exempt from the commissioning process in buildings where:

1. The total installed lighting load is less than 20 kW.
2. Where the lighting load controlled by occupancy sensors or automatic daylighting controls is less than 10 kW.

C408.3.1 Functional testing. Prior to passing final inspection, the *certified commissioning professional* shall provide evidence that the lighting control systems have been tested to ensure that control hardware and software are calibrated,

adjusted, programmed and in proper working condition in accordance with the construction documents and manufacturer's instructions. Written procedures which clearly describe the individual systematic test procedures, the expected systems' response or acceptance criteria for each procedure, the actual response or findings, and any pertinent discussion shall be followed. Functional testing shall comply with Section C408.3.1.1 through C408.3.1.3 for the applicable control type.

C408.3.1.1 Occupant sensor controls. Where occupancy sensors are provided, the following procedures shall be performed:

1. Certify that the occupancy sensor has been located and aimed in accordance with manufacturer recommendations.
2. For projects with seven or fewer occupancy sensors, each sensor shall be tested. For projects with more than seven occupancy sensors, testing shall be done for each unique combination of sensor type and space geometry. Where multiples of each unique combination of sensor type and space geometry are provided, no fewer than the greater of one or 10 percent of each combination shall be tested unless the code official or design professional requires a higher percentage to be tested. Where 30 percent or more of the tested controls fail, all remaining identical combinations shall be tested.

3. For each occupancy sensor to be tested, verify the following:

- 3.1. Where occupancy sensors include status indicators, verify correct operation.
- 3.2. The controlled lights turn off or down to the permitted level within the required time.
- 3.3. For auto-on occupancy sensors, the lights turn on to the permitted level within the required time.
- 3.4. For manual on sensors, the lights turn on only when manually activated.
- 3.5. The lights are not incorrectly turned on by movement in adjacent areas or by HVAC operation.

C408.3.1.2 Time switch controls. Where automatic time switches are provided, the following procedures shall be performed:

1. Confirm that the automatic time switch control is programmed with accurate weekday, weekend and holiday schedules, and set up and preference program settings.
2. Provide documentation to the owner of automatic time switch programming, including weekday, weekend, holiday schedules and set up and preference program settings.
3. Verify the correct time and date in the time switch.
4. Verify that any battery backup is installed and energized.
5. Verify that the override time limit is set to not more than two hours.
6. Simulate occupied conditions. Verify and document the following:
 - 6.1. All lights can be turned on and off by their respective area control switch.
 - 6.2. The switch only operates lighting in the enclosed space in which the switch is located.
7. Simulate unoccupied condition. Verify the following:
 - 7.1. All nonexempt lighting turns off.

7.2. Manual override switch allows only the lights in the enclosed space where the override switch is located to turn on or remain on until the next scheduled shut off occurs.

8. Additional testing as specified by the *certified commissioning professional*.

C408.3.1.3 Daylight responsive controls. Where *daylight responsive controls* are provided, the following procedures shall be performed:

1. All control devices have been properly located, field-calibrated and set for accurate setpoints and threshold light levels.

2. Daylight controlled lighting loads adjusted to light level setpoints in response to available daylight.

3. The locations of calibration adjustment equipment are readily accessible only to authorized personnel.

C408.3.2 Documentation requirements. The construction documents shall specify that documents certifying that the installed lighting controls meet documented performance criteria of Section C405 be provided to the building owner within 90 days from the date of receipt of the certificate of occupancy.)) **C408.3 Service water heating systems commissioning.** Service water heating equipment and controls subject to Section C404 shall be included in the commissioning process required by Section C408.1. The commissioning process shall minimally include equipment and components installed to meet all energy code requirements for devices to "start," "automatically turn off," "automatically adjust," "limit operation," and "limit the temperature" and "be configured to."

C408.3.1 System testing. Functional performance testing shall demonstrate that heaters, piping, distribution systems, and system-to-system interfacing relationships are installed and operate in accordance with approved construction documents. Testing shall include the *sequence of operation*, and be conducted under at least 50 percent water heating load, part-load and the following conditions:

1. Normal operation;
2. Redundant or automatic back-up mode;
3. Performance of alarms; and
4. Mode of operation upon a loss of power and restoration of power.

AMENDATORY SECTION (Amending WSR 16-13-089, filed 6/15/16, effective 7/16/16)

WAC 51-11C-40804 Section C408.4—((Service water heating)) Controlled receptacle and lighting control system(s) commissioning.

C408.4 ((Service water heating)) Controlled receptacle and lighting control system(s) commissioning. ((Service water heating equipment and controls subject to Section C404 shall be included in the commissioning process required by Section C408.1. The commissioning process shall minimally include all energy code requirements for which the code states that equipment or controls shall "be capable of" or "configured to" perform specific functions.

EXCEPTION: 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 (58.6 W) and where there are no pools or permanent spas.))

Controlled receptacles and lighting control systems subject to Section C405 shall be included in the commissioning process required by Section C408.1. The configuration and function of controlled receptacles and lighting control systems required by this code shall be tested and shall comply with Section C408.4.1.

EXCEPTION: Lighting control systems are exempt from the commissioning process in buildings where:

1. The total installed lighting load is less than 20 kW; and
2. The lighting load controlled by occupancy sensors or automatic daylighting controls is less than 10 kW.

C408.4.1 ((Functional performance)) System testing. Functional performance testing ((specified in Sections C408.4.1.1 through C408.4.1.3 shall be conducted. Written procedures which clearly describe the individual systematic test procedures, the expected systems' response or acceptance criteria for each procedure, the actual response or findings, and any pertinent discussion shall be followed. Testing shall affirm operation with the system under 50 percent water heating load.

C408.4.1.1 Equipment. Equipment functional performance testing shall demonstrate the installation and operation of components, systems, and system-to-system interfacing relationships in accordance with approved plans and specifications such that operation, function, and maintenance serviceability for each of the commissioned systems is confirmed. Testing shall include all modes and *sequence of operation*, including under full load, part load and the following emergency conditions.)) shall demonstrate that occupant sensors, time switches, manual overrides, night sweep-off, daylight responsive control, and controlled receptacles are installed and operate in accordance with approved construction documents. Testing shall include the *sequence of operation* and be conducted under the following conditions:

1. Normal operation;
2. Redundant or automatic back-up mode;
- ((2-)) 3. Performance of alarms; and
- ((3-)) 4. Mode of operation upon a loss of power and restoration of power.

((**C408.4.1.2 Controls.** Service water heating controls shall be tested to document that control devices, components, equipment, and systems are calibrated, adjusted and operate in accordance with approved plans and specifications. Sequences of operation shall be functionally tested to document they operate in accordance with *approved* plans and specifications.

C408.4.1.3 Pools and spas. Service water heating equipment, time switches, and heat recovery equipment which serve pools and permanent spas shall undergo a functional test to determine that they operate in accordance with manufacturer's specifications.))

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-408045 Section C408.5—Other systems commissioning.

C408.5 Systems installed to meet Section C406 or C407. Equipment, components, controls or configuration settings for ~~((mechanical, service water heating, electrical power or lighting))~~ systems which are included in the project to comply with Section C406 or C407 shall be included in the commissioning process required by Section C408.1.

C408.5.1 System testing. Functional performance testing for these appliances, equipment, components, controls and/or configuration settings shall demonstrate operation, function and maintenance serviceability for each of the commissioned systems in accordance with the approved construction documents.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40805 Section C408.6—Metering system commissioning.

C408.6 Metering system commissioning. Energy metering systems required by Section C409 shall comply with Section C408.6 and be included in the commissioning process required by Section C408.1. The commissioning process shall include all energy metering equipment and controls required by Section C409.

C408.6.1 (~~Functional performance~~) System testing. ~~Functional performance testing shall ((be conducted by following written procedures which clearly describe the individual systematic test procedures, the expected systems' response or acceptance criteria for each procedure, the actual response or findings, and any pertinent discussion. Functional testing shall document that energy source meters, energy end-use meters, the energy metering data acquisition system, and required energy consumption display are calibrated, adjusted and operate in accordance with approved plans and specifications)) demonstrate that energy source meters, end-use meters, data acquisition systems, and energy displays are installed and operate in accordance with approved construction documents.~~ At a minimum, testing shall confirm that:

1. The metering system devices and components work properly under low and high load conditions.
2. The metered data is delivered in a format that is compatible with the data collection system.
3. The energy display is ~~((accessible))~~ in a location with access to building operation and management personnel.
4. The energy display meets code requirements regarding views required in Section C409.4.3. The display shows energy data in identical units (e.g., kWh).

NEW SECTION

WAC 51-11C-40807 Section C408.7—Refrigeration system commissioning.

C408.7 Refrigeration system commissioning. All installed refrigeration systems subject to Section C410 shall be included in the commissioning process required by Section C408.1.

EXCEPTIONS: 1. Self-contained refrigeration systems are exempt from the commissioning process.
2. Total installed capacity for refrigeration is equal to or less than 240 kBtu/h.

C408.7.1 System testing. Functional performance testing shall demonstrate that compressors, heat exchangers, piping, distribution systems, and system-to-system interfacing relationships are installed and operate in accordance with approved construction documents. Testing shall include the sequence of operation and be conducted under full-load at, part-load and the following conditions:

1. Normal mode;
2. Redundant or automatic back-up mode;
3. Performance of alarms; and
4. Mode of operation upon a loss of power and restoration of power.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40901 Section C409.1—General.

C409.1 General. All new buildings and additions shall have the capability of metering source energy for on-site renewable energy production in accordance with Section C409.2.4 and the end-use energy usage for electric vehicle charging in accordance with Section C409.3.4. New buildings and additions with a gross conditioned floor area over 50,000 square feet shall comply with Section C409. Buildings shall be equipped to measure, monitor, record and display energy consumption data for each energy source and end use category per the provisions of this section, to enable effective energy management.

EXCEPTIONS: 1. Tenant spaces smaller than 50,000 square feet within buildings if the tenant space has its own utility service and utility meters.
2. Buildings in which there is no gross conditioned floor area over 25,000 square feet, including building common area, that is served by its own utility services and meters.

C409.1.1 Alternate metering methods. Where approved by the building official, energy use metering systems may differ from those required by this section, provided that they are permanently installed and that the source energy measurement, end use category energy measurement, data storage and data display have similar accuracy to and are at least as effective in communicating actionable energy use information to the building management and users, as those required by this section.

C409.1.2 Conversion factor. Any threshold stated in kW shall include the equivalent BTU/h heating and cooling capacity of installed equipment at a conversion factor of 3,412 Btu per kW at 50 percent demand.

C409.1.3 Dwelling units. See Sections C404.9 and C405.7 for additional metering requirements for Group R-2 dwelling units.

AMENDATORY SECTION (Amending WSR 13-04-056, filed 2/1/13, effective 7/1/13)

WAC 51-11C-40902 Section C409.2—Energy source metering.

C409.2 Energy source metering. Buildings shall have a meter at each energy source. For each energy supply source listed in Section C409.2.1 through C409.2.4, meters shall collect data for the whole building or for each separately metered portion of the building where not exempted by the exception to Section C409.1.

EXCEPTIONS: 1. Energy source metering is not required where end use metering for an energy source accounts for all usage of that energy type within a building, and the data acquisition system accurately totals the energy delivered to the building or separately metered portion of the building.
2. Solid fuels such as coal, firewood or wood pellets that are delivered via mobile transportation do not require metering.

C409.2.1 Electrical energy. This category shall include all electrical energy supplied to the building and its associated site, including site lighting, parking, recreational facilities, and other areas that serve the building and its occupants.

C409.2.2 Gas and liquid fuel supply energy. This category shall include all natural gas, fuel oil, propane and other gas or liquid fuel energy supplied to the building and site.

C409.2.3 District energy. This category shall include all net energy extracted from district steam systems, district chilled water loops, district hot water systems, or other energy sources serving multiple buildings.

C409.2.4 Site-generated renewable energy. This category shall include all net energy generated from on-site solar, wind, geothermal, tidal or other natural sources. For buildings exempt from data collection systems, the data from these meters is permitted to either be stored locally using a manual totalizing meter or other means at the meter or fed into a central data collection system.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-40903 Section C409.3—End-use metering.

C409.3 End-use metering. Meters shall be provided to collect energy use data for each end-use category listed in Sections C409.3.1 through ~~((C409.3.2))~~ C409.3.7. These meters shall collect data for the whole building or for each separately metered portion of the building where not exempted by the exception to Section C409.1. Not more than 10 percent of the total connected load of any of the end-use metering categories in Sections C409.3.1 through C409.3.6 is permitted to be excluded from that end-use data collection. Not more than 10 percent of the total connected load of any of the end-use metering categories in Sections C409.3.1 through C409.3.6 is

permitted to consist of loads not part of that category. Multiple meters may be used for any end-use category, provided that the data acquisition system totals all of the energy used by that category. Full-floor tenant space submetering data shall be provided to the tenant in accordance with Section C409.7, and the data shall not be required to be included in other end-use categories.

EXCEPTIONS: 1. HVAC and service water heating equipment serving only an individual dwelling unit or sleeping unit does not require end-use metering.
2. Separate metering is not required for fire pumps, stairwell pressurization fans or other life safety systems that operate only during testing or emergency.
3. End use metering is not required for individual tenant spaces not exceeding 2,500 square feet in floor area when a dedicated source meter meeting the requirements of Section C409.4.1 is provided for the tenant space.
4. Health care facilities with loads in excess of 150 kVA are permitted to have submetering that measures electrical energy usage in accordance with the normal and essential electrical systems except that submetering is required for the following load categories:
4.1. HVAC system energy use in accordance with the requirements of Section C409.3.1.
4.2. Service water heating energy use in accordance with the requirements of Section C409.3.2.
4.3. Process load system energy in accordance with the requirements of Section C409.3.5 for each significant facility not used in direct patient care including, but not limited to, food service, laundry and sterile processing facilities, where the total connected load of the facility exceeds 100 kVA.
5. End-use metering is not required for electrical circuits serving only sleeping rooms and guest suites within Group R-1 occupancies. This exception does not apply to common areas or to equipment serving multiple sleeping rooms.

C409.3.1 HVAC system energy use. This category shall include all energy including electrical, gas, liquid fuel, district steam and district chilled water that is used by boilers, chillers, pumps, fans and other equipment used to provide space heating, space cooling, dehumidification and ventilation to the building, but not including energy that serves process loads, service water heating or miscellaneous loads as defined in Section C409.3. Multiple HVAC energy sources, such as gas, electric and steam, are not required to be summed together.

EXCEPTIONS: 1. ~~((A#))~~ 120 volt equipment.
2. ~~((208/120-volt equipment in a building where the main service is 480/277-volt power.))~~ An HVAC branch circuit where the total MCA of equipment served equates to less than 10 kVA.
3. ~~((Electrical energy fed through variable frequency drives that are connected to the energy metering data acquisition center.))~~ Individual fans or pumps that are not on a variable frequency drive.

C409.3.2 Service water heating energy use. This category shall include all energy used for heating of domestic and service hot water, but not energy used for space heating.

EXCEPTION: Service water heating energy use less than 50 ((kW)) kVA does not require end-use metering.

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.

C409.3.4 Electric vehicle charging energy use. This category shall include all energy used for electric vehicle charging. For buildings exempt from data collection systems, the data from these meters is permitted to either be stored locally using a manual totalizing meter or other means at the meter or fed into a central data collection system.

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.

EXCEPTION: Where the total connected load of all plug load circuits is less than 50 kVA, end-use metering is not required.

C409.3.6 Process load system energy use. This category shall include all energy used by any nonbuilding process load including, but not limited to, nonresidential refrigeration and cooking equipment, laundry equipment, industrial equipment, and stage lighting.

EXCEPTION: Where the process load energy use is less than 50 kVA, end-use metering is not required.

C409.3.7 Full-floor tenant space electrical submetering. In a multitenant building where more than 90 percent of the leasable area of a floor is occupied by a single tenant, an electrical energy use display shall be provided to the tenant in accordance with the requirements of Section C409.4.3. Electrical loads from areas outside of the tenant space or from equipment that serves areas outside the tenant space shall not be included in the tenant space submetering. A single display is permitted to serve multiple floors occupied by the same tenant.

AMENDATORY SECTION (Amending WSR 16-13-089, filed 6/15/16, effective 7/16/16)

WAC 51-11C-40904 Section C409.4—Measurement devices, data acquisition system and energy display.

C409.4 Measurement devices, data acquisition system and energy display.

C409.4.1 Meters. Meters and other measurement devices required by this section shall have local displays or be configured to automatically communicate energy data to a data acquisition system. Source meters may be any digital-type meters. Current sensors or flow meters are allowed for end use metering, provided that they have an accuracy of +/- 5%. All required metering systems and equipment shall provide at least hourly data that is fully integrated into the data acquisition and display system per the requirements of Section C409.

C409.4.2 Data acquisition system. The data acquisition system shall store the data from the required meters and other sensing devices in a single database for a minimum of 36 months. For each energy supply and end use category required by C409.2 and C409.3, it shall provide real-time energy consumption data and logged data for any hour, day, month or year.

C409.4.3 Energy display. For each building subject to Section C409.2 and C409.3, either a ~~((readily accessible and))~~ visible display in a location with ready access, or a single web page or other electronic document ((accessible)) available for access to building management or to a third-party energy data analysis service shall be provided in the building accessible by building operation and management personnel. The display shall graphically provide the current energy consumption rate for each whole building energy source, plus each end use category, as well as the ~~((average))~~ total and peak values for any day, week ~~((or)), month, and year.~~

C409.4.4 Commissioning. ~~((The entire))~~ Energy metering and energy consumption management systems shall be commissioned in accordance with Section C408. ((Deficiencies found during testing shall be corrected and retested and the commissioning report shall be updated to confirm that the entire metering and data acquisition and display system is fully functional.))

AMENDATORY SECTION (Amending WSR 16-24-070, filed 12/6/16, effective 5/1/17)

WAC 51-11C-41000 Section C410—Refrigeration system requirements.

C410.1 General ~~((prescriptive))~~. Walk-in coolers, walk-in freezers, refrigerated warehouse coolers, refrigerated warehouse freezers, and refrigerated display cases shall comply with this Section.

Refrigerated warehouse coolers and refrigerated warehouse freezers shall comply with Section C402. Section C402.1.5 Component performance alternative, may be used if granted prior approval by the jurisdiction.

C410.1.1 Refrigeration equipment performance. Refrigeration equipment shall have an energy use in kWh/day not greater than the values of Tables ~~((C410.2))~~ C410.1(1) and ((C410.2)) C410.1(2) when tested and rated in accordance with AHRI Standard 1200. The energy use shall be verified through certification under an approved certification program or, where a certification program does not exist, the energy use shall be supported by data furnished by the equipment manufacturer.

Table C410.1.1(1)
Minimum Efficiency Requirements: Commercial Refrigeration

EQUIPMENT TYPE	APPLICATION	ENERGY USE LIMITS (kWh per day) ^a	TEST PROCEDURE
Refrigerator with solid doors	Holding Temperature	$0.10 \times V + 2.04$	AHRI 1200
Refrigerator with transparent doors		$0.12 \times V + 3.34$	
Freezers with solid doors		$0.40 \times V + 1.38$	
Freezers with transparent doors		$0.75 \times V + 4.10$	
Refrigerator/freezers with solid doors		The greater of $0.12 \times V + 3.34$ or 0.70	
Commercial refrigerators	Pulldown	$0.126 \times V + 3.51$	

^a V = Volume of the chiller for frozen compartment as defined in AHAM-HRF-1.

Table C410.1.1(2)
Minimum Efficiency Requirements: Commercial Refrigerators and Freezers

EQUIPMENT TYPE				ENERGY USE LIMITS (kWh per day) ^{a,b}	TEST PROCEDURE
Equipment Class ^c	Family Code	Operating Mode	Rating Temperature		
VOP.RC.M	Vertical open	Remote condensing	Medium	$0.82 \times TDA + 4.07$	AHRI 1200
SVO.RC.M	Semivertical open	Remote condensing	Medium	$0.83 \times TDA + 3.18$	
HZO.RC.M	Horizontal open	Remote condensing	Medium	$0.35 \times TDA + 2.88$	
VOP.RC.L	Vertical open	Remote condensing	Low	$2.27 \times TDA + 6.85$	
HZO.RC.L	Horizontal open	Remote condensing	Low	$0.57 \times TDA + 6.88$	
VCT.RC.M	Vertical transparent door	Remote condensing	Medium	$0.22 \times TDA + 1.95$	
VCT.RC.L	Vertical transparent door	Remote condensing	Low	$0.56 \times TDA + 2.61$	
SOC.RC.M	Service over counter	Remote condensing	Medium	$0.51 \times TDA + 0.11$	
VOP.SC.M	Vertical open	Self-contained	Medium	$1.74 \times TDA + 4.71$	
SVO.SC.M	Semivertical open	Self-contained	Medium	$1.73 \times TDA + 4.59$	
HZO.SC.M	Horizontal open	Self-contained	Medium	$0.77 \times TDA + 5.55$	
HZO.SC.L	Horizontal open	Self-contained	Low	$1.92 \times TDA + 7.08$	
VCT.SC.I	Vertical transparent door	Self-contained	Ice cream	$0.67 \times TDA + 3.29$	
VCS.SC.I	Vertical solid door	Self-contained	Ice cream	$0.38 \times V + 0.88$	
HCT.SC.I	Horizontal transparent door	Self-contained	Ice cream	$0.56 \times TDA + 0.43$	
SVO.RC.L	Semivertical open	Remote condensing	Low	$2.27 \times TDA + 6.85$	
VOP.RC.I	Vertical open	Remote condensing	Ice cream	$2.89 \times TDA + 8.7$	

EQUIPMENT TYPE				ENERGY USE LIMITS (kWh per day) ^{a,b}	TEST PROCEDURE
Equipment Class ^c	Family Code	Operating Mode	Rating Temperature		
SVO.RC.I	Semivertical open	Remote con- densing	Ice cream	2.89 x TDA + 8.7	
HZO.RC.I	Horizontal open	Remote con- densing	Ice cream	0.72 x TDA + 8.74	
VCT.RC.I	Vertical trans- parent door	Remote con- densing	Ice cream	0.66 x TDA + 3.05	
HCT.RC.M	Horizontal transparent door	Remote con- densing	Medium	0.16 x TDA + 0.13	
HCT.RC.L	Horizontal transparent door	Remote con- densing	Low	0.34 x TDA + 0.26	
HCT.RC.I	Horizontal transparent door	Remote con- densing	Ice cream	0.4 x TDA + 0.31	
VCS.RC.M	Vertical solid door	Remote con- densing	Medium	0.11 x V + 0.26	
VCS.RC.L	Vertical solid door	Remote con- densing	Low	0.23 x V + 0.54	
VCS.RC.I	Vertical solid door	Remote con- densing	Ice cream	0.27 x V + 0.63	
HCS.RC.M	Horizontal solid door	Remote con- densing	Medium	0.11 x V + 0.26	
HCS.RC.L	Horizontal solid door	Remote con- densing	Low	0.23 x V + 0.54	
HCS.RC.I	Horizontal solid door	Remote con- densing	Ice cream	0.27 x V + 0.63	
SOC.RC.L	Service over counter	Remote con- densing	Low	1.08 x TDA + 0.22	
SOC.RC.I	Service over counter	Remote con- densing	Ice cream	1.26 x TDA + 0.26	
VOP.SC.L	Vertical open	Self-contained	Low	4.37 x TDA + 11.82	
VOP.SC.I	Vertical open	Self-contained	Ice cream	5.55 x TDA + 15.02	
SVO.SC.L	Semivertical open	Self-contained	Low	4.34 x TDA + 11.51	
SVO.SC.I	Semivertical open	Self-contained	Ice cream	5.52 x TDA + 14.63	
HZO.SC.I	Horizontal open	Self-contained	Ice cream	2.44 x TDA + 9.0	
SOC.SC.I	Service over counter	Self-contained	Ice cream	1.76 x TDA + 0.36	
HCS.SC.I	Horizontal solid door	Self-contained	Ice cream	0.38 x V + 0.88	

^a V = Volume of the case, as measured in accordance with Appendix C of AHRI 1200.

^b TDA = Total display area of the case, as measured in accordance with Appendix D of AHRI 1200.

^c Equipment class designations consist of a combination [(in sequential order separated by periods (AAA).(BB).(C))] of:

(AAA) An equipment family code where:

VOP = Vertical open

SVO = Semi-vertical open

HZO = Horizontal open

- VCT = Vertical transparent doors
- VCS = Vertical solid doors
- HCT = Horizontal transparent doors
- HCS = Horizontal solid doors
- SOC = Service over counter

(BB) An operating mode code:

- RC = Remote condensing
- SC = Self-contained

(C) A rating temperature code:

- M = Medium temperature (38°F)
- L = Low temperature (0°F)
- I = Ice cream temperature (15°F)

For example, "VOP.RC.M" refers to the "vertical-open, remote-condensing, medium-temperature" equipment class.

C410.2 Walk-in coolers, walk-in freezers, refrigerated warehouse coolers and refrigerated warehouse freezers. *Refrigerated warehouse coolers, refrigerated warehouse freezers, and all walk-in coolers and walk-in freezers including site assembled, site constructed and pre-fabricated units shall comply with the following:*

1. Automatic door-closers shall be provided that fully close walk-in doors that have been closed to within 1 inch (25 mm) of full closure.

EXCEPTION: Automatic closers are not required for doors more than 45 inches (1143 mm) in width or more than 7 feet (2134 mm) in height.

2. Doorways shall be provided with strip doors, curtains, spring-hinged doors or other method of minimizing infiltration when doors are open.

3. *Walk-in coolers and refrigerated warehouse coolers* shall be provided with wall, ceiling, and door insulation of not less than R-25 or have wall, ceiling and door assembly U-factors no greater than U-0.039. *Walk-in freezers and refrigerated warehouse freezers* shall be provided with wall, ceiling and door insulation of not less than R-32 or have wall, ceiling and door assembly U-factors no greater than U-0.030.

EXCEPTION: Insulation is not required for glazed portions of doors or at structural members associated with the walls, ceiling or door frame.

4. The floor of walk-in coolers shall be provided with floor insulation of not less than R-25 or have a floor assembly U-factor no greater than U-0.40. The floor of walk-in freezers shall be provided with floor insulation of not less than R-28 or have a floor assembly U-factor no greater than U-0.035.

EXCEPTION: Insulation is not required in the floor of a walk-in cooler that is mounted directly on a slab on grade.

5. Transparent fixed window and reach-in doors for walk-in freezers and windows in *walk-in freezer* doors shall be provided with triple-pane glass, with the interstitial spaces filled with inert gas or be provided with heat-reflective treated glass.

6. Transparent fixed window and reach-in doors for walk-in coolers and windows for *walk-in coolers* doors shall be provided with double-pane or triple-pane glass, with interstitial space filled with inert gas, or be provided with heat-reflective treated glass.

7. Evaporator fan motors that are less than 1 hp (0.746 kW) and less than 460 volts shall be provided with electroni-

cally commutated motors, brushless direct-current motors, or 3-phase motors.

8. Condenser fan motors that are less than 1 hp (0.746 kW) shall use electronically commutated motors, permanent split capacitor-type motors or 3-phase motors.

9. Antisweat heaters that are not provided with antisweat heater controls shall have a total door rail, glass and frame heater power draw of not greater than 7.1 W/ft² (76 W/m²) of door opening for *walk-in freezers* and not greater than 3.0 W/ft² (32 W/m²) of door opening for *walk-in coolers*.

10. Where antisweat heater controls are provided, they shall be capable of reducing the energy use of the antisweat heater as a function of the relative humidity in the air outside the door or to the condensation on the inner glass pane.

11. Lights in *walk-in coolers, walk-in freezers, refrigerated warehouse coolers and refrigerated warehouse freezers* shall either be provided with light sources with an efficacy of not less than 40 lumens per watt, including ballast losses, or shall be provided with a device that automatically turns off the lights within 15 minutes of when the *walk-in cooler or walk-in freezer* space is not occupied.

C410.2.1 ((Reserved)) Performance standards. Site-assembled and site-constructed walk-in coolers and walk-in freezers shall meet the requirements of Tables C410.2.1.1(1), C410.2.1.1(2), and C410.2.1.1(3).

Table C410.2.1.1(1)

Walk-in Cooler and Freezer Display Doors Efficiency Requirements

<u>Class Description</u>	<u>Class</u>	<u>Maximum Energy Consumption (kWh/day)^a</u>
<u>Display door, medium temperature</u>	<u>DD, M</u>	<u>0.04 x A_{dd} + 0.41</u>
<u>Display door, low temperature</u>	<u>DD, L</u>	<u>0.15 x A_{dd} + 0.29</u>

^a A_{dd} is the surface area of the display door.

Table C410.2.1.1(2)

Walk-in Cooler and Freezer Nondisplay Doors Efficiency Requirements

<u>Class Description</u>	<u>Class</u>	<u>Maximum Energy Consumption (kWh/day)^a</u>
<u>Passage door, medium temperature</u>	<u>PD, M</u>	<u>0.05 x A_{nd} + 1.7</u>
<u>Passage door, low temperature</u>	<u>PD, L</u>	<u>0.14 x A_{nd} + 4.8</u>
<u>Freight door, medium temperature</u>	<u>FD, M</u>	<u>0.04 x A_{nd} + 1.9</u>
<u>Freight door, low temperature</u>	<u>FD, L</u>	<u>0.12 x A_{nd} + 5.6</u>

^a A_{nd} is the surface area of the display door.

Table C410.2.1.1(3)

Walk-in Cooler and Freezer Refrigeration Systems Efficiency Requirements

<u>Class Description</u>	<u>Class</u>	<u>Minimum Annual Walk-in Energy Factor AWEF (Btu/hW-h)</u>
<u>Dedicated condensing, medium temperature, indoor system</u>	<u>DC.M.I</u>	<u>5.61</u>
<u>Dedicated condensing, medium temperature, indoor system, >9,000 Btu/h capacity</u>	<u>DC.M.I. >9,000</u>	<u>5.61</u>
<u>Dedicated condensing, medium temperature, outdoor system</u>	<u>DC.MI</u>	<u>7.60</u>
<u>Dedicated condensing, medium temperature, outdoor system, >9,000 Btu/h capacity</u>	<u>DC.M.I. >9,000</u>	<u>7.60</u>

C410.2.2 Refrigerated display cases. Site-assembled or site-constructed refrigerated display cases shall comply with the following:

1. Lighting and glass doors in refrigerated display cases shall be controlled by one of the following:

1.1. Time switch controls to turn off lights during non-business hours. Timed overrides for display cases shall turn the lights on for up to 1 hour and shall automatically time out to turn the lights off.

1.2. Motion sensor controls on each display case section that reduce lighting power by at least 50 percent within 3 minutes after the area within the sensor range is vacated.

2. Low-temperature display cases shall incorporate temperature-based defrost termination control with a time-limit default. The defrost cycle shall terminate first on an upper

temperature limit breach and second upon a time limit breach.

3. Antisweat heater controls shall reduce the energy use of the antisweat heater as a function of the relative humidity in the air outside the door or to the condensation on the inner glass pane.

C410.3 Refrigeration systems. Refrigerated display cases, walk-in coolers or walk-in freezers that are served by remote compressor and remote condensers not located in a condensing unit, shall comply with Sections C410.4.1, C410.4.2, and ((C403.5.3)) C403.9.7.

EXCEPTION: Systems where the working fluid in the refrigeration cycle goes through both subcritical and supercritical states (transcritical) or that use ammonia refrigerant are exempt.

C410.3.1 Condensers serving refrigeration systems. Fan-powered condensers shall comply with the following:

1. The design saturated condensing temperatures for air-cooled condensers shall not exceed the design dry-bulb temperature plus 10°F (5.6°C) for low-temperature refrigeration systems, and the design dry-bulb temperature plus 15°F (8°C) for medium temperature refrigeration systems where the saturated condensing temperature for blend refrigerants shall be determined using the average of liquid and vapor temperatures as converted from the condenser drain pressure.

2. Condenser fan motors that are less than 1 hp (0.75 kW) shall use electronically commutated motors, permanent split-capacitor-type motors or 3-phase motors.

3. Condenser fans for air-cooled condensers, evaporatively cooled condensers, air- or water-cooled fluid coolers or cooling towers shall reduce fan motor demand to not more than 30 percent of design wattage at 50 percent of design air volume, and incorporate one of the following continuous variable speed fan control approaches:

3.1. Refrigeration system condenser control for air-cooled condensers shall use variable setpoint control logic to reset the condensing temperature setpoint in response to ambient dry-bulb temperature.

3.2. Refrigeration system condenser control for evaporatively cooled condensers shall use variable setpoint control logic to reset the condensing temperature setpoint in response to ambient wet-bulb temperature.

4. Multiple fan condensers shall be controlled in unison.

5. The minimum condensing temperature setpoint shall be not greater than 70°F (21°C).

C410.3.2 Compressor systems. Refrigeration compressor systems shall comply with the following:

1. Compressors and multiple-compressor system suction groups shall include control systems that use floating suction pressure control logic to reset the target suction pressure temperature based on the temperature requirements of the attached refrigeration display cases or walk-ins.

EXCEPTION: Controls are not required for the following:

1. Single-compressor systems that do not have variable capacity capability.

2. Suction groups that have a design saturated suction temperature of 30°F (-1.1°C) or higher, suction groups that comprise the high stage of a two-stage or cascade system, or suction groups that primarily serve chillers for secondary cooling fluids.

2. Liquid subcooling shall be provided for all low-temperature compressor systems with a design cooling capacity equal to or greater than 100,000 Btu/hr (29.3 kW) with a design-saturated suction temperature of -10°F (-23°C) or lower. The subcooled liquid temperature shall be controlled at a maximum temperature setpoint of 50°F (10°C) at the exit of the subcooler using either compressor economizer (inter-stage) ports or a separate compressor suction group operating at a saturated suction temperature of 18°F (-7.8°C) or higher.

2.1. Insulation for liquid lines with a fluid operating temperature less than 60°F (15.6°C) shall comply with Table C403.2.10.

3. Compressors that incorporate internal or external crankcase heaters shall provide a means to cycle the heaters off during compressor operation.

C410.4 Commissioning. Refrigeration systems shall be commissioned in accordance with Section C408.

EXCEPTION: Self-contained units.

Reviser's note: The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency and appear in the Register pursuant to the requirements of RCW 34.08.040.

NEW SECTION

WAC 51-11C-41100 Section C411—Solar readiness.

C411.1 General. A solar zone shall be provided on nonresidential buildings that are 20 stories or less in height above grade plan. The solar zone shall be located on the roof of the building or on another structure elsewhere on the site. The solar zone shall be in accordance with Sections C411.2 through C411.8 and the *International Fire Code*.

EXCEPTION: A solar zone is not required where the solar exposure of the building's roof area is less than 75 percent of that of an unshaded area, as defined in Section C411.5, in the same location, as measured by one of the following:

1. Incident solar radiation expressed in kWh/ft²-yr using typical meteorological year (TMY) data.
2. Annual sunlight exposure expressed in cumulative hours per year using TMY data.
3. Shadow studies indicating that the roof area is more than 25 percent in shadow, on September 21st at 10 a.m., 11 a.m., 12 p.m., 1 p.m., and 2 p.m. solar time.

C411.2 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 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.

EXCEPTION: Subject to the approval of the code official, buildings with extensive rooftop equipment that would make full compliance with this section impractical shall be permitted to reduce the size of the solar zone required by Section C411.2 to the maximum practicable area.

C411.3 Contiguous area. The solar zone is permitted to be comprised of separated subzones. Each subzone shall be at least 5 feet wide in the narrowest dimension.

C411.4 Obstructions. The solar zone shall be free of pipes, vents, ducts, HVAC equipment, skylights and other obstructions, except those serving photovoltaic systems within the solar zone. The solar zone is permitted to be located above any such obstructions, provided that the racking for support of the future system is installed at the time of construction, the elevated solar zone does not shade other portions of the solar zone, and its height is permitted by the *International Building Code*. Photovoltaic or solar water heating systems are permitted to be installed within the solar zone.

C411.5 Shading. The solar zone shall be set back from any existing or new object on the building or site that is located south, east or west of the solar zone a distance at least two times the object's height above the nearest point on the roof surface. Such objects include, but are not limited to, taller portions of the building itself, parapets, chimneys, antennas, signage, rooftop equipment, trees, and roof plantings. No portion of the solar zone shall be located on a roof slope greater than 2:12 that faces within 45 degrees of true north.

C411.6 Access. Areas contiguous to the solar zone shall provide access pathways and provisions for emergency smoke ventilation as required by the *International Fire Code*.

C411.7 Structural integrity. The as-designed dead load and live load for the solar zone shall be clearly marked on the record drawings and shall accommodate future photovoltaic system arrays at an assumed dead load of 4 pounds per square foot in addition to other required live and dead loads. A location for future inverters shall be designated either within or adjacent to the solar zone, with a minimum area of 2 square feet for each 1000 square feet of solar zone area, and shall accommodate an assumed dead load of 175 pounds per square foot. Where photovoltaic systems are installed in the solar zone, structural analysis shall be based upon calculated loads, not upon these assumed loads.

C411.8 Photovoltaic interconnection. Interconnection of the future photovoltaic system shall be provided for at the main service panel, either ahead of the service disconnecting means or at the end of the bus opposite the service disconnecting means, in one of the following forms:

1. A space for the mounting of a future overcurrent device, sized to accommodate the largest standard rated overcurrent device that is less than 20 percent of the bus rating.

2. Lugs sized to accommodate conductors with an ampacity of at least 20 percent of the bus rating, to enable the mounting of an external overcurrent device for interconnection.

The electrical construction documents shall indicate all of the following:

1. Solar zone boundaries and access pathways.

2. Location for future inverters and metering equipment.
3. Route for future wiring between the photovoltaic panels and the inverter, and between the inverter and the main service panel.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-50000 Chapter 5 [CE]—Existing buildings.

C501 General.

C501.1 Scope. The provisions of this chapter shall control the *alteration, repair, addition* and change of occupancy of existing buildings and structures.

C501.2 Existing buildings. Except as specified in this chapter, this code shall not be used to require the removal, *alteration* or abandonment of, nor prevent the continued use and maintenance of, an existing building or building system lawfully in existence at the time of adoption of this code.

C501.3 Maintenance. Buildings and structures, and parts thereof, shall be maintained in a safe and sanitary condition. Devices and systems which are required by this code shall be maintained in conformance with the code edition under which installed. The owner or the owner's authorized agent shall be responsible for the maintenance of buildings and structures. The requirements of this chapter shall not provide the basis for removal or abrogation of energy conservation, fire protection and safety systems and devices in existing structures.

C501.4 Compliance. *Alterations, repairs, additions* and changes of occupancy to, or relocation of, existing buildings and structures shall comply with the provisions for *alterations, repairs, additions* and changes of occupancy or relocation, respectively, in this code and in the *International Building Code, International Existing Building Code, International Fire Code, International Fuel Gas Code, International Mechanical Code, Uniform Plumbing Code, and NFPA 70.*

C501.4.1 U-factor requirements for additions and alterations. For existing building projects where an *addition or building envelope alteration* area is combined with existing-to-remain building areas to demonstrate compliance with this code as a whole building, the *U-factors* applied to existing-to-remain envelope assemblies shall be in accordance with record documents.

EXCEPTION: If accurate record documents are not available, *U-factors* for the existing envelope assemblies may be in accordance with the edition of the Washington State Energy Code that was in effect at the time the building was permitted, or as approved by the *code official.*

C501.4.2 Calculations of mechanical heating and cooling loads for alterations. For the installation of new or replacement mechanical equipment that serves existing building areas, design loads associated with heating, cooling and ventilation of the existing building areas served shall be determined in accordance with Section C403.1.2.

R-values and *U-factors* used to determine existing thermal envelope performance for the purpose of calculating design loads shall be in accordance with record documents or existing conditions.

EXCEPTIONS:

1. If accurate record documents are not available, *R-values* and *U-factors* used to determine existing building thermal envelope performance may be in accordance with the edition of the Washington State Energy Code that was in effect at the time the building was permitted.
2. *R-values* and *U-factors* for the existing envelope assemblies as approved by the *code official.*

C501.5 New and replacement materials. Except as otherwise required or permitted by this code, materials permitted by the applicable code for new construction shall be used. Like materials shall be permitted for repairs, provided no hazard to life, health or property is created. Hazardous materials shall not be used where the code for new construction would not permit their use in buildings of similar occupancy, purpose and location.

C501.6 Historic buildings. The building official may modify the specific requirements of this code for historic buildings and require alternate provisions which will result in a reasonable degree of energy efficiency. This modification may be allowed for those buildings or structures that are listed in the state or national register of historic places; designated as a historic property under local or state designation law or survey; certified as a contributing resource with a national register listed or locally designated historic district; or with an opinion or certification that the property is eligible to be listed on the national or state registers of historic places either individually or as a contributing building to a historic district by the state historic preservation officer or the keeper of the national register of historic places.

C501.7 Commissioning. Existing building systems shall be commissioned in accordance with Section C408. For the purposes of meeting the commissioning thresholds in Section C408.1, only the new and altered system capacities are considered when determining whether the project is exempt from some portion of the commissioning process.

Reviser's note: The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency and appear in the Register pursuant to the requirements of RCW 34.08.040.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-50200 Section C502—Additions.

C502.1 General. *Additions* to an existing building, building system or portion thereof shall conform to the provisions of this code as they relate to new construction without requiring the unaltered portion of the existing building or building system to comply with this code. *Additions* shall not create an unsafe or hazardous condition or overload existing building systems. An *addition* shall be deemed to comply with this code if the *addition* alone complies or if the existing building and *addition* comply with this code as a single building. *Additions* shall comply with Sections C402, C403, C404, C405, C406, C409.5, C410 and C502.2.

C502.2 Prescriptive compliance. *Additions* shall comply with Sections C502.2.1 through C502.2.6.2.

C502.2.1 Vertical fenestration. Additions with *vertical fenestration* that results in a total building vertical fenestration area less than or equal to that specified in Section C402.4.1 shall comply with Section C402.4. *Additions* with *vertical fenestration* that results in a total building vertical fenestration area greater than that specified in Section C402.4.1 shall comply with one of the following:

1. ~~(Vertical fenestration alternate per Section C402.4.1.1 or C402.4.1.3 for the addition only.~~
- 2.)) Component performance ~~((option))~~ alternative with target area adjustment per Section C402.1.5 ~~((or the total building performance option in Section C407))~~ for the addition area of the building only.
2. Existing building and addition area are combined to demonstrate compliance with the component performance alternative for the whole building.
3. Total building performance in accordance with Section C407 for the addition area of the building only.
4. Total building performance for the whole building.

C502.2.2 Skylight area. *Additions* with *skylights* that result in a total building skylight area less than or equal to that specified in Section C402.4.1 shall comply with Section C402.4. *Additions* with *skylights* that result in a total building skylight area greater than that specified in Section C402.4.1 shall comply with ~~((the component performance option with the target area adjustment per Section C402.1.5 or the total building performance option in Section C407))~~ one of the following:

1. Vertical fenestration alternate per Section C402.4.1.1 or C402.4.1.3 for the addition area of the building only.

2. Component performance alternative with target area adjustment per Section C402.1.5 for the addition area of the building only.

3. Existing building and addition area are combined to demonstrate compliance with the component performance alternative for the whole building.

4. Total building performance in accordance with Section C407 for the addition area of the building only.

5. Total building performance for the whole building.

C502.2.3 Building mechanical systems. New mechanical systems and equipment serving the building heating, cooling or ventilation needs, that are part of the addition, shall comply with Section C403.

C502.2.4 Service water heating systems. New service water-heating equipment, controls and service water heating piping shall comply with Section C404.

C502.2.5 Pools and permanent spas. New pools and permanent spas shall comply with Section C404.11.

C502.2.6 Lighting and power systems. New lighting systems that are installed as part of the addition shall comply with Section C405.

C502.2.6.1 Interior lighting power. The total interior lighting power for the addition shall comply with Section C405.4.2 for the addition alone, or the existing building and the addition shall comply as a single building.

C502.2.6.2 Exterior lighting power. The total exterior lighting power for the addition shall comply with Section C405.5.1 for the addition alone, or the existing building and the addition shall comply as a single building.

C502.2.7 Refrigeration systems. New refrigerated spaces and refrigeration equipment shall comply with Section C410.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-60000 Chapter 6 [CE]—Referenced standards. This chapter lists the standards that are referenced in various sections of this document. The standards are listed herein by the promulgating agency of the standard, the standard identification, the effective date and title, and the section or sections of this document that reference the standard. The application of the referenced standards shall be as specified in Section C106.

AAMA	American Architectural Manufacturers Association 1827 Walden Office Square Suite 550 Schaumburg, IL 60173-4268	
Standard reference number	Title	Referenced in code section number
AAMA/WDMA/CSA 101/I.S.2/A ((C440—11)) C440—17	North American Fenestration Standard/Specifications for Windows, Doors and Unit Skylights	..... Table C402.4.2
AHAM	Association of Home Appliance Manufacturers 1111 19th Street, N.W., Suite 402 Washington, D.C. 20036	
Standard reference number	Title	Referenced in code section number

ANSI/AHAM RAC-1—2008	Room Air Conditioners	.....	Table ((C403.2.3) C403.3.2(3))
AHAM ((HRF-1-2007) HRF-1—2017)	Energy, Performance and Capacity of Household Refrigerators, Refrigerator-Freezers and Freezers	.....	Table C410.1(1)
AHRI	Air Conditioning, Heating, and Refrigeration Institute 4100 North Fairfax Drive, Suite 200 Arlington, VA 22203		
Standard reference number	Title		Referenced in code section number
ISO/AHRI/ASHRAE 13256-1 ((2014)) (2017)	Water-source Heat Pumps - Testing and Rating for Performance - Part 1: Water-to-air and Brine-to-air Heat Pumps	.....	Table ((C403.2.3) C403.3.2(2))
ISO/AHRI/ASHRAE 13256-2 ((2014)) (2017)	Water-source Heat Pumps - Testing and Rating for Performance - Part 2: Water-to-water and Brine-to-water Heat Pumps	.....	Table ((C403.2.3) C403.3.2(2))
((210/240—08 with Addenda 1 and 2) 210/240—2016	Unitary Air Conditioning and Air-source Heat Pump Equipment	.....	Table ((C403.2.3) C403.3.2(1), Table ((C403.2.3) C403.3.2(2))
((310/380—04) 310/380—2014	Standard for Packaged Terminal Air Conditioners and Heat Pumps	.....	Table ((C403.2.3) C403.3.2(3))
((340/360—2007 with Addendum 2) 340/360—2015	Commercial and Industrial Unitary Air-conditioning and Heat Pump Equipment	.....	Table ((C403.2.3) C403.3.2(1), Table ((C403.2.3) C403.3.2(2))
((365—09) 365—2009	Commercial and Industrial Unitary Air-conditioning Condensing Units	.....	Table ((C403.2.3) C403.3.2(1), Table ((C403.2.3) C403.3.2(6))
((390—03) 390—2015	Performance Rating of Single Package Vertical Air Conditioners and Heat Pumps	.....	Table ((C403.2.3) C403.3.2(3))
((400—01) 400—2015	Liquid to Liquid Heat Exchangers with Addendum 2	.....	Table ((C403.2.3) C403.3.2(9))
440—08	Room Fan Coil	.....	C403.2.8
460—05	Performance Rating Remote Mechanical Draft Air-cooled Refrigerant Condensers	.....	Table ((C403.2.3) C403.3.2(8))
((550/590—2011 with Addendum 1) 550/590—2015	Water Chilling Packages Using the Vapor Compression Cycle—with Addenda	.....	C403.2.3.1, Table C403.2.3(7), Table C406.2(6)
560—00	Absorption Water Chilling and Water-heating Packages	.....	Table C403.2.3(7)
920—2015	Performance Rating of DX-Dedicated Outdoor Air System Units	.....	C202, Table C403.3.2(11), Table C403.3.2(12)
((1160—08) 1160—2014	Performance Rating of Heat Pump Pool Heaters	.....	Table C404.2

((1200-2010)) <u>1200—2013</u>	Performance Rating of Commercial Refrigerated Display Merchandisers and Storage Cabinets	.....	C410.1, Table C410.1(1), Table C410.1(2)
AMCA	Air Movement and Control Association International 30 West University Drive Arlington Heights, IL 60004-1806		
Standard reference number	Title		Referenced in code section number
205—12	Energy Efficiency Classification for Fans	.....	((C403.2.11.3)) <u>C403.8.3</u>
220—8 (2012)	Laboratory Methods for Testing Air Curtain Units for Aerodynamic Performance Rating	.....	C402.5.7
500D—12	Laboratory Methods for Testing Dampers for Rating	.....	C402.4.5.1, C402.4.5.2
ANSI	American National Standards Institute 25 West 43rd Street Fourth Floor New York, NY 10036		
Standard reference number	Title		Referenced in code section number
ANSI/ASME A17.1—2010	Safety code for elevators and escalators	.....	C405.12.1
Z21.10.3/CSA 4.3—11	Gas Water Heaters, Volume III—Storage Water Heaters with Input Ratings Above 75,000 Btu per Hour, Circulating Tank and Instantaneous	.....	Table C404.2
Z21.47/CSA 2.3—12	Gas-fired Central Furnaces	.....	Table ((C403.2.3)) <u>C403.3.2(4)</u>
Z83.8/CSA 2.6—09	Gas Unit Heaters, Gas Packaged Heaters, Gas Utility Heaters and Gas-fired Duct Furnaces	.....	Table ((C403.2.3)) <u>C403.3.2(4)</u>
APSP	The Association of Pool and Spa Professionals 2111 Eisenhower Avenue Alexandria, VA 22314		
Standard reference number	Title		Referenced in code section number
((14-14)) <u>14—2014</u>	American National Standards for Portable Electric Spa Efficiency	.....	C404.12
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. 1791 Tullie Circle, N.E. Atlanta, GA 30329-2305		
Standard reference number	Title		Referenced in code section number
ANSI/ASHRAE/ACCA Standard 127-2007	Method of Testing for Rating Computer and Data Processing Room Unitary Air Conditioners	.....	Table ((C403.2.3)) <u>C403.3.2(9)</u>

Standard 183—2007	Peak Cooling and Heating Load Calculations in Buildings, Except Low-rise Residential Buildings	.....	((C403.2.1)) C403.1.2
((ASHRAE—2012)) ASHRAE—2016	ASHRAE HVAC Systems and Equipment Handbook— ((2012)) 2016	.....	((C403.2.1)) C403.1.2
ISO/AHRI/ASHRAE 13256-1 (2011)	Water-source Heat Pumps—Testing and Rating for Performance— Part 1: Water-to-air and Brine-to-air Heat Pumps	.....	Table ((C403.2.3)) C403.3.2(2)
ISO/AHRI/ASHRAE 13256-2 (2011)	Water-source Heat Pumps—Testing and Rating for Performance—Part 2: Water-to-water and Brine-to-water Heat Pumps	.....	Table ((C403.2.3)) C403.3.2(2)
90.1— ((2013)) 2016	Energy Standard for Buildings Except Low-rise Residential Buildings (ANSI/ASHRAE/IESNA 90.1—2010)	.....	Table C402.1.3, Table C402.1.4, C406.2 ((Table C407.6.1))
((140—2011	Standard Method of Test for the Evaluation of Building Energy Analysis Computer Programs	.....	C407.6.1))
90.4—2016	Energy Standard for Data Centers	.....	C403.1.3
146—2011	Testing and Rating Pool Heaters	.....	Table C404.2
ASME	American Society of Mechanical Engineers Two Park Avenue New York, NY 10016-5990		
Standard reference number	Title		Referenced in code section number
ASME A17.1/CSA ((B44-2013)) B44—2016	Safety Code for Elevators and Escalators	.....	C405.9.2
ASTM	ASTM International 100 Barr Harbor Drive West Conshohocken, PA 19428-2859		
Standard reference number	Title		Referenced in code section number
C ((90—13)) 90—14	Specification for Load-bearing Concrete Masonry Units	.....	Table C402.1.3
C1363—11	Standard Test Method for Thermal Performance of Building Materials and Envelope Assemblies by Means of a Hot Box Apparatus	.....	C303.1.4.1, Table C402.1.4
C ((1371—04a(2010)e1)) 1371—15	Standard Test Method for Determination of Emittance of Materials Near Room Temperature Using Portable Emissometers	.....	Table C402.4
C 1549—09	Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using A Portable Solar Reflectometer	.....	Table C402.4
D ((4003—11e1)) 1003—13	Standard Test Method for Haze and Luminous Transmittance of Transparent Plastics	.....	C402.4.2.2

E 283—04(2012)	Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Differences Across the Specimen	.....	C402.5.1.2.2
E ((408—71 (2008)) 408—13	Test Methods for Total Normal Emittance of Surfaces Using Inspection-meter Techniques	.....	Table C402.4
E 779—10	Standard Test Method for Determining Air Leakage Rate by Fan Pressurization	.....	C402.5.1.2.3
E ((903—96)) 903—12	Standard Test Method Solar Absorptance, Reflectance and Transmittance of Materials Using Integrating Spheres (Withdrawn 2005)	.....	Table C402.4
E 1677—11	Standard Specification for an Air-retarder (AR) Material or System for Low-rise Framed Building Walls	.....	C402.5.1.2.2
E 1918—06 (2015)	Standard Test Method for Measuring Solar Reflectance of Horizontal or Low-sloped Surfaces in the Field	.....	Table C402.4
E 1980—11	Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-sloped Opaque Surfaces	.....	Table C402.2.1.1
E 2178—13	Standard Test Method for Air Permanence of Building Materials	.....	C402.4
E 2357—11	Standard Test Method for Determining Air Leakage of Air Barrier Assemblies	.....	C402.5.1.2.2
CSA	Canadian Standards Association 5060 Spectrum Way Mississauga, Ontario, Canada L4W 5N6		
Standard reference number	Title		Referenced in code section number
AAMA/WDMA/CSA 101/I.S.2/A440—11	North American Fenestration Standard/Specification for Windows, Doors and Unit Skylights	.....	Table C402.4.2
CTI	Cooling Technology Institute 2611 FM 1960 West, Suite A-101 Houston, TX 77068		
Standard reference number	Title		Referenced in code section number
ATC 105 (00)	Acceptance Test Code for Water Cooling Tower	.....	Table ((C403.2.3) C403.3.2(8))
ATC 105S—11	Acceptance Test Code for Closed Circuit Cooling Towers	.....	Table ((C403.2.3) C403.3.2(8))
ATC 106—11	Acceptance Test Code for Mechanical Draft Evaporative Vapor Condensers	.....	Table ((C403.2.3) C403.3.2(8))
STD 201—11	Standard for Certification of Water Cooling Towers Thermal Performances	.....	Table ((C403.2.3) C403.3.2(8))
DASMA	Door and Access Systems Manufacturers Association 1300 Sumner Avenue Cleveland, OH 44115-2851		

Standard reference number	Title	Referenced in code section number
105—92 (R2004)—13	Test Method for Thermal Transmittance and Air Infiltration of Garage Doors	Table C402.4.2
DOE	U.S. Department of Energy c/o Superintendent of Documents U.S. Government Printing Office Washington, D.C. 20402-9325	
Standard reference number	Title	Referenced in code section number
10 C.F.R., Part 430— ((1998)) <u>2015</u>	Energy Conservation Program for Consumer Products: Test Procedures and Certification and Enforcement Requirement for Plumbing Products; and Certification and Enforcement Requirements for Residential Appliances; Final Rule	Table ((C403.2.3)) <u>C403.3.2(4)</u> , Table ((C403.2.3)) <u>C403.3.2(5)</u> , Table C404.2
10 C.F.R., Part 430, Subpart B, Appendix N— ((1998)) <u>2015</u>	Uniform Test Method for Measuring the Energy Consumption of Furnaces and Boilers	C202
10 C.F.R., Part 431— ((2004)) <u>2015</u>	Energy Efficiency Program for Certain Commercial and Industrial Equipment: Test Procedures and Efficiency Standards; Final Rules	Table ((C403.2.3)) <u>C403.3.2(5)</u> , Table C406.2(5)
NAECA 87—(88)	National Appliance Energy Conservation Act 1987 [(Public Law 100-12 (with Amendments of 1988-P.L. 100-357)]	Tables ((C403.2.3)) <u>C403.3.2 (1), (2), (4)</u>
IAPMO	International Association of Plumbing and Mechanical Officials 4755 E. Philadelphia Street Ontario, CA 91761	
Standard reference number	Title	Referenced in code section number
UPC—2015	Uniform Plumbing Code	C201.3, C501.4
ICC	International Code Council, Inc. 500 New Jersey Avenue, N.W., 6th Floor Washington, D.C. 20001	
Standard reference number	Title	Referenced in code section number
IBC—15	International Building Code	C201.3, C303.2, C402.4.3
IFC—15	International Fire Code	C201.3, C501.4
IFGC—15	International Fuel Gas Code	C201.3, C501.4

IMC—15	International Mechanical Code	.....	C106.3, C201.3, C402.5.3, ((C403.2.4.3, C403.2.6, C403.2.6.2, C403.2.6.4, C403.2.6.4.1, C403.2.8.2, C403.2.8.3, C403.2.8.3.1, C403.2.8.3.2, C403.2.11.4, C403.2.11.5, C403.4.4, C403.4.4.3, C403.5.1)) <u>C403.2.2.1, C403.2.2.2, C403.3.5, C403.3.5.1, C403.6.1, C403.6.5, C403.6.10, C403.7.1, C403.7.2, C403.7.5, C403.7.5.1, C403.7.6, C403.7.7.3, C403.7.8.1, C403.7.8.4, C403.8.4, C403.8.5.1, Table C403.10.1, C403.10.1.2, Table C403.10.1.2, C403.10.2.2, C403.12, C406.6, C408.2.2.1, C501.4</u>
IEEE	The Institute of Electrical and Electronic Engineers, Inc. 3 Park Avenue New York, NY 10016		
Standard reference number	Title		Referenced in code section number
IEEE 515.1—2012	IEEE Standard for the Testing, Design, Installation and Maintenance of Electrical Resistance Trace Heating for Commercial Applications	.....	C404.6.2
IESNA	Illuminating Engineering Society of North America 120 Wall Street, 17th Floor New York, NY 10005-4001		
Standard reference number	Title		Referenced in code section number
ANSI/ASHRAE/IESNA 90.1—2013	Energy Standard for Buildings Except Low-rise Residential Buildings	.....	Table C402.1.3, Table C402.1.4, Table C407.5.1
ISO	International Organization for Standardization 1, rue de Varembe, Case postale 56, CH-1211 Geneva, Switzerland		
Standard reference number	Title		Referenced in code section number
ISO/AHRI/ASHRAE 13256-1 (2011)	Water-source Heat Pumps—Testing and Rating for Performance—Part 1: Water-to-air and Brine-to-air Heat Pumps	.....	((C403.2.3)) <u>C403.3.2(2)</u>
ISO/AHRI/ASHRAE 13256-2 (2011)	Water-Source Heat Pumps—Testing and Rating for Performance—Part 2: Water-to-water and Brine-to-water Heat Pumps	.....	((C403.2.3)) <u>C403.3.2(2)</u>

NEMA		
National Electric Manufacturers Association 1300 North 17th Street Suite 1752 Rosslyn, VA 22209		
Standard reference number	Title	Referenced in code section number
TP-1-2002	Guide for Determining Energy Efficiency for Distribution Transformers	C405.9
MGI—((1993)) <u>2014</u>	Motors and Generators	C202
NFRC		
National Fenestration Rating Council, Inc. 6305 Ivy Lane, Suite 140 Greenbelt, MD 20770		
Standard reference number	Title	Referenced in code section number
100—((2009)) <u>2017</u>	Procedure for Determining Fenestration Product U-factors	C303.1.2, C402.2.2
200—((2009)) <u>2017</u>	Procedure for Determining Fenestration Product Solar Heat Gain Coefficients and Visible Transmittance at Normal Incidence	C303.1.3, C402.4.1.1
<u>202—2017</u>	<u>Procedure for Determining Fenestration Product Visible Transmittance at Normal Incidence</u>	<u>C202</u>
<u>NFRC 203—2017</u>	<u>Procedure for Determining Visible Transmittance of Tubular Daylighting Devices</u>	<u>C202, C402.4.2</u>
400—((2009)) <u>2017</u>	Procedure for Determining Fenestration Product Air Leakage	Table C402.4.2
SMACNA		
Sheet Metal and Air Conditioning Contractors National Association, Inc. 4021 Lafayette Center Drive Chantilly, VA 20151-1209		
Standard reference number	Title	Referenced in code section number
SMACNA—2012	HVAC Air Duct Leakage Test Manual	((C403.2.8.1.3)) <u>C403.10.2.3</u>
UL		
Underwriters Laboratories 333 Pfingsten Road Northbrook, IL 60062-2096		
Standard reference number	Title	Referenced in code section number
710—12	Exhaust Hoods for Commercial Cooking Equipment	C403.2.8
727—06	Oil-fired Central Furnaces—with Revisions through April 2010	Table ((C403.2.3)) <u>C403.3.2(4)</u>
731—95	Oil-fired Unit Heaters—with Revisions through April 2010	Table ((C403.2.3)) <u>C403.3.2(4)</u>
US-FTC		
United States-Federal Trade Commission 600 Pennsylvania Avenue N.W. Washington, D.C. 20580		

Standard reference number	Title	Referenced in code section number
C.F.R. Title 16 (((May 31, 2005)) 2015)	R-value Rule	C303.1.4
WDMA	Window and Door Manufacturers Association 1400 East Touhy Avenue, Suite 470 Des Plaines, IL 60018	
Standard reference number	Title	Referenced in code section number
AAMA/WDMA/CSA 101/I.S.2/A440—((H)) 17	North American Fenestration Standard/Specification for Windows, Doors and Unit Skylights	Table C402.4.2

Reviser's note: The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency and appear in the Register pursuant to the requirements of RCW 34.08.040.

