City of Bellingham
City Council Regular Meeting Agenda
December 13, 2021, 7:00 PM

Mayor Seth Fleetwood
Council Members Hannah Stone, Gene Knutson, Daniel Hammill, Pinky Vargas, Lisa Anderson, Michael Lilliquist and Hollie Huthman
Legislative Assistant, Nalini Margaitis

Contact: (360) 778-8200, ccmail@cob.org
www.cob.org/council
All meetings are held in the City Hall Council Chambers at 210 Lottie Street, Bellingham, WA, unless otherwise noted.
Please note the doors to City Hall unlock at 6:30 PM.

Council members will participate in this meeting remotely through an online web-based meeting platform. Per Washington State Proclamation 20-28, in-person attendance at meetings is not required at this time.

Council meetings are streamed live via the City's website at meetings.cob.org and on the City's YouTube channel. Meetings are also broadcast in high definition on BTV on Comcast channel 321, and in standard definition on Comcast channel 10. Members of the public who do not have cable or Internet access may listen to the meeting via telephone. Members of the public who would like to listen by phone can do so using any of the following phone numbers:

- (253) 215-8782
- (346) 248-7799
- (669) 900-6833
- (301) 715-8592
- (312) 626-6799
- (929) 205-6099

Advance Public Hearing testimony, and general Public Comment, can always be presented to the Council:

- by mail (210 Lottie Street, Bellingham, WA 98225)
- online
    - for a public hearing: https://cob.org/gov/public/public-hearing-testimony
    - for general public comment: https://engagebellingham.org/council-public-comment
- by telephone (360-778-8200)

Members of the public are also invited to provide live testimony during any Public Hearing. Pre-registration through the sign-up link (https://cob.org/ccsignup) is encouraged but not required. To testify live during the meeting, speakers can join the remote meeting at the following link: https://cob.org/cczoom

Meeting ID: **941 9601 5179**

Meeting Password: **9**

The following items are heard in the Regular Meeting only:

Call to Order

Announcements & Upcoming Meetings:
Bellingham City Council meets all requirements of the State of Washington Open Meetings Act.

1. **The next two City Council public comment sessions will be held at 7:00 PM on December 20 and December 27. Public comment sessions may be accessed via Zoom at: https://cob.org/commentzoom (Meeting ID:** 923 0705 9297 **Password:** 018602**)**

2. **The 2022 City Council Reorganization meeting will occur at 1:00 PM on January 03, 2022 and may be accessed via Zoom at: https://cob.org/cczoom (Meeting ID:** 933 2687 3296 **Passcode:** 9**)**

3. **The Swearing-In Ceremony for Hollie Huthman, Michael Lilliquist, Skip Williams, and Kristina Martens will occur at 7:00 PM on January 03, 2022 and may be accessed via Zoom at: https://cob.org/cczoom (Meeting ID:** 919 5742 8832 **Passcode:** 9**)**

Roll Call

Public Hearing

23146	**1.**	**Public Hearing to Review an Ordinance Extending the Moratorium on the Processing of Development Applications and Permits Relating to the Redevelopment of Existing Mobile Home Parks**	**p. 8**
23193	**2.**	**Public Hearing to Consider Amendments to BMC Chapter 17.10 and the Washington State Energy Code - Commercial, Requiring Electrification and Efficiency Standards for Certain Multi-Family and Commercial Buildings**	**p. 17**

Mayor's Report
Standing time for briefings, updates and reports to Council by the Mayor, if needed.
Information only.

23194	**1.**	**Mayor's Reappointment of Robin Williams to the Civil Service Commission (Approval)**	**p. 321**
23195	**2.**	**Mayor's Reappointment of Garrett Leque to the Lake Whatcom Watershed Advisory Board (Approval)**	**p. 322**
23196	**3.**	**Mayor's Appointments to the Greenway Advisory Committee (Approval)**	**p. 323**

23197	**4.**	**Mayor's Appointments to the Immigration Advisory Board (Approval)**	**p. 338**
23198	**5.**	**Mayor's Appointment of Katy Scherrer to the Transportation Commission (Approval)**	**p. 346**
23199	**6.**	**Mayor's Reappointment of Mary Hooker to the Bellingham Sister Cities Board (Information)**	**p. 350**
23200	**7.**	**Mayor's Reappointment of Sara Holliday and Appointment of Marc Blake to the Tourism Commission (Information)**	**p. 351**
23201	**8.**	**Mayor's Appointments to the Parks & Recreation Advisory Board (Information)**	**p. 355**

Public Comment Report

The following are heard in both Committee sessions and Regular Meeting in order below:

Council Standing Committee Meetings:
Open to the public to attend. Note: there is generally no public comment period for Committee sessions. Standing Committee Members receive reports and information, ask questions and, when appropriate, vote on a recommended action for consideration by the full Council at the Regular Meeting. The notice of Committee Meetings identified below also serves as notice of Special Meetings of the City Council at the times identified as Council Members who are not members of the committee routinely attend and participate in the Committee Meetings. Committee Chairs give a report of the Committee Meeting at the Regular Meeting in the evening prior to deliberation and formal vote in the order shown below:

Public Works and Natural Resources 10:00 AM
Michael Lilliquist, Chair
Gene Knutson, Lisa Anderson

23202	**1.**	**Donation of Real Property for City Ownership and Maintenance of Stormwater Facilities Located Thereon**	**p. 360**
23203	**2.**	**Post Point Sludge Pumping System Replacement**	**p. 370**
23204	**3.**	**Report from the December 1, 2021 Lake Whatcom Policy Group Meeting**	**p. 374**
23205	**4.**	**Emergency Repairs Resulting from November Flood**	**p. 377**
23069	**5.**	**Broadband Advisory Workgroup Update #2**	**p. 380**

Public Health, Safety, and Justice 11:15 AM
Daniel Hammill, Chair
Gene Knutson, Hollie Huthman

23206	**1.**	**Inter-Agency Agreement for Paramedic Training Class**	**p. 390**
23207	**2.**	**Inter-Agency Agreement for Lateral Paramedic Training**	**p. 401**

Community and Economic Development 1:00 PM
Hollie Huthman, Chair
Pinky Vargas, Michael Lilliquist

23208	**1.**	**A Presentation of the Whatcom County Community & Economic Development Strategy**	**p. 409**
23209	**2.**	**Update on a New Pathway for Families with Children that are Experiencing Homelessness**	**p. 410**
23210	**3.**	**Assessment of Downtown Services and Description of New Initiatives Underway**	**p. 413**
23211	**4.**	**Update on Outdoor Dining Areas in the Public Right-of-Way**	**p. 422**

Committee Of The Whole 2:15 PM
Hannah Stone, Chair
Gene Knutson, Daniel Hammill, Pinky Vargas, Lisa Anderson, Michael Lilliquist,
Hollie Huthman

Please be advised that if the City Council is ahead of schedule, they may start with old/new business before the official Committee of the Whole meeting time.

23212	**1.**	**Return to City Facilities Planning**	**p. 439**
23213	**2.**	**Adoption of the 2021 Whatcom County Multi-jurisdictional Natural Hazards Mitigation Plan**	**p. 442**
23180	**3.**	**Continued Review of an Ordinance Amending the Infill Housing Toolkit Provisions of the Bellingham Municipal Code**	**p. 446**
23214	**4.**	**Resource Recovery Project Update and Loan Application**	**p. 510**
	5.	**Approval of Minutes**	
	6.	**Old/New Business**	

Executive Session 4:15 PM
Closed to the public. Report in the Regular Meeting only:

1. **Litigation: Hanlon v. City of Bellingham (Miller, approx. 15 min)**

2. **Labor Relations: Discuss Collective Bargaining Strategy (Monahan, approx. 10 min)**

Consent Agenda
All matters listed on the Consent Agenda are considered routine and/or non-controversial items and may be approved in a single motion. A member of the Council may ask that an item be removed from the Consent Agenda and considered separately.

23215	**1.**	**Authorization of A/P Transactions Issued November 25, 2021 through December 02, 2021**	**p. 552**
23216	**2.**	**2022 Interlocal Agreement with Whatcom County for Use of Bellingham's Vactor Waste Transfer Facility**	**p. 553**
23217	**3.**	**Term Extension of United States Geological Survey Collaborative Agreement for the Coastal Storm Surge Modeling System Project**	**p. 562**

Final Consideration of Ordinances

23179	**1.**	**An Ordinance Extending a Franchise to Comcast Cable Communications Management, LLC to Operate and Maintain a Cable System in the City of Bellingham; Setting forth Conditions Accompanying the Grant of Franchise; and Providing for City Regulation and Administration of the Cable System**	**p. 565**
23183	**2.**	**An Ordinance Relating to Land Use and Zoning, Amending Bellingham Municipal Code Sections 20.08.020, 20.10.030, 20.10.036, 20.10.037, and 20.12.040, and Chapter 20.52 to Improve the City's Code Enforcement Procedures by Making Violation of the City's Short-Term Rental, Accessory Dwelling Unit, and Sign Ordinances and Other Sections of Title 20 A Civil Infraction and by Authorizing the City to Record a Notice of Violation Against a Property that is in Violation of the Bellingham Municipal Code**	**p. 632**
23145	**3.**	**An Ordinance Amending the 2021-2022 Biennial Budget, Providing for Adoption of the Mid-Biennium Adjustments to the Biennial Budget Pursuant to the Terms of RCW 35.34.130**	**p. 640**

Presentation

23191	**1.**	**Resolution Honoring Councilmember Pinky Vargas**	**p. 648**
23192	**2.**	**Resolution Honoring Councilmember Gene Knutson**	**p. 652**

Adjournment

Agenda Information:
Council Committee and Regular Meeting agendas and agenda packets, which contain the supporting documentation for agenda items, are available to the public Wednesday afternoon prior to the meeting. They are posted at https://meetings.cob.org. A hard copy of the agenda packet is available for review from the reference desk at the Central Library or the Finance office at City Hall.

Live Broadcast Information:
The Bellingham City Council Committee Meetings are broadcast live on BTV Bellingham at the times listed on the Agenda. Committee session start times between 9:00 AM and 5:00 PM are estimated. A specific Committee may start later than the time published but will not begin earlier than its published time.

BTV can be found on cable systems as follows: Comcast channels 10 (standard) and 321 (high definition), and CenturyLink channels 40 (standard) and 1040 (high definition).

The meetings are also streamed live on the internet as they occur. Online viewers will see exactly what cable customers would see.

The Bellingham Public Library also has DVD's available for checkout. Video and audio files are available on the Internet at https://meetings.cob.org within 5 business days following each meeting.

BTV Council Meeting Rebroadcast Schedule:
Tues. 12 PM: Repeat broadcast of Monday afternoon Committee meetings
Tues. 7 PM: Repeat broadcast of Monday night regular meeting
Wed. 8 AM: Repeat broadcast of Monday night regular meeting
Sat. 12 PM: Repeat broadcast of Monday afternoon Committee meetings
Sat. 7 PM: Repeat broadcast of Monday night regular meeting

Accessibility:
The Council Chambers is fully accessible. Elevator access to the second floor is available at City Hall's west entrance. Hearing assistance is available, and a receiver may be checked out through the Deputy City Clerk prior to the evening session. For additional accommodations, contact the Legislative Assistant at 778-8200 in advance of the meeting. Thank you.

Upcoming meetings:

2022 Reorganization Meeting*
Monday, January 03, 2022, at 1:00 PM

Swearing-In Ceremony
Monday, January 03, 2022, at 7:00 PM

Next City Council Meeting
Monday, January 10, 2022

* As in past years, the Reorganization meeting is not streamed live to YouTube, nor broadcast by BTV. Members of the public will have live access via Zoom (please refer to the information provided on page 2 of this packet), and a recording will be available on demand at www.cob.org/meetings. For additional accommodations, please contact the City Council Office at 360-778-8200. Thank you.

Deadline to submit material for any public hearing for inclusion in the published agenda packet is 8:00 a.m. on Wednesday prior to the meeting.

City Council Agenda Bill

23146

Bill Number

Subject: **Public Hearing to Review an Ordinance Extending the Moratorium on the Processing of Development Applications and Permits Relating to the Redevelopment of Existing Mobile Home Parks**

Summary Statement: On October 25, 2021, the City Council approved a six-month extension of an ordinance establishing a moratorium on the acceptance or processing of development applications or permits relating to the redevelopment of any of the ten manufactured home parks in Bellingham. State law (RCW 36.70A.390) requires the City Council to hold a Pubic Hearing on the extension of the ordinance within 60-days of passage. City Council can take no action and keep the moratorium in place or vote to rescind or modify the ordinance. This moratorium is needed to ensure the continued availability of this form of affordable housing while the City develops potential preservation options.

Previous Council Action: **Adoption of Ordinance No. 2021-11-048**

Fiscal Impact: **N/A**

Funding Source: **N/A**

Attachments:
1. STAFF MEMO
2. ORDINANCE
3. MAP
4. PUBLIC HEARING NOTICE

Meeting Activity	Meeting Date	Recommendation	Presented By	Time
Public Hearing - Direction Requested	12/13/2021	Provide Direction	Greg Aucutt, PCDD	5 minutes

Recommended Motion:

Council Committee:

Agenda Bill Contact:
Greg Aucutt, Planning and Community Development, 360-778-8300

Reviewed By	Department	Date
Gregory R. Aucutt	Planning & Community Development	12/06/2021
James E. Erb	Legal	12/06/2021
Seth M. Fleetwood	Executive	12/07/2021

Council Action:

City of Bellingham
210 Lottie Street
Bellingham, WA 98225

MEMORANDUM

TO: **BELLINGHAM CITY COUNCIL**

FROM: GREG AUCUTT, ASSISTANT DIRECTOR, PCDD

SUBJECT: PUBLIC HEARING ON A MORATORIUM PROHIBITING THE PROCESSING OF APPLICATIONS TO CHANGE THE USE OF MOBILE AND MANUFACTURED HOME PARKS

DATE: DECEMBER 13, 2021

On October 25, 2021, the City Council approved a six-month extension of the moratorium ordinance that prohibits the acceptance or processing of any application to redevelop or change the use of any of the ten mobile/manufactured home parks (MHPs) in Bellingham. (Ord. 2021-11-048)

State law requires the City Council to conduct a public hearing within 60 days of adoption of an emergency ordinance. This public hearing is intended to fulfill that requirement. **At the conclusion of public testimony, City Council can take no action and keep the moratorium in place or vote to rescind or modify the moratorium ordinance.**

Staff recommends that the Council take no action and allow the moratorium to remain in effect. The moratorium will preserve the status quo and ensure the continued availability of housing in the city's MHPs, while the City investigates options to potentially preserve this form of affordable housing. We have talked with owners of a number of the parks and none has expressed objections to the moratorium at this time.

Applications to replace, repair, maintain or otherwise improve an existing mobile or manufactured home within the ten parks are not impacted by the moratorium.

ORDINANCE NO. _____

AN ORDINANCE OF THE CITY OF BELLINGHAM, WASHINGTON, RELATING TO LAND USE AND ZONING, EXTENDING A MORATORIUM ON DEVELOPMENT APPLICATIONS AND PERMITS RELATING TO THE REDEVELOPMENT OF EXISTING MOBILE HOME OR MANUFACTURED HOME PARKS, AND SETTING SIX MONTHS AS THE EFFECTIVE PERIOD OF THE MORATORIUM TO ALLOW THE CITY TO REVIEW OPTIONS AND DRAFT REGULATIONS FOR THE PRESERVATION OF EXISTING MOBILE HOME AND MANUFACTURED HOME PARKS.

WHEREAS, as land values, home prices and interest rates continue to rise, housing becomes less and less affordable in Bellingham, the state and the nation; and

WHEREAS, severe housing cost burdens disproportionately impact low-income and fixed income households; and

WHEREAS, mobile home and manufactured home parks provide some of the most affordable ownership and housing opportunities for elderly and low-income residents available today; and

WHEREAS, there are ten (10) existing mobile home and manufactured home parks, with approximately 900 dwelling units, within the city of Bellingham; and

WHEREAS, the City Council has expressed the need to evaluate methods to preserve existing mobile home and manufactured home parks to ensure their continued provision of affordable housing; and

WHEREAS, all lands within the city of Bellingham are under pressure to develop or redevelop for many reasons including extremely low vacancy rates and available housing stock; and

WHEREAS, the remaining mobile home and manufactured home parks are also subject to redevelopment pressure and the residents of those parks are at risk of being displaced and many of the units in those parks may not be suitable or able to relocate within the city of Bellingham; and

WHEREAS, the City believes a moratorium on applications to redevelop or convert existing manufactured home parks is in the City's best interest; and

WHEREAS, the moratorium will prevent the vesting of new development rights leading to development or redevelopment that would displace existing manufactured home park tenants; and

WHEREAS, the moratorium will preserve the status quo and ensure the availability of housing in the City's existing mobile home and manufactured parks while new regulations are

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

drafted and reviewed through the legislative process; and

WHEREAS, RCW 36.70A.390 authorizes the City Council to adopt an immediate moratorium for a period of up to twelve months without holding a public hearing on the proposal provided that a public hearing is held within at least 60 days of its adoption and a work plan is developed for related studies providing for the twelve month period; and

WHEREAS, RCW 36.70A.390 provides that, "A county or city governing body that adopts a moratorium, interim zoning map, interim zoning ordinance, or interim official control without holding a public hearing on the proposed moratorium, interim zoning map, interim zoning ordinance, or interim official control, shall hold a public hearing on the adopted moratorium, interim zoning map, interim zoning ordinance, or interim official control within at least sixty days of its adoption, whether or not the governing body received a recommendation on the matter from the planning commission or department. If the governing body does not adopt findings of fact justifying its action before this hearing, then the governing body shall do so immediately after this public hearing. A moratorium, interim zoning map, interim zoning ordinance, or interim official control adopted under this section may be effective for not longer than six months, but may be effective for up to one year if a work plan is developed for related studies providing for such a longer period. A moratorium, interim zoning map, interim zoning ordinance, or interim official control may be renewed for one or more six-month periods if a subsequent public hearing is held and findings of fact are made prior to each renewal"; and

WHEREAS, RCW 35.63.200 provides a similar process for adopting and extending land use moratoriums; and

WHEREAS, moratoriums enacted under RCW 36.70A.390 and/or RCW 35.63.200 are methods by which local governments may preserve the status quo so that new regulations will not be rendered moot by intervening projects; and

WHEREAS, RCW 36.70A.390 and RCW 35.63.200 both authorize the enactment of a moratorium without holding a public hearing if a public hearing is held within at least sixty days of its enactment; and

WHEREAS, pursuant to WAC 197-11-880, the adoption of this emergency moratorium is exempt from the requirements of a threshold determination under the State Environmental Policy Act (SEPA); and

WHEREAS, a moratorium will provide the City with additional time to explore options and to draft new land use regulations regarding the preservation of mobile home and manufactured home parks; and

WHEREAS, the City Council concludes that the City has the authority to establish a moratorium and that the City must adopt a moratorium concerning the filing, acceptance, and processing of new applications for redevelopment of the City's existing mobile home and manufactured home parks; and

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

WHEREAS, on June 3, 2019 the Bellingham City Council adopted an emergency ordinance (Ordinance No. 2019-06-021) establishing a moratorium on development applications and permits relating to the redevelopment of existing mobile home or manufactured home parks; and

WHEREAS, the City Council approved a six-month extension of this ordinance in June 2020; and

WHEREAS, this ordinance expires on December 2, 2021; and

WHEREAS, the City Council has determined it needs additional time to explore the City's options for preserving mobile home and manufactured home parks and draft new land use regulations to preserve mobile home and manufactured home parks if necessary; and

WHEREAS, the City Council has determined that the existing moratorium should be extended an additional six months; and

WHEREAS, the City Council adopts the foregoing as its findings of facts justifying the adoption of this ordinance.

NOW THEREFORE, THE CITY OF BELLINGHAM DOES ORDAIN:

Section 1. Findings of Fact. The City Council adopts the above "WHEREAS" recitals as findings of fact in support of its action as required by RCW 36.70A.390 and RCW 35.63.200.

Section 2: Definitions.

A. "Mobile home or manufactured home park" shall include all lands currently developed with mobile or manufactured homes as identified on EXHIBIT A, including all abutting lands and property held under common ownership of the existing parks. This definition does not include individual designated manufactured homes on individual lots or parcels not located in the parks identified on EXHIBIT A.

B. "Application" means any application or permit for demolition, construction, land use or alteration of land including, but not limited to, variances, conditional use permits, planned development permits, rezones, use permits or any other applications or permits associated with mobile home and manufactured home parks as determined by the Planning and Community Development Director. This term does not include any land use or development permit or application that is subject to the vested rights doctrine, and that was submitted to the City and determined by the City staff to be complete on or before the effective date of this ordinance.

Section 3. Purpose. The purpose of this moratorium is to allow the City adequate time to explore options that seek to preserve existing mobile home and manufactured home parks.