AMENDATORY SECTION (Amending WSR 16-03-072, filed 1/19/16, effective 7/1/16)

WAC 51-11C-80500 Appendix D—((Renewable energy)) Calculation of HVAC total system performance ratio.

~~((AE101.1 On-site renewable energy systems. Each new commercial building or addition larger than 5,000 square feet of gross conditioned floor area shall include a renewable energy generation system consisting of at least 70 watts rated peak photovoltaic energy production, or 240 kBtu of annual solar water heating energy production, per 1,000 square feet of conditioned floor area or fraction thereof. For buildings over 5 stories in height, the conditioned area for this calculation shall be based on the conditioned area of the largest 5 above-grade stories in the building. If the on-site renewable energy option in C406 is selected, this energy shall be in addition to that required by C406.~~

EXCEPTION: Alternate means of achieving equivalent energy savings are permissible where approved by the code official, if the calculated net annual energy savings equals or exceeds the calculated annual energy production of the required on-site renewable energy system.))

D101 Scope. This appendix establishes criteria for demonstrating compliance using the *HVAC total system performance ratio (HVAC TSPR)* for systems serving office, retail, library and education occupancies and buildings, which are subject to the requirements of Section C403.3.5 without exceptions. Those HVAC systems shall comply with Section C403 and this appendix as required by Section C403.1.1.

D201 Compliance. Compliance based on *HVAC total system performance ratio* requires that the provisions of Section C403.3 are met and the *HVAC total system performance ratio* of the *proposed design* is more than or equal to the *HVAC total system performance ratio* of the *standard reference design*. The *HVAC TSPR* is calculated according to the following formula:

$$\text{HVAC TSPR} = \frac{\text{annual heating and cooling load/annual carbon emissions from energy consumption of the building HVAC systems}}$$

Where:

Annual carbon emissions from energy consumption of the building HVAC systems = sum of the annual carbon emissions in pounds for heating, cooling, fans, energy recovery, pumps, and heat rejection calculated by multiplying site energy consumption by the carbon emission factors from Table C407.1

Annual heating and cooling load = sum of the annual heating and cooling loads met by the building HVAC system in thousands of Btus.

Table C407.1 (Reprinted from Chapter 4) Carbon Emissions Factors

Type	CO2e (lb/unit)	Unit
Electricity	0.70	kWh
Natural gas	11.70	Therm
Oil	19.2	Gallon
Propane	10.5	Gallon
Other ^a	195.00	mmBtu
On-site renewable energy	0.00	

^a District energy systems may use alternative emissions factors supported by calculations approved by the *code official*.

D300 Simulation program.

D301 General.

D302 Calculation of the HVAC TSPR for the Standard Reference Design. The simulation program shall calculate

the HVAC TSPR based only on the input for the *proposed design* and the requirements of this appendix. The calculation procedure shall not allow the user to directly modify the building component characteristics of the *standard reference design*.

D303 Specific approval. Performance analysis tools meeting the applicable subsections of Appendix D and tested according to ASHRAE Standard 140 shall be permitted to be *approved*. Tools are permitted to be *approved* based on meeting a specified threshold for a jurisdiction. The *code official* shall be permitted to approve tools for a specified application or limited scope.

D400 Climatic data. The simulation program shall perform the simulation using hourly values of climatic data, such as temperature and humidity, using TMY3 data for the site as specified here: <https://buildingenergyscore.energy.gov/resources>

D500 Documentation. Documentation conforming to the provisions of this section shall be provided to the *code official*.

D501 Compliance report. Building permit submittals shall include:

1. A report produced by the simulation software that includes the following:

1.1 Address of the building.

1.2 Name of individual completing the compliance report.

1.3 Name and version of the compliance software tool.

1.4 The dimensions, floor heights and number of floors for each *block*.

1.5 By *block*, the *U*-factor, *C*-factor, or *F*-factor for each simulated opaque envelope component and the *U*-factor and SHGC for each fenestration component.

1.6 By *block* or by surface for each *block*, the fenestration area.

1.7 By *block*, a list of the HVAC equipment simulated in the proposed design including the equipment type, fuel type, equipment efficiencies and system controls.

1.8 The *HVAC total system performance ratio* for both the *standard reference design* and the *proposed design*.

2. A mapping of the actual building HVAC component characteristics and those simulated in the *proposed design* showing how individual pieces of HVAC equipment identified above have been combined into average inputs as required by Section D601.11 including:

2.1 Fans.

2.2 Hydronic pumps.

2.3 Air handlers.

2.4 Packaged cooling equipment.

2.5 Furnaces.

2.6 Heat pumps.

2.7 Boilers.

2.8 Chillers.

2.9 Cooling towers.

2.10 Electric resistance coils.

2.11 Condensing units.

2.12 Motors for fans and pumps.

2.13 Energy recovery devices.

For each piece of equipment identified above, include the following as applicable:

2.14 Equipment name or tag consistent with that found on the design documents.

2.15 Efficiency level.

2.16 Capacity.

2.17 Input power for fans and pumps.

3. Floor plan of the building identifying how portions of the building are assigned to the simulated *blocks* and areas of the building that are not covered under the requirements of Section C403.1.1.

D600 Calculation procedure. Except as specified by this appendix, the *standard reference design* and *proposed design* shall be configured and analyzed using identical methods and techniques.

D601 Simulation of the proposed building design. The *proposed design* shall be configured and analyzed as specified in this section.

D601.1 Utility rates. For the purpose of calculating the *HVAC TSPR* the following simple utility rate determined by the Washington state department of commerce shall be used:

\$0.112/kWh of electricity.

\$1.158/therm of fossil fuel.

D601.2 Block geometry. The geometry of buildings shall be configured using one or more *blocks*. Each *block* shall define attributes including *block* dimensions, number of floors, floor to floor height and floor to ceiling height. Simulation software may allow the use of simplified shapes (such as rectangle, L shape, H shape, U shape or T shape) to represent *blocks*. Where actual building shape does not match these predefined shapes, simplifications are permitted providing the following requirements are met:

1. The conditioned floor area and volume of each *block* shall match the *proposed design* within 10 percent.

2. The area of each exterior envelope component from Table C402.1.4 is accounted for within 10 percent of the actual design.

3. The area of vertical fenestration and skylights is accounted for within 10 percent of the actual design.

4. The orientation of each component in 2 and 3 above is accounted for within 45 degrees of the actual design.

The creation of additional *blocks* may be necessary to meet these requirements.

EXCEPTION: Portions of the building that are unconditioned or served by systems not covered by the requirements of Section C403.1.1 shall be omitted.

D601.2.1 Number of blocks. One or more *blocks* may be required per building based on the following restrictions:

1. Each *block* can have only one occupancy type (office, library, education or retail). Therefore, at least one single *block* shall be created for each unique use type.

2. Each *block* can be served by only one type of HVAC system. Therefore, a single *block* shall be created for each unique HVAC system and use type combination. Multiple HVAC units of the same type may be represented in one *block*. Table D601.10.2 provides directions for combining multiple HVAC units or components of the same type into a single *block*.

3. Each *block* can have a single definition of floor to floor or floor to ceiling heights. Where floor heights differ by more than 2 feet, unique *blocks* should be created for the floors with varying heights.

4. Each *block* can include either above grade or below grade floors. For buildings with both above grade and below grade floors, separate *blocks* should be created for each. For buildings with floors partially above grade and partially below grade, if the total wall area of the floor(s) in consideration is greater than or equal to 50 percent above grade, then it should be simulated as a completely above grade *block*, otherwise it should be simulated as a below grade *block*.

5. Each wall on a façade of a *block* shall have similar vertical fenestration. The product of the *proposed design U-factor* times the area of windows (UA) on each façade of a given floor cannot differ by more than 15 percent of the average UA for that façade in each *block*. The product of the *proposed design SHGC* times the area of windows (USHGC) on each façade of a given floor cannot differ by more than 15 percent of the average USHGC for that façade in each *block*. If either of these conditions are not met, additional *blocks* shall be created consisting of floors with similar fenestration.

6. For a building model with multiple *blocks*, the *blocks* should be configured together to have the same adjacencies as the actual building design.

D601.3 Thermal zoning. Each floor in a *block* shall be modeled as a single thermal zone or as five thermal zones consisting of four perimeter zones and a core zone. Below grade floors shall be modeled as a single thermal *block*. If any façade in the *block* is less than 45 feet in length, there shall only be a single thermal zone per floor. Otherwise each floor shall be modeled with 5 thermal zones. A perimeter zone shall be created extending from each façade to a depth of 15 feet. Where facades intersect, the zone boundary shall be formed by a 45 degree angle with the 2 facades. The remaining area or each floor shall be modeled as a core zone with no exterior walls.

D601.4 Occupancy.

D601.4.1 Occupancy type. The occupancy type for each *block* shall be consistent with the building area type as determined in accordance with Section C405.4.2.1. Portions of the building that are building area types other than office, school (education), library, or retail shall not be included in the simulation.

D601.4.2 Occupancy schedule, density, and heat gain. The occupant density, heat gain, and schedule shall be for office, retail, library, or school as specified by ASHRAE Standard 90.1 Normative Appendix C.

D601.5 Envelope components.

D601.5.1 Roofs. Roofs will be modeled with insulation above a steel roof deck. The roof *U-factor* and area shall be modeled as in the *proposed design*. If different roof thermal properties are present in a single *block*, an area weighted *U-factor* shall be used. Roof solar absorbance shall be modeled at 0.70 and emittance at 0.90.

D601.5.2 Above grade walls. Walls will be modeled as steel frame construction. The *U-factor* and area of above grade walls shall be modeled as in the *proposed design*. If different wall constructions exist on the façade of a *block* an area-weighted *U-factor* shall be used.

D601.5.3 Below grade walls. The *C-factor* and area of below grade walls shall be modeled as in the *proposed design*. If different slab on grade floor constructions exist in a *block*, an area-weighted *C-factor* shall be used.

D601.5.4 Above grade exterior floors. Exterior floors shall be modeled as steel frame. The *U-factor* and area of floors shall be modeled as in the *proposed design*. If different wall constructions exist in the *block* an area-weighted *U-factor* shall be used.

D601.5.5 Slab on grade floors. The *F-factor* and area of slab on grade floors shall be modeled as in the *proposed design*. If different below grade wall constructions exist in a *block*, an area-weighted *F-factor* shall be used.

D601.5.6 Vertical fenestration. The window area and area weighted *U-factor* and SHGC shall be modeled for each façade based on the *proposed design*. Each exterior surface in a *block* must comply with Section D601.2.1 item 5. Windows will be combined in to a single window centered on each façade based on the area and sill height input by the user.

D601.5.7 Skylights. The skylight area and area weighted *U-factor* and SHGC shall be modeled for each floor based the *proposed design*. Skylights will be combined in to a single skylight centered on the roof of each zone based on the area and sill height input by the user.

D601.6 Lighting. Interior lighting power density shall be equal to the allowance in Table C405.4.2(1) for office, retail, library, or school. The lighting schedule shall be for office, retail, library, or school as specified by ASHRAE Standard 90.1 Normative Appendix C. The impact of lighting controls is assumed to be captured by the lighting schedule and no explicit controls shall be modeled. Exterior lighting shall not be modeled.

D601.7 Miscellaneous equipment. The miscellaneous equipment schedule and power shall be for office, retail, library, or school as specified by ASHRAE Standard 90.1 Normative Appendix C. The impact of miscellaneous equipment controls is assumed to be captured by the equipment schedule and no explicit controls shall be modeled.

D601.8 Elevators. Elevators shall not be modeled.

D601.9 Service water heating equipment. Service water heating shall not be modeled.

D601.10 On-site renewable energy systems. On-site renewable energy systems shall not be modeled.

D601.11 HVAC equipment. HVAC systems shall meet the requirements of Section C403.

D601.11.1 Supported HVAC systems. At a minimum, the HVAC systems shown in Table D601.11.1 shall be supported by the simulation program.

Table D601.11.1
Proposed Building HVAC Systems Supported by HVAC
TSPR Simulation Software

<u>System No.</u>	<u>System Name</u>	<u>System Abbreviation</u>
<u>1</u>	<u>Packaged Terminal Air Conditioner</u>	<u>PTAC</u>
<u>2</u>	<u>Packaged Terminal Air Heat Pump</u>	<u>PTHP</u>
<u>3</u>	<u>Packaged Single Zone Gas Furnace</u>	<u>PSZGF</u>
<u>4</u>	<u>Packaged Single Zone Heat Pump (air to air only)</u>	<u>PSZHP</u>
<u>5</u>	<u>Variable Refrigerant Flow (air cooled only)</u>	<u>VRF</u>
<u>6</u>	<u>Four Pipe Fan Coil</u>	<u>FPFC</u>
<u>7</u>	<u>Water Source Heat Pump</u>	<u>WSHP</u>
<u>8</u>	<u>Ground Source Heat Pump</u>	<u>GSHP</u>
<u>9</u>	<u>Packaged Variable Air Volume (dx cooling)</u>	<u>PVAV</u>
<u>10</u>	<u>Variable Air Volume (hydronic cooling)</u>	<u>VAV</u>

<u>System No.</u>	<u>System Name</u>	<u>System Abbreviation</u>
<u>11</u>	<u>Variable Air Volume with Fan Powered Terminal Units</u>	<u>VAVFPTU</u>
<u>12</u>	<u>Dedicated Outdoor Air System (in conjunction with systems 1-8)</u>	<u>DOAS</u>

D601.11.2 Proposed building HVAC system simulation. The HVAC systems shall be modeled as in the *proposed design* with clarifications and simplifications as described in Table D601.11.2. System parameters not described in the following sections shall be simulated to meet the minimum requirements of Section C403. All zones within a *block* shall be served by the same HVAC system type as described in Section D601.2.1 item 2. Where multiple system components serve a block, average values weighed by the appropriate metric as described in this section shall be used. Heat loss from ducts and pipes shall not be modeled.

EXCEPTION: Where the building permit applies to only a portion of an HVAC system and remaining components will be designed under a future building permit, the future components shall be modeled to meet, but not exceed, the requirements of Section C403.

Table D601.11.2
Proposed Building System Parameters

<u>Category</u>	<u>Parameter</u>	<u>Fixed or User Defined</u>	<u>Required</u>	<u>Applicable Systems</u>
<u>HVAC System Type</u>	<u>System Type</u>	<u>User Defined</u>	<u>Selected from Table D601.11.1</u>	<u>All</u>
<u>System Sizing</u>	<u>Design Day Information</u>	<u>Fixed</u>	<u>99.6 percent heating design and 1 percent dry-bulb and 1 percent wet-bulb cooling design</u>	<u>All</u>
	<u>Zone Coil Capacity</u>	<u>Fixed</u>	<u>Sizing factors used are 1.25 for heating equipment and 1.15 for cooling equipment</u>	<u>All</u>
	<u>Supply Airflow</u>	<u>Fixed</u>	<u>Based on a supply-air-to-room-air temperature set-point difference of 20°F</u>	<u>1-11</u>
<u>Fixed</u>		<u>Equal to required outdoor air ventilation</u>	<u>12</u>	
<u>Outdoor Ventilation Air</u>	<u>Outdoor Ventilation Air Flow Rate</u>	<u>Fixed</u>	<u>As specified in ASHRAE Standard 90.1 Normative Appendix C, adjusted for proposed DCV control</u>	<u>All</u>
<u>System Operation</u>	<u>Space Temperature Setpoints</u>	<u>Fixed</u>	<u>As specified in ASHRAE Standard 90.1 Normative Appendix C</u>	<u>1-11</u>
	<u>Fan Operation - Occupied</u>	<u>User Defined</u>	<u>Runs continuously during occupied hours or cycled to meet load</u>	<u>1-11</u>
	<u>Fan Operation - Occupied</u>	<u>Fixed</u>	<u>Fan runs continuously during occupied hours</u>	<u>12</u>
	<u>Fan Operation - Night Cycle</u>	<u>Fixed</u>	<u>Fan cycles on to meet setback temperatures</u>	<u>1-11</u>

<u>Category</u>	<u>Parameter</u>	<u>Fixed or User Defined</u>	<u>Required</u>	<u>Applicable Systems</u>
<u>Packaged Equipment Efficiency</u>	<u>DX Cooling Efficiency</u>	<u>User Defined</u>	<u>Cooling COP without fan energy calculated in accordance with ASHRAE Standard 90.1 Section 11.5.2c.^b</u>	<u>1, 2, 3, 4, 5, 7, 8, 9, 11, 12</u>
	<u>Heat Pump Efficiency</u>	<u>User Defined</u>	<u>Heating COP without fan energy calculated in accordance with ASHRAE Standard 90.1 Section 11.5.2c.^c</u>	<u>2, 4, 5, 7, 8</u>
	<u>Furnace Efficiency</u>	<u>User Defined</u>	<u>Furnace thermal efficiency^e</u>	<u>3, 11</u>
<u>Heat Pump Supplemental Heat</u>	<u>Control</u>	<u>Fixed</u>	<u>Supplemental electric heat locked out above 40°F. Runs in conjunction with compressor between 40°F and 0°F.</u>	<u>2, 4</u>
<u>System Fan Power</u>	<u>Design Fan Power (W/cfm)</u>	<u>User Defined</u>	<u>Input electric power for all fans is required to operate at <i>fan system design conditions</i> divided by the supply airflow rate</u>	<u>All</u>
	<u>Single Zone System Fan Power During Deadband (W/cfm)</u>	<u>User Defined</u>	<u>W/cfm during deadband for VAV or multispeed single zone fans</u>	<u>3, 4, 5, 6, 7, 8</u>
<u>Variable Air Volume Systems</u>	<u>Part Load Fan Controls</u>	<u>User Defined</u>	<u>VFD included. User specifies presence of static pressure reset</u>	<u>9, 10, 11</u>
	<u>Supply Air Temperature Controls</u>	<u>User Defined</u>	<u>If not SAT reset constant at 55°F. SAT reset results in 60°F SAT during low load conditions</u>	<u>9, 10, 11</u>
	<u>Minimum Terminal Unit Airflow Percentage</u>	<u>User Defined</u>	<u>Average minimum terminal unit airflow percentage for <i>block</i> weighted by cfm</u>	<u>9, 10, 11</u>
	<u>Terminal Unit Heating Source</u>	<u>User Defined</u>	<u>Electric or hydronic</u>	<u>9, 10, 11</u>
	<u>Fan Powered Terminal Unit (FPTU) Type</u>	<u>User Defined</u>	<u>Series or parallel FPTU</u>	<u>11</u>
	<u>Parallel FPTU Fan</u>	<u>Fixed</u>	<u>Sized for 50 percent peak primary air at 0.35 W/cfm</u>	<u>11</u>
	<u>Series FPTU Fan</u>	<u>Fixed</u>	<u>Sized for 50 percent peak primary air at 0.35 W/cfm</u>	<u>11</u>
<u>Economizer</u>	<u>Economizer Presence</u>	<u>User Defined</u>	<u>Yes or No</u>	<u>3, 4, 9, 10, 11</u>
	<u>Economizer High Limit</u>	<u>Fixed</u>	<u>75°F fixed dry-bulb</u>	<u>3, 4, 9, 10, 11</u>

Category	Parameter	Fixed or User Defined	Required	Applicable Systems
<u>Energy Recovery</u>	<u>Sensible Effectiveness</u>	<u>User Defined</u>	<u>Heat exchanger sensible effectiveness at design heating and cooling conditions</u>	<u>3, 4, 9, 10, 11, 12</u>
	<u>Latent Effectiveness</u>	<u>User Defined</u>	<u>Heat exchanger latent effectiveness at design heating and cooling conditions</u>	<u>3, 4, 9, 10, 11, 12</u>
	<u>Economizer Bypass</u>	<u>User Defined</u>	<u>If ERV is bypassed during economizer conditions</u>	<u>3, 4, 9, 10, 11, 12</u>
	<u>Energy Recovery Temp Control</u>	<u>User Defined</u>	<u>If bypass, target supply air temperature</u>	<u>3, 4, 9, 10, 11, 12</u>
	<u>Fan Power Reduction during Bypass (W/cfm)</u>	<u>User Defined</u>	<u>If ERV system include bypass, static pressure setpoint and variable speed fan, fan power can be reduced during economizer conditions</u>	<u>3, 4, 9, 10, 11, 12</u>
<u>Demand Controlled Ventilation</u>	<u>DCV Application</u>	<u>User Defined</u>	<u>Percent of block floor area under DCV control</u>	<u>3, 4, 9, 10, 11, 12</u>
<u>DOAS</u>	<u>DOAS Fan Power W/cfm</u>	<u>User Defined</u>	<u>Fan input power in W/cfm of supply airflow^a</u>	<u>12</u>
	<u>DOAS Supplemental Heating and Cooling</u>	<u>User Defined</u>	<u>Heating source, cooling source</u>	<u>12</u>
	<u>DOAS Supply Air Temperature Control</u>	<u>User Defined</u>	<u>SAT setpoint if DOAS includes supplemental heating or cooling and active temperature controls</u>	<u>12</u>
<u>Heating Plant</u>	<u>Boiler Efficiency^d</u>	<u>User Defined</u>	<u>Boiler thermal efficiency</u>	<u>1, 6, 7, 9, 10, 11, 12</u>
	<u>Heating Water Pump Power (W/gpm)</u>	<u>User Defined</u>	<u>Pump input W/gpm heating water flow</u>	<u>1, 6, 7, 9, 10, 11, 12</u>
	<u>Heating Water Loop Temperature</u>	<u>Fixed</u>	<u>180°F supply, 130°F return</u>	<u>1, 6, 9, 10, 11</u>
<u>Chilled Water Plant</u>	<u>Chiller Compressor Type</u>	<u>User Defined</u>	<u>Screw/scroll, centrifugal or reciprocating</u>	<u>6, 10, 11, 12</u>
	<u>Chiller Condenser Type</u>	<u>User Defined</u>	<u>Air cooled or water cooled</u>	<u>6, 10, 11, 12</u>
	<u>Chiller Full Load Efficiency^d</u>	<u>User Defined</u>	<u>Chiller COP</u>	<u>6, 10, 11, 12</u>
	<u>Chilled Water Loop Configuration</u>	<u>User Defined</u>	<u>Variable flow primary only, constant flow primary - variable flow secondary</u>	<u>6, 10, 11, 12</u>
	<u>Chilled Water Pump Power (W/gpm)</u>	<u>User Defined</u>	<u>Pump input W/gpm chilled water flow</u>	<u>6, 10, 11, 12</u>
	<u>Chilled Water Temperature Reset Included</u>	<u>User Defined</u>	<u>Yes/No</u>	<u>6, 10, 11, 12</u>
	<u>Chilled Water Temperature Reset Schedule (if included)</u>	<u>Fixed</u>	<u>Outdoor air reset: CHW supply temperature of 44°F at 80°F outdoor air dry-bulb and above, CHW supply temperature of 54°F at 60°F outdoor air dry-bulb temperature and below, ramped linearly between</u>	<u>6, 10, 11, 12</u>

<u>Category</u>	<u>Parameter</u>	<u>Fixed or User Defined</u>	<u>Required</u>	<u>Applicable Systems</u>
	<u>Condenser Water Pump Power (W/gpm)</u>	<u>User Defined</u>	<u>Pump input W/gpm condenser water flow</u>	<u>6, 7, 8, 9, 10, 11, 12</u>
	<u>Condenser Water Pump Control</u>	<u>User Defined</u>	<u>Constant speed or variable speed</u>	<u>6, 7, 10, 11, 12</u>
	<u>Cooling Tower Efficiency</u>	<u>User Defined</u>	<u>gpm/hp tower fan</u>	<u>6, 10, 11, 12</u>
<u>Cooling Tower</u>	<u>Cooling Tower Fan Control</u>	<u>User Defined</u>	<u>Constant or variable speed</u>	<u>6, 10, 11, 12</u>
	<u>Cooling Tower Approach and Range</u>	<u>User Defined</u>	<u>Design cooling tower approach and range temperature</u>	<u>6, 10, 11, 12</u>
<u>Heat Pump Loop Flow Control</u>	<u>Loop Flow and Heat Pump Control Valve</u>	<u>Fixed</u>	<u>Two position valve with VFD on pump. Loop flow at 3 gpm/ton</u>	<u>7, 8</u>
<u>Heat Pump Loop Temperature Control</u>		<u>Fixed</u>	<u>Set to maintain temperature between 50°F and 70°F</u>	<u>7</u>
<u>GLHP Well Field</u>		<u>Fixed</u>	<u>Bore depth = 250 feet Bore length 200 feet/ton for greater of cooling or heating load Bore spacing = 15 feet Bore diameter = 5 inches 3/4 inch Polyethylene pipe Ground and grout conductivity = 4.8 Btu-in/h-ft²-°F</u>	<u>8</u>

^a Where multiple fan systems serve a single *block*, fan power is based on weighted average using on supply air cfm.

^b Where multiple cooling systems serve a single *block*, COP is based on a weighted average using cooling capacity.

^c Where multiple heating systems serve a single *block*, thermal efficiency or heating COP is based on a weighted average using heating capacity.

^d Where multiple boilers or chillers serve a heating water or chilled water loop, efficiency is based on a weighted average for using heating or cooling capacity.

D602 Simulation of the standard reference design. The *standard reference design* shall be configured and analyzed as specified in this section.

D602.1 Utility rates. Same as proposed.

D602.2 Blocks. Same as proposed.

D602.3 Thermal zoning. Same as proposed.

D602.4 Occupancy type, schedule, density, and heat gain. Same as proposed.

D602.5 Envelope components. Same as proposed.

D602.6 Lighting. Same as proposed.

D602.7 Miscellaneous equipment. Same as proposed.

D602.8 Elevators. Not modeled. Same as proposed.

D602.9 Service water heating equipment. Not modeled. Same as proposed.

D602.10 On-site renewable energy systems. Not modeled. Same as proposed.

D602.11 HVAC equipment. The *standard reference design* HVAC equipment consists of separate space conditioning systems and dedicated outside air systems as described in Table D602.11 for the appropriate building occupancies.

Table D602.11
Standard Reference Design HVAC Systems

Parameter	Building Type			
	Large Office^a	Small Office and Libraries^a	Retail	School
System Type	Water-source Heat Pump	Packaged air-source Heat Pump	Packaged air-source Heat Pump	Packaged air-source Heat Pump
Fan Control ^b	Cycle on Load	Cycle on Load	Cycle on Load	Cycle on Load
Space Condition Fan Power (W/cfm)	0.528	0.528	0.522	0.528
Heating/Cooling Sizing Factor ^c	1.25/1.15	1.25/1.15	1.25/1.15	1.25/1.15
Supplemental Heating Availability	NA	<40°F	<40°F	<40°F
Modeled cooling COP (Net of Fan) ^d	4.46	3.83	4.25	3.83
Modeled heating COP (Net of Fan) ^d	4.61	3.81	3.57	3.81
Cooling Source	DX (Heat Pump)	DX (Heat Pump)	DX (Heat Pump)	DX (Heat Pump)
Heat Source	Heat Pump	Heat Pump	Heat Pump	Heat Pump
OSA Economizer ^e	No	No	Yes	Yes
Occupied Ventilation Source ^f	DOAS	DOAS	DOAS	DOAS
DOAS Fan Power (W/cfm of Outside Air)	0.819	0.819	0.730	0.742
DOAS Temperature Control ^{g,h}	Bypass	Wild	Bypass	Bypass
ERV Efficiency (Sensible Only)	70 percent	70 percent	70 percent	70 percent
WSHP Loop Heat Rejection	Cooling Tower ⁱ	NA	NA	NA
WSHP Loop Heat Source	Gas Boiler ^j	NA	NA	NA
WSHP Loop Temperature Control ^k	50°F to 70°F	NA	NA	NA
WSHP Circulation Pump W/gpm ^l	16	NA	NA	NA
WSHP Loop Pumping Control ^m	HP Valves & Pump VSD	NA	NA	NA

^a Offices less than 50,000 square feet use "Small Office" parameters; otherwise use "Large Office" parameters.

^b Space conditioning system shall cycle on to meet heating and cooling setpoint schedules as specified in ASHRAE Standard 90.1 Normative Appendix C. One space conditioning system is modeled in each zone. Conditioning system fan operation is not necessary for ventilation delivery.

^c The equipment capacities (i.e., system coil capacities) for the *standard reference design* building design shall be based on design day sizing runs and shall be oversized by 15 percent for cooling and 25 percent for heating.

^d COPs shown are direct heating or cooling performance and do not include fan energy use. See ASHRAE 90.1 Appendix G (G3.1.2.1) for separation of fan from COP in packaged

equipment for units where the efficiency rating includes fan energy (e.g., SEER, EER, HSPF, COP).

^e Economizer on space conditioning systems shall be simulated when outdoor air conditions allow free cooling. Economizer high limit shall be based on differential dry-bulb control. DOAS system continues to operate during economizer mode.

^f Airflow equal to the outside air ventilation requirements is supplied and exhausted through a separate DOAS system including a supply fan, exhaust fan and sensible only heat exchanger. No additional heating or cooling shall be provided by the DOAS. A single DOAS system will be provided for each *block*. The DOAS supply and return fans shall run

whenever the HVAC system is scheduled to operate in accordance with ASHRAE 90.1 Normative Appendix C.

^a "Wild" DOAS control indicates no active control of the supply air temperature leaving the DOAS system. Temperature will fluctuate based only on entering and leaving conditions and the effectiveness of ERV.

^b "Bypass" DOAS control includes modulating dampers to bypass ERV with the intent to maintain supply air temperature at a maximum of 60°F when outside air is below 75°F. Once outside air is above 75°F, bypass dampers will be fully closed.

ⁱ Includes a single axial fan cooling tower with variable speed fans at 40.2 gpm/hp, sized for an approach of 10°F and a range of 10°F.

^j Includes a single natural draft boiler with 80 percent E_t .

^k Loop boiler and heat rejection shall be controlled to maintain loop temperature entering heat pumps between 50°F and 70°F.

^l Pump motor input power shall be 16 W/gpm.

^m Loop flow shall be variable with variable speed drive pump and unit fluid flow shutoff at each heat pump when its compressor cycles off.

NEW SECTION

WAC 51-11C-90000 Appendix E—Renewable energy.

Informational Note: *The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.*

F101.1 On-site renewable energy systems. Each new commercial building or addition larger than 5,000 square feet of gross conditioned floor area shall include a renewable energy generation system consisting of at least 70 watts rated peak photovoltaic energy production, or 240 kBtu of annual solar water heating energy production, per 1,000 square feet of conditioned floor area or fraction thereof. For buildings over 5 stories in height, the conditioned area for this calculation shall be based on the conditioned area of the largest 5 above-grade stories in the building. If the on-site renewable energy option in C406 is selected, this energy shall be in addition to that required by C406.

EXCEPTION: Alternate means of achieving equivalent energy savings are permissible where approved by the code official, if the calculated net annual energy savings equals or exceeds the calculated annual energy production of the required on-site renewable energy system.

NEW SECTION

WAC 51-11C-90500 Appendix F—Outcome-based energy budget.

Informational Note: *The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.*

F101.1 General. This section is an outcome-based energy budget compliance requirement pursuant to RCW 19.27A.-160 to incrementally move toward achieving by 2031 a 70

percent reduction in annual net energy use compared with 2006 baseline. As an outcome-based energy budget, this requirement uses a building's actual energy use to determine compliance.

F101.2 Scope. Buildings permitted under this section shall document one year of net energy use below an energy budget within 3 years after occupancy and every 5 years thereafter. Buildings and sites shall also be designed with the ability to offset in the future all estimated energy needs through renewable energy generation with minimum 40 percent on-site, maximum 40 percent off-site, and maximum 20 percent through green power purchase. Buildings that exceed the energy budget by up to 20 percent shall offset the excess amount through a green power purchase agreement. Buildings that exceed the energy budget by more than 20 percent shall, using a posted performance bond or financial security, offset the excess amount over 20 percent by installing renewable energy or with an energy retrofit.

F101.3 Building permit submittal. Building designs shall establish on the Washington State Outcome-Based Energy Budget form (Figure F101.3):

1. The anticipated building energy use is lower than the energy budget.
2. The energy generation ability in the future is greater than or equal to the anticipated building energy use.

F101.3.1 Anticipated building energy use. The total yearly energy use from all metered fuel sources is the anticipated building energy use. Any energy used from district energy, combined heat and power, renewable energy, or captured waste heat systems must be metered. Buildings with any non-metered energy sources are not permitted for compliance with this section. All secondary spaces and services (examples: Exterior building and site lighting, surface parking, garages, and exterior swimming pools) associated with the building shall be included in the overall energy use total. The anticipated site Energy Use Intensity (EUI) for each fuel source shall be reported in units of kWh/ft²/yr or kBtu/ft²/yr using the conversions listed below:

Metered Fuel Source	to kWh:	to kBtu:
Electric	kWh × 1	kWh × 3.412
Gas	Therm × 29.308	Therm × 100
Propane	Cubic Foot × 0.738	Cubic Foot × 2.5185
Fuel Oil	Gallon × 43.872	Gallon × 149.6905

F101.3.2 Building use and occupancy types. Building use and occupancy types permitted are indicated in Table F101.3.2.

F101.3.3 Maximum site energy budget. Table F101.3.2 indicates the site EUI budget for each building use and occupancy type along with the building enclosure requirements for all use and occupancy types.

F101.3.3.1 Mixed-use buildings. For buildings that contain more than one building use or occupancy type, the overall

energy budget shall be based on the individual floor area percentage totals of each use times the individual energy budget and summing the results of all individual areas.

F101.3.3.2 Energy budget level options. Development teams may commit to a future, more stringent energy budget level from Table F101.3.2. Actual energy use and energy generation ability will be evaluated on this lower budget level.

F101.3.3.3 Energy modeling. A proposed building energy model is required for compliance with Section F101.3.2. A baseline energy model is not required. The proposed design model must show estimated energy use below the energy.

F101.3.4 Energy generation ability. Permit documents shall indicate the location, space allocated, and connection pathways for future installation of all potential energy generation systems. Only items defined by the Washington State Energy Code as on-site renewable energy shall be used to meet energy generation requirements.

F101.3.4.1 Energy generation categories. The development team shall complete the Washington State Outcome-Based Energy Budget form (Figure F101.3) to show the total renewable energy generation ability in the following categories:

1. Building integral: Renewable energy generation sources attached to the building. This value, combined with the on-site value, shall be at least 40 percent of the energy budget.
2. On-site: Renewable energy generation sources located on the building site property. This value, combined with the building integral value, shall be at least 40 percent of the energy budget.
3. Off-site: Renewable energy generation sources not located on the building site. This amount is limited to 40 percent of the energy budget. A specific off-site location does not need to be identified.
4. Green Power: Renewable energy purchased through the electric utility provider for the building. This amount is limited to 20 percent of the energy budget.

F101.3.4.2 Energy generation ability for building sites within a 2030 District. The development team for building sites within a designated 2030 District recognized by Architecture 2030 may use the Architecture 2030 Challenge 70 percent energy reduction target from the 2003 baseline as the energy budget. Building locations meeting this criteria and choosing this energy budget are exempt from the building integral and on-site requirements in Section F101.3.4.1. Green power remains capped at 20 percent. The generation requirements may be split, in any amount, among the building integral, on-site, or off-site categories. Actual energy use will be evaluated against the Architecture 2030 Challenge 70 percent energy reduction budget.

F101.4 Actual energy use submittal. The building owner or representative shall submit energy use documentation summary from all energy source providers or from an energy benchmarking service to the building code official. Code compliance is achieved with net energy use below the energy budget for any continuous 12-month span within the first 3 years of occupancy.

F101.4.1 Energy use monitoring period and occupancy. The energy use monitoring time frame shall start on the first full-month billing cycle of the utility or energy source provider(s) 6 months after a certificate of occupancy is issued. Buildings shall be deemed substantially occupied when a minimum 85 percent of the floor area, including all common areas, is occupied. The energy monitoring start time may be delayed up to an additional 6 months from certificate of occupancy (up to 12 months total) if 85 percent occupancy is not yet achieved. Buildings not 85 percent occupied after 12 months shall start the monitoring period for the portions occupied with an energy budget based on the spaces occupied and all common areas combined.

F101.4.2 Change of occupancy use during monitoring period. If an area within the building changes from one occupancy use to another with a different target EUI energy budget or if the building occupancy level drops below 50 percent, the target EUI energy budget shall be recalculated to become the new energy budget against which the building energy use shall be compared for compliance.

F101.4.3 Energy metering. All building spaces and uses subject to an energy budget or a portion of the energy budget shall be metered separately for all energy uses.

F101.4.4 Energy budget responsibility. The building owner is responsible for the compliance of the whole building. At the building owner's discretion, responsibility for the energy use budget may be divided and transferred into portions attributable to the occupant, operator or controller of each energy budget space. Common area spaces not under the control of an occupant or tenant may not be transferred.

F101.5 Actual energy use above the energy budget. Buildings exceeding the energy budget are not in compliance with the energy code and the building owner shall complete one of the following measures within 1 year:

1. Owners of buildings with actual energy use that exceeds the energy budget by up to 20 percent may offset the excess energy amount through annual green power purchase agreement from the utility provider at a rate of 1.1 times the excess energy amount until future code compliance is demonstrated.
2. Owners of buildings with actual energy use that exceeds the energy budget by more than 20 percent and up to 40 percent shall complete item 1 and either install on-building, on-site, or off-site energy generation equipment or invest in an energy conservation retrofit using the performance bond or financial security for energy amount remaining above 20 percent.
3. Owners of buildings with actual energy use that exceeds the energy budget by more than 40 percent shall complete item 1, item 2, and post a replacement performance bond or financial security equal to the first bond or security amount.

F101.5.1 Continued energy monitoring. Upon completing the necessary compliance measure(s) in Section F101.5 the building owner is provided another 3-year time frame to achieve and document net energy use below the energy budget for any continuous 12-month span. Owners of buildings

that remain more than 20 percent above the energy budget shall repeat the measures in Section F101.5, up to 3 times maximum, using the performance bond or financial security to install energy generation equipment or to install an energy retrofit and post a new performance bond equal to the first.

F101.5.2 Tradable certificate for energy savings. As an alternate to the requirements of Section F101.5 a building owner may, when this market-based instrument becomes available, purchase a Tradable Certificate for Energy Savings (TCES) or "white certificates" from a building or entity with energy savings. The building owner shall purchase TCES's equal to 1.1 times the amount that the building's actual energy use exceeds the energy budget.

F101.6 Performance bond or financial security. A building developer must secure and submit to the code official a performance bond or an irrevocable financial security letter of credit from a state of Washington financial institution prior to certificate of occupancy issuance. The bond or security shall have a value equal to \$4.00 per square foot of gross conditioned floor area. The bond or security shall be used only to install renewable energy on the building or for investment into energy conservation measures as part of an energy retrofit. The bond or security may also be held for one additional 3-year energy-monitoring period if green power is purchased.

Upon demonstrated compliance with the energy budget, the bond or security requirement shall be released.

F101.6.1 Failure to submit energy use data. Building owners that fail to submit energy use data at the end of the 3-year monitoring period shall forfeit the full amount of the performance bond or financial security as payment to the local jurisdiction. Building owners that fail to submit energy use data at the end of each continuing five-year monitoring period shall be fined an amount equal to the original bond or financial security by the local jurisdiction.

F101.7 Continued energy budget certification. After achieving code compliance buildings shall be required every 5 years to document a continuous 12-month span with net energy use that is lower than the required energy budget. Owners of buildings with actual energy use that is at least 2.5 percent below their energy budget (from year permitted baseline, not voluntary year) may sell, when a future market-based instrument becomes available, their unused energy equivalents in the form of a "white certificate" or Tradable Certificate for Energy Savings.

F101.8 Local amendments. Local jurisdictions may amend the current code cycle EUI maximum energy budget by adopting a more stringent future code year value stated in Table F101.3.2.

**Table F101.3.2
Washington State Outcome-Based Energy Budget**

Zone 4C:

Building Occupancy/Use	Site EUI ft ² /year	Base 2003	Current 2018	Future			
				2021	2024	2027	2030
A-3 Library	kWh	30.5	14.6	13.3	11.9	10.5	9.1
	kBtu	104	49.9	45.3	40.6	35.9	31.2
B Office/Bank Medical Office (nondiagnostic)	kWh	19.7	8.5	7.8	7.2	6.6	5.9
	kBtu	67.3	28.9	26.7	24.5	22.4	20.2
	kWh	14.8	7.1	6.4	5.8	5.1	4.4
	kBtu	50.4	24.2	21.9	19.6	17.4	15.1
E School K-12	kWh	17.1	8.2	7.4	6.7	5.9	5.1
	kBtu	58.4	28.0	25.4	22.8	20.2	17.5
I-2 Hospital (in-patient)	kWh	51.6	24.8	22.5	20.1	17.8	15.5
	kBtu	176.1	84.5	76.6	68.7	60.8	52.8
M Grocery/Food Market Retail	kWh	66.6	32.0	29.0	26.0	23.0	20.0
	kBtu	227.4	109.1	98.9	88.7	78.5	68.2
	kWh	25.7	12.3	11.2	10.0	8.9	7.7
	kBtu	87.5	42.0	38.1	34.1	30.2	26.3
S-1							

	Site EUI	Base	Current	Future				
Building Occupancy/Use	ft ² /year	2003	2018	2021	2024	2027	2030	
Parking	Enclosed Garage ^a	kWh	3.8	2.3	2.0	1.7	1.4	1.1
		kBtu	13.0	8.0	7.0	5.9	4.9	3.9
	Open Garage ^a	kWh	2.3	1.4	1.2	1.0	0.9	0.7
		kBtu	7.8	4.8	4.2	3.6	3.0	2.3
S-2	NonRefrigerated Distribution/Shipping ^b	kWh	8.6	4.1	3.7	3.3	3.0	2.6
		kBtu	29.2	14.0	12.7	11.4	10.1	8.8
R-2 Multi-Family (3+ stories)	Lobby/Common Area	kWh	29.0	17.5	15.3	13.1	10.9	8.7
		kBtu	99	59.7	52.2	44.7	37.2	29.7
	Studio/Micro-unit	kWh	9238	3284	3156	3028	2900	2771
		kBtu	31520	11205	10768	10331	9893	9456
	One Bedroom	kWh	18476	6568	6312	6055	5799	5543
		kBtu	63040	22411	21536	20661	19787	18912
	Two Bedroom	kWh	27714	9852	9468	9083	8699	8314
		kBtu	94560	33616	32304	30992	29680	28368
	Three Bedroom	kWh	36952	13136	12624	12111	11598	11086
		kBtu	126080	44821	43072	41323	39573	37824
	Additional Bedroom	kWh	9238	3284	3156	3028	2900	2771
		kBtu	31520	11205	10768	10331	9893	9456

All Occupancies/Use Types	2003	2018	2021	2024	2027	2030
U-Factor						
Vertical Fenestration						
Nonmetal		0.28	0.27	0.25	0.24	0.23
Metal - Fixed		0.33	0.31	0.28	0.26	0.23
Metal - Operable		0.34	0.32	0.29	0.26	0.23
Roof		0.016	0.015	0.014	0.013	0.012
Wall (above/below grade)		0.031	0.028	0.024	0.021	0.018
Floors		0.024	0.023	0.021	0.020	0.018
F-Value						
Slab on Grade		0.41	0.39	0.36	0.34	0.32
CFM75/ft²						
Air Leakage		0.25	0.17	0.14	0.11	0.08

Zone 5B:

	Site EUI	Base	Current	Future				
Building Occupancy/Use	ft ² /year	2003	2018	2021	2024	2027	2030	
A-3	Library	kWh	31.9	15.3	13.9	12.4	11.0	9.6
		kBtu	108.8	52.2	47.3	42.4	37.5	32.6
B								

	Site EUI	Base	Current	Future				
Building Occupancy/Use	ft ² /year	2003	2018	2021	2024	2027	2030	
Office/Bank	kWh	20.1	9.1	8.3	7.5	6.8	6.0	
	kBtu	68.6	30.9	28.3	25.8	23.2	20.6	
Medical Office (nondiagnostic)	kWh	15.0	7.2	6.5	5.9	5.2	4.5	
	kBtu	51.3	24.6	22.3	20.0	17.7	15.4	
E School K-12	kWh	18.3	8.8	8.0	7.1	6.3	5.5	
	kBtu	62.4	30.0	27.2	24.3	21.5	18.7	
I-2 Hospital (in-patient)	kWh	48.5	23.3	21.1	18.9	16.7	14.6	
	kBtu	165.5	79.4	72.0	64.5	57.1	49.7	
M Grocery/Food Market	kWh	66.3	31.8	28.8	25.8	22.9	19.9	
	kBtu	226.1	108.5	98.4	88.2	78.0	67.8	
	Retail	kWh	28.4	13.6	12.4	11.1	9.8	8.5
		kBtu	97.0	46.6	42.2	37.8	33.5	29.1
S-1 Parking Enclosed Garage ^a	kWh	3.8	2.3	2.0	1.7	1.4	1.1	
	kBtu	13.0	8.0	7.0	5.9	4.9	3.9	
	Open Garage ^a	kWh	2.3	1.4	1.2	1.0	0.9	0.7
		kBtu	7.8	4.8	4.2	3.6	3.0	2.3
S-2 NonRefrigerated Distribution/Shipping ^b	kWh	10.5	5.0	4.6	4.1	3.6	3.1	
	kBtu	35.8	17.2	15.6	14.0	12.4	10.7	
R-2 Multi-Family (3+ stories)	Lobby/Common Area	kWh	29.0	18.8	16.3	13.8	11.2	8.7
		kBtu	99	64.2	55.6	46.9	38.3	29.7
	Studio/Micro-unit	kWh	9238	3495	3314	3133	2952	2771
		kBtu	31520	11925	11308	10691	10073	9456
	One Bedroom	kWh	18476	6990	6628	6267	5905	5543
		kBtu	63040	23851	22616	21381	20147	18912
	Two Bedroom	kWh	27714	10485	9943	9400	8857	8314
		kBtu	94560	35776	33924	32072	30220	28368
	Three Bedroom	kWh	36952	13980	13257	12533	11809	11086
		kBtu	126080	47701	45232	42763	40293	37824
	Additional Bedroom	kWh	9238	3495	3314	3133	2952	2771
		kBtu	31520	11925	11308	10691	10073	9456

All Occupancies/Use Types	2003	2018	2021	2024	2027	2030
	U-Factor					
Vertical Fenestration						
Nonmetal		0.25	0.23	0.21	0.18	0.16

All Occupancies/Use Types	2003	2018	2021	2024	2027	2030
Metal - Fixed		0.31	0.27	0.23	0.20	0.16
Metal - Operable		0.32	0.28	0.24	0.20	0.16
Roof		0.016	0.015	0.014	0.013	0.012
Wall (above/below grade)		0.031	0.028	0.024	0.021	0.018
Floors		0.024	0.023	0.021	0.020	0.018
	F-Value					
Slab on Grade		0.41	0.39	0.36	0.34	0.32
	CFM75/ft²					
Air Leakage		0.25	0.17	0.14	0.11	0.08

^aLighting power allowance must still comply with Table C405.4.2(2).

^bApplicable to heated warehouses only.

**FIGURE F101.3.2
Washington State Outcome-based Energy Budget Form**

WASHINGTON STATE OUTCOME-BASED ENERGY BUDGET FORM

(reserved for graphics)

Building occupancy/use _____

Conditioned floor area SF

Code maximum site EUI energy budget

Predicted EUI

Electric

Gas

Propane

Oil

Other (source/generation)

Generation Potential EUI

Building Integral (combined must exceed 40%)

On-site

Off-site (max 40%)

Purchase (max 40%)

Percentage better than energy budget

Percentage potential EUI above predicted EUI

PROJECT SUMMARY

Building Name

Address

City

Owner

Address

City, State, Zip

PROJECT CERTIFICATION

Name

Firm

Date

(seal)

**WSR 19-24-044
PERMANENT RULES
SUPERINTENDENT OF
PUBLIC INSTRUCTION**

[Filed November 26, 2019, 11:34 a.m., effective December 27, 2019]

Effective Date of Rule: Thirty-one days after filing.

Purpose: This rule-making order repeals chapter 392-196 WAC, School personnel—Teacher assistance program. The teacher assistance program (TAP) was authorized under RCW 28A.415.250, which directed the office of superintendent of public instruction (OSPI) to adopt rules to establish and operate the program. RCW 28A.415.250 was repealed in 2013, see section 601(3), chapter 18, Laws of 2013 2nd sp.s., and has not been replaced by another statute providing statutory authority for the rule. Because OSPI no longer has authority to administer this program, chapter 392-196 WAC is repealed.

Citation of Rules Affected by this Order: Repealing chapter 392-196 WAC.

Statutory Authority for Adoption: RCW 28A.415.250.

Adopted under notice filed as WSR 19-19-070 on September 17, 2019.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 0, Repealed 0; or Recently Enacted State Statutes: New 0, Amended 0, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 0, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 0, Repealed 11.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 0, Amended 0, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 0, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 0, Repealed 0.

Date Adopted: November 26, 2019.

Chris Reykdal
State Superintendent
of Public Instruction

REPEALER

The following chapter of the Washington Administrative Code is repealed:

WAC 392-196-005 Authority.

WAC 392-196-010 Purpose.

WAC 392-196-011 Definition—Teacher.

WAC 392-196-020 Definition—Teacher stipend.

WAC 392-196-055 Mentor teacher—Qualifications for nomination.

WAC 392-196-060 Mentor teacher—Selection process.

WAC 392-196-077 Conditions of the program.

WAC 392-196-086 Coordination.

WAC 392-196-089 Program accountability.

WAC 392-196-100 Distribution of state moneys for the teacher assistance program.

WAC 392-196-110 Maximum control factor—Proration.

WSR 19-24-046
PERMANENT RULES
SUPERINTENDENT OF
PUBLIC INSTRUCTION

[Filed November 26, 2019, 11:37 a.m., effective December 27, 2019]

Effective Date of Rule: Thirty-one days after filing.

Purpose: The rule-making order repeals chapter 392-330 WAC, State magnet school program, which was adopted in 1993 to implement a grant program authorized in the operating budget during the 1993-1995 biennium. The magnet school projects funding proviso and the office of superintendent of public instruction's (OSPI) authority to promulgate rules related to the grants were discontinued in the 1995-97 operating budget and have not been renewed. Because the statutory authority on which the rule is based has been repealed and the rule is no longer necessary, OSPI is repealing chapter 392-330 WAC through expedited rule making.

Citation of Rules Affected by this Order: Repealing chapter 392-330 WAC.

Statutory Authority for Adoption: Section 516(13), chapter 232, Laws of 1992.

Adopted under notice filed as WSR 19-18-086 on September 4, 2019.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 0, Repealed 0; or Recently Enacted State Statutes: New 0, Amended 0, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 0, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 0, Repealed 8.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 0, Amended 0, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 0, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 0, Repealed 0.

Date Adopted: November 26, 2019.

Chris Reykdal
 State Superintendent
 of Public Instruction

REPEALER

The following chapter of the Washington Administrative Code is repealed:

WAC 392-330-010 Authority.

WAC 392-330-020 Purpose.

WAC 392-330-030 Definitions.

WAC 392-330-040 Policy.

WAC 392-330-050 Eligibility.

WAC 392-330-060 Information—Forms.

WAC 392-330-070 Annual report.

WAC 392-330-080 Advisory committee.

WSR 19-24-048
PERMANENT RULES
DEPARTMENT OF
SOCIAL AND HEALTH SERVICES

(Economic Services Administration)

[Filed November 26, 2019, 12:01 p.m., effective January 1, 2020]

Effective Date of Rule: January 1, 2020.

Purpose: The department is amending WAC 388-450-0025 What is unearned income?, to incorporate benefits payable from the family and medical leave program authorized under chapter 50A.05 RCW, beginning January 1, 2020, into the examples of unearned income described in this rule. This change will clearly identify that paid family medical leave is unearned income for cash and food assistance applicant eligibility determinations and will be considered in the calculation of the amount of benefits received by an eligible recipient.

Citation of Rules Affected by this Order: Amending WAC 388-450-0025.

Statutory Authority for Adoption: RCW 74.04.005, 74.04.050, 74.04.055, 74.04.057, 74.04.770, 74.08.090, 74.08A.100, 74.09.035, 74.09.530, 74.62.030.

Other Authority: 7 C.F.R. 273.9.

Adopted under notice filed as WSR 19-19-051 on September 13, 2019.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 1, Repealed 0; or Recently Enacted State Statutes: New 0, Amended 0, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 0, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 0, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 0, Amended 0, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 0, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 1, Repealed 0.

Date Adopted: November 26, 2019.

Katherine I. Vasquez
 Rules Coordinator

AMENDATORY SECTION (Amending WSR 15-02-006, filed 12/26/14, effective 1/26/15)

WAC 388-450-0025 What is unearned income? This section applies to cash assistance and food assistance.

(1) Unearned income is income you get from a source other than employment or self-employment. Some examples of unearned income include, but are not limited to:

(a) Railroad retirement;

(b) Unemployment compensation;

(c) Social Security benefits (including retirement benefits, disability benefits, and benefits for survivors);

(d) Time loss benefits as described in WAC 388-450-0010, such as benefits from the department of labor and industries (L&I); (~~or~~)

- (e) Veteran Administration benefits; or
- (f) Paid family and medical leave benefits.

(2) For food assistance we also count the total amount of cash benefits due to you before any reductions caused by your failure (or the failure of someone in your assistance unit) to perform an action required under a federal, state, or local means-tested public assistance program, such as TANF/SFA, ABD assistance, PWA, and SSI.

(3) When we count your unearned income, we count the amount you get before any taxes are taken out.

WSR 19-24-052
PERMANENT RULES
NOXIOUS WEED
CONTROL BOARD

[Filed November 26, 2019, 1:12 p.m., effective January 1, 2020]

Effective Date of Rule: January 1, 2020.

Purpose: The Washington state noxious weed list provides the basis for noxious weed control efforts for county and district weed control boards as well as other entities. This rule-making order amends chapter 16-750 WAC by:

- South American spongeplant, *Limnobiium laevigatum*, to the Class A list.
- Designating Eurasian watermilfoil, *Myriophyllum spicatum*, to the Class B list in Kitsap County of region 2, and Kittitas and Whitman counties of region 5.
- Designate Bohemian knotweed, *Polygonum x bohemicum*, to the Class B list in San Juan County of region 2, Stevens County of region 4, and Whitman and Yakima counties of region 5.
- Designate Japanese knotweed, *Polygonum cuspidatum*, to the Class B list in Stevens County of region 4.
- Designate Himalayan knotweed, *Persicaria wallichii*, to the Class B list in Clark County of region 3 and Stevens County of region 4.
- Designate lesser celandine, *Ficaria verna*, to the Class B list in all of region 1, 3, 4, 5, 6 and region 2 except for King and Whatcom counties.
- Designate leafy spurge, *Euphorbia virgata*, to the Class B list in Whitman County of region 5 and Garfield County of region 6.
- Designate purple loosestrife, *Lythrum salicaria*, to the Class B list in Pierce County of region 2 and Benton County of region 6.
- Designate wand loosestrife, *Lythrum virgatum*, to the Class B list in Mason County of region 1, Pierce County of region 2, and Benton County of region 6.
- Designate poison hemlock, *Conium maculatum*, to the Class B list in Douglas County of region 4.
- Designate policeman's helmet, *Impatiens glandulifera*, to the Class B list in Pacific County of region 1 and Pierce County of region 2.
- Designate Ravenna grass, *Saccharum ravennae*, to the Class B list in Grant County of region 5.
- Designate rush skeletonweed, *Chondrilla juncea*, to the Class B list in Kitsap County of region 2.

- Designate European coltsfoot, *Tussilago farfara*, to the Class B list in Grant County of region 5.
- Adding a standing legislative committee to WAC 16-750-140.
- Adding new WAC 16-750-142 State noxious weed control board—Executive secretary and education specialist—Hiring and dismissal.
- Editing the State noxious weed control board—Executive secretary—Definition in WAC 16-750-145.
- Adding new WAC 16-750-146 State noxious weed control board—Education specialist—Definition.
- Repealing WAC 16-750-150 State noxious weed control board—Executive secretary—Hiring and dismissal. This information was moved to WAC 16-750-142.

Citation of Rules Affected by this Order: New WAC 16-750-142 and 16-750-146; repealing WAC 16-750-150; and amending WAC 16-750-005, 16-750-011, 16-750-140, and 16-750-145.

Statutory Authority for Adoption: Chapter 17.10 RCW.
 Other Authority: Chapter 34.05 RCW.

Adopted under notice filed as WSR 19-20-120 on October 2, 2019.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 0, Repealed 0; or Recently Enacted State Statutes: New 0, Amended 0, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 0, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 2, Amended 4, Repealed 1.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 2, Amended 0, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 0, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 0, Repealed 0.

Date Adopted: November 26, 2019.

Anthony J. Stadelman
 Chairman

AMENDATORY SECTION (Amending WSR 17-24-035, filed 11/29/17, effective 1/1/18)

WAC 16-750-005 State noxious weed list—Class A noxious weeds.

Common Name	Scientific Name
broom, French	<i>Genista monspessulana</i>
broom, Spanish	<i>Spartium junceum</i>
common crupina	<i>Crupina vulgaris</i>
cordgrass, common	<i>Spartina anglica</i>
cordgrass, dense-flowered	<i>Spartina densiflora</i>
cordgrass, salt meadow	<i>Spartina patens</i>
cordgrass, smooth	<i>Spartina alterniflora</i>
dyer's woad	<i>Isatis tinctoria</i>

Common Name	Scientific Name
eggleaf spurge	<i>Euphorbia oblongata</i>
false brome	<i>Brachypodium sylvaticum</i>
floating primrose-willow	<i>Ludwigia peploides</i>
flowering rush	<i>Butomus umbellatus</i>
garlic mustard	<i>Alliaria petiolata</i>
giant hogweed	<i>Heracleum mantegazzianum</i>
goatsrue	<i>Galega officinalis</i>
hydrilla	<i>Hydrilla verticillata</i>
Johnsongrass	<i>Sorghum halepense</i>
knawweed, bighead	<i>Centaurea macrocephala</i>
knawweed, Vochin	<i>Centaurea nigrescens</i>
kudzu	<i>Pueraria montana</i> var. <i>lobata</i>
meadow clary	<i>Salvia pratensis</i>
oriental clematis	<i>Clematis orientalis</i>
purple starthistle	<i>Centaurea calcitrapa</i>
reed sweetgrass	<i>Glyceria maxima</i>
ricefield bulrush	<i>Schoenoplectus mucronatus</i>
sage, clary	<i>Salvia sclarea</i>
sage, Mediterranean	<i>Salvia aethiopsis</i>
silverleaf nightshade	<i>Solanum elaeagnifolium</i>
small-flowered jewelweed	<i>Impatiens parviflora</i>
<u>South American sponge-plant</u>	<u><i>Limnobium laevigatum</i></u>
Syrian bean-caper	<i>Zygophyllum fabago</i>
Texas blueweed	<i>Helianthus ciliaris</i>
thistle, Italian	<i>Carduus pycnocephalus</i>
thistle, milk	<i>Silybum marianum</i>
thistle, slenderflower	<i>Carduus tenuiflorus</i>
variable-leaf milfoil	<i>Myriophyllum heterophyllum</i>
wild four o'clock	<i>Mirabilis nyctaginea</i>

AMENDATORY SECTION (Amending WSR 18-24-010, filed 11/26/18, effective 1/1/19)**WAC 16-750-011 State noxious weed list—Class B noxious weeds.**

Name		Will be a "Class B designate" in all lands lying within:	
(1)	blueweed, <i>Echium vulgare</i>	(a)	regions 1, 2, 3, 4, 6
		(b)	region 5, except Spokane County
(2)	Brazilian elodea, <i>Egeria densa</i>	(a)	region 1, except Grays Harbor County
		(b)	region 2, except Kitsap County
		(c)	King County of region 2, except lakes Dolloff, Fenwick, Union, Washington, and Sammamish, and the Sammamish River
		(d)	region 3, except Wahkiakum County
		(e)	regions 4, 5, and 6
(3)	bugloss, annual, <i>Anchusa arvensis</i>	(a)	regions 1, 2, 3, 4, and 6
		(b)	region 5, except Spokane County
(4)	bugloss, common, <i>Anchusa officinalis</i>	(a)	regions 1, 2, 3, and 6
		(b)	All of region 4 except those areas lying within the Entiat River Valley between the Columbia River confluence and Stormy Creek in Chelan County
		(c)	region 5, except Spokane County
(5)	butterfly bush, <i>Buddleja davidii</i>	(a)	Grays Harbor County of region 1
		(b)	San Juan County of region 2
		(c)	Cowlitz County of region 3
(6)	camelthorn, <i>Alhagi maurorum</i>	(a)	regions 1, 2, 3, 4, 5, and 6
(7)	common fennel, <i>Foeniculum vulgare</i> (except bulbous fennel, <i>F. vulgare</i> var. <i>azoricum</i>)	(a)	region 1, except Jefferson County
		(b)	region 2, except King and Skagit counties
		(c)	region 3, except Clark County
		(d)	regions 4, 5, and 6
(8)	common reed, <i>Phragmites australis</i> (nonnative genotypes only)	(a)	regions 1, 2, 3, and 4
		(b)	region 5, except Grant County
		(c)	Asotin, Columbia, and Garfield counties of region 6
(9)	Dalmatian toadflax, <i>Linaria dalmatica</i> ssp. <i>dalmatica</i>	(a)	regions 1, 2, and 3
		(b)	Adams, Kittitas, and Lincoln counties of region 5
		(c)	Benton, Franklin, and Walla Walla counties of region 6
(10)	Eurasian watermilfoil, <i>Myriophyllum spicatum</i>	(a)	region 1, except Pacific County
		(b)	Island, Kitsap, and San Juan counties of region 2
		(c)	Clark and Cowlitz counties of region 3
		(d)	Chelan and Okanogan counties, and all lakes with public boat launches except Fan Lake in Pend Oreille County of region 4
		(e)	Adams ((and)) , Kittitas, Lincoln, and Whitman counties of region 5
		(f)	Asotin, Columbia, and Garfield counties of region 6
(11)	European coltsfoot, <i>Tussilago farfara</i>	(a)	regions 1, 2, 3, 4, <u>5</u> , and 6
		((b))	region 5, except Grant County))

Name		Will be a "Class B designate" in all lands lying within:	
(12)	fanwort, <i>Cabomba caroliniana</i>	(a)	regions 1, 2, 4, 5, and 6
		(b)	region 3, except Cowlitz County
(13)	gorse, <i>Ulex europaeus</i>	(a)	region 1, except Grays Harbor and Pacific counties
		(b)	regions 2, 3, 4, 5, 6
(14)	grass-leaved arrowhead, <i>Sagittaria graminea</i>	(a)	region 1
		(b)	region 2, except Snohomish County
		(c)	regions 3, 4, 5, and 6
(15)	hairy willow-herb, <i>Epilobium hirsutum</i>	(a)	regions 1, 3, and 4
		(b)	region 2, except Thurston and Whatcom counties
		(c)	region 5, except Klickitat County
		(d)	region 6, except Benton and Franklin counties
(16)	hawkweed oxtongue, <i>Picris hieracioides</i>	(a)	regions 1, 2, 4, 5, and 6
		(b)	region 3, except Skamania County
(17)	hawkweed, orange, <i>Hieracium aurantiacum</i>	(a)	regions 1, 3, and 6
		(b)	region 2, except Whatcom County
		(c)	region 4, except Pend Oreille and Stevens counties
		(d)	region 5, except Kittitas and Spokane counties
(18)	hawkweeds: All nonnative species and hybrids of the Meadow subgenus (<i>Pilosella</i>), including, but not limited to, mouseear (<i>Hieracium pilosella</i>), pale (<i>H. lactucella</i>), queen-devil (<i>H. glomeratum</i>), tall (<i>H. piloselloides</i>), whiplash (<i>H. flagellare</i>), yellow (<i>H. caespitosum</i>), and yellow-devil (<i>H. x floribundum</i>)	(a)	region 1
		(b)	region 2, except Thurston County
		(c)	region 3, except Cowlitz County
		(d)	region 4, except Pend Oreille and Stevens counties
		(e)	region 5, except Klickitat and Spokane counties
		(f)	region 6
(19)	hawkweeds: All nonnative species and hybrids of the Wall subgenus (<i>Hieracium</i>), including, but not limited to, common (<i>Hieracium lachenalii</i>), European (<i>H. sabaudum</i>), polar (<i>H. atratum</i>), smooth (<i>H. laevigatum</i>), spotted (<i>H. maculatum</i>), and wall (<i>H. murorum</i>)	(a)	regions 1, 3, 5, and 6
		(b)	region 2, except King, Skagit, and Whatcom counties
		(c)	region 4, except Stevens County
(20)	herb-Robert, <i>Geranium robertianum</i>	(a)	regions 4, 5, and 6
(21)	hoary alyssum, <i>Berteroa incana</i>	(a)	regions 1, 2, 3, and 6
		(b)	region 4, except Pend Oreille and Ferry counties
		(c)	region 5, except Klickitat County
(22)	houndstongue, <i>Cynoglossum officinale</i>	(a)	regions 1, 2, and 3
		(b)	Chelan and Douglas counties of region 4
		(c)	Yakima, Grant and Adams counties of region 5
		(d)	Benton and Franklin counties of region 6

Name		Will be a "Class B designate" in all lands lying within:	
(23)	indigobush, <i>Amorpha fruticosa</i>	(a)	regions 1, 2, and 4
		(b)	Lewis County of region 3
		(c)	region 5, except Klickitat County
(24)	knapweed, black, <i>Centaurea nigra</i>	(a)	regions 1, 2, 3, 4, 5, and 6
(25)	knapweed, brown, <i>Centaurea jacea</i>	(a)	regions 1, 2, 3, 4, 5, and 6
(26)	knapweed, diffuse, <i>Centaurea diffusa</i>	(a)	region 1
		(b)	region 2
		(c)	region 3, except Cowlitz County
		(d)	Adams County of region 5
(27)	knapweed, meadow, <i>Centaurea x moncktonii</i>	(a)	regions 1 and 4
		(b)	region 2, except Whatcom County
		(c)	Thurston County of region 2, except below the ordinary high-water mark of the Nisqually River
		(d)	Lewis and Wahkiakum counties of region 3
		(e)	region 5, except Kittitas and Klickitat counties
		(f)	region 6, except Franklin and Walla Walla counties
(28)	knapweed, Russian, <i>Rhaponticum repens</i>	(a)	regions 1, 2, and 3
		(b)	Ferry and Pend Oreille counties of region 4
		(c)	Lincoln, Spokane, and Whitman counties of region 5
		(d)	Adams County of region 5, except for the area west of Highway 17 and north of Highway 26
		(e)	Asotin and Garfield counties of region 6
(29)	knapweed, spotted, <i>Centaurea stoebe</i>	(a)	region 1, except Grays Harbor
		(b)	region 2, except Whatcom County
		(c)	Clark, Lewis, and Wahkiakum counties of region 3
		(d)	Ferry County of region 4
		(e)	Adams, Grant and Yakima counties of region 5
		(f)	region 6, except Columbia and Walla Walla counties
(30)	knotweed, Bohemian, <i>Polygonum x bohemicum</i>	(a)	Island ((County)) and San Juan counties of region 2
		(b)	Skamania County of region 3
		(c)	region 4, ((except Stevens County)) 5, and 6
		((d))	region 5, except Whitman and Yakima counties
		(e)	region 6))
(31)	knotweed, giant, <i>Polygonum sachalinense</i>	(a)	region 2, except King, Pierce, and Snohomish counties
		(b)	region 3, except Cowlitz and Lewis counties
		(c)	regions 4, 5, and 6
(32)	knotweed, Himalayan, <i>Persicaria wallichii</i>	(a)	region 1, except Pacific County
		(b)	region 2, except King and Pierce counties
		(c)	((Cowlitz, Lewis and Skamania counties of)) region 3, <u>except Wahkiakum County</u>
		(d)	region 4, ((except Stevens County)) 5, and 6
		((e))	regions 5 and 6))

Name		Will be a "Class B designate" in all lands lying within:	
(33)	knotweed, Japanese, <i>Polygonum cuspidatum</i>	(a)	Island, San Juan, and Whatcom counties of region 2
		(b)	Skamania County of region 3
		(c)	region 4, except Okanogan (and Stevens counties) <u>County</u>
		(d)	region 5, except Spokane County
		(e)	region 6
(34)	kochia, <i>Bassia scoparia</i>	(a)	regions 1, 2, and 3
		(b)	Stevens and Pend Oreille counties of region 4
		(c)	Adams County of region 5
(35)	lesser celandine, <i>Ficaria verna</i>	(a)	((Snohomish County of region 2)) <u>region 1, 3, 4, 5, and 6</u>
		(b)	((Skamania County of region 3)) <u>region 2, except King and Whatcom counties</u>
		((e))	Pend Oreille and Stevens counties of region 4))
(36)	loosestrife, garden, <i>Lysimachia vulgaris</i>	(a)	regions 1, 2, 3, 4, 5, 6
(37)	loosestrife, purple, <i>Lythrum salicaria</i>	(a)	Clallam, Jefferson, and Mason counties of region 1
		(b)	region 2, except Kitsap, (Pierce) Skagit, and Snohomish counties
		(c)	Clark, Lewis, and Skamania counties of region 3
		(d)	region 4, except Douglas County
		(e)	region 5, except Grant and Spokane counties
		(f)	((Columbia, Garfield, and Walla Walla counties of)) <u>region 6, except Asotin and Franklin counties</u>
(38)	loosestrife, wand, <i>Lythrum virgatum</i>	(a)	Clallam (and), Jefferson, and Mason counties of region 1
		(b)	region 2, except Kitsap, (Pierce) Skagit, and Snohomish counties
		(c)	Clark, Lewis, and Skamania counties of region 3
		(d)	region 4, except Douglas County
		(e)	region 5, except Grant and Spokane counties
		(f)	((Columbia, Garfield, and Walla Walla counties of)) <u>region 6, except Asotin and Franklin counties</u>
(39)	Malta starthistle, <i>Centaurea melitensis</i>	(a)	regions 1, 2, and 3
		(b)	region 4, except T36 R38 in the area contained within Hwy 395/Hwy 20, Pingston Creek Road, and Highland Loop Road in Stevens County
		(c)	region 5, except Klickitat and Whitman counties
(40)	parrotfeather, <i>Myriophyllum aquaticum</i>	(a)	region 1, except Pacific County
		(b)	regions 2, 4, 5, and 6
		(c)	Clark and Skamania counties of region 3
(41)	perennial pepperweed, <i>Lepidium latifolium</i>	(a)	regions 1, 2, and 4
		(b)	region 3, except Clark and Cowlitz counties
		(c)	Kittitas, Lincoln and Spokane counties of region 5
		(d)	Columbia and Garfield counties of region 6
(42)	poison hemlock, <i>Conium maculatum</i>	(a)	Clallam, Mason, and Pacific counties of region 1
		(b)	region 2, except King, Skagit, and Whatcom counties

Name		Will be a "Class B designate" in all lands lying within:
(43)	policeman's helmet, <i>Impatiens glandulifera</i>	(c) Clark and Skamania counties of region 3
		(d) Chelan, Douglas , and Pend Oreille counties of region 4
		(e) Grant, Kittitas and Lincoln counties of region 5
		(a) region 1, (except Pacific County) <u>3, 4, 5, and 6</u>
(44)	puncturevine, <i>Tribulus terrestris</i>	(b) region 2, except (Pierce) Thurston((;)) and Whatcom counties
		((e) regions 3, 4, 5, and 6))
		(a) regions 1, 2, and 3
(45)	Ravenna grass, <i>Saccharum ravennae</i>	(b) Ferry, Pend Oreille, and Stevens counties of region 4
		(c) region 5, except Grant, Klickitat, and Yakima counties
		(a) Cowlitz County of region 3
(46)	rush skeletonweed, <i>Chondrilla juncea</i>	(b) region 4, except Chelan County
		(c) region 5, except (Grant and Yakima counties) <u>Yakima County</u>
		(d) region 6, except Benton County
		(a) regions <u>1, 2,</u> and 3
(47)	saltcedar, <i>Tamarix ramosissima</i> (unless intentionally planted prior to 2004)	(b) (region 2, except Kitsap County
		(e)) region 4, except all areas of Stevens County south of Township 29
		((d)) Kittitas and Yakima counties of region 5, and Adams County, except those areas lying east of Sage Road, the western border of Range 36
		((e)) Asotin County of region 6
(48)	Scotch broom, <i>Cytisus scoparius</i>	<u>(d)</u>
		(a) regions 1, 3, 4, and 5
		(b) region 2, except King and Thurston counties
(49)	shiny geranium, <i>Geranium lucidum</i>	(c) region 6, except Benton and Franklin counties
		(a) regions 4 and 6
		(b) region 5, except Klickitat County
(50)	spurge flax, <i>Thymelaea passerina</i>	(a) regions 1, 4, 5, and 6
		(b) regions 2, except Thurston County
		(c) region 3, except Clark County
(51)	spurge laurel, <i>Daphne laureola</i>	(a) region 4, except Okanogan County
		(b) regions 5 and 6
		(a) region 1, except Clallam and Jefferson counties
(52)	spurge, leafy, <i>Euphorbia virgata</i>	(b) region 2, except King, Kitsap, and Pierce counties
		(c) region 3, except Skamania County
		(d) regions 4, 5, and 6
		(a) regions 1, 2, 3, and 4
(53)	spurge, myrtle, <i>Euphorbia myrsinites</i>	(b) region 5, except Spokane (and Whitman counties) <u>County</u>
		(c) region 6, except Columbia (and Garfield counties) <u>County</u>
		(a) region 1, except Clallam and Jefferson counties
		(b) region 2, except King, Kitsap, Pierce, and Whatcom counties

Name		Will be a "Class B designate" in all lands lying within:	
(54)	sulfur cinquefoil, <i>Potentilla recta</i>	(c)	regions 3, 5, and 6
		(d)	region 4, except Okanogan and Stevens counties
		(a)	region 1
		(b)	region 2, except Pierce and Thurston counties
		(c)	region 3, except Lewis and Skamania counties
(55)	tansy ragwort, <i>Jacobaea vulgaris</i>	(d)	Adams, Grant, Lincoln, and Whitman counties of region 5
		(e)	region 6, except Asotin County
		(a)	Island and San Juan counties of region 2
		(b)	Clark and Wahkiakum counties of region 3
		(c)	regions 4 and 6
(56)	thistle, musk, <i>Carduus nutans</i>	(d)	region 5, except Klickitat County
		(a)	regions 1, 2, 3, and 6
		(b)	region 4, except Douglas and Ferry counties
(57)	thistle, plumeless, <i>Carduus acanthoides</i>	(c)	region 5, except Kittitas County
		(a)	regions 1, 2, 3, 5, 6
		(b)	region 4, except those areas north of State Highway 20 in Stevens County
(58)	thistle, Scotch, <i>Onopordum acanthium</i>	(a)	regions 1, 2, and 3
		(b)	region 4, except Douglas County
		(c)	region 5, except Spokane and Whitman counties
(59)	velvetleaf, <i>Abutilon theophrasti</i>	(a)	regions 1, 2, 3, and 4
		(b)	region 5, except Yakima County
		(c)	region 6, except Franklin County
(60)	water primrose, <i>Ludwigia hexapetala</i>	(a)	regions 1, 2, 4, 5, and 6
(61)	white bryony, <i>Bryonia alba</i>	(b)	region 3, except Cowlitz County
		(a)	regions 1, 2, 3, and 4
		(b)	region 5, except Whitman County
(62)	wild chervil, <i>Anthriscus sylvestris</i>	(c)	Benton County of region 6
		(a)	regions 1, 4, and 6
		(b)	region 2, except Island and Whatcom counties
		(c)	Wahkiakum and Lewis counties of region 3
(63)	yellow archangel, <i>Lamium galeobdolon</i>	(d)	region 5, except Whitman County
		(a)	Clallam County of region 1
		(b)	Island, San Juan, Skagit, and Whatcom counties of region 2
		(c)	Skamania and Wahkiakum counties of region 3
(64)	yellow floating heart, <i>Nymphoides peltata</i>	(d)	regions 4, 5, and 6
		(a)	regions 1, 2, and 6
		(b)	region 3, except Cowlitz County
		(c)	region 4, except Stevens County
(65)	yellow nutsedge, <i>Cyperus esculentus</i>	(d)	region 5, except Spokane County
		(a)	regions 1 and 4
		(b)	region 2, except Skagit and Thurston counties

Name	Will be a "Class B designate" in all lands lying within:
(66) yellow starthistle, <i>Centaurea solstitialis</i>	(c) region 3, except Clark County
	(d) region 5, except Klickitat and Yakima counties
	(e) region 6, except Franklin and Walla Walla counties
	(a) regions 1, 2, and 3
	(b) region 4, except T36 R38 in the area contained within Hwy 395/Hwy 20, Pingston Creek Road, and Highland Loop Road in Stevens County
	(c) region 5, except Klickitat, and Whitman counties

AMENDATORY SECTION (Amending WSR 12-01-050, filed 12/15/11, effective 1/15/12)

WAC 16-750-140 State noxious weed control board—Committees. Standing committees shall fairly reflect the composition of the board and unless advertised and open to the public, not more than four voting members may attend a committee meeting.

(1) Executive committee. An executive committee is authorized to deal with housekeeping and personnel matters, subject to board approval at the next scheduled board meeting. The chairperson appoints the executive committee with approval of the board.

(2) Standing committees. The standing committees of the board are: Budget, executive, legislative, noxious weed, and education. The board chairperson appoints the chairperson and other members of each committee.

(3) Ad-hoc committees may be appointed from time to time.

(4) Committee voting procedures.

(a) All members of a particular committee have the right to vote. Other members in attendance may enter into discussion, but shall have no vote.

(b) Proxy voting is not permitted.

(c) All questions decided by the committee will be by majority of the committee members present.

(5) Advisory committees. Advisory committees are established by the board as deemed necessary to the functioning of the board. Advisory committees are limited in their scope to the purposes determined by the board.

(6) Notice. Notice of committee meetings shall be given to the executive secretary.

(7) Committee reports.

(a) Committee reports and recommendations are submitted to the board in writing except when committees meet in conjunction with the board.

(b) Minority reports may be submitted by members of a committee, if signed by those members.

(8) Committee compensation. Board members attending meetings of committees will, upon request, be reimbursed on the same basis as for attendance at regularly called board meetings.

(9) All committee appointments will be reviewed in January of even-numbered years.

NEW SECTION

WAC 16-750-142 State noxious weed control board—Executive secretary and education specialist—Hiring and dismissal. The board has the responsibility for hiring and removing from office the executive secretary and education specialist which are exempt employees. The executive secretary or education specialist may be dismissed by a majority vote of the full board upon the recommendation of the chairperson and the executive committee. Prior to initiating a dismissal the executive committee will notify the department. Neglect of duty, gross inefficiency, gross incompetence, gross misconduct, malfeasance or willful violation of obligations may give cause for a recommendation for dismissal or dismissal. Before any action is taken by the board to dismiss the executive secretary or education specialist, the chairperson and one member of the executive committee will confer with the employee and provide in writing and fully explain the charges and contemplated recommendation for dismissal. The privilege of a hearing before the executive committee or full board will be granted to the employee prior to any formal action taken by the board. The employee is granted thirty days preparation time for the hearing and is entitled to present evidence, to be assisted by favorable witnesses, and to confront unfavorable witnesses at the hearing.

AMENDATORY SECTION (Amending WSR 99-24-029, filed 11/23/99, effective 1/3/00)

WAC 16-750-145 State noxious weed control board—Executive secretary—Definition. The executive secretary acts as the chief administrative officer for the board ~~((and)), duties of whom are fixed by the board which include, but are not limited to, as follows:~~

(1) Implements and administers the statutes, administrative rules, and policies of the noxious weed control program assigned to the board;

(2) Plans, develops, and prepares administrative rules and policies for the state noxious weed control program in conjunction with the board and the department; arranges public hearings in compliance with the Administrative Procedure Act and acts as chief hearing officer for the board; conducts elections for positions on the board;

~~(3) ((Coordinates the educational and weed control efforts of county and regional noxious weed control boards and weed districts;~~

~~((4))~~ Coordinates board activities with the department, maintains a liaison and performs coordinating activities with other public and private agencies;

~~((5))~~ ~~(4)~~ Negotiates agreements, ~~((on behalf))~~ with consultation and approval of the board, with federal agencies, tribes, and other public and private agencies;

~~((6))~~ ~~(5)~~ Represents the board before the state legislature; coordinates the development, edits, and oversees the production of the biennial report to the county noxious weed boards and weed districts on how state funds were spent and recommendations for the continued best use of state funds for noxious weed control;

~~((7) Plans, prepares, and presents programs on noxious weed control, specific weed species, and the role of the board;)~~ ~~(6)~~ Acts as the principal spokesperson of the board to the media, technical audiences, and the public;

~~((8) Maintains a collection of scientific and technical information relating to noxious weeds and integrated vegetation management; prepares written findings for the inclusion of species on the state noxious weed list;~~

~~(9) Develops, maintains, and ensures dissemination of information relating to noxious weeds to county noxious weed control boards and weed districts and keeps the general public and program participants informed of board activities and accomplishments;~~

~~((10))~~ ~~(7)~~ Provides technical advice to county noxious weed boards and weed districts on the state noxious weed law and related rules;

~~((11))~~ ~~(8)~~ Plans and coordinates statewide approaches to selected noxious weeds, assists in the development of statewide noxious weed survey standards, coordinates efforts with department weed specialists;

~~((12))~~ ~~(9)~~ Coordinates the activities of the board by scheduling all regular and committee meetings; in consultation with the chair, prepares meeting agendas; prepares all board correspondence; updates board on local, state, and federal noxious weed activities; acts as an ex officio, nonvoting member of all committees;

~~((13))~~ ~~(10)~~ Records the official minutes of the board and ensures their distribution; maintains all board records, acts as public records officer;

~~((14))~~ ~~(11)~~ Oversees fiscal management of the board's administrative budget and cooperates with the department in budget development;

~~((15))~~ ~~(12)~~ Supervises ~~((aH))~~ additional board employees, approves hiring, rehiring, promotion, and termination of ~~((aH))~~ additional board employees and ensures these processes and any disciplinary actions comply with state and department personnel policies; notifies board and department prior to initiating an adverse personnel action against any employee;

~~((16))~~ ~~(13)~~ Performs other assignments as determined by the board.

NEW SECTION

WAC 16-750-146 State noxious weed control board—Education specialist—Definition. The education specialist duties whom are fixed by the board which include, but are not limited to, as follows:

(1) Supports and assists the educational and weed control efforts of county and regional noxious weed control boards and weed districts;

(2) Plans, prepares, and presents programs on noxious weed control, specific weed species, and the role of the board;

(3) Maintains a collection of scientific and technical information relating to noxious weeds and integrated vegetation management; prepares written findings for the inclusion of species on the state noxious weed list;

(4) Develops, maintains, and ensures dissemination of information relating to noxious weeds to county noxious weed control boards and weed districts and keeps the general public and program participants informed of board activities and accomplishments;

(5) Performs other assignments as determined by the board.

REPEALER

The following section of the Washington Administrative Code is repealed:

WAC 16-750-150 State noxious weed control board—
Executive secretary—Hiring and dismissal.

WSR 19-24-058 PERMANENT RULES BUILDING CODE COUNCIL

[Filed November 27, 2019, 8:16 a.m., effective July 1, 2020]

Effective Date of Rule: July 1, 2020.

Purpose: The purpose of this permanent rule making is to adopt the 2018 Washington State Building Code, as amended and adopted by the state building code council on July 26, 2019. The implementation date is July 1, 2020.

Citation of Rules Affected by this Order: New 7; and amending 9 [10].

Statutory Authority for Adoption: RCW 19.27.031.

Other Authority: RCW 19.27.074.

Adopted under notice filed as WSR 19-11-091 on May 17, 2019.

A final cost-benefit analysis is available by contacting Richard Brown, 1500 Jefferson Street S.E., phone 360-407-9277, email Richard.Brown@des.wa.gov, website www.sbcc.wa.gov.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 0, Repealed 0; or Recently Enacted State Statutes: New 0, Amended 0, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 7, Amended 9, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 0, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 0, Amended 0, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 0, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 0, Repealed 0.

Date Adopted: July 26, 2019.

Doug Orth
Chair

AMENDATORY SECTION (Amending WSR 16-05-065, filed 2/12/16, effective 7/1/16)

WAC 51-54A-003 International Fire Code. The ((2015)) 2018 edition of the International Fire Code, published by the International Code Council is hereby adopted by reference with the following additions, deletions, and exceptions.

AMENDATORY SECTION (Amending WSR 17-10-028, filed 4/25/17, effective 5/26/17)

WAC 51-54A-007 Exceptions. The exceptions and amendments to the International Fire Code contained in the provisions of chapter 19.27 RCW shall apply in case of conflict with any of the provisions of these rules.

Codes referenced which are not adopted through RCW 19.27.031 or chapter 19.27A RCW shall not apply unless specifically adopted by the authority having jurisdiction. The ((2015)) 2018 International Wildland Urban Interface Code is included in this code as Section 8200 with amendments found in Appendix Chapter N.

The provisions of this code do not apply to temporary growing structures used solely for the commercial production of horticultural plants including ornamental plants, flowers, vegetables, and fruits. "Temporary growing structure" means a structure that has the sides and roof covered with polyethylene, polyvinyl, or similar flexible synthetic material and is used to provide plants with either frost protection or increased heat retention. A temporary growing structure is not considered a building for purposes of this code.

The provisions of this code do not apply to the construction, alteration, or repair of temporary worker housing except as provided by rule adopted under chapter 70.114A RCW or chapter 37, Laws of 1998 (2SSB 6168). "Temporary worker housing" means a place, area, or piece of land where sleeping places or housing sites are provided by an employer for his or her employees or by another person, including a temporary worker housing operator, who is providing such accommodations for employees, for temporary, seasonal occupancy, and includes "labor camps" under RCW 70.54.110.

The manufacture, storage, handling, sale and use of fireworks shall be governed by chapter 70.77 RCW and by chapter 212-17 WAC and local ordinances consistent with chapter 212-17 WAC.

AMENDATORY SECTION (Amending WSR 16-03-055, filed 1/16/16, effective 7/1/16)

WAC 51-54A-008 Implementation. The *International Fire Code* adopted by chapter 51-54A WAC shall become

effective in all counties and cities of this state on July 1, ((2016)) 2020.

AMENDATORY SECTION (Amending WSR 17-10-028, filed 4/25/17, effective 5/26/17)

WAC 51-54A-0105 Permits.

SECTION 105 SCOPE AND GENERAL REQUIREMENTS

105.6.4 Carbon dioxide systems. An operational permit is required for carbon dioxide systems having more than 100 pounds of carbon dioxide.

105.6.4.9 Marijuana extraction systems. An operational permit is required to use a marijuana/cannabis extraction system regulated under WAC 314-55-104.

105.6.30 Mobile food preparation vehicles. A permit is required for mobile preparation vehicles equipped with appliances that produce smoke or grease-laden vapors or utilize LP-gas systems or CNG systems.

105.7.19 Marijuana extraction systems. A construction permit is required to install a marijuana/cannabis extraction system regulated under WAC 314-55-104.

105.7.20 Underground supply piping for automatic sprinkler system. A construction permit is required for the installation of the portion of the underground water supply piping, public or private, supplying a water-based fire protection system. The permit shall apply to all underground piping and appurtenances downstream of the first control valve on the lateral piping or service line from the distribution main to one foot above finished floor of the facility with the fire protection system. Maintenance performed in accordance with this code is not considered to be a modification and does not require a permit.

EXCEPTIONS:

1. When the underground piping is installed by the aboveground piping contractor.
2. Underground piping serves a fire protection system installed in accordance with NFPA 13D.

AMENDATORY SECTION (Amending WSR 16-03-055, filed 1/16/16, effective 7/1/16)

WAC 51-54A-0202 General definitions.

SECTION 202 GENERAL DEFINITIONS

ADULT FAMILY HOME. A dwelling, licensed by Washington state, in which a person or persons provide personal care, special care, room and board to more than one but not more than six adults who are not related by blood or marriage to the person or persons providing the services.

ALERT SIGNAL. A distinctive signal indicating the need for trained personnel and occupants to initiate a specific action, such as shelter-in-place.

ALERT SYSTEM. Approved devices, equipment and systems or combinations of systems used to transmit or broadcast an alert signal.

ASSISTED LIVING FACILITY. A home or other institution, licensed by the state of Washington, providing housing, basic

services and assuming general responsibility for the safety and well-being of residents under chapters 18.20 RCW and 388-78A WAC. These facilities may provide care to residents with symptoms consistent with dementia requiring additional security measures.

CHILD CARE. For the purposes of these regulations, child care is the care of children during any period of a 24-hour day.

CHILD CARE, FAMILY HOME. A child care facility, licensed by Washington state, located in the dwelling of the person or persons under whose direct care and supervision the child is placed, for the care of twelve or fewer children, including children who reside at the home.

CLUSTER. Clusters are multiple *portable school classrooms* separated by less than the requirements of the building code for separate buildings.

COVERED BOAT MOORAGE. A pier or system of floating or fixed access ways to which vessels on water may be secured and any portion of which are covered by a roof.

ELECTRICAL CODE. The National Electrical Code, promulgated by the National Fire Protection Association, as adopted by rule or local ordinance under the authority of chapter 19.28 RCW.

EXISTING. Buildings, facilities or conditions that are already in existence, constructed or officially authorized prior to the adoption of this code.

GRAVITY-OPERATED DROP OUT VENTS. Automatic smoke and heat vents containing heat-sensitive glazing designed to shrink and drop out of the vent openings when exposed to fire.

HOSPICE CARE CENTER. A building or portion thereof used on a 24-hour basis for the provision of hospice services to terminally ill inpatients.

MOBILE FOOD PREPERATION VEHICLE. Mobile food preparation vehicles that are equipped with appliances that produce smoke or grease-laden vapors or utilize LP-gas systems or CNG systems for the purpose of preparing and serving food to the public. Vehicles intended for private recreation shall not be considered mobile food preparation vehicles.

MOTOR VEHICLE. Includes, but not limited to, a vehicle, machine, tractor, trailer or semitrailer, or any combination thereof, propelled or drawn by mechanical power and designed for use upon the highways in the transportation of passengers or property. It does not include a vehicle, locomotive or car operated exclusively on a rail or rails, or a trolley bus operated by electric power derived from a fixed overhead wire, furnishing local passenger transportation similar to street-railway service. The term "motor vehicle" also includes freight containers or cargo tanks used, or intended for use, in connection with motor vehicles.

NIGHTCLUB. An A-2 Occupancy use under the 2006 International Building Code in which the aggregate area of concentrated use of unfixed chairs and standing space that is specifically designated and primarily used for dancing or viewing performers exceeds three hundred fifty square feet, excluding

adjacent lobby areas. "Nightclub" does not include theaters with fixed seating, banquet halls, or lodge halls.

OCCUPANCY CLASSIFICATION. For the purposes of this code, certain occupancies are defined as follows:

Institutional Group I-1. Institutional Group I-1 occupancy shall include buildings, structures or portions thereof for more than 16 persons excluding staff, who reside on a 24-hour basis in a supervised environment and receive custodial care. Buildings of Group I-1 shall be classified as one of the occupancy conditions indicated below. This group shall include, but not be limited to, the following: Assisted living facilities licensed under chapter 388-78A WAC and residential treatment facilities licensed under chapter 246-337 WAC shall be classified as Group I-1, Condition 2.

Group I-2. This occupancy shall include buildings and structures used for medical care on a 24-hour basis for more than five persons who are incapable of self-preservation. This group shall include, but not be limited to, the following:

- Foster care facilities
- Detoxification facilities
- Hospice care centers
- Hospitals
- Nursing homes
- Psychiatric hospitals

Five or fewer persons receiving care. A facility such as the above with five or fewer persons receiving such care shall be classified as Group R-3 or shall comply with the *International Residential Code* provided an *automatic sprinkler system* is installed in accordance with Section 903.3.1.3 or with Section P2904 of the *International Residential Code*.

~~(**Licensed care facility.** A facility such as the above providing licensed care to clients in one of the categories listed in Section 310.1 of the *International Building Code* licensed by Washington state shall be classified as Group R-2.)~~

Family home child care. Family home child care licensed by Washington state for the care of twelve or fewer children shall be classified as Group R-3 or shall comply with the *International Residential Code*.

Adult care facility. A facility that provides accommodations for less than 24 hours for more than five unrelated adults and provides supervision and personal care services shall be classified as Group I-4.

EXCEPTION: Where the occupants are capable of responding to an emergency situation without physical assistance from the staff, the facility shall be classified as Group R-3.

Child care facility. Child care facilities that provide supervision and personal care on a less than 24-hour basis for more than five children 2 1/2 years of age or less shall be classified as Group I-4.

- EXCEPTIONS:
1. A child day care facility that provides care for more than five but no more than 100 children 2 1/2 years or less of age, where the rooms in which the children are cared for are located on a level of exit discharge serving such rooms and each of these child care rooms has an exit door directly to the exterior, shall be classified as Group E.
 2. Family child care homes licensed by Washington state for the care of 12 or fewer children shall be classified as Group R-3.

Residential Group R. Residential Group R includes, among others, the use of a building or structure, or a portion thereof, for sleeping purposes when not classified as an Institutional Group I or when not regulated by the *International Residential Code*. This group shall include:

R-1 Residential occupancies containing sleeping units where the occupants are primarily transient in nature, including:

- Boarding houses (transient) with more than 10 occupants
- Congregate living facilities (transient) with more than 10 occupants

- Hotels (transient)

- Motels (transient)

R-2 Residential occupancies containing sleeping units or more than two dwelling units where the occupants are primarily permanent in nature, including:

- Apartment houses

- Boarding houses (nontransient) with more than 16 occupants

- Congregate living facilities (nontransient) with more than 16 occupants

- Convents

- Dormitories

- Fraternities and sororities

- Hotels (nontransient)

- Live/work units

- Monasteries

- Motels (nontransient)

~~((Residential treatment facilities as licensed by Washington state under chapter 246-337 WAC))~~

- Vacation timeshare properties

R-3 Residential occupancies where the occupants are primarily permanent in nature and not classified as Group R-1, R-2, or I, including:

- Buildings that do not contain more than two dwelling units.

- Boarding houses (nontransient) with 16 or fewer occupants.

- Boarding houses (transient) with 10 or fewer occupants.

- Care facilities that provide accommodations for five or fewer persons receiving care.

- Congregate living facilities (nontransient) with 16 or fewer occupants.

- Congregate living facilities (transient) with 10 or fewer occupants.

Care facilities within a dwelling. Care facilities for five or fewer persons receiving care that are within a single-family dwelling are permitted to comply with the *International Residential Code* provided an automatic sprinkler system is

installed in accordance with Section 903.3.1.3 or with Section P2904 of the *International Residential Code*.

Adult family homes, family home child care. Adult family homes and family home child care facilities that are within a single-family home are permitted to comply with the *International Residential Code*.

Foster family care homes. Foster family care homes licensed by Washington state are permitted to comply with the *International Residential Code*, as an accessory use to a dwelling, for six or fewer children including those of the resident family.

R-4 Classification is not adopted. Any reference in this code to R-4 does not apply.

PORTABLE SCHOOL CLASSROOM. A prefabricated structure consisting of one or more rooms with direct exterior egress from the classroom(s). The structure is transportable in one or more sections, and is designed to be used as an educational space with or without a permanent foundation. The structure shall be capable of being demounted and relocated to other locations as needs arise.

RECALL SIGNAL. An electrically or mechanically operated signal used to recall occupants after an emergency drill or to terminate a shelter-in-place event that shall be distinct from any alarm or alert signal used to initiate an emergency plan, or other signals.

SHELTER-IN-PLACE. An emergency response used to minimize exposure of facility occupants to chemical or environmental hazards by taking refuge in predetermined interior rooms or areas where actions are taken to isolate the interior environment from the exterior hazard.

Reviser's note: The spelling error in the above section occurred in the copy filed by the agency and appears in the Register pursuant to the requirements of RCW 34.08.040.

NEW SECTION

WAC 51-54A-0314 Indoor displays.

314.1 General. Indoor displays constructed within any occupancy shall comply with Sections 314.2 through 314.4.

314.2 Fixtures and displays. Fixtures and displays of goods for sale to the public shall be arranged so as to maintain free, immediate and unobstructed access to exits as required by Chapter 10.

314.3 Highly combustible goods. The display of highly combustible goods including, but not limited to, fireworks, flammable or combustible liquids, liquefied flammable gases, oxidizing materials, pyroxylin plastics and agricultural goods, in main exit access aisles, corridors, covered and open malls, or within 5 feet (1524 mm) of entrances to exits and exterior exit doors is prohibited where a fire involving such goods would rapidly prevent or obstruct egress.

314.4 Vehicles. Liquid- or gas-fueled vehicles, boats, aircraft or other motorcraft shall not be located indoors except as follows:

1. The engine starting system is made inoperable, batteries are disconnected except where the fire code official

requires that the batteries remain connected to maintain safety features.

2. Fuel in fuel tanks does not exceed one-quarter tank or 5 gallons (19 L) (whichever is least).

3. Fuel tanks and fill openings are closed and sealed to prevent tampering.

Vehicles, aircraft, boats or other motorcraft equipment are not fueled or defueled within the building.

NEW SECTION

WAC 51-54A-0315 General storage.

Table 315.7.6(1)

Separation Distance Between Pallet Stack and Building

Wall Construction	Opening Type	Wood Pallet Separation Distance (feet)		
		≤ 50 Pallets	51 to 200 Pallets	> 200 Pallets
Masonry	None	2	2	2
Masonry	Fire-rated glazing with open sprinklers	2	5	20
Masonry	Fire-rated glazing	5	10	20
Masonry	Plain glass with open sprinklers	5	10	20
Noncombustible	None	5	10	20
Wood with open sprinklers	_____	5	10	20
Wood	None	15	30	90
Any	Plain glass	15	30	90

For SI: 1 foot = 304.8 mm

NEW SECTION

WAC 51-54A-0319 Mobile food preparation vehicles.

319.1 General. Mobile food preparation vehicles that are equipped with appliances that produce smoke or grease-laden vapors or utilize LP-gas systems or CNG systems shall comply with this system.

NEW SECTION

WAC 51-54A-0510 Emergency responder radio coverage.

510.4.1.1 Minimum signal strength into building. The minimum inbound signal strength shall be sufficient to provide usable voice communications throughout the coverage area as specified by the *fire code official*. The inbound signal level shall be a minimum of -95 dBm throughout the coverage area and sufficient to provide not less than a delivered audio quality (DAQ) of 3.0 or an equivalent signal-to-interference-plus-noise ratio (SINR) applicable to the technology for either analog or digital signals.

510.4.2.4 Signal booster requirements. If used, signal boosters shall meet the following requirements:

1. All signal booster components shall be a National Electrical Manufacturer's Association (NEMA) 4, IP656-type waterproof cabinet or equivalent.

2. Battery systems used for the emergency power source shall be contained in a NEMA 3R or higher-rated cabinet, IP656-type waterproof cabinet or equivalent.

3. Equipment shall have FCC or other radio licensing authority certification and be suitable for public safety use prior to installation.

4. Where a donor antenna exists, isolation shall be maintained between the donor antenna and all inside antennas to not less than 20 dB greater than the system gain under all operating conditions.

5. Bi-directional amplifiers (BDAs) active RF emitting devices used in emergency responder radio coverage systems shall have oscillation prevention built-in oscillation detection and control circuitry.

6. The installation of amplification systems or systems that operate on or provide the means to cause interference on any emergency responder radio coverage networks shall be coordinated and approved by the fire code official.

510.5.3 Acceptance test procedure. Where an emergency responder radio coverage system is required, and upon completion of installation, the building *owner* shall have the radio system tested to verify that two-way coverage on each floor of the building is not less than 95 percent. The test procedure shall be conducted as follows:

1. Each floor of the building shall be divided into a grid of 20 approximately equal test areas.

2. The test shall be conducted using a calibrated portable radio of the latest brand and model used by the agency talking through the agency's radio communications system or equipment approved by the fire code official.

3. Failure of more than one test area shall result in failure of the test.

4. In the event that two of the test areas fail the test, in order to be more statistically accurate, the floor shall be permitted to be divided into 40 equal test areas. Failure of not more than two nonadjacent test areas shall not result in failure of the test. If the system fails the 40 area test, the system shall be altered to meet the 95 percent coverage requirement.

5. A test location approximately in the center of each test area shall be selected for the test, with the radio enabled to verify two-way communications to and from the outside of the building through the public agency's radio communications system. Once the test location has been selected, that location shall represent the entire test area. Failure in the selected test location shall be considered to be a failure of that test area. Additional test locations shall not be permitted.

6. The gain values of all amplifiers shall be measured and the test measurement results shall be kept on file with the building *owner* so that the measurements can be verified during annual tests. In the event that the measurement results become lost, the building *owner* shall be required to rerun the acceptance test to reestablish the gain values.

7. As part of the installation, a spectrum analyzer or other suitable test equipment shall be utilized to ensure spurious oscillations are not being generated by the subject signal

booster. This test shall be conducted at the time of installation and at subsequent annual inspections.

8. Systems incorporating Class B signal-booster devices or Class B broadband fiber remote devices shall be tested using two portable radios simultaneously conducting subjective voice quality checks. One portable radio shall be positioned not greater than 10 feet (3048 mm) from the indoor antenna. The second portable radio shall be positioned at a distance that represents the farthest distance from any indoor antenna. With both portable radios simultaneously keyed up on different frequencies within the same band, subjective audio testing shall be conducted and comply with DAQ levels as specified in Sections 510.4.1.1 and 510.4.1.2.

510.5 Installation requirements. The installation of the public safety radio coverage system shall be in accordance with NFPA 1221 and Sections 510.5.1 through 510.5.5.

510.5.5 Mounting of the donor antenna(s). To maintain proper alignment with the system designed donor site, donor antennas shall be permanently affixed on the highest possible position on the building or where approved by the fire code official. A clearly visible sign stating "movement or repositioning of this antenna is prohibited without approval from the fire code official." The antenna installation shall be in accordance with the applicable requirements in the International Building Code for weather protection of the building envelope.

510.6.1 Testing and proof of compliance. The owner of the building or owner's authorized agent shall have the emergency responder radio coverage system inspected and tested annually or where structural changes occur including additions or remodels that could materially change the original field performance tests. Testing shall consist of the following:

1. In-building coverage test as described in Section 510.5.3 or as required by the fire code official.
2. Signal boosters shall be tested to verify that the gain is the same as it was upon initial installation and acceptance or set to optimize the performance of the system.
3. Backup batteries and power supplies shall be tested under load of a period of 1 hour to verify that they will properly operate during an actual power outage. If within the 1-hour test period the battery exhibits symptoms of failure, the test shall be extended for additional 1-hour periods until the integrity of the battery can be determined.
4. Other active components shall be checked to verify operation within the manufacturers specification.
5. At the conclusion of the testing, a report, which shall verify compliance with Section 510.5.3, shall be submitted to the fire code official.

AMENDATORY SECTION (Amending WSR 16-03-055, filed 1/16/16, effective 7/1/16)

WAC 51-54A-0609 Section 607—Commercial kitchen hoods.

~~(M) 609.2~~ 607.2 Where required. A Type I hood shall be installed at or above all commercial cooking appliances and

domestic cooking appliances used for commercial purposes that produce grease laden vapors.

- EXCEPTIONS:
1. A Type I hood shall not be required for an electric cooking appliance where an approved testing agency provides documentation that the appliance effluent contains 5 mg/m³ or less of grease when tested at an exhaust flow rate of 500 cfm (0.236 m³/s) in accordance with Section 17 of UL 710B.
 2. A Type I hood shall not be required to be installed in an R-2 occupancy, an assisted living facility licensed under chapter 388-78A WAC, or a residential treatment facility licensed under chapter 246-337 WAC with not more than 16 residents.

~~(609.2.1)~~ 607.2.1 Domestic cooking appliances used for commercial purposes. Domestic cooking appliances utilized for commercial purposes shall be provided with Type I, Type II or residential hoods as required for the type of appliances and processes in accordance with Table ~~((609.2.1 and) 607.2.1~~ or Sections 507.2 ~~(, 507.2.1 and 507.2.2))~~ and 507.3 of the *International Mechanical Code*.

Table ~~((609.2.1)~~ 607.2.1 Type of Hood Required for Domestic Cooking Appliances in the Following Spaces^{a,b}

Type of Space	Type of Cooking	Type of Hood
Church	1. Boiling, steaming and warming precooked food	<u>Residential hood^e or Type II hood</u>
	2. Roasting, pan frying and deep frying	Type I hood
Community or party room in apartment and condominium	1. Boiling, steaming and warming precooked food	Residential hood ^e or Type II hood ^d
	2. Roasting, pan frying and deep frying	Type I hood
Day care	1. Boiling, steaming and warming precooked food	Residential hood ^e or Type II hood ^d
	2. Roasting, pan frying and deep frying	Type I hood
Dormitory, assisted living facility, nursing home	1. Boiling, steaming and warming precooked food	<u>Residential hood^e or Type II hood</u>
	2. Roasting, pan frying and deep frying	Type I hood
Office lunch room	1. Boiling, steaming and warming precooked food	Residential hood ^e or Type II hood ^d

Type of Space	Type of Cooking	Type of Hood
	2. Roasting, pan frying and deep frying	Type I hood

^a Commercial cooking appliances shall comply with Section 507.2 of the *International Mechanical Code*.

^b Requirements in this table apply to electric or gas fuel appliances only. Solid fuel appliances or charbroilers require Type I hoods.

^c Residential hood shall ventilate to the outside.

^d Type II hood required when more than one appliance is used.

^e Hoods are not required where the HVAC design meets IMC 507.3.

~~((609.3))~~ **607.3 Operations, inspection and maintenance.** Commercial cooking systems shall be operated, inspected and maintained in accordance with Sections ~~((609.3.1 through 609.3.4))~~ 607.3.1 through 607.3.4 and Chapter 11 of NFPA 96.

AMENDATORY SECTION (Amending WSR 17-10-028, filed 4/25/17, effective 5/26/17)

WAC 51-54A-0903 Automatic sprinkler systems.

903.2.1.6 Assembly occupancies on roofs. Where an occupied roof has an assembly occupancy with an occupant load exceeding 100 for Group A-2, and 300 for other Group A occupancies, the building shall be equipped with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2.

EXCEPTION: Open parking garages of Type I or Type II construction.

903.2.1.8 Nightclub. An automatic sprinkler system shall be provided throughout Group A-2 nightclubs as defined in this code.

903.2.3 Group E. An automatic sprinkler system shall be provided for fire areas containing Group E occupancies where the fire area has an occupant load of 51 or more, calculated in accordance with Table 1004.1.2.

EXCEPTIONS:

1. Portable school classrooms with an occupant load of 50 or less calculated in accordance with Table 1004.1.2, provided that the aggregate area of any cluster of portable classrooms does not exceed 6,000 square feet (557 m²); and clusters of portable school classrooms shall be separated as required by the building code; or
2. Portable school classrooms with an occupant load from 51 through 98, calculated in accordance with Table 1004.1.2, and provided with two means of direct independent exterior egress from each classroom in accordance with Chapter 10, and one exit from each classroom shall be accessible, provided that the aggregate area of any cluster of portable classrooms does not exceed 6,000 square feet (557 m²); and clusters of portable school classrooms shall be separated as required by the building code; or
3. Fire areas containing day care and preschool facilities with a total occupant load of 100 or less located at the level of exit discharge where every room in which care is provided has not fewer than one exit discharge door.

903.2.6 Group I. An automatic sprinkler system shall be provided throughout buildings with a Group I *fire area*.

EXCEPTIONS:

1. An *automatic sprinkler system* installed in accordance with Section 903.3.1.2 shall be permitted in Group I-1 Condition 1 facilities.
2. Where new construction or additions house less than sixteen persons receiving care, an automatic sprinkler system installed in accordance with Section 903.2.8.3 shall be permitted for Group I-1, Condition 2, assisted living facilities licensed under chapter 388-78A WAC and residential treatment facilities licensed under chapter 246-337 WAC.

903.2.6.1 Group I-4. An automatic sprinkler system shall be provided in fire areas containing Group I-4 occupancies where the fire area has an occupant load of 51 or more, calculated in accordance with Table 1004.1.2.

EXCEPTIONS:

1. An automatic sprinkler system is not required where Group I-4 day care facilities with a total occupant load of 100 or less, and located at the level of exit discharge and where every room where care is provided has not fewer than one exterior exit door.
2. In buildings where Group I-4 day care is provided on levels other than the level of exit discharge, an automatic sprinkler system in accordance with Section 903.3.1.1 shall be installed on the entire floor where care is provided, all floors between the level of care and the level of exit discharge and all floors below the level of exit discharge other than areas classified as an open parking garage.

903.2.8 Group R. An automatic sprinkler system installed in accordance with Section 903.3 shall be provided throughout all buildings with a Group R fire area.

EXCEPTION:

Group R-1 if all of the following conditions apply:

1. The Group R fire area is no more than 500 square feet and is used for recreational use only.
2. The Group R fire area is on only one story.
3. The Group R fire area does not include a basement.
4. The Group R fire area is no closer than 30 feet from another structure.
5. Cooking is not allowed within the Group R fire area.
6. The Group R fire area has an occupant load of no more than 8.
7. A hand-held (portable) fire extinguisher is in every Group R fire area.

903.2.9 Group S-1. An automatic sprinkler system shall be provided throughout all buildings containing a Group S-1 occupancy where one of the following conditions exists:

1. A Group S-1 fire area exceeds 12,000 square feet (1115 m²).
2. A Group S-1 fire area is located more than three stories above grade plane.
3. The combined area of all Group S-1 fire areas on all floors, including any mezzanines, exceeds 24,000 square feet (2230 m²).
4. A Group S-1 fire area used for the storage of commercial motor vehicles where the fire area exceeds 5,000 square feet (464 m²).
5. A Group S-1 occupancy used for the storage of upholstered furniture or mattresses exceeds 2,500 square feet (232 m²).

6. A Group S-1 occupancy used for self-storage where the *fire area* exceeds 2,500 square feet (232 m²).

903.2.11.1.3 Basements. Where any portion of a basement is located more than 75 feet (22,860 mm) from openings required by Section 903.2.11.1, or where new walls, partitions or other similar obstructions are installed that increase the exit access travel distance to more than 75 feet, the basement shall be equipped throughout with an approved automatic sprinkler system.

903.2.11.7 Relocatable buildings within buildings. Relocatable buildings or structures located within a building with an approved fire sprinkler system shall be provided with fire sprinkler protection within the occupiable space of the building and the space underneath the relocatable building.

EXCEPTIONS:

1. Sprinkler protection is not required underneath the building when the space is separated from the adjacent space by construction resisting the passage of smoke and heat and combustible storage will not be located there.
2. If the building or structure does not have a roof or ceiling obstructing the overhead sprinklers.
3. Construction trailers and temporary offices used during new building construction prior to occupancy.
4. Movable shopping mall kiosks with a roof or canopy dimension of less than 4 feet on the smallest side.

903.3.5.3 Underground portions of fire protection system water supply piping. The installation or modification of an underground water main, public or private, supplying a water-based fire protection system shall be in accordance with NFPA 24 and chapter 18.160 RCW. Piping and appurtenances downstream of the first control valve on the lateral or service line from the distribution main to one-foot above finished floor shall be approved by the fire *code official*. Such underground piping shall be installed by a fire sprinkler system contractor licensed in accordance with chapter 18.160 RCW and holding either a Level U or a Level 3 license. For underground piping supplying systems installed in accordance with Section 903.3.1.2, a Level 2, 3, or U licensed contractor is acceptable.

EXCEPTION: Portions of underground piping supplying automatic sprinkler systems installed in accordance with NFPA 13D.

AMENDATORY SECTION (Amending WSR 16-03-055, filed 1/16/16, effective 7/1/16)

WAC 51-54A-0904 Alternative automatic fire-extinguishing systems.

904.1.1 Certification of service personnel for fire-extinguishing equipment. Service personnel performing system design, installation or conducting system maintenance or testing on automatic fire-extinguishing systems, other than automatic sprinkler systems, shall possess the appropriate ICC/NAFED certification.

904.1.1.1 Preengineered kitchen fire-extinguishing systems. A current ICC/NAFED certification for preengineered kitchen fire-extinguishing systems is required when performing design, installation, inspection/testing or maintenance on kitchen suppression systems.

904.1.1.2 Engineered fire suppression systems. A current ICC/NAFED certification for engineered fire suppression systems is required when performing design, installation, inspection/testing or maintenance on kitchen suppression systems.