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

Section 4. Moratorium Extended. The City Council extends the existing moratorium on the filing, acceptance, processing and/or review of any application to develop, redevelop or to establish a new use or accessory use, or change a use or accessory use for any site currently used as a mobile home or manufactured home park as identified on EXHIBIT A. Any such application submitted shall be rejected and returned to the applicant. Applications to replace in-kind, repair, maintain, or otherwise improve an existing mobile home or manufactured home within the parks identified on EXHIBIT A, or any other applications necessary for public health and safety as determined by the Planning and Community Development Director shall not be impacted by this moratorium and shall be allowed to proceed through the standard application and review process.

Applications to locate individual new designated manufactured homes as provided in Bellingham Municipal Code 20.10.030 on lands not designated as mobile home or manufactured home parks as identified on EXHIBIT A shall not be subject to this moratorium.

Section 5. Duration of Moratorium. This moratorium shall be extended and in effect for an additional six (6) months, beginning on December 2, 2021 and ending on June 2, 2022, unless final regulations and codes governing the preservation of existing mobile home or manufactured home parks have been adopted by the City Council before June 2, 2022. This moratorium may be extended as provided by state statute.

Section 6. Public Hearing Required. As required by RCW 36.70A.390, within sixty (60) days of passage of this ordinance, the City Council will hold a public hearing on this moratorium.

Section 7. Work Plan. During the moratorium period, City staff will study the issues concerning the loss of affordable housing options through redevelopment of existing manufactured home parks. Staff will, if necessary, prepare appropriate revisions to the City's codes and regulations and conduct the public review process as required for amendments to the Bellingham Municipal Code as shown in the Proposed Work Plan attached as EXHIBIT B.

Section 8. Effective Date. This ordinance shall take effect and be in full force and effect beginning on December 2, 2021 as set forth herein.

Section 9. Conflict with other BMC Provisions. If the provisions of this ordinance are found to be inconsistent with other provisions of the Bellingham Municipal Code, this ordinance shall control.

Section 10. Severability. If any section, sentence, clause or phrase of this ordinance should be held to be unconstitutional or unlawful by a court of competent jurisdiction, such invalidity or unconstitutionality shall not affect the validity or constitutionality of any other section, sentence, clause or phrase of this ordinance.

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

PASSED by the Council this _____ day of _____, 2021.

_____
Council President

APPROVED by me this _____ day of _____, 2021.

_____
Mayor

ATTEST:_____
Finance Director

APPROVED AS TO FORM:

_____
Office of the City Attorney

Published:

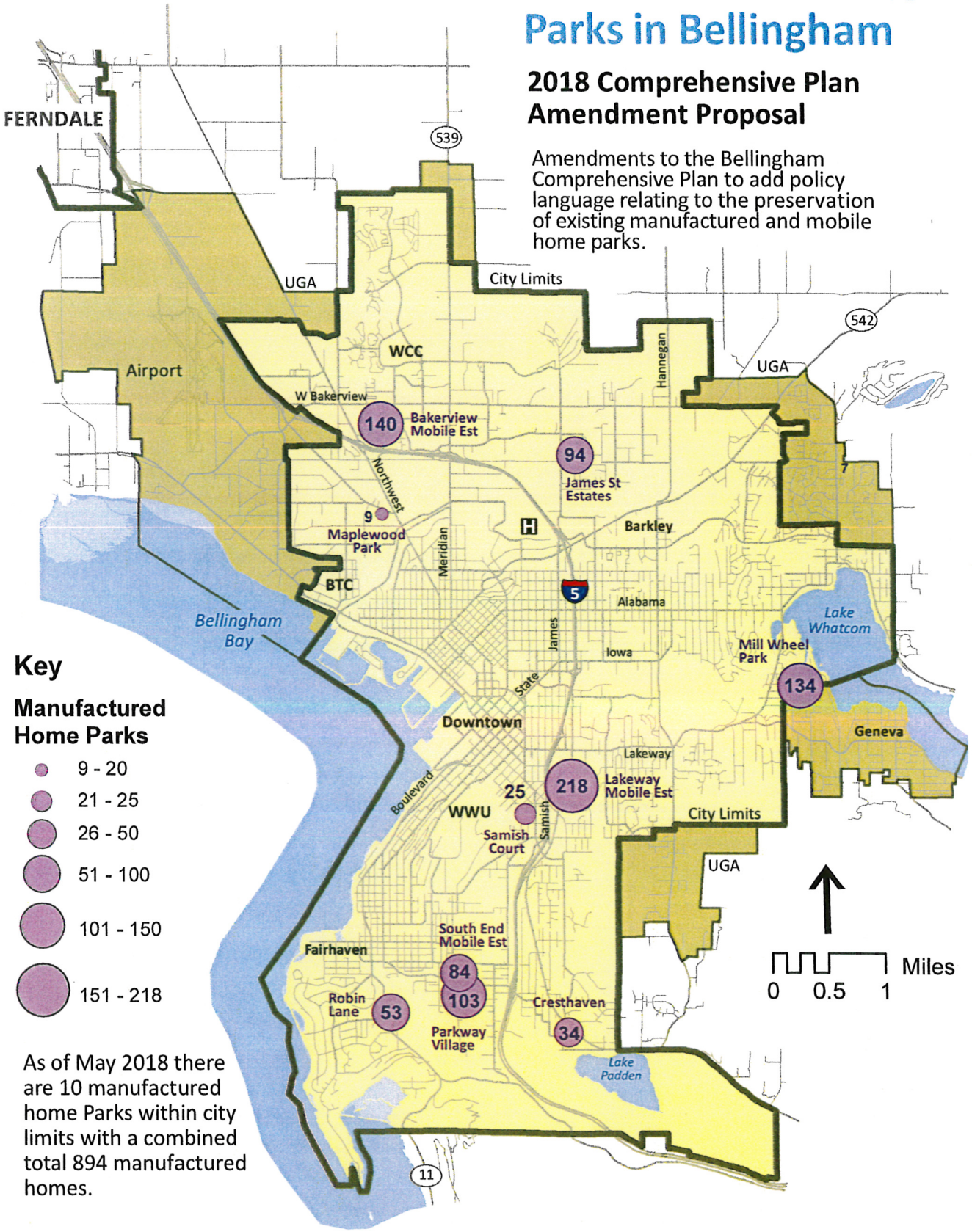
_____

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

Manufactured Home Parks in Bellingham

2018 Comprehensive Plan Amendment Proposal

Amendments to the Bellingham Comprehensive Plan to add policy language relating to the preservation of existing manufactured and mobile home parks.



Key

Manufactured Home Parks

- 9 - 20
- 21 - 25
- 26 - 50
- 51 - 100
- 101 - 150
- 151 - 218

As of May 2018 there are 10 manufactured home Parks within city limits with a combined total 894 manufactured homes.

BELLINGHAM CITY COUNCIL
210 Lottie Street, Bellingham, Washington 98225
Telephone (360) 778-8200 Fax (360)778-8101
Email: ccmail@cob.org Website: www.cob.org

BELLINGHAM CITY COUNCIL
NOTICE OF PUBLIC HEARING

Notice is hereby given that the Bellingham City Council will hold a Public Hearing on **December 13, 2021 at 7:00 PM** or as soon thereafter as possible during their Regular City Council meeting, which will take place remotely, to take public comment on the following:

Consideration of the recent extension of the moratorium prohibiting redevelopment of manufactured home parks in Bellingham.

Detailed information can be found at: meetings.cob.org five days prior to the public hearing.

Staff Contact: Gregory Aucutt, Assistant Director of Planning & Community Development
gaucutt@cob.org, 360-778-8344

Anyone wishing to comment on this item is invited to do so. Advanced testimony is encouraged and can be presented to the Council online (https://cob.org/ccsignup), by telephone (360-778-8200), or by mail (210 Lottie Street, Bellingham, WA 98225). Comment received prior to 10:00 AM on December 08 2021, will be included in the agenda packet. Comment received after that will be distributed to Council but not included in the published packet. Anyone wishing to testify live during the public hearing can do so by registering at the following link: https://cob.org/ccsignup. Pre-registration is encouraged. Anyone wishing to join the public hearing on December 13, 2021 may do so via the following link: https://cob.org/cczoom.

Those who would like to listen in by phone can do so using any of the following phone numbers:

- (253) 215-8782
- (346) 248-7799
- (669) 900-6833
- (301) 715-8592
- (312) 626-6799
- (929) 205-6099

Meeting ID: **941 9601 5179**

Password: **9**

Publication date: **December 03, 2021**

HANNAH STONE Council Member 1st Ward 778-8211 hetsone@cob.org
GENE KNUTSON Council Member 2nd Ward 734-4686 gknutson@cob.org
DANIEL HAMMILL Council Member 3rd Ward 778-8213 dchammill@cob.org
PINKY VARGAS Council Member 4th Ward 778-8210 ptvargas@cob.org
LISA ANDERSON Council Member 5th Ward 778-8217 laanderson@cob.org
MICHAEL LILLIQUIST Council Member 6th Ward 778-8212 mlilliquist@cob.org
HOLLIE HUTHMAN Council Member At Large 778-8216 hahuthman@cob.org

City Council Agenda Bill

23193

Bill Number

Subject: **Public Hearing to Consider Amendments to BMC Chapter 17.10 and the Washington State Energy Code - Commercial, Requiring Electrification and Efficiency Standards for Certain Multi-Family and Commercial Buildings**

Summary Statement: In 2020 the Bellingham City Council adopted Resolution 2020-45 amending the 2018 Climate Action Plan by adding 10 new measures, including one entitled “Electrify New Buildings." The proposal includes amendments to BMC 17.10 - Building Codes, modifying the recently adopted 2018 state energy code to require electrification of space and water heating, incremental improvements in energy efficiency, and solar installation or readiness measures in certain multi-family and commercial buildings.

Previous Council Action: **Adoption of Resolution 2020-45 Regarding the Climate Action Plan**

Fiscal Impact: **Staff time to develop the amendments was included in the City's 2021-2022 Budget**

Funding Source: **Citywide Funds**

Attachments:
1. STAFF MEMO
2. DRAFT ORDINANCE
3. EXHIBIT A - BELLINGHAM ENERGY CODE
4. PUBLIC COMMENT
5. COUNCIL PUBLIC COMMENT
6. PRESENTATION
7. PUBLIC HEARING NOTICE

Meeting Activity	Meeting Date	Recommendation	Presented By	Time
Public Hearing - Direction Requested	12/13/2021	Provide Direction	Kurt Nabbefeld, PCDD	20 minutes

Recommended Motion:

Council Committee:

Agenda Bill Contact:
Kurt Nabbefeld, Planning and Community Development, 360-778-8300

Reviewed By	Department	Date
Gregory R. Aucutt	Planning & Community Development	12/08/2021
Alan A. Marriner	Legal	12/08/2021
Seth M. Fleetwood	Executive	12/08/2021

Council Action:

City of Bellingham
210 Lottie Street
Bellingham, WA 98225

STAFF MEMO

TO:	**BELLINGHAM CITY COUNCIL**
FROM:	KURT NABBEFELD, DEVELOPMENT SERVICES MANAGER, SEAN ANGELEY, BUILDING OFFICIAL
CC:	MAYOR SETH FLEETWOOD; ERIC JOHNSTON, PUBLIC WORKS DIRECTOR; RENEE LACROIX, ASSIST. PUBLIC WORKS DIRECTOR, NATURAL RESOURCES; SETH VIDAÑA, CLIMATE AND ENERGY MANAGER
SUBJECT:	INTRODUCTION TO NEW BUILDING ELECTRIFICATION, EFFICIENCY, AND SOLAR REQUIREMENTS
DATE:	December 13, 2021

New Building Electrification, Efficiency, and Solar Requirements

I. Summary

In 2020 the Bellingham City Council adopted Resolution 2020-45 amending the 2018 Climate Action Plan by adding 10 new measures, including one entitled "Electrify New Buildings." That measure allows for development of policy and regulations requiring the electrification of all new buildings built in Bellingham. It should be noted that Washington State law only allows local jurisdictions the ability to modify IBC code (commercial and larger multifamily) and not IRC codes (single-family). City staff have been researching options to require electric space and water heating for new commercial and large (4+ stories) multi-family buildings (IBC regulated).

The proposal modifies the recently adopted 2018 state energy code to require electrification of space and water heating, incremental improvements in energy efficiency, and solar installation or readiness measures in new buildings. These proposed changes are modeled on codes adopted by Seattle in February 2021 and in Shoreline in December 2021, and currently under consideration for adoption in King County.[1] These changes build on substantial progress on electrification achieved by California, where around 50 jurisdictions have adopted legislation either banning or discouraging gas in new construction.[2] The proposal described below would apply to new commercial and medium and high-rise residential construction but not low rise residential (single-family), with the exception of relatively minimal solar-ready requirements described below.

The three elements in this proposal for new buildings are:

- No gas space heating, and no gas water heating (in buildings with central water heating)
- Increased efficiency measures – such as better building envelopes, lighting, and insulation
- Solar readiness and/or solar installation requirements

The three elements of the proposal work together to create synergies not available from the achievement of one of these alone. These positive impacts are discussed below. The City is committed to an equitable transition to new patterns of energy use, and these proposed changes will have positive health, resilience, and economic benefits. There will also be some negative impacts such as increased construction costs and impacts on the construction workforce. Concerns and mitigations are discussed in Section IV.

II. Context and rationale

Electrification of new buildings. These proposed code changes would shift space and water heating in new commercial and multifamily buildings from gas to electricity, helping to curtail further growth of fossil fuel use as the building stock expands or is replaced. In Bellingham's last greenhouse gas inventory in 2015, commercial and residential buildings accounted for 23% and 20%, respectively of all CO2e in Bellingham community emissions, and commercial and residential gas use is responsible for 26% of all building emissions.[3] While new buildings built in any particular year are not a large proportion of the carbon problem, with projected decarbonization of the electric grid, carbon from fossil fuel combustion in buildings will account for an expanding portion of emissions over time. Absent changes in the energy mix of new buildings, the approximately 45 million square feet of new floor area to be constructed in Bellingham between now and 2035 would account for 17.5% of total building sector emissions by that year.[4] Because space and water heating account for approximately 90% of gas use in buildings, the proposal outlined here would target the vast majority of new building gas emissions in the affected sectors.

Electrification leads to expanding benefits over time. Under the decarbonization requirements of the state's 2019 Clean Energy Transformation Act (CETA), the electricity grid is required to be carbon neutral by 2030, and 100% generated by renewables or non-carbon-generating sources by 2045.[5] As the electric grid gets cleaner, each building that has been electrified will produce less carbon.

While direct combustion of gas in buildings creates lower greenhouse gas impacts than consumption of coal fired electricity, a full life-cycle analysis of the impact of gas needs to take into account fugitive emissions from the production and distribution of gas. Natural gas is mostly composed of methane.[6] Methane is a potent greenhouse gas source, with short term impacts (20-year time horizon) substantially higher than carbon dioxide. Estimates have increased lately regarding the impact of what are called "fugitive emissions," with studies indicating that leaks in the gas distribution system account for from 20-40% of all domestic methane emissions.[7] Given this large secondary impact, it is critically important to remove gas from buildings to achieve long-term carbon reduction goals.

Efficiency and Renewables. Washington state has set a target for its building energy codes to achieve, by 2031, 70% less energy use compared to what would have been allowed by the 2006 codes.[8] By

requiring incremental improvements in energy efficiency over what is required in the 2018 code, this proposal accelerates the local achievement of these efficiency targets. The proposal also encourages investments in renewables by implementing very low-cost solar readiness regulations and requiring a small amount of direct investment in solar in new commercial multifamily buildings, with exemptions for low-income housing and buildings with limited solar potential.[9]

Coupling electrification with efficiency and renewable energy requirements will help hold down the growth of demand for new grid electricity resulting from electrification of buildings. As an example of the power of efficiency, Seattle City Light has greatly expanded the number of buildings it serves across growing residential and business sectors while simultaneously reducing the total amount of electricity required, and total electricity use is projected to decline from around 9,300 gigawatt hours in the 2016 period to a projected 8,900 gigawatt hours by 2024.[10] While electrification will push up overall grid demand compared to existing use patterns, coupling electrification with efficiency and renewable measures will reduce the growth in demand for new utility sources of power.

Other benefits of the proposal. This proposal has numerous other benefits. Reducing carbon production during new construction is substantially less expensive and disruptive than removing carbon sources from existing buildings, helping to reduce the overall cost of building decarbonization. In addition, packaging electrification with measures to encourage efficiency upgrades and renewable energy will result in long-term operational cost reductions via lower utility bills.

Basing our local codes on models already pioneered by King County jurisdictions catalyzes regional innovation, and Seattle and King County staff are providing education and technical assistance to other Puget Sound jurisdictions as requested. This accelerates the learning curve among regional public staff. The synchronization of standards also means that builders and designers can take advantage of peer learning opportunities offered throughout the Puget Sound corridor.

Electrification also provides health benefits. There are growing concerns over the health impacts of methane gas combustion, especially respiratory issues and asthma. In 2018, 558,951 adults in Washington had current asthma -- 9.6 percent of the population[11] -- and asthma is much more common in low-income communities and among people of color. Direct combustion of gas in buildings is an environmental trigger for health problems, including respiratory issues.[12] This can compound other environmental hazards faced by low-income or communities of color, such as lead exposure, high concentrations of particulate matter, and exposure to urban heat islands. Additional health and comfort advantages arise with electric heat pumps, which can be operated in reverse, providing summer cooling during heat waves without additional equipment.

Note that these new requirements raise some issues that will have to be mitigated, including cost concerns and labor and equipment supply issues. These concerns are discussed in Section IV. below.

III. Summary of Major Proposed Changes

Overview of the proposal. The proposed code changes impact both commercial and larger (4+ stories) multifamily buildings governed by the state energy code for commercial buildings. This proposal builds on changes already being implemented in the 2018 energy code, as adopted by the city council in 2021, and requires additional incremental improvements in efficiency, solar readiness or investment, and electrification of space and water heating. These measures do not impact low rise residential (detached

houses, duplexes, townhomes or row houses), with one exception: a requirement for solar ready roofs in cases where solar is practical. This is included through the proposed adoption of an optional solar appendix for low rise residential included in the 2018 state building code.

These code provisions will result in the following three improvements:

- Buildings with better building envelopes and that use less energy per square foot
- Buildings that use less gas
- Increased renewable energy via solar readiness rules and/or solar arrays

The main elements of the proposal are:

Electrification:

- **Space heating.** No gas space heating is allowed. Extensive use of lower-efficiency electric resistance heating is discouraged. Exceptions are made for minimal in-room residential resistance heating that is feasible with high-efficiency building envelopes (allowance for 750 Watts per habitable room, and 1000 Watts for a corner room).
- **Water heating.** Heat pump hot water heaters are required for central water heating in multifamily and hotel use.
- **Electrical outlets for any gas appliances.** If gas appliances such as gas cook stoves are installed, electrical outlets need to be installed nearby to allow for later conversion to electric.

Efficiency:

- **Efficient equipment.** Lighting and windows must use approximately 10% less energy than existing code. Some buildings (e.g. health care) are exempted from the lighting rules.
- **Energy efficiency credits.** Buildings must achieve 8 energy efficiency credits rather than the 6 points currently required by the 2018 Washington state energy code. Gas appliances would not qualify for credits.
- **Energy modeling.** Energy modeling must result in 10% lower energy use than a building conforming to state prescriptive energy code requirements.
- **Building envelope.** If using energy modeling, the envelope component cannot allow more than 10% loss compared to the prescriptive energy code (state allows 20%).
- **Improved thermal control.** Increased insulation and reduction of thermal bridging is required at openings in the building envelope, and in balconies.
- **Window coverage.** Total area cannot exceed 35%.
- **Air recovery.** 10 percentage points improvements over state code in air-to-air energy recovery for indoor/outdoor ventilation

Solar:

- **Solar ready.** Commercial buildings are currently required by state code to meet *solar ready* requirements. This proposal requires both low-rise and larger residential buildings to also be solar-ready. This entails attention to placement of items such as vents and other equipment that could obstruct solar panels. For multifamily buildings less than 20 stories, 40% of the roof area, or an area adequate to generate 20% of building electrical energy use, must be available for solar panels. For low-rise residential buildings (single family detached and duplexes) 300 square

feet of solar ready area is required. Exemptions are available for buildings where solar production would be hampered by shade.

- **Installed solar requirements.** A small amount of *installed solar* capacity (one quarter of a watt per square foot of indoor space based on area of all floors) is required for larger multifamily and commercial buildings. Building additions greater than 5000 square feet must also meet this requirement. Building owners may donate the solar to an affordable housing project in lieu of installing panels on a particular building. This requirement does not apply to low rise residential construction or to new affordable housing construction.

Some of the above requirements also apply to existing buildings if they are undergoing substantial renovations, additions, or equipment replacement. For example, replacing an exterior wall of a building or installing a replacement water heating system would require conformity to the new codes. Additional metering of HVAC systems is also required for existing buildings when new equipment is installed.