904.1.1.3 Preengineered industrial fire-extinguishing system. A current ICC/NAFED certification for preengineered industrial fire-extinguishing system is required when performing design, installation, inspection/testing or maintenance on kitchen suppression systems.

904.12 Commercial cooking systems. The automatic fire-extinguishing system for commercial cooking systems shall be of a type recognized for protection of commercial cooking equipment and exhaust systems of the type and arrangement protected. Preengineered automatic dry and wet chemical extinguishing systems shall be tested in accordance with UL 300 and listed and labeled for the intended application. Other types of automatic fire-extinguishing systems shall be listed and labeled for specific use as protection for commercial cooking operations. The system shall be installed in accordance with this code, its listing and the manufacturer's installation instructions. Signage shall be provided on the exhaust hood or system cabinet, indicating the type and arrangement of cooking appliances protected by the automatic fire-extinguishing system. Signage shall indicate appliances from left to right, be durable, and the size, color, and lettering shall be approved. Automatic fire-extinguishing systems of the following types shall be installed in accordance with the referenced standard indicated, as follows:

1. Carbon dioxide extinguishing systems, NFPA 12;
2. *Automatic sprinkler systems*, NFPA 13;
3. Foam-water sprinkler systems or foam-water spray systems, NFPA 16;
4. Dry-chemical extinguishing systems, NFPA 17;
5. Wet-chemical extinguishing systems, NFPA 17A.

EXCEPTION: Factory-built commercial cooking recirculating systems that are tested in accordance with UL 710B and *listed, labeled* and installed in accordance with Section 304.1 of the *International Mechanical Code*.

AMENDATORY SECTION (Amending WSR 16-03-055, filed 1/16/16, effective 7/1/16)

WAC 51-54A-1010 Doors, gates and turnstiles. ~~((1010.1.9.3))~~ **1010.1.9.4 Locks and latches.** Locks and latches shall be permitted to prevent operation of doors where any of the following exists:

1. Places of detention or restraint.
2. In buildings in occupancy Group A having an occupant load of 300 or less, Groups B, F, M, and S, and in places of religious worship, the main door or doors are permitted to be equipped with key-operated locking devices from the egress side provided:
 - 2.1. The locking device is readily distinguishable as locked;
 - 2.2. A readily visible sign is posted on the egress side on or adjacent to the door stating: THIS DOOR TO REMAIN UNLOCKED WHEN BUILDING IS OCCUPIED. The sign shall be in letters 1 inch (25 mm) high on a contrasting background; and

2.3. The use of the key-operated locking device is revocable by the building official for due cause.

3. Where egress doors are used in pairs, approved automatic flush bolts shall be permitted to be used, provided that the door leaf having the automatic flush bolts has no door-knob or surface-mounted hardware.

4. Doors from individual dwelling or sleeping units of Group R occupancies having an occupant load of 10 or less are permitted to be equipped with a night latch, dead bolt, or security chain, provided such devices are openable from the inside without the use of a key or a tool.

5. Fire doors after the minimum elevated temperature has disabled the unlatching mechanism in accordance with listed fire door test procedures.

6. Approved, listed locks without delayed egress shall be permitted in Group I-1 condition 2 assisted living facilities licensed under chapter 388-78A WAC and Group I-1 Condition 2 residential treatment facilities licensed under chapter 246-337 WAC by the state of Washington, provided that:

6.1. The clinical needs of one or more patients require specialized security measures for their safety.

6.2. The doors unlock upon actuation of the automatic sprinkler system or automatic fire detection system.

6.3. The doors unlock upon loss of electrical power controlling the lock or lock mechanism.

6.4. The lock shall be capable of being deactivated by a signal from a switch located in an approved location.

6.5. There is a system, such as a keypad and code, in place that allows visitors, staff persons and appropriate residents to exit. Instructions for exiting shall be posted within six feet of the door.

6.6. Emergency lighting shall be provided at the door.

~~((1010.1.9.6))~~ **1010.1.9.7 Controlled egress doors in Groups I-1 and I-2.** Electric locking systems, including ~~((electro-mechanical))~~ electromechanical locking systems and electromagnetic locking systems, shall be permitted to be locked in the means of egress in Group I-1 or I-2 occupancies where the clinical needs of persons receiving care require their containment. Controlled egress doors shall be permitted in such occupancies where the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or an approved automatic smoke or heat detection system installed in accordance with Section 907, provided that the doors are installed and operate in accordance with all of the following:

1. The doors unlock upon actuation of the automatic sprinkler system or automatic fire detection system.

2. The doors unlock upon loss of power controlling the lock or lock mechanism.

3. The door locking system shall be installed to have the capability of being unlocked by a switch located at the fire command center, a nursing station or other approved location. The switch shall directly break power to the lock.

4. A building occupant shall not be required to pass through more than one door equipped with a ~~((special))~~ controlled egress ((lock)) locking system before entering an exit.

5. The procedures for unlocking the doors shall be described and approved as part of the emergency planning and preparedness required by Chapter 4 of the *International Fire Code*.

6. There is a system, such as a keypad and code, in place that allows visitors, staff persons and appropriate residents to exit. Instructions for exiting shall be posted within six feet of the door.

7. All clinical staff shall have the keys, codes or other means necessary to operate the locking systems.

~~((7-))~~ 8. Emergency lighting shall be provided at the door.

~~((8-))~~ 9. The door locking system units shall be listed in accordance with UL 294.

EXCEPTIONS:

- Items 1 through 4 and 6 shall not apply to doors to areas where persons, which because of clinical needs, require restraint or containment as part of the function of a psychiatric treatment area ~~((provided that all clinical staff shall have the keys, codes or other means necessary to operate the locking devices))~~.
- Items 1 through 4 and 6 shall not apply to doors to areas where a listed egress control system is utilized to reduce the risk of child abduction from nursery and obstetric areas of a Group I-2 hospital.

1010.1.10 Panic and fire exit hardware. Doors serving a Group H occupancy and doors serving rooms or spaces with an occupant load of 50 or more in a Group A or E occupancy shall not be provided with a latch or lock other than panic hardware or fire exit hardware.

EXCEPTIONS:

- A main exit of a Group A occupancy shall be permitted to be locking in accordance with Section 1010.1.9.3, Item 2.
- Doors serving a Group A or E occupancy shall be permitted to be electromagnetically locked in accordance with Section 1010.1.9.9.

1010.1.10.3 Electrical rooms and working clearances. Exit and exit access doors serving electrical rooms and working spaces shall swing in the direction of egress travel and shall be equipped with panic hardware or fire exit hardware where such rooms or working spaces contain one or more of the following:

- Equipment operating at more than 600 volts, nominal.
- Equipment operating at 600 volts or less, nominal and rated at 800 amperes or more, and where the equipment contains overcurrent devices, switching devices or control devices.

EXCEPTION:

Panic and fire exit hardware is not required on exit and exit access doors serving electrical equipment rooms and working spaces where such doors are not less than twenty-five feet (7.6 m) from the nearest edge of the electrical equipment.

NEW SECTION

WAC 51-54A-3304 Precautions against fire.

3304.5.1 Fire watch during construction. Where required by the fire code official, a fire watch shall be provided during nonworking hours for new construction that exceeds 40 feet (12,192 mm) in height above the lowest adjacent grade.

EXCEPTIONS:

- New construction that is built under the IRC.
- New construction less than 5 stories and 50,000 square feet per story.

AMENDATORY SECTION (Amending WSR 17-03-104, filed 1/17/17, effective 5/1/17)

WAC 51-54A-3800 Marijuana processing or extraction facilities.

SECTION 3801—ADMINISTRATION

3801.1 Scope. Facilities used for marijuana processing or extraction that utilize chemicals or equipment as regulated by the International Fire Code shall comply with this chapter and the International Building Code. The extraction process includes the act of extraction of the oils and fats by use of a solvent, desolventizing of the raw material and production of the miscella, distillation of the solvent from the miscella and solvent recovery. The use, storage, transfilling, and handling of hazardous materials in these facilities shall comply with this chapter and the International Building Code.

3801.2 Application. The requirements set forth in this chapter are requirements specific only to marijuana processing and extraction facilities and shall be applied as exceptions or additions to applicable requirements set forth elsewhere in this code.

3801.2.1 For the purposes of this chapter, marijuana processing and extraction shall be limited to those processes and extraction methods that utilize chemicals defined as hazardous by the International Fire Code and are regulated as such. Such processes and extraction methods shall meet the requirements of this chapter and other applicable requirements elsewhere in this code and its referenced standards.

EXCEPTION: Provisions of WAC 314-55-104 do not apply to this chapter.

3801.2.2 The use of equipment regulated by the International Fire Code for either marijuana processing or marijuana extraction shall meet the requirements of this chapter and other applicable requirements elsewhere in this code.

3801.3 Multiple hazards. Where a material, its use or the process it is associated with poses multiple hazards, all hazards shall be addressed in accordance with Section 5001.1 and other material specific chapters.

3801.4 Existing building or facilities. Existing buildings or facilities used for the processing of marijuana shall comply with this chapter.

3801.5 Permits. Permits shall be required as set forth in Section 105.6 and 105.7.

SECTION 3802—DEFINITIONS

Desolventizing. The act of removing a solvent from a material.

Finding. The results of an inspection, examination, analysis or review.

Marijuana processing. Processing that uses chemicals or equipment as regulated by the International Fire Code; this does not include the harvesting, trimming, or packaging of the plant.

Miscella. A mixture, in any proportion, of the extracted oil or fat and the extracting solvent.

Observation. A practice or condition not technically non-compliant with other regulations or requirements, but could lead to noncompliance if left unaddressed.

Transfilling. The process of taking a gas source, either compressed or in liquid form (usually in bulk containers), and transferring it into a different container (usually a smaller compressed cylinder).

SECTION 3803—PROCESSING OR EXTRACTION OF MARIJUANA

3803.1 Location. Marijuana processing shall be located in a building complying with the International Building Code and this code. Requirements applied to the building shall be based upon the specific needs for mitigation of the specific hazards identified.

3803.2 Systems, equipment and processes. Systems, equipment, and processes shall be in accordance with Sections 3803.2.1 through 3803.2.7. In addition to the requirements of this chapter, electrical equipment shall be listed or evaluated for electrical fire and shock hazard in accordance with RCW 19.28.010(1).

3803.2.1 Application. Systems, equipment and processes shall include, but are not limited to, vessels, chambers, containers, cylinders, tanks, piping, tubing, valves, fittings, and pumps.

3803.2.2 General requirements. In addition to the requirements in Section 3803, systems, equipment and processes shall also comply with Section 5003.2, other applicable provisions of this code, the International Building Code, and the International Mechanical Code. The use of ovens in post-process purification or winterization shall comply with Section 3803.2.7.

3803.2.3 Systems and equipment. Systems or equipment used for the extraction of oils from plant material shall be listed and approved for the specific use. If the system used for extraction of oils and products from plant material is not listed, then a technical report prepared by a Washington licensed engineer shall be provided to the code official for review and approval.

3803.2.4 Change of extraction medium. Where the medium of extraction or solvent is changed from the material indicated in the technical report, or as required by the manufacturer, the technical report shall be revised at the cost of the facility owner, and submitted for review and approval by the fire code official prior to the use of the equipment with the new medium or solvent.

3803.2.5 Required technical report. The technical report documenting the equipment design shall be submitted for review and approval by the fire code official prior to the equipment being installed at the facility.

3803.2.5.1 Content of technical report and engineering analysis. All, but not limited to, the items listed below shall be included in the technical report.

1. Manufacturer information.
2. Engineer of record information.
3. Date of review and report revision history.

4. Signature page shall include:

4.1 Author of the report;

4.2 Date of report;

4.3 Seal, date and signature of engineer of record performing the design; and

5. Model number of the item evaluated. If the equipment is provided with a serial number, the serial number shall be included for verification at the time of site inspection.

6. Methodology of the design review process used to determine minimum safety requirements. Methodology shall consider the basis of design, and shall include a code analysis and code path to demonstrate the reason why specific codes or standards are applicable or not.

7. Equipment description. A list of all components and subassemblies of the system or equipment, indicating the material, solvent compatibility, maximum temperature and pressure limits.

8. A general flow schematic or general process flow diagram (PFD) of the process, including maximum temperatures, pressures and solvent state of matter shall be identified in each step or component. It shall provide maximum operating temperature and pressure in the system.

9. Analysis of the vessel(s) if pressurized beyond standard atmospheric pressure. Analysis shall include purchased and fabricated components.

10. Structural analysis for the frame system supporting the equipment.

11. Process safety analysis of the extraction system, from the introduction of raw product to the end of the extraction process.

12. Comprehensive process hazard analysis considering failure modes and points of failure throughout the process. This portion of the review should include review of emergency procedure information provided by the manufacturer of the equipment or process and not that of the facility, building or room.

13. Review of the assembly instructions, operational and maintenance manuals provided by the manufacturer.

14. Report shall include findings and observations of the analysis.

15. List of references used in the analysis.

3803.2.6 Building analysis. The technical report, provided by the engineer of record, shall include a review of the construction documents for location, room, space or building and include recommendations to the fire code official.

3803.2.6.1 Site inspection. The engineer of record of the equipment shall inspect the installation of the extraction equipment for conformance with the technical report and provide documentation to the fire code official that the equipment was installed in conformance with the approved design.

3803.2.7 Post-process purification and winterization. Post-processing and winterization involving the heating or pressurizing of the miscella shall be approved and performed in an appliance listed for such use. Domestic or commercial cooking appliances shall not be used. The use of industrial ovens shall comply with Chapter 30.

EXCEPTION: An automatic fire extinguishing system shall not be required for batch-type Class A ovens having less than 3.0 cubic feet of work space.

3803.3 Construction requirements.

3803.3.1 Location. Marijuana extraction shall not be located in any building containing a Group A, E, I or R occupancy.

3803.3.1.1 Extraction room. The extraction equipment and processes utilizing hydrocarbon solvents shall be located in a room or area dedicated to extraction.

3803.3.2 Egress. ~~((Any egress door serving an extraction room shall swing in the direction of egress travel and))~~ Doors installed on rooms or areas dedicated to extraction shall be equipped with panic hardware ((and self-closing)) or fire exit hardware.

3803.3.2.1 Facility egress. Egress requirements shall be in compliance with Chapter 10 of the International Building Code.

3803.3.3 Ventilation. Ventilation shall be provided in compliance with Chapter 4 of the International Mechanical Code.

3803.3.4 Control area. Control areas shall comply with Section 5003.8.3.

3803.3.5 Ignition source control. Extraction equipment and processes using flammable or combustible gas or liquid solvents shall be provided with ventilation rates for the room to maintain the concentration of flammable constituents in air below 25((%) percent) of the lower flammability limit of the respective solvent. If not provided with the required ventilation rate, Class I Division II electrical requirements shall apply to the entire room.

3803.3.6 Interlocks. When a hazardous exhaust system is provided, all electrical components within the extraction room or area shall be interlocked with the hazardous exhaust system, and when provided, the gas detection system. When the hazardous exhaust system is not operational, then light switches and electrical outlets shall be disabled. Activation of the gas detection system shall disable all light switches and electrical outlets.

3803.3.7 Emergency power.

3803.3.7.1 Emergency power for extraction process. Where power is required for the operation of the extraction process, an automatic emergency power source in accordance with Section 5004.7 and 604 shall be provided. The emergency power source shall have sufficient capacity to allow safe shutdown of the extraction process plus an additional 2 hours of capacity beyond the shutdown process.

3803.3.7.2 Emergency power for other than extraction process. An automatic emergency power system in accordance with Section 604 shall be provided when any of the following items are installed:

1. Extraction room lighting;
2. Extraction room ventilation system;
3. Solvent gas detection system;
4. Emergency alarm systems;
5. Automatic fire extinguishing systems.

3803.3.8 Continuous gas detection system. For extraction processes utilizing gaseous hydrocarbon-based solvents, a continuous gas detection system shall be provided. The gas detection threshold shall not exceed 25((%)) percent of the LEL/LFL limit of the materials.

3803.4 Carbon dioxide enrichment or extraction. Extraction processes using carbon dioxide shall comply with this section.

3803.4.1 Scope. Carbon dioxide systems with more than 100 pounds of carbon dioxide shall comply with Sections 3803.4 through 3803.4.3. This section is applicable to carbon dioxide systems utilizing compressed gas systems, liquefied-gas systems, dry ice, or on-site carbon dioxide generation.

3803.4.2 Permits. Permits shall be required as set forth in Sections 105.6 and 105.7.

3803.4.3 Signage. At the entrance to each area using or storing carbon dioxide, signage shall be posted indicating the hazard. Signs shall be durable and permanent in nature and not less than 7 inches wide by 10 inches tall. Signs shall bear the warning "DANGER! POTENTIAL OXYGEN DEFICIENT ATMOSPHERE." NFPA 704 signage shall be provided at the building main entry and the rooms where the carbon dioxide is used and stored.

3803.5 Flammable or combustible liquid. The use of a flammable or combustible liquid for the extraction of oils and fats from marijuana shall comply with this section.

3803.5.1 Scope. The use of flammable and combustible liquids for liquid extraction processes where the liquid is boiled, distilled, or evaporated shall comply with this section and NFPA 30.

3803.5.2 Location. The process using a flammable or combustible liquid shall be located within a hazardous exhaust fume hood, rated for exhausting flammable vapors. Electrical equipment used within the hazardous exhaust fume hood shall be listed or approved for use in flammable atmospheres. Heating of flammable or combustible liquids over an open flame is prohibited.

NEW SECTION

WAC 51-54A-3904 Systems and equipment.

3904.2 Systems and equipment. Systems or equipment used for the extraction of oils from plant material shall comply with either Section 3404.2.1 or 3404.2.2.

3904.2.1 Listings. Systems or equipment used for the extraction of oils from plant material shall be listed and labeled in accordance with UL 1389 and installed in accordance with the listing and the manufacturer's installation instructions.

3904.2.2 Approvals. Systems or equipment used for the extraction of oils from plant material shall be approved for the specific use. The system shall be reviewed by a registered design professional. The registered design professional shall review and consider any information provided by the system's designer or manufacturer. A technical report in accordance with Section 3904.2.2.1 shall be prepared and submitted to the fire code official for review and approval. The firm or individual preparing the technical report shall be approved by the fire code official prior to performing the analysis.

3904.2.2.1 Technical report. A technical report, reviewed and approved by the *fire code official* as required by Section 3904.2.2, is required prior to the equipment being located or installed at the facility. The report shall be prepared by a *registered design professional* or other professional approved by the *fire code official*.

3904.2.2.2 Report content. The technical report shall contain all of the following:

1. Manufacturer information;
2. Preparer of record of the technical report;
3. Date of review and report revision history;
4. Signature page, including all of the following:
 - 4.1. Author of the report;
 - 4.2. Date of report;
 - 4.3. Date and signature of *registered design professional* of record performing the design or peer review.
5. Model number of the item evaluated. If the equipment is provided with a serial number, the serial number shall be included for verification at the time of site inspection;
6. Methodology of the design or peer review process used to determine minimum safety requirements. Methodology shall consider the basis of design, and shall include a code analysis and code path to demonstrate whether specific codes or standards are applicable;
7. Equipment description. A list of every component and subassembly, such as fittings, hose, quick disconnects, gauges, site glass, gaskets, valves, pumps, vessels, containers and switches, of the system or equipment, indicating the manufacturer, model number, material and solvent compatibility. Manufacturer's data sheets shall be provided;
8. A general flow schematic or general process flow diagram of the process. Postprocessing or winterization shall be included in this diagram. Primary components of the process equipment shall be identified and match the equipment list required in Item 7. Operating temperatures, pressures and solvent state of matter shall be identified in each primary step or component. A piping and instrumentation diagram (PID or P&ID) shall be provided;
9. Analysis of the vessel(s) if pressurized beyond standard atmospheric pressure. Analysis shall include purchased and fabricated components;
10. Structural analysis for the frame system supporting the equipment;
11. Process safety analysis of the extraction system, from the introduction of raw product to the end of the extraction process;
12. Comprehensive process hazard analysis considering failure modes and points of failure throughout the process. The process hazard analysis shall include a review of emergency procedure information provided by the manufacturer of the equipment or process and not that of the facility, building or room;
13. Review of the assembly instructions, operational and maintenance manuals provided by the manufacturer;
14. List of references used in the analysis.

3904.2.2.3 Site inspection. Prior to operation of the extraction equipment, where required by the *fire code official*, the engineer of record or *approved* professional, as *approved* in Section 3904.2.2, shall inspect the site of the extraction process once equipment has been installed for compliance with the technical report and the building analysis. The engineer of record or *approved* professional shall provide a report of findings and observations of the site inspection to the *fire code official* prior to the approval of the extraction process. The field inspection report authored by the engineer of record shall include the serial number of the equipment used in the process and shall confirm that the equipment installed is the same model and type of equipment identified in the technical report.

NEW SECTION

WAC 51-54A-5003 General requirements.

Table 5003.11.1

Maximum Allowable Quantities Per Indoor and Outdoor Control Area in Group M and S Occupancies - Nonflammable Solids, Nonflammable and Combustible Liquids ^{d,e,f}

Conditions		Maximum Allowable Quantities Per Control Area	
Materials	Class	Solids (pounds)	Liquids (gallons)
A. Health-Hazard Materials Nonflammable and Noncombustible Solids and Liquids			
1. Corrosive ^{b,c}	Not Applicable	9,750	975
2. Highly Toxic	Not Applicable	20 ^{b,c}	2 ^{b,c}
3. Toxics ^{b,c}	Not Applicable	1,000	100
B. Physical-Hazard Materials Nonflammable and Noncombustible Solids and Liquids			
1. Oxidizer ^{b,c}	4	Not Allowed	Not Allowed
	3	1,350 ^g	135
	2	2,250 ^h	225
	1	18,000 ^{ij}	1,800 ^{ij}
2. Unstable (Reactives) ^{b,c}	4	Not Allowed	Not Allowed
	3	550	55
	2	1,150	115
	1	Not Limited	Not Limited
3. Water Reactives	3 ^{b,c}	550	55
	2 ^{b,c}	1,150	115
	1	Not Limited	Not Limited

- For SI: 1 pound = 0.454 kg, 1 gallon = 3.785 L, 1 cubic foot = 0.02832 m³.
- a. Hazard categories are as specified in Section 5001.2.2.
 - b. Maximum allowable quantities shall be increased 100 percent in buildings equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1. Where note c applies, the increase for both notes shall be applied accumulatively.
 - c. Maximum allowable quantities shall be increased 100 percent where stored in approved storage cabinets in accordance with Section 5003.8. Where note b applies, the increase for both notes shall be applied accumulatively.
 - d. See Table 5003.8.3.2 for design and number of control areas.
 - e. Maximum allowable quantities for other hazardous material categories shall be in accordance with Section 5003.1.
 - f. Maximum allowable quantities shall be increased 100 percent in outdoor control areas.
 - g. Maximum allowable quantities shall be increased to 2,250 pounds where individual packages are in the original sealed containers from the manufacturer or packager and do not exceed 10 pounds each.
 - h. Maximum allowable quantities shall be increased to 4,500 pounds where individual packages are in the original sealed containers from the manufacturer or packager and do not exceed 10 pounds each.
 - i. Quantities are unlimited where protected by an automatic sprinkler system.
 - j. Quantities are unlimited in an outdoor control area.
 - k. Maximum allowable quantity of consumer products shall be increased to 10,000 pounds where individual packages are in original sealed containers from the manufacturer and the toxic classification is exclusively based on the LC₅₀.

**WSR 19-24-059
PERMANENT RULES
WASHINGTON STATE PATROL**

[Filed November 27, 2019, 8:17 a.m., effective December 28, 2019]

Effective Date of Rule: Thirty-one days after filing.

Purpose: To add the American Society of Sanitary Engineering 15010 Field Technician Certification as an alternative prerequisite certification for inspection and testing technician.

Citation of Rules Affected by this Order: Amending WAC 212-80-093.

Statutory Authority for Adoption: RCW 18.270.900 and 18.160.030.

Adopted under notice filed as WSR 19-21-013 on October 4, 2019.

A final cost-benefit analysis is available by contacting Kimberly Mathis, Agency Rules Coordinator, 106 11th Avenue S.W., Olympia, WA 98504, phone 360-596-4017, email wsprules@wsp.wa.gov, website wsp.wa.gov.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 0, Repealed 0; or Recently Enacted State Statutes: New 0, Amended 0, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 1, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 0, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 0, Amended 0, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 0, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 0, Repealed 0.

Date Adopted: November 27, 2019.

John R. Batiste
Chief

AMENDATORY SECTION (Amending WSR 17-10-031, filed 4/26/17, effective 5/27/17)

WAC 212-80-093 Certificate holder certification. (1) **How do I become a certificate holder?** The issuance of a certificate is dependent on employment with a licensed contractor. All applications for a certificate must be submitted with the fire protection sprinkler system contractor's license application. A certificate application will not be processed without the fire protection sprinkler system contractor's license application. All applications must be made on the forms provided by the director and include the required fees provided by WAC 212-80-098 and documentation for the required level of certification as provided by this section.

(a) **For Level 1 design certification**, the applicant must:

(i) Have satisfactorily passed with a final score of eighty percent or better an examination administered by the director, or present a copy of a current certificate from the National Institute for Certification in Engineering Technologies showing that the applicant has achieved Level 2 certification in the field of water-based fire protection system layout; or

(ii) Be a Washington licensed professional engineer.

(b) **For Level 2 design certification**, the applicant must:

(i) Present a copy of a current certificate from the National Institute for Certification in Engineering Technologies showing that the applicant has achieved a Level 2 in the field of water-based fire protection systems layout; or

(ii) Be a Washington licensed professional engineer.

(c) **For Level 3 design certification**, the applicant must either:

(i) Present a copy of a current certificate from the National Institute for Certification in Engineering Technologies showing that the applicant has achieved a Level 3 in the field of water-based fire protection systems layout; or

(ii) Be a Washington licensed professional engineer.

(d) **For Level U certification**, the applicant must have satisfactorily passed with a final score of eighty percent or better an examination administered by the director.

(e) **For inspection and testing technician certification**, the applicant must:

(i) Possess a National Institute for Certification and Engineering Technologies Inspection, Testing and Maintenance Level 2 or Level 3 certification or American Society of Sanitary Engineers 15010 Field Technician Certification; and

(ii) Perform work consistent with the employing contractor's licensing level.

(f) **For journey-level sprinkler fitter certification**, the applicant must:

(i) Provide evidence on the forms provided by the director of at least eight thousand hours of trade related fire protection sprinkler system experience in installation and repair;

(ii) Not have more than three thousand hours of the required eight thousand hours of experience in residential sprinkler fitting; and

(iii) Satisfactorily pass an examination provided by the director with a final score of eighty percent.

(g) **For residential sprinkler fitter certification**, the applicant must:

(i) Provide evidence on the forms provided by the director, of at least four thousand hours of trade related fire protection sprinkler system experience in installation, repair, and maintenance; and

(ii) Satisfactorily pass an examination provided by the director with a final score of eighty percent.

(h) **For journey- or residential-level sprinkler fitter training certification**, except as provided by (g)(i) of this subsection, the applicant must:

(i) Provide evidence to the director, on the forms provided by the director, of trade related employment by a licensed contractor;

(ii) Remain employed by a licensed contractor to maintain trainee status; and

(iii) Only engage in the fire protection sprinkler system trade when under the supervision of a certified journey level or residential installer.

(i) **For a professional engineer** to act as a Level 1, 2, or 3 certificate of competency holder and be issued a stamp, the professional engineer must:

(i) Be licensed by the department of licensing;

(ii) Obtain a Level 1, Level 2, or Level 3 certificate;

(iii) Properly register with the department of licensing;

(iv) Complete the application process for certification provided by WAC 212-80-093;

(v) Pay fees provided by WAC 212-80-073;

(vi) Supply the director with proof that he or she holds a current, valid state of Washington registration as a professional engineer; and

(vii) Otherwise the professional engineer is exempt from certification when acting solely in a professional capacity as an engineer.

(2) Proof of competency to the satisfaction of the director is mandatory.

Certificate of Competency Holder Requirements				
Certificate of Competency Level	Application Required	Certification or Exam Required	Stamp Issued	Type of work performed by Certificate Holder
Level 1	Yes	NICET Level 2 or pass an exam (See WAC 212-80-093 (1)(a))	Yes	Designs NFPA 13D fire sprinkler systems or inspection, testing, maintenance (NFPA 25) for NFPA 13D
Level 2	Yes	NICET Level 2 (See WAC 212-80-093 (1)(b))	Yes	Designs NFPA 13D, 13R or certain NFPA 24 (Restricted to only certain NFPA 13R systems, see WAC 212-80-018 (1)(b)) fire sprinkler systems or inspection, testing, maintenance (NFPA 25) for NFPA 13D or 13R
Level 3	Yes	NICET Level 3 or 4 (See WAC 212-80-093 (1)(b)) (c))	Yes	Designs NFPA 13, 13D, 13R or 24 fire sprinkler systems or inspection, testing, maintenance (NFPA 25) for NFPA 13, 13D or 13R
Level "U"	Yes	Pass an exam (See WAC 212-80-093 (1)(e)) (d))	Yes	Supervises or performs the underground installation of fire sprinkler system piping
Inspection, Testing Technician (ITT) Employed by an Inspection & Testing Contractor	Yes	NICET Level 2 or <u>ASSE 15010</u> (See WAC 212-80-093 (1)(d)) (e))	No	Performs inspection or testing on NFPA 13R or 13, wet and dry pipe fire protection systems only
Inspection, Testing Technician (ITT) Employed by a Level 2 Contractor	Yes	NICET Level 2 or <u>ASSE 15010</u> (See WAC 212-80-093 (1)(d)) (e))	No	Performs inspection, testing and maintenance on NFPA 13R or 13, wet and dry pipe fire protection systems only
Inspection, Testing Technician (ITT) Employed by a Level 3 Contractor	Yes	NICET Level 2 or <u>ASSE 15010</u> (See WAC 212-80-093 (1)(d)) (e))	No	Same as ITT above and includes the testing of other fire protection systems such as preaction, deluge, foam, or fire pump
Journey Sprinkler Fitter	Yes	Pass an exam (See WAC 212-80-093 (1)(e)) (f))	No	Installs and repairs NFPA 13D, 13R, or 13 fire sprinkler systems

Certificate of Competency Holder Requirements				
Certificate of Competency Level	Application Required	Certification or Exam Required	Stamp Issued	Type of work performed by Certificate Holder
Residential Sprinkler Fitter	Yes	Pass an exam (See WAC 212-80-093 (1)(f)) (g)	No	Installs, repairs, and performs maintenance on fire sprinkler systems in residential occupancies
Professional Engineer (P.E.) Licensed in Washington State	Only if acting as a Level 1, 2 or 3 certificate of competency holder	Licensed with department of licensing	By DOL unless acting as a Level 1, 2, or 3 certificate of competency holder	Designs, evaluates or consults on fire protection fire sprinkler systems

(3) All information submitted by an applicant to the director to apply for a certificate must be true and accurate. If the director finds that information or documents submitted by an applicant is false, misleading, or has been altered in an effort to meet the requirements provided by this chapter, the finding will constitute a level 3 violation.

(4) A violation of this section that involves a contractor allowing an employee to engage in performing fire protection sprinkler system work:

(a) Without a license or certificate, or with a license or certificate that has been expired for one or more years is a level 3 violation.

(b) With a license or certificate that has been expired for more than ninety days and less than one year is a level 2 violation.

(c) With a license or certificate that has been expired less than ninety days is a level 1 violation.

(d) By engaging in the trade of fire sprinkler fitting without having a valid sprinkler fitter certificate of competency issued for the work being conducted is a level 3 violation.

(e) By a trainee sprinkler fitter engaging in the trade of fire sprinkler fitting without the direct supervision of a certified residential or journey sprinkler fitter is a level 3 violation.

(f) As a trainee without a trainee certificate but with the direct supervision of a certified residential or journey sprinkler fitter is a level 1 violation.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 0, Repealed 0; or Recently Enacted State Statutes: New 0, Amended 0, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 0, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 0, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 0, Amended 1, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 0, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 1, Repealed 0.

Date Adopted: November 27, 2019.

Wendy Barcus
Rules Coordinator

AMENDATORY SECTION (Amending WSR 17-18-024, filed 8/28/17, effective 10/1/17)

WAC 182-523-0100 Washington apple health—Medical extension. (1) A parent or caretaker relative who was eligible for and who received coverage under Washington apple health for parents and caretaker relatives, described in WAC 182-505-0240, in any three of the last six months is eligible, along with all dependent children living in the household, for twelve months' extended health care coverage if the person becomes ineligible for (~~his or her current~~) coverage due to increased earnings or hours of employment.

(2) A person remains eligible for apple health medical extension unless:

(a) The person:

(i) Moves out of state;

(ii) Dies; or

(iii) (~~Becomes an inmate of a public institution; or~~ (~~is~~)) Leaves the household.

(b) The family:

(i) Moves out of state;

(ii) Loses contact with the agency or its designee or the whereabouts of the family are unknown; or

**WSR 19-24-060
PERMANENT RULES**

HEALTH CARE AUTHORITY

[Filed November 27, 2019, 11:12 a.m., effective December 28, 2019]

Effective Date of Rule: Thirty-one days after filing.

Purpose: The agency is striking subsection (2)(iii). The agency does not change eligibility based on incarceration status.

Citation of Rules Affected by this Order: Amending WAC 182-523-0100.

Statutory Authority for Adoption: RCW 41.05.021, 41.05.160; SSB 6430, chapter 154, 2016 regular session.

Adopted under notice filed as WSR 19-21-129 on October 21, 2019.

(iii) No longer includes an eligible dependent child as defined in WAC 182-503-0565(2).

(3) When a person or family is determined ineligible for apple health coverage under subsection (2)(a)(i) through (iii) or (b)(i) or (ii) of this section during the medical extension period, the agency or its designee redetermines eligibility for the remaining household members as described in WAC 182-504-0125 and sends written notice as described in chapter 182-518 WAC before apple health medical extension is terminated.

WSR 19-24-063

PERMANENT RULES

HEALTH CARE AUTHORITY

[Filed November 27, 2019, 11:27 a.m., effective January 1, 2020]

Effective Date of Rule: January 1, 2020.

Purpose: This rule making is required to comply with the requirements in 2ESHB 1388 which changed the designation of the state behavioral health authority from the department of social and health services to the health care authority, effective July 1, 2018. These rules currently operate under emergency filing WSR 19-13-057.

This rule making is also required to implement E2SSB 5432 which directs the agency to fully implement behavioral health integration for January 1, 2020, by: (1) Removing behavioral health organizations from law; (2) clarifying the roles and responsibilities among the health care authority, the department of social and health services, and the department of health; (3) clarifying the roles and responsibilities of behavioral health administrative services organizations and the medicaid managed care organizations; and (4) making technical corrections related to the behavioral health system.

This rule making is also needed to implement 2SSB 6312 concerning state purchasing of mental health and chemical dependency treatment services and the full integration of medical and behavioral health services by January 1, 2020.

Citation of Rules Affected by this Order: New WAC 182-538-170 Notice requirements, 182-538-180 Rights and protections, 182-538-190 Behavioral health services only (BH-SO), 182-538C-252 Behavioral health administrative services organizations—Advisory board membership, chapter 182-100 WAC, Problem gambling and chapter 182-538D WAC, Behavioral health services; repealing WAC 182-538A-040 Washington apple health fully integrated managed care, 182-538A-050 Definitions, 182-538A-060 Fully integrated managed care and choice, 182-538A-067 Qualifications to become a managed care organization (MCO) in fully integrated managed care (FIMC) regional service areas, 182-538A-068 Qualifications to become a primary care case management (PCCM) provider in fully integrated managed care (FIMC) regional service areas, 182-538A-070 Payments to managed care organizations (MCOs) in fully integrated managed care (FIMC) regional service areas, 182-538A-071 Payments to primary care case management (PCCM) providers in fully integrated managed care (FIMC) regional service areas, 182-538A-095 Scope of care for fully integrated managed care (FIMC) and behavioral health services only (BH-SO) enrollees, 182-538A-100 Managed care emergency

services for fully integrated managed care (FIMC) and enrollees, 182-538A-110 The grievance and appeal system, and agency administrative hearing for fully integrated managed care (FIMC) managed care organization (MCO) enrollees, 182-538A-111 The administrative hearing process for primary care case management (PCCM) enrollees in FIMC regional service areas, 182-538A-120 Fully integrated managed care (FIMC) enrollee request for a second medical opinion, 182-538A-130 Exemptions and ending enrollment in fully integrated managed care (FIMC), 182-538A-140 Fully integrated managed care (FIMC) quality of care, 182-538A-150 Apple health foster care program in fully integrated managed care regional service areas, 182-538A-170 Notice requirements, 182-538A-180 Rights and protections and 182-538A-190 Behavioral health services only (BH-SO); and amending WAC 182-538-040 Introduction, 182-538-050 Definitions, 182-538-060 Managed care choice and assignment, 182-538-067 Qualification to become a managed care organization (MCO), 182-538-068 Qualifications to become a primary care case management (PCCM) provider, 182-538-070 Payments to managed care organization (MCOs), 182-538-071 Payments for primary care case management (PCCM) providers, 182-538-095 Scope of care for managed care enrollees, 182-538-096 Scope of service for PCCM enrollees, 182-538-100 Managed care emergency services, 182-538-110 The grievance and appeal system and agency administrative hearing for managed care organization (MCO) enrollees, 182-538-111 The administrative hearing process for primary care case management (PCCM), 182-538-130 Exemptions and ending enrollment in managed care, 182-538-140 Quality of care, 182-538-150 Apple health foster care program, 182-538C-040 Behavioral health services, 182-538C-050 Definitions, 182-538C-070 Payment, 182-538C-110 Grievance and appeal system and agency administrative hearing for behavioral health administrative services organizations (BH-ASOs), 182-538C-220 Covered crisis mental health services, 182-538C-230 Covered substance use disorder detoxification services, and chapter 182-538B WAC, Behavioral health wraparound services.

Statutory Authority for Adoption: RCW 41.05.021, 41.05.160; E2SSB 5432, 66th legislature, 2019 regular session; 2SSB 6312, 63rd legislature, 2104 [2014] regular session; 2ESBH [2ESHB] 1388 (chapter 201, Laws of 2018).

Other Authority: Not applicable.

Adopted under notice filed as WSR 19-20-125 on October 2, 2019.

Changes Other than Editing from Proposed to Adopted Version:

Proposed/Adopted	WAC Subsection	Reason
WAC 182-538-070 Payments.		
Proposed	<p><u>(5) The MCO pays a reimbursement for each patient day of care that exceeds the MCO daily allocation of state hospital beds based on a quarterly calculation of the bed usage.</u></p> <p><u>(a) The agency bills the MCO quarterly for state hospital patient days of care exceeding the MCO daily allocation of state hospital beds and the established rate of reimbursement.</u></p> <p><u>(b) An MCO using fewer patient days of care than its quarterly allocation of state hospital beds receives a portion of the reimbursement collected proportional to its share of the total number of patient days of care that were not used at the appropriate state hospital.</u></p>	The agency removed the bed allocation process because related fees ended in the summer of 2019. Specifically, the agency removed WAC 182-538-070(5).
Adopted	<p>(5) The MCO pays a reimbursement for each patient day of care that exceeds the MCO daily allocation of state hospital beds based on a quarterly calculation of the bed usage.</p> <p>(a) The agency bills the MCO quarterly for state hospital patient days of care exceeding the MCO daily allocation of state hospital beds and the established rate of reimbursement.</p> <p>(b) An MCO using fewer patient days of care than its quarterly allocation of state hospital beds receives a portion of the reimbursement collected proportional to its share of the total number of patient days of care that were not used at the appropriate state hospital.</p>	
WAC 182-538-110 The grievance and appeal system and agency administrative hearing for managed care organization (MCO) enrollees.		
Proposed	<p><u>(3)(g) Methods to file either a grievance or appeal include, but are not limited to, U.S. mail, commercial delivery services, hand delivery, fax, and email.</u></p>	The agency added "telephone" to the list of additional methods to file either a grievance or appeal. This is to more closely match federal provisions in 42 C.F.R. 438.406 (b)(3).
Adopted	<p><u>(3)(g) Methods to file either a grievance or appeal include, but are not limited to, U.S. mail, commercial delivery services, hand delivery, fax, <u>telephone</u>, and email.</u></p>	

Proposed/Adopted	WAC Subsection	Reason
WAC 182-538-130 Exemptions and ending enrollment in managed care.		
Proposed	(2)(b) The agency grants a request to exempt or to end enrollment in managed care when the client or enrollee:	This change was made to clarify when a request for exemption from managed care becomes effective for clients who have a right to be exempted.
Adopted	(2)(b) The agency grants a request to exempt or to end enrollment in managed care, <u>with the change effective the earliest possible date given the requirements of the agency's enrollment system</u> , when the client or enrollee:	
WAC 182-538-190 Behavioral health services only (BHSO).		
Proposed	(5) A BHSO enrollee may change MCOs for any reason with the change becoming effective according to the agency's managed care policy.	The agency made this change to match the agency's online behavioral health organization (BHO) fact sheet, which states that clients can change managed care organizations (MCOs) at "any time." The agency also added a more specific statement about the agency's policy for the effective date of MCO choices.
Adopted	(5) A BHSO enrollee may change MCOs <u>at any time</u> for any reason with the change becoming effective <u>the earliest possible date given the requirements of the agency's enrollment system</u> .	

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 0, Repealed 0; or Recently Enacted State Statutes: New 0, Amended 0, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 0, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 0, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 17, Amended 23, Repealed 18.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 0, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 17, Amended 23, Repealed 18.

Date Adopted: November 27, 2019.

Wendy Barcus
Rules Coordinator

**Chapter 182-100 WAC
PROBLEM GAMBLING**

NEW SECTION

WAC 182-100-0100 Problem gambling and gambling disorder treatment services. (1) Under RCW 41.05.-750, the Washington state health care authority (HCA) administers a program to:

- (a) Prevent and treat problem gambling and gambling disorder; and
- (b) Train professionals to identify and treat problem gambling issues and gambling disorders. Training must be administered by a qualified person who has training and

experience in treatment services for people experiencing a problem gambling issue or gambling disorder.

(2) To be eligible to receive treatment under this program, a person must participate in a behavioral health assessment process under WAC 246-341-0610 to determine that the person:

- (a) Has a problem gambling issue or gambling disorder;
- (b) Wants treatment and is willing to do the work necessary to undergo treatment; and
- (c) Is unable to afford treatment.

(3) Family members of a person who has a problem gambling issue or gambling disorder may be eligible to receive treatment if they are unable to afford treatment.

(4) Treatment under this section is available only to the extent of the funds appropriated or otherwise made available to HCA for this purpose.

(5) Problem gambling and gambling disorder treatment services include diagnostic screening and assessment, and individual, group, couples, and family counseling and case management.

(6) An agency providing problem gambling and gambling disorder services must meet the behavioral health agency licensure, certification, administration, personnel, clinical, and outpatient requirements in WAC 246-341-0754 and 246-341-0300 through 246-341-0650.

(7) Definitions for the purposes of this section only.

(a) "**Gambling disorder**" means a mental disorder as defined in the most current edition of the *Diagnostic and Statistical Manual of Mental Disorders* and is characterized by loss of control over gambling, progression in preoccupation with gambling and in obtaining money to gamble, and continuation of gambling despite adverse consequences;

(b) "**Problem gambling**" means at-risk behavior that compromises, disrupts, or damages family or personal relationships, or vocational pursuits.

AMENDATORY SECTION (Amending WSR 17-23-199, filed 11/22/17, effective 12/23/17)

WAC 182-538-040 Introduction. (1) This chapter governs services provided under the Washington apple health integrated managed care (IMC) contract ~~((s. If a conflict exists between the requirements of this chapter and other rules, the requirements of this chapter take precedence)).~~

(2) IMC provides physical and behavioral health services to medicaid beneficiaries through managed care.

(3) IMC includes enrollees receiving behavioral health services only (BHSO).

(4) IMC medicaid services are available only through a contracted managed care organization (MCO) and its provider network, except as identified in this chapter.

(5) For nonmedicaid funded behavioral health wrap-around services, see chapter 182-538B WAC.

(6) For crisis and crisis related behavioral health services, see chapter 182-538C WAC.

(7) For behavioral health services, also see chapter 182-538D WAC.

AMENDATORY SECTION (Amending WSR 17-23-199, filed 11/22/17, effective 12/23/17)

WAC 182-538-050 Definitions. The following definitions and abbreviations and those found in chapter 182-500 WAC ~~((; Medical definitions;))~~ apply to this chapter. If conflict exists, this chapter takes precedence.

"Administrative hearing" means ~~((the agency's administrative hearing process))~~ an evidentiary adjudicative proceeding before an administrative law judge or presiding officer that is available to an enrollee under chapter 182-526 WAC ((for review of an adverse benefit determination in accordance with)) according to RCW 74.09.741.

"Adverse benefit determination" means one or more of the following:

(a) The denial or limited authorization of a requested service, including determinations based on the type or level of service, requirements for medical necessity, appropriateness, setting, or effectiveness of a covered benefit;

(b) The reduction, suspension, or termination of a previously authorized service;

(c) The denial, in whole or in part, of payment for a service;

(d) The failure to provide services in a timely manner, as defined by the state;

(e) The failure of a managed care organization (MCO) to act within the time frames provided in 42 C.F.R. Sec. 438.408 (a), (b)(1) and (2) for standard resolution of grievances and appeals; or

(f) For a resident of a rural area with only one MCO, the denial of an enrollee's request to exercise the enrollee's right to obtain services outside the network under 42 C.F.R. Sec. 438.52 (b)(2)(ii).

"Agency" - See WAC 182-500-0010.

"Appeal" means a review by an MCO of an adverse benefit determination.

"Apple health foster care (AHFC)" means the managed care program developed by the agency and the department of social and health services to serve children and youth

in foster care and adoption support and young adult alumni of the foster care program.

"Assign" or **"assignment"** means the agency selects an MCO to serve a client who has not selected an MCO.

"Auto enrollment" means the agency has automatically enrolled a client into an MCO in the client's area of residence.

"Behavioral health" - See WAC 182-538D-0200.

"Behavioral health administrative service organization (BH-ASO)" means an entity selected by the medicaid agency to administer behavioral health services and programs, including crisis services for all people in an integrated managed care regional service area. The BH-ASO administers crisis services for all people in its defined regional service area, regardless of a person's ability to pay.

"Behavioral health services only (BHSO)" means the program in which enrollees only receive behavioral health benefits through a managed care delivery system.

"Client" ~~((means, for the purposes of this chapter, a person eligible for any Washington apple health program, including managed care programs, but who is not enrolled with an MCO or PCCM provider))~~ - See WAC 182-500-0020.

"Disenrollment" - See "end enrollment."

"Emergency medical condition" means a condition meeting the definition in 42 C.F.R. Sec. 438.114(a).

"Emergency services" means services defined in 42 C.F.R. Sec. 438.114(a).

"End enrollment" means ending the enrollment of an enrollee for one of the reasons outlined in WAC 182-538-130.

"Enrollee" means a person eligible for any Washington apple health program enrolled in managed care with an MCO or PCCM provider that has a contract with the state.

"Enrollee's representative" means a person with a legal right or written authorization from the enrollee to act on behalf of the enrollee in making decisions.

"Enrollees with special health care needs" means enrollees having chronic and disabling conditions and the conditions:

(a) Have a biologic, psychologic, or cognitive basis;

(b) Have lasted or are virtually certain to last for at least one year; and

(c) Produce one or more of the following conditions stemming from a disease:

(i) Significant limitation in areas of physical, cognitive, or emotional function;

(ii) Dependency on medical or assistive devices to minimize limitation of function or activities; or

(iii) In addition, for children, any of the following:

(A) Significant limitation in social growth or developmental function;

(B) Need for psychological, educational, medical, or related services over and above the usual for the child's age; or

(C) Special ongoing treatments, such as medications, special diet, interventions, or accommodations at home or school.

"Exemption" means agency approval of a client's preenrollment request to remain in the fee-for-service deliv-

ery system for one of the reasons outlined in WAC 182-538-130.

"Fully integrated managed care (FIMC)" - See integrated managed care.

"Grievance" means an expression of dissatisfaction about any matter other than an adverse benefit determination.

"Grievance and appeal system" means the processes the MCO implements to handle appeals of adverse benefit determinations and grievances, as well as the processes to collect and track information about them.

"Health care service" or "service" means a service or item provided for the prevention, cure, or treatment of an illness, injury, disease, or condition.

"Integrated managed care (IMC)" means the program under which a managed care organization provides:

(a) Physical health services funded by medicaid; and

(b) Behavioral health services funded by medicaid, and other available resources provided for in chapters 182-538B, 182-538C, and 182-538D WAC.

"Managed care" means a comprehensive health care delivery system that includes preventive, primary, specialty, and ancillary services. These services are provided through either an MCO or PCCM provider.

"Managed care contract" means the agreement between the agency and an MCO to provide prepaid contracted services to enrollees.

"Managed care organization" or "MCO" means an organization having a certificate of authority or certificate of registration from the office of insurance commissioner that contracts with the agency under a comprehensive risk contract to provide prepaid health care services to enrollees under the agency's managed care programs.

"Mandatory enrollment" means the agency's requirement that a client enroll in managed care.

"Mandatory service area" means a service area in which eligible clients are required to enroll in an MCO.

"Nonparticipating provider" means a person, health care provider, practitioner, facility, or entity acting within their scope of practice and licensure that:

(a) Provides health care services to enrollees; and

(b) Does not have a written agreement with the managed care organization (MCO) to participate in the MCO's provider network.

"Participating provider" means a person, health care provider, practitioner, or entity acting within their scope of practice and licensure with a written agreement with the MCO to provide services to enrollees.

"Patient days of care" means all voluntary patients and involuntarily committed patients under chapter 71.05 RCW, regardless of where in the state hospital the patients reside. Patients who are committed to the state hospital under chapter 10.77 RCW are not included in the patient days of care. Patients who are committed under RCW 10.77.088 by municipal or district courts after failed competency restoration and dismissal of misdemeanor charges are not counted in the patient days of care until a petition for ninety days of civil commitment under chapter 71.05 RCW has been filed in court. Patients who are committed under RCW 10.77.086 by a superior court after failed competency restoration and dismissal of felony charges are not counted in the patient days of

care until the patient is civilly committed under chapter 71.05 RCW.

"Primary care case management" or "PCCM" means the health care management activities of a provider that contracts with the agency to provide primary health care services and to arrange and coordinate other preventive, specialty, and ancillary health services.

"Primary care provider" or "PCP" means a person licensed or certified under Title 18 RCW including, but not limited to, a physician, an advanced registered nurse practitioner (ARNP), naturopath, or a physician assistant who supervises, coordinates, and provides health services to a client or an enrollee, initiates referrals for specialist and ancillary care, and maintains the client's or enrollee's continuity of care.

"Regional service area (RSA)" means a single county or multi-county grouping formed for the purpose of health care purchasing and designated by the agency and the department of social and health services.

"Timely" concerning the provision of services, means an enrollee has the right to receive medically necessary health care as expeditiously as the enrollee's health condition requires. Concerning authorization of services and grievances and appeals, "timely" means according to the agency's managed care program contracts and the time frames stated in this chapter.

"Wraparound with intensive services (WISE)" is a program that provides comprehensive behavioral health services and support to:

(a) Medicaid-eligible people age twenty or younger with complex behavioral health needs; and

(b) Their families.

AMENDATORY SECTION (Amending WSR 15-24-098, filed 12/1/15, effective 1/1/16)

WAC 182-538-060 Managed care choice and assignment. (1) ~~((Except as provided in subsection (2) of this section,))~~ The medicaid agency requires a client to enroll in integrated managed care (IMC) when that client:

(a) Is eligible for one of the Washington apple health programs for which enrollment is mandatory;

(b) Resides in an area where enrollment is mandatory; and

(c) Is not exempt from ~~((managed care))~~ IMC enrollment ~~((or))~~ and the agency has not ended the client's managed care enrollment, consistent with WAC 182-538-130.

(2) American Indian and Alaska native (AI/AN) clients and their descendants may choose one of the following:

(a) Enrollment with a managed care organization (MCO) available in their regional service area;

(b) Enrollment with a PCCM provider through a tribal clinic or urban Indian center available in their area; or

(c) The agency's fee-for-service system for physical health or behavioral health or both.

(3) To enroll with an MCO or PCCM provider, a client may:

(a) Enroll online via the Washington Healthplanfinder at <https://www.wahealthplanfinder.org>;

(b) Call the agency's toll-free enrollment line at 800-562-3022; or

(c) Go to the ProviderOne client portal at <https://www.waproviderone.org/client> and follow the instructions;

~~(d) Mail a postage-paid completed managed care enrollment form (HCA 13-862) to the agency's unit responsible for managed care enrollment; or~~

~~(e) Fax the managed care enrollment form (HCA 13-862) to the agency at the number located on the enrollment form).~~

(4) ~~((A client))~~ An enrollee in IMC must enroll with an MCO available in the regional service area where the ~~((client))~~ enrollee resides.

(5) All family members will be enrolled with the same MCO, except family members of an enrollee placed in the patient review and coordination (PRC) program under WAC 182-501-0135 need not enroll in the same MCO as the family member placed in the PRC program.

(6) ~~((A client))~~ An enrollee may be placed into the PRC program by the ~~((client's))~~ MCO or the agency. ~~((The client))~~ An enrollee placed in the PRC program must follow the enrollment requirements of the program as stated in WAC 182-501-0135.

(7) When a client requests enrollment with an MCO or PCCM provider, the agency enrolls a client effective the earliest possible date given the requirements of the agency's enrollment system.

(8) The agency assigns a client who does not choose an MCO or PCCM provider as follows:

(a) If the client was enrolled with an MCO or PCCM provider within the previous six months, the client is reenrolled with the same MCO or PCCM provider;

(b) If (a) of this subsection does not apply and the client has a family member enrolled with an MCO, the client is enrolled with that MCO;

(c) The client is reenrolled within the previous six months with their prior MCO plan if:

(i) The agency identifies the prior MCO and the program is available; and

(ii) The client does not have a family member enrolled with an agency-contracted MCO or PCCM provider.

(d) If the client has a break in eligibility of less than two months, the client will be automatically reenrolled with his or her previous MCO or PCCM provider and no notice will be sent; or

(e) If the client cannot be assigned according to (a), (b), (c), or (d) of this subsection, the agency assigns the client according to agency policy.

(f) If the client cannot be assigned according to (a) or (b) of this subsection, the agency assigns the client as follows:

(i) If a client who is not ~~((AI or AN))~~ AI/AN does not choose an MCO, the agency assigns the client to an MCO available in the area where the client resides. The MCO is responsible for primary care provider (PCP) choice and assignment.

(ii) For clients who are newly eligible or who have had a break in eligibility of more than six months, the agency sends a written notice to each household of one or more clients who are assigned to an MCO. The assigned client has ten calendar

days to contact the agency to change the MCO assignment before enrollment is effective. The notice includes:

(A) The agency's toll-free number;

(B) The toll-free number and name of the MCO to which each client has been assigned;

(C) The effective date of enrollment; and

(D) The date by which the client must respond in order to change the assignment.

~~((iii) If the client has a break in eligibility of less than six months, the client will be automatically reenrolled with his or her previous MCO and no notice will be sent.~~

~~(9) Upon request, the agency will assist clients in identifying an MCO with which their provider participates.~~

~~(10))~~ (9) An MCO enrollee's selection of a PCP or assignment to a PCP occurs as follows:

(a) An MCO enrollee may choose:

(i) A PCP or clinic that is in the enrollee's MCO and accepting new enrollees; or

(ii) A different PCP or clinic participating with the enrollee's MCO for different family members.

(b) The MCO assigns a PCP or clinic that meets the access standards set forth in the relevant managed care contract if the enrollee does not choose a PCP or clinic.

(c) An MCO enrollee may change PCPs or clinics in an MCO for any reason, with the change becoming effective no later than the beginning of the month following the enrollee's request.

(d) An MCO enrollee may file a grievance with the MCO if the MCO does not approve an enrollee's request to change PCPs or clinics.

(e) MCO enrollees required to participate in the agency's PRC program may be limited in their right to change PCPs (see WAC 182-501-0135).

AMENDATORY SECTION (Amending WSR 15-24-098, filed 12/1/15, effective 1/1/16)

WAC 182-538-067 Qualifications to become a managed care organization (MCO) in integrated managed care. (1) To provide physical or behavioral health services under the IMC medicaid contract:

(a) An MCO must contract with the agency.

(b) MCO must also contract with an agency-contracted behavioral health administrative service organization (BH-ASO) that maintains an adequate provider network to deliver services to clients in IMC regional service areas.

(2) A managed care organization (MCO) must meet the following qualifications to be eligible to contract with the medicaid agency:

(a) Have a certificate of registration from the Washington state office of the insurance commissioner (OIC) that allows the MCO to provide health care services under a risk-based contract;

(b) Accept the terms and conditions of the agency's managed care contract;

(c) Be able to meet the network and quality standards established by the agency; and

(d) Pass a readiness review, including an on-site visit conducted by the agency.

~~((2))~~ (3) At its discretion, the agency awards a contract to an MCO through a competitive process or an application process available to all qualified providers.

~~((3))~~ (4) The agency reserves the right not to contract with any otherwise qualified MCO.

AMENDATORY SECTION (Amending WSR 15-24-098, filed 12/1/15, effective 1/1/16)

WAC 182-538-068 Qualifications to become a primary care case management (PCCM) provider in integrated managed care regional service areas. A primary care case management (PCCM) provider or the individual providers in a PCCM group or clinic must:

- (1) Have a core provider agreement with the medicaid agency;
- (2) Be a recognized urban Indian health center or tribal clinic;
- (3) Accept the terms and conditions of the agency's PCCM contract;
- (4) Be able to meet the quality standards established by the agency; and
- (5) Accept the case management rate paid by the agency.

AMENDATORY SECTION (Amending WSR 18-08-035, filed 3/27/18, effective 4/27/18)

WAC 182-538-070 Payments ~~((+))~~ and sanctions for managed care organizations (MCOs) in integrated managed care regional service areas. (1) The medicaid agency pays apple health managed care organizations (MCOs) monthly capitated premiums that:

- (a) Have been developed using generally accepted actuarial principles and practices;
 - (b) Are appropriate for the populations to be covered and the services to be furnished under the MCO contract;
 - (c) Have been certified by actuaries who meet the qualification standards established by the American Academy of Actuaries and follow the practice standards established by the Actuarial Standards Board;
 - (d) Are based on analysis of historical cost, rate information, or both; and
 - (e) Are paid based on legislative allocations.
- (2) The MCO is solely responsible for payment of MCO-contracted health care services. The agency will not pay for a service that is the MCO's responsibility, even if the MCO has not paid the provider for the service.

(3) The agency pays MCOs a service-based enhancement rate for wraparound with intensive services (WISe) administered by a certified WISe provider who holds a current behavioral health agency license issued by the department of health under chapter 246-341 WAC.

(4) For crisis services, the MCO must determine whether the person receiving the services is eligible for Washington apple health or if the person has other insurance coverage.

(5) The agency may:

(a) Impose intermediate sanctions under 42 C.F.R. Sec. 438.700 and corrective action for substandard rates of clinical performance measures and for deficiencies found in audits and on-site visits;

(b) Require corrective action for findings for noncompliance with any contractual, state, or federal requirements;

(c) Impose sanctions for noncompliance with any contractual, state, or federal requirements not corrected; and

(d) Apply a monthly penalty assessment associated with poor performance on selected behavioral health performance measures.

(6) The agency pays an enhancement rate for each MCO enrollee assigned to a federally qualified health center (FQHC) or rural health clinic (RHC) according to chapters 182-548 and 182-549 WAC.

~~((4))~~ (7) The agency pays MCOs a delivery case rate, separate from the capitation payment, when an enrollee delivers a child(ren) and the MCO pays for any part of labor and delivery.

AMENDATORY SECTION (Amending WSR 15-24-098, filed 12/1/15, effective 1/1/16)

WAC 182-538-071 Payments for primary care case management (PCCM) providers in the integrated managed care for regional service areas. (1) The medicaid agency pays PCCM providers a monthly case management fee according to contracted terms and conditions.

(2) The agency pays PCCM providers for health care services under the fee-for-service health care delivery system.

AMENDATORY SECTION (Amending WSR 15-24-098, filed 12/1/15, effective 1/1/16)

WAC 182-538-095 Scope of care for integrated managed care enrollees and managed care organization benefit administration requirements.

Scope of Care.

(1) ~~((A managed care))~~ An enrollee in integrated managed care (IMC) is eligible only for the scope of services ~~((#~~ WAC 182-501-0060 for categorically needy clients.

~~((a))~~ that are covered based on the apple health program (eligibility program) in which they are enrolled.

(a) See the chart in WAC 182-501-0060 for category of covered services that are covered based on enrollee's apple health eligibility program, and the program rules to determine which specific services are covered. See WAC 182-501-0065 for a description of the category of covered services.

(b) The apple health eligibility programs for IMC includes the alternative benefit plan (ABP), categorically needy (CN), and medically needy (MN) programs.

(2) The managed care organization (MCO) covers the services included ~~((in the contract for its enrollees.~~

(i) ~~MCOs may, at their discretion, cover services not required under the MCO contract.~~

~~((#))~~ under the IMC medicaid contract for IMC enrollees based on their apple health eligibility program.

(3) If an IMC enrollee is enrolled in behavioral health services only (BHSO):

(a) The MCO will only cover the behavioral health benefit included in the IMC medicaid contract.

(b) The MCO is not responsible for coverage of the physical health benefit in the IMC contract.

(c) See WAC 182-538-190 regarding additional rules related to BHSO.

(4) The agency ~~((cannot))~~ does not require the MCO to cover any services outside the scope of covered services in the MCO's contract with the agency. At its discretion, an MCO may cover services not required under the IMC medic-aid contract.

~~((b) The agency covers services identified as covered for categorically needy clients in WAC 182-501-0060 and described in WAC 182-501-0065 that are excluded from coverage in the MCO contract.~~

~~(2) The following services are not covered by the MCO:))~~ (5) Services included in enrollees' medicaid eligibility program, and identified as covered based on program rules, may be excluded from coverage by the agency under the managed care contract. These excluded services that are covered based on program rules are available on a fee-for-service basis.

(6) The MCO is not required to authorize or pay for covered services if:

~~(a) Services ~~((that))~~ are determined to be not medically necessary as defined in WAC 182-500-0070.~~

~~(b) Services ~~((not included in the categorically needy scope of services))~~ are excluded from coverage under the managed care contract.~~

~~(c) Services received in a hospital emergency department for nonemergency medical conditions, except for a screening exam as described in WAC 182-538-100.~~

~~(d) Services received from a participating provider that require prior authorization from the MCO, but were not authorized by the MCO.~~

~~(e) All nonemergency services covered under the MCO contract and received from nonparticipating providers that were not prior authorized by the MCO.~~

~~((3) A provider may bill an enrollee for noncovered services as described in subsection (2) of this section, if the requirements of WAC 182-502-0160 are met.))~~

MCO Benefit Administration Requirements.

~~((4))~~ (7) For services covered by the agency through contracts with MCOs:

~~(a) The agency requires the MCO to subcontract with enough providers to deliver the scope of contracted services in a timely manner~~((Except for emergency services;))~~;~~

~~(b) The agency requires MCOs to provide new enrollees with written information about how enrollees may obtain covered services;~~

~~(c) MCOs provide covered services to enrollees through their participating providers~~((;~~~~

~~(b) The agency requires MCOs to provide new enrollees with written information about how enrollees may obtain covered services;~~

~~((e))~~, unless an exception applies. An MCO covers services from a nonparticipating provider when an enrollee obtains:

(i) Emergency services; or

(ii) Authorization from the MCO to receive services from a nonparticipating provider.

(d) For nonemergency services, MCOs may require:

(i) The enrollee to obtain a referral from the primary care provider (PCP)~~((and/or))~~; or

(ii) The provider to obtain authorization from the MCO, according to the requirements of the MCO contract;

~~((4))~~ (e) MCOs and their contracted providers determine which services are medically necessary given the enrollee's condition, according to the requirements included in the MCO contract;

~~((e))~~ (f) The agency requires the MCO to coordinate benefits with other insurers in a manner that does not reduce benefits to the enrollee or result in costs to the enrollee;

~~((f))~~ (g) A managed care enrollee does not need a PCP referral to receive women's health care services, as described in RCW 48.42.100, from any women's health care provider participating with the MCO. Any covered services ordered or prescribed by a women's health care provider must meet the MCO's service authorization requirements for the specific service;

~~((g))~~ (h) For enrollees outside their MCO services area, the MCO must cover enrollees for emergency care and medically necessary covered benefits that cannot wait until the enrollees return to their MCO services area.

~~((5))~~ (8)(a) An MCO enrollee may obtain specific services described in the managed care contract from either an MCO-contracted provider or a provider with a separate agreement with the agency without a referral from the PCP or MCO. These services are communicated to enrollees by the agency and MCOs as described in (b) of this subsection.

~~(b) The agency sends each enrollee written information about covered services when the client must enroll in managed care and any time there is a change in covered services. The agency requires MCOs to provide new enrollees with written information about covered services.~~

~~((6))~~ (9) An enrollee is entitled to timely access to covered services that are medically necessary as defined in WAC 182-500-0070.

~~((7))~~ (10) All nonemergency services covered under the MCO contract and received from nonparticipating providers require prior authorization from the MCO.

(11) A provider may bill an enrollee for services only if the requirements of WAC 182-502-0160 are met.

AMENDATORY SECTION (Amending WSR 15-24-098, filed 12/1/15, effective 1/1/16)

WAC 182-538-096 Scope of service for PCCM enrollees. (1) An enrollee is entitled to timely access to covered services that are medically necessary.

(2) A primary care case management (PCCM) enrollee is eligible for the scope of services ~~((in))~~ that are covered based on the enrollee's apple health eligibility program. See WAC 182-501-0060 and 182-501-0065~~((An enrollee is entitled to timely access to covered services that are medically necessary))~~ for categories of services that are covered and program rules for specific services that are covered.

~~((a))~~ (3) The agency covers services through the fee-for-service system for enrollees with a primary care case management (PCCM) provider. ~~((Except for emergencies;))~~

(a) The PCCM provider must either provide the covered services or refer the enrollee to other providers who are con-

tracted with the agency for covered services, except for emergency services.

(b) The PCCM provider is responsible for explaining to the enrollee how to obtain the services for which the PCCM provider is referring the enrollee.

(c) Services that require PCCM provider referral are described in the PCCM contract.

~~((b))~~ (d) The agency sends each enrollee written information about covered services when the client enrolls in managed care and when there is a change in covered services. This information describes covered services, which services are covered by the agency, and how to access services through the PCCM provider.

~~((2))~~ For services covered by the agency through PCCM contracts for managed care:

~~(a) The agency covers medically necessary services included in the categorically needy scope of care and furnished by providers who have a current care provider agreement with the agency to provide the requested service;~~

~~(b) The agency may require the PCCM provider to obtain authorization from the agency for coverage of non-emergency services;~~

~~(c) The PCCM provider determines which services are medically necessary;~~

~~(d) Services referred by the PCCM provider require an authorization number to receive payment from the agency; and~~

~~(e) An enrollee may request a hearing for review of PCCM provider or agency coverage decisions (see WAC 182-538-110).~~

~~(3))~~ (4) The agency will not authorize or pay for the following services (~~are not covered~~):

(a) Services that are not medically necessary as defined in WAC 182-500-0070.

(b) Services not included in the (~~categorically needy~~) scope of covered services for the client's apple health eligibility program.

(c) Services (~~, other than a screening exam as described in WAC 182-538-100(3),~~) received in a hospital emergency department for non-emergency medical conditions (~~-~~

~~(d) Services that require a referral from the PCCM provider as described in the PCCM contract, but were not referred by the PCCM provider), other than a screening exam as described in WAC 182-538-100(3).~~

AMENDATORY SECTION (Amending WSR 15-24-098, filed 12/1/15, effective 1/1/16)

WAC 182-538-100 Managed care emergency services. (1) A managed care enrollee may obtain emergency services for emergency medical conditions from any qualified medicaid provider.

(a) The managed care organization (MCO) covers emergency services for MCO enrollees.

(b) The agency covers emergency services for primary care case management (PCCM) enrollees.

(2) Emergency services for emergency medical conditions do not require prior authorization by the MCO, primary care provider (PCP), PCCM provider, or the agency.

(3) MCOs must cover all emergency services provided to an enrollee by a provider who is qualified to furnish medicaid services, without regard to whether the provider is a participating or nonparticipating provider.

(4) An enrollee who requests emergency services may receive an exam to determine if the enrollee has an emergency medical condition. What constitutes an emergency medical condition may not be limited on the basis of diagnosis or symptoms.

(5) The MCO must cover emergency services provided to an enrollee when:

(a) The enrollee had an emergency medical condition, including cases in which the absence of immediate medical attention would not have had the outcomes specified in the definition of an emergency medical condition; and

(b) The plan provider or other MCO representative instructs the enrollee to seek emergency services.

(6) In any disagreement between a hospital and the MCO about whether the enrollee is stable enough for discharge or transfer, or whether the medical benefits of an unstabilized transfer outweigh the risks, the judgment of the attending physician(s) actually caring for the enrollee at the treating facility prevails.

(7) Under 42 C.F.R. 438.114, the enrollee's MCO must cover and pay for:

(a) Emergency services provided to enrollees by an emergency room provider, hospital or (~~fiscal agent~~) provider outside the managed care system; and

(b) Any screening and treatment the enrollee requires after the provision of the emergency services.

AMENDATORY SECTION (Amending WSR 17-23-199, filed 11/22/17, effective 12/23/17)

WAC 182-538-110 The grievance and appeal system and agency administrative hearing for managed care organization (MCO) enrollees. (1) **Introduction.** This section contains information about the grievance and appeal system and the right to an agency administrative hearing for MCO enrollees. See WAC 182-538-111 for information about PCCM enrollees.

(2) **Statutory basis and framework.**

(a) Each MCO must have a grievance and appeal system in place for enrollees.

(b) Once an MCO enrollee has completed the MCO appeals process, the MCO enrollee has the option of requesting an agency administrative hearing regarding any adverse benefit determination upheld by the MCO. See chapter 182-526 WAC.

(3) **MCO grievance and appeal system - General requirements.**

(a) The MCO grievance and appeal system must include:

(i) A process for addressing complaints about any matter that is not an adverse benefit determination, which is a grievance;

(ii) An appeal process to address enrollee requests for review of an MCO adverse benefit determination; and

(iii) Access to the agency's administrative hearing process for review of an MCO's resolution of an appeal.

(b) MCOs must provide information describing the MCO's grievance and appeal system to all providers and sub-contractors.

(c) An MCO must have agency approval for written materials sent to enrollees regarding the grievance and appeal system and the agency's administrative hearing process under chapter 182-526 WAC.

(d) MCOs must inform enrollees in writing within fifteen calendar days of enrollment about enrollees' rights with instructions on how to use the MCO's grievance and appeal system and the agency's administrative hearing process.

(e) An MCO must give enrollees any reasonable assistance in completing forms and other procedural steps for grievances and appeals (e.g., interpreter services and toll-free numbers).

(f) An MCO must allow enrollees and their authorized representatives to file grievances and appeals orally as well as in writing (~~(including)~~).

(g) Methods to file either a grievance or appeal include, but are not limited to, U.S. mail, commercial delivery services, hand delivery, fax, telephone, and email.

(h) MCOs may not require enrollees to provide written follow-up for a grievance (~~(or an appeal)~~) the MCO received orally.

~~((g))~~ (i) The MCO must resolve each grievance and appeal and provide notice of the resolution as expeditiously as the enrollee's health condition requires, and within the time frames identified in this section.

~~((h))~~ (j) The MCO must ensure that the people who make decisions on grievances and appeals:

(i) Neither were involved in any previous level of review or decision making, nor a subordinate of any person who was so involved; and

(ii) Are health care professionals with appropriate clinical expertise in treating the enrollee's condition or disease if deciding any of the following:

(A) An appeal of an adverse benefit determination concerning medical necessity;

(B) A grievance concerning denial of an expedited resolution of an appeal; or

(C) A grievance or appeal that involves any clinical issues.

(iii) Take into account all comments, documents, records, and other information submitted by the enrollee or the enrollee's representative without regard to whether the information was submitted or considered in the initial adverse benefit determination.

(4) **The MCO grievance process.**

(a) Only an enrollee or enrollee's authorized representative may file a grievance with the MCO. A provider may not file a grievance on behalf of an enrollee without the enrollee's written consent.

(b) The MCO must acknowledge receipt of each grievance within two business days. Acknowledgment may be orally or in writing.

(c) The MCO must complete the resolution of a grievance and provide notice to the affected parties as expeditiously as the enrollee's health condition requires, but no later than forty-five days after receiving the grievance.

(d) The MCO must notify enrollees of the resolution of grievances within five business days of determination.

(i) Notices of resolution of grievances not involving clinical issues can be oral or in writing.

(ii) Notices of resolution of grievances for clinical issues must be in writing.

(e) Enrollees do not have a right to an agency administrative hearing to dispute the resolution of a grievance unless the MCO fails to adhere to the notice and timing requirements for grievances.

(f) If the MCO fails to adhere to the notice and timing requirements for grievances, the enrollee is deemed to have completed the MCO's appeals process and may initiate an agency administrative hearing.

(5) **MCO's notice of adverse benefit determination.**

(a) **Language and format requirements.** The notice of adverse benefit determination must be in writing in the enrollee's primary language, and in an easily understood format, in accordance with 42 C.F.R. Sec. 438.404.

(b) **Content of notice.** The notice of MCO adverse benefit determination must explain:

(i) The adverse benefit determination the MCO has made or intends to make, and any pertinent effective date;

(ii) The reasons for the adverse benefit determination, including citation to rules or regulations and the MCO criteria that were the basis of the decision;

(iii) The enrollee's right to receive upon request, free of charge, reasonable access to and copies of all documents, records, and other information relevant to the enrollee's adverse benefit determination, including medical necessity criteria and any processes, strategies, or evidentiary standards used in setting coverage limits;

(iv) The enrollee's right to file an appeal of the MCO adverse benefit determination, including information on the MCO appeal process and the right to request an agency administrative hearing;

(v) The procedures for exercising the enrollee's rights;

(vi) The circumstances under which an appeal can be expedited and how to request it;

(vii) The enrollee's right to have benefits continued pending resolution of an appeal, how to request that benefits be continued, and the circumstances under which the enrollee may be required to pay the costs of these services.

(c) **Timing of notice.** The MCO must mail the notice of adverse benefit determination within the following time frames:

(i) For termination, suspension, or reduction of previously authorized services, at least ten calendar days prior to the effective date of the adverse benefit determination in accordance with 42 C.F.R. Sec. 438.404 and 431.211. This time period does not apply if the criteria in 42 C.F.R. Sec. 431.213 or 431.214 are met. This notice must be mailed by a method that certifies receipt and assures delivery within three calendar days.

(ii) For denial of payment, at the time of any adverse benefit determination affecting the claim. This applies only when the enrollee can be held liable for the costs associated with the adverse benefit determination.

(iii) For standard service authorization decisions that deny or limit services, as expeditiously as the enrollee's

health condition requires not to exceed fourteen calendar days following receipt of the request for service. An extension of up to fourteen additional days may be allowed if:

(A) The enrollee or enrollee's provider requests the extension.

(B) The MCO determines and justifies to the agency upon request, a need for additional information and that the extension is in the enrollee's interest.

(iv) If the MCO extends the time frame for standard service authorization decisions, the MCO must:

(A) Give the enrollee written notice of the reason for the decision to extend and inform the enrollee of the right to file a grievance if the enrollee disagrees with that decision; and

(B) Issue and carry out its determination as expeditiously as the enrollee's health condition requires and no later than the date the extension expires.

(v) For expedited authorization decisions:

(A) In cases involving mental health drug authorization decisions, or where the provider indicates or the MCO determines that following the standard time frame could seriously jeopardize the enrollee's life or health or ability to attain, maintain, or regain maximum function, the MCO must make an expedited authorization decision and provide notice no later than seventy-two hours after receipt of the request for service.

(B) The MCO may extend the seventy-two-hour time frame up to fourteen calendar days if:

(I) The enrollee requests the extension; or

(II) The MCO determines and justifies to the agency, upon request, there is a need for additional information and it is in the enrollee's interest.

(6) The MCO appeal process.

(a) **Authority to appeal.** An enrollee, the enrollee's authorized representative, or the provider acting with the enrollee's written consent may appeal an adverse benefit determination from the MCO.

(b) **Oral appeals.** An MCO must treat oral inquiries about appealing an adverse benefit determination as an appeal to establish the earliest possible filing date for the appeal. The oral appeal must be confirmed in writing by the MCO, unless the enrollee or provider requests an expedited resolution.

(c) **Acknowledgment letter.** The MCO must acknowledge in writing receipt of each appeal to both the enrollee and the requesting provider within five calendar days of receiving the appeal request. The appeal acknowledgment letter sent by the MCO serves as written confirmation of an appeal filed orally by an enrollee.

(d) **Standard service authorization - Sixty-day deadline.** For appeals involving standard service authorization decisions, an enrollee must file an appeal within sixty calendar days of the date on the MCO's notice of adverse benefit determination. This time frame also applies to a request for an expedited appeal.

(e) **Previously authorized service - Ten-day deadline.** For appeals of adverse benefit determinations involving termination, suspension, or reduction of a previously authorized service, and the enrollee is requesting continuation of the service, the enrollee must file an appeal within ten calendar days

of the MCO mailing notice of the adverse benefit determination.

(f) **Untimely service authorization decisions.** When the MCO does not make a **service authorization decision** within required time frames, it is considered a denial. In this case, the MCO sends a formal notice of adverse benefit determination, including the enrollee's right to an appeal.

(g) **Appeal process requirements.** The MCO appeal process must:

(i) Provide the enrollee a reasonable opportunity to present evidence and allegations of fact or law, in person, by telephone, or in writing. The MCO must inform the enrollee of the limited time available for this in the case of expedited resolution;

(ii) Provide the enrollee and the enrollee's representative opportunity before and during the appeal process to examine the enrollee's case file, including medical records, other relevant documents and records, and any new or additional evidence considered, relied upon, or generated by the MCO (or at the direction of the MCO) in connection with the appeal of the adverse benefit determination. This information must be provided free of charge and sufficiently in advance of the resolution time frame for appeals as specified in this section; and

(iii) Include as parties to the appeal:

(A) The enrollee and the enrollee's representative; or

(B) The legal representative of the deceased enrollee's estate.

(h) **Level of appeal.** There will only be one level of review in the MCO appeals process.

(i) Time frames for resolution of appeals and notice to the enrollee. MCOs must resolve each appeal and provide notice as expeditiously as the enrollee's health condition requires, and within the following time frames:

(i) For standard resolution of appeals, including notice to the affected parties, no longer than thirty calendar days from the day the MCO receives the appeal. This includes appeals involving termination, suspension, or reduction of previously authorized services.

(ii) For expedited resolution of appeals, including notice to the affected parties, no longer than seventy-two hours after the MCO receives the appeal. The MCO may extend the seventy-two-hour time frame up to fourteen calendar days if:

(A) The enrollee requests the extension; or

(B) The MCO determines and shows to the satisfaction of the agency, upon request, there is a need for additional information and it is in the enrollee's interest.

(iii) If the MCO fails to adhere to the notice and timing requirements for appeals, the enrollee is deemed to have completed the MCO's appeals process and may request an agency administrative hearing.

(j) **Language and format requirements - Notice of resolution of appeal.**

(i) The notice of the resolution of the appeal must be in writing in the enrollee's primary language and in an easily understood format, in accordance with 42 C.F.R. Sec. 438.10.

(ii) The notice of the resolution of the appeal must be sent to the enrollee and the requesting provider.

(iii) For notice of an expedited resolution, the MCO must also make reasonable efforts to provide oral notice.

(k) **Content of resolution of appeal.**

(i) The notice of resolution must include the results of the resolution process and the date it was completed;

(ii) For appeals not resolved wholly in favor of the enrollee, the notice of resolution must include:

(A) The right to request an agency administrative hearing under RCW 74.09.741 and chapter 182-526 WAC, and how to request the hearing;

(B) The right to request and receive benefits while an agency administrative hearing is pending, and how to make the request in accordance with subsection (9) of this section and the agency's administrative hearing rules in chapter 182-526 WAC;

(C) That the enrollee may be held liable for the cost of those benefits received for the first sixty days after the agency or the office of administrative hearings (OAH) receives an agency administrative hearing request, if the hearing decision upholds the MCO's adverse benefit determination. See RCW 74.09.741 (5)(g).

(7) MCO expedited appeal process.

(a) Each MCO must establish and maintain an expedited appeal process when the MCO determines or the provider indicates that taking the time for a standard resolution of an appeal could seriously jeopardize the enrollee's life, physical or mental health, or ability to attain, maintain, or regain maximum function.

(b) The enrollee may file an expedited appeal either orally, according to WAC 182-526-0095, or in writing. No additional follow-up is required of the enrollee.

(c) The MCO must make a decision on the enrollee's request for expedited appeal and provide written notice as expeditiously as the enrollee's health condition requires and no later than two calendar days after the MCO receives the appeal. The MCO must also make reasonable efforts to orally notify the enrollee of the decision.

(d) The MCO may extend the time frame for decision on the enrollee's request for an expedited appeal up to fourteen calendar days if:

(i) The enrollee requests the extension; or

(ii) The MCO determines and shows to the satisfaction of the agency, upon its request, that there is a need for additional information and the delay is in the enrollee's interest.

(e) The MCO must make reasonable efforts to provide the enrollee prompt verbal notice and provide written notice for any extension not requested by the enrollee with the reason for the delay.

(f) If the MCO grants an expedited appeal, the MCO must issue a decision as expeditiously as the enrollee's physical or mental health condition requires, but not later than seventy-two hours after receiving the appeal. The MCO may extend the time frame for a decision and to provide notice to the enrollee for an expedited appeal, up to fourteen days, if:

(i) The enrollee requests the extension; or

(ii) The MCO determines and shows to the satisfaction of the agency, upon its request, that there is a need for additional information and the delay is in the enrollee's interest.

(g) The MCO must provide written notice for any extension not requested by the enrollee within two calendar days of the decision and inform the enrollee of the reason for the delay and the enrollee's right to file a grievance.

(h) If the MCO denies a request for expedited resolution of an appeal, it must:

(i) Process the appeal based on the time frame for standard resolution;

(ii) Make reasonable efforts to give the enrollee prompt oral notice of the denial; and

(iii) Provide written notice within two calendar days.

(i) The MCO must ensure that punitive action is not taken against a provider who requests an expedited resolution or supports an enrollee's appeal.

(8) The right to an agency administrative hearing for managed care (MCO) enrollees.

(a) **Authority to file.** Only an enrollee, the enrollee's authorized representative, or a provider with the enrollee's or authorized representative's written consent may request an administrative hearing. See RCW 74.09.741, WAC 182-526-0090, and 182-526-0155.

(b) **Right to agency administrative hearing.** If an enrollee has completed the MCO appeal process and does not agree with the MCO's resolution of the appeal, the enrollee may file a request for an agency administrative hearing based on the rules in this section and the agency administrative hearing rules in chapter 182-526 WAC.

(c) **Deadline - One hundred twenty days.** An enrollee's request for an agency administrative hearing must be filed no later than one hundred twenty calendar days from the date of the written notice of resolution of appeal from the MCO.

(d) **Independent party.** The MCO is an independent party and responsible for its own representation in any agency administrative hearing, appeal to the board of appeals, and any subsequent judicial proceedings.

(e) **Applicable rules.** The agency's administrative hearing rules in chapter 182-526 WAC apply to agency administrative hearings requested by enrollees to review the resolution of an enrollee appeal of an MCO adverse benefit determination.

(9) Continuation of previously authorized services.

(a) The MCO must continue the enrollee's services if all of the following apply:

(i) The enrollee, or enrollee's authorized representative, or provider with written consent files the appeal on or before the later of the following:

(A) Within ten calendar days of the MCO mailing the notice of adverse benefit determination; or

(B) The intended effective date of the MCO's proposed adverse benefit determination.

(ii) The appeal involves the termination, suspension, or reduction of previously authorized services;

(iii) The services were ordered by an authorized provider; and

(iv) The original period covered by the original authorization has not expired.

(b) If the MCO continues or reinstates the enrollee's services while the appeal is pending at the enrollee's request, the services must be continued until one of the following occurs:

(i) The enrollee withdraws the MCO appeal;

(ii) The enrollee fails to request an agency administrative hearing within ten calendar days after the MCO sends the notice of an adverse resolution to the enrollee's appeal;

(iii) The enrollee withdraws the request for an agency administrative hearing; or

(iv) The office of administrative hearings (OAH) issues a hearing decision adverse to the enrollee.

(c) If the final resolution of the appeal upholds the MCO's adverse benefit determination, the MCO may recover from the enrollee the amount paid for the services provided to the enrollee for the first sixty calendar days after the agency or the office of administrative hearings (OAH) received a request for an agency administrative hearing, to the extent that services were provided solely because of the requirement for continuation of services.

(10) Effect of reversed resolutions of appeals.

(a) Services not furnished while an appeal is pending.

If the MCO or a final order entered by the HCA board of appeals, as defined in chapter 182-526 WAC, or an independent review organization (IRO) reverses a decision to deny, limit, or delay services that were not provided while the appeal was pending, the MCO must authorize or provide the disputed services promptly, and as expeditiously as the enrollee's health condition requires, but not later than seventy-two hours from the date it receives notice reversing the determination.

(b) **Services furnished while the appeal is pending.** If the MCO reverses a decision to deny authorization of services or the denial is reversed through an IRO or a final order of OAH or the board of appeals and the enrollee received the disputed services while the appeal was pending, the MCO must pay for those services.

AMENDATORY SECTION (Amending WSR 15-24-098, filed 12/1/15, effective 1/1/16)

WAC 182-538-111 The administrative hearing process for primary care case management (PCCM). ~~((+)) This section contains information about the administrative hearing process for primary care case management (PCCM) enrollees. See WAC 182-538-110 for information about the grievance system for managed care organization (MCO) enrollees.~~

~~((2))~~ PCCM enrollees follow the same administrative hearing rules and processes as fee-for-service clients under chapter 182-526 WAC.

AMENDATORY SECTION (Amending WSR 16-23-021, filed 11/4/16, effective 1/1/17)

WAC 182-538-130 Exemptions and ending enrollment in managed care. ~~((+))~~ The medicaid agency enrolls clients into integrated managed care (IMC) based on the rules in WAC 182-538-060. IMC is mandatory in all regional service areas.

(1) Authority to request. The following people may request that the agency approve an exemption or end enrollment in managed care:

(a) A client or enrollee;

(b) A client or enrollee's authorized representative under WAC 182-503-0130; or

(c) A client or enrollee's representative as defined in RCW 7.70.065.

(2) Standards to exempt or end enrollment.

~~((a))~~ The agency ~~((approves a request to exempt a client from enrollment or to))~~ exempts or ends enrollment from mandatory managed care when any of the following apply:

~~((a))~~ (i) The client or enrollee is eligible for medicare;

~~((b))~~ (ii) The client or enrollee is not eligible for managed care enrollment, for Washington apple health programs, or both;

~~((c))~~ A request for exemption or to end enrollment is received and approved by the agency as described in this section.

~~((i))~~ If a client requests exemption within the notice period stated in WAC 182-538-060, the client is not enrolled until the agency approves or denies the request.

~~((ii))~~ If an enrollee request to end enrollment is received after the enrollment effective date, the enrollee remains enrolled pending the agency's decision, unless continued enrollment creates loss of access to providers for medically necessary care.

~~((2))~~(a) The following people may request the agency to approve an exemption or end enrollment in managed care:

(i) A client or enrollee;

(ii) A client or enrollee's authorized representative under WAC 182-503-0130; or

(iii) A client or enrollee's representative as defined in RCW 7.70.065).

(b) The agency grants a request to exempt or to end enrollment in managed care, with the change effective the earliest possible date given the requirements of the agency's enrollment system, when the client or enrollee:

(i) Is American Indian or Alaska native or is a descendant of an AI/AN client and requests not to be in managed care;

(ii) Lives in an area or is enrolled in a Washington apple health program in which participation in managed care is voluntary; or

(iii) Requires care that meets the criteria in subsection (3) of this section for case-by-case clinical exemptions or to end enrollment.

(3) Case-by-case clinical criteria ~~((to authorize an exemption or to))~~, Clinical criteria for an enrollee or client to be exempted or end enrollment in IMC.

(a) The agency may approve a request for exemption or to end enrollment when the following criteria are met:

(i) The care must be medically necessary;

(ii) ~~((That))~~ The medically necessary care at issue is covered under the agency's managed care contracts and is not a benefit under the behavioral health services only (BHSO) program;

(iii) The client is receiving the medically necessary care at issue from an established provider or providers who are not available through any contracted MCO; and

(iv) It is medically necessary to continue that care from the established provider or providers.

(b) If a client requests exemption prior to enrollment, the client is not enrolled until the agency approves or denies the request.

(c) If an enrollee request to end enrollment is received after the enrollment effective date, the enrollee remains enrolled pending the agency's decision.

(4) Approved request.

(a) When the agency approves a request for exemption or to end enrollment, the agency will notify the client or enrollee of its decision by telephone or in writing.

(b) For clients who are not AI/AN, the following rules apply:

(i) If the agency approves the request for a limited time, the client or enrollee is notified of the time limitation and the process for renewing the exemption.

~~((e))~~ (ii) The agency limits the period of time based on the circumstances or how long the conditions described are expected to exist.

(iii) The agency may periodically review those circumstances or conditions to determine if they continue to exist.

(iv) Any authorized exemption will continue only until the client can be enrolled in managed care.

(5) BHSO.

(a) When a client is exempt from mandatory IMC or their enrollment in the mandatory IMC program ends, the exemption is for the physical health benefit only. The client remains enrolled in behavioral health services only (BHSO) for the behavioral health benefit.

(b) AI/AN clients are an exception in that they can choose to receive their behavioral health benefit on a fee-for-service basis.

(6) Denied request. When the agency denies a request for exemption or to end enrollment ~~((, the))~~:

(a) ~~The~~ agency will notify the client or enrollee of its decision by telephone or in writing and confirms a telephone notification in writing.

(b) When a client or enrollee is limited-English proficient, the written notice must be available in the client's or enrollee's primary language under 42 C.F.R. 438.10.

(c) The written notice must contain all the following information:

- (i) The agency's decision;
- (ii) The reason for the decision;
- (iii) The specific rule or regulation supporting the decision; and
- (iv) The right to request an agency administrative hearing.

~~((4))~~ **(7) Administrative hearing request.** If a client or enrollee does not agree with the agency's decision regarding a request for exemption or to end enrollment, the client or enrollee may file a request for an agency administrative hearing based on RCW 74.09.741, the rules in this chapter, and the agency hearing rules in chapter 182-526 WAC.

~~((5))~~ **(8) MCO request.** The agency will grant a request from an MCO to end enrollment of an enrollee ~~((on a case-by-case basis))~~ when the request is submitted to the agency in writing and includes sufficient documentation for the agency to determine that the criteria to end enrollment in this subsection is met.

(a) All of the following criteria must be met to end enrollment:

(i) The enrollee puts the safety or property of the contractor or the contractor's staff, providers, patients, or visitors at risk and the enrollee's conduct presents the threat of imminent harm to others, except for enrollees described in (c) of this subsection;

(ii) A clinically appropriate evaluation was conducted to determine whether there was a treatable problem contributing to the enrollee's behavior and there was not a treatable problem or the enrollee refused to participate;

(iii) The enrollee's health care needs have been coordinated as contractually required and the safety concerns cannot be addressed; and

(iv) The enrollee has received written notice from the MCO of its intent to request to end enrollment of the enrollee, unless the requirement for notification has been waived by the agency because the enrollee's conduct presents the threat of imminent harm to others. The MCO's notice to the enrollee includes the enrollee's right to use the MCO's grievance process to review the request to end enrollment.

(b) The agency will not approve a request to end enrollment when the request is solely due to any of the following:

- (i) An adverse change in the enrollee's health status;
- (ii) The cost of meeting the enrollee's health care needs or because of the enrollee's utilization of services;
- (iii) The enrollee's diminished mental capacity; or
- (iv) Uncooperative or disruptive behavior resulting from the enrollee's special needs or behavioral health condition, except when continued enrollment in the MCO or PCCM seriously impairs the entity's ability to furnish services to either this particular enrollee or other enrollees.

(c) The agency will not approve a request to end enrollment of an enrollee's behavioral health services. The agency may determine to transition the enrollee to behavioral health services only (BHSO).

(d) When the agency receives a request from an MCO to end enrollment of an enrollee, the agency reviews each request on a case-by-case basis. The agency will respond to the MCO in writing with the decision. If the agency grants the request to end enrollment:

(i) The MCO will notify the enrollee in writing of the decision. The notice must include:

(A) The enrollee's right to use the MCO's grievance system as described in WAC 182-538-110; and

(B) The enrollee's right to use the agency's hearing process (see WAC 182-526-0200 for the hearing process for enrollees).

(ii) The agency will send a written notice to the enrollee at least ten calendar days in advance of the effective date that enrollment will end. The notice to the enrollee includes the information in subsection (3)(c) of this section.

~~((4))~~ (e) The MCO will continue to provide services to the enrollee until the date the ~~((individual))~~ person is no longer enrolled.

~~((6))~~ (f) The agency may exempt the client for the period of time the circumstances ~~((or conditions described in this section))~~ are expected to exist. The agency may periodically review those circumstances ~~((or conditions))~~ to determine if they continue to exist. Any authorized exemption will continue only until the client can be enrolled in ~~((managed care))~~ IMC.

AMENDATORY SECTION (Amending WSR 17-23-199, filed 11/22/17, effective 12/23/17)

WAC 182-538-140 Quality of care. (1) To assure that managed care enrollees receive quality health care services, the agency requires managed care organizations (MCOs) to comply with quality improvement standards detailed in the agency's managed care contract. MCOs must:

(a) Have a clearly defined quality organizational structure and operation, including a fully operational quality assessment, measurement, and improvement program;

(b) Have effective means to detect ~~((over))~~ overutilization and underutilization of services;

(c) Maintain a system for provider and practitioner credentialing and recertification;

(d) Ensure that MCO subcontracts and the delegation of MCO responsibilities align with agency standards;

(e) Ensure MCO oversight of delegated entities responsible for any delegated activity to include:

(i) A delegation agreement with each entity describing the responsibilities of the MCO and the entity;

(ii) Evaluation of the entity before delegation;

(iii) An annual evaluation of the entity; and

(iv) Evaluation or regular reports and follow-up on issues that are not compliant with the delegation agreement or the agency's managed care contract specifications.

(f) Cooperate with an agency-contracted, qualified independent external quality review organization (EQRO) conducting review activities as described in 42 C.F.R. Sec. 438.358;

(g) Have an effective mechanism to assess the quality and appropriateness of care furnished to enrollees with special health care needs;

(h) Assess and develop individualized treatment plans for enrollees with special health care needs which ensure integration of clinical and nonclinical disciplines and services in the overall plan of care;

(i) Submit annual reports to the agency on performance measures as specified by the agency;

(j) Maintain a health information system that:

(i) Collects, analyzes, integrates, and reports data as requested by the agency;

(ii) Provides information on utilization, grievances and appeals, enrollees ending enrollment for reasons other than the loss of medicaid eligibility, and other areas as defined by the agency;

(iii) Retains enrollee grievance and appeal records described in 42 C.F.R. Sec. 438.416, base data as required by 42 C.F.R. Sec. 438.5(c), MLR reports as required by 42 C.F.R. Sec. 438.8(k), and the data, information, and documentation specified in 42 C.F.R. Secs. 438.604, 438.606, 438.408, and 438.610 for a period of no less than ten years;

(iv) Collects data on enrollees, providers, and services provided to enrollees through an encounter data system, in a standardized format as specified by the agency; and

(v) Ensures data received from providers is adequate and complete by verifying the accuracy and timeliness of reported data and screening the data for completeness, logic, and consistency.

(k) Conduct performance improvement projects designed to achieve significant improvement, sustained over

time, in clinical care outcomes and services, and that involve the following:

(i) Measuring performance using objective quality indicators;

(ii) Implementing system changes to achieve improvement in service quality;

(iii) Evaluating the effectiveness of system changes;

(iv) Planning and initiating activities for increasing or sustaining performance improvement;

(v) Reporting each project status and the results as requested by the agency; and

(vi) Completing each performance improvement project timely so as to generally allow aggregate information to produce new quality of care information every year.

(l) Ensure enrollee access to health care services;

(m) Ensure continuity and coordination of enrollee care;

(n) Maintain and monitor availability of health care services for enrollees;

(o) Perform client satisfaction surveys; and

(p) Obtain and maintain national committee on quality assurance (NCQA) accreditation.

(2) The agency may:

(a) Impose intermediate sanctions under 42 C.F.R. Sec. 438.700 and corrective action for substandard rates of clinical performance measures and for deficiencies found in audits and on-site visits;

(b) Require corrective action for findings for noncompliance with any contractual state or federal requirements; and

(c) Impose sanctions for noncompliance with any contractual, state, or federal requirements not corrected.

AMENDATORY SECTION (Amending WSR 16-23-021, filed 11/4/16, effective 1/1/17)

WAC 182-538-150 Apple health foster care program.

(1) Unless otherwise stated in this section, all of the provisions of chapter 182-538 WAC apply to apple health foster care (AHFC).

(2) The following sections of chapter 182-538 WAC do not apply to AHFC:

(a) WAC 182-538-068;

(b) WAC 182-538-071;

(c) WAC 182-538-096; and

(d) WAC 182-538-111.

(3)(a) Enrollment in AHFC is voluntary for eligible ~~((individuals))~~ people.

(b) The agency will enroll eligible ~~((individuals))~~ people in the single MCO that serves children and youth in foster care and adoption support, and young adult alumni of the foster care system.

~~((b))~~ (c) An AHFC enrollee may request to end enrollment in AHFC without cause if the client is in the adoption support or young adult alumni programs. WAC 182-538-130 does not apply to these requests as enrollment in AHFC is voluntary.

(4) ~~((In addition to the scope of medical care services in WAC 182-538-095,))~~ AHFC coordinates health care services for enrollees. This includes services with the department of social and health services community mental health system and other health care systems as needed.

(5) The agency sends written information about covered services when the ~~((individual))~~ person becomes eligible to enroll in AHFC and at any time there is a change in covered services. In addition, the agency requires MCOs to provide new enrollees with written information about:

- (a) Covered services;
- (b) The right to grievances and appeals through the MCO; and
- (c) Hearings through the agency.

NEW SECTION

WAC 182-538-170 Notice requirements. The notice requirements in chapter 182-518 WAC apply to integrated managed care (IMC).

NEW SECTION

WAC 182-538-180 Rights and protections. (1) People have medicaid-specific rights when applying for, eligible for, or receiving medicaid-funded health care services.

(2) All applicable statutory and constitutional rights apply to all medicaid people including, but not limited to:

- (a) The participant rights under WAC 246-341-0600;
- (b) Applicable necessary supplemental accommodation services including, but not limited to:
 - (i) Arranging for or providing help to complete and submit forms to the agency;
 - (ii) Helping people give or get the information the agency needs to decide or continue eligibility;
 - (iii) Helping to request continuing benefits;
 - (iv) Explaining the reduction in or ending of benefits;
 - (v) Assisting with requests for administrative hearings;
- and
- (vi) On request, reviewing the agency's decision to terminate, suspend, or reduce benefits.
- (c) Receiving the name, address, telephone number, and any languages offered other than English of providers in a managed care organization (MCO);
- (d) Receiving information about the structure and operation of the MCO and how health care services are delivered;
- (e) Receiving emergency care, urgent care, or crisis services;
- (f) Receiving poststabilization services after receiving emergency care, urgent care, or crisis services that result in admittance to a hospital;
- (g) Receiving age-appropriate and culturally appropriate services;
- (h) Being provided a qualified interpreter and translated material at no cost to the person;
- (i) Receiving requested information and help in the language or format of choice;
- (j) Having available treatment options and explanation of alternatives;
- (k) Refusing any proposed treatment;
- (l) Receiving care that does not discriminate against a person;
- (m) Being free of any sexual exploitation or harassment;
- (n) Making an advance directive that states the person's choices and preferences for health care services under 42 C.F.R. Sec. 489 Subpart I;

- (o) Choosing a contracted health care provider;
- (p) Requesting and receiving a copy of health care records;
- (q) Being informed the cost for copying, if any;
- (r) Being free from retaliation;
- (s) Requesting and receiving policies and procedures of the MCO as they relate to health care rights;
- (t) Receiving services in an accessible location;
- (u) Receiving medically necessary services in accordance with the early and periodic screening, diagnosis, and treatment (EPSDT) program under WAC 182-534-0100, if the person is age twenty or younger;
- (v) Being treated with dignity, privacy, and respect;
- (w) Receiving treatment options and alternatives in a manner that is appropriate to a person's condition;
- (x) Being free from seclusion and restraint;
- (y) Receiving a second opinion from a qualified health care professional within an MCO provider network at no cost or having one arranged outside the network at no cost, as provided in 42 C.F.R. Sec. 438.206(b)(3);
- (z) Receiving medically necessary health care services outside of the MCO if those services cannot be provided adequately and timely within the MCO;
 - (aa) Filing a grievance with the MCO if the person is not satisfied with a service;
 - (bb) Receiving a notice of action so that a person may appeal any decision by the MCO that:
 - (i) Denies or limits authorization of a requested service;
 - (ii) Reduces, suspends, or terminates a previously authorized service; or
 - (iii) Denies payment for a service, in whole or in part.
 - (cc) Filing an appeal if the MCO fails to provide health care services in a timely manner as defined by the state or act within the time frames in 42 C.F.R. Sec. 438.408(b); and
 - (dd) Requesting an administrative hearing if an appeal is not resolved in a person's favor.

NEW SECTION

WAC 182-538-190 Behavioral health services only (BHSO). This section applies to enrollees receiving behavioral health services only (BHSO) under the integrated managed care (IMC) medicaid contract.

(1) IMC is mandatory for clients in eligible programs, but the agency may end enrollment or exempt clients from IMC based on WAC 182-538-130.

(2) If the agency ends enrollment or exempts a client from IMC, the client is required to enroll in behavioral health services only (BHSO). An exception to this requirement exists for American Indian and Alaskan native (AI/AN) clients. IMC including BHSO is optional for AI/AN clients.

(3) For BHSO enrollees, the MCO covers the behavioral health benefits included in the IMC medicaid contract, and the agency covers physical health services on a fee-for-service basis.

(4) The agency assigns the BHSO enrollee to an MCO available in the area where the client resides.

(5) A BHSO enrollee may change MCOs at any time for any reason with the change becoming effective the earliest

possible date given the requirements of the agency's enrollment system.

REPEALER

The following chapter of the Washington Administrative Code is repealed:

- WAC 182-538A-040 Washington apple health fully integrated managed care.
- WAC 182-538A-050 Definitions.
- WAC 182-538A-060 Fully integrated managed care and choice.
- WAC 182-538A-067 Qualifications to become a managed care organization (MCO) in fully integrated managed care (FIMC) regional service areas.
- WAC 182-538A-068 Qualifications to become a primary care case management (PCCM) provider in fully integrated managed care (FIMC) regional service areas.
- WAC 182-538A-070 Payments to managed care organizations (MCOs) in fully integrated managed care (FIMC) regional service areas.
- WAC 182-538A-071 Payments to primary care case management (PCCM) providers in fully integrated managed care (FIMC) regional service areas.
- WAC 182-538A-095 Scope of care for fully integrated managed care (FIMC) and behavioral health services only (BHSO) enrollees.
- WAC 182-538A-100 Managed care emergency services for fully integrated managed care (FIMC) enrollees.
- WAC 182-538A-110 The grievance and appeal system, and agency administrative hearing for fully integrated managed care (FIMC) managed care organization (MCO) enrollees.
- WAC 182-538A-111 The administrative hearing process for primary care case management (PCCM) enrollees in FIMC regional service areas.
- WAC 182-538A-120 Fully integrated managed care (FIMC) enrollee request for a second medical opinion.
- WAC 182-538A-130 Exemptions and ending enrollment in fully integrated managed care (FIMC).
- WAC 182-538A-140 Fully integrated managed care (FIMC) quality of care.

- WAC 182-538A-150 Apple health foster care program in fully integrated managed care regional service areas.
- WAC 182-538A-170 Notice requirements.
- WAC 182-538A-180 Rights and protections.
- WAC 182-538A-190 Behavioral health services only (BHSO).

AMENDATORY SECTION (Amending WSR 16-05-051, filed 2/11/16, effective 4/1/16)

WAC 182-538B-040 Behavioral health wraparound services. (1) This chapter governs nonmedicaid funded behavioral health services provided under the medicaid agency's behavioral health services wraparound contract. See also chapter 182-538D WAC for rules applicable to nonmedicaid behavioral health services.

(2) Washington apple health (~~(fully)~~) integrated managed care (~~((FIMC))~~) (IMC) behavioral health wraparound services are available only through a managed care organization (MCO) contracted to provide (~~((FIMC))~~) IMC services (~~((or behavioral health services only (BHSO)))~~).

(3) The MCO provides contracted nonmedicaid funded behavioral health wraparound services to medicaid enrollees in an (~~((FIMC))~~) IMC regional service area:

- (a) Within available resources;
- (b) Based on medical necessity; and
- (c) In order of priority to populations as identified by state and federal authorities.

(4) When nonmedicaid funding is exhausted, behavioral health wraparound services are no longer paid for and cannot be authorized regardless of medical necessity.

AMENDATORY SECTION (Amending WSR 16-05-051, filed 2/11/16, effective 4/1/16)

WAC 182-538B-050 Definitions. The following definitions and those found in chapters 182-500(~~(s)~~) and 182-538(~~(s)~~ and ~~182-538A~~) WAC apply to this chapter, unless otherwise stated.

"Action" means the denial or limited authorization of a service covered under the behavioral health services wraparound contract based on medical necessity.

"Available resources" means funds appropriated for the purpose of providing behavioral health wraparound services.

(a) This includes:

- (i) Federal funds, except those provided according to Title XIX of the Social Security Act; and
- (ii) State funds appropriated by the legislature for the purpose of providing services under the behavioral health administrative services organization contract.

(b) This does not include funds appropriated for the purpose of operating and administering the state psychiatric hospitals.

"Integrated managed care (IMC)" See WAC 182-538-050.

AMENDATORY SECTION (Amending WSR 17-23-199, filed 11/22/17, effective 12/23/17)

WAC 182-538B-110 Grievance and appeal system and agency administrative hearing. (1) **Introduction.** This section contains information about the managed care organization (MCO) grievance and appeal system and the agency's administrative hearing process for enrollees under the behavioral health services wraparound contract in ~~((fully))~~ integrated managed care ~~((FIMC))~~ (IMC) regional service areas.

(a) The MCO must have a grievance and appeal system and access to an agency administrative hearing to allow enrollees to file grievances and seek review of an MCO action as defined in this chapter.

(b) The agency's administrative hearing rules in chapter 182-526 WAC apply to agency administrative hearings requested by an enrollee to review the resolution of an enrollee's appeal of an MCO action.

(c) If a conflict exists between the requirements of this chapter and other rules, the requirements of this chapter take precedence.

(d) The MCO's policies and procedures regarding the grievance system must be approved by the agency.

(2) **MCO grievance and appeal system.** The MCO grievance and appeal system includes:

(a) A grievance process for addressing complaints about any matter that is not an action;

(b) An appeals process to address an enrollee's request for review of an MCO action;

(c) Access to an independent review by an independent review organization (IRO) under RCW 48.43.535 and WAC 182-526-0200;

(d) Access to the agency's administrative hearing process for review of an MCO's resolution of an appeal; and

(e) Allowing enrollees and the enrollee's authorized representatives to file grievances and appeals orally or in writing. An MCO cannot require enrollees to provide written follow-up for a grievance or an appeal the MCO received orally.

(3) **The MCO grievance process.**

(a) An enrollee or enrollee's authorized representative may file a grievance with an MCO. A provider may not file a grievance on behalf of an enrollee without the enrollee's written consent.

(b) An enrollee does not have a right to an agency administrative hearing in regards to the resolution of a grievance.

(c) The MCO must acknowledge receipt of each grievance either orally or in writing within two business days.

(d) The MCO must notify enrollees of the resolution of grievances within five business days of determination.

(4) **The MCO appeals process.**

(a) An enrollee, the enrollee's authorized representative, or a provider acting on behalf of the enrollee with the enrollee's written consent may appeal an MCO action.

(b) An MCO treats oral inquiries about appealing an action as an appeal to establish the earliest possible filing date for the appeal. The MCO confirms the oral appeal in writing.

(c) An MCO must acknowledge in writing receipt of each appeal to both the enrollee and the requesting provider within five calendar days of receiving the appeal request. The

appeal acknowledgment letter sent by the MCO serves as written confirmation of an appeal filed orally by an enrollee.

(d) The enrollee must file an appeal of an MCO action within sixty calendar days of the date on the MCO's notice of action.

(e) The MCO is not obligated to continue services pending the results of an appeal or subsequent agency administrative hearing.

(f) The MCO appeal process:

(i) Provides the enrollee a reasonable opportunity to present evidence and allegations of fact or law, both in person and in writing;

(ii) Provides the enrollee and the enrollee's representative the enrollee's case file, including medical records, other documents and records, and any new or additional evidence considered, relied upon, or generated by the MCO, PIHP or PAHP (or at the direction of the MCO, PIHP or PAHP) in connection with the action. This information must be provided free of charge and sufficiently in advance of the resolution time frame for appeals as specified in this section; and

(iii) Includes as parties to the appeal:

(A) The enrollee and the enrollee's authorized representative; and

(B) The legal representative of the deceased enrollee's estate.

(g) The MCO ensures that the people making decisions on appeals:

(i) Were not involved in any previous level of review or decision making; and

(ii) Are health care professionals who have appropriate clinical expertise in treating the enrollee's condition or disease if deciding either of the following:

(A) An appeal of an action involving medical necessity;

or

(B) An appeal that involves any clinical issues.

(h) Time frames for resolution of appeals.

(i) An MCO resolves each appeal and provides notice as expeditiously as the enrollee's health condition requires and no longer than seventy-two hours after the day the MCO receives the appeal.

(ii) The MCO may extend the time frame by an additional fourteen calendar days if:

(A) The enrollee requests the extension; or

(B) The MCO determines additional information is needed and delay is in the interests of the enrollee.

(i) Notice of resolution of appeal. The notice of the resolution of the appeal must:

(i) Be in writing and be sent to the enrollee and the requesting provider;

(ii) Include the results of the resolution of the appeal process and the date it was completed; and

(iii) Include information on the enrollee's right to request an agency administrative hearing and how to do so as provided in the agency hearing rules in WAC 182-526-0200, if the appeal is not resolved wholly in favor of the enrollee.

(j) **Deemed completion of the appeals process.** If the MCO fails to adhere to the notice and timing requirements for appeals, the enrollee is deemed to have completed the MCO's appeals process and may request an agency administrative hearing under WAC 182-526-0200.

(5) Agency administrative hearing.

(a) Only an enrollee or enrollee's authorized representative may request an agency administrative hearing. A provider may not request a hearing on behalf of an enrollee.

(b) If an enrollee does not agree with the MCO's resolution of an appeal and has completed the MCO appeal process, the enrollee may file a request for an agency administrative hearing based on the rules in this section and the agency hearing rules in WAC 182-526-0200. The enrollee must request an agency administrative hearing within ninety calendar days of the notice of resolution of appeal.

(c) An MCO is an independent party and responsible for its own representation in any agency administrative hearing, independent review, appeal to the board of appeals, and any subsequent judicial proceedings.

(6) **Effect of reversed resolutions of appeals.** If an MCO, a final order as defined in chapter 182-526 WAC, or an independent review organization (IRO) reverses a decision to deny or limit services, the MCO must authorize or provide the disputed services promptly and as expeditiously as the enrollee's health condition requires.

(7) **Available resources exhausted.** When available resources are exhausted, any appeals process, independent review, or agency administrative hearing process related to a request to authorize a service will be terminated, since services cannot be authorized without funding regardless of medical necessity.

AMENDATORY SECTION (Amending WSR 16-05-051, filed 2/11/16, effective 4/1/16)

WAC 182-538B-170 Notice requirements. Chapter 182-518 WAC applies to notice requirements in ~~((fully))~~ integrated managed care ~~((FIMC))~~ (IMC) regional service areas.

AMENDATORY SECTION (Amending WSR 17-23-200, filed 11/22/17, effective 12/23/17)

WAC 182-538C-040 Behavioral health services. (1) This chapter governs crisis-related and other behavioral health services provided under the medicaid agency's behavioral health administrative services organization (BH-ASO) contract. See also chapter 182-538D WAC for rules applicable to nonmedicaid behavioral health services.

(2) The BH-ASO contracts with the agency to provide behavioral health services within ~~((a fully))~~ an integrated managed care ~~((FIMC))~~ (IMC) regional service area.

(a) The BH-ASO provides the following services to all people, regardless of insurance status, income level, ability to pay, and county of residence:

(i) Mental health crisis services; ~~((and))~~

(ii) Operation of a behavioral health ombuds (ombudsman); and

(iii) Implementation of the Involuntary Treatment Act for both mental health and substance use disorders.

(b) The BH-ASO may provide substance use disorder crisis services within available resources to all people, regardless of the person's insurance status, income level, ability to pay, and county of residence.

(c) The BH-ASO provides the following services to people who are not eligible for medicaid coverage and are involuntarily or voluntarily detained under chapter 71.05, 71.24, or 71.34 RCW, ~~((RCW 70.96A.140,))~~ or a less restrictive alternative (LRA) court order:

(i) Evaluation and treatment services;

(ii) Substance use disorder residential treatment services; and

(iii) Outpatient behavioral services, under an LRA court order.

(d) To be eligible to contract with the agency, the BH-ASO must:

(i) Accept the terms and conditions of the agency's contracts; and

(ii) Be able to meet the network and quality standards established by the agency.

(e) Services related to the administration of chapters 71.05, 71.24, and 71.34 RCW ~~((and RCW 70.96A.140)).~~

(3) The BH-ASO may provide contracted noncrisis behavioral health services to people in an ~~((FIMC))~~ IMC regional service area:

(a) Within available resources;

(b) Based on medical necessity; and

(c) In order of priority to populations as identified by state and federal authorities.

(4) Within an ~~((FIMC))~~ IMC regional service area, the BH-ASO is a subcontractor with all ~~((FIMC))~~ IMC managed care organizations (MCOs) to provide crisis services for medicaid enrollees and the administration of involuntary treatment acts under ~~((RCW 70.96A.140 or))~~ chapter 71.05, 71.24, or 71.34 RCW.

(5) For medicaid-funded services subcontracted for by ~~((FIMC))~~ IMC managed care organizations (MCOs) to the BH-ASO:

(a) Grievances and appeals must be filed with the ~~((FIMC))~~ IMC MCO; and

(b) The grievance and appeal system and the agency's administrative hearing rules in chapter 182-538 WAC apply instead of the grievance and appeal system and hearing rules in this chapter.

AMENDATORY SECTION (Amending WSR 16-05-051, filed 2/11/16, effective 4/1/16)

WAC 182-538C-050 Definitions. The definitions ~~((and abbreviations))~~ in this section and those found in chapters 182-500 and 182-538 WAC apply to this chapter. ~~((If conflict exists, this chapter takes precedence.))~~

"Action" means the denial or limited authorization of a service covered under the behavioral health administrative services organization (BH-ASO) contract based on medical necessity.

"Available resources" means funds appropriated for the purpose of providing community behavioral health programs.

(a) This includes:

(i) Federal funds, except those provided according to Title XIX of the Social Security Act; and

(ii) State funds appropriated by the legislature for the purpose of providing services under the BH-ASO contract.

(b) This does not include funds appropriated for the purpose of operating and administering the state psychiatric hospitals.

"Behavioral health" (~~means mental health and substance use disorder conditions and related benefits~~) - See WAC 182-538-050.

"Behavioral health administrative services organization (BH-ASO)" (~~means an entity selected by the medicaid agency to administer behavioral health programs, including crisis services for individuals in a fully integrated managed care regional service area. The BH-ASO administers crisis services for all individuals in its defined regional service area, regardless of an individual's ability to pay~~) - See WAC 182-538-050.