IV. Costs and Other Issues

While there are many benefits of this proposal, some issues also arise, including up-front costs, possible bottlenecks in equipment availability, installation complexities, and shortages of skilled labor necessary to ensure that equipment and construction techniques are deployed properly. These issues are described below.

Costs. Some of these required changes can be made with minimal additional investment. Others will result in cost increases. Higher construction costs will be offset by lower long-term operating costs in most instances. For rental properties, some of this operating cost reduction accrues to the tenant and not to the building owner, although better performing buildings may be easier to rent, thus reducing turnover and vacancy rates. As local understanding of the changes increases, and the availability of required equipment increases, cost differentials are likely to dissipate.

The following table highlights some of the cost implications, along with an estimated cost or range of costs. Note that these are incremental costs for the new codes in this proposal only. Costs vary according to design and equipment choices. For example, when residential units are built with efficient envelopes, less expensive forms of electric resistance heat can be used. With condominium or high-end apartment units, builders may choose to use heat pumps throughout to provide for summer cooling. Additional costs for heat pumps deployed in this manner are not reflected in the cost table below.

Analyses by Seattle and King County indicate that total increases in construction costs fall into the range of from less than one percent of total costs, to around 2.5% of total costs. (Note that installed solar costs do not apply to affordable housing). Although construction costs between Bellingham and the King County area are now relatively similar, City of Bellingham staff continue to verify that these cost estimates apply locally.

Code Proposals: Multifamily Housing Cost Impact Estimates		
Measure	**Range of costs per unit**	**Notes**
■ **Efficiency**		
10% more efficient lighting and windows	$100 to $500	Cost varies according to number of windows.
10% more efficient if use Building Performance Path	$0	
Elimination of Substandard Envelope	$0	
Reduced thermal bridging	$0 to $1000	Depends on design choice e.g. presence of cantilevered decks
Require 8 instead of 6 energy credits	$0	
■ **Electrification**		
Electrical outlets for gas appliances	$0 to $750	Varies depending on # of appliances. $250 per appliance.
No fossil fuel space heating	$0 to $1000	Efficient envelope will allow use of low-cost resistance heating; $1000 assumes units require triple-pane windows.
Heat pump water heating	$900 to $1,900	Depends on technology chosen
■ **Solar**		
Multifamily solar readiness	$0	Requires minimal additional attention during design
Installed solar (affordable housing exempted)	$0 to $650	Highest cost assumes 100 unit building. Cost after tax credits.
■ **TOTAL - RANGE**	$1000 to $5,800	
Source: Cost estimates provided by King County with the exception of space heating estimate provided by the City of Seattle.		

It is acknowledged that these changes will include cost increases in construction that will likely affect affordability, which remains a major concern for Bellingham residents. Housing prices are a local, region and nationwide concern, however our continued reliance on fossil fuels brings global consequences.

Employment Issues and Training. This proposal is likely to be a net positive for employment. However, there is likely to be increased demand for some occupations along with reduced demand for workers specializing in natural gas infrastructure. More workers will be needed who have skills in heat pump technology, energy efficiency services, and solar installations. Note that this will be an incremental extension of trends already occurring in the building industry, since heat pumps are becoming more commonplace, and efficiency and solar requirements are strengthened with each successive iteration of the Washington state energy codes.

Work could decline for pipefitters specializing in the extension of natural gas lines. Pipefitters could lose work in buildings that go all-electric. For buildings with some gas appliances such as gas stoves, gas piping would be reduced but not eliminated. Pipefitters could *gain* some work doing connections of refrigerant lines between different components of split heat pump systems. Plumbers would gain some work, as heat pump water heating involves additional plumbing connections. Electricians could also gain work in providing connections to the heat pump equipment.

Shortages of workers, particular for those with specialized skills, is currently a major issue in the construction industry. There could be local benefit from increased attention to both training of new workers and retraining of those who may want to move into expanding occupations. This could entail working with local educational institutions, local branches of state agencies (e.g. WorkSource), the Opportunity Council's Building Performance Center, trade associations, contractors, and unions to develop short and longer-term plans to accelerate local workforce development. This could help build a workforce for growing occupations and help retrain and redeploy those who might otherwise be idled by changes in occupational demand. The new federal infrastructure bill (HR 3684) will make funds available to enhance local training systems, and effort should be expended to see if these dollars can be accessed by Whatcom County institutions.

The City will need to work with designers and contractors to ensure that the necessary knowledge to implement these codes is acquired. Training will also be needed by City Permit Center staff. Successful efforts regarding business and labor will result in a trained workforce and more knowledgeable contractors and designers, raising the general level of local expertise and helping to sustain local job and business growth.

Other construction and operational issues. As with any changes to required equipment and building techniques, issues may arise that require adaptation. For example, installing heat pumps for space heating requires attention to placement of equipment and required piping. This will require different approaches during the design phase from those associated with gas heat. This process of adaptation is already underway given that more buildings are being built with heat pump technology. Once buildings are completed, new technologies may require different expertise to operate. A learning curve is expected, but as designers, builders, and building operators become more familiar with the requirements, design or operational difficulties and any associated additional costs will be reduced and in some cases eliminated.

V. Public Process and Consistency with Adopted Policy and Plans

Outreach and Communication. City staff have been meeting regularly with members of the Building Industry Association of Whatcom County to get feedback regarding these proposed code changes. Staff are also briefing other interested parties, including advocacy groups working on climate changes issues. Staff have also met with representatives of labor unions to discuss workforce impacts. These consultations extend public participation conducted earlier in the development of the City's Climate Action Plan, and during the deliberations of the Climate Action Task Force. Engage Bellingham is also being used as a platform to solicit additional input.

After the December Council meeting and the public hearing, staff will take testimony and feedback into account and make changes that may be warranted. City Council work sessions will be scheduled to review proposed changes responding to issues that are identified as well as provide additional technical information on the proposed amendments if needed.

Applicable Policies and Plans. The proposal is a direct response to work and recommendations produced by the Climate Action Task Force and consistent with the 2018 Climate Protection Action Plan as well as the City's Legacies and Strategic Commitments. The draft changes implement Goal EV-8 of the Bellingham Comprehensive Plan by reducing contributions to climate change as well as Policies EV-42,

45, 46 and 47 by reducing greenhouse gases, promoting energy efficiencies in buildings and encouraging renewable energy resources such as solar. It should also be noted that many of the efficiency requirements proposed are currently being discussed by State Building Code Council technical advisory groups for inclusion into the 2021 State Building Code.

VI. Recommendation

Staff believe that these changes are necessary to implement our climate and comprehensive plans and for the city to be a leader in building efficiency and reducing our reliance on fossil fuels. The changes allow us to decrease the climate impact that new buildings have while also reducing health impacts related to greenhouse gases and the combustion of gases within buildings. Staff propose that the new regulations go into effect six months after final passage to allow the industry to become more familiar with the requirements and to provide time for training. Staff recommends that the City Council adopt the code as drafted or provide direction on areas that should be further analyzed.

Notes

[1] City of Seattle, Office of the City Clerk, "An Ordinance relating to Seattle's construction codes…" http://seattle.legistar.com/LegislationDetail.aspx?ID=4763161&GUID=A4B94487-56DE-4EBD-9BBA-C332F6E0EE5D; King County, " Building Cleaner: Executive Constantine unveils stronger building codes for unincorporated King County to reduce greenhouse gas emissions and improve indoor air quality for all residents," News release, September 22, 2021, https://kingcounty.gov/elected/executive/constantine/news/release/2021/September/22-building-codes-to-reduce-greenhouse-gas-emissions.aspx*; Shoreline Area News*, Notes from Shoreline council meeting August 16, 2021, https://www.shorelineareanews.com/2021/08/notes-from-shoreline-council-meeting_20.html; City of Shoreline staff, Dec. 6, 2021.

[2] Tom DiChristopher, "Gas Ban Monitor: Building electrification evolves as 19 states prohibit bans," *S&P Global Market Intelligence*, July 20, 2021, https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/gas-ban-monitor-building-electrification-evolves-as-19-states-prohibit-bans-65518738

[3] City of Bellingham, Climate Protection Action Plan, 2018 update, https://cob.org/wp-content/uploads/Climate-Protection-Action-Plan-2018-Update.pdf

[4] Bellingham Climate Action Task Force, "Climate Action Task Force Final Report," December 2, 2019, https://cob.org/wp-content/uploads/Climate-Task-Force-FINAL-Report-12_2_19.pdf.

[5] Washington State Department of Commerce, "Clean Energy Transformation Act (CETA)," Clean Energy Transformation Act (CETA) - Washington State Department of Commerce

[6] By Karine Lacroix, Matthew Goldberg, Abel Gustafson, Seth Rosenthal and Anthony Leiserowitz, "Should it be called "natural gas" or "methane"?, Yale Program on Climate Change Communication, December 1, 2020, https://climatecommunication.yale.edu/publications/should-it-be-called-natural-gas-or-methane/

[7] David Kirchgessner, Robert Lott, Michal Cowgill, Matthew Harrison, and Theresa Shires, "Estimate of Methane Emissions from the U.S. Natural Gas Industry," https://www.epa.gov/sites/production/files/2020-11/documents/methane.pdf; Ramon Alvarez, Daniel Zavala-Araiza, et. al. "Assessment of methane emissions from the U.S. oil and gas supply chain," *Science*, July 13, 2018, https://science.sciencemag.org/content/361/6398/186.

[8] See RCW 19.27A.160, https://app.leg.wa.gov/rcw/default.aspx?cite=19.27A.160. For the entire section of the code, see Chapter 19.27A RCW, https://app.leg.wa.gov/rcw/default.aspx?cite=19.27A

[9] There are already solar requirements for commercial in the 2018 energy code.

[10] Seattle City Light, "We Power Seattle," Strategic Plan 2019-2024, https://www.seattle.gov/documents/Departments/CityLightReviewPanel/Documents/2019-2024%20City%20Light%20Strategic%20Plan(0).pdf

[11] U.S. Centers for Disease Control and Prevention, "Most recent State or Territory Asthma Data, 2018, https://www.cdc.gov/asthma/most_recent_data_states.htm

[12] Dr. Yifang Zhu, Rachel Connolly Dr. Yan Lin, Timothy Mathews, Zemin Wang, "Effects of Residential Gas Appliances on Indoor and Outdoor Air Quality and Public Health in California," UCLA Fielding School of Public Health, April 2020, https://ucla.app.box.com/s/xyzt8jc1ixnetiv0269qe704wu0ihif7.

ORDINANCE NO. _____

AN ORDINANCE OF THE CITY OF BELLINGHAM AMENDING BELLINGHAM MUNICIPAL CODE CHAPTER 17.10 - BUILDING CODES, TO PROVIDE AMENDMENTS TO THE WASHINGTON STATE ENERGY CODE – COMMERCIAL, PROMOTING ENERGY EFFICENCY AND THE DECARBONZATION OF COMMERCIAL AND LARGE MULTIFAMILY BUILDINGS AND REQUIRING SOLAR READINESS FOR NEW BUILDINGS.

WHEREAS, climate change, if unchecked, will have ever increasing impacts on human health, natural systems, wildlife, and infrastructure, creating mounting costs for individuals, communities, businesses, and governments; and

WHEREAS, the scientific consensus as documented by the Intergovernmental Panel on Climate Change (IPCC) demands we limit global temperature increases below 1.5 degrees Celsius to avoid the most destructive and dangerous effects of climate change; and

WHEREAS, the Washington State Department of Ecology has reported that, "human caused climate change poses an immediate and urgent threat"; and

WHEREAS, economists have concluded that Washington's families and businesses are likely to incur billions of dollars of annual economic costs if communities fail to drive reductions in greenhouse gas pollution. These economic impacts include increased energy costs, coastal and storm damage, reduced food production, increased wildland fire, and increased public health costs; and

WHEREAS, the City of Bellingham has shown its commitment, declaring ambitious climate action goals commensurate with its obligations as a signatory of multiple climate agreements, including the We Are Still In Declaration, the City's Climate Protection Action Plan, the Compact of Mayors, 100% Clean Energy, and Local Governments for Sustainability (ICLEI) Cities for Climate Protection, the Race to Zero; and

WHEREAS, in 2007 the Bellingham City Council passed Resolution 2007-10 adopting greenhouse gas reduction targets and a Climate Protection Action Plan to achieve those targets; and

WHEREAS, the City's original 2007 Climate Protection Action Plan was updated in 2018 and adopted as policy by the Bellingham City Council under Resolution 2018-06; and

WHEREAS, the Mayor's signature on to the Race to Zero global campaign commits the City to work even faster on our climate initiatives to reach carbon pollution reduction targets of 59% by 2030 and a 100% by 2050 against a baseline in the year 2000; and

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

WHEREAS, staff have conducted analysis of all Climate Action Task Force recommendations, developed a process for assessing which of the recommended polices to advance for further consideration, and undertaken additional research on the feasibility of ten measures for inclusion in the 2018 Climate Protection Action Plan as policy of the City of Bellingham; and

WHEREAS, these measures include development of an implementation plan for the electrification of all new buildings built in Bellingham; and

WHEREAS, nationally, buildings account for 40% of US energy use and greenhouse gas pollution; and

WHEREAS, residential and commercial buildings are responsible for 43% of all emissions in Bellingham per a 2015 Greenhouse Gas Inventory; and

WHEREAS, natural gas combustion in residential and commercial buildings is responsible for 26% of all building-based carbon pollution in Bellingham per a 2015 Greenhouse Gas Inventory: and

WHEREAS, requiring that new buildings be built all electric where feasible will reduce the need to convert future buildings to all electric; and

WHEREAS, every new building that is built with natural gas technology represents both a city-sectioned long term carbon pollution source as well as a potential financial risk to the City and building owners; and

WHEREAS, Washington's Clean Energy Transformation Act (CETA) requires utilities to make an 80% reduction in the carbon pollution content of grid electricity and electrification allows buildings to make use of this power source; and

WHEREAS, CETA does not cover carbon pollution from natural gas and renewable natural gas is in very short supply, and offsets come with many questions as to their efficacy; and

WHEREAS, municipalities in the State of Washington cannot amend single-family residential energy or building codes; and

WHEREAS, adoption of local building codes which advance carbon pollution reductions beyond those attained by through current state codes encourages the state the adopt advanced codes for all buildings in Washington State; and

WHEREAS, several US cities have passed legislation or have created incentives to achieve all electric buildings including more than three dozen local governments in California; and

WHEREAS, the cities of Seattle and Shoreline Washington have adopted building codes associated with building electrification, efficiency, and solar readiness, and King County and other Washington cities are considering similar ordinances; and

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

WHEREAS, the City Council held a public hearing on December 13, 2021 and took public testimony on proposed amendments and conducted work sessions on January XXX and XXX; and

WHEREAS, the City Council finds that the adoption of building electrification, energy efficient and solar readiness regulations will implement various goals and policies of the Climate Protection Action Plan and the Bellingham Comprehensive Plan.

NOW THEREFORE, THE CITY OF BELLINGHAM DOES ORDAIN:

Section 1. Bellingham Municipal Code Section 17.10.010 A. is hereby amended as follows:

A. Except as amended by this chapter, the following codes, published by the International Code Council, as now and hereafter amended by the state of Washington, are hereby adopted by reference:

1. 2018 International Building Code – Chapter 51-50 WAC;
2. 2018 International Residential Code – Chapter 51-51 WAC;
3. 2018 International Mechanical Code – Chapter 51-52 WAC;
4. 2018 International Fuel Gas Code – Chapter 51-52 WAC;
5. 2018 International Property Maintenance Code;
6. 2018 International Existing Building Code – Chapter 51-50 WAC;
7. 2018 International Energy Conservation Code – Chapters ~~51-11C and~~ 51-11R WAC;
8. 2009 ICC/ANSI A117.1 Accessibility Code; and
9. 2018 International Swimming Pool and Spa Code – Chapter 51-51 WAC.

Section 2. Bellingham Municipal Code Section 17.10.015 is hereby created as follows and as attached in Exhibit A:

17.10.015 – Bellingham Commercial Energy Code

Section 3. SECTION 118 of Bellingham Municipal Code 17.10.020, is hereby amended as follows:

SECTION 118: INTERNATIONAL RESIDENTIAL CODE TECHNICAL AMENDMENTS

The 2018 Edition of the International Residential Code, as adopted by BMC 17.10.010 is amended as follows:

[1-6 NO CHANGE]

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

7. Appendix T – "Solar-ready provisions-detached one- and two-family dwellings, multiple single-family dwellings (townhouses)" is adopted.

Section 4. City administration and the codifiers of this ordinance are authorized to make necessary clerical corrections including, but not limited to, the correction of scrivener's/clerical errors, references, ordinance numbering, section/subsection numbers and any reference thereto.

Section 5. The effective date on this ordinance shall be XXXXX (six (6) months from passage by the City Council).

PASSED by the Council this _____ day of _____, 2021

_____
Council President

APPROVED by me this _____ day of _____, 2021

_____
Mayor

ATTEST: _____
Finance Director

APPROVED AS TO FORM:

_____
Office of the City Attorney

Published: _____

DRAFT

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

CHAPTER 1 [CE]

SCOPE AND ADMINISTRATION

SECTION C101

SCOPE AND GENERAL REQUIREMENTS

C101.1 Title. This code, consisting of Chapter 1 [CE] through Chapter ((~~5~~)) 6 [CE] and Appendices A through D, shall be known as the ((~~*Washington State Energy Code*~~)) "Bellingham Commercial 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 and the reduction of **carbon** emissions 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.

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

C101.5 Compliance. *Residential buildings* shall meet the provisions of WSEC Residential Provisions. *Commercial buildings* shall meet the provisions of ((~~WSEC~~)) the Bellingham Energy Code—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.

SECTION C102

ALTERNATIVE MATERIALS, DESIGN AND METHODS OF CONSTRUCTION AND EQUIPMENT

C102.1 General. The provisions of this code ((~~are not intended to~~)) do not prevent the installation of any material, or to prohibit any design or method of construction prohibited by this code or not specifically ((~~prescribed~~)) allowed by this code, provided that any such alternative 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. <

The *code official* may require that sufficient evidence or proof be submitted to reasonably substantiate any claims regarding the use or suitability of the alternate. The *code official* may, but is not required to, record the approval of modifications and any relevant information in the files of the building official or on the *approved* permit plans.

C102.2 Modifications. The *code official* may modify the requirements of this code for individual cases provided the *code official* finds: (1) there are practical difficulties involved in carrying out the provisions of this code; (2) the modification is in conformity with the intent and purpose of this code; (3) the modification will provide a reasonable level of fire protection and structural integrity when considered together with other safety features of the building or other relevant circumstances, and (4) the modification maintains or improves the energy efficiency of the building. The *code official* may, but is not required to, record the approval of modifications and any relevant information in the files of the *code official* or on the *approved* permit plans.

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 zone*s 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.~~))

C103.2.2 Document retention. One set of reviewed and *approved* 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 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 device.
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 set points 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 set points. 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, and 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 envelope insulation compliance path (prescriptive or component performance).
2. All required completed code compliance forms, and all required 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 ((C401.2)) Section C402.2, 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 shutdown and start-up procedures.
3. Training completion report.

SECTION C104

INSPECTIONS

C104.1 General. Construction or work for which a permit is required shall be subject to inspection by the *code official,* his or her designated agent, or an *approved* agency, in accordance with this section and the International Building Code, International Mechanical Code and NEC, and such construction or work shall remain 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 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,* 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 insulation. Inspections shall verify footing and/or foundation insulation *R*-value, location, thickness, depth of burial and protection of insulation as required by the code, *approved* plans and specifications.

C104.2.2 Thermal envelope. Inspections shall be made before application of interior finish and shall verify 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, *approved* plans and specifications, including envelope components in future tenant spaces of multi-tenant buildings.

C104.2.3 Plumbing system. Inspections shall verify 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 system. Inspections shall verify the installed HVAC equipment for the correct type and size, controls, duct and piping insulation *R*-values, *duct system* and damper air leakage, minimum fan efficiency, energy recovery and economizer as required by the code, *approved* plans and specifications.

C104.2.5 Electrical system. Inspections shall verify lighting system controls, components, 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 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.~~))

SECTION C105

VALIDITY

C105.1 General. If a portion of this code is held to be illegal or void, such a decision shall not affect the validity of the remainder of this code.

SECTION C106

REFERENCED STANDARDS

C106.1 Referenced codes and standards. The codes and standards referenced in this code shall be those listed in Chapter ((~~5~~)) 6, and such codes and standards shall be considered as part of the requirements of this code to the prescribed extent of each such reference and as further regulated in Sections C106.1.1 and C106.1.2.

C106.1.1 ((~~Conflicts~~)) References to other codes. ((~~Where differences occur between provisions of this code and referenced codes and standards, the provisions of this code shall apply.~~)) Whenever an International, National or Uniform Code is referenced in this code, it means the Bellingham adopted edition of that code, which includes local amendments.

C106.1.2 Provisions in referenced codes and standards. Where the extent of the reference to a referenced code or standard includes subject matter that is within the scope of this code, the provisions of this code, as applicable, shall take precedence over the provisions in the referenced code or standard.

C106.2 Application of references. References to chapter or section numbers, or to provisions not specifically identified by number, shall be construed to refer to such chapter, section or provision of this code.

C106.3 Other laws. The provisions of this code shall not be deemed to nullify any provisions of local, state or federal law. ((~~In addition to the requirements of this code, all occupancies shall conform to the provisions included in the State Building Code (chapter 19.27 RCW). In case of conflicts among the codes enumerated in RCW 19.27.031 (1) through (4) and this code, an earlier named code shall govern over those following.~~)) In the case of conflict between the duct sealing and insulation

requirements of this code and the ((~~duct insulation~~)) requirements of Sections 603 and 604 of the *International Mechanical Code*, the ((~~duct insulation~~)) requirements of this code ((~~, or where applicable, a local jurisdiction's energy code~~)) shall govern.

SECTION C107

FEES

C107.1 Fees. A permit shall not be issued until the fees prescribed in Section C107.2 have been paid, nor shall an amendment to a permit be released until the additional fee, if any, has been paid.

C107.2 Schedule of permit fees. A fee for each permit shall be paid as required, in accordance with the schedule as established by the applicable governing authority.

C107.3 Work commencing before permit issuance. Any person who commences any work before obtaining the necessary permits shall be subject to an additional fee established by the *code official*, which shall be in addition to the required permit fees.

C107.4 Related fees. The payment of the fee for the construction, *alteration*, removal or demolition of work done in connection to or concurrently with the work or activity authorized by a permit shall not relieve the applicant or holder of the permit from the payment of other fees that are prescribed by law.

C107.5 Refunds. The *code official* is authorized to establish a refund policy.

SECTION C108

STOP WORK ORDER

C108.1 Authority. Whenever the *code official* finds any work regulated by this code being performed in a manner either contrary to the provisions of this code or dangerous or unsafe, the *code official* is authorized to issue a stop work order.

C108.2 Issuance. The stop work order shall be in writing and shall be given to the owner of the property involved, the owner's authorized agent, or to the person doing the work. Upon issuance of a stop work order, the cited work shall immediately cease. The stop work order shall state the reason for the order, and the conditions under which the cited work will be permitted to resume.

C108.3 Emergencies. Where an emergency exists, the *code official* shall not be required to give a written notice prior to stopping the work.

C108.4 Failure to comply. Any person who shall continue any work after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be liable to a fine as set by the applicable governing authority.

SECTION C109

~~BOARD OF~~ APPEALS

C109.1 General. ~~In order to hear and decide appeals of orders, decisions or determinations made by the *code official* relative to the application and interpretation of this code, there shall be and is hereby created a board of appeals. The *code official* shall be an ex officio member of said board but shall have no vote on any matter before the board. The board of appeals shall be appointed by the governing body and shall hold office at its pleasure. The board shall adopt rules of procedure for conducting its business, and shall render all decisions and findings in writing to the appellant with a duplicate copy to the *code official*.~~)) Appeals of orders, decisions, or determinations made by the

building official relative to the application and interpretation of this code may be appealed to the City of Bellingham Hearing Examiner within 14 days of issuance of the order, decision, or determination.

C109.2 Limitations on authority. An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply or an equally good or better form of construction is proposed. The board shall have no authority to waive requirements of this code.

~~**C109.3 Qualifications.** The board of appeals shall consist of members who are qualified by experience and training and are not employees of the jurisdiction.~~))

SECTION C110

VIOLATIONS

It shall be unlawful for any person, firm, or corporation to erect or construct any building, or remodel or rehabilitate any existing building or structure in the state, or allow the same to be done, contrary to or in violation of any of the provisions of this code.

SECTION C111

LIABILITY

Nothing contained in this code is intended to be nor shall be construed to create or form the basis for any liability on the part of any city or county or its officers, employees or agents for any injury or damage resulting from the failure of a building to conform to the provisions of this code.

CHAPTER 2 [CE]

DEFINITIONS

SECTION C201

GENERAL

C201.1 Scope. Unless stated otherwise, the following words and terms in this code shall have the meanings indicated in this chapter.

C201.2 Interchangeability. Words used in the present tense include the future; words in the masculine gender include the feminine and neuter; the singular number includes the plural and the plural includes the singular.

C201.3 Terms defined in other codes. Terms that are not defined in this code but are defined in the *International Building Code*, *International Fire Code*, *International Fuel Gas Code*, *International Mechanical Code*, *Uniform Plumbing Code* or the *International Residential Code* shall have the meanings ascribed to them in those codes.

C201.4 Terms not defined. Terms not defined by this chapter shall have ordinarily accepted meanings such as the context implies.

SECTION C202

GENERAL DEFINITIONS

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.

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.

AFFORDABLE HOUSING. Affordable housing for the purposes of this code shall include buildings which; a) receive or have received public funding or an allocation of federal low-income housing tax credits; and b) are subject to a regulatory agreement, covenant, or other legal instrument recorded on the property title, and enforceable by the City of Bellingham, Washington State Housing Finance Commission, State of Washington, Whatcom County, U.S. Department of Housing and Urban Development, or other similar entity as *approved* by the Bellingham Planning Director, that either:

1) Restricts at least 40 percent of the units to occupancy by households earning no greater than 60 percent of median income, and controls the rents that may be charged, for a minimum period of 40 years; or

2) Restricts initial and subsequent sales of at least 40 percent of the residential units to households with incomes no greater than 80 percent of median income, for a minimum period of 50 years. The sale price for sales subsequent to the initial sale shall be calculated

to allow modest growth in homeowner equity while maintaining long-term affordability for future buyers.

AIR BARRIER. 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*. 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.

APPROVED. Acceptable to the *code official*.

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

ATTIC AND OTHER ROOFS. ((~~All other roofs~~)) Roofs other than roofs with insulation entirely above deck and metal building 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 example, a change in current strength, pressure, temperature or mechanical configuration (see "Manual").

AUTOMATIC CONTROL DEVICE. A device capable of automatically turning loads off and on without manual intervention.

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 building systems have been installed, and function according to the *approved* construction documents.

BUILDING ENTRANCE. Any doorway, set of doors, revolving door, vestibule, or other form of portal (including elevator doors such as in parking garages) that is ordinarily used to gain access to the building 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. Where buildings have separate one-way doors to enter and leave, this also includes any doors ordinarily used to leave the building.

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 assemblies that enclose *conditioned space* or provides a boundary between *conditioned space, semiheated space* and exempt or unconditioned space.

***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 ft^2 x °F) [W/(m^2 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 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 occupanc*y 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 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 total *information technology equipment (ITE)* equipment load less than or equal to 20 watts per square foot of *conditioned floor area* (215 watts/m^2) or a design *ITE* equipment load less than or equal to 10 kW. See also *data center*.

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. Elevator shafts, stair enclosures, enclosed corridors connecting *conditioned spaces,* and *enclosed spaces* through which conditioned air is transferred at a rate exceeding three air changes per hour are considered *conditioned spaces* for the purposes of the *building thermal envelope* requirements. <

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 (0.12 percent where all metal thermal bridges are stainless steel) 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 used exclusively for and specifically controlled to facilitate and enhance plant growth and production by manipulating various indoor 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.

CONTROLLED RECEPTACLE. An electrical receptacle that is controlled by an *automatic control device.*

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

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)* equipment 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 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 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.

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 openable 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 used for occupant ingress, egress and access in nonresidential buildings including, but not limited to, exterior entrances utilizing latching hardware and *automatic* closers and containing over 50 percent glazing specifically designed to withstand heavy 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.*

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.

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 that are fixed or operable, doors with no more than 50 percent glazed area and glazed block composed of glass or other transparent or translucent glazing materials and installed at a slope of 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 $^{\circ}_{F}$) [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 x E_{AE})/1000 x E_F.+ 3.412 x 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.

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.

GREENHOUSE. A structure or a thermally isolated area of a building that maintains a specialized sunlit environment that is used exclusively for, and 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.

HEAT TRAP. An arrangement of piping and fittings, such as elbows, or a commercially available heat trap that prevents thermosyphoning 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.~~)) See *Landmark.*

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.

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/communication 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.

IT (INFORMATION TECHNOLOGY) ENERGY. Electrical energy consumed by UPS (uninterruptible power supply) units, servers, and associated electronic data storage and data processing equipment, but not by lighting or HVAC equipment.

LABELED. Equipment, materials or products to which have been affixed a label, seal, symbol or other identifying mark of a nationally recognized testing laboratory, *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.

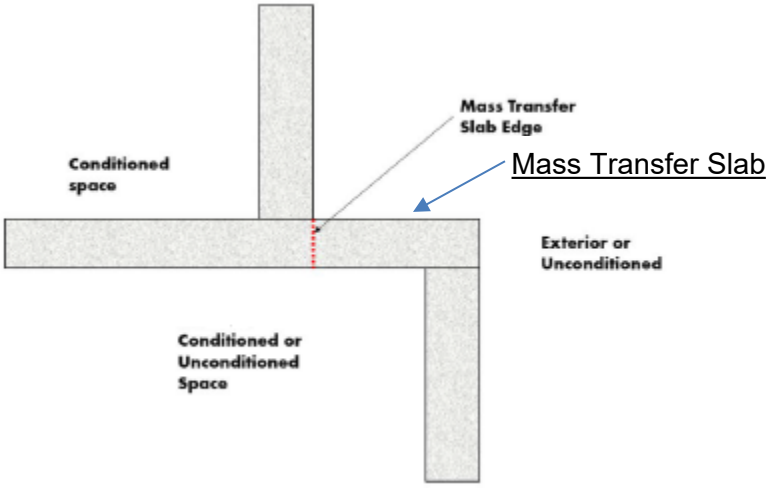
LOW-VOLTAGE LIGHTING. A lighting system consisting of an isolating power supply, the low voltage luminaires, and associated equipment that are all identified for the use.

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 *luminaires* where each *luminaire* has embedded lighting control logic, occupancy and ambient light sensors, and local override switching capability, where required. Each *luminaire* shall also have local or central wireless networking capabilities to detect and share information with other *luminaires* to adjust to occupancy and/or daylight in the space.

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.~~)) A concrete slab designed to transfer structural load from the building perimeter wall or column line above, laterally to an offset wall or column line below, and which has conditioned or semi-heated space on the inside of the upper wall and exterior or unconditioned space on the outside of the upper wall. The area of the slab edge shall be defined as the thickness of the slab multiplied by the ((~~perimeter~~)) length 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. A cantilevered concrete balcony does not constitute a mass transfer deck slab.



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 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 item a. or b.

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

MULTI-PASS. A heat pump water heater control strategy requiring multiple passes of water through the heat pump to reach the final target storage water temperature.

NAMEPLATE HORSEPOWER. The nominal motor 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 §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, able to be accessed 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.

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.

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.

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

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 square feet 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 ft^2 and is designed to maintain temperatures 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: makeup 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 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 ($h \times ft^2 \times °F/Btu$) [$(m^2 \times K)/W$].

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.

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 an installed heating system output capacity greater than or equal to 3.4 Btu/(h-ft^2) but not greater than 8 Btu/(h-ft^2);
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.

SIDE LIT. See Section C405.2.4.2.

SINGLE-PASS. A heat pump water heater control strategy using variable flow or variable capacity to deliver water from the heat pump at the final target storage water temperature in a single pass through the heat exchanger with variable incoming water temperatures.

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 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.

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

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.

SOLAR ZONE. A clear area or areas reserved solely for current and future installation of photovoltaic or solar hot water systems.

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 ((~~from lowest to highest~~)) 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 system of doors and windows mulled 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 mulled 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.

TEMPERATURE MAINTENANCE. The system used to maintain the temperature of the building domestic hot water delivery system, typically by circulation and reheating or by a heat trace system.

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 non-operable 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.

***U*-FACTOR (THERMAL TRANSMITTANCE).** The coefficient of heat transmission (air to air) through a building component or assembly, equal to the time rate of heat flow per unit area and unit temperature difference between the warm side and cold side air films (Btu/h x ft^2 x°F) [W/(m^2 x K)].

UNHEATED SLAB-ON-GRADE FLOOR. A slab-on-grade floor that is not a heated slab-on-grade floor.

UNIFORM ILLUMINATION. A quality of illumination delivered by a lighting system typically comprised of similar fixtures mounted at a regular spacing interval. This lighting system provides a uniform contrast ratio of no greater that 5:1 maximum-to-minimum ratio throughout the entire area served, including task areas.

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.

WALK-IN COOLER. An enclosed storage space capable of being refrigerated to temperatures above 32°F but less than 55°F that can be walked into, has a ceiling height of not less than 7 feet (2134 mm) and has a total chilled storage area of less than 3,000 ft^2.

WALK-IN FREEZER. An enclosed storage space capable of being refrigerated to temperatures at or below 32°F that can be walked into, has a ceiling height of not less than 7 feet and has a total chilled storage area of less than 3,000 ft^2.

WALL. That portion of the *building envelope*, including opaque area and *fenestration*, that is vertical or tilted at an angle of 60 degrees from horizontal or greater. This includes *above-grade walls* and *below-grade walls*, between floor spandrels, peripheral edges of floors, and foundation *walls.*

WALL, METAL BUILDING. 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*).

WALL, WOOD-FRAMED AND OTHER. All other *wall* types, including wood stud *walls*.

WATER HEATER. Any heating appliance or equipment that heats potable water and supplies such water to the potable hot water distribution system.

ZONE. A space or group of spaces within a building with heating or cooling requirements that are sufficiently similar so that desired conditions can be maintained throughout using a single controlling device.

CHAPTER 3 [CE]

GENERAL REQUIREMENTS

SECTION C301

CLIMATE ZONES

C301.1 General. *Climate zones* from Table C301.1 shall be used in determining the applicable requirements from Chapter 4. Bellingham is in Zone 4-C (4-Marine).

TABLE C301.1

CLIMATE ZONES, MOISTURE REGIMES, AND WARM-HUMID DESIGNATIONS BY STATE AND COUNTY

Key: A – Moist, B - Dry, C - Marine

Absence of moisture designation indicates moisture regime is irrelevant

WASHINGTON

5B Adams	4C Grays Harbor	4C Pierce
5B Asotin	4C Island	4C San Juan

5B Benton	4C Jefferson	4C Skagit
5B Chelan	4C King	5B Skamania
4C Clallam	4C Kitsap	4C Snohomish
4C Clark	5B Kittitas	5B Spokane
5B Columbia	5B Klickitat	5B Stevens
4C Cowlitz	4C Lewis	4C Thurston
5B Douglas	5B Lincoln	4C Wahkiakum
5B Ferry	4C Mason	5B Walla Walla
5B Franklin	5B Okanogan	4C Whatcom
5B Garfield	4C Pacific	5B Whitman
5B Grant	5B Pend Oreille	5B Yakima

SECTION C302

DESIGN CONDITIONS

C302.1 Interior design conditions. The interior design temperatures used for heating and cooling load calculations shall be a maximum of 72°F (22°C) for heating and minimum of 75°F (24°C) for cooling.

C302.2 Exterior design conditions. The heating or cooling outdoor design temperatures shall be ((~~selected from Appendix C~~)) 19°F for heating and 75°F dry bulb and 65°F wet bulb for cooling.

SECTION C303

MATERIALS, SYSTEMS AND EQUIPMENT

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. Alternatively, 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 shall be written in inches (mm) on markers for every 300 square feet (28 m^2) 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 shall be determined as follows:

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

2. Where required for *garage door*s 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.

TABLE C303.1.3(1)

DEFAULT GLAZED WINDOW, GLASS DOOR AND SKYLIGHT *U*-FACTORS

FRAME TYPE	Window and Glass Door		SKYLIGHT
	SINGLE PANE	DOUBLE PANE	
Metal	1.20	0.80	See Table C303.1.3(4)
Metal with Thermal Break[a]	1.10	0.65	
Nonmetal or Metal Clad	0.95	0.55	
Glazed Block	0.60		

[a] Metal Thermal Break .= A metal thermal break framed window shall incorporate the following minimum design characteristics:

1) The thermal conductivity of the thermal break material shall be not more than 3.6 Btu-in/h/ft^2/°F;
2) The thermal break material must produce a gap in the frame material of not less than 0.210 inches; and
3) All metal framing members of the products exposed to interior and exterior air shall incorporate a thermal break meeting the criteria in 1) and 2) above.

TABLE C303.1.3(2)

DEFAULT OPAQUE DOOR *U*-FACTORS

See Appendix A, Section A107

TABLE C303.1.3(3)

DEFAULT GLAZED FENESTRATION SHGC AND VT

	SINGLE GLAZED		DOUBLE GLAZED		GLAZED BLOCK
	Clear	Tinted	Clear	Tinted	
SHGC	0.40	0.40	0.40	0.40	0.40
VT	0.6	0.3	0.6	0.3	0.6

TABLE C303.1.3(4)

DEFAULT *U*-FACTORS FOR SKYLIGHTS

Fenestration Type	Frame Type			
	Aluminum Without Thermal Break	Aluminum With Thermal Break	Reinforced Vinyl/ Aluminum-Clad Wood or Vinyl	Wood or Vinyl-Clad Wood/ Vinyl without Reinforcing
Single Glazing				
glass	U-1.58	U-1.51	U-1.40	U-1.18
acrylic/polycarb	U-1.52	U-1.45	U-1.34	U-1.11
Double Glazing				
air	U-1.05	U-0.89	U-0.84	U-0.67
argon	U-1.02	U-0.86	U-0.80	U-0.64
Double Glazing, *e*=0.20				
air	U-0.96	U-0.80	U-0.75	U-0.59
argon	U-0.91	U-0.75	U-0.70	U-0.54
Double Glazing, *e*=0.10				
air	U-0.94	U-0.79	U-0.74	U-0.58
argon	U-0.89	U-0.73	U-0.68	U-0.52
Double Glazing, *e*=0.05				
air	U-0.93	U-0.78	U-0.73	U-0.56
argon	U-0.87	U-0.71	U-0.66	U-0.50
Triple Glazing				
air	U-0.90	U-0.70	U-0.67	U-0.51
argon	U-0.87	U-0.69	U-0.64	U-0.48
Triple Glazing, *e*=0.20				

air	U-0.86	U-0.68	U-0.63	U-0.47
argon	U-0.82	U-0.63	U-0.59	U-0.43
Triple Glazing, *e*=0.20 on 2 surfaces				
air	U-0.82	U-0.64	U-0.60	U-0.44
argon	U-0.79	U-0.60	U-0.56	U-0.40
Triple Glazing, *e*=0.10 on 2 surfaces				
air	U-0.81	U-0.62	U-0.58	U-0.42
argon	U-0.77	U-0.58	U-0.54	U-0.38
Quadruple Glazing, *e*=0.10 on 2 surfaces				
air	U-0.78	U-0.59	U-0.55	U-0.39
argon	U-0.74	U-0.56	U-0.52	U-0.36
krypton	U-0.70	U-0.52	U-0.48	U-0.32

Notes for Table C303.1.3(4)

1. U-factors are applicable to both glass and plastic, flat and domed units, all spacers and gaps.
2. Emissivities shall be less than or equal to the value specified.
3. Gap fill shall be assumed to be air unless there is a minimum of 90% argon or krypton.
4. Aluminum frame with thermal break is as defined in footnote 1 to Table C303.1.3(1).

TABLE C303.1.3(5)

SMALL BUSINESS COMPLIANCE TABLE

DEFAULT *U*-FACTORS FOR VERTICAL FENESTRATION

Vertical Fenestration Description				Frame Type		
Panes	Low-e[1]	Spacer	Fill	Any Frame	Aluminum Thermal Break[2]	Wood/Vinyl/ Fiberglass
Double[3]	A	Any	Argon	0.48	0.41	0.32
	B	Any	Argon	0.46	0.39	0.30
	C	Any	Argon	0.44	0.37	0.28
	C	High Performance	Argon	0.42	0.35	Deemed to comply[5]
Triple[4]	A	Any	Air	0.50	0.44	0.26
	B	Any	Air	0.45	0.39	0.22
	C	Any	Air	0.41	0.34	0.20
	Any double low-e	Any	Air	0.35	0.32	0.18

[1] Low-eA (emissivity) shall be 0.24 to 0.16.

Low-eB (emissivity) shall be 0.15 to 0.08.

Low-eC (emissivity) shall be 0.07 or less.

[2] Aluminum Thermal Break = An aluminum thermal break framed window shall incorporate the following minimum design characteristics:

a) The thermal conductivity of the thermal break material shall be not more than 3.6 Btu-in/h/ft^2/°F;

b) The thermal break material must produce a gap in the frame material of not less than 0.210 inches; and

c) All metal framing members of the products exposed to interior and exterior air shall incorporate a thermal break meeting the criteria in a) and b) above.

[3] A minimum air space of 0.375 inches between panes of glass is required for double glazing.

[4] A minimum air space of 0.25 inches between panes of glass is required for triple glazing.

[5] Deemed to comply glazing shall not be used for performance compliance.

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 × ft^2 × °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 non-metallic 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 wall*s or spandrel panels.