"Complaint" - See "grievance."

"Crisis" (~~means an actual or perceived urgent or emergent situation that occurs when:~~

(a) An individual's stability or functioning is disrupted; and

(b) There is an immediate need to resolve the situation to prevent:

(i) A serious deterioration in the individual's mental or physical health; or

(ii) The need for referral to a significantly higher level of care.

"Fully integrated managed care (FIMC)" means the program under which a managed care organization provides:

(a) Physical health services funded by medicaid; and

(b) Behavioral health services funded by other available resources as defined in this chapter.

"Grievance" means an expression of dissatisfaction made by or on behalf of an individual and referred to a behavioral health administrative services organization (BH-ASO) about any matter other than an action)) - See WAC 182-538D-0200.

"Grievance" - See WAC 182-538-050.

"Integrated managed care (IMC)" - See WAC 182-538-050.

"Less restrictive alternative (LRA)" means court-ordered outpatient treatment in a setting less restrictive than total confinement.

"Noncrisis services" means services funded by non-medicaid funding sources that are provided to ((individuals)) people who are not enrolled in Washington apple health or otherwise eligible for medicaid. These services may be provided at the discretion of the behavioral health administrative services organization (BH-ASO) within available resources, such as:

(a) Crisis stabilization;

(b) Outpatient mental health or substance use disorder services; and

(c) Withdrawal management.

"Patient days of care" (~~means all voluntary patients and involuntarily committed patients under chapter 71.05 RCW, regardless of where in the state hospital the patients reside. Patients who are committed to the state hospital under chapter 10.77 RCW are not included in the patient days of care. Patients who are committed under RCW 10.77.088 by municipal or district courts after failed competency restoration and dismissal of misdemeanor charges are not counted~~

~~in the patient days of care until a petition for ninety days of civil commitment under chapter 71.05 RCW has been filed in court. Patients who are committed under RCW 10.77.086 by a superior court after failed competency restoration and dismissal of felony charges are not counted in the patient days of care until the patient is civilly committed under chapter 71.05 RCW.~~

"Regional service area" means a single county or multi-county grouping formed for the purpose of health care purchasing and designated by the agency and the department of social and health services)) - See WAC 182-538-050.

"Regional service area" - See WAC 182-538-050.

AMENDATORY SECTION (Amending WSR 16-05-051, filed 2/11/16, effective 4/1/16)

WAC 182-538C-070 Payment. (1) For crisis services, the behavioral health administrative services organization (BH-ASO) must determine whether the ((individual)) person receiving the services is eligible for Washington apple health or if the ((individual)) person has any other form of insurance coverage.

(2) For ((individuals)) people receiving crisis services who do not have other insurance coverage, the BH-ASO is responsible for the cost of those services.

(3) The BH-ASO administers and pays for the evaluation of involuntary detention or involuntary treatment under chapters 71.05, 71.24, and 71.34 RCW ((and RCW 70.96A.140)).

(4) The BH-ASO pays a reimbursement for each state hospital patient day of care that exceeds the BH-ASO daily allocation of state hospital beds based on a quarterly calculation of the bed usage by the BH-ASO.

(a) The medicaid agency bills the BH-ASO quarterly for state hospital patient days of care exceeding the BH-ASO daily allocation of state hospital beds and the established rate of reimbursement.

(b) The BH-ASO using fewer patient days of care than its quarterly allocation of state hospital beds will receive a portion of the reimbursement collected proportional to its share of the total number of patient days of care that were not used at the appropriate state hospital.

AMENDATORY SECTION (Amending WSR 17-23-200, filed 11/22/17, effective 12/23/17)

WAC 182-538C-110 Grievance and appeal system and agency administrative hearing for behavioral health administrative services organizations (BH-ASOs). (1) **General.** This section applies to the behavioral health administrative service organization (BH-ASO) grievance system for people within ((fully)) integrated managed care ((FIMC)) (IMC) regional service areas.

(a) The BH-ASO must have a grievance and appeal system to allow a person to file a grievance and request a review of a BH-ASO action as defined in this chapter.

(b) The agency's administrative hearing rules in chapter 182-526 WAC apply to agency administrative hearings requested by a person to review the resolution of an appeal of a BH-ASO action.

(c) If a conflict exists between the requirements of this chapter and other rules, the requirements of this chapter take precedence.

(d) The BH-ASO must maintain records of grievances and appeals.

(e) The BH-ASO is not obligated to continue services pending the results of an appeal or subsequent agency administrative hearing.

(2) **The BH-ASO grievance and appeal system.** The BH-ASO grievance system includes:

(a) A process for addressing complaints about any matter that is not an action;

(b) An appeal process to address a person's request for a review of a BH-ASO action as defined in this chapter; and

(c) Access to the agency's administrative hearing process for a person to request a review of a BH-ASO's resolution of an appeal.

(3) **The BH-ASO grievance process.**

(a) A person or a person's authorized representative may file a grievance with a BH-ASO. A provider may not file a grievance on behalf of a person without the written consent of the person or the person's authorized representative.

(b) There is no right to an agency administrative hearing regarding the BH-ASO's decision on a grievance, since a grievance is not an action.

(c) The BH-ASO must notify a person of the decision regarding the person's grievance within five business days of the decision.

(4) **The BH-ASO appeal process.**

(a) Parties to the appeal include:

(i) The person and the person's authorized or legal representative; or

(ii) The authorized representative of the deceased person's estate.

(b) A person, the person's authorized representative, or the provider acting with the person's written consent may appeal a BH-ASO action.

(c) A BH-ASO must treat oral inquiries about appealing an action as an appeal in order to establish the earliest possible filing date for the appeal.

(d) The BH-ASO must confirm any oral appeal in writing to the person or provider acting on behalf of the person.

(e) The person or provider acting on behalf of the person must file an appeal, either orally or in writing, within sixty calendar days of the date on the BH-ASO's notice of action.

(f) The BH-ASO must acknowledge receipt of each appeal to both the person and the provider requesting the service within three calendar days of receipt. ~~((The appeal acknowledgment letter sent by the BH-ASO serves as written confirmation of an appeal filed orally by a person.))~~

(g) If the person requests an expedited appeal for a crisis-related service, the BH-ASO must make a decision on whether to grant the person's request for expedited appeal and provide written notice as expeditiously as the person's health condition requires, within three calendar days after the BH-ASO receives the appeal. The BH-ASO must make reasonable efforts to provide oral notice.

(h) The BH-ASO appeal process:

(i) Provides the person a reasonable opportunity to present evidence and allegations of fact or law in writing.

(ii) Provides the person and the person's authorized representative opportunity before and during the appeals process to examine the person's case file, including medical records and any other documents and records considered during the appeal process free of charge.

(iii) If the person requests an expedited appeal, the BH-ASO must inform the person that it may result in the person having limited time to review records and prepare for the appeal.

(i) The BH-ASO ensures the staff making decisions on appeals:

(i) Were not involved in any previous level of review or decision making; and

(ii) Are health care professionals with appropriate clinical expertise in treating the person's condition or disease if deciding any of the following:

(A) An appeal of an action; or

(B) An appeal that involves any clinical issues.

(j) Time frames for standard resolution of appeals.

(i) For appeals involving termination, suspension, or reduction of previously authorized noncrisis services, the BH-ASO must make a decision within fourteen calendar days after receipt of the appeal.

(ii) If the BH-ASO cannot resolve an appeal within fourteen calendar days, the BH-ASO must notify the person that an extension is necessary to complete the appeal.

(k) Time frames for expedited appeals for crisis-related services ~~((or behavioral health prescription drug authorization decisions)).~~

(i) The BH-ASO must resolve the expedited appeal and provide notice of the decision no later than three calendar days after the BH-ASO receives the appeal.

(ii) The BH-ASO may extend the time frame by fourteen additional calendar days if:

(A) The person requests the extension; or

(B) The BH-ASO determines additional information is needed and the delay is in the interests of the person.

(iii) If the BH-ASO denies a request for expedited resolution of a noncrisis related service appeal, it must:

(A) Process the appeal based on the time frame for standard resolution;

(B) Make reasonable efforts to give the person prompt oral notice of the denial; and

(C) Follow-up within two calendar days of the oral notice with a written notice of denial.

(l) Extension of a standard resolution or expedited appeal not requested by the person.

(i) The BH-ASO must notify the person in writing of the reason for the delay, if not requested by that person.

(ii) The extension cannot delay the decision beyond twenty-eight calendar days of the request for appeal, without the informed written consent of the person.

(m) Notice of resolution of appeal. The notice of the resolution of the appeal must:

(i) Be in writing and be sent to the person and the provider requesting the services;

(ii) Include the results of the resolution process and the date it was completed; and

(iii) Include notice of the right to request an agency administrative hearing and how to do so as provided in the

agency hearing rules in chapter 182-526 WAC, if the appeal is not resolved wholly in favor of the person.

(5) Agency administrative hearings.

(a) Only a person or a person's authorized representative may request an agency administrative hearing. A provider may not request a hearing on behalf of a person.

(b) If a person does not agree with the BH-ASO's resolution of an appeal, the person may file a request for an agency administrative hearing based on this section and the agency hearing rules in chapter 182-526 WAC.

(c) The BH-ASO is an independent party and responsible for its own representation in any agency administrative hearing, appeal to the board of appeals, and any subsequent judicial proceedings.

(6) Effect of reversed resolutions of appeals. If the BH-ASO's decision not to provide services is reversed on appeal by the BH-ASO or through a final order from the agency administrative hearing process, the BH-ASO must authorize or provide the disputed services promptly and as expeditiously as the person's health condition requires.

(7) Available resources exhausted. When available resources are exhausted, any appeals or administrative hearing process related to a request for authorization of a noncrisis service will be terminated, since noncrisis services cannot be authorized without funding, regardless of medical necessity.

AMENDATORY SECTION (Amending WSR 16-05-051, filed 2/11/16, effective 4/1/16)

WAC 182-538C-220 Covered crisis mental health services. (1) Crisis mental health services are intended to stabilize ~~((an individual))~~ a person in crisis to:

(a) Prevent further deterioration;

(b) Provide immediate treatment and intervention in a location best suited to meet the needs of the ~~((individual))~~ person; and

(c) Provide treatment services in the least restrictive environment available.

(2) Crisis mental health services include:

(a) Crisis telephone support ~~((under WAC 388-877A-0230))~~;

(b) Crisis outreach services ~~((under WAC 388-877A-0240))~~;

(c) Crisis stabilization services ~~((under WAC 388-877A-0260))~~;

(d) Crisis peer support services ~~((under WAC 388-877A-0270))~~; and

(e) Emergency involuntary detention services ~~((under WAC 388-877A-0280))~~.

(3) A facility providing any crisis mental health service to ~~((an individual))~~ a person must:

(a) Be licensed by the department of ~~((social and))~~ health ~~((services))~~ as a behavioral health agency;

(b) Be certified by the department of ~~((social and))~~ health ~~((services))~~ to provide crisis mental health services;

(c) Have policies and procedures to support and implement the:

(i) Program-specific requirements ~~((in WAC 388-877A-0230 through 388-877A-0280))~~ for each crisis mental health service provided; and

(ii) Department of corrections access to confidential mental health information requirements in WAC ~~((388-865-0600 through 388-865-0640))~~ 182-538D-0600 through 182-538D-0640.

(4) A BH-ASO or its subcontractor providing crisis mental health services only is not required to meet the initial assessment, individual service plan, and clinical record requirements in WAC ~~((388-877-0610, 388-877-0620, and 388-877-0640))~~ 246-341-0610, 246-341-0620, and 246-341-0640.

(5) A BH-ASO or its subcontractor must ensure crisis mental health services:

(a) Are, with the exception of stabilization services, available twenty-four hours a day, seven days a week;

(b) Include family members, significant others, and other relevant treatment providers, as necessary, to provide support to the ~~((individual))~~ person in crisis; and

(c) Are provided in a setting that is safe for the ~~((individual))~~ person and staff members of the BH-ASO and its subcontractor.

AMENDATORY SECTION (Amending WSR 16-05-051, filed 2/11/16, effective 4/1/16)

WAC 182-538C-230 Covered substance use disorder detoxification services. (1) Chemical dependency detoxification services are provided to ~~((an individual))~~ a person to assist in the process of withdrawal from psychoactive substances in a safe and effective manner.

(2) A facility providing detoxification services to ~~((an individual))~~ a person must:

(a) Be a facility licensed by the department of health under one of the following:

(i) Chapter 246-320 WAC;

(ii) Chapter 246-322 WAC;

(iii) Chapter 246-324 WAC; or

(iv) Chapter 246-337 WAC.

(b) Be licensed by the department of ~~((social and))~~ health ~~((services))~~ as a behavioral health agency;

(c) Meet the applicable behavioral health agency licensure, certification, administration, personnel, clinical requirements, and behavioral health services administrative requirements; and

(d) Have policies and procedures to support and implement the applicable requirements in WAC ~~((388-877B-0110 through 388-877B-0130))~~ 246-341-1100 and 246-341-1102.

(3) A BH-ASO or its subcontractor agency must:

(a) Provide counseling to each ~~((individual))~~ person that addresses the ~~((individual's))~~ person's:

(i) Chemical dependency and motivation; and

(ii) Continuing care needs and need for referral to other services.

(b) Maintain a list of resources and referral options that can be used by staff members to refer ~~((an individual))~~ a person to appropriate services.

(c) Post any rules and responsibilities for ~~((individuals))~~ people receiving treatment, including information on poten-

tial use of increased motivation interventions or sanctions, in a public place in the facility.

(d) Provide tuberculosis screenings to ~~((individuals))~~ people for the prevention and control of tuberculosis.

(e) Provide HIV/AIDS information and include a brief risk intervention and referral as indicated.

NEW SECTION

WAC 182-538C-252 Behavioral health administrative services organizations—Advisory board membership. (1) A behavioral health administrative services organization (BH-ASO) must appoint advisory board members and maintain an advisory board in order to:

(a) Promote active engagement with people with behavioral health disorders, their families, and behavioral health agencies; and

(b) Solicit and use the advisory board members input to improve service delivery and outcome.

(2) The BH-ASO must appoint advisory board members and maintain an advisory board that:

(a) Broadly represents the demographic character of the service area;

(b) Is composed of at least fifty-one percent representation of one or more of the following:

(i) People with lived experience;

(ii) Parents or legal guardians of people with lived experience; or

(iii) Self-identified as people in recovery from a behavioral health disorder.

(c) Includes law enforcement representation; and

(d) Includes tribal representation, upon request of a tribe.

(3) When the BH-ASO is not a function of county government, the advisory board must include no more than four county elected officials.

(4) The advisory board:

(a) May have members who are employees of subcontracted agencies, as long as there are written rules that address potential conflicts of interest.

(b) Has the discretion to set rules in order to meet the requirements of this section.

(c) Membership is limited to three years per term for time served, per each advisory board member. Multiple terms may be served by a member if the advisory board rules allow it.

(5) The advisory board independently reviews and provides comments to the BH-ASO, on plans, budgets, and policies developed by the BH-ASO to implement the requirements of this section, chapters 71.05, 71.24, 71.34 RCW, and applicable federal laws.

Chapter 182-538D WAC

BEHAVIORAL HEALTH SERVICES

NEW SECTION

WAC 182-538D-0200 Behavioral health services—Definitions. The following definitions and those found in chapters 182-500, 182-538, and 182-538C WAC apply to this chapter. If conflict exists, this chapter takes precedence.

"Adult" means a person age eighteen or older. For purposes of the medicaid program, people age eighteen through age twenty have the early and periodic screening, diagnostic and treatment (EPSDT) benefit described in chapter 182-534 WAC. In the medicaid program, EPSDT is available until a person reaches age twenty-one.

"Assessment" means the process of obtaining all pertinent bio-psychosocial information, as identified by the person, and family and collateral sources, for determining a diagnosis and to plan individualized services and supports.

"Behavioral health" means the prevention, treatment of, and recovery from substance use disorders, mental health disorders or problem and pathological gambling disorders.

"Behavioral health administrative service organization (BH-ASO)" See WAC 182-538-050.

"Behavioral health agency" means an entity licensed by the department of health to provide behavioral health services, including services for mental health disorders and substance use disorders.

"Chemical dependency professional" or "CDP" means a person credentialed by the department of health as a chemical dependency professional (CDP) with primary responsibility for implementing an individualized service plan for substance use disorder services.

"Child" means a person under the age of eighteen. For the purposes of the medicaid program, people age eighteen through age twenty have the early and periodic screening, diagnostic and treatment (EPSDT) benefit described in chapter 182-534 WAC. In the medicaid program, EPSDT is available until a person reaches age twenty-one.

"Clinical record" means a paper or electronic file that is maintained by the provider and contains pertinent psychological, medical, and clinical information for each person served.

"Community support services" means services authorized, planned, and coordinated through resource management services including, at a minimum, assessment, diagnosis, emergency crisis intervention available twenty-four hours, seven days a week; prescreening determinations for people who are mentally ill being considered for placement in nursing homes as required by federal law; screening for patients being considered for admission to residential services; diagnosis and treatment for children who are mentally or severely emotionally disturbed discovered under screening through the federal Title XIX early and periodic screening, diagnosis, and treatment (EPSDT) program; investigation, legal, and other nonresidential services under chapter 71.05 RCW; case management services; psychiatric treatment including medication supervision; counseling; psychotherapy; assuring transfer of relevant patient information between service providers; recovery services; and other services determined by behavioral health administrative service organizations and managed care organizations.

"Complaint" See "grievance" in WAC 182-538-050.

"Consent" means agreement given by a person after the person is provided with a description of the nature, character, anticipated results of proposed treatments and the recognized serious possible risks, complications, and anticipated benefits, including alternatives and nontreatment. Informed con-

sent must be provided in a terminology that the person can reasonably be expected to understand.

"Consultation" means the clinical review and development of recommendations regarding activities, or decisions of, clinical staff, contracted employees, volunteers, or students by people with appropriate knowledge and experience to make recommendations.

"Crisis" means an actual or perceived urgent or emergent situation that occurs when a person's stability or functioning is disrupted and there is an immediate need to resolve the situation to prevent a serious deterioration in the person's mental or physical health, or to prevent the need for referral to a significantly higher level of care.

"Cultural competence" or **"culturally competent"** means the ability to recognize and respond to health-related beliefs and cultural values, disease incidence and prevalence, and treatment efficacy. Examples of culturally competent care include striving to overcome cultural, language, and communications barriers, providing an environment in which people from diverse cultural backgrounds feel comfortable discussing their cultural health beliefs and practices in the context of negotiating treatment options, encouraging people to express their spiritual beliefs and cultural practices, and being familiar with and respectful of various traditional healing systems and beliefs and, where appropriate, integrating these approaches into treatment plans.

"Designated crisis responder (DCR)" means a mental health professional appointed by the county, or an entity appointed by the county, to perform the duties described in chapter 71.05 RCW.

"Disability" means a physical or mental impairment that substantially limits one or more major life activities of a person and the person:

- (a) Has a record of such an impairment; or
- (b) Is regarded as having such impairment.

"Ethnic minority" or **"racial/ethnic groups"** means, for the purposes of this chapter, any of the following general population groups:

- (a) African American;
- (b) An American Indian or Alaskan native, which includes:
 - (i) A person who is a member or considered to be a member in a federally recognized tribe;
 - (ii) A person determined eligible to be found Indian by the secretary of interior;
 - (iii) An Eskimo, Aleut, or other Alaskan native; and
 - (iv) An unenrolled Indian meaning a person considered Indian by a federally or nonfederally recognized Indian tribe or off-reservation Indian/Alaskan native community organization.
- (c) Asian/Pacific Islander; or
- (d) Hispanic.

"Housing services" means the active search and promotion of individual access to, and choice in, safe and affordable housing that is appropriate to the person's age, culture, and needs.

"Integrated managed care (IMC)" See WAC 182-538-050.

"Less restrictive alternative (LRA)" See WAC 182-538C-050.

"Mental health professional" means a person who meets the following:

(a) A psychiatrist, psychologist, physician assistant working with a supervising psychiatrist, psychiatric advanced registered nurse practitioner (ARNP), psychiatric nurse, or social worker as defined in chapters 71.05 and 71.34 RCW;

(b) A person who is licensed by the department of health as a mental health counselor, mental health counselor associate, marriage and family therapist, or marriage and family therapist associate; or

(c) A person with a master's degree or further advanced degree in counseling or one of the social sciences from an accredited college or university who has at least two years of experience in direct treatment of people with mental illness or emotional disturbance, experience that was gained under the supervision of a mental health professional recognized by the department of health or attested to by the licensed behavioral health agency.

"Mental health specialist" means:

(a) A **"child mental health specialist"** is defined as a mental health professional with the following education and experience:

(i) A minimum of one hundred actual hours (not quarter or semester hours) of special training in child development and the treatment of children and youth with serious emotional disturbance and their families; and

(ii) The equivalent of one year of full-time experience in the treatment of seriously emotionally disturbed children and youth and their families under the supervision of a child mental health specialist.

(b) A **"geriatric mental health specialist"** is defined as a mental health professional who has the following education and experience:

(i) A minimum of one hundred actual hours (not quarter or semester hours) of specialized training devoted to the mental health problems and treatment of people age sixty and older; and

(ii) The equivalent of one year of full-time experience in the treatment of people age sixty and older, under the supervision of a geriatric mental health specialist.

(c) An **"ethnic minority mental health specialist"** is defined as a mental health professional who has demonstrated cultural competence attained through major commitment, ongoing training, experience and/or specialization in serving ethnic minorities, including evidence of one year of service specializing in serving the ethnic minority group under the supervision of an ethnic minority mental health specialist; and

(i) Evidence of support from the ethnic minority community attesting to the person's commitment to that community; or

(ii) A minimum of one hundred actual hours (not quarter or semester hours) of specialized training devoted to ethnic minority issues and treatment of ethnic minorities.

(d) A **"disability mental health specialist"** is defined as a mental health professional with special expertise in working with an identified disability group. For purposes of this chapter only, "disabled" means a person with a disability

other than a mental illness, including a developmental disability, serious physical handicap, or sensory impairment.

(i) If the consumer is deaf, the specialist must be a mental health professional with:

(A) Knowledge about the deaf culture and psychosocial problems faced by people who are deaf; and

(B) Ability to communicate fluently in the preferred language system of the consumer.

(ii) The specialist for people with developmental disabilities must be a mental health professional who:

(A) Has at least one year experience working with people with developmental disabilities; or

(B) Is a developmental disabilities professional as defined in RCW 71.05.020.

"Peer counselor" means a person recognized by medicare agency as a person who:

(a) Is a self-identified consumer of behavioral health services who:

(i) Has applied for, is eligible for, or has received behavioral health services; or

(ii) Is the parent or legal guardian of a person who has applied for, is eligible for, or has received behavioral health services;

(b) Is a counselor credentialed under chapter 18.19 RCW;

(c) Has completed specialized training provided by or contracted through the medicare agency. If the person was trained by trainers approved by the department of social and health services before October 1, 2004, and has met the requirements in (a), (b) and (d) of this subsection by January 31, 2005, the person is exempt from completing this specialized training;

(d) Has successfully passed an examination administered by the medicare agency or an authorized contractor; and

(e) Has received a written notification letter from the medicare agency stating that the medicare agency recognizes the person as a "peer counselor."

"Quality plan" means an overarching system and/or process whereby quality assurance and quality improvement activities are incorporated and infused into all aspects of a behavioral health administrative service organization's (BH-ASO's) or managed care organization's (MCO's) operations.

"Residential services" means a complete range of residences and supports authorized by resource management services and which may involve a facility, a distinct part thereof, or services which support community living, for people who are acutely mentally ill, adults who are chronically mentally ill, children who are severely emotionally disturbed, or adults who are seriously disturbed and determined by the behavioral health organization to be at risk of becoming acutely or chronically mentally ill.

"Resource management services" means the planning, coordination, and authorization of residential services and community support services for people who are:

(a) Adults and children who are acutely mentally ill;

(b) Adults who are chronically mentally ill;

(c) Children who are severely emotionally disturbed; or

(d) Adults who are seriously disturbed and determined solely by a behavioral health organization to be at risk of becoming acutely or chronically mentally ill.

"Substance use disorder" means a cluster of cognitive, behavioral, and physiological symptoms indicating that a person continues using the substance despite significant substance-related problems. The diagnosis of a substance use disorder is based on a pathological pattern of behaviors related to the use of the substances.

"Supervision" means the regular monitoring of the administrative, clinical, or clerical work performance of a staff member, trainee, student, volunteer, or employee on contract by a person with the authority to give direction and require change.

"Youth" means a person who is age seventeen or younger.

NEW SECTION

WAC 182-538D-0234 Behavioral health administrative service organizations—When the medicare agency administers regional behavioral health services. (1) If a currently operating behavioral health administrative service organization (BH-ASO) chooses to stop functioning as a BH-ASO, fails to perform contract requirements and fails to correct the issue to the medicare agency's satisfaction when corrective action is issued, or does not meet the requirements under RCW 71.24.045, the following is implemented:

(a) Under RCW 71.24.035(16), the director of the medicare agency:

(i) Is designated as the BH-ASO until a new BH-ASO is designated; and

(ii) Assumes the duties assigned to the region without a participating BH-ASO.

(b) The medicare agency:

(i) Administers behavioral health services within the region without a participating BH-ASO; and

(ii) Continues to apply the BH-ASO requirements in chapter 182-538C WAC.

(2) A person who resides within the service area of a region without a participating BH-ASO may receive services, within available resources as defined in RCW 71.24.025(2), from any provider of behavioral health services that is contracted with the medicare agency and licensed by the department of health.

NEW SECTION

WAC 182-538D-0246 Behavioral health administrative service organizations and managed care organizations—Public awareness of behavioral health services. A behavioral health administrative service organization (BH-ASO), or a managed care organization (MCO), or a BH-ASO's or MCO's designee must provide public information on the availability of mental health and substance use disorder services. The BH-ASO or MCO must:

(1) Maintain information on available services, including crisis services and the recovery help line in telephone directories, public web sites, and other public places in easily accessible formats; and

(2) Publish and disseminate brochures and other materials or methods for describing services and hours of operation that are appropriate for all people, including those who may

be visually impaired, limited-English proficient, or unable to read.

NEW SECTION

WAC 182-538D-0254 Behavioral health administrative service organizations and managed care organizations—Voluntary and involuntary inpatient evaluation and treatment services. (1) A behavioral health administrative service organization (BH-ASO) and managed care organization (MCO) must develop and implement age and culturally competent behavioral health services that are consistent with chapters 71.24, 71.05, and 71.34 RCW.

(2) For involuntary evaluation and treatment services, the BH-ASO or MCO:

(a) Must ensure that people in their regional service area have access to involuntary inpatient care; and

(b) Is responsible for coordinating discharge planning with the treating inpatient facility.

NEW SECTION

WAC 182-538D-0258 Behavioral health administrative service organizations—Administration of the Mental Health Involuntary Treatment Act and Substance Use Disorders Involuntary Treatment Act. Behavioral health administrative service organizations (BH-ASOs) are responsible for administration of the Mental Health Involuntary Treatment Act and Substance Use Disorders Involuntary Treatment Act, including investigation, detention, transportation for people not eligible for medicaid, due process and other court-related services, and other services required by chapters 71.05, 71.24, and 71.34 RCW. This includes:

(1) BH-ASOs ensuring that designated crisis responders (DCRs) perform the duties of involuntary investigation and detention in accordance with the requirements of chapters 71.05, 71.24, and 71.34 RCW.

(2) BH-ASOs and managed care organizations documenting the person's compliance with the conditions of mental health less restrictive alternative court orders by:

(a) Ensuring periodic evaluation of each committed person for release from or continuation of an involuntary treatment order. Evaluations must be recorded in the clinical record, and must occur at least monthly for ninety-day commitments and one hundred eighty-day commitments.

(b) Notifying the DCR if noncompliance with the less restrictive alternative order impairs the person sufficiently to warrant detention or evaluation for detention and petitioning for revocation of the less restrictive alternative court order.

NEW SECTION

WAC 182-538D-0262 Behavioral health administrative service organizations and managed care organizations—Behavioral health ombuds office. (1) A behavioral health administrative service organization (BH-ASO) must provide unencumbered access to and maintain the independence of the behavioral health ombuds. Managed care organizations (MCOs) must ensure the BH-ASO provides access to ombuds for medicaid managed care enrollees.

(2) Behavioral health ombuds must be current consumers of the mental health or substance use disorder system, or past consumers or family members of past consumers.

(3) The BH-ASO must maintain a behavioral health ombuds office that:

(a) Is reflective of the age and demographic character of the region and assists and advocates for people with resolving issues at the lowest possible level;

(b) Is independent of the BH-ASO, MCO, medicaid agency, and the provider network, unless by written exception from the medicaid agency;

(c) Supports people, family members, and other interested parties regarding issues, grievances, and appeals;

(d) Is accessible to people, including having a toll-free, independent phone line for access;

(e) Is able to access provider sites and records relating to people with appropriate releases so that it can reach out to people and help to resolve issues, grievances, and appeals;

(f) Receives training and adheres to confidentiality consistent with this chapter and chapters 71.05, 71.24, and 71.34 RCW;

(g) Involves other people, at the person's request;

(h) Supports people in the pursuit of a formal resolution;

(i) If necessary, continues to assist the person through the administrative hearing process;

(j) Coordinates and collaborates with allied services to improve the effectiveness of advocacy and to reduce duplication when serving the same person;

(k) Provides information on grievances to the BH-ASO;

(l) Provides reports and formalized recommendations at least biennially to the BH-ASO and local consumer and family advocacy groups; and

(m) Posts and makes information available to people regarding the behavioral health ombuds office consistent with WAC 182-538D-0262, and local advocacy organizations that may assist people in understanding their rights.

NEW SECTION

WAC 182-538D-0264 Behavioral health administrative service organizations and managed care organizations—Quality plan. A behavioral health administrative service organization (BH-ASO) and managed care organization (MCO) must have a quality plan for continuous quality improvement in the delivery of culturally competent behavioral health services. See WAC 182-538-140 for MCOs and WAC 182-538C-040 for BH-ASOs.

NEW SECTION

WAC 182-538D-0380 Managed care organization—Choice of primary behavioral health provider. The managed care organization (MCO) must:

(1) Ensure that each person receiving nonemergency behavioral health rehabilitation services has a primary behavioral health provider who is responsible to carry out the individual service plan; and

(2) Allow people, parents of people age twelve and younger, and guardians of people of all ages to select a primary behavioral health provider from the available primary behavioral health provider staff within the MCO.

(3) Assign a primary behavioral health provider not later than fifteen working days after the person requests services if the person does not select a primary behavioral health provider.

(4) Allow a person to change primary behavioral health providers at any time for any reason. The person must notify the MCO or its designee of the request for a change, and inform the MCO or designee of the name of the new primary behavioral health provider.

DEPARTMENT OF CORRECTIONS ACCESS TO CONFIDENTIAL MENTAL HEALTH INFORMATION

NEW SECTION

WAC 182-538D-0600 Purpose. In order to enhance and facilitate the department of corrections' ability to carry out its responsibility of planning and ensuring community protection, mental health records and information, as defined in this section, that are otherwise confidential shall be released by any mental health service provider to the department of corrections personnel for whom the information is necessary to carry out the responsibilities of their office as authorized in RCW 71.05.445. Department of corrections personnel must use records only for the stated purpose and must assure that records remain confidential and subject to the limitations on disclosure outlined in chapter 71.05 RCW, except as provided in RCW 72.09.585.

NEW SECTION

WAC 182-538D-0620 Scope. Many records and reports are updated on a regular or as needed basis. The scope of the records and reports to be released to the department of corrections are dependent upon the reason for the request.

(1) For the purpose of a presentence investigation release only the most recently completed or received records of those completed or received within the twenty-four-month period before the date of the request; or

(2) For all other purposes including risk assessments release all versions of records and reports that were completed or received within the ten year period prior to the date of the request that are still available.

NEW SECTION

WAC 182-538D-0630 Time frame. The mental health service provider will provide the requested relevant records, reports and information to the authorized department of corrections person in a timely manner, according to the purpose of the request:

(1) Presentence investigation - Within seven days of the receipt of the request. If some or all of the requested relevant records, reports and information are not available within that time period the mental health service provider shall notify the authorized department of corrections person prior to the end of the seven-day-period and provide the requested relevant records, reports or information within a mutually agreed to time period; or

(2) All other purposes - Within thirty days of the receipt of the request. If some or all of the requested relevant records, reports and information are not available within that time period the mental health service provider shall notify the authorized department of corrections person prior to the end of the thirty-day period and provide the requested relevant records, reports or information within a mutually agreed to time period; or

(3) Emergent situation requests - When an offender subject has failed to report for department of corrections supervision or in an emergent situation that poses a significant risk to the public, the mental health provider shall upon request, release information related to mental health services delivered to the offender and, if known, information regarding the whereabouts of the offender. Requests if oral must be subsequently confirmed in writing the next working day, which includes email or facsimile so long as the requesting person at the department of corrections is clearly defined. The request must specify the information being requested. Disclosure of the information requested does not require the consent of consumer.

Information that can be released is limited to:

(a) A statement as to whether the offender is or is not being treated by the mental health services provider; and

(b) Address or information about the location or whereabouts of the offender.

NEW SECTION

WAC 182-538D-0640 Written requests. The written request for relevant records, reports and information must include:

(1) Verification that the person for whom records, reports and information are being requested is under the authority of the department of corrections, per chapter 9.94A RCW, and the expiration date of that authority;

(2) Sufficient information to identify the person for whom records, reports and information are being requested including name and other identifying data;

(3) Specification as to which records and reports are being requested and the purpose for the request;

(4) Specification as to what relevant information is requested and the purpose for the request;

(5) Identification of the department of corrections person to whom the records, reports and information shall be sent, including the person's name, title and address;

(6) Name, title and signature of the requestor and date of the request.

WSR 19-24-064

PERMANENT RULES

HEALTH CARE AUTHORITY

[Filed November 27, 2019, 11:33 a.m., effective January 1, 2020]

Effective Date of Rule: January 1, 2020.

Purpose: Effective January 1, 2020, a medical care services (MCS) client may receive the same dental coverage in WAC 182-535-1066 as other eligible clients. The agency is

repealing WAC 182-535-1066 which contains limited dental coverage for MCS clients. This section will no longer apply.

Citation of Rules Affected by this Order: Repealing WAC 182-535-1066.

Statutory Authority for Adoption: RCW 41.05.021, 41.05.160; ESHB 1109, section 211(30), chapter 415, Laws of 2019.

Adopted under notice filed as WSR 19-21-131 on October 21, 2019.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 0, Repealed 0; or Recently Enacted State Statutes: New 0, Amended 0, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 0, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 0, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 0, Amended 0, Repealed 1.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 0, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 0, Repealed 1.

Date Adopted: November 27, 2019.

Wendy Barcus
Rules Coordinator

REPEALER

The following section of the Washington Administrative Code is repealed:

WAC 182-535-1066 Dental-related services—Medical care services clients.

WSR 19-24-065

PERMANENT RULES

HEALTH CARE AUTHORITY

[Filed November 27, 2019, 11:38 a.m., effective December 28, 2019]

Effective Date of Rule: Thirty-one days after filing.

Purpose: The agency is revising the definition of alternate living facility (ALF) to include a staffed residential facility, a group care facility for medically complex children, and a facility for children and youth twenty years of age and younger where a state-operated living alternative program is operated.

Citation of Rules Affected by this Order: Amending WAC 182-513-1100.

Statutory Authority for Adoption: RCW 41.05.021, 41.05.160.

Adopted under notice filed as WSR 19-21-104 on October 16, 2019.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 0, Repealed 0; or

Recently Enacted State Statutes: New 0, Amended 0, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 0, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 1, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 0, Amended 0, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 0, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 1, Repealed 0.

Date Adopted: November 27, 2019.

Wendy Barcus
Rules Coordinator

AMENDATORY SECTION (Amending WSR 17-03-116, filed 1/17/17, effective 2/17/17)

WAC 182-513-1100 Definitions related to long-term services and supports (LTSS). This section defines the meaning of certain terms used in chapters 182-513 and 182-515 WAC. Within these chapters, institutional, home and community based (HCB) waiver, program of all-inclusive care for the elderly (PACE), and hospice in a medical institution are referred to collectively as long-term care (LTC). Long-term services and supports (LTSS) is a broader definition which includes institutional, HCB waiver, and other services such as medicaid personal care (MPC), community first choice (CFC), PACE, and hospice in the community. See chapter 182-500 WAC for additional definitions.

"Adequate consideration" means that the fair market value (FMV) of the property or services received, in exchange for transferred property, approximates the FMV of the property transferred.

"Administrative costs" or **"costs"** means necessary costs paid by the guardian including attorney fees.

"Aging and long-term support administration (AL TSA)" means the administration within the Washington state department of social and health services (DSHS).

"Alternate living facility (ALF)" is not an institution under WAC 182-500-0050; it is one of the following community residential facilities:

(a) An adult family home (AFH) licensed under chapter 70.128 RCW.

(b) An adult residential care facility (ARC) licensed under chapter 18.20 RCW.

(c) A (~~mental~~) behavioral health adult residential treatment facility licensed under chapter 246-337 WAC.

(d) An assisted living facility (AL) licensed under chapter 18.20 RCW.

(e) A developmental disabilities administration (DDA) group home (GH) licensed as an adult family home under chapter 70.128 RCW or an assisted living facility under chapter 18.20 RCW.

(f) An enhanced adult residential care facility (EARC) licensed as an assisted living facility under chapter 18.20 RCW.

(g) An enhanced service facility (ESF) licensed under chapter 70.97 RCW.

(h) A staffed residential facility licensed under chapter 74.15 RCW.

(i) A group care facility for medically complex children licensed under chapter 74.15 RCW.

(j) A facility for children and youth twenty years of age and younger where a state-operated living alternative program, as defined under chapter 71A.10 RCW, is operated.

"**Assets**" means all income and resources of a person and of the person's spouse, including any income or resources which that person or that person's spouse would otherwise currently be entitled to but does not receive because of action:

(a) By that person or that person's spouse;

(b) By another person, including a court or administrative body, with legal authority to act in place of or on behalf of the person or the person's spouse; or

(c) By any other person, including any court or administrative body, acting at the direction or upon the request of the person or the person's spouse.

"**Authorization date**" means the date payment begins for long-term services and supports (LTSS) under WAC 388-106-0045.

"**Clothing and personal incidentals (CPI)**" means the cash payment (under WAC 388-478-0090, 388-478-0006, and 388-478-0033) issued by the department for clothing and personal items for people living in an ALF or medical institution.

"**Community first choice (CFC)**" means a medicaid state plan home and community based service developed under the authority of section 1915(k) of the Social Security Act under chapter 388-106 WAC.

"**Community options program entry system (COPEs)**" means a medicaid HCB waiver program developed under the authority of section 1915(c) of the Social Security Act under chapter 388-106 WAC.

"**Community spouse (CS)**" means the spouse of an institutionalized spouse.

"**Community spouse resource allocation (CSRA)**" means the resource amount that may be transferred without penalty from:

(a) The institutionalized spouse (IS) to the community spouse (CS); or

(b) The spousal impoverishment protections institutionalized (SIPI) spouse to the spousal impoverishment protections community (SIPC) spouse.

"**Community spouse resource evaluation**" means the calculation of the total value of the resources owned by a married couple on the first day of the first month of the institutionalized spouse's most recent continuous period of institutionalization.

"**Comprehensive assessment reporting evaluation (CARE) assessment**" means the evaluation process defined under chapter 388-106 WAC used by a department designated social services worker or a case manager to determine a person's need for long-term services and supports (LTSS).

"**Continuing care contract**" means a contract to provide a person, for the duration of that person's life or for a term in excess of one year, shelter along with nursing, medical, health-related, or personal care services, which is condi-

tioned upon the transfer of property, the payment of an entrance fee to the provider of such services, or the payment of periodic charges for the care and services involved.

"**Continuing care retirement community**" means an entity which provides shelter and services under continuing care contracts with its members and which sponsors or includes a health care facility or a health service.

"**Dependent**" means a minor child, or one of the following who meets the definition of a tax dependent under WAC 182-500-0105: Adult child, parent, or sibling.

"**Developmental disabilities administration (DDA)**" means an administration within the Washington state department of social and health services (DSHS).

"**Developmental disabilities administration (DDA) home and community based (HCB) waiver**" means a medicaid HCB waiver program developed under the authority of section 1915(c) of the Social Security Act under chapter 388-845 WAC authorized by DDA. There are five DDA HCB waivers:

(a) Basic Plus;

(b) Core;

(c) Community protection;

(d) Children's intensive in-home behavioral support (CIIBS); and

(e) Individual and family services (IFS).

"**Equity**" means the fair market value of real or personal property less any encumbrances (mortgages, liens, or judgments) on the property.

"**Fair market value (FMV)**" means the price an asset may reasonably be expected to sell for on the open market in an agreement, made by two parties freely and independently of each other, in pursuit of their own self-interest, without pressure or duress, and without some special relationship (arm's length transaction), at the time of transfer or assignment.

"**Guardianship fees**" or "**fees**" means necessary fees charged by a guardian for services rendered on behalf of a client.

"**Home and community based (HCB) waiver programs authorized by home and community services (HCS)**" means medicaid HCB waiver programs developed under the authority of Section 1915(c) of the Social Security Act under chapter 388-106 WAC authorized by HCS. There are three HCS HCB waivers: Community options program entry system (COPEs), new freedom consumer directed services (New Freedom), and residential support waiver (RSW).

"**Home and community based services (HCBS)**" means LTSS provided in the home or a residential setting to persons assessed by the department.

"**Institutional services**" means services paid for by Washington apple health, and provided:

(a) In a medical institution;

(b) Through an HCB waiver; or

(c) Through programs based on HCB waiver rules for post-eligibility treatment of income under chapter 182-515 WAC.

"**Institutionalized individual**" means a person who has attained institutional status under WAC 182-513-1320.

"**Institutionalized spouse**" means a person who, regardless of legal or physical separation:

(a) Has attained institutional status under WAC 182-513-1320; and

(b) Is legally married to a person who is not in a medical institution.

"Life care community" see continuing care community.

"Likely to reside" means the agency or its designee reasonably expects a person will remain in a medical institution for thirty consecutive days. Once made, the determination stands, even if the person does not actually remain in the facility for that length of time.

"Long-term care services" see "Institutional services."

"Long-term services and supports (LTSS)" includes institutional and noninstitutional services authorized by the department.

"Medicaid personal care (MPC)" means a medicaid state plan home and community based service under chapter 388-106 WAC.

"Most recent continuous period of institutionalization (MRCPI)" means the current period an institutionalized spouse has maintained uninterrupted institutional status when the request for a community spouse resource evaluation is made. Institutional status is determined under WAC 182-513-1320.

"Noninstitutional medicaid" means any apple health program not based on HCB waiver rules under chapter 182-515 WAC, or rules based on a person residing in an institution for thirty days or more under chapter 182-513 WAC.

"Nursing facility level of care (NFLOC)" is under WAC 388-106-0355.

"Participation" means the amount a person must pay each month toward the cost of long-term care services received each month; it is the amount remaining after the post-eligibility process under WAC 182-513-1380, 182-515-1509, or 182-515-1514. Participation is not room and board.

"Penalty period" or **"period of ineligibility"** means the period of time during which a person is not eligible to receive services that are subject to transfer of asset penalties.

"Personal needs allowance (PNA)" means an amount set aside from a person's income that is intended for personal needs. The amount a person is allowed to keep as a PNA depends on whether the person lives in a medical institution, ALF, or at home.

"Room and board" means the amount a person must pay each month for food, shelter, and household maintenance requirements when that person resides in an ALF. Room and board is not participation.

"Short stay" means residing in a medical institution for a period of twenty-nine days or fewer.

"Special income level (SIL)" means the monthly income standard that is three hundred percent of the supplemental security income (SSI) federal benefit rate.

"Spousal impoverishment protections" means the financial provisions within Section 1924 of the Social Security Act that protect income and assets of the community spouse through income and resource allocation. The allocation process is used to discourage the impoverishment of a spouse due to the other spouse's need for LTSS. This includes services provided in a medical institution, HCB waivers authorized under 1915(c) of the Social Security Act, and

through December 31, 2018, services authorized under 1115 and 1915(k) of the Social Security Act.

"Spousal impoverishment protections community (SIPC) spouse" means the spouse of a SIPI spouse.

"Spousal impoverishment protections institutionalized (SIPI) spouse" means a legally married person who qualifies for the noninstitutional categorically needy (CN) Washington apple health SSI-related program only because of the spousal impoverishment protections under WAC 182-513-1220.

"State spousal resource standard" means the minimum CSRA standard for a CS or SIPC spouse.

"Third-party resource (TPR)" means funds paid to or on behalf of a person by a third party, where the purpose of the funds is for payment of activities of daily living, medical services, or personal care. The agency does not pay for these services if there is a third-party resource available.

"Transfer" means, in the context of long-term care eligibility, the changing of ownership or title of an asset, such as income, real property, or personal property, by one of the following:

(a) An intentional act that changes ownership or title; or

(b) A failure to act that results in a change of ownership or title.

"Uncompensated value" means the fair market value (FMV) of an asset on the date of transfer, minus the FMV of the consideration the person receives in exchange for the asset.

"Undue hardship" means a person is not able to meet shelter, food, clothing, or health needs. A person may apply for an undue hardship waiver based on criteria under WAC 182-513-1367.

WSR 19-24-067

PERMANENT RULES

DEPARTMENT OF TRANSPORTATION

[Filed November 27, 2019, 2:50 p.m., effective December 28, 2019]

Effective Date of Rule: Thirty-one days after filing.

Purpose: The proposed amends WAC 468-38-071 to allow government vehicles to operate during emergency conditions to respond to events such as snow and ice operations. Additional language was added to exempt government vehicles operating during an emergency event from pilot/escort car requirements.

Citation of Rules Affected by this Order: Amending WAC 468-38-071 (4) and (5).

Statutory Authority for Adoption: RCW 46.44.090.

Adopted under notice filed as WSR 19-21-090 on October 15, 2019.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 0, Repealed 0; or Recently Enacted State Statutes: New 0, Amended 0, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 0, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 1, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 0, Amended 1, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 1, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 0, Repealed 0.

Date Adopted: November 27, 2019.

Kara Larsen, Director
Risk Management and
Legal Services Division

AMENDATORY SECTION (Amending WSR 13-18-009, filed 8/22/13, effective 9/22/13)

WAC 468-38-071 Maximums and other criteria for special permits—Divisible. (1) **Can a vehicle, or vehicle combination, acquire a permit to exceed the dimensions for legal vehicles in regular operation when moving items of a divisible nature?** Yes. There are specific configurations that receive extra length, extra width, or extra height when carrying a divisible load.

(2) **What configurations can be issued a permit, and how are they measured?** The configurations and measurement criteria are:

(a) An overlength permit may be issued to a truck-tractor to pull a single trailer or semi-trailer, with a trailer length not to exceed fifty-six feet. The measurement for the single trailing unit will be from the front of the trailer (including draw bar when used), or load, to the rear of the trailer, or load, whichever provides the greater distance up to fifty-six feet. Rear overhang may not exceed fifteen feet.

(b) An overlength permit may be issued to a truck-tractor to pull a set of double trailers, composed of a semi-trailer and full trailer or second semi-trailer, with a combined trailer length not to exceed sixty-eight feet. The measurement for double trailers will be from the front of the first trailer, or load, to the end of the second trailer or load, whichever provides the greatest distance up to sixty-eight feet. Note: If the truck-tractor is carrying an allowable small freight compartment (dromedary box), the total combined length of the combination, combined trailer length notwithstanding, is limited to seventy-five feet.

(c) An overlength permit may be issued to a log truck pulling a pole-trailer, trailer combination, carrying two distinct and separate loads, as if it was a truck-tractor pulling a set of double trailers. Measurement for the log truck, pole-trailer, trailer combination will be from the front of the first bunk on the truck to the rear of the second trailer, or load, whichever provides the greatest distance up to sixty-eight feet.

(d) An overheight permit may be issued to a vehicle or vehicle combination, hauling empty apple bins, not to exceed fifteen feet high. Measurement is taken from a level roadbed. This permit may be used in conjunction with either of the overlength permits in (a) or (b) of this subsection. The permit may also provide an exemption from a front pilot/escort vehicle as required by WAC 468-38-100 (1)(h). The exemption does not limit the liability assumed by the permit applicant.

(e) An overheight permit may be issued to a vehicle or vehicle combination owned by a rancher and used to haul the rancher's own hay from the rancher's own fields to feed the rancher's own livestock, not to exceed fifteen feet high, measured from a level roadbed. This permit may be used in conjunction with either of the overlength permits in (a) or (b) of this subsection. The permit may also provide an exemption from a front pilot/escort vehicle as required by WAC 468-38-100 (1)(h). The exemption does not limit the liability assumed by the permit applicant.

(f) An overwidth permit, termed a tarping system permit, may be issued to a vehicle or vehicle combination for a divisible load when such vehicle is equipped with a tarping system as defined in WAC 468-38-073 (5)(n) and under the following conditions:

(i) The divisible load must be authorized by a tarping system permit in order to display the special conditions on the permit;

(ii) A tarping system permit is required for any divisible load exceeding one hundred and two inches (eight feet six inches) in width but not exceeding nine feet in width, all of which must be within the confines of the tarping system dimensions. For example, bulging of the tarping material, to accommodate the load, is not authorized;

(iii) A tarping system permit is authorized to be used in conjunction with either of the overlength permits authorized under (a) or (b) of this subsection; and

(iv) Vehicles operating with a tarping system permit are exempt from the requirements and restrictions listed in WAC 468-38-075(1).

(3) **Are there any measurement exclusive devices related to these permits?** Measurements should not include nonload-carrying devices designed for the safe and/or efficient operation of the vehicle, or vehicle combination components, for example: An external refrigeration unit, a resilient bumper, an aerodynamic shell, etc. Safety and efficiency appurtenances, such as, but not limited to, tarp rails and splash suppression devices, may not extend more than three inches beyond the width of a vehicle. The examples are not all inclusive.

(4) **Are overweight permits available for divisible loads?** Yes. There are specific criteria authorizing overweight permits to divisible loads.

~~(a) ((The secretary of transportation, or designee, may issue permits to department vehicles used for the emergent preservation of public safety and/or the infrastructure (i.e., snow removal, sanding highways during emergency winter conditions, emergent debris removal or retainment, etc.). The permits will also be valid for the vehicles in transit to or from the emergent worksite. The special permits may allow:~~

~~(i) Weight on axles in excess of what is allowed in RCW 46.44.041;~~

~~(ii) Movement during hours of the day, or days of the week, that may be restricted in WAC 468-38-175;~~

~~(iii) Exemption from the sign requirements of WAC 468-38-155(7) if weather conditions render such signs ineffectual; and~~

~~(iv) Movement at night, that may be restricted by WAC 468-38-175(3), by vehicles with lights that meet the stan-~~

~~standards for emergency maintenance vehicles established by the commission on equipment.~~

~~(b))~~ Additional weight allowances are authorized through special permit for a segment of US-97 from the Canadian border to milepost 331.12 designated as a heavy haul industrial corridor. The permits will authorize vehicles to haul divisible loads weighing up to the Canadian inter-provincial weight limits and must comply with the following requirements:

(i) Vehicles applying for the Canadian weight special permit must be licensed to their maximum legal weight limit in Washington state.

(ii) Displaying the US-97 heavy haul industrial corridor permit does not waive registration fees, fuel taxes, operating authority requirements, future legislative or regulatory changes. Except as provided in the provisions for the heavy weight industrial corridor on US-97, all Washington state and federal laws must be complied with.

(iii) Routes of travel are strictly limited: Both directions of US-97 from the Canadian border at milepost 336.48 to milepost 331.12.

(iv) A Washington state axle spacing report is required for Canadian weight verification.

(F) Maximum gross weight - Pounds (kilograms).

Number of Axles	2	3	4	5	6	7	8
Truck	36,000 (16,350)	53,000 (24,250)					
Truck and Full Trailer			74,000 (33,500)	91,000 (41,250)	106,500 (48,250)	118,000 (53,500)	139,994 (63,500)
Truck and Pup		56,200 (25,450)	74,000 (33,550)	91,000 (41,250)	99,800 (45,250)		
Tractor and Semi		52,300 (23,700)	69,700 (31,600)	87,100 (39,500)	95,900 - 102,500*		
A-Train**				92,500 (41,900)	109,800 (49,800)	118,000 (53,500)	118,000 (53,500)
B-Train**				90,000 (40,700)	107,200 (48,600)	124,600 (56,500)	139,994 (63,500)
C-Train**				92,500 (41,900)	109,800 (49,800)	120,500 (54,600)	130,000 (58,500)

*Semi tridem axle spacing and weight limits:

94" to < 118" (2.4m to < 3.0m) spread - 95,900 lbs. (43,500 kg).

118" to < 141" (3.0m to < 3.6m) spread - 100,310 lbs. (45,500 kg).

141" to < 146" (3.6m to < 3.7m) spread - 102,500 lbs. (46,500 kg).

**Double trailer vehicles definition for this section:

A-Train: Double trailers coupled by a single drawbar.

B-Train: Two semi-trailers coupled by a fifth wheel mounted to rear of first trailer.

C-Train: Double trailers coupled by double drawbars with self-steering dolly axle(s).

~~((e))~~ (b) Additional weight allowances are authorized through a special permit for the transportation of divisible loads on state highways during national emergencies or major disasters declared by the president. Emergency permits are available for loads that comply with the conditions following:

(v) The following descriptions indicate the maximum weight limits that will be permitted:

(A) Primary steering axle - 600 lbs. (272 kg) per inch (25.4 mm) of width of tire* with a maximum limit of 12,100 lbs.

(B) Other axles - 500 lbs. (227 kg) per inch of width of tire*.

(C) Single axles - 20,000 lbs. (9,100 kg) maximum.

(D) Tandem axles - 37,500 lbs. (17,000 kg) maximum.

*Width of tire is determined by tire side-wall nomenclature.

(E) Tridem axles.

Axle Spread	Pounds	Kilograms
94" (2.4m) to < 118" (3.0m)	46,300	21,000
118" (3.0m) to < 141" (3.6m)	50,700	23,000
141" (3.6m) to < 146" (3.7m)	52,900	24,000

Note: When computing allowable weights, the most conservative figure (whether weight per width of tire, axle weights, or gross weights) will govern.

(i) The national emergency must be declared by the president of the United States;

(ii) Permits are issued exclusively for vehicles and loads that are delivering relief supplies for any destination that is part of the geographical area covered by the emergency declaration;

(iii) The entire permitted load must consist of emergency supplies; and

(iv) The weight limits for an emergency permit are as follows:

(A) Single axle weight not to exceed 21,500 lbs.;

(B) Tandem axle weight not to exceed 43,000 lbs.;

(C) Tridem axle group weight not to exceed 53,000 lbs. (Tridem axle group defined for this section as three consecutive axles more than 8 feet apart but less than 13 feet apart measured from the center of the first axle of the group to the center of the last axle of the group);

(D) 160,000 lbs. gross weight;

(E) Must comply with all bridge and road weight restrictions;

(F) When requested by law enforcement, documents must be displayed describing the permitted load and that it is destined for the declared emergency area;

(G) Emergency permits under this section will expire no later than one hundred twenty calendar days after the date of the emergency declaration; and

(H) Permits authorized by the emergency declaration will not be issued for loads originating in the declared emergency area except for activities that clear roadways, staging areas, or locations for temporary structures in specific areas in the disaster area.

(5)(a) Are there special permits available to government vehicles for emergent conditions? Yes. There are specific criteria authorizing issuance of permits to government vehicles during emergent conditions.

(b) The secretary of transportation, or designee, may issue permits to government vehicles used for the emergent preservation of public safety and/or the infrastructure (i.e., snow removal, sanding highways during emergency winter conditions, emergent debris removal or retention, etc.). The permits will also be valid for the vehicles in transit to or from the emergent worksite. The special permits may allow:

(i) Weight on axles in excess of what is allowed in RCW 46.44.041;

(ii) Movement during hours of the day, or days of the week, that may be restricted in WAC 468-38-175;

(iii) Exemption from the sign requirements of WAC 468-38-155(7) if weather conditions render such signs ineffectual;

(iv) Movement at night that may be restricted by WAC 468-38-175(3), by vehicles with lights that meet the standards for maintenance vehicles established by the commission on equipment; and

(v) Exemption from the pilot/escort vehicle(s) requirements of WAC 468-38-100(1).

WSR 19-24-068

PERMANENT RULES

DEPARTMENT OF TRANSPORTATION

[Filed November 27, 2019, 3:00 p.m., effective December 28, 2019]

Effective Date of Rule: Thirty-one days after filing.

Purpose: Updates the process for submitting public records requests and clarifies that the rule also applies to public records requests made to the Washington state transportation commission.

Citation of Rules Affected by this Order: Amending WAC 468-06-010, 468-06-020, 468-06-050, and 468-06-060.

Statutory Authority for Adoption: RCW 42.56.040.

Adopted under notice filed as WSR 19-21-094 on October 15, 2019.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 0, Repealed 0; or Recently Enacted State Statutes: New 0, Amended 0, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 0, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 4, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 0, Amended 4, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 0, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 0, Repealed 0.

Date Adopted: November 27, 2019.

Kara Larsen, Director
Risk Management and
Legal Services Division

AMENDATORY SECTION (Amending WSR 15-24-130, filed 12/2/15, effective 1/2/16)

WAC 468-06-010 Purpose. The purpose of this chapter is to provide rules for the Washington state department of transportation (the department), and the Washington state transportation commission (the commission) implementing the provisions of chapter 42.56 RCW that relate to requests for inspection and copying of public records.

AMENDATORY SECTION (Amending WSR 15-24-130, filed 12/2/15, effective 1/2/16)

WAC 468-06-020 Definitions. (1) "Commission" means the Washington state transportation commission.

(2) "Denial" means the department withheld a record in part or in its entirety based on a statutory or other legal exemption.

~~((2))~~ (3) "Department" means the Washington state department of transportation.

~~((3))~~ (4) "Disclosure" means the existence of a record is revealed to a requestor in response to a PRA request, regardless of whether it is produced.