C303.1.5.1 Window wall application. Where "window wall" or a 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)~~)) A103.3.7.2 or as determined using an *approved* calculation.

303.1.5.2 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 this table or Equations 1-3 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)**

$$U_{overall} = \left[\frac{1}{(R_{gypsum} + R_{airgap}) + \left[\frac{1}{0.2798 + \left(\frac{0.8929}{R_{addedinsulation} + \left(\frac{1}{U_{centerofglass}} \right)} \right)} \right]} \right]$$

Aluminum with Thermal Break **(Equation 3-2)**

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

Structural Glazing **(Equation 3-3)**

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

Table C303.1.5

U-Factors for Spandrel Panels and Glass Curtain Walls

			Rated R-Value of Insulation Between Framing Members							
			None	R-4	R-7	R-10	R-15	R-20	R-25	R-30
Frame Type	**Spandrel Panel**		**A**	**B**	**C**	**D**	**E**	**F**	**G**	**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

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

C303.2.1 Protection of exposed foundation insulation. Insulation applied to the exterior of basement walls, crawlspace 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. <

CHAPTER 4 [CE]

COMMERCIAL ENERGY EFFICIENCY

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. **Prescriptive Path.** The requirements of ((~~Sections C402, C403, C404, C405, C406, C408, C409, C410 and C411~~)) all of Chapter 4, other than Sections C407.
2. **Total Building Performance Path.** The requirements of Section C407.
3. **Appendix F is not adopted by the City of Bellingham**. When adopted by the local jurisdiction, the requirements of Appendix F, Outcome-Based Energy Budget, Sections C408, C409, C410, C411 and any specific section 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.

SECTION C402
BUILDING ENVELOPE REQUIREMENTS

C402.1 General. *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 the 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.

Bellingham Informative Note: For the application of the building envelope requirements to elevator shafts and stair enclosures, see the definition of *conditioned space* in Chapter 2 and the exception to Section C402.1.3.

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 provisions 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 × ft^2 (10.7 W/m^2) or 1.0 watt/ft^2 (10.7 W/m^2) of floor area for space conditioning purposes.
2. Those that do not contain *conditioned space*.
3. Unstaffed equipment shelters or cabinets used solely for personal wireless service facilities.

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, except as modified by this section. Building envelope assemblies separating *conditioned space* from semi-heated space shall comply with the 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. Fenestration that forms part of the *building thermal envelope* enclosing semi-heated spaces shall comply with Section C402.4. 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 the component performance alternative in Section C402.1.5, and for the ((~~Standard Reference~~)) Baseline Building Design for Total Building Performance compliance per ASHRAE 90.1, Appendix G. 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~~)) alternative:

1. Electric infrared heating equipment for localized heating applications, but not for general area heating, insulated in compliance with Section C402.2.8 and controlled by occupant sensing devices in compliance with Section C403.11.1.

((~~2. Heat pumps with cooling capacity permanently disabled, as pre-approved by the jurisdiction.~~))

Bellingham Informative Note: There is no separate “freeze protection” space conditioning category for unoccupied utility buildings. Spaces with no cooling and less than 3.4 BTU/h-ft^2 heating capacity are not required to be insulated. The opaque walls of spaces that meet the definition of “semiheated” in Chapter 2 are not required to be insulated, but otherwise the thermal envelope of semiheated spaces must meet all requirements for *conditioned space.* Spaces with any mechanical cooling or with more than 8 BTU/h-ft^2 heating capacity must meet all the *building thermal envelope* requirements for *conditioned space.*

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 complying 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. Non-opaque envelope assemblies complying with the thermal envelope requirements in Table C402.1.1.3. The U-factor for the non-opaque 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 pre-*approved* by the jurisdiction.

TABLE C402.1.1.3

NON-OPAQUE THERMAL ENVELOPE MAXIMUM REQUIREMENTS

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

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 m^2).
2. Are intended to house electronic equipment with installed equipment power totaling at least 7 watts per square foot (75 W/m^2) 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).
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 system 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 space*s 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 set points 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.

C402.1.3 Insulation component *R*-value method. *Building thermal envelope* opaque assemblies shall 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 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.

Exception: For stair and elevator shafts that do not comply with Section C402.1.2.1 and that are located within enclosed garages or other enclosed non-conditioned spaces and without conditioned supply air or cooling or heating appliances rated higher than 2 kW in any shaft, walls enclosing the shafts are permitted to be:

1. Concrete or masonry with minimum R-5 *continuous insulation*;
2. Metal studs with R-15 *cavity insulation* and without *continuous insulation*; or
3. Other assemblies with a maximum U-value of 0.120.

Slab floors, intermediate mass floor edges and elevator pits within shafts using this exception are excluded from envelope insulation requirements. Shaft surfaces using this exception shall not be included in the gross exterior wall area for purposes of maximum fenestration area calculations in Section C402.4.1 component performance calculations in Section C402.1.5, or for the total building performance calculation of Section C407.

TABLE C402.1.3
OPAQUE THERMAL ENVELOPE INSULATION COMPONENT MINIMUM REQUIREMENTS, R-VALUE METHOD[a, j]

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~~)) R-22 LS	R-25 .+ ((~~R-11~~)) R-22 LS
Attic and other	R-49	R-49
Walls, Above Grade[i]		
Mass[h]	((~~R-9.5[c] ci~~)) Exterior: R-16 c.i. Interior: R-13 + R-6 ci wood stud, or R-13 + R-10 ci metal stud	((~~R-13.3ci~~)) Exterior: R-16 c.i. Interior: R-13 + R-6 ci wood stud, or R-13 + R-10 ci metal stud
Mass transfer deck slab edge	((~~R-5~~)) N/R	((~~R-5~~)) N/R
Metal building	R-19ci or R-13+13ci	R-19ci or R-13+13ci
Steel framed	R-13 .+ R-10ci	R-19 .+ R-8.5ci

CLIMATE ZONE	5 AND MARINE 4	
	All Other	Group R
Wood framed and other	((~~R-21 int or R-15+5ci std~~)) R-13 + R-7.5 ci	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~~)) Exterior: R-10 ci Interior: R-19 wood stud, or R-13 + R-6 ci metal stud	((~~Same as above grade~~)) Exterior: R-10 ci Interior: R-19 wood stud, or R-13 + R-6 ci metal stud
Floors		
Mass[f]	R-30ci	R-30ci
Joist/framing	((~~R-30[e]~~)) Steel frame: R-38 +R-10 ci Wood frame: R-38	((~~R-30[e]~~)) Steel frame: R-38 +R-10 ci Wood frame: R-38
Slab-on-Grade Floors		
Unheated slabs	R-10 for 24" below	R-10 for 24" below
Heated slabs[d]	R-10 perimeter & under entire slab	R-10 perimeter & under entire slab
Opaque Doors[g]		
Swinging	U-0.37	U-0.37
Nonswinging	R-4.75	R-4.75

Keys for Table C402.1.3

For SI: 1 inch = 25.4 mm. ci = *Continuous insulation*. NR = No requirement. LS = Liner system

Footnotes for Table C402.1.3

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 ½ 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.~~ (Reserved) ((~~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. (Reserved) ((~~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 door*s. 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 c for typical conditions of above grade slab edges.

i. Where the total area of through-wall mechanical equipment is greater than 1 percent of the opaque *above-grade wall* area, use of the *R*-value method is not permitted. See Section C402.1.4.2.

j. For roof, wall or floor assemblies where the proposed assembly would not be *continuous insulation*, ((~~an~~)) alternate nominal *R*-value compliance ((~~option~~)) options for assemblies with isolated metal ((~~penetrations of~~)) fasteners that penetrate otherwise *continuous insulation* ((~~is~~)) are as shown in Columns B and C of Table C402.1.3(i):

Table C402.1.3(j)
Continuous Insulation Equivalents

Column A **Assemblies with continuous insulation (see definition)**	**Column B** **Alternate option for assemblies with metal penetrations, greater than 0.04% but less than 0.08%**	**Column C** **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
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

Footnotes for Table C402.1.3(j)

((~~This~~)) These alternate nominal R-value compliance ((~~option is~~)) options are 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 0.0008 (0.08%), for use of Column B equivalents, and greater than or equal to 0.0008 (0.08%), but less than 0.0012 (0.12%), for use of Column C equivalents.

a. Where all metal penetrations are stainless steel, Column B is permitted to be used for penetrations greater than 0.12% but less than 0.24% of opaque surface area, and Column C is permitted to be used for penetrations greater than or equal to 0.24% but less than 0.48% of opaque surface area.

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.

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 *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 of 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 either by using the values in Table C402.1.4.1, or in accordance with Equation 4-1:

$U = 1/[Rs + (ER)]$ **(Equation 4-1)**

where:

Rs = The cumulative *R*-value of the wall components along the path of heat transfer, excluding the *cavity insulation* and steel studs.

ER = The effective *R*-value of the *cavity insulation* with steel studs.

C402.1.4.2 Thermal resistance of mechanical equipment penetrations. When the total area of penetrations from **through-wall mechanical equipment** or equipment listed in Table C403.3.2(3) exceeds 1 percent of the opaque *above-grade wall* area, the mechanical equipment penetration area shall be calculated as a separate wall assembly with a default U-factor of 0.5. Mechanical system ducts and louvers, including those for supply, exhaust and relief, and for condenser air intake and outlet, are not considered to be mechanical equipment for the purposes of this section.

Exception: Where mechanical equipment has been tested in accordance with *approved* testing standards, the mechanical equipment penetration area is permitted to be calculated as a separate wall assembly using the U-factor determined by such test.

TABLE C402.1.4

OPAQUE THERMAL ENVELOPE ASSEMBLY MAXIMUM REQUIREMENTS, *U*-FACTOR METHOD[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-0.027	((~~U-0.031~~)) U-0.027
Attic and other	U-0.021	U-0.021
Joist or single rafter	U-0.027	U-0.027
Walls, Above Grade		
Mass[g,k]	((~~U-0.104[d]~~)) U-0.057	((~~U-0.078~~)) U-0.057
Mass transfer deck slab edge[i]	U-0.20	U-0.20
Slab penetrating thermal envelope wall[h]	U-0.10	U-0.10
Metal building[k]	U-0.052	U-0.052
Steel framed[k]	U-0.055	U-0.055
Wood framed and other[k]	((~~U-0.054~~)) U-0.051	U-0.051
Walls, Below Grade		
Below-grade wall[b,g]	((~~Same as above grade~~)) U-0.070	((~~Same as above grade~~)) U-0.070
Floors		
Mass[e]	U-0.031	U-0.031
Joist/framing	((~~U-0.029~~)) U-0.029 steel joist U-0.025 wood joist	((~~U-0.029~~)) U-0.029 steel joist U-0.025 wood joist
Concrete column or concrete wall penetrating thermal envelope floor[i]	U-0.55	U-0.55
Concrete slab floor directly above an electrical utility vault	N.R.	N.R.
Slab-on-Grade Floors		
Unheated slabs	F-0.54	F-0.54
Heated slabs[c]	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-0.31	U-0.31

Footnotes for Table C402.1.4

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. (Reserved) ((~~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.~~ (Reserved) ((~~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 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 c for typical conditions of above grade slab edges.

h. Intermediate concrete floor slabs penetrating the *building thermal envelope* shall comply with Section C402.2.9. The area of such penetrating concrete floor slabs shall be defined as the thickness of the slab multiplied by the length of the penetration. The "exposed concrete" row in Table A103.3.7.2 shall be used for typical default *U*-factors for the penetrating concrete slab.

i. Value applies to concrete columns and concrete walls that interrupt mass floor insulation, but not to perimeter walls or columns separating interior *conditioned space* from exterior space.

j. A mass transfer deck, due to its configuration, is not insulated. The table value (U-0.20) shall be used as the baseline value for component performance, total building performance calculation. For the proposed value, the appropriate value from the top line of Table A104.3.7.2 shall be used.

k. Through-wall mechanical equipment subject to Section C402.1.4.2 shall be calculated at the U-factor defined in Section C402.1.4.2. The area-weighted U-factor of the wall, including through-wall mechanical equipment, shall not exceed the value in the table.

TABLE C402.1.4.1

EFFECTIVE *R*-VALUES FOR STEEL STUD WALL ASSEMBLIES

NOMINAL STUD DEPTH (inches)	SPACING OF FRAMING (inches)	CAVITY *R*-VALUE (insulation)	CORRECTION FACTOR (*Fc*)	EFFECTIVE *R*-VALUE (ER) (Cavity *R*-Value *x Fc*)

3 1/2	16	13	0.46	5.98
		15	0.43	6.45
3 1/2	24	13	0.55	7.15
		15	0.52	7.80
6	16	19	0.37	7.03
		21	0.35	7.35
6	24	19	0.45	8.55
		21	0.43	9.03
8	16	25	0.31	7.75
	24	25	0.38	9.50

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.

Proposed Total UA ≤ Allowable Total UA (Equation 4-2)

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 area [1]
UA-glaz-excess	=	U-value for the proposed wall type from ((~~Table C402.4~~)) Table C402.1.4[2] 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 C402.4[3] 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 and F-factors. The *U*-factors and F-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 of 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 of 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 of 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 total SHGC×A is less than the allowable total SHGC×A as determined by Equation 4-3.

Proposed Total SHGCxA ≤ Allowable Total SHGCxA **(Equation 4-3)**

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 SHGC x proposed area) for each distinct vertical fenestration type
SHGCxA-sky-prop	=	Sum of (proposed SHGC x 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 C402.4 x 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.

C402.2 Specific building thermal envelope insulation requirements. Insulation in *building thermal envelope* opaque assemblies shall comply with Sections C402.2.1 through ((~~C402.2.6~~)) C402.2.10 and Table C402.1.3.

Where this section refers to installing insulation levels as specified in Section C402.1.3, assemblies complying with Section ((~~C402.1.5~~)) 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. ◄

C402.2.1 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. (Reserved) ((~~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" x 24" plan area around each roof drain has a minimum insulation requirement of R-13, but otherwise is permitted to be excluded from roof insulation area-weighted calculations.

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 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.

C402.2.2 Reserved.

C402.2.3 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" where used as a component in the thermal envelope of a building shall comply with one of the following:

1. Weigh not less than 35 psf (170 kg/m^2) of wall surface area.
2. Weigh not less than 25 psf (120 kg/m^2) of wall surface area where the material weight is not more than 120 pounds per cubic foot (pcf) (1,900 kg/m^3).

3. Have a heat capacity exceeding 7 Btu/ft^2 x °F (144 kJ/m^2 x K).

4. Have a heat capacity exceeding 5 Btu/ft^2 x° F (103 kJ/m^2 x K) where the material weight is not more than 120 pcf (1900 kg/m^3).

C402.2.4 Below-grade walls. The R-value of the insulating material installed in, or continuously on, the *below-grade walls* shall be 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*.

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 of 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.*

C402.2.6 Slabs-on-grade perimeter insulation. Where the slab-on-grade is in contact with the ground, the minimum thermal resistance (*R*-value) of the insulation around the perimeter of unheated or heated slab-on-grade floors designed in accordance with the *R*-value method of Section C402.1.3 shall be as specified in Table C402.1.3. The insulation shall be placed on the outside of the foundation or on the inside of the foundation wall. The insulation shall extend downward from the top of the slab for a minimum distance as shown in the table or to the top of the footing, whichever is less, or downward to at least the bottom of the slab and then horizontally to the interior or exterior for the total distance shown in the table. Insulation extending away from the building shall be protected by pavement or by a minimum of 10 inches (254 mm) of soil. Insulation complying with Table C402.1.3 shall be provided under the entire area of heated slabs-on-grade.

Exception: Where the slab-on-grade floor is greater than 24 inches (61 mm) below the finished exterior grade, perimeter insulation is not required.

C402.2.7 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.

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 insulated to an R-value of not less than R-3.5 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 the 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.

C402.2.9 Above-grade exterior concrete slabs. Above-grade concrete slabs that penetrate the *building thermal envelope*, including but not limited to decks and balconies, shall each include a minimum R-10 thermal break, aligned with the primary insulating layer in the adjoining wall assemblies. Stainless steel (but not carbon steel) reinforcing bars are permitted to penetrate the thermal break. If the Total Building Performance path or the component performance alternative in Section C402.1.5 is utilized and the thermal break required by this section is not provided where concrete slabs penetrate the *building thermal envelope*, the sectional area of the penetration shall be assigned the default U-factors from the "exposed concrete" row of Table A103.3.7.2.

Exception: *Mass transfer deck slab* edges.

C402.2.10 *Vertical fenestration* intersection with opaque walls. *Vertical fenestration* shall comply with items 1, 2 and 3, as applicable:

1. Where wall assemblies include *continuous insulation*, the exterior glazing layer of *vertical fenestration* and any required thermal break in the frame shall each be aligned within 2 inches laterally of either face of the *continuous insulation* layer.
2. Where wall assemblies do not include *continuous insulation*, the exterior glazing layer of *vertical fenestration* and any required thermal break in the frame shall each be aligned within the thickness of the *wall* insulation layer and not more than 2 inches laterally from the exterior face of the outermost insulation layer.
3. Where the exterior face of the *vertical fenestration* frame does not extend to the exterior face of the opaque wall rough opening, the exposed exterior portion of the rough opening shall be covered with either a material having an *R-value* not less than R-3, or with minimum 1.5-inch thickness wood.

C402.4 Fenestration. 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~~)) C405.2.4.

Exception: For prescriptive envelope compliance, single-pane glazing is permitted for security purposes and for revolving doors, not to exceed 1 percent of the gross exterior wall area. Where Section C402.1.5, component performance alternative, is used, the single glazing shall be included in the percentage of the total glazing area, U-factor and SHGC requirements.

TABLE C402.4

BUILDING ENVELOPE FENESTRATION MAXIMUM *U*-FACTOR AND SHGC REQUIREMENTS

CLIMATE ZONEs 5 AND MARINE 4		
***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]**		
Fixed[b] *U*-factor	((~~U-0.38~~)) U-0.34	
Operable[c] *U*-factor	((~~U-0.40~~)) U-0.36	
***Entrance doors*[d]**		
U-factor	U-0.60	
U-factor for all other vertical fenestration		
Fixed *U*-factor	((~~U-0.30~~)) U-0.26	
Operable[c] *U*-factor	U-0.28	
SHGC for all vertical fenestration		
Orientation[e,f]	**SEW**	**N**
PF < 0.2	0.38	0.51
0.2 ≤ PF < 0.5	0.46	0.56
PF ≥ 0.5	0.61	0.61
Skylights		
***U*-factor**	((~~U-0.50~~)) U-0.45	
SHGC	((~~0.35~~)) 0.32	

Footnotes for Table C402.4

a. U-factor and SHGC shall be rated in accordance with NFRC 100.

b. "Fixed" includes *curtain wall*, storefront, picture windows, and other fixed windows.

c. "Operable" includes openable fenestration products other than "entrance doors."

d. "Entrance door" includes glazed *swinging* entrance doors and *automatic* glazed sliding *entrance doors*. Other doors which are not entrance doors, including manually operated 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.

Bellingham Informative Note: The category at the top of Table C402.4, labeled "*U-factor for Class AW windows rated in accordance with AAMA/CSA101/I.S.2/A440, vertical curtain walls and site-built fenestration products,*" includes *curtain wall*, storefront, ribbon wall, window wall, and similar site-assembled systems, but does not include typical punched-opening manufactured windows except for "Class AW" windows. Class AW is the AAMA designation for windows typically used in mid-rise and high-rise buildings to resist high wind and water intrusion loads.

C402.4.1 Maximum area. The total building vertical fenestration area (not including opaque doors and opaque spandrel panels) shall not exceed ((~~30~~)) 35 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 Vertical fenestration maximum area with 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~~)) 35 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. 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 2.

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

1. All *vertical fenestration* in the building shall comply with the following maximum U-factors:
   a. U-factor for Class AW windows rated in accordance with AAMA/CSA101/I.S.2/A440, vertical *curtain wall*s and site-built fenestration products (fixed) = ((~~0.34~~)) 0.30
   b. U-factor for Class AW windows rated in accordance with AAMA/CSA101/I.S.2/A440, vertical *curtain wall*s and site-built fenestration products (operable) = 0.36
   c. Entrance doors = 0.60
   d. U-factor for all other vertical fenestration, fixed = ((~~0.28~~)) 0.22

e. U-factor for all other vertical fenestration, operable = 0.24

2. The SHGC of the vertical fenestration shall be no more than 0.90 times the maximum SHGC values listed in Table C402.4 ((~~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.

C402.4.2 Minimum skylight fenestration area. For buildings with single story *enclosed space*s greater than 2,500 square feet (232 m^2) in floor area that are directly under a roof and have a ceiling height greater than 15 feet (4572 mm) 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, and workshop. Skylights in these spaces are required to provide a total toplit zone area not less than 50 percent of the floor area and shall provide one of the following:

1. A minimum ratio of skylight area to toplit *daylight zone* area 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.

$$\text{Skylight Effective Aperture} = \frac{(0.85 \times \text{Skylight Area} \times \text{Skylight VT} \times \text{WF})}{\text{Toplit zone}}$$

(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* with *VT-annual* ratings measured according to 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 zone*s of *enclosed space*s are not required in:
   1.1. Reserved.
   1.2. Spaces where the designed *general lighting* power densities are less than 0.5 W/ft^2 (5.4 W/m^2) and at least 10 percent lower than the lighting power allowance in Section C405.4.2.
   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.

1.4. Spaces where the *daylight zone* under rooftop monitors is greater than 50 percent of the *enclosed space* floor area.

1.5. Spaces where the total floor area minus the sidelit zone area is less than 2,500 square feet (232 m^2), and where the lighting in the *daylight zone* is controlled in accordance with Section ((~~C405.2.3.1~~)) C405.2.4.

2. The skylight effective aperture, calculated in accordance with Equation 4-5, is permitted to be 0.66 percent in lieu of one 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~~)) C405.2.4 shall be provided to control all electric lights within 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 zone*s 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 zone*s shall include *toplit* zones and *sidelit* zones.

C402.4.3 Maximum *U*-factor and SHGC. The maximum *U*-factor and solar heat gain coefficient (SHGC) for fenestration shall be as specified in Table C402.4.

The window projection factor shall be determined in accordance with Equation 4-6.

$$PF = A/B$$

(Equation 4-6)

Where:

PF = Projection factor (decimal).

A = Distance measured horizontally from the furthest continuous extremity of any overhang, eave, or permanently attached shading device to the vertical surface of the glazing.

B = Distance measured vertically from the bottom of the glazing to the underside of the overhang, eave, or permanently attached shading device.

Where different windows or glass doors have different *PF* values, they shall each be evaluated separately.

C402.4.3.1 Reserved

C402.4.3.2 Reserved.

C402.4.3.3 Dynamic glazing. Where *dynamic glazing* is intended to satisfy the SHGC and VT requirements of Table C402.4, the ratio of the higher to lower labeled SHGC shall be greater than or equal to 2.4, and the *dynamic glazing* shall be automatically controlled to modulate the amount of solar gain into the space in multiple steps. *Dynamic glazing* shall be considered separately from other fenestration, and area-weighted averaging with other fenestration that is not *dynamic glazing* shall not be permitted.

Exception: *Dynamic glazing* is not required to comply with this section where both the lower and higher labeled SHGC already comply with the requirements of Table C402.4.

C402.4.3.4 Area-weighted *U*-factor. An area-weighted average shall be permitted to satisfy the *U*-factor requirements for each fenestration product category listed in Table C402.4. Individual fenestration products from different fenestration product categories listed in Table C402.4 shall not be combined in calculating area-weighted average *U*-factor.

C402.4.4 Doors. Opaque *swinging* doors shall comply with 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*.

C402.5 Air leakage – thermal envelope. The thermal envelope of buildings shall comply with Sections C402.5.1 through C402.5.8.

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 seams associated with penetrations shall be sealed in the same manner or taped. Sealing materials shall be securely installed around the penetrations 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. <

Bellingham Informative Note: The continuous air barrier is intended to control the air leakage into and out of the *conditioned space*. The definition of *conditioned space* includes semi-heated spaces, so these spaces are included when detailing the continuous air barrier and when determining the pressure boundary for conducting the air leakage test. However, unheated spaces are not included when determining the pressure boundary.

C402.5.1.2 Building test. The completed building shall be tested and the air leakage rate of the *building envelope* shall not exceed 0.25 cfm/ft^2 at a pressure differential of 0.3 inches water gauge (1.27 ((~~2.0~~)) L/s x m^2 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/ft^2, 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/ft^2, corrective actions must be made and the test completed again. A test above 0.40 cfm/ft^2 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 correct P for pressurization in accordance with Section 9.4 of ASTM E779.
2. The test pressure range shall be from 25 Pa to 80 Pa per Section 8.10 of ASTM E779, 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 E779, 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.

C402.5.2 Reserved.

C402.5.3 Rooms containing fuel-burning appliances. Where combustion air is supplied through openings in an exterior wall to a room or space containing a space conditioning fuel-burning appliance, one of the following shall apply:

1. The room or space containing the appliance shall be located outside of the *building thermal envelope*.
2. The room or space containing the appliance shall be enclosed and isolated from *conditioned spaces* inside the *building thermal envelope*. Such rooms shall 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.
   2.2. The walls, floors and ceiling that separate the enclosed room or space from *conditioned spaces* shall be sealed in accordance with Section C402.5.1.1
   2.3. The doors into the enclosed room or space shall be fully gasketed.
   2.4. Water lines and ducts in the enclosed room or space shall be insulated in accordance with Section C403.
   2.5. Where the air duct supplying combustion air to the enclosed room or space passes through *conditioned space*, the duct shall be insulated to an R-value of not less than R-8.

Exception: Fireplaces and stoves complying with Sections 901 through 905 of the *International Mechanical Code*, and Section 2111.13 of the *International Building Code*.

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 716 of the *International Building Code.*
2. Doors and door openings required to comply with UL 1784 by the *International Building Code*.

C402.5.5 Air intakes, exhaust openings, stairways and shafts. Stairway enclosures, elevator shaft vents and other outdoor air intake and exhaust openings integral to the building envelope shall be provided with dampers in accordance with Section **((~~C403.7.9~~)) C403.7.8.**

C402.5.6 Loading dock weatherseals. Cargo door openings and loading dock door openings shall be equipped with weatherseals that restrict infiltration and provide direct contact along the top and sides of vehicles that are parked in the doorway.

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. T he 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 m^2) 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 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 three 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 square feet 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.

11. Doors that are used only to access outdoor seating areas that are separated from adjacent walking areas by a fence or other barrier.

Bellingham Informative Note: *Building entrance* is defined as the means ordinarily used to gain access to the building. Doors other than *building entrances,* such as those leading to service areas, mechanical rooms, electrical equipment rooms, outdoor seating areas or exits from fire stairways, are not covered by this requirement. There is less traffic through these doors, and the vestibule may limit access for large equipment. Note that enclosed lobbies in parking garages also serve to reduce the flow of vehicle exhaust into the building.

C402.5.8 Recessed lighting. Recessed luminaires installed in the *building thermal envelope* shall be all of the following:

1. IC Rated.
2. *Labeled* as having an air leakage rate of not more than 2.0 cfm (0.944 L/s) when tested in accordance with ASTM E 283 at a 1.57 psf (75 Pa) pressure differential.
3. Sealed with a gasket or caulk between the housing and interior wall or ceiling covering.

SECTION C403

MECHANICAL SYSTEMS

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

Exceptions:

1. Energy using equipment used by a manufacturing, industrial or commercial process other than for conditioning spaces or maintaining comfort and amenities for the occupants and not otherwise regulated by C403.3.2, Tables C403.3.2(1) through (12) inclusive, C403.7.7, C403.9.2.1, C403.10.3, C403.11.2, C403.11.3, C404.2, Table C404.2, C405.8, and C410. *Data center* and *computer room* HVAC equipment is not covered by this exception
2. *Data center systems* are exempt from Sections C403.4 and C403.5.

C403.1.1 HVAC total system performance ratio (*HVAC TSPR*). For systems serving office, medical office, retail, library and education occupancies and buildings, and the *dwelling unit*s and residential common areas within R-2 multifamily 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 with no more than 10 percent of the cooling capacity of the combination being supplied by air cooled chillers.

5. HVAC system 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.
10. HVAC systems serving laundry rooms, elevator rooms, mechanical rooms, electrical rooms, *data center*s, *computer rooms*, and kitchens.
11. Buildings or areas of medical office buildings that comply fully with ASHRAE Standard 170, including but not limited to surgical centers, or that are required by other applicable codes or standards to provide 24/7 air handling unit operation,

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** (2019) ((~~, 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 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~~))

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

Exceptions.

1. **Low heating capacity.** Buildings or areas of buildings, other than *dwelling unit*s or sleeping units, that meet the interior temperature requirements of IBC Chapter 12 with a total installed HVAC heating capacity no greater than 8.5 BTU/h (2.5 watts) per square foot of *conditioned space* are permitted to be heated using electric resistance appliances. For the purposes of this exception, overhead or wall-mounted radiant heating panels installed in an unheated or semi-

heated space, insulated in compliance with Section C402.2.8 and controlled by occupant sensing devices in compliance with Section C403.11.1 need not be included as part of the HVAC heating energy calculation.

2. **Dwelling and sleeping units.** Dwelling or sleeping units having an installed HVAC heating capacity no greater than 750 watts in any separate habitable room with exterior fenestration are permitted to be heated using electric resistance appliances.

3a. Corner rooms. A room within a dwelling or sleeping unit that has two primary walls facing different cardinal directions, each with exterior fenestration, is permitted to have an installed HVAC heating capacity no greater than 1000 watts. Bay windows and other minor offsets are not considered primary walls.

3. **Small buildings.** Buildings with less than 2,500 square feet of *conditioned floor area* are permitted to be heated using electric resistance appliances.

4. **Defrost**. Heat pumps are permitted to utilize electric resistance as the first stage of heating when a heat pump defrost cycle is required and is in operation.

5. **Air-to-air heat pumps.** Buildings are permitted to utilize internal electric resistance heaters to supplement heat pump heating for air-to-air heat pumps that meet all of the following conditions:

a. Internal electric resistance heaters have controls that prevent supplemental heater operation when the heating load can be met by the heat pump alone during both steady-state operation and setback recovery.
b. The heat pump controls are configured to use the compressor as the first stage of heating down to an outdoor air temperature of 17°F or lower.
c. The heat pump complies with one of the following:
    1. Controlled by a digital or electronic thermostat designed for heat pump use that energizes the supplemental heat only when the heat pump has insufficient capacity to maintain set point or to warm up the space at a sufficient rate,
    2. Controlled by a multistage space thermostat and an outdoor air thermostat wired to energize supplemental heat only on the last stage of the space thermostat and when outdoor air temperature is less than 32°F.
    3. The minimum efficiency of the heat pump is regulated by NAECA, its rating meets the requirements shown in Table C403.3.2(2), and its rating includes all usage of internal electric resistance heating.
d. The heat pump rated heating capacity is sized to meet the heating load at an outdoor air temperature of 32°F or lower and has a rated heating capacity at 47°F no less than 2 times greater than supplemental internal electric resistance heating capacity, or utilizes the smallest available factory-available internal electric resistance heater.

6. **Air-to-water heat pumps, up to 2,000 MBH.** Buildings are permitted to utilize electric resistance auxiliary heating to supplement heat pump heating for hydronic heating systems that have air-to-water heat pump heating capacity no greater than 2000 kBTU/hr at 47°F, and that meet all of the following conditions:

a. Controls for the auxiliary electric resistance heating are configured to lock out the supplemental heat when the outside air temperature is above 32°F, unless the hot water supply temperature setpoint to the building heat coils cannot be maintained for 20

minutes.

b. The heat pump controls are configured to use the compressor as the first stage of heating down to an outdoor air temperature of 17°F or lower except during startup or defrost operation.

c. The heat pump rated heating capacity at 47°F is no less than 2 times greater than supplemental electric resistance heating capacity.

7. **Air-to-water heat pumps, up to 3,000 MBH.** Buildings are permitted to utilize electric resistance auxiliary heating to supplement heat pump heating for hydronic heating systems that have air-to-water heat pump heating capacity greater than 2000 KBTU/hr and no greater than 3000 kBTU/hr at 47°F, and that meet all of the following conditions:

a. Controls for the auxiliary electric resistance heating are configured to **lock out the supplemental heat when the outside air temperature is above 36°F,** unless the hot water supply temperature setpoint to the building heat coils cannot be maintained for 20 minutes.

b. The heat pump controls are configured to use the compressor as the first stage of heating down to an outdoor air temperature of 17°F or lower except during startup or defrost operation.

c. The heat pump rated heating capacity at 47°F is no less than 1.75 times greater than supplemental electric resistance heating capacity.

8. **Air-to-water heat pumps, over 3,000 MBH.** Buildings are permitted to utilize electric resistance auxiliary heating to supplement heat pump heating for hydronic heating systems that have air-to-water heat pump heating capacity greater than 3000 kBTU/hr at 47°F and that meet all of the following conditions:

a. Controls for the auxiliary resistance heating are configured to **lock out the supplemental heat when the outside air temperature is above 40°F** unless the hot water supply temperature setpoint to the building heat coils cannot be maintained for 20 minutes.

b. The heat pump controls are configured to use the compressor as the first stage of heating down to an outdoor air temperature of 17°F or lower except during startup or defrost operation.

c. The heat pump rated heating capacity at 47°F is no less than 1.5 times greater than supplemental electric resistance heating capacity.

9. **Ground source heat pumps**. Buildings are permitted to utilize electric resistance auxiliary heating to supplement heat pump heating for hydronic heating systems with ground source heat pump equipment that meets all of the following conditions:

a. Controls for the auxiliary resistance heating are configured to lock out the supplemental heat when the outdoor air temperature is above 32°F, unless the hot water supply temperature setpoint to the building heat coils cannot be maintained for 20 minutes.

b. The heat pump controls are configured to use the compressor as the first stage of heating down to an outdoor temperature of 17°F or lower.

c. The heat pump rated heating capacity at 32°F entering water conditions is no less than 2 times greater than supplemental electric resistance heating capacity.

10. **Small systems.** Buildings in which electric resistance or fossil fuel appliances, including decorative appliances, either provide less than 5 percent of the total building HVAC system heating capacity or serve less than 5 percent of the *conditioned floor area*.

11. **Specific conditions.** Portions of buildings that require fossil fuel or electric resistance space heating for specific conditions *approved* by the *code official* for research, health care, process or other specific needs that cannot practicably be served by heat pump or other space heating systems. This does not constitute a blanket exception for any occupancy type.

12. **Kitchen exhaust.** Make-up air for commercial kitchen exhaust systems required to be tempered by Section 508.1.1 of the International Mechanical Code is permitted to be heated using electric resistance appliances.

13. **District energy.** Steam or hot water district energy systems that utilize fossil fuels as their primary source of heat energy, that serve multiple buildings, and that were already in existence prior to the effective date of this code, including more energy-efficient upgrades to such existing systems, are permitted to serve as the primary heating energy source.

14. **Heat tape.** Heat tape is permitted where it protects water-filled equipment and piping located outside of the *building thermal envelope*, provided that it is configured and controlled to be automatically turned off when the outside air temperature is above 40°F.

15. **Temporary systems.** Temporary electric resistance heating systems are permitted where serving future tenant spaces that are unfinished and unoccupied, provided that the heating equipment is sized and controlled to achieve interior space temperatures no higher than 40°F.

16. **Emergency generators.** Emergency generators are permitted to use fossil fuels.

17. **Pasteurization.** Electric resistance heat controls are permitted to reset the supply water temperature of hydronic heating systems that serve service water heating heat exchangers during pasteurization cycles of the service hot water storage volume. The hydronic heating system supply water temperature shall be configured to be 145°F or lower during the pasteurization cycle.

C403.2 System design. Mechanical systems shall be designed to comply with Sections C403.2.1 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.

C403.2.1 Zone isolation required. HVAC systems serving ((~~*zones*~~)) areas 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 m^2) 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.

C403.2.2 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 exhaust rates when not required for the preceding uses.

2. Domestic range hood exhaust in Group R occupancies.

3. Exhaust for Group I occupancies.

C403.2.3 Variable flow capacity. For fan and pump motors 5 ((~~7.5~~)) hp and greater including motors in or serving custom and packaged air handlers serving variable air volume fan systems, constant volume fans, parking garage ventilation 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.).

C403.3 Equipment selection. Heating and cooling equipment installed in mechanical systems shall be sized in accordance with Section C403.3.1 and shall be not less efficient in the use of energy than as specified in Section C403.3.2.

C403.3.1 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.

C403.3.2 HVAC equipment performance requirements. Equipment shall meet the minimum efficiency requirements of Tables C403.3.2(1) through ((~~C403.3.2(12)~~)) C403.3.2(13) 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 of 225,000 Btu/h (65 kW) or greater 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 of 225,000 Btu/h (65 kW) or greater, including electric furnaces, that are not located within the *conditioned space* shall have jacket losses not exceeding 0.75 percent of the input rating.

Air-to-water heat pump manufacturers shall report the hourly heating output or heating efficiency with and without defrost operation at 32°F, in addition to meeting the efficiency requirements of Table C403.3.2(13) at the AHRI 550/590 applicable leaving water temperatures. The hourly heating

output or heating efficiency with and without defrost operation shall be documented on the mechanical permit drawings.

Exception:

Heat recovery chillers and air-to-water heat pumps covered under Table C403.3.2(13), are not required to be listed in the AHRI certification program for AHRI 550/590. The equipment heating and cooling efficiency ratings shall be supported by data furnished by the manufacturer at AHRI 550/590 conditions. Where multiple rating conditions or performance requirements are provided, the equipment shall satisfy all stated requirements.

Bellingham Informative Note: Table C403.3.2.(13) is from ASHRAE 90.1-2019. At the time of the adoption of the 2018 SEC there were no air-to-water heat pumps or heat recovery chillers listed in the AHRI Certified Product Directory. https://www.ahridirectory.org/ According to AHRI 550/590 Section 5.3, "Full and part-load application ratings shall include the range of Rating Conditions listed in Table 2 or be within the operating limits of the equipment."

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.~~))

TABLE 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	

EQUIPMENT TYPE	SIZE CATEGORY	HEATING SECTION TYPE	SUBCATEGORY OR RATING CONDITION	MINIMUM EFFICIENCY	TEST PROCEDURE[a]
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	AHRI 340/360
		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 11.0 IEER	

TABLE C403.3.2(1)A (continued)

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, 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 340/360
		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	

EQUIPMENT TYPE	SIZE CATEGORY	HEATING SECTION TYPE	SUBCATEGORY OR RATING CONDITION	MINIMUM EFFICIENCY	TEST PROCEDURE[a]
	≥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 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 C403.3.2(1)B

MINIMUM EFFICIENCY REQUIREMENTS: ELECTRICALLY OPERATED VARIABLE REFRIGERANT FLOW AIR CONDITIONERS

Equipment Type	Size Category	Heating Section Type	Sub-Category 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
	≥65,000 Btu/h and <135,000 Btu/h	Electric Resistance (or none)	VRF Multi-split System	11.2 EER 15.5 IEER	
	≥135,000 Btu/h and <240,000 Btu/h	Electric Resistance (or none)	VRF Multi-split System	11.0 EER 14.9 IEER	
	≥240,000 Btu/h	Electric Resistance (or none)	VRF Multi-split System	10.0 EER ((~~13.9 EER~~)) 13.9 IEER	

TABLE 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	Sub-Category 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 14.6 IEER	
	≥65,000 Btu/h and <135,000 Btu/h	Electric Resistance (or none)	VRF Multi-split System with Heat Recovery	10.8 EER 14.4 IEER	
	≥135,000 Btu/h and <240,000 Btu/h	Electric Resistance (or none)	VRF Multi-split System	10.6 EER 13.9 IEER	
	≥135,000 Btu/h and <240,000 Btu/h	Electric Resistance (or none)	VRF Multi-split System with Heat Recovery	10.4 EER 13.7 IEER	
	≥240,000 Btu/h	Electric Resistance (or none)	VRF Multi-split System	9.5 EER 12.7 IEER	

Equipment Type	Size Category	Heating Section Type	Sub-Category or Rating Condition	Minimum Efficiency	Test Procedure
	≥240,000 Btu/h	Electric Resistance (or none)	VRF Multi-split System with Heat Recovery	9.3 EER 12.5 IEER	
VRF Water source (cooling mode)	<65,000 Btu/h	All	VRF Multi-split systems 86ºF entering water	12.0 EER 16.0 IEER	AHRI 1230
	<65,000 Btu/h	All	VRF Multi-split systems with Heat Recovery 86ºF entering water	11.8 EER 15.8 IEER	
	≥65,000 Btu/h and <135,000 Btu/h	All	VRF Multi-split System 86ºF entering water	12.0 EER 16.0 IEER	
	≥65,000 Btu/h and <135,000 Btu/h	All	VRF Multi-split System with Heat Recovery 86ºF entering water	11.8 EER 15.8 IEER	
	≥135,000 Btu/h and <240,000 Btu/h	All	VRF Multi-split System 86ºF entering water	10.0 EER 14.0 IEER	
	≥135,000 Btu/h and <240,000 Btu/h	All	VRF Multi-split System with Heat Recovery 86ºF entering water	9.8 EER 13.8 IEER	
	≥240,000 Btu/h	All	VRF Multi-split System 86ºF entering water	12.0 IEER	
	≥240,000 Btu/h	All	VRF Multi-split System with Heat Recovery 86ºF entering water	11.8 IEER	

TABLE C403.3.2(1)C (continued)