~~((4))~~ (5) "Production" means disclosed records are produced (made available for inspection and copying).

~~((5))~~ (6) "Public Records Act" or "PRA" means chapter 42.56 RCW.

AMENDATORY SECTION (Amending WSR 15-24-130, filed 12/2/15, effective 1/2/16)

WAC 468-06-050 Public records officer. The department's public records officer is designated by the department

as the person responsible for implementing the department's rules and regulations, for acknowledging receipt of public records requests, and for coordinating with staff statewide to identify, gather, and release public records in compliance with the public records disclosure requirements. The department's public records officer also serves as the commission's public records officer.

AMENDATORY SECTION (Amending WSR 19-14-003, filed 6/19/19, effective 7/20/19)

WAC 468-06-060 Requesting public records. (1) Submitting a request. Requests for public records to the department or the commission can be made by:

(a) Using the public disclosure request center, by clicking on the link on the web site at <http://www.wsdot.wa.gov/Contact/PublicDisclosure>, or going to https://wsdot.mycusthelp.com/WEBAPP/_rs/supporthome.aspx; or

(b) Submitting a written request to the department that includes:

(i) The name, address, telephone number, and email address of the person requesting the records;

(ii) The date and time of the request;

(iii) A description of the public records sought adequate for the department to identify and locate all responsive records;

(iv) Language stating that the request for records is intended as a public records request or a similar statement placing the department on fair notice that records are being sought under the PRA; and

(v) A statement indicating whether copies or the records are sought or if the requestor wants to arrange to inspect records.

Requests not submitted through the public disclosure request center identified in (a) of this subsection can be submitted ~~((to the department))~~ via U.S. mail, hand delivery, or facsimile at:

Public Records Office
Transportation Building
310 Maple Park Avenue S.E.
P.O. Box 47410
Olympia, WA 98504-7410
Facsimile: 360-705-6808

~~((Failure to submit requests to the department at the above location may result in a delay in the department's response.))~~

(2) A request not submitted in a manner identified in subsection (1) of this section will not be considered a public records request under chapter 42.56 RCW, but will be responded to as an informal routine inquiry or a general request for information.

(3) Requested production. Nonexempt records are available through inspection, paper copies, or electronic copies. The requestor should indicate the production preference and make arrangements to pay the fees, if any.

WSR 19-24-078

PERMANENT RULES

BUILDING CODE COUNCIL

[Filed December 2, 2019, 2:28 p.m., effective January 2, 2020]

Effective Date of Rule: Thirty-one days after filing.

Purpose: The proposed changes are in response to RCW 19.27.035 requiring the state building code council to adopt a revised process for the review of proposed statewide amendments and review of proposed or enacted local amendments to the codes enumerated in RCW 19.27.031.

Citation of Rules Affected by this Order: Amending 9.

Statutory Authority for Adoption: RCW 19.27.031.

Other Authority: RCW 19.27.074.

Adopted under notice filed as WSR 19-15-024 on July 9, 2019.

Changes Other than Editing from Proposed to Adopted Version: Not applicable.

A final cost-benefit analysis is available by contacting Richard Brown, 1500 Jefferson Street S.E., phone 360-407-9277, email Richard.Brown@des.wa.gov, website www.sbcc.wa.gov.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 0, Repealed 0; or Recently Enacted State Statutes: New 0, Amended 0, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 9, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 0, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 0, Amended 0, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 0, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 0, Repealed 0.

Date Adopted: October 11, 2019.

Doug Orth
Chair

AMENDATORY SECTION (Amending WSR 17-03-123, filed 1/18/17, effective 2/18/17)

WAC 51-04-010 Declaration of purpose. The Washington state building code council, hereinafter called the council, is required by chapter 266, Laws of 1988, to adopt and maintain the state building code, hereinafter referred to as the building code, as provided in chapters 19.27, 19.27A, and 70.92 RCW, and the state legislature.

(1) The primary objective of the council is to encourage consistency in the building code throughout the state of Washington and to maintain the building code consistent with the state's interest as provided in RCW 19.27.020. An objective of statewide adoption is to minimize state amendments to the model codes.

The building code shall be as defined in WAC 51-04-015 (8).

(2) The council is also required by RCW 19.27.074 to approve or deny all city and county amendments to the building code that apply to single family or multifamily buildings as defined in RCW 19.27.015.

(3) The council may issue opinions relating to the codes at the request of a local official charged with the duty to enforce the enumerated codes as specified in RCW 19.27.031 and 19.27A.015.

(4) The purpose of this chapter is to establish policies and procedures for:

(a) Submittal and council review and consideration of proposed statewide amendments to the building code;

(b) Submittal and council review and consideration of proposed city and county amendments to the building code that apply to single family or multifamily buildings as defined in RCW 19.27.074;

(c) Reconsideration of council actions; and

(d) Issuing opinions to local officials.

AMENDATORY SECTION (Amending WSR 17-03-123, filed 1/18/17, effective 2/18/17)

WAC 51-04-015 Definitions. (1) "Council" means the Washington state building code council.

(2) "Emergency statewide amendment" means any proposed statewide amendment, the adoption of which is necessary immediately in order to protect life, safety or health of building occupants; preserve the structural integrity of buildings built to the state building code; to correct errors and omissions; or by the direction of the Washington state legislature or federal legislation. Emergency statewide amendments to the state building code must be adopted in accordance with the Administrative Procedure Act, chapter 34.05 RCW.

(3) "Local government amendment" means any amendment to the state building code, as adopted by cities or counties for implementation and enforcement in their respective jurisdictions.

(4) "Local government residential amendment" means any amendment to the state building code, as adopted by cities or counties for implementation and enforcement in their respective jurisdictions, that applies to single and multifamily buildings as defined by RCW 19.27.015.

(5) "Local official" and "code official" means the officer or other designated authority charged with the administration and enforcement of the codes adopted under chapters 19.27 and 19.27A RCW.

(6) "Model codes" means the codes developed by the model code organizations and adopted by and referenced in chapter 19.27 RCW.

~~((6))~~ (7) "Model code organization(s)" means the national code-promulgating organizations that develop the model codes (as defined herein), such as the International Code Council, International Association of Plumbing and Mechanical Officials, and National Fire Protection Association.

~~((7))~~ (8) "State building code" means the codes adopted by and referenced in chapter 19.27 RCW; the state energy code; and any other codes so designated by the Washington state legislature as adopted and amended by the council.

~~((8))~~ (9) "Statewide amendment" means any amendment to the ~~(building)~~ model codes, initiated through council action or by petition to the council from any agency, city or county, or interested individual or organization, that would have the effect of amending the building code for the entire state of Washington. Statewide amendments to the state building code must be adopted in accordance with the Administrative Procedure Act, chapter 34.05 RCW.

~~((9))~~ (10) "State building code update cycle" means that period during which the model code and standards referenced in chapter 19.27 RCW are updated and amended by the council in accordance with the Administrative Procedure Act, chapter 34.05 RCW hereinafter referred to as the "adoption period" and those additional periods when code changes are received for review as proposed amendments to the model codes, hereinafter referred to as "submission periods."

AMENDATORY SECTION (Amending WSR 94-05-058, filed 2/10/94, effective 3/13/94)

WAC 51-04-018 Petition for preliminary review. An agency, city or county, ~~(or other interested individual or organization)~~ wishing to submit ~~(statewide or)~~ local government residential amendments to the building code for council consideration, may file with the council a petition for preliminary review of the ~~(statewide or)~~ local government residential amendment, in order to solicit comments from council members and interested parties, prior to council action.

The council may refer a petition for preliminary review to one of the council standing committees for review and comment.

AMENDATORY SECTION (Amending WSR 17-03-123, filed 1/18/17, effective 2/18/17)

WAC 51-04-020 Policies for the consideration of proposed statewide amendments. (1) The council will accept and consider petitions for emergency statewide amendments to the building code at any time, in accordance with RCW 19.27.074 and chapter 34.05 RCW. The council will accept and consider all petitions for statewide amendments that meet the complete application requirements as set by the council in conjunction with the state building code update cycle, in accordance with RCW 19.27.074 and chapter 34.05 RCW, and WAC 51-04-015 and 51-04-020 as follows:

(a) For the purpose of review and adoption of new model code editions and statewide amendment submission, the state building code shall be divided into two groups as follows, unless otherwise directed by the council:

(i) Group 1: International Building Code (IBC); International Existing Building Code (IEBC); International Fire Code (IFC) Washington state energy code-commercial (WSEC-C) and Wildland Urban Interface Code (WUI).

(ii) Group 2: International Residential Code (IRC); International Mechanical Code (IMC); International Fuel Gas Code (IFGC); standards liquefied petroleum gas are National Fire Protection Association (NFPA) standards 58 and 54; Uniform Plumbing Code (UPC); Washington state energy code-residential (WSEC-R).

(b) The adoption period of new model codes commences when new editions of the model codes are available to the public. Within sixty days, the council shall publish a timeline to include a report of significant model code amendments and applicability of existing state amendments, followed by a submission period for new proposed statewide amendments.

(i) The council shall review Group 1 model codes and approve a report on significant changes and applicability of existing state amendments. The Group 1 report shall be posted on the council web site and a submission period of at least ~~((two months))~~ sixty calendar days shall be allowed for new proposed statewide amendments.

(ii) Upon completion ~~((and posting))~~ of the Group 1 ~~((report))~~, public meetings, council actions and posting of the actions on the state building code council's web site and provided new editions of Group 2 model codes are available to the public, the council shall review the Group 2 codes and approve a report on significant changes and applicability of existing state amendments. The Group 2 report shall be posted on the ~~((council))~~ state building code council's web site and a submission period of at least ~~((two months))~~ sixty calendar days shall be allowed for new proposed statewide amendments

(2) The council shall review proposed new statewide amendments, and approve those meeting the appropriate criteria to file as proposed rules in accordance with chapter 34.05 RCW. The proposed rules filing shall include a small business economic impact statement in accordance with chapter 19.85 RCW.

(3) The council shall conduct at least two public hearings for each group (one in western Washington and one in eastern Washington) following the filing of the proposed rules with the code reviser's office.

(4) Amendments to Group 1 codes during the Group 2 adoption shall be limited to legislative direction, code correlation, correction of errors, language clarification and updated section references.

~~(5) The code ((adoption)) development period shall conclude with formal adoption of the state building code as amended by the council. As required by RCW 19.27.074, all decisions to adopt or amend the state building code shall be made prior to December 1st and shall not take effect before the end of the regular legislative session in the next year. Group 1 and 2 codes shall be filed with the code reviser at the same time. ((Amendments to Group 1 codes during the Group 2 adoption shall be limited to code correlation, errors, language clarification and updated section references.~~

~~(5))~~ (6) State amendments as approved by the council shall be submitted to the appropriate model code organization, at the direction of the council, except those adopted for consistency with state statutes or regulation and held for further review during the adoption period of those model codes by the council. The effective date of any statewide amendments shall be the same as the effective date of the new edition of the model codes, except for emergency amendments adopted in accordance with chapter 34.05 RCW and deemed appropriate by the council.

AMENDATORY SECTION (Amending WSR 17-03-123, filed 1/18/17, effective 2/18/17)

WAC 51-04-025 Procedure for submittal of proposed statewide amendments. (1) Statewide and emergency statewide amendments to the state building code shall conform to the purposes, objectives, and standards prescribed in RCW 19.27.020.

~~((All proposed))~~ Applications for proposed statewide amendments shall be complete, include a detailed economic analysis of impacts of the proposed statewide amendment and be submitted in writing to the council, on the form provided by the council. The amendment must address existing model code language; a change in the model codes since a previous edition; or an existing state or local amendment to the model code; or a portion of the state code other than the model code. The state building code council shall consider the action of the model code organizations in their consideration of these proposals.

Statewide and emergency statewide amendments to the state building code shall be based on one of the following criteria:

(a) The amendment is needed to address a critical life/safety need.

(b) The amendment clarifies the intent or application of the code.

(c) The amendment is necessary for consistency with state or federal laws and regulations.

(d) The amendment corrects errors and omissions.

(e) The amendment eliminates an obsolete, conflicting, duplicating or unnecessary regulation.

(2) Petitions for statewide amendments to the building code shall be submitted to the council during the submission period and the adoption period in accordance with WAC 51-04-020. Minimum requirements specified on the form for submittals must be included. Incomplete submittals will be held for thirty days and the proponent will be notified with a request for more information. If after thirty days, the applicant has not provided requested information for a complete application, the proponent's proposal will be deemed incomplete and shall not move forward.

(3) Petitions for emergency statewide amendments to the building code may be submitted at any time, in accordance with RCW 19.27.074 and chapter 34.05 RCW, and WAC 51-04-015 and 51-04-020.

The council may refer a proposed statewide amendment to one of the council standing committees for review and comment prior to council action in accordance with chapter 34.05 RCW.

(4) The council shall consider and take action on all proposed statewide amendments within the time frames required by chapter 19.27 RCW, RCW 34.05.330, and all other deadlines established by statute.

AMENDATORY SECTION (Amending WSR 17-03-123, filed 1/18/17, effective 2/18/17)

WAC 51-04-040 Reconsideration. (1) When the council approves, denies or modifies a statewide or local amendment to the building code, any party with written or oral testimony to the council related to the amendment on the record

may file a petition for reconsideration. The petition must be received by the Washington State Building Code Council, 1500 Jefferson Avenue S.E., P.O. Box 41449, Olympia, Washington 98504-1449, within twenty calendar days of the date of notification of the council action on the amendment. The petition must give specific reasons for why the council should reconsider the amendment for approval or denial.

(2) Within sixty calendar days of receipt of a timely petition for reconsideration, the council shall in writing:

(a) Grant the petition for reconsideration and enter rule making to revise the amendment;

(b) Deny the petition for reconsideration, giving reasons for the denial; or

(c) Request additional information and extend the time period for not more than thirty calendar days to either grant or deny the petition for reconsideration.

(3) The council's denial of a proposed statewide or local government amendment, or the council denial of a petition for reconsideration under this section, is subject to judicial review under chapter 34.05 RCW.

AMENDATORY SECTION (Amending WSR 90-02-108, filed 1/3/90, effective 2/3/90)

WAC 51-04-050 Ex parte communications. All written communications related to council business received by council members (~~(during council rule making proceedings,))~~ shall be forwarded to staff for inclusion in the public record.

AMENDATORY SECTION (Amending WSR 07-15-043, filed 7/13/07, effective 8/13/07)

WAC 51-04-060 Opinions. RCW 19.27.031 grants the council authority to render opinions relating to the building code at the request of a local code official.

For the purposes of this section, the term "code official" means the local or state official, or their designee, responsible for implementation and enforcement of the specific code provision on which the opinion is requested.

At the request of a code official, the council will issue opinions relating to the codes adopted under chapters 19.27, 19.27A, and 70.92 RCW, (~~(including the state energy code, the state ventilation and indoor air quality code,))~~ and council amendments to the model codes. At the request of a local code official, the council may issue opinions on the applicability of WAC 51-04-030 to a local government ordinance regulating construction.

Council related opinions may be developed and approved by a standing committee of the council.

Opinions approved by a standing committee may be reviewed and modified by the council.

AMENDATORY SECTION (Amending WSR 16-01-042, filed 12/9/15, effective 1/9/16)

WAC 51-04-070 Council mailing address. All requests for information, documentation, etc., should be submitted to:

Washington State Building Code Council
1500 Jefferson Avenue S.E.
P.O. Box 41449
Olympia, Washington 98504-1449
Phone: ((360-407-9280)) 360-407-9255
((Fax: 360-586-9088)) www.sbcc.wa.gov

WSR 19-24-083
PERMANENT RULES
DEPARTMENT OF REVENUE

[Filed December 3, 2019, 10:11 a.m., effective January 3, 2020]

Effective Date of Rule: Thirty-one days after filing.

Purpose: The department is amending WAC 458-20-279 to clarify that the information in the rule only applies to sales and use tax exemptions that were in effect from January 1, 2009, through July 1, 2015, for clean alternative fuel vehicles and high gas mileage vehicles. Language was also added to the rule that directs the reader on where to find information for similar exemptions that were in effect after July 1, 2015.

Citation of Rules Affected by this Order: Amending WAC 458-20-279 Clean alternative fuel vehicles and high gas mileage vehicles.

Statutory Authority for Adoption: RCW 82.32.300 and 82.01.060(2).

Adopted under notice filed as WSR 19-20-015 on September 20, 2019.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 0, Repealed 0; or Recently Enacted State Statutes: New 0, Amended 0, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 0, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 1, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 0, Amended 0, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 0, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 0, Repealed 0.

Date Adopted: December 4, 2019.

Atif Aziz
Rules Coordinator

AMENDATORY SECTION (Amending WSR 10-17-069, filed 8/13/10, effective 9/13/10)

WAC 458-20-279 Clean alternative fuel vehicles and high gas mileage vehicles. (1) **Introduction.** This ~~((section))~~ rule provides information about the requirements for ~~((the))~~ retail sales and use tax exemptions ~~((provided))~~ for clean alternative fuel vehicles ~~((by RCW 82.08.809 and 82.12.809, respectively, and the exemption from the 0.3 percent retail sales tax on retail sales of motor vehicles provided for high gas mileage vehicles by RCW 82.08.020(7) ("the exemp-~~

tions")) that were in effect from January 1, 2009, through July 1, 2015. For information on available exemptions after July 1, 2015, refer to RCW 82.08.809, 82.08.9999, or dor.wa.gov.

(2) **Exemption periods.** The exemption periods provided for clean alternative fuel vehicles and high gas mileage vehicles differ.

(a) **Clean alternative fuel vehicles.**

(i) **New vehicles.** The exemptions provided for new passenger cars, light duty trucks, and medium duty passenger vehicles that are exclusively powered by a clean alternative fuel apply to purchases made from January 1, 2009, through July 1, 2015.

(ii) **Used vehicles.** The exemptions provided for qualifying used passenger cars, light duty trucks, and medium duty passenger vehicles, which were modified after their initial purchase, with an EPA certified conversion to be exclusively powered by a clean alternative fuel apply to purchases made from July 12, 2010, through July 1, 2015.

(iii) **Use of previously exempt vehicles on or after July 1, 2015.** Use tax does not apply to the use, on or after July 1, 2015, of a vehicle if:

- The person used the vehicle in this state before July 1, 2015; and
- The use prior to July 1, 2015, was exempt from use tax as described in (a)(i) or (ii) of this subsection.

(b) **High gas mileage vehicles.** The exemptions provided for new passenger cars, light duty trucks, and medium duty passenger vehicles that utilize hybrid technology and have a United States Environmental Protection Agency estimated highway gasoline mileage rating of at least forty miles per gallon apply as follows:

(i) **January 1, 2009, through July 31, 2009.** The exemptions apply to all retail sales and use taxes.

(ii) **August 1, 2009, through December 31, 2010.** The exemption is limited to the 0.3 percent retail sales tax imposed by RCW 82.08.020(3) on retail sales of motor vehicles.

(3) **Definitions.** The following definitions apply throughout this section:

(a) "Clean alternative fuel" means natural gas, propane, hydrogen, or electricity, when used as a fuel in a motor vehicle that meets the California motor vehicle emission standards in Title 13 of the California code of regulations, effective January 1, 2005, and the rules of the Washington state department of ecology. See RCW 82.08.809(3) and 82.12.809(2).

(b) "Gross vehicle weight rating" is the value specified by the manufacturer as the maximum design loaded weight of a single vehicle. See WAC 173-423-040(4).

(c) "Hybrid technology" means propulsion units powered by both electricity and gasoline. See RCW 82.08.813(3) and 82.12.813(2).

(d) "Light duty truck" is any vehicle certified to the standards in Title 13, CCR, section 1961 (a)(1) rated at eight thousand five hundred pounds gross vehicle weight or less, and any other motor vehicle rated at six thousand pounds gross vehicle weight or less, which is designed primarily for the purposes of transportation of property or is a derivative of such vehicle, or is available with special features enabling

off-street or off-highway operation and use. See WAC 173-423-040(8).

(e) "Medium duty passenger vehicle" is any medium duty vehicle with a gross vehicle weight rating of less than ten thousand pounds that is designed primarily for the transportation of persons. The medium duty passenger vehicle definition does not include any vehicle which:

(i) Is an "incomplete truck," i.e., is a truck that does not have the primary load carrying device or container attached; or

(ii) Has a seating capacity of more than twelve persons; or

(iii) Is designed for more than nine persons in seating rearward of the driver's seat; or

(iv) Is equipped with an open cargo area of seventy-two inches in interior length or more. A covered box not readily accessible from the passenger compartment will be considered an open cargo area for the purpose of this definition. See WAC 173-423-040(9).

(f) "Medium duty vehicle" is a vehicle with a gross vehicle weight rating of eight thousand five hundred one to four thousand pounds. See WAC 173-423-100(2).

(g) "Model year" is the manufacturer's annual production period which includes January 1 of a calendar year. If the manufacturer has no annual production period, "model year" is the calendar year. In the case of any vehicle manufactured in two or more stages, the time of manufacture shall be the date of completion of the chassis. See WAC 173-423-040(10).

(h) "New motor vehicle" is any motor vehicle that:

• Is self-propelled;

• Is required to be registered and titled under Title 46 RCW;

• Has not been previously titled to a retail purchaser or lessee; and

• Is not a vehicle which has been sold, bargained, exchanged, given away, or title transferred from the person who first took title to it from the manufacturer or first importer, dealer, or agent of the manufacturer or importer, and so used as to have become what is commonly known as "secondhand" within the ordinary meaning thereof. See RCW 46.70.011 and 46.04.660.

The model year of the vehicle is not determinative of whether it meets the definition of "new motor vehicle."

(i) "Passenger car" means every motor vehicle except motorcycles and motor-driven cycles designed primarily for transportation of persons and having a design capacity of twelve persons or less. See WAC 173-423-040(13) and RCW 46.04.382.

(j) "Qualifying used passenger cars, light duty trucks, and medium duty passenger vehicles" means vehicles that:

• Are part of a fleet of at least five vehicles, all owned by the same person;

• Have an odometer reading of less than thirty thousand miles;

• Are less than two years past their original date of manufacture; and

• Are being sold for the first time after modification.

(4) **New passenger cars, light duty trucks, and medium duty passenger vehicles.** In order to qualify for the

exemptions, the vehicle must meet the definition of "passenger car," "light duty truck," or "medium duty passenger vehicle" in addition to meeting the definition of "new motor vehicle."

(5) **Purchases of previously owned clean alternative fuel or high gas mileage vehicles.** The exemptions do not apply to purchases of used vehicles unless they are qualifying used passenger cars, light duty vehicles, or medium passenger vehicles, which were modified after their initial purchase, with an EPA certified conversion to be exclusively powered by clean alternative fuel.

(a) **Example 1.** Mike purchases a *used* 2009 model year hybrid vehicle from a dealer or private party in July 2011. The purchase would not qualify for the exemptions. The exemption for vehicles using hybrid technology only applies to new vehicles.

(b) **Example 2.** Nicole purchases a *new* 2008 model year hybrid vehicle in July 2009 from a dealer. This purchase would be exempt (assuming it meets the other requirements). A new vehicle could be any model year as long as it has not been previously titled to a retail purchaser or lessee.

(c) **Example 3.** Joe purchases a *new* 2009 model year hybrid vehicle on August 5, 2009, from a dealer. This purchase is not exempt from all retail sales taxes but, assuming it meets the other requirements, is exempt from the 0.3 percent retail sales tax on retail sales of motor vehicles.

(6) **Conversions.** For purposes of this section, a conversion refers to the alteration of an otherwise nonqualifying vehicle exclusively powered by gasoline or diesel into a qualifying vehicle that either:

(a) Is exclusively powered by clean alternative fuel; or

(b) Utilizes hybrid technology and has a United States environmental protection agency estimated highway gasoline mileage rating of at least forty miles per gallon.

(i) **Purchases of converted vehicles.** The purchase of a new vehicle, or a used vehicle satisfying the requirements described in subsection (2)(a)(ii) of this section, that is converted prior to or as part of the retail sale to the purchaser and that otherwise satisfies the requirements of the exemptions will qualify for the exemptions. If the conversion is performed after the retail sale, the purchase of the vehicle will not qualify for the exemptions.

(ii) **Purchases of the service of converting vehicles.** While the purchase of a new vehicle converted by the seller prior to or as part of the retail sale to the purchaser qualifies for the exemptions as described in subsection (6)(a) of this section, the purchase of the service of converting a vehicle does not qualify for the exemptions. However, if the seller hires a third party to convert the vehicle, it can give the third party a resale certificate (WAC 458-20-102A) for work completed before January 1, 2010, or a reseller permit (WAC 458-20-102) for work completed on or after January 1, 2010. Even though resale certificates are no longer used after December 31, 2009, they must be kept on file by the seller for five years from the date of last use or December 31, 2014.

(A) **Example 1.** Tom wants to purchase a new nonqualifying vehicle from Dealer but have it converted as a part of the purchase transaction. Dealer hires John's Shop to convert the vehicle for Tom, and Tom purchases the converted vehicle

from Dealer. Tom's purchase of the converted vehicle qualifies for the exemptions.

(B) **Example 2.** Tom purchases a new nonqualifying vehicle from Dealer. Tom then hires John's Shop to convert the vehicle. The purchase of the nonqualifying vehicle does not qualify for the exemptions, even if Dealer delivers the vehicle directly to John's Shop on Tom's behalf for conversion.

(7) **Use tax.** The use of a qualifying vehicle by the original title holder is exempt from use tax if the vehicle is purchased during the applicable exemption period specified in subsection (2) of this section.

(a) **Example 1.** Will, a Washington resident, purchases a new qualifying clean alternative fuel vehicle in Oregon from Dealer on February 1, 2009, and returns to Washington in the vehicle on February 2, 2009. Will's use of the vehicle in Washington is exempt from use tax.

(b) **Example 2.** Oliver, an Oregon resident, purchases a new qualifying hybrid vehicle from Dealer in Oregon on April 1, 2009. Oliver moves to Washington on May 15, 2009. Oliver's use of the vehicle in Washington is exempt from use tax. Note: In the absence of the exemptions discussed in this section, Oliver's purchase would be subject to use tax since his first use of the vehicle in Washington occurred within 90 days of his acquisition and use of the vehicle in another state. See RCW 82.12.0251.

(8) **Extended warranties and maintenance agreements.** The sale of an extended warranty or maintenance agreement is subject to retail sales tax even though the vehicle itself may qualify for the exemptions. See WAC 458-20-257.

(9) **Replacement parts and/or repair services.** The sale of replacement parts or repair services is subject to retail sales tax even though the vehicle itself may have qualified for the exemptions. Only the purchase and use of a qualifying vehicle is exempt from retail sales and use taxes.

(10) **Accessories.** A qualifying vehicle includes all accessories installed or sold as part of the sale of the vehicle.

(a) **Example 1.** A dealership installs a ski rack and applies pinstriping on an otherwise qualifying vehicle on January 5, 2009, before a customer purchases the vehicle. Any separate, itemized charges for the accessories listed on the vehicle sales invoice are exempt from retail sales tax.

(b) **Example 2.** On January 5, 2009, a customer purchases an otherwise qualifying vehicle, and as a condition of the purchase requires that the seller install stereo speakers and apply paint sealant. The seller does not have the accessories in stock, but the customer takes delivery of the vehicle. The customer then brings the vehicle back to the seller, and the accessories are installed and applied on January 12, 2009. Any separate, itemized charges for the accessories listed on the vehicle sales invoice are exempt from retail sales tax.

(11) **Leases.** A vehicle is exempt from retail sales and use taxes on a lease if the other requirements are met. If the vehicle is new, registered, and titled in the lessee's name during the applicable exemption period specified in subsection (2) of this section, the retail sales tax exemption will apply only to amounts due during the exemption period. See also WAC 458-20-103 and 458-20-235.

(a) **Example 1.** Alex leases a new hybrid vehicle that he registers and titles on December 8, 2008. None of his lease payments will qualify for the exemptions because the vehicle was registered and titled prior to January 1, 2009.

(b) **Example 2.** Beth leases a new clean alternative fuel vehicle that she registers and titles on December 8, 2010. Assuming that the other requirements of the exemptions are met, any amounts due under the lease before January 1, 2011, are exempt from retail sales tax.

(12) **Payments made prior to January 1, 2009.** Any payment made toward the purchase of an otherwise qualifying vehicle prior to the effective date of the exemptions, January 1, 2009, qualifies for the exemptions if:

(a) The vehicle sold is titled and registered on or after January 1, 2009, but before the applicable exemption expires; and

(b) The purchaser takes possession of the vehicle on or after January 1, 2009, but before the applicable exemption expires. See WAC 458-20-103, 458-20-197, and 458-20-235.

Example. Greg makes a down payment toward the purchase of a new qualifying hybrid vehicle on November 7, 2008, but does not actually take possession of the vehicle at the dealership lot until January 2, 2009. The vehicle is titled and registered on January 9, 2009. The purchase of the vehicle is exempt from all retail sales taxes.

(13) **Payments made prior to the expiration date of the applicable exemption.** Any payment made toward the purchase of an otherwise qualifying vehicle prior to the expiration date of the applicable exemption does not qualify for the exemption if:

(a) The vehicle sold is titled or registered on or after the expiration date of the exemption; or

(b) The purchaser takes possession of the vehicle on or after the expiration date of the exemption. See WAC 458-20-103, 458-20-197, and 458-20-235.

Example. Craig makes a down payment toward the purchase of a new qualifying clean alternative fuel vehicle on November 7, 2010, but does not actually take possession of the vehicle at the dealership lot until January 2, 2011. The vehicle is titled and registered on January 11, 2011. The purchase of the vehicle is subject to retail sales tax and the 0.3 percent retail sales tax imposed by RCW 82.08.020(3) on retail sales of motor vehicles.

WSR 19-24-084

PERMANENT RULES

DEPARTMENT OF REVENUE

[Filed December 3, 2019, 11:24 a.m., effective January 3, 2020]

Effective Date of Rule: Thirty-one days after filing.

Purpose: WAC 458-20-177 is being amended to incorporate language from ESSB 5997 (Part I) (2019), narrowing the nonresident sales and use tax exemption. WAC 458-20-177 is also being amended to modernize the structure and language of the rule.

Citation of Rules Affected by this Order: Amending WAC 458-20-177.

Statutory Authority for Adoption: RCW 82.32.300 and 82.01.060(2).

Other Authority: RCW 82.08.0264, 82.08.0269, 82.08.0273.

Adopted under notice filed as WSR 19-20-091 on October 1, 2019.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 0, Repealed 0; or Recently Enacted State Statutes: New 0, Amended 1, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 0, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 1, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 0, Amended 0, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 0, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 0, Repealed 0.

Date Adopted: December 4 [3], 2019.

Atif Aziz
Rules Coordinator

AMENDATORY SECTION (Amending WSR 15-01-106, filed 12/18/14, effective 1/18/15)

WAC 458-20-177 Sales of motor vehicles, campers, and trailers to nonresident consumers. (1) Introduction. This rule applies to any sale of a vehicle to a consumer who is not a resident of the state, including nonresident military personnel temporarily stationed in Washington. The rule describes the different business and occupation (B&O) and retail sales tax consequences that result from vehicle sales to nonresidents, particularly the sales tax exemption provided by RCW 82.08.0264. It also describes the documentation a seller must retain to demonstrate that a sale is exempt.

(a) For information on use tax liability associated with vehicles, see WAC 458-20-178(;) Use tax and the use of tangible personal property.

(b) For the collection of use tax by county auditors and the department of licensing, see WAC 458-20-17802 Collection of use tax by county auditors and department of licensing—Measure of tax.

(c) For sales of vehicles to Indians or Indian tribes and required documentation, see WAC 458-20-192(;) Indians—Indian country.

(d) Questions regarding vehicle licensing or registration requirements should be directed to the department of licensing.

(2) (~~What is a~~) Definition of "vehicle."(?) For the purposes of this rule, a "vehicle" is any vehicle of a type that may be lawfully licensed under chapter 46.16A RCW for operation on a public highway in this state, except that the term does not include any machinery and implements for use in conducting a farming activity subject to RCW 82.08.0268. The term "vehicle" includes, but is not limited to, a car, truck, camper, trailer, bus, motorhome, and motorcycles equipped for road use. It does not include farm tractors, bicycles,

mopeds, motorized scooters, snowmobiles, or vehicles that are manufactured for exclusively off-road use.

(3) ~~((What are the))~~ **Tax consequences when a vehicle sold to a nonresident is delivered in-state(?)**. A sale of a vehicle to a nonresident where the vehicle is delivered in-state is exempt from retail sales tax if the sale meets the requirements of RCW 82.08.0264. In all other cases where the vehicle is delivered to the buyer in this state, the retail sales tax applies and must be collected at the time of sale, unless otherwise exempt by law. The mere fact that the buyer may be or claims to be a nonresident or that the buyer intends to, and actually does, use the vehicle in some other state does not, by itself, entitle the buyer to the exemption. In any case where the seller licenses or registers the vehicle in Washington on the buyer's behalf, the retail sales tax applies.

In computing the B&O tax liability of persons engaged in the business of selling vehicles, no deduction is allowed for a sale made to a nonresident for use outside this state if the nonresident buyer takes delivery in Washington. This is true even if the buyer is entitled to an exemption from the retail sales tax.

(a) **Exemption requirements.** If a vehicle is delivered within this state to a nonresident buyer, retail sales tax does not apply if the vehicle is purchased for use outside this state and, immediately upon delivery, the vehicle:

(i) Is removed from the state under the authority of a trip permit issued by the department of licensing pursuant to RCW 46.16A.320 or any agency of another state that has authority to issue similar permits; or

(ii) Is registered and licensed in the state of the buyer's residence, will not be used in this state more than three months, and will not be legally required to be registered and licensed in this state.

If the vehicle bears Washington state license plates, the seller must remove the Washington plates before delivering the vehicle and retain evidence of that removal to avoid liability for collection and payment of the retail sales tax.

(b) **Seller obligations; documentation required from natural person buyers.** The seller must retain the following documents, which must be made available upon request by the department of revenue (department):

(i) A copy of the buyer's currently valid out-of-state driver's license or other official picture identification issued by a jurisdiction other than Washington state;

(ii) A copy of any one of the following documents, on which there is an out-of-state address for the buyer:

(A) A current residential rental agreement;

(B) A property tax statement from the current or previous year;

(C) A utility bill, dated within the previous two months;

(D) A state income tax return from the previous year;

(E) A voter registration card;

(F) A current credit report; or

(G) Any other document determined by the department to be acceptable, with buyer's street address, such as:

(I) A bank statement issued within the previous two months;

(II) A government check issued within the previous two months;

(III) A pay check issued within the previous two months;

(IV) Mortgage documents of current personal residence;

(V) Current vehicle insurance card;

(VI) Letter or other documentation issued by the postmaster within the previous two months; or

(VII) Other government document issued within the previous two months;

(ii) A completed witnessed declaration in the form designated by the department, signed by the buyer, and stating that the buyer's purchase meets the requirements of this section (buyer's affidavit); and

(iv) A seller's certification, in the form designated by the department, that either a vehicle trip permit was issued or the vehicle was immediately registered and licensed in another state as required by RCW 82.08.0264.

To comply with these requirements, the seller must retain a properly completed buyer's affidavit and seller's certificate (in-state delivery). See the department's web site dor.wa.gov for affidavit and certificate forms.

(c) **Seller obligations; documentation required from corporate buyers.** Sales tax does not apply to sales of vehicles to nonresident corporations for use outside of this state. The sale must meet the requirements stated in (b) of this subsection pertaining to qualified nonresident natural persons. Some documents listed in (b)(ii) of this subsection, such as residential rental agreement, voter registration card, or mortgage documents for a personal residence, do not pertain to corporate purchases. In addition to the applicable requirements in (b) of this subsection, the seller must establish that the corporation is the purchaser (i.e., paid for by corporate check and registered in the corporation's name). A distinction exists between the corporation and its employees or officers. The exemption still applies, for example, when an officer or employee, purchasing on behalf of the corporation, is a Washington resident when all other requirements are met.

A corporation with places of business in one or more other states outside Washington (~~((s))~~) may qualify as a "nonresident" for purposes of RCW 82.08.0264. A Washington corporation purchasing a vehicle for out-of-state use by a nonresident salesperson or out-of-state office qualifies for this exemption if the vehicle leaves the state with a valid one-transit permit or with foreign state license plates attached at the time of delivery, and nonresident affidavits are completed. If the vehicle is subsequently used in Washington, use tax is due on the value of the vehicle at the time of its first use in Washington. See the department's web site dor.wa.gov for affidavit and certificate forms.

(d) ~~((What are the))~~ **Consequences for noncompliance(?)**.

(i) Any seller that makes sales without collecting the tax ~~((to))~~ from a person who does not provide the documents required under (b) of this subsection, and any seller who fails to retain the documents required under (b) of this subsection for the period prescribed by RCW 82.32.070 is personally liable for the amount of tax due.

(ii) Any seller that makes sales without collecting the retail sales tax pursuant to RCW 82.08.0264 and who has actual knowledge that the buyer's documentation required by (b) of this subsection is fraudulent is guilty of a misdemeanor and, in addition, is liable for the tax and subject to a penalty equal to the greater of one thousand dollars or the tax due on

such sales. In addition, both the buyer and the seller are liable for any penalties and interest assessable under chapter 82.32 RCW.

(4) ~~((What are the tax consequences when))~~ **Tax consequences of a vehicle sold to a nonresident ((is)) and delivered out-of-state((?)).** A sale of a vehicle to a nonresident where the seller delivers the vehicle out-of-state is exempt from retail sales tax. If the vehicle is delivered to the buyer outside the state, the seller may also deduct the sale amount from the gross proceeds of sales for B&O tax purposes. The deductible amount must be included in the gross income reported on the excise tax return and then deducted on the return to determine the amount of taxable income. The deduction must be identified on the deduction detail page of the return as an "interstate and foreign sales" deduction.

(a) **Requirements.** If a vehicle is delivered outside the state to a nonresident buyer, retail sales tax does not apply if:

(i) The seller, as required by the contract of sale, delivers possession of the vehicle to the buyer at a point outside Washington; and

(ii) The vehicle is not licensed or registered in this state. If the vehicle bears Washington state license plates, the seller must remove the Washington plates before delivery and retain evidence of that removal to avoid liability for collection and payment of the retail sales tax.

(b) **Seller obligations; documentation.** The seller must properly document the following facts:

(i) The buyer's out-of-state address;

(ii) The vehicle is not licensed or registered in this state or the Washington state license plates have been removed from the vehicle before delivery;

(iii) Under the terms of the sales agreement, the seller is required to deliver the vehicle to the buyer at a point outside this state; and

(iv) The out-of-state delivery was actually made by the seller or by a common carrier acting as the seller's agent.

To comply with these requirements, the seller must retain a properly completed buyer's certificate and seller's certificate (out-of-state delivery). The seller's certificate must be signed by the person who actually delivers the vehicle to the buyer at the out-of-state location and may be completed only after delivery occurs.

(5) ~~((What))~~ **Forms ((should be used)) required to document an exempt sale((?)).** Where the vehicle is delivered determines which two properly completed documents: "Buyer's Affidavit" and "Seller's Certificate In-State Delivery," or "Buyer's Certificate Out-of-State Delivery" and "Seller's Certificate Out-of-State Delivery" are necessary to substantiate exempt sales to nonresidents. Do not send the documents to the department; keep them as part of the seller's permanent records for five years. Without this documentation, claims that a transaction was exempt from tax will be disallowed.

Copies of the forms can be obtained:

- From the department's web site at dor.wa.gov or
- By writing to:

Taxpayer Services
Washington State Department of Revenue
P.O. Box 47478
Olympia, Washington 98504-7478

Documents in substantially the same form as the department's forms will be accepted in lieu of the department's documents.

(a) **In-state delivery.** A sale with in-state delivery requires a completed buyer's affidavit and seller's certificate-in-state delivery.

(b) **Delivery out-of-state by seller.** A sale with out-of-state delivery by a seller requires a completed buyer's certificate and seller's certificate-out-of-state.

(c) **Delivery out-of-state by common carrier.** When a vehicle is delivered outside the state by common carrier acting as the seller's agent, the seller must retain:

(i) Evidence that the vehicle's license plates (if licensed in Washington) were removed; and

(ii) A signed copy of the bill of lading issued by the carrier. The bill of lading must show the seller as the consignor and indicate that the carrier agrees to transport the vehicle to a point outside the state; or

(iii) A seller's certificate out-of-state delivery signed by the person who delivers the vehicle and provides the name of the hauling company.

(6) ~~((What are a))~~ **Seller's obligations to verify a buyer's statements on nonresidency((?)).**

(a) The seller must exercise a reasonable degree of care in accepting statements regarding a buyer's nonresidence. If delivery occurs in-state, the seller must examine and retain a copy of at least one form of documentary evidence showing the buyer's out-of-state residence. Lack of good faith on the part of the seller or lack of the exercise of the degree of care required is indicated, for example, in the following circumstances:

(i) If the seller knows that the buyer is living in Washington;

(ii) If the buyer gives a Washington address for the purpose of financing the purchase of the vehicle;

(iii) If, at the time of sale, arrangements are made for future servicing of the vehicle in the seller's shop and a Washington address or telephone number is shown for the shop customer; or

(iv) If the seller has ready access to any other information that discloses that the buyer is a resident of Washington.

(b) ~~((What if the department))~~ **Questions about the authenticity of the information provided by the buyer((?)).** If the department has information indicating the buyer is a Washington resident, or if the addresses for the buyer shown on the documentation provided under subsection (3)(b) or (c) of this rule are not the same, the department may contact the buyer to verify the buyer's eligibility for the exemption provided by RCW 82.08.0264. If the department subsequently determines the buyer was not eligible for an exemption, the department will pursue collection of the retail sales tax from the buyer. The seller will not be liable for the retail sales tax except as provided in subsection (3)(d) of this rule.

(7) ~~((Do))~~ **Military personnel ((qualify)) qualifications for the nonresident exemptions((?)).** A member of the armed services who is temporarily stationed in Washington is presumed to be a nonresident, unless that person was a resident of this state when enlisted or inducted. This presumption does not apply to a civilian employee of the armed services.

~~(Nonetheless,)~~ A sale to a nonresident member of the armed forces must meet all of the statutory requirements for a retail sales tax exemption or B&O tax deduction. If a vehicle sold to a member of the armed forces will remain in Washington for more than three months, retail sales tax is due on the sale, even if the vehicle is registered in the home state of the armed forces member.

(a) **Military temporary license.** In addition to the exemptions provided under RCW 82.08.0264, a member of the armed forces may alternatively qualify for the retail sales tax and use tax exemptions provided by RCW 46.16A.340 if the member obtains a forty-five day nonresident military temporary permit from the department of licensing and satisfies the requirements of RCW 46.16A.340.

(b) **Additional documentation required.** In addition to the documentation otherwise required by this rule, for a sale to a member of the armed forces a seller must retain a copy of military orders showing that the buyer:

(i) Is temporarily stationed in Washington and will leave within three months of the date of purchase; or

(ii) Is permanently reassigned to a new duty station outside Washington and will leave within three months of the date of purchase.

(c) **Military personnel of NATO-member nations.** Pursuant to treaty, a member of the armed forces of any NATO-member nation who is stationed in Washington is considered to be a nonresident for purposes of the RCW 82.08.0264 retail sales tax exemption. The buyer must meet all otherwise applicable requirements for exemption. In addition, the seller must retain proof of the buyer's military assignment in Washington as a member of a NATO-member nation's armed forces.

(8) ~~(Are)~~ **Sales to residents of noncontiguous states are exempt from Washington retail sales tax(?)**. RCW 82.08.0269 exempts purchases of tangible personal property from the retail sales tax if the property is purchased for use in states, territories, and possessions of the United States that are not contiguous with any other state. However, the exemption only applies if, as a necessary incident to the contract of sale, the seller delivers the property to the purchaser or the purchaser's designated agent at the usual receiving terminal of the carrier selected to transport the goods, under such circumstances that it is reasonably certain that the goods will be transported directly to a destination in a noncontiguous state, territory, or possession.

RCW 82.08.0269 applies to the sale of motor vehicles when the requirements stated above are met. Therefore, in addition to being exempt from retail sales tax under RCW 82.08.0264 (discussed above), a sale of a motor vehicle to a resident of a noncontiguous state, territory, or possession may qualify for exemption under RCW 82.08.0269. If so, the sale is exempt from retail sales tax but does not qualify for a B&O tax deduction. For more information on the requirements of the RCW 82.08.0269 exemption, including the documentation requirements, see WAC 458-20-193, Inbound and outbound interstate sales of tangible personal property.

(9) ~~(Are sales to nonresidents of this state exempt from)~~ **Washington retail sales tax(?) exemption for qualified nonresidents.** RCW 82.08.0273 ~~(exempts)~~ provides an exemption, in the form of a remittance from the

department, of the state portion of the retail sales tax on purchases of tangible personal property ~~(from the retail sales tax)~~, digital goods, and digital codes, if the purchaser is a resident of another state or possession or a province of Canada that does not impose a retail sales tax or use tax of three percent or more. That statute does not apply to purchases of vehicles. Because RCW 82.08.0264 more specifically applies to the sale of vehicles, it takes precedence over RCW 82.08.0273. A nonresident of this state may purchase and take delivery of a vehicle in Washington free of retail sales tax only if the person meets the requirements of RCW 82.08.0264. For sales to residents of noncontiguous states, territories, and possessions see RCW 82.08.0269.

(10) **Examples.** The following examples identify a number of facts and then state a conclusion. These examples should be used only as a general guide. The tax results of other situations must be determined after a review of all facts and circumstances. In each example concluding that the sale qualifies for a retail sales tax and/or B&O tax exemption, the Dealer must retain the documents required in subsection (3)(b) or (c) of this rule.

(a) Buyer purchases a vehicle from Dealer. Buyer provides identification indicating that Buyer is a resident of California and provides California license plates for the vehicle. However, Buyer also states that he intends to use the vehicle in the state of Washington for four months before returning to California. Buyer does not qualify for a sales tax exemption because Buyer will use the vehicle for more than three months in the state.

(b) Buyer provides proof of residency in Idaho; there are no contrary facts regarding Buyer's residency. Buyer completes the buyer's affidavit, stating that the vehicle is for use out-of-state. Buyer obtains and uses a trip permit issued under authority of RCW 46.16A.320 to remove the vehicle from Washington. The Dealer completes a seller's certificate and certifies that the Dealer removed the Washington license plates before delivering the vehicle to Buyer. This sale qualifies for the retail sales tax exemption but not the B&O tax deduction.

(c) Buyer is a Washington resident, employed by out-of-state Corporation X. On behalf of Corporation X, Buyer purchases and accepts in-state delivery of a vehicle from Dealer. The vehicle will be used as a company car out-of-state and will not be used or garaged in Washington. Payment is made by corporate check. Buyer provides a trip permit for transport of the vehicle out of Washington. This sale qualifies for the retail sales tax exemption (but not for the B&O tax deduction) notwithstanding the Washington residency of its employee.

(d) Buyer is a resident of Alaska and purchases a vehicle from Dealer in Washington. The sales contract requires Dealer to deliver the vehicle to Buyer in Anchorage, Alaska. Before shipping the vehicle, Dealer removes the vehicle's Washington state license plates and retains a photocopy of the plates as evidence of the removal. Seller ships the vehicle to Alaska by common carrier. Seller retains a signed copy of the bill of lading, indicating the Seller as consignor and the Buyer as consignee. This sale qualifies for the retail sales tax exemption and a B&O tax deduction.

(e) Buyer is a resident of Alaska and purchases a vehicle from Dealer in Washington. Dealer delivers the vehicle to the Buyer at dockside in Seattle to be shipped to Anchorage, Alaska by common carrier. Before shipping the vehicle, Dealer removes the vehicle's Washington state license plates and retains a photocopy of the plates as evidence of the removal. Dealer retains the exemption certificate and documentation required by WAC 458-20-193. This sale qualifies for the retail sales tax exemption provided by RCW 82.08.0269 but not for a B&O tax deduction.

(f) Buyer is a member of the armed forces and provides a copy of her orders showing that she is temporarily stationed in Washington. Before entering military service, buyer resided in another state. Buyer purchases a vehicle from Dealer and licenses it in her home state, but intends to keep the vehicle in this state for over three months. This sale does not qualify for any exemption or deduction. If the vehicle were to be removed from the state within three months, the sale would qualify for the RCW 82.08.0264 retail sales tax exemption but not for a B&O tax deduction.

(g) Buyer owns homes in Washington and Arizona, spending summers in Washington and winters in Arizona. In October, Buyer purchases a vehicle from Dealer, asserting that he will immediately drive the vehicle to Arizona and license it in that state. Buyer presents an Arizona driver's license for identification and provides a trip permit to remove the vehicle from Washington. Dealer is aware that Buyer lives in Washington for a significant portion of each year. In such a case, the sale would not qualify for the retail sales tax exemption. Under these facts, Buyer is not a nonresident of Washington for tax purposes because the buyer has dual residency in Washington and Arizona ((for tax purposes)).

(h) Buyer purchases a motorcycle from Dealer in Vancouver, Washington. The motorcycle is equipped for use on public highways. Buyer provides an Oregon driver's license and asserts that the motorcycle will be licensed in Oregon. Buyer also states that the motorcycle will only be used outside of Washington. Buyer places the motorcycle in the back of a truck for transport to Oregon. This sale does not qualify for any exemption or deduction. To qualify for the sales tax exemption, RCW 82.08.0264 requires the Buyer to obtain a trip permit or provide license plates from another state before removing the vehicle from Washington.

(11) **Buyer obligations when claiming exemption.** It is the buyer's responsibility to provide the seller with valid identification that entitles the buyer to purchase a motor vehicle, trailer, or camper exempt from retail sales tax as provided by RCW 82.08.0264.

(a) A buyer making fraudulent statements, which includes the offer of fraudulent identification or fraudulently procured identification to a seller, to purchase without paying retail sales tax a motor vehicle, trailer, or camper is guilty of perjury under chapter 9A.72 RCW.

(b) Any buyer making tax exempt purchases under RCW 82.08.0264 by displaying proof of identification not ((his or her)) the buyer's own, or counterfeit identification, with intent to violate the provisions of RCW 82.08.0264 is guilty of a misdemeanor and, in addition, is liable for the tax and subject to a penalty equal to the greater of one hundred dollars or the tax due on such purchases.

WSR 19-24-086
PERMANENT RULES
DEPARTMENT OF
LABOR AND INDUSTRIES

[Filed December 3, 2019, 11:51 a.m., effective December 3, 2019]

Effective Date of Rule: December 3, 2019.

Other Findings Required by Other Provisions of Law as Precondition to Adoption or Effectiveness of Rule: As permitted by RCW 34.05.380 (3)(a), immediate implementation is necessary in order to implement SSB 5471 (chapter 151, Laws of 2019).

Purpose: The purpose of this rule making is to adopt amendments to the elevator rules in chapter 296-96 WAC, Safety regulations and fees for all elevators, dumbwaiters, escalators and other conveyances, as required by SSB 5471. SSB 5471 was the department of labor and industries (L&I) agency request legislation that took effect July 28, 2019. This rule making is necessary to adopt rules for clarity and consistency with the new statutory requirements.

This rule making will:

- Increase the number of elevator safety advisory committee members from seven to nine.
- Adopt new requirements for temporary elevator mechanic licenses by:
 - Making a temporary elevator mechanic license valid for one year from the date of issuance; and
 - Establishing fees for temporary elevator mechanic licenses as per RCW 70.87.030, which gives L&I the authority to establish fees to pay the costs incurred by the department for work related to administration.
- Allow for permanent removal of stairway chairlifts and platform lifts by homeowners in their private residences or by a certified contractor.

Citation of Rules Affected by this Order: Amending WAC 296-96-00800, 296-96-00902, 296-96-00903, 296-96-00906, 296-96-00912, and 296-96-00922.

Statutory Authority for Adoption: Chapter 70.87 RCW, Elevators, lifting devices, and moving walks.

Adopted under notice filed as WSR 19-20-124 on October 2, 2019.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 0, Repealed 0; or Recently Enacted State Statutes: New 0, Amended 6, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 0, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 6, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 0, Amended 6, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 0, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 6, Repealed 0.

Date Adopted: December 3, 2019.

Joel Sacks
Director

AMENDATORY SECTION (Amending WSR 18-18-070, filed 8/31/18, effective 10/1/18)

WAC 296-96-00800 Advisory committee on conveyances. (1) The purpose of the advisory committee is to advise the department on the adoption of regulations that apply to conveyances; methods of enforcing and administering the elevator law, chapter 70.87 RCW; and matters of concern to the conveyance industry and to the individual installers, owners and users of conveyances.

(2) The advisory committee consists of not less than seven ((members)) persons nor more than nine persons appointed by the director or his or her authorized representative.

(3) The committee members shall serve four years. However, if a member is unable to fulfill his or her obligations, a new member may be appointed to fill the remainder of the unexpired term.

(4) The committee shall meet on the third Tuesday of February, May, August, and November of each year, and at other times at the discretion of the chief of the elevator section.

(5) The chief of the elevator section shall be the secretary for the advisory committee.

(6) An advisory committee member may appoint an alternate to attend meetings in case of conflict or illness.

AMENDATORY SECTION (Amending WSR 18-18-068, filed 8/31/18, effective 10/1/18)

WAC 296-96-00902 Exceptions to elevator mechanic license requirements. (1) An elevator mechanic license issued under chapter 70.87 RCW and this chapter is not required for:

(a) Individuals who install signal systems, fans, electric light fixtures, illuminated thresholds, finished cab flooring materials that are identical to existing materials and feed wires to the terminals on the elevator main line control provided that the individual does not require access to the pit, hoistway, or top of the car for the installation of these items.

(b) An owner or regularly employed employee of the owner performing only maintenance work of conveyances in accordance with RCW 70.87.270.

(c) Permanent removal of a stairway chairlift or platform lift in a private residence in accordance with RCW 70.87.270 when performed by:

(i) Homeowners;

(ii) Persons employed by homeowners who are registered as required by chapter 18.27 RCW.

"Permanent removal" means to take away and not replace a stairway chairlift or platform lift.

(2) Elevator mechanic licenses may not be required for certain types of incidental work that is performed on conveyances when the appropriate lockout and tagout procedures have been performed by a licensed elevator mechanic in the appropriate category. The department shall be notified in

writing and shall approve the scope of work prior to it being performed.

(3) An elevator mechanic license in accordance with RCW 70.87.230, is not required when dismantling or removing a conveyance, if the building or structure is secure from public and unauthorized access, and:

(a) The entire building or portion thereof containing the conveyance(s) is completely demolished down to and including the foundation; or

(b) The entire building or portion thereof containing the conveyance(s) is returned to the basic supporting walls, floors, and roof.

Otherwise, the work is to be performed by a licensed elevator mechanic who works for a licensed elevator contractor.

(4) For license categories (01), (02), (03), (05), (06), (07), and (08) an individual is not required to be licensed if the individual is employed as a helper/apprentice working under the general direction of a licensed elevator mechanic provided the licensed mechanic:

(a) Is working in the same license category or as a category (01) mechanic; and

(b) Is on the same job site as the helper/apprentice at least seventy-five percent of each working day when performing installations, alterations, repairs and callbacks;

There shall not be more than one helper/apprentice assigned to a licensed elevator mechanic at any time;

(c) Provides the necessary education, assistance and supervision to ensure that the maintenance work is performed safely and to code.

(5) For license category (04), an individual is not required to be licensed if the helper/apprentice is working under the general direction of a licensed elevator mechanic provided the mechanic:

(a) Is working in the same license category or as a category (01) mechanic; and

(b) Is on the same job site as the helper/apprentice at least one hundred percent of each working day when performing installation, alterations, repairs and callbacks.

There shall not be more than three helpers/apprentices assigned to a licensed elevator mechanic at any time.

AMENDATORY SECTION (Amending WSR 18-18-068, filed 8/31/18, effective 10/1/18)

WAC 296-96-00903 Exceptions to elevator contractor license requirements. Elevator contractor licenses issued under chapter 70.87 RCW and this chapter are not required for:

(1) An owner or regularly employed employee of the owner performing only maintenance work of conveyances in accordance with RCW 70.87.270.

(2) Permanent removal of a stairway chairlift or platform lift located in a private residence in accordance with RCW 70.87.270 performed by:

(a) Homeowners;

(b) Persons hired by homeowners, who are registered as required by 18.27 RCW.

(3) A public agency that employs licensed elevator mechanics to perform maintenance.

((3)) (4) Demolition of a conveyance as outlined in RCW 70.87.230 and WAC 296-96-00902.

AMENDATORY SECTION (Amending WSR 18-18-068, filed 8/31/18, effective 10/1/18)

WAC 296-96-00906 License requirements for elevator mechanics. (1) Any person wishing to engage in the installation, alteration, service, replacement or maintenance of equipment covered by this chapter within the state of Washington shall apply for a license with the department of labor and industries.

(2) Applicants for a category (01) license as identified under WAC 296-96-00910 shall demonstrate at least one of the following qualifications in order to obtain a license without an exam:

(a) Successfully completed an apprenticeship training program for elevator mechanics and have passed the final examination required by such program; or

(b) Performed at least five thousand four hundred hours of acceptable work experience in construction, installation, maintenance, service or repair of elevators or other conveyances subject to this chapter, as verified by current and prior employers, and have passed a nationally recognized elevator mechanic's examination, such as that administered by the National Elevator Industry Education Program or as approved by the department; or

(c) Possess an elevator mechanic's license from another state that has standards substantially equal to those established in this chapter.

(3) Any person wishing to obtain a category (01) license coming from another state without licensing may obtain a license with examination by paying the required fee and submitting an application with documentation demonstrating the applicant has worked as an elevator mechanic without supervision for at least five thousand four hundred hours.

(4) Conditions for temporary elevator mechanics: In the event an elevator contractor encounters a verifiable shortage of licensed mechanics, an elevator contractor may request that the department issue temporary elevator mechanic licenses to persons certified by the licensed elevator contractor to have an acceptable combination of documented experience and education to perform elevator work without direct and immediate supervision. Each license shall recite that it is valid for ~~((thirty days))~~ one year to the holder as long as he or she is employed by the licensed elevator contractor that certified the individual as qualified.

As part of the initial licensing process the applicant shall: Have seventy-five percent of both education and training hours to obtain a license (see WAC 296-96-00908).