MINIMUM EFFICIENCY REQUIREMENTS: ELECTRICALLY OPERATED VARIABLE REFRIGERANT FLOW AIR-TO-AIR AND APPLIED HEAT PUMPS

Equipment Type	Size Category	Heating Section Type	Sub-Category or Rating Condition	Minimum Efficiency	Test Procedure
VRF Groundwater source (cooling mode)	<135,000 Btu/h	All	VRF Multi-split System 59ºF entering water	16.2 EER	AHRI 1230
	<135,000 Btu/h	All	VRF Multi-split System with Heat Recovery 59ºF entering water	16.0 EER	
	≥135,000 Btu/h	All	VRF Multi-split System 59ºF entering water	13.8 EER	
	≥135,000 Btu/h	All	VRF Multi-split System with Heat Recovery 59ºF entering water	13.6 EER	
VRF Ground source (cooling mode)	<135,000 Btu/h	All	VRF Multi-split System 77ºF entering water	13.4 EER	AHRI 1230
	<135,000 Btu/h	All	VRF Multi-split System with Heat Recovery 77ºF entering water	13.2 EER	
	≥135,000 Btu/h	All	VRF Multi-split System 77ºF entering water	11.0 EER	
	≥135,000 Btu/h	All	VRF Multi-split System with Heat Recovery 77ºF entering water	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 47ºF db/43ºF wb outdoor air 17ºF db/15ºF wb outdoor air	3.3 COP 2.25 COP	
	≥135,000 Btu/h (cooling capacity)	- - -	VRF Multi-split System 47ºF db/43ºF wb outdoor air 17ºF db/15ºF wb outdoor air	3.2 COP 2.05 COP	

Equipment Type	Size Category	Heating Section Type	Sub-Category or Rating Condition	Minimum Efficiency	Test Procedure
VRF Water source (heating mode)	<135,000 Btu/h (cooling capacity)	---	VRF Multi-split System 68ºF entering water	4.3 COP	AHRI 1230
	≥135,000 Btu/h and <240,000 Btu/h (cooling capacity)	---	VRF Multi-split System 68ºF entering water	4.0 COP	
	≥240,000 Btu/h (cooling capacity)	---	VRF Multi-split System 68ºF entering water	3.9 COP	
VRF Groundwater source (heating mode)	<135,000 Btu/h (cooling capacity)	---	VRF Multi-split System 50ºF entering water	3.6 COP	AHRI 1230
	≥135,000 Btu/h (cooling capacity)	---	VRF Multi-split System 50ºF entering water	3.3 COP	
VRF Ground source (heating mode)	<135,000 Btu/h (cooling capacity)	---	VRF Multi-split System 32ºF entering water	3.1 COP	AHRI 1230
	≥135,000 Btu/h (cooling capacity)	---	VRF Multi-split System 32ºF entering water	2.8 COP	

TABLE 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 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, groundwater (cooling mode)	< 135,000 Btu/h	All	59°F entering water	18.0 EER	
Brine to air, ground loop (cooling mode)	< 135,000 Btu/h	All	77°F entering water	14.1 EER	
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	
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
		—	Single Package	8.0 HSPF	
Through-the-wall, (air cooled, heating mode)	≤30,000 Btu/h[b] (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)	—	47ºF db/43ºF wb Outdoor Air	3.3 COP	AHRI 340/360
			17ºF db/15ºF wb Outdoor Air	2.25 COP	
	≥ 135,000 Btu/h (cooling capacity)	—	47ºF db/43ºF wb Outdoor Air	3.2 COP	

			17ºF db/15ºF wb Outdoor Air	2.05 COP	

TABLE C403.3.2(2) (continued)

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]
Water 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, groundwater (heating mode)	< 135,000 Btu/h (cooling capacity)	—	50°F entering water	3.7 COP	
Brine to air, ground loop (heating mode)	< 135,000 Btu/h (cooling capacity)	—	32°F entering fluid	3.2 COP	
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	
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 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 C403.3.2(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	
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	11.0 EER	AHRI 390
	≥65,000 Btu/h and < 135,000 Btu/h	95°F db/ 75°F wb outdoor air	11.0 EER	

	≥135,000 Btu/h and < 240,000 Btu/h	95°F db/ 75°F wb outdoor air	11.0 EER	
SPVHP (cooling mode)	< 65,000 Btu/h	95°F db/ 75°F wb outdoor air	11.0 EER	
	≥65,000 Btu/h and < 135,000 Btu/h	95°F db/ 75°F wb outdoor air	11.0 EER	
	≥135,000 Btu/h and < 240,000 Btu/h	95°F db/ 75°F wb outdoor air	11.0 EER	

TABLE C403.3.2(3) (continued)

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]
SPVHP (heating mode)	<65,000 Btu/h	47°F db/ 43°F wb outdoor air	3.3 COP	AHRI 390
	≥65,000 Btu/h and < 135,000 Btu/h	47°F db/ 43°F wb outdoor air	3.3 COP	
	≥135,000 Btu/h and < 240,000 Btu/h	47°F db/ 43°F wb outdoor air	3.3 COP	
Room air conditioners, with louvered sides	< 6,000 Btu/h	—	11.0 CEER	ANSI/AHA-MRAC-1
	≥6,000 Btu/h and < 8,000 Btu/h	—	11.0 CEER	
	≥8,000 Btu/h and < 14,000 Btu/h	—	10.9 CEER	
	≥14,000 Btu/h and < 20,000 Btu/h	—	10.7 CEER	
	≥20,000 Btu/h and < 25,000 Btu/h	---	9.4 CEER	
	≥25,000 Btu/h	—	9.0 CEER	
Room air conditioners, without louvered sides	<6,000 Btu/h	--	10.0 CEER	
	≥6,000 Btu/h and < 8,000 Btu/h	--	10.0 CEER	
	≥ 8,000 Btu/h < 11,000 Btu/h	—	9.6 CEER	
	≥11,000 Btu/h and < 14,000 Btu/h	—	9.5 CEER	
	≥ 14,000 Btu/h and < 20,000 Btu/h		9.3 CEER	
	≥20,000 Btu/h	—	9.4 CEER	
Room air-conditioner heat pumps with louvered sides	< 20,000 Btu/h	—	9.8 CEER	ANSI/AHA-MRAC-1
	≥20,000 Btu/h	—	9.3 CEER	
Room air-conditioner heat pumps without louvered sides	< 14,000 Btu/h	—	9.3 CEER	
	≥14,000 Btu/h	—	8.7 CEER	
Room air conditioner casement only	All capacities	—	9.5 CEER	
Room air conditioner casement-slider	All capacities	—	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 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.

TABLE C403.3.2(4)

WARM AIR FURNACES AND COMBINATION WARM AIR FURNACES/AIR-CONDITIONING UNITS,

WARM AIR DUCT FURNACES AND UNIT HEATERS, MINIMUM EFFICIENCY REQUIREMENTS

SDCI Informative Note: See Section C403.1.4 for restrictions on use of electric resistance and fossil fuel-fired HVAC heating equipment.

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	—	80% AFUE or 80%*Et*[c]	DOE 10 CFR Part 430 or ANSI Z21.47
	≥225,000 Btu/h	Maximum capacity[c]	80%*Et*[f]	ANSI Z21.47
Warm air furnaces, oil fired	< 225,000 Btu/h	—	83% AFUE or 80%*Et*[c]	DOE 10 CFR Part 430 or UL 727
	≥ 225,000 Btu/h	Maximum capacity[b]	81%*Et*[g]	UL 727
Warm air duct furnaces, gas fired	All capacities	Maximum capacity[b]	80%*Ec*	ANSI Z83.8
Warm air unit heaters, gas fired	All capacities	Maximum capacity[b]	80%*Ec*	ANSI Z83.8
Warm air unit heaters, oil fired	All capacities	Maximum capacity[b]	80%*Ec*	UL 731

For SI: 1 British thermal unit per hour = 0.2931 W.

a. Chapter 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. *Et* = Thermal efficiency. See test procedure for detailed discussion.

e. *Ec* = Combustion efficiency (100% less flue losses). See test procedure for detailed discussion.

f. *Ec* = 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. *Et* = 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*.

TABLE C403.3.2(5)

MINIMUM EFFICIENCY REQUIREMENTS: GAS- AND OIL-FIRED BOILERS

SDCI Informative Note: See Section C403.1.4 for restrictions on use of electric resistance and fossil fuel-fired HVAC heating equipment.

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 CFR Part 430
		≥ 300,000 Btu/h and ≤ 2,500,000 Btu/h[b]	80% *Et*	10 CFR Part 431
		> 2,500,00 Btu/h[a]	82% *Ec*	
	Oil-fired[c]	< 300,000 Btu/h[e]	84% AFUE	10 CFR Part 430

		≥ 300,000 Btu/h and ≤ 2,500,000 Btu/h[b]	82% *Et*	10 CFR Part 431
		> 2,500,000 Btu/h[a]	84% *Ec*	
Boilers, steam	Gas-fired	< 300,000 Btu/h[d]	80% AFUE	10 CFR Part 430
	Gas-fired- all, except natural draft	≥ 300,000 Btu/h and ≤ 2,500,000 Btu/h[b]	79% *Et*	10 CFR Part 431
		> 2,500,000 Btu/h[a]	79% *Et*	
	Gas-fired-natural draft	≥ 300,000 Btu/h and ≤ 2,500,000 Btu/h[b]	79% *Et*	
		> 2,500,000 Btu/h[a]	79% *Et*	
	Oil-fired[c]	< 300,000 Btu/h	82% AFUE	10 CFR Part 430
		≥ 300,000 Btu/h and ≤ 2,500,000 Btu/h[b]	81% *Et*	10CFR Part 431
		> 2,500,000 Btu/h[a]	81% *Et*	

For SI: 1 British thermal unit per hour = 0.2931 W.

Ec = Combustion efficiency (100 percent less flue losses). *Et* = 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.

TABLE C403.3.2(6)

RESERVED

TABLE C403.3.2(7)

MINIMUM EFFICIENCY REQUIREMENTS:

WATER CHILLING PACKAGES[a, b]

EQUIPMENT TYPE	SIZE CATEGORY	UNITS	PATH A		PATH B		TEST PROCEDURE[c]
			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, electrical 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, 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	

Keys for Table C403.3.2(7)

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.

Footnotes for Table C403.2.3(7)

a. ((~~The centrifugal chiller equipment requirements, after adjustment in accordance with Section C403.3.2.2 or Section C403.3.2.3, do not apply to chillers used in low-temperature applications where the design leaving fluid temperature is less than 36ºF. The requirements do not apply to positive displacement chillers with leaving fluid temperatures less than or equal to 32ºF. The requirements do not apply to absorption chillers with design leaving fluid temperatures less than 40ºF.~~)) The requirements for air-cooled, water-cooled positive displacement, and absorption chillers are at standard rating conditions defined in the reference test procedure. The requirements for centrifugal chillers shall be adjusted for nonstandard rating conditions per Section C403.2.3.1 and are only applicable for the range of conditions listed there.

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 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(8)

MINIMUM EFFICIENCY REQUIREMENTS:

HEAT REJECTION EQUIPMENT

EQUIPMENT TYPE[a]	TOTAL SYSTEM HEAT REJECTION CAPACITY AT RATED CONDITIONS	SUBCATEGORY OR RATING CONDITION[i]	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	≥ 40.2 gpm/hp	CTI ATC-105 and CTI STD-201 RS
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 RS

Propeller or axial fan closed circuit cooling towers	All	102°F Entering Water 90°F Leaving Water 75°F Entering wb	≥ 16.1 gpm/hp	CTI ATC-105S and CTI STD-201 RS
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 RS
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.

b. 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 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 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 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, if 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.

TABLE C403.3.2(9)

MINIMUM EFFICIENCY REQUIREMENTS: AIR CONDITIONERS AND CONDENSING UNITS SERVING COMPUTER ROOMS AND DATA CENTERS

Equipment Type	Net Sensible Cooling Capacity	Standard Model	Minimum Net Sensible COP_C Return Air Dry-Bulb Temperature/ Dew-Point Temperature			Test Procedure
			Class 1	Class 2	Class 3	
			75°F/52°F	85°F/52°F	95°F/52°F	
Air cooled	<65,000 Btu/h	Downflow unit	2.09	2.30	2.45	AHRI 1360
		Upflow unit—ducted		2.10		
		Upflow unit—unducted				
		Horizontal-flow unit				
	≥ 65,000 Btu/h and < 240,000 Btu/h	Downflow unit	1.99	2.20	2.35	
		Upflow unit—ducted		2.05		
		Upflow unit—unducted				
		Horizontal-flow unit				
	≥ 240,000 Btu/h	Downflow unit	1.79	2.00	2.15	
		Upflow unit—ducted		1.85		
		Upflow unit—unducted				
		Horizontal-flow unit				
Water cooled	<65,000 Btu/h	Downflow unit	2.25	2.50	2.70	AHRI 1360
		Upflow unit—ducted		2.30		
		Upflow unit—unducted				
		Horizontal-flow unit				
	≥ 65,000 Btu/h and < 240,000 Btu/h	Downflow unit	2.15	2.40	2.60	
		Upflow unit—ducted		2.20		
		Upflow unit—unducted				
		Horizontal-flow unit				
	≥ 240,000 Btu/h	Downflow unit	2.05	2.25	2.45	
		Upflow unit—ducted		2.10		
		Upflow unit—unducted				
		Horizontal-flow unit				
Water cooled with fluid economizer	<65,000 Btu/h	Downflow unit	2.20	2.45	2.60	AHRI 1360
		Upflow unit—ducted		2.25		
		Upflow unit—unducted				
		Horizontal-flow unit				
	≥ 65,000 Btu/h and < 240,000 Btu/h	Downflow unit	2.10	2.35	2.55	
		Upflow unit—ducted		2.15		
		Upflow unit—unducted				
		Horizontal-flow unit				
	≥ 240,000 Btu/h	Downflow unit		2.20		

		Upflow unit—ducted Upflow unit—unducted Horizontal-flow unit	2.00	2.05	2.40	

TABLE C403.3.2(9) (continued)

MINIMUM EFFICIENCY REQUIREMENTS: AIR CONDITIONERS AND CONDENSING UNITS SERVING COMPUTER ROOMS AND DATA CENTERS

Equipment Type	Net Sensible Cooling Capacity	Standard Model	Minimum Net Sensible COP_C Return Air Dry-Bulb Temperature/ Dew-Point Temperature			Test Procedure
			Class 1 75°F/52°F	Class 2 85°F/52°F	Class 3 95°F/52°F	
Glycol cooled	<65,000 Btu/h	Downflow unit	2.00	2.30	2.40	AHRI 1360
		Upflow unit—ducted		2.10		
		Upflow unit—unducted				
		Horizontal-flow unit				
	≥ 65,000 Btu/h and < 240,000 Btu/h	Downflow unit	1.85	2.05	2.15	
		Upflow unit—ducted		1.85		
		Upflow unit—unducted				
		Horizontal-flow unit				
	≥ 240,000 Btu/h	Downflow unit	1.75	1.95	2.10	
		Upflow unit—ducted		1.80		
		Upflow unit—unducted				
		Horizontal-flow unit				
Glycol cooled with fluid economizer	<65,000 Btu/h	Downflow unit	2.00	2.25	2.35	AHRI 1360
		Upflow unit—ducted		2.10		
		Upflow unit—unducted				
		Horizontal-flow unit				
	≥ 65,000 Btu/h and < 240,000 Btu/h	Downflow unit	1.75	1.95	2.10	
		Upflow unit—ducted		1.80		
		Upflow unit—unducted				
		Horizontal-flow unit				
	≥ 240,000 Btu/h	Downflow unit	1.70	1.90	2.10	
		Upflow unit—ducted		1.80		
		Upflow unit—unducted				
		Horizontal-flow unit				

TABLE 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

a. Chapter 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

EQUIPMENT TYPE	SUBCATEGORY OR RATING CONDITION	MINIMUM EFFICIENCY	TEST PROCEDURE
Air cooled (dehumidification mode)		4.0 ISMRE	AHRI 920
Air source heat pumps (dehumidification mode)		4.0 ISMRE	AHRI 920
Water cooled (dehumidification mode)	Cooling tower condenser water	4.9 ISMRE	AHRI 920
	Chilled water	6.0 ISMRE	
Air source heat pump (heating mode)		2.7 ISCOP	AHRI 920
Water source heat pump (dehumidification mode)	Ground source, closed loop	4.8 ISMRE	AHRI 920
	Ground-water source	5.0 ISMRE	
	Water source	4.0 ISMRE	
Water source heat pump (heating mode)	Ground source, closed loop	2.0 ISCOP	AHRI 920
	Ground-water source	3.2 ISCOP	
	Water source	3.5 ISCOP	

TABLE C403.3.2(12)

MINIMUM EFFICIENCY REQUIREMENTS: ELECTRICALLY OPERATED DX-DOAS UNITS, SINGLE-PACKAGE AND REMOTE CONDENSER, WITH ENERGY RECOVERY

EQUIPMENT TYPE	SUBCATEGORY OR RATING CONDITION	MINIMUM EFFICIENCY	TEST PROCEDURE
Air cooled (dehumidification mode)		5.2 ISMRE	AHRI 920
Air source heat pumps (dehumidification mode)		5.2 ISMRE	AHRI 920
Water cooled (dehumidification mode)	Cooling tower condenser water	5.3 ISMRE	AHRI 920
	Chilled water	6.6 ISMRE	
Air source heat pump (heating mode)		3.3 ISCOP	AHRI 920
Water source heat pump (dehumidification mode)	Ground source, closed loop	5.2 ISMRE	AHRI 920
	Ground-water source	5.8 ISMRE	
	Water source	4.8 ISMRE	
Water source heat pump (heating mode)	Ground source, closed loop	3.8 ISCOP	AHRI 920
	Ground-water source	4.0 ISCOP	
	Water source	4.8 ISCOP	

Table C403.3.2(13) [f, g, h, i]

Heat Pump and Heat Recovery Chiller Packages – Minimum Efficiency Requirements

Equipment Type	Size Category ($tons_R$)	Cooling only Operation Cooling Efficiency[a] (Air EER FL/IPLV-Btu/W-h) Water Source Power Input per Capacity FL/IPLV-(kW/ton_R)		Heating Operation									Test Procedure
				Heating Source Conditions (Entering/ leaving water) or OAT (db/wb) °F	Heat Pump Heating Full Load Efficiency (COP_H)[ab] (W/W)				Heat Recovery Chiller Full Load Efficiency Full Load Efficiency (COP_{HR})[b,c] (W/W) Simultaneous Cooling and Heating Full Load Efficiency (COP_{SHC})[b] (W/W)				
					Leaving Heating Water Temperature				Leaving Heating Water Temperature				
					Low	Medium	High	Boost	Low	Medium	High	Boost	
		Path A	Path B		105°F	120°F	140°F	140°F	105°F	120°F	140°F	140°F	
Air Source	All sizes	≥9.595 FL ≥13.02 IPLV.IP	-≥9.215 FL ≥15.01 IPLV.IP	47 db 43 wb[d]	≥3.290	≥2.770	≥2.310	NA	NA	NA	NA	NA	AHRI 550/590
		≥9.595 FL ≥13.30 IPLV.IP	≥9.215 FL ≥15.30 IPLV.IP	17 db 15 wb[d]	≥2.230	≥1.950	≥1.630	NA	NA	NA	NA	NA	
Water Source electrically operated positive displacement	< 75	≤0.7885 FL ≤0.6316 IPLV.IP	≤0.7875 FL ≤0.5145 IPLV.IP	54/44[e]	≥4.640	≥3.680	≥2.680	NA	≥8.330	≥6.410	≥4.420	NA	AHRI 550/590
				75/65[e]	NA	NA	NA	≥3.550	NA	NA	NA	6.150	
	≥75 and <150	≤0..7579 FL ≤0.5895 IPLV.IP	≤0.7140 FL ≤0.4620 IPLV.IP	54/44[e]	≥4.640	≥3.680	≥2.680	NA	≥8.330	≥6.410	≥4.420	NA	
				75/65[e]	NA	NA	NA	≥3.550	NA	NA	NA	6.150	
	≥150 and <300	≤0.6947 FL ≤0.5684 IPLV.IP	≤0.7140 FL ≤0.4620 IPLV.IP	54/44[e]	≥4.640	≥3.680	≥2.680	NA	≥8.330	≥6.410	≥4.420	NA	
				75/65[e]	NA	NA	NA	≥3.550	NA	NA	NA	6.150	
	≥300 and <600	≤0.6421 FL ≤0.5474 IPLV.IP	≤0.6563 FL ≤0.4305 IPLV.IP	54/44[e]	≥4.930	≥3.960	≥2.970	NA	≥8.900	≥6.980	≥5.000	NA	
				75/65[e]	NA	NA	NA	≥3.900	NA	NA	NA	6.850	
	≥600	≤0.5895 FL ≤0.5263 IPLV.IP	≤0.6143 FL ≤0.3990 IPLV.IP	54/44[e]	≥4.930	≥3.960	≥2.970	NA	≥8.900	≥6.980	≥5.000	NA	
				75/65[e]	NA	NA	NA	≥3.900	NA	NA	NA	6.850	
Water source electrically operated centrifugal	< 75	≤0.6421 FL ≤0.5789 IPLV.IP	≤0.7316 FL ≤0.4632 IPLV.IP	54/44[e]	≥4.640	≥3.680	≥2.680	NA	≥8.330	≥6.410	≥4.420	NA	AHRI 550/590
				75/65[e]	NA	NA	NA	≥3.550	NA	NA	NA	6.150	
	≥75 and <150	≤0.5895 FL ≤0.5474 IPLV.IP	≤0.6684 FL ≤0.4211 IPLV.IP	54/44[e]	≥4.640	≥3.680	≥2.680	NA	≥8.330	≥6.410	≥4.420	NA	
				75/65[e]	NA	NA	NA	≥3.550	NA	NA	NA	6.150	
	≥150 and <300	≤0.5895 FL ≤0.5263 IPLV.IP	≤0.6263 FL ≤0.4105 IPLV.IP	54/44[e]	≥4.640	≥3.680	≥2.680	NA	≥8.330	≥6.410	≥4.420	NA	
				75/65[e]	NA	NA	NA	≥3.550	NA	NA	NA	6.150	

	≥300 and <600	≤0.5895 FL ≤0.5263 IPLV.IP	≤0.6158 FL ≤0.4000 IPLV.IP	54/44[e]	≥4.930	≥3.960	≥2.970	NA	≥8.900	≥6.980	≥5.000	NA	
				75/65[e]	NA	NA	NA	≥3.900	NA	NA	NA	6.850	
	≥600	≤0.5895 FL ≤0.5263 IPLV.IP	≤0.6158 FL ≤0.4000 IPLV.IP	54/44[e]	≥4.930	≥3.960	≥2.970	NA	≥8.900	≥6.980	≥5.000	NA	
				75/65[e]	NA	NA	NA	≥3.900	NA	NA	NA	6.850	

Table ©ASHRAE, www.ashrae.org. Used with permission from 2019 ASHRAE Standard 90.1

Footnotes::

a. Cooling-only rating conditions are standard rating conditions defined in AHRI 550/590, Table 1.
b. Heating full-load rating conditions are at rating conditions defined in AHRI 550/590, Table 1.
c. For water-cooled heat recovery chillers that have capabilities for heat rejection to a heat recovery condenser and a tower condenser, the COP_{HR} applies to operation at full load with 100% heat recovery (no tower rejection). Units that only have capabilities for partial heat recovery shall meet the requirements of Table 6.8.1-3
d. Outdoor air entering dry-bulb (db) temperature and wet-bulb (wb) temperature.
e. Source-water entering and leaving water temperature.
f. AHRI ratings are not required for equipment sizes larger than those covered by the test standard.
g. Air-to-water heat pumps that are configured to operate only in heating and not in cooling only need to comply with the minimum heating efficiencies.
h. Units that are both an air-to-water heat pump and an heat recovery chiller are required to comply with either the applicable air source efficiency requirements or the heat recovery chiller requirements but not both.
i. Heat pumps and heat recovery chillers are only required to comply with one of the four leaving heating water temperature criteria. The leaving heater water temperature criteria that is closet to the design leaving water temperature shall be utilized.