(5) Conditions for emergency elevator mechanics: If the governor should declare a state of emergency due to a disaster, or an act of God, or other extenuating circumstances and the number of persons in the state holding valid licenses is insufficient to cope with the emergency, an elevator contractor may request emergency elevator mechanic licenses for persons who are not licensed to perform work subject to this chapter but are certified by the elevator contractor to have an acceptable combination of documented experience and education to perform elevator work without direct and immediate

supervision. Each such license shall be valid for a period of thirty days and renewable as long as the emergency exists.

(6) The department may deny renewal or application, or suspend an individual's license if they have an outstanding final judgment.

(7) Qualify for licensing:

(a) For conveyance work covered by all categories identified in WAC 296-96-00910 except personnel hoists (04), material lifts (05), residential conveyances (06), residential inclined elevators (07) and temporary licenses (09), the applicant shall comply with the applicable mechanic licensing requirements as follows:

(i) Test.

(A) The applicant shall provide acceptable proof to the department that shows the necessary combination of documented experience and education credits in the applicable license category (see WAC 296-96-00910) of not less than three years' work experience in the elevator industry under the general direction of a licensed elevator mechanic performing conveyance work in the same category as verified by current and previous employers licensed to do business in this state or as an employee of a public agency;

Acceptable proof may include department-approved forms documenting years of experience, affidavits, letters from previous employers, declarations of experience, education credits, copies of contractor registration information, etc. Additional documentation may be requested by the department to verify the information provided on the application; and

(B) Pass an examination administered by the department on chapter 70.87 RCW and this chapter; or

(ii) National exam/education.

(A) Have obtained a certificate of completion and successfully passed the mechanic examination of a nationally recognized training program for the elevator industry such as the National Elevator Industry Educational Program or its equivalent; or

(B) Have obtained a certificate of completion of an apprenticeship program for an elevator mechanic, having standards substantially equal to those of chapter 70.87 RCW and this chapter, and registered with the Washington state apprenticeship and training council under chapter 49.04 RCW; or

(iii) Reciprocity. The applicant shall provide acceptable proof to the department that shows that the applicant is holding a valid license from a state having entered into a reciprocal agreement with the department and having standards substantially equal to those of chapter 70.87 RCW and this chapter.

(b) For conveyance work performed on personnel hoists as identified in WAC 296-96-00910(4):

(i) Test. The applicant shall provide acceptable proof to the department that shows the necessary combination of documented experience and education credits in the applicable license category (see WAC 296-96-00910) of not less than one year's work experience in the elevator industry or not less than three years (for the purpose of this category one year will be equivalent to seven hundred hours) documented experience and education credits in conveyance work under the general direction of a licensed elevator mechanic as

described in category (04) performing conveyance work in the same category as verified by current and previous employers licensed to do business in this state; and

(ii) Pass an examination administered by the department on chapter 70.87 RCW, A10.4 and this chapter.

(iii) Reciprocity. The applicant shall provide acceptable proof to the department that shows the applicant is holding a valid license from a state having entered into a reciprocal agreement with the department and having standards substantially equal to those of chapter 70.87 RCW and this chapter.

(c) For conveyance work performed on material lifts as identified in WAC 296-96-00910(5):

(i) Test. The applicant and the licensed elevator contractor/employer shall comply with the provisions of RCW 70.87.245; and

(ii) The applicant shall pass an examination administered by the department on chapter 70.87 RCW and this chapter;

(d) For residential conveyance work covered by category (06) as identified in WAC 296-96-00910:

(i) Test. The applicant shall provide acceptable proof to the department that shows the necessary combination of documented experience and education credits in the applicable license category (see WAC 296-96-00910) of not less than two years' work experience in the elevator industry performing conveyance work as verified by current and previous employers licensed to do business in this state; and

(ii) Pass an examination administered by the department on chapter 70.87 RCW and this chapter.

(e) For residential inclined conveyance work covered by category (07) as identified in WAC 296-96-00910:

(i) Test. The applicant shall provide acceptable proof to the department that shows the necessary combination of documented experience and education credits in the applicable license category (see WAC 296-96-00910) of not less than one year's work experience in the elevator industry or not less than three years' documented experience and education credits in conveyance work as described in category (01) performing conveyance work as verified by current and previous employers licensed to do business in this state; and

(ii) Pass an examination administered by the department on chapter 70.87 RCW and this chapter.

(f) For temporary mechanic licenses as identified in WAC 296-96-00910 category (09) the applicant shall provide acceptable proof from a licensed elevator contractor that attests that the individual is competent to perform work under chapter 70.87 RCW and this chapter.

(8) Complete and submit a department-approved application.

An applicant who is required to take an examination under the provisions of this section may not perform the duties of a licensed elevator mechanic until the applicant has been notified by the department that he/she has passed the examination.

(9) Pay the fees specified in WAC 296-96-00922.

(10) The department may deny application of a license under this section if the applicant owes outstanding final judgments to the department or does not meet the minimum criteria established in the elevator laws and rules.

AMENDATORY SECTION (Amending WSR 18-18-068, filed 8/31/18, effective 10/1/18)

WAC 296-96-00912 License renewal requirements.

(1) An elevator contractor or elevator mechanic license issued pursuant to this chapter shall be valid for a period of two years and may be renewed by submission of a renewal application to the department, payment of a renewal fee as specified in WAC 296-96-00922 and proof of compliance with the requirements of this chapter.

(a) Elevator contractor licenses expire on the calendar date two years from issuance.

Upon renewal the elevator contractor shall verify the primary point of contact information is correct.

(b) Elevator mechanic licenses expire on the licensee's birth date in the calendar year two years from the year of application. It is noted that the initial license term may be valid for a longer or shorter period of time depending on when the licensee's birthday falls compared to the date on which the initial license was issued.

(i) If a license is issued in an even-numbered year, the license will expire on the license holder's birth date in the next even-numbered year.

(ii) If a license is issued in an odd-numbered year, the license will expire on the license holder's birth date in the next odd-numbered year.

(c) Renewal of an elevator mechanic license shall be conditioned upon completion of not less than eight hours of instruction within one year immediately preceding a license renewal application and submission of a certificate of completion for the course. Continuing education courses and instructors shall be approved by the department.

(2) Temporary elevator mechanics (category (09)). ~~((The renewal is limited to no greater than twelve times in a twelve-month period. The limitation))~~ A temporary elevator mechanic license may be ((extended)) renewed at the discretion of the department. Examples include, but are not limited to, abnormally high rate of construction or natural disaster.

(a) The renewal period is ~~((thirty days))~~ one year from the date of issuance.

(b) As part of the renewal process the applicant shall:

(i) Complete and submit a department-approved application.

(ii) Pay the fees specified in WAC 296-96-00922.

(iii) Have seventy-five percent of both education and training hours to obtain a license (see WAC 296-96-00908).

Note: The department may require the applicant demonstrate more than seventy-five percent of education hours if multiple temporary licenses are requested.

(3) The department may deny renewals of licenses under this section if the applicant owes outstanding final judgments to the department. Final judgment also includes any penalties assessed against an individual or firm owed the department because of an unappealed civil penalty or any outstanding fees due under chapter 70.87 RCW and this chapter.

(4) Renewals will be considered timely when the renewal application is received on or prior to the expiration date of the license.

(5) Renewals are considered late if the renewal applications are received after the expiration date of the license but

no later than ninety days after the expiration of the licenses. If the application is not received within ninety days from license expiration, the licensee must reapply and pass the competency examination.

(6) A mechanic licensed in the state of Washington may take a withdrawal if they are no longer working for a company licensed in the state or no longer performing work that requires a license. A mechanic holding a valid license that wishes to withdraw their license shall submit their request, in writing, to the department of labor and industries elevator section prior to the license expiration date. To cancel a withdrawal request and be reinstated, the mechanic shall submit their request in writing, reapply, complete the required continuing education, and pay the renewal licensing fee.

AMENDATORY SECTION (Amending WSR 18-24-102, filed 12/4/18, effective 1/4/19)

WAC 296-96-00922 Licensing fees. The following are the department's elevator license fees:

Type of Fee	Period Covered by Fee	Dollar Amount of Fee
Elevator contractor/mechanic application fee (not required for renewal of valid license)	Per application	\$66.80
Elevator contractor/mechanic examination fee	Per application	\$201.30***
Reciprocity application fee	Per application*	\$66.80
Elevator mechanic license	2 years	\$134.10
Elevator contractor license	2 years	\$134.10
<u>Temporary elevator mechanic license application fee (not required for renewal)</u>	<u>Per application</u>	<u>\$66.80</u>
Temporary elevator mechanic license	((30 days)) 1 year	((33.20)) \$134.10
Emergency elevator mechanic license	30 days	\$33.20
Elevator mechanic/contractor timely renewal fee	2 years	\$134.10
Elevator mechanic/contractor late renewal fee	2 years	\$268.60

Type of Fee	Period Covered by Fee	Dollar Amount of Fee
<u>Temporary elevator mechanic timely renewal fee</u>	<u>1 year</u>	<u>\$134.10</u>
<u>Temporary elevator mechanic late renewal fee</u>	<u>1 year</u>	<u>\$268.60</u>
Training provider application/renewal fee	2 years	\$134.10
Continuing education course fee by approved training provider	1 year**	Not applicable
Replacement of any licenses		\$19.90
Refund processing fee		\$40.00

* Reciprocity application is only allowed for applicants who are applying for licensing based upon possession of a valid license that was obtained in state(s) with which the department has a reciprocity.

** This fee is paid directly to the continuing education training course provider approved by the department.

***This fee may be collected by an outside vendor for some exams and may differ from the fee shown above.

**WSR 19-24-098
PERMANENT RULES
APPLE COMMISSION**

[Filed December 4, 2019, 6:56 a.m., effective January 4, 2020]

Effective Date of Rule: Thirty-one days after filing.

Purpose: The Washington apple commission is add[ing] public records disclosure procedures to its rules as required by RCW 42.56.040. In addition, the commission is amending WAC 24-12-010 to bring the apple container types and their corresponding net shipping weights in line with Washington state department of agriculture for the purpose of computing the mandatory assessments; amending WAC 24-12-011 to update the procedures for referendum voting eligibility addressed in the revised RCW 15.24.090; and amending WAC 24-12-012 to update the procedure for collecting any potential past due assessments.

Citation of Rules Affected by this Order: New WAC 24-20-010, 24-20-020, 24-20-030, 24-20-040, 24-20-050, 24-20-060, 24-20-070, 24-20-080 and 24-20-090; and amending WAC 24-12-010, 24-12-011, and 24-12-012.

Statutory Authority for Adoption: RCW 15.24.070, 15.24.090, and 42.56.040

Other Authority: Chapter 34.05 RCW.

Adopted under notice filed as WSR 19-20-107 on October 2, 2019.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal

Rules or Standards: New 0, Amended 0, Repealed 0; or Recently Enacted State Statutes: New 0, Amended 0, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 0, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 9, Amended 3, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 0, Amended 0, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 0, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 0, Repealed 0.

Date Adopted: December 4, 2019.

Todd M. Fryhover
President

AMENDATORY SECTION (Amending WSR 09-19-074, filed 9/16/09, effective 10/17/09)

WAC 24-12-010 Amount of assessments. (1) There is hereby levied upon all fresh apples grown annually in this state, and upon all apples packed as Washington apples, including fresh sliced, an assessment of eight and seventy-five one-hundredths cents per one hundred pounds of apples, based on net shipping weight or reasonable equivalent net product assessment measurement as determined by the commission.

(2) Assessments shall be payable as provided in WAC 24-12-012, whether in bulk or loose in boxes or any other container, or packed in any style package. The net shipping weights for the following containers shall apply for the purpose of computing the assessments:

DESCRIPTION OF CONTAINER	NET SHIPPING WEIGHT RANGE
Tray Carton	37-52 lbs.
Cell Carton	37-52 lbs.
1 Layer Carton AKA Euro Carton	10-15 lbs.
2 Layer Carton AKA Euro Carton	20-30 lbs.
3 Layer Carton AKA Euro Carton	30-40 lbs.
Euro Carton 1-3 Layers	10-45 lbs.
Master Carton (Bags in Box/Clamshell)	((10-50)) 13-45 lbs.
Master Bin (Bags in Bin/Clamshell)	300-600 lbs.
Bin (Loose/Jumble/Bulk)	((500-900)) 500-950 lbs.
Loose Carton (Jumble/Bulk)	((10-40)) 8-40 lbs.
Carton (2/3 Bushel)	((25-35)) 25-40 lbs.
1/2 Carton	18-25 lbs.
1/3 Bushel Carton	10-15 lbs.
Overwrap Carton	30-40 lbs.

DESCRIPTION OF CONTAINER	NET SHIPPING WEIGHT RANGE
<u>RPC Tray Carton</u>	<u>37-52 lbs.</u>
<u>RPC Master Carton</u>	<u>25-45 lbs.</u>

AMENDATORY SECTION (Amending WSR 09-19-074, filed 9/16/09, effective 10/17/09)

WAC 24-12-011 Referendum mail ballot voting eligibility. (1) In the conduct of a referendum mail ballot pursuant to the provisions of RCW 15.24.090 the commission shall require that each returned ballot be accompanied by a completed apple grower eligibility certificate in substantially the following form:

WASHINGTON APPLE COMMISSION
APPLE GROWER ELIGIBILITY CERTIFICATE

(Note: All appropriate spaces on this certificate must be completed to properly qualify your vote.)

I HEREBY CERTIFY THAT:

- My name and address are as follows (please print):
Name:
Mailing Address:
Orchard Address:
City: State:
- I am qualified to vote for one of the following reasons (please check the appropriate space):
a I am an individual owner-operator or an individual lessee-operator of commercially producing apple orchard/orchards.
b I am a member of and have been designated to cast the single ballot for (please fill in name), a partnership, joint venture or corporation owning/leasing and operating commercially producing apple orchard/orchards.
- ((The orchard/orchards for which I am casting a vote represents acres of commercially producing apple trees situated in the county/counties of within the state of Washington. (Please combine the total commercially producing apple acreage for which you are voting in the space above.))) I take my fresh apple crop to the following dealer organizations to pack/ship my fruit. (Please list all that apply to this orchard.)

By signing this certificate, I grant the commission permission to contact dealer(s) listed above to verify total net lbs. fresh apples shipped in the two prior crop years.

.....
Signature of Voter
Name (print)
Date

Note: A completed apple grower eligibility certificate must accompany each ballot.

(2) The commission shall contact each dealer listed on the apple grower eligibility certificate to verify total net lbs. fresh apples shipped in the last two crop years by voting grower.

(3) The commission and the director of the department of agriculture may, in counting and validating ballots, rely on and accept the representations of eligibility to vote and the representations of ((acreage as set forth in the certificate)) total net lbs. fresh apples shipped by grower as certified by dealer.

~~((3))~~ (4) Apple growers entitled to vote in a referendum mail ballot pursuant to the provisions of RCW 15.24.090 are defined to be each grower who operates a commercial producing apple orchard, whether an individual proprietor, partnership, joint venture, or corporation, being entitled to one vote. As to bona fide leased or rented orchards, only the lessee-operator, if otherwise qualified, shall be entitled to vote. Individual commercial orchard operator, if otherwise qualified, shall be entitled to vote as such, even though he is also a member of a partnership or corporation that votes for other apple acreage.

~~((4))~~ (5) A commercial producing apple orchard means an apple orchard currently producing or growing apples in sufficient quantity so that the apples are or will be marketed through prevailing commercial channels and are or will be subject to assessment pursuant to the provisions of chapter 15.24 RCW.

AMENDATORY SECTION (Amending WSR 09-19-074, filed 9/16/09, effective 10/17/09)

WAC 24-12-012 Collection of accounts. (1) The commission shall obtain from the department of agriculture a record of all shipments of fresh apples, including fresh apples designated for slices, and shall from this record periodically invoice all apple dealers and handlers shown thereon for assessments on apples levied pursuant to WAC 24-12-010. The date of the invoice shall be known as the billing date.

(2) ~~((For fresh apples designated for slices:~~

~~(a) The department of agriculture does not require a certificate of compliance for fresh apples designated for slicing that are moved and produced internally by a shipper.~~

~~(b) All shippers (first handlers) with internal fresh apple slicing operations will be required to remit and report quarterly the net weight in pounds of all fresh apples packed or unpacked designated for slicing. The reporting period dates and forms will be determined and created by the commission.~~

~~(c) All payments and reports are due thirty-five days from the end of the reporting period established by the commission.~~

~~((3))~~ If the assessments are not paid within thirty-five days from the billing date, a notice of delinquency shall be

sent to the dealer or handler involved, ~~((with a copy to the district))~~ requesting them to bring their account current within ten days from the date of the letter. At forty-five days from the billing date, a second notice of delinquency shall be sent to the dealer with a copy to the regional inspection office of the department of agriculture. The notice shall state that if the delinquent assessments are not paid within ((forty-five)) sixty days from the billing date, the department of agriculture will notify the dealer or handler involved ((will thereafter be put on a cash basis until the delinquent assessments are paid, and that the Compliance Certificate Book will be removed by the department of agriculture)) that the department of agriculture will deny service if the account is not paid in full within the next thirty days. The notice shall also advise that if the delinquent assessments are not paid within ~~((sixty))~~ ninety days from the billing date, the inspection service may be withdrawn.

~~((If at any time an account thereafter is again unpaid in the same crop year shipping season for more than thirty-five days from the billing date, the commission may place the dealer or handler on a cash basis for the remainder of the crop year shipping season, or such shorter period as the commission may at its option specify, and the Compliance Certificate Book may be removed by the department of agriculture. If the subsequent delinquency shall continue more than sixty days from the billing date, inspection service may be withdrawn.))~~

Once withdrawn, inspection service will be reinstated only upon mutual agreement of the department of agriculture and the commission and after all delinquent assessments have been paid.

~~((4) Delinquent))~~ (3) If assessments are not paid within ((thirty-five)) forty-five days of the billing date ((shall bear)), the commission reserves the right to charge interest at the maximum legal rate, not to exceed ((1-1/2%)) one and one-half percent per month, and in case of suit to collect the delinquent assessments, the prevailing party shall, in addition to any other relief granted, be allowed an attorneys fee in such amount as the court in its discretion deems reasonable, together with costs of suit.

Chapter 24-20 WAC

WASHINGTON APPLE COMMISSION PUBLIC RECORDS

NEW SECTION

WAC 24-20-010 Purpose. The purpose of this chapter is to ensure compliance by the Washington apple commission with the provisions of the Public Records Act, chapter 42.56 RCW. These rules provide information to persons requesting access to the commission's public records and establish procedures for both requestors and commission staff.

NEW SECTION

WAC 24-20-020 Public record. A public record includes any writing containing information relating to the conduct of government or the performance of any governmental or proprietary function prepared, owned, used, or

retained by the commission regardless of physical form or characteristics.

NEW SECTION

WAC 24-20-030 Public records officer. (1) The commission's public records shall be in the charge of the public records officer designated by the commission.

(2) The name of the commission's current public records officer is on file with the office of the code reviser in accordance with RCW 42.56.580 and is published in the *Washington State Register*.

(3) The commission or its president may appoint a temporary public records officer to serve during the absence of the designated records officer. The public records officer shall be responsible for implementing the commission's rules regarding disclosure of public records, coordination of staff regarding disclosure of public records, and generally ensuring compliance by staff with public records disclosure requirements.

NEW SECTION

WAC 24-20-040 Requests for public records. (1) All requests for disclosure of public records must be submitted in writing directly to the commission's public records officer by mail at:

Washington Apple Commission
2900 Euclid Avenue
Wenatchee, WA 98801
email: publicrecords@waapple.org

The written request should include:

- (a) The name of the person requesting the record and their contact information;
- (b) The calendar date on which the request is made; and
- (c) Sufficient information to readily identify the records being requested.

(2) Any person wishing to inspect the commission's public records may make an appointment with the public records officer to inspect the records at the commission office during regular business hours. In order to adequately protect the commission's public records, the following will apply:

(a) Public records made available for inspection may not be removed from the area the commission makes available for inspection.

(b) Inspection of any public record will be conducted in the presence of the public records officer or designee.

(c) Public records may not be marked or altered in any manner during inspection.

(d) The commission has the discretion to designate the means and the location for the inspection of records. The viewing of those records that require specialized equipment shall be limited to the availability of that equipment located at the commission office and the availability of authorized staff to operate that equipment.

NEW SECTION

WAC 24-20-050 Response to public records request.

(1) The public records officer shall respond to public records requests within five business days by:

- (a) Providing the record;
- (b) Providing a link or address for a record available on the internet under RCW 42.56.520;
- (c) Acknowledging receipt of the request and providing a reasonable estimate of the time the commission will require to respond to the request; or
- (d) Denying the public records request. Responses refusing in whole or in part the inspection of a public record shall include a statement of the specific exemption authorizing the withholding of the record (or any part) and a brief explanation of how the exemption applies to the record(s) withheld or to any redactions in records produced.

(2) Additional time to respond to the request may be based upon the need to:

- (a) Clarify the intent of the request;
- (b) Locate and assemble the information requested;
- (c) Notify third persons or agencies affected by the request; or
- (d) Determine whether any of the information requested is exempt and that a denial should be made as to all or part of the request.

(3) In acknowledging receipt of a public records request that is unclear, the public records officer may ask the requestor to clarify what records the requestor is seeking. The public records officer is not obligated to provide further response if the requestor fails to clarify the request.

NEW SECTION

WAC 24-20-060 Costs of disclosure. (1) No fee shall be charged for the inspection of public records.

(2) Pursuant to RCW 42.56.120(2), the commission declares for the following reasons that it would be unduly burdensome for it to calculate the actual costs it charges for providing copies of public records: Funds were not allocated for performing a study to calculate such actual costs and the agency lacks the necessary funds to perform a study and calculations; staff resources are insufficient to perform a study and to calculate such actual costs; and a study would interfere with and disrupt other essential agency functions.

(3) The commission may charge fees for production of copies of public records consistent with the fee schedule established in RCW 42.56.120.

(4) The public records officer may waive the fee when the expenses of processing payment exceeds the costs of providing copies.

NEW SECTION

WAC 24-20-070 Exemptions. The commission's public records are available for disclosure except as otherwise provided under chapter 42.56 RCW or any other law. Requestors should be aware of the following exemptions to public disclosure specific to commission records. This list is not exhaustive and other exemptions may apply:

(1) Production or sales records required to determine assessment levels and actual assessment payments the commission under chapter 15.24 RCW (reference RCW 42.56.380(3)).

(2) Financial and commercial information and records supplied by persons:

(a) To the commission for the purpose of conducting a referendum for the establishment of the commission; or

(b) To the commission under chapter 15.24 RCW, with respect to domestic or export marketing activities or individual producer's production information (reference RCW 42.56.380(5)).

(3) Lists of individuals requested for commercial purposes (reference RCW 42.56.070).

(4) Records which are relevant to a controversy to which the commission is a party but which records would not be available to another party under the rules of pretrial discovery for causes pending in the superior courts, including records involving attorney-client communications between the commission and the office of the attorney general privileged under RCW 5.60.060(2).

(5) Personal information in any files maintained for employees, appointees, or elected officials of any public agency to the extent that disclosure would violate their right to privacy (reference RCW 42.56.230(3)).

(6) Residential addresses, residential telephone numbers, personal wireless telephone numbers, personal electronic mail addresses, dates of birth, Social Security numbers and emergency contact information of employees, dependents of employees, or volunteers of a public agency that are held by any agency in personnel records, public employment related records, or volunteer rosters, or are included in any mailing list of employees or volunteers of any public agency (reference RCW 42.56.250(3)).

NEW SECTION

WAC 24-20-080 Review of denials of public records requests. (1) Any person who objects to the denial of a request to copy or inspect public records may petition the commission for review of such decision by submitting a written request to the commission. The request shall specifically refer to the statement which constituted or accompanied the denial.

(2) The commission's president or designee shall immediately consider the matter and either affirm or reverse such denial. In any case, the request shall be returned with a final decision, within ten business days following receipt of the written request for review of the original denial.

(3) Under RCW 42.56.530, if the commission denies a requestor access to public records because it claims the record is exempt in whole or in part from disclosure, the requestor may request the attorney general's office to review the matter.

(4) Any person may obtain court review of a denial of a public records request under RCW 42.56.550.

NEW SECTION

WAC 24-20-090 Records index. The commission shall establish a records index, which shall be made available for

public review. The records index may be accessed on the commission's web site at www.bestapples.com.

The index includes the following records:

(1) Washington apple commission statute, chapter 15.24 RCW.

(2) Washington apple commission rules, Title 24 WAC.

(3) Commission policy and procedure manuals.

WSR 19-24-101 PERMANENT RULES PROFESSIONAL EDUCATOR STANDARDS BOARD

[Filed December 4, 2019, 9:14 a.m., effective January 4, 2020]

Effective Date of Rule: Thirty-one days after filing.

Purpose: Provide appropriate options for notification of educators in appeals relating to certification.

Citation of Rules Affected by this Order: Amending WAC 181-86-145.

Statutory Authority for Adoption: Chapter 28A.410 RCW.

Other Authority: Not applicable.

Adopted under notice filed as WSR 19-20-126 on October 2, 2019.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 0, Repealed 0; or Recently Enacted State Statutes: New 0, Amended 1, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 0, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 0, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 0, Amended 0, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 0, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 0, Repealed 0.

Date Adopted: December 3, 2019.

Justin Montermini
Rules Coordinator

AMENDATORY SECTION (Amending WSR 18-01-022, filed 12/8/17, effective 1/8/18)

WAC 181-86-145 Appeal procedure—Informal SPI review. Any person who appeals the decision or order to deny his or her application, the issuance of a reprimand, or the order to suspend or revoke his or her certificate must file a written notice with the superintendent of public instruction within thirty calendar days following the date of postmarked mailing or other notification, whichever is earlier, from the section of the superintendent of public instruction's office responsible for certification of the decision or order.

The written notice must set forth the reasons why the appellant believes his or her application should have been

granted or why his or her certificate should not be suspended or revoked, or why the reprimand should not be issued whichever is applicable.

Following timely notice of appeal, the superintendent of public instruction shall appoint a review officer who shall proceed as follows:

(1) If the appeal does not involve good moral character, personal fitness, or unprofessional conduct, the review officer shall review the application and appeal notice and may request further written information including, but not limited to, an explanation from the person or persons who initially reviewed the application of the reason(s) why the application was denied. If the review officer deems it advisable, he or she shall schedule an informal meeting with the appellant, the person or persons who denied the application, and any other interested party designated by the review officer to receive oral information concerning the application. Any such meeting must be held within thirty calendar days of the date of receipt by the superintendent of public instruction of the timely filed appeal notice.

(2) If the appeal involves good moral character, personal fitness, or acts of unprofessional conduct, the review officer shall schedule an informal meeting of the applicant or certificate holder and/or counsel for the applicant or certificate holder with the admissions and professional conduct advisory committee. Such meeting shall be scheduled in accordance with the calendar of meetings of the advisory committee: Provided, That notice of appeal must be received at least fifteen calendar days in advance of a scheduled meeting.

(3) Send by certified mail a written decision (i.e., findings of fact and conclusions of law) on the appeal within thirty calendar days from the date of post-marked mailing the timely filed appeal notice or informal meeting, whichever is later. The review officer may uphold, reverse, or modify the decision to deny the application, the order to reprimand, or the order to suspend or revoke the certificate.

(4) The timelines stated herein may be extended by the review officer for cause.

(5) Provided, That in the case of an action for suspension or revocation of a certificate, the review officer, if so requested by an appellant, shall delay any review under this section until all quasi-judicial administrative or judicial proceedings (i.e., criminal and civil actions), which the review officer and the appellant agree are factually related to the suspension or revocation proceeding, are completed, including appeals, if the appellant signs the agreement stated in WAC 181-86-160. In requesting such delay, the appellant shall disclose fully all pending quasi-judicial administrative proceedings in which the appellant is involved.

WSR 19-24-103
PERMANENT RULES
PROFESSIONAL EDUCATOR
STANDARDS BOARD

[Filed December 4, 2019, 10:45 a.m., effective January 4, 2020]

Effective Date of Rule: Thirty-one days after filing.

Purpose: As required in SB [2SSB] 5082, to incorporate the social emotional learning (SEL) standards into educator preparation program standards.

Citation of Rules Affected by this Order: Amending WAC 181-78A-232.

Statutory Authority for Adoption: Chapter 28A.410 RCW.

Other Authority: Not applicable.

Adopted under notice filed as WSR 19-20-127 on October 2, 2019.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 0, Repealed 0; or Recently Enacted State Statutes: New 0, Amended 1, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 0, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 0, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 0, Amended 0, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 0, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 0, Repealed 0.

Date Adopted: November 17, 2019.

Justin Montermini
Rules Coordinator

AMENDATORY SECTION (Amending WSR 19-15-144, filed 7/24/19, effective 8/24/19)

WAC 181-78A-232 Teacher, principal, career and technical education director, superintendent, and program administrator—Specific program approval domain standard—Candidate knowledge, skills, and cultural responsiveness. Knowledge, skills, and cultural responsiveness. Providers prepare candidates who demonstrate the knowledge, skills and cultural responsiveness required for the particular certificate and areas of endorsement, which reflect the state's approved standards.

(1) Providers demonstrate effective, culturally responsive pedagogy using multiple instructional methods, formats, and assessments.

(a) Qualified faculty use multiple instructional strategies, pedagogies, and assessments to address students' academic language ability levels and cultural and linguistic backgrounds.

(b) Providers create opportunities for faculty members and program personnel to pursue, apply, and practice ongoing professional learning to improve their knowledge, skill, effectiveness, and cultural responsiveness.

(c) Faculty within the program and the unit collaborate among one another, with content specialists, P-12 schools, members of the broader professional community, and diverse members of local communities for continuous program improvement.

(d) Faculty members and program leaders systematically and comprehensively evaluate faculty's effectiveness in teaching and learning.

(2) Providers ensure that completers demonstrate the necessary subject matter knowledge for success as educators in schools.

(a) Candidates demonstrate knowledge and competence relative to the national standards related to the role, which were adopted by the board. Providers ensure that candidates in teacher preparation programs demonstrate most recently published InTASC Standards, candidates in principal programs demonstrate most recently published NELP - Building Level Standards, and candidates in superintendent programs demonstrate most recently published NELP - District Level Standards, and candidates in career and technical education educator preparation programs demonstrate and document the career and technical education standards approved by the professional educator standards board.

(b) Teacher candidates must take a board approved basic skills assessment prior to program admission and take an endorsement assessment prior to beginning student teaching. Endorsement assessments are not required for teacher candidates in career and technical education business and industry route programs.

(c) Teacher candidates apply content knowledge as reflected in board approved endorsement standards.

(d) Teacher candidates engage with the since time immemorial curriculum focused on history, culture, and government of American Indian peoples as prescribed in WAC 181-78A-300.

(e) Providers ensure that educator candidates complete a course on issues of abuse as required by RCW 28A.410.035 and WAC 181-79A-030.

(3) Providers ensure that candidates demonstrate pedagogical knowledge and skill relative to the national professional standards adopted by the board for the role for which candidates are being prepared.

(a) Candidates demonstrate knowledge and competence relative to the national standards related to the role, which were adopted by the board. Providers ensure that candidates in teacher preparation programs demonstrate most recently published InTASC Standards, candidates in principal programs demonstrate most recently published NELP - Building Level Standards, candidates in superintendent programs demonstrate most recently published NELP - District Level Standards, and candidates in career and technical education educator preparation programs demonstrate and document the career and technical education standards approved by the professional educator standards board.

(b) Faculty and mentors provide regular and ongoing feedback to candidates regarding field based performance that is actionable and leads to improvement in candidates' practice.

(c) Providers demonstrate through structured observation, discussion, surveys, and/or artifacts that program completers effectively apply the professional knowledge, skills, and dispositions that the preparation program was designed to achieve.

(d) Providers ensure that teacher candidates achieve passing scores on the teacher performance assessment, also

known as the pedagogy assessment, approved by the board. The teacher performance assessment is not required for teacher candidates in career and technical education business and industry route programs.

(e) Providers ensure that all educator candidates demonstrate knowledge of the paraeducator standards of practice, as published by the paraeducator board.

(f) Providers of career and technical educator preparation programs provide candidates all necessary guidance to document, demonstrate, and submit for approval the required hours of occupational experience.

(g) Providers ensure that teacher and principal candidates can recognize signs of emotional or behavioral distress in students and appropriately refer students for assistance and support. The guidance provided to candidates must include the social-emotional learning standards, benchmarks, and related competencies described in RCW 28A.410.270.

(4) Providers ensure that candidates are well prepared to exhibit the knowledge and skills of culturally responsive educators.

(a) Providers offer all candidates meaningful, reflective opportunities to interact with racially and culturally diverse colleagues, faculty, P-12 practitioners, and P-12 students and families.

(b) Providers prepare candidates to adapt their practices based on students' prior experiences, cultural knowledge, and frames of reference to make learning encounters more relevant and effective.

(c) Providers ensure course work explicitly focuses on cultural responsiveness and integrates components of culturally responsive education within and throughout all courses.

(d) Faculty explicitly model equity pedagogy in course work and practica in ways that enable candidates to integrate their own cultural and linguistic backgrounds into classroom activities.

WSR 19-24-105
PERMANENT RULES
OLYMPIC REGION
CLEAN AIR AGENCY

[Filed December 4, 2019, 11:18 a.m., effective January 4, 2020]

Effective Date of Rule: Thirty-one days after filing.

Purpose: This action updates the effective date of the federal regulations that have been adopted by the agency.

Citation of Rules Affected by this Order: Amending ORCAA Regulations Rule 1.11 and Appendix A.

Statutory Authority for Adoption: Chapter 70.94 RCW.

Adopted under notice filed as WSR 19-19-063 on September 16, 2019.

Changes Other than Editing from Proposed to Adopted Version: The dates listed in WSR 19-19-063 Appendix A were erroneously listed as July 1, 2017. The date should have been July 1, 2016. This rule change removes those dates from Appendix A to avoid this issue in the future.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 0, Repealed 0; or

Recently Enacted State Statutes: New 0, Amended 0, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 0, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 0, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 0, Amended 0, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 0, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 0, Repealed 0.

Date Adopted: November 13, 2019.

Francea L. McNair
Executive Director

AMENDATORY SECTION

APPENDIX A - ADOPTED FEDERAL REGULATIONS AND STANDARDS

40 CFR Part 60 - Standards of Performance for New Stationary Sources (~~(adopted by reference effective July 1, 2016.)~~)

Subpart A	General Provisions
Subpart D	Fossil-Fuel-Fired Steam Generators for which Construction is Commenced after August 17, 1971
Subpart Da	Electric Utility Steam Generating Units for which Construction is Commenced after September 18, 1978
Subpart Db	Industrial-Commercial-Institutional Steam Generating Units
Subpart Dc	Small Industrial-Commercial-Institutional Steam Generating Units
Subpart E	Incinerators
Subpart Ea	Municipal Waste Combustors for which Construction is Commenced after December 20, 1989 and on or before September 20, 1994
Subpart Eb	Large Municipal Waste Combustors
Subpart Ec	Hospital/Medical/Infectious Waste Incinerators
Subpart F	Portland Cement Plants
Subpart G	Nitric Acid Plants
Subpart Ga	Nitric Acid Plants for which Construction, Reconstruction, or Modification Commenced after October 14, 2011
Subpart H	Sulfuric Acid Plants
Subpart I	Hot Mix Asphalt Facilities
Subpart J	Petroleum Refineries

Subpart Ja	Petroleum Refineries for which Construction, Reconstruction, or Modification Commenced After May 14, 2007
Subpart K	Storage Vessels for Petroleum Liquids for which Construction, Reconstruction, or Modification Commenced after June 11, 1973 and prior to May 19, 1978
Subpart Ka	Storage Vessels for Petroleum Liquids for which Construction, Reconstruction, or Modification Commenced after May 18, 1978 and prior to July 23, 1984
Subpart Kb	VOC Liquid Storage Vessels (including Petroleum Liquid Storage Vessels) for which Construction, Reconstruction, or Modification Commenced after July 23, 1984
Subpart L	Secondary Lead Smelters
Subpart M	Secondary Brass and Bronze Production Plants
Subpart N	Primary Emissions from Basic Oxygen Process Furnaces for which Construction is Commenced after June 11, 1973
Subpart Na	Secondary Emissions from Basic Oxygen Process Steel-making Facilities for which Construction is Commenced after January 20, 1983
Subpart O	Sewage Treatment Plants
Subpart P	Primary Copper Smelters
Subpart Q	Primary Zinc Smelters
Subpart R	Primary Lead Smelters
Subpart T	Phosphate Fertilizer Industry: Wet Process Phosphoric Acid Plants
Subpart U	Phosphate Fertilizer Industry: Superphosphoric Acid Plants
Subpart V	Phosphate Fertilizer Industry: Diammonium Phosphate Plants
Subpart W	Phosphate Fertilizer Industry: Triple Superphosphate Plants
Subpart X	Phosphate Fertilizer Industry: Granular Triple Superphosphate Storage Facilities
Subpart Y	Coal Preparation Plants
Subpart Z	Ferroalloy Production Facilities
Subpart AA	Steel Plants: Electric Arc Furnaces Constructed after October 21, 1974 and on or before August 17, 1983

Subpart AAa	Steel Plants: Electric Arc Furnaces and Argon-Oxygen Decarburization Vessels Constructed after August 7, 1983
Subpart CC	Glass Manufacturing Plants
Subpart DD	Grain Elevators
Subpart EE	Surface Coating of Metal Furniture
Subpart GG	Stationary Gas Turbines
Subpart HH	Lime Manufacturing Plants
Subpart KK	Lead-Acid Battery Manufacturing Plants
Subpart LL	Metallic Mineral Processing Plants
Subpart MM	Automobile and Light Duty Truck Surface Coating Operations
Subpart NN	Phosphate Rock Plants
Subpart PP	Ammonium Sulfate Manufacture
Subpart QQ	Graphic Arts Industry: Publication Rotogravure Printing
Subpart RR	Pressure Sensitive Tape and Label Surface Coating Standards
Subpart SS	Industrial Surface Coating: Large Appliances
Subpart TT	Metal Coil Surface Coating
Subpart UU	Asphalt Processing and Asphalt Roof Manufacture
Subpart VV	Equipment Leaks of VOC in Synthetic Organic Chemical Manufacturing Industry
Subpart VVa	Equipment Leaks of VOC in Synthetic Organic Chemical Manufacturing Industry for which Construction, Reconstruction, or Modification Commenced After November 7, 2006
Subpart WW	Beverage Can Surface Coating Industry
Subpart XX	Bulk Gasoline Terminals
Subpart AAA	New Residential Wood Heaters - Title V sources only
Subpart BBB	Rubber Tire Manufacturing Industry
Subpart DDD	VOC Emissions from Polymer Manufacturing Industry
Subpart FFF	Flexible Vinyl and Urethane Coating and Printing
Subpart GGG	Equipment Leaks of VOC in Petroleum Refineries
Subpart GGGa	Equipment Leaks of VOC in Petroleum Refineries for which Construction, Reconstruction, or Modification Commenced After January 4, 1983, And On Or Before November 7, 2006

Subpart HHH	Synthetic Fiber Production Facilities
Subpart III	VOC Emissions from Synthetic Organic Chemical Manufacturing Industry Air Oxidation Unit Processes
Subpart JJJ	Petroleum Dry Cleaners
Subpart KKK	Equipment Leaks of VOC from Onshore Natural Gas Processing Plants
Subpart LLL	Onshore Natural Gas Processing: SO ₂ Emissions
Subpart NNN	VOC Emissions from Synthetic Organic Chemical Manufacturing Industry Distillation Operations
Subpart OOO	Nonmetallic Mineral Processing Plants
Subpart PPP	Wool Fiberglass Insulation Manufacturing Plants
Subpart QQQ	VOC Emissions from Petroleum Refinery Wastewater Systems
Subpart RRR	VOCs from Synthetic Organic Chemical Manufacturing Industry Reactor Processes
Subpart SSS	Magnetic Tape Coating Facilities
Subpart TTT	Industrial Surface Coating: Surface Coating of Plastic Parts for Business Machines
Subpart UUU	Calciners and Dryers in Mineral Industries
Subpart VVV	Polymeric Coating of Supporting Substrates Facilities
Subpart WWW	Municipal Solid Waste Landfills
Subpart AAAA	Small Municipal Waste Combustion Units for which Construction is Commenced after August 30, 1999 or for which Modification or Reconstruction is Commenced after June 6, 2001
Subpart CCCC	Commercial and Industrial Solid Waste Incineration Units for which Construction is Commenced after November(±) 30, 1999 or for which Modification or Reconstruction is Commenced on or after June 1, 2001
Subpart EEEE	Standards of Performance for Other Solid Waste Incineration Units for Which Construction is Commenced After December 9, 2004, or for Which Modification or Reconstruction is Commenced on or After June 16, 2006
Subpart IIII	Standards of Performance for Stationary Compression Ignition Internal Combustion Engines - Title V sources only.

Subpart JJJJ	Standards of Performance for Stationary Spark Ignition Internal Combustion Engines - Title V sources only.
Subpart KKKK	Standards of Performance for Stationary Combustion Turbines
Subpart LLLL	Standards of Performance for New Sewage Sludge Incineration Units
Subpart OOOO	Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution
Subpart QQQQ	Standards of Performance for New Residential Hydronic Heaters and Forced-Air Furnaces - Title V sources only.
Subpart TTTT	Standards of Performance for Greenhouse Gas Emissions for Electric Generating Units
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40 CFR Part 61 - National Emission Standards for Hazardous Air Pollutants ((~~adopted by reference effective July 1, 2016.~~))

Subpart A	General Provisions
Subpart C	Beryllium
Subpart D	Beryllium Rocket Motor Firing
Subpart E	Mercury
Subpart F	Vinyl Chloride
Subpart J	Equipment Leaks of Benzene
Subpart L	Benzene from Coke By-Product Recovery Plants
Subpart M	Asbestos
Subpart N	Inorganic Arsenic from Glass Manufacturing Plants
Subpart O	Inorganic Arsenic from Primary Copper Smelters
Subpart P	Inorganic Arsenic emissions from Arsenic Trioxide and Metallic Arsenic Production Facilities
Subpart V	Equipment Leaks (Fugitive Sources)
Subpart Y	Benzene from Benzene Storage Vessels
Subpart BB	Benzene from Benzene Transfer Operations
Subpart FF	Benzene Waste Operations

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40 CFR Part 61	Appendix B
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40 CFR Part 63 - National Emission Standards for Hazardous Air Pollutants for Source Categories ((~~adopted by reference effective July 1, 2016.~~))

Subpart A	General Provisions
Subpart B	Requirements for Control Technology Determinations for Major Sources in Accordance with Clean Air Act Sections, Sections 112(g) and 112(j)
Subpart C	List of Hazardous Air Pollutants, Petition Process, Lesser Quantity Designations, Source Category List
Subpart D	Regulations Governing Compliance Extensions for Early Reductions of Hazardous Air Pollutants
Subpart F	National Emission Standards for Organic Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry
Subpart G	National Emission Standards for Organic Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry Process Vents, Storage Vessels, Transfer Operations, and Wastewater
Subpart H	National Emission Standards for Organic Hazardous Air Pollutants for Equipment Leaks
Subpart I	National Emission Standards for Organic Hazardous Air Pollutants for Certain Processes Subject to the Negotiated Regulation for Equipment Leaks
Subpart J	National Emission Standards for Hazardous Air Pollutants for Polyvinyl Chloride and Copolymers Production
Subpart L	National Emission Standards for Coke Oven Batteries
Subpart M	National Perchloroethylene Air Emission Standards for Dry Cleaning Facilities - Title V sources only.
Subpart N	National Emission Standards for Chromium Emissions from Hard and Decorative Chromium Electroplating and Chromium Anodizing Tanks
Subpart O	Ethylene Oxide Emissions Standards for Sterilization Facilities

Subpart Q	National Emission Standards for Hazardous Air Pollutants for Industrial Process Cooling Towers
Subpart R	National Emission Standards for Gasoline Distribution Facilities (Bulk Gasoline Terminals and Pipeline Breakout Stations)
Subpart S	National Emission Standards for Hazardous Air Pollutants from the Pulp and Paper Industry
Subpart T	National Emission Standards for Halogenated Solvent Cleaning
Subpart U	National Emission Standards for Hazardous Air Pollutant Emissions: Group I Polymers and Resins
Subpart W	National Emission Standards for Hazardous Air Pollutants for Epoxy Resins Production and Non-Nylon Polyamides Production
Subpart X	National Emission Standards for Hazardous Air Pollutants from Secondary Lead Smelting
Subpart Y	National Emission Standards for Marine Tank Vessel Loading Operations
Subpart AA	National Emission Standards for Hazardous Air Pollutants from Phosphoric Acid Manufacturing Plants
Subpart BB	National Emission Standards for Hazardous Air Pollutants from Phosphate Fertilizers Production Plants
Subpart CC	National Emission Standards for Hazardous Air Pollutants from Petroleum Refineries
Subpart DD	National Emission Standards for Hazardous Air Pollutants from Off-Site Waste and Recovery Operations
Subpart EE	National Emission Standards for Magnetic Tape Manufacturing Operations
Subpart GG	National Emission Standards for Aerospace Manufacturing and Rework Facilities
Subpart HH	National Emission Standards for Hazardous Air Pollutants from Oil and Natural Gas Production Facilities
Subpart II	National Emission Standards for Shipbuilding and Ship Repair (Surface Coating)
Subpart JJ	National Emission Standards for Wood Furniture Manufacturing Operations

Subpart KK	National Emission Standard for the Printing and Publishing Industry
Subpart MM	National Emission Standard for Hazardous Air Pollutants for Chemical Recovery Combustion Sources at Kraft, Soda, Sulfitic, and Stand-Alone Semichemical Pulp Mills
Subpart OO	National Emission Standards for Tanks - Level 1
Subpart PP	National Emission Standards for Containers
Subpart QQ	National Emission Standards for Surface Impoundments
Subpart RR	National Emission Standards for Individual Drain Systems
Subpart SS	National Emission Standards for Closed Vent Systems, Control Devices, Recovery Devices and Routing to a Fuel Gas System or a Process
Subpart TT	National Emission Standards for Equipment Leaks - Control Level 1
Subpart UU	National Emission Standards for Equipment Leaks - Control Level 2 Standards
Subpart VV	National Emission Standards for Oil-Water Separators and Organic-Water Separators
Subpart WW	National Emission Standards for Storage Vessels (Tanks) - Control Level 2
Subpart XX	National Emission Standards for Ethylene Manufacturing Process Units: Heat Exchange Systems and Waste Operations
Subpart YY	National Emission Standards for Hazardous Air Pollutants for Source Categories: Generic Maximum Achievable Control Technology Standards
Subpart CCC	National Emission Standards for Hazardous Air Pollutants for Steel Pickling—HCl Process Facilities and Hydrochloric Acid Regeneration Plants
Subpart DDD	National Emission Standards for Hazardous Air Pollutants for Mineral Wool Production
Subpart EEE	National Emission Standard for Hazardous Air Pollutants from Hazardous Waste Combustors
Subpart GGG	National Emission Standards Pharmaceuticals Production

Subpart HHH	National Emission Standards for Hazardous Air Pollutants from Natural Gas Transmission and Storage Facilities
Subpart III	National Emission Standards for Hazardous Air Pollutants for Flexible Polyurethane Foam Production
Subpart JJJ	National Emission Standard for Hazardous Air Pollutant Emissions: Group IV Polymers and Resins
Subpart LLL	National Emission Standards for Hazardous Air Pollutants from the Portland Cement Manufacturing Industry
Subpart MMM	National Emission Standards for Hazardous Air Pollutants for Pesticide Active Ingredient Production
Subpart NNN	National Emission Standards for Hazardous Air Pollutants for Wool Fiberglass Manufacturing
Subpart OOO	National Emission Standards for Hazardous Air Pollutants Emissions: Manufacture of Amino/Phenolic Resins
Subpart PPP	National Emission Standards for Hazardous Air Pollutants Emissions for Polyether Polyols Production
Subpart QQQ	National Emission Standards for Hazardous Air Pollutants for Primary Copper Smelting
Subpart RRR	National Emission Standards for Hazardous Air Pollutants for Secondary Aluminum Production - Title V sources only.
Subpart TTT	National Emission Standards for Hazardous Air Pollutants for Primary Lead Smelting
Subpart UUU	National Emission Standards for Hazardous Air Pollutants for Petroleum Refineries: Catalytic Cracking Units, Catalytic Reforming Units, and Sulfur Recovery Units.
Subpart VVV	National Emission Standard for Hazardous Air Pollutants: Publicly Owned Treatment Works
Subpart XXX	National Emission Standards for Hazardous Air Pollutants for Ferroalloys Production: Ferromanganese and Silicomanganese
Subpart AAAA	National Emission Standard for Hazardous Air Pollutants: Municipal Solid Waste Landfills

Subpart CCCC	National Emission Standard for Hazardous Air Pollutants: Manufacturing of Nutritional Yeast
Subpart DDDD	National Emission Standard for Hazardous Air Pollutants: Plywood and Composite Wood Products
Subpart EEEE	National Emission Standard for Hazardous Air Pollutants: Organic Liquids Distribution (Non-Gasoline)
Subpart FFFF	National Emission Standard for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing
Subpart GGGG	National Emission Standard for Hazardous Air Pollutants: Solvent Extractions for Vegetable Oil Production
Subpart HHHH	National Emission Standard for Hazardous Air Pollutants for Wet-Formed Fiberglass Mat Production
Subpart IIII	National Emission Standard for Hazardous Air Pollutants: Surface Coating of Automobiles and Light-Duty Trucks
Subpart JJJJ	National Emission Standard for Hazardous Air Pollutants: Paper and Other Web Coating
Subpart KKKK	National Emission Standard for Hazardous Air Pollutants: Surface Coating of Metal Cans
Subpart MMMM	National Emission Standard for Hazardous Air Pollutants for Surface Coating of Miscellaneous Metal Parts and Products
Subpart NNNN	National Emission Standard for Hazardous Air Pollutants: Surface Coating of Large Appliances
Subpart OOOO	National Emission Standard for Hazardous Air Pollutants: Printing, Coating, and Dyeing of Fabrics and Other Textiles
Subpart PPPP	National Emission Standards for Hazardous Air Pollutants for Surface Coating of Plastic Parts and Products
Subpart QQQQ	National Emission Standard for Hazardous Air Pollutants: Surface Coating of Wood Building Products
Subpart RRRR	National Emission Standard for Hazardous Air Pollutants: Surface Coating of Metal Furniture
Subpart SSSS	National Emission Standard for Hazardous Air Pollutants: Surface Coating of Metal Coil

Subpart TTTT	National Emission Standard for Hazardous Air Pollutants for Leather Finishing Operations
Subpart UUUU	National Emission Standard for Hazardous Air Pollutants for Cellulose Products Manufacturing
Subpart VVVV	National Emission Standard for Hazardous Air Pollutants for Boat Manufacturing
Subpart WWWW	National Emission Standard for Hazardous Air Pollutants: Reinforced Plastic Composites Production
Subpart XXXX	National Emission Standard for Hazardous Air Pollutants: Rubber Tire Manufacturing
Subpart YYYY	National Emission Standard for Hazardous Air Pollutants for Stationary Combustion Turbines
Subpart ZZZZ	National Emission Standard for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines - Title V sources only.
Subpart AAAAA	National Emission Standard for Hazardous Air Pollutants for Lime Manufacturing Plants
Subpart BBBBB	National Emission Standard for Hazardous Air Pollutants for Semiconductor Manufacturing
Subpart CCCCC	National Emission Standard for Hazardous Air Pollutants for Coke Ovens: Pushing, Quenching, and Battery Stacks
Subpart DDDDD	National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers and Process Heaters
Subpart EEEEE	National Emission Standard for Hazardous Air Pollutants for Iron and Steel Foundries
Subpart FFFFF	National Emission Standard for Hazardous Air Pollutants for Integrated Iron and Steel Manufacturing Facilities
Subpart GGGGG	National Emission Standard for Hazardous Air Pollutants: Site Remediation
Subpart HHHHH	National Emission Standard for Hazardous Air Pollutants: Miscellaneous Coating Manufacturing

Subpart IIIII	National Emission Standard for Hazardous Air Pollutants: Mercury Emissions from Mercury Cell Chlor-Alkali Plants
Subpart JJJJJ	National Emission Standard for Hazardous Air Pollutants for Brick and Structural Clay Products Manufacturing
Subpart KKKKK	National Emission Standard for Hazardous Air Pollutants for Clay Ceramics Manufacturing
Subpart LLLLL	National Emission Standard for Hazardous Air Pollutants: Asphalt Processing and Asphalt Roofing Manufacturing
Subpart MMMMM	National Emission Standard for Hazardous Air Pollutants: Flexible Polyurethane Foam Fabrication Operations
Subpart NNNNN	National Emission Standard for Hazardous Air Pollutants: Hydrochloric Acid Production
Subpart PPPPP	National Emission Standard for Hazardous Air Pollutants for Engine Test Cells/Stands
Subpart QQQQQ	National Emission Standard for Hazardous Air Pollutants for Friction Materials Manufacturing Facilities
Subpart RRRRR	National Emission Standard for Hazardous Air Pollutants: Taconite Iron Ore Processing
Subpart SSSSS	National Emission Standard for Hazardous Air Pollutants for Refractory Products Manufacturing
Subpart TTTTT	National Emission Standard for Hazardous Air Pollutants for Primary Magnesium Refining
Subpart UUUUU	National Emission Standards for Hazardous Air Pollutants: Coal- and Oil-Fired Electric Utility Steam Generating Units
Subpart WWWW	National Emission Standards for Hospital Ethylene Oxide Sterilizers
Subpart YYYYY	National Emission Standard for Hazardous Air Pollutants for Area/Sources: Electric Arc Furnace Steelmaking Facilities
Subpart ZZZZZ	National Emission Standard for Hazardous Air Pollutants for Iron and Steel Foundries Area Sources

Subpart BBBBBB	National Emission Standards for Hazardous Air Pollutants for Source Category: Gasoline Distribution Bulk Terminals, Bulk Plants, and Pipeline Facilities - Title V sources only.
Subpart CCCCCC	National Emission Standards for Hazardous Air Pollutants for Source Category: Gasoline Dispensing Facilities ((-Title V sources only.))
Subpart DDDDDD	National Emission Standards for Hazardous Air Pollutants for Polyvinyl Chloride and Copolymers Production Area Sources
Subpart EEEEEE	National Emission Standards for Hazardous Air Pollutants for Primary Copper Smelting Area Sources
Subpart FFFFFF	National Emission Standards for Hazardous Air Pollutants for Secondary Copper Smelting Area Sources
Subpart GGG-GGG	National Emission Standards for Hazardous Air Pollutants for Primary Nonferrous Metals Area Sources—Zinc, Cadmium, and Beryllium
Subpart HHH-HHH	National Emission Standards for Hazardous Air Pollutants: Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources - Title V sources only.
Subpart JJJJJ	National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources
Subpart LLLLLL	National Emission Standards for Hazardous Air Pollutants for Acrylic and Modacrylic Fibers Production Area Sources
Subpart MMMMMM	National Emission Standards for Hazardous Air Pollutants for Carbon Black Production Area Sources
Subpart NNN-NNN	National Emission Standards for Hazardous Air Pollutants for Chemical Manufacturing Area Sources: Chromium Compounds
Subpart OOOOOO	National Emission Standards for Hazardous Air Pollutants for Flexible Polyurethane Foam Production and Fabrication Area Sources
Subpart PPPPPP	National Emission Standards for Hazardous Air Pollutants for Lead Acid Battery Manufacturing Area Sources

Subpart QQQQQQ	National Emission Standards for Hazardous Air Pollutants for Wood Preserving Area Sources
Subpart RRR-RRR	National Emission Standards for Hazardous Air Pollutants for Clay Ceramics Manufacturing Area Sources
Subpart SSSSSS	National Emission Standards for Hazardous Air Pollutants for Glass Manufacturing Area Sources
Subpart TTTTTT	National Emission Standards for Hazardous Air Pollutants for Secondary Nonferrous Metals Processing Area Sources
Subpart VVVVVV	National Emission Standards for Hazardous Air Pollutants for Chemical Manufacturing Area Sources
Subpart WWW- WWW	National Emission Standards for Hazardous Air Pollutants: Area Source Standards for Plating and Polishing Operations
Subpart XXXXXX	National Emission Standards for Hazardous Air Pollutants Area Source Standards for Nine Metal Fabrication and Finishing Source Categories - Title V sources only.
Subpart YYYYYY	National Emission Standards for Hazardous Air Pollutants for Area Sources: Ferroalloys Production Facilities
Subpart ZZZZZZ	National Emission Standards for Hazardous Air Pollutants Area Source Standards for Aluminum, Copper, and Other Nonferrous Foundries
Subpart AAAAAAA	National Emission Standards for Hazardous Air Pollutants for Area Sources: Asphalt Processing and Asphalt Roofing Manufacturing
Subpart BBBBBBB	National Emission Standards for Hazardous Air Pollutants for Area Sources: Chemical Preparations Industry
Subpart CCCCCCC	National Emission Standards for Hazardous Air Pollutants for Area Sources: Paints and Allied Products Manufacturing
Subpart DDDDDDD	National Emission Standards for Hazardous Air Pollutants: Area Source Standards for Prepared Feeds Manufacturing

Subpart EEEEEEE	National Emission Standards for Hazardous Air Pollutants: Gold Mine Ore Processing and Production Area Source Category
Subpart HHHH-HHH	National Emission Standards for Hazardous Air Pollutant Emissions for Polyvinyl Chloride and Copolymers Production
40 CFR Part 63	Appendix A
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40 CFR Part 63	Appendix D
40 CFR Part 63	Appendix E
Section 2.18 of 40 CFR Part 65	Consolidated Requirements for the Synthetic Organic Chemical Manufacturing Industry.

Reviser's note: The typographical error in the above material occurred in the copy filed by the Olympic Region Clean Air Agency and appears in the Register pursuant to the requirements of RCW 34.08.040.

AMENDATORY SECTION

Rule 1.11 FEDERAL REGULATION REFERENCE DATE

Whenever federal regulations are referenced in ORCAA's rules, the effective date shall be July 1, (~~2018~~) 2019.