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 x kW) condenser water flow shall have maximum full-load kW/ton (*FL*) and part-load ratings adjusted using Equations 4-7 and 4-8.

Exception: Centrifugal chillers designed to operate outside of these temperature ranges are not regulated by this section.

$$FL_{adj} = FL/K_{adj}$$

(Equation 4-7)

$$PLV_{adj} = IPLV/K_{adj}$$

(Equation 4-8)

Where:

K_{adj} = A × B

FL = Full-load kW/ton values as specified in Table C403.3.2(7)

FL_{adj} = Maximum full-load kW/ton rating, adjusted for nonstandard conditions

IPLV = Values as specified in Table C403.3.2(7)

PLV_{adj} = Maximum NPLV rating, adjusted for nonstandard conditions.

A = $0.00000014592 \times (LIFT)^4 - 0.0000346496 \times (LIFT)^3 + 0.00314196 \times (LIFT)^2 - 0.147199 \times LIFT + 3.9302$

B = $0.0015 \times L_{vg}^{Evap}$ (°F) + 0.934

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 and not greater than 80°F.

C403.3.2.3 Positive displacement (air- and water-cooled) chilling package. 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 and split system electric heating and cooling equipment. Packaged and split system electric equipment providing both heating and cooling, and cooling-only equipment with electric heat in the main supply duct before VAV boxes, in each case 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% 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.

C403.3.3 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

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.

C403.3.4 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

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

C403.3.5 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 in accordance with 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 complying with Section C403.12 for occupancy classifications 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.
3. Spaces that are within building types not subject to the requirements of Section C403.3.5, and that qualify as accessory occupancies according to Section 508.2 of the International Building Code, are not required to comply with this section.

TABLE C403.3.5

OCCUPANCY CLASSIFICATIONS REQUIRING DOAS

Occupancy Classification[a]	Inclusions	Exempted
A-1	All occupancies not specifically exempted	Television and radio studios
A-2	Casinos (gaming area)	All other A-2 occupancies
A-3	Lecture halls, community halls, exhibition halls, gymnasiums, courtrooms, libraries, places of religious worship	All other A-3 occupancies
A-4, A-5		All occupancies excluded
B	All occupancies not specifically exempted	Food processing establishments including commercial kitchens, restaurants, cafeterias; laboratories for testing and research; data processing facilities and telephone exchanges; air traffic control towers; animal hospitals, kennels, pounds; ambulatory care facilities.
F, H, I, R, S, U		All occupancies excluded
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~~)) 60 percent enthalpy recovery effectiveness in accordance with Section C403.7.6. 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:
   a. complying with Section C403.7.6,
   b. served by equipment less than 5000 cfm,
   c. with an average occupant load ((~~greater than 25~~)) 15 people or greater per 1000 square feet (93 m^2) of floor area (as established in Table 403.3.1.1 of the *International Mechanical Code*),
   d. 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, and
   e. smaller than 650 square feet.
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.
3. The energy recovery systems for R-1 and R-2 occupancies are permitted to provide 60 percent minimum sensible heat recovery effectiveness in lieu of 60 percent enthalpy recovery effectiveness. The return/exhaust air stream temperature for heat recovery device selection shall be 70°F or as determined by an *approved* calculation procedure.

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 set point dead band (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 of the requirements of Section 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.

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.

Bellingham Informative Note. When an H/ERV (heat recovery ventilator or energy recovery ventilator) that is rated and listed in accordance with HVI 920 is used to comply with the "sensible recovery effectiveness" requirement in Section C403.3.6 or C403.7.6 Exception 2, use the product's Adjusted Sensible Recovery Efficiency (ASRE) at 32°F, as listed in the HVI Section 3 H/ERV Directory. Select the ASRE for a flow rate that is no less than the design flow rate, or interpolate between two listed flow rates. HVI refers to the Home Ventilating Institute.

C403.3.7 Hydronic System flow rate. Chilled water and condenser water piping shall be designed such that the design flow rate in each pipe segment shall not exceed the values listed in Table C403.3.7 for the appropriate total annual hours of operation. Pipe sizes for systems that operate under variable flow conditions (e.g. modulating 2-way control valves at coils) and that contain variable speed pump motors are permitted to be selected from the “Variable Flow/ Variable Speed” columns. All others shall be selected from the “Other” columns.

EXCEPTION. Design flow rates exceeding the values in Table C403.3.7 are permitted in specific sections of pipe if the pipe is not in the critical circuit at design conditions and is not predicted to be in the critical circuit during more than 30 percent of operating hours.

SDCI Informative Note. The flow rates listed here do not consider noise or erosion. Lower flow rates are often recommended for noise sensitive locations.

TABLE C403.3.7

PIPING SYSTEM DESIGN MAXIMUM FLOW RATE IN GPM[1]

Pipe Size	<= 2000 hours/yr		>2000 and <= 4400 hours/year		> 4400 hours/year	
(in)	Other	Variable Flow/ Variable Speed	Other	Variable Flow/ Variable Speed	Other	Variable Flow/ Variable Speed
2 1/2	120	180	85	130	68	110
3	180	270	140	210	110	170
4	350	530	260	400	210	320
5	410	620	310	470	250	370
6	740	1100	570	860	440	680
8	1200	1800	900	1400	700	1100
10	1800	2700	1300	2000	1000	1600
12	2500	3800	1900	2900	1500	2300

1. There are no requirements for pipe sizes smaller than the minimum size or larger than the maximum size shown in the table.

C403.4 HVAC system controls. 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.

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 set points and dead bands 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.~~)) Where an interior zone and a perimeter zone are open to each other with permanent openings larger than 10 percent of the floor area of either zone, cooling in the interior zone is permitted to operate at times when the perimeter zone is in heating and the interior zone temperature is at least 5°F (2.8°C) higher than the perimeter zone temperature. For the purposes of this exception, a permanent opening is an opening without doors or other operable closures.

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 control. Heat pumps equipped with internal electric resistance heaters shall have controls that prevent supplemental heater operation when the heating load can be met by the heat pump alone during both steady-state operation and setback recovery. Supplemental heater operation is permitted during outdoor coil defrost cycles. Heat pumps equipped with supplementary heaters shall comply with all conditions of Section C403.1.4,

Exception. Heat pumps whose minimum efficiency is regulated by NAECA and whose ratings meet the requirements shown in Table C403.3.2(2) and include all usage of internal electric resistance heating.

((~~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.~~))

C403.4.1.2 Dead band. Where used to control both heating and cooling, *zone* thermostatic controls shall be configured to provide a temperature range or dead band 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 Set point 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 set point and to maintain a dead band 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 set point 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 set point 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.

C403.4.2 Off-hour controls. For all occupancies other than Group R and for *conditioned spaces* other than *dwelling unit*s within Group R occupancies, 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 manually 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 set point and increase the cooling temperature set point 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.

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 C403.4.3.1 through 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.

403.4.3.1 Three-pipe system. Hydronic systems that use a common return system for both hot water and chilled water are prohibited.

C403.4.3.2 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.

C403.4.3.3 Hydronic (water loop) heat pump systems. Hydronic heat pump systems shall comply with Sections C403.4.3.3.1 through C403.4.3.3.3.

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.

C403.4.3.3.2 Heat rejection. 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, either 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.

C403.4.3.3.3 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 C403.4.6.

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 a 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

Climate Zones 4c, 5b	VSD Required for Motors with Rated Output of at Least
Heating Water Pumps	≥7.5 HP
Chilled water and Heat Rejection Loop Pumps	≥7.5 HP

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.

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; or
   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; or
   2.3. Reset directly by an integral controller based on the relationship between variable speed controller frequency and power.

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 2 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.

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 (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:

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 dead band 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 (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 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 dead band configured to at least 5°F in accordance with Section C403.4.1.2.

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.

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 units 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 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

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, C403.4.3, C403.5, and C403.6.8:

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.

C403.4.12 Pressure Independent Control Valves. Where design flow rate of heating water and chilled water coils is 10 GPM or higher, modulating pressure independent control valves shall be provided.

C403.5 Economizers. *Air economizer*s 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.

Exception: Economizers are not required for the systems listed below:

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~~)) where an economizer would 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(3).

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. Dedicated outdoor air systems that include energy recovery as required by Section C403.7.6 but that do not include mechanical cooling.

10. 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.

11. Equipment used to cool any dedicated server room, electronic equipment room, elevator machine room or telecom switch room provided the system complies with Option a, b, ((~~or~~)) c, d or e in ((~~the table~~)) Table C403.5(11) below. The total cooling capacity of all fan systems qualifying under this exception 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.

12. Medical and laboratory equipment that is directly water-cooled and is not dependent upon space air temperature.

Table C403.5(11)
Server room, electronic equipment room or telecom room cooling equipment

	Equipment Type	Higher Equipment Efficiency	Part-Load Control	Economizer
Option a	Tables C403.3.2(1) and C403.3.2(2)[a]	+15%[b]	Required over 85,000 Btu/h[c]	None Required
Option b	Tables C403.3.2(1) and C403.3.2(2)[a]	+5%[d]	Required over 85,000 Btu/h[c]	Water-side Economizer[e]
Option c	ASHRAE Standard 127[f]	+0%[g]	Required over 85,000 Btu/h[c]	Water-side Economizer[e]
Option d	Table C403.3.2(7)[h]	+ 25%[i]	Required for all chillers[j]	None Required
Option e	Table C403.3.2(7)[h]	+ 10/15%[k]	Required over 85,000 Btu/h[c]	Dedicated waterside Economizer[e]

((~~Notes for Exception 11~~)) Footnotes for Table C403.5(11):

a. For 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~~)) the higher equipment efficiency, part-load control and economizer requirements of the row in which this footnote is located, including the associated footnotes (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).

b. The cooling equipment shall have an SEER/EER value and an IEER/IPLV value that each is a minimum of 15 percent greater than the value listed in Tables C403.3.2(1) and C403.3.2(2).

c. For 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).

d. The cooling equipment shall have an SEER/EER value and an IEER/IPLV value that each is a minimum of 5 percent greater than the value listed in Tables C403.3.2(1) and C403.3.2(2).

e. The system shall include a *water economizer* in lieu of *air economizer*. *Water economizer*s shall meet the requirements of Sections 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 non-dedicated condenser water system exists that can provide appropriate water temperatures during hours when water-side economizer cooling is available.

f. For a system where all cooling equipment is subject to ASHRAE Standard 127, the system shall comply with the higher equipment efficiency, part-load control, and economizer requirements of the row in which this footnote is located, including the associated footnotes.

g. The cooling equipment subject to ASHRAE Standard 127 shall have an ((~~EER value and an IPLV~~)) SCOP value that is ((~~equal or~~)) a minimum of 10 percent greater than the value listed in Tables C403.3.2(1) and C403.3.2(2) (1.10 x values in these tables) when determined in accordance with the rating conditions in 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.

h. For a system with chillers subject to the AHRI standards listed in Table C403.3.2(7) (e.g., a chilled water system with fan coil units), the system shall comply with the higher equipment efficiency, part-load control and economizer requirements of the row in which this footnote is located, including the associated footnotes.

i. The cooling equipment shall have an full-load EER value and an IPLV value that is a minimum of 25 percent greater than the value listed in Table C403.3.2(7) (1.25 x value in Table C403.3.2(7) or a full-load and IPLV kW/ton that is at least 25 percent lower than the value listed in Table C403.3.2(7) (0.75 x value in Table C403.3.2(7)).

j. For all chillers, 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 and that result 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, or dual tandem scrolls, but hot gas bypass is not a qualifying compressor unloading system).

k. For air-cooled chillers, the cooling equipment shall have an IPLV EER value that is a minimum of 10 percent greater than the IPLV EER value listed in Table C403.3.2(7) (1.10 x values in Table C403.3.2(7). For water-cooled chillers, the cooling equipment shall have an IPLV kW/ton that is at least 15 percent lower than the IPLV kW/ton value listed in Table C403.3.2(7) (0.85 x values in Table C403.3.2(7)).

TABLE C403.5(3)
EQUIPMENT EFFICIENCY PERFORMANCE EXCEPTION FOR ECONOMIZERS

Climate Zone	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.

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% of full load

For SI: 1 Btu/h = 0.2931 W

a. For *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.

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.

C403.5.3. Air economizers. *Air economizer*s 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 mechanical cooling equipment and shall not be controlled by only mixed air temperature. *Air economizer*s 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 economizer*s 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 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°F	Outdoor air temperature exceeds 75°F	T_{OA} > 70°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°F
Fixed enthalpy with fixed dry-bulb temperatures	h_{OA} > 28 Btu/lb[a] or T_{OA} > 75°F	Outdoor air enthalpy exceeds 28 Btu/lb of dry air[a] or outdoor temperature exceeds 75°F	h_{OA} > 26 Btu/lb[a] or T_{OA} > 70°F	Outdoor air enthalpy exceeds 26 Btu/lb of dry air[d] or outdoor temperature exceeds 70°F

Differential enthalpy with fixed dry-bulb temperatures	$h_{OA} > h_{RA}$ or $T_{OA} > 75°F$	Outdoor air enthalpy exceeds return air enthalpy oroutdoor temperature exceeds 75°F	$h_{OA} > (h_{RA} - 2)$ or $T_{OA} > 70°F$	Outdoor air enthalpy exceeds return air enthalpy or outdoor temperature exceeds 70°F

For SI: °C = (°F - 32) × 5/9, 1 Btu/lb = 2.33 kJ/kg.

a. At 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.

b. Devices with selectable set point shall be capable of being set to within 2°F and 2 Btu/lb of the set point listed.

c. Where fans cycle on only to provide heating and cooling, limits are adjusted lower to compensate for fan energy use in economizer mode.

d. For 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% 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 C403.7.8.

C403.5.4 Water-side economizers. Water-side 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 configured to cool supply air by indirect evaporation and providing up to 100 percent of the expected system cooling load at *outdoor air* temperatures of not greater than 50°F dry-bulb (10°C dry-bulb)/45°F wet-bulb (7.2°C wet-bulb.

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 economizer*s.

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 water-side 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.

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 ±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 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.

C403.6 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 thirty percent of the maximum supply air for other systems.

2. Systems with DDC where items 2.1 through 2.3 apply.

   2.1 The airflow rate in the dead band 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 set point up to a maximum set point while the airflow is maintained at the dead band flow rate.

   2.3 The second stage of heating modulates the airflow rate from the dead band 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 rate required 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 complying with Section C403.3.5, DOAS, with ventilation rates complying 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 (75%) 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.
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 set point 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 set point is no greater than 1.2 inches w.c. (299 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.

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 in addition to the applicable requirements of Sections C403.8.6 through C403.8.8. This exception shall not be used as a substitution for a DOAS per Section C406.6 or C406.7. <

1. Each VAV system must serve a minimum of 3,000 square feet (278.7 m^2) 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 (4645 m^2) unless a single floor is greater than 50,000 square feet (4645 m^2) 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 set point of 50 percent or greater of the maximum primary airflow set point shall be sized with an inlet velocity of no greater than 900 feet per minute. 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. <
9. 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 set point shall be configured to exceed the value required to provide the required ventilation air**.**

10. 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.

11. When in occupied heating or in occupied dead band between heating and cooling all fan powered VAV terminal units shall be configured to reset the primary air supply set point, based on the VAV air handling unit outdoor air vent fraction, to the minimum ventilation airflow required per *International Mechanical Code*.
12. Spaces that are larger than 150 square feet (14 m^2) and with an occupant load greater than or equal to ((~~25~~)) 15 people per 1000 square feet (93 m^2) 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:
    12.1. A dedicated VAV terminal unit capable of controlling the space temperature and minimum ventilation shall be provided.
    12.2. *Demand control ventilation* (DCV) shall be provided that utilizes a carbon dioxide sensor to reset the ventilation set point of the VAV terminal unit from the design minimum to design maximum ventilation rate as required by Chapter 4 of the *International Mechanical Code*.
    12.3. Occupancy sensors shall be provided that are configured to reduce the minimum ventilation rate to zero and setback room temperature set points by a minimum of 5°F, for both cooling and heating, when the space is unoccupied.
13. Dedicated *data center*s, *computer rooms*, electronic equipment rooms, telecom rooms, or other similar spaces with cooling loads greater than 5 watts/ft^2 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 C403.5 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.

14. HVAC system central heating or cooling plant will include a minimum of one of the following options:
    14.1. 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 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 (48.9°C) for peak anticipated heating load conditions.
    14.2. Chilled water VAV air handing 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.
15. The DDC system shall include a fault detection and diagnostics (FDD) system complying with the following:
    15.1. The following temperature sensors shall be permanently installed to monitor system operation:
        15.1.1. Outside air.
        15.1.2. Supply air.
        15.1.3. Return air.

15.2. 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).

15.3. The VAV air handling unit controller shall be configured to provide system status by indicating the following:

15.3.1. Free cooling available.

15.3.2. Economizer enabled.

15.3.3. Compressor enabled.

15.3.4. Heating enabled.

15.3.5. Mixed air low limit cycle active.

15.3.6. The current value of each sensor.

15.4. 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.

15.5. The VAV air handling unit shall be configured to report faults to a fault management application able to be accessed by day-to-day operating or service personnel or annunciated locally on zone thermostats.

15.6. 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:

15.6.1. Command VAV terminal unit primary air inlet valve closed and verify that primary airflow goes to zero or other *approved* means to verify that the VAV terminal unit damper actuator and flow ring are operating properly.

15.6.2. Command VAV thermal unit primary air inlet valve to design airflow and verify that unit is controlling to with 10% of design airflow.

15.7. 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:

15.7.1. Supply air temperature set point reset to lowest supply air temperature set point for cooling operation.

15.7.2. Supply air duct static pressure set point reset for the highest duct static pressure set point allowable.

15.8. The FDD system shall be configured to detect the following faults:

15.8.1. Air temperature sensor failure/fault.

15.8.2. Not economizing when the unit should be economizing.

15.8.3. Economizing when the unit should not be economizing.

15.8.4. Outdoor air or return air damper not modulating.

15.8.5. Excess outdoor air.

15.8.6. VAV terminal unit primary air valve failure.

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.

C403.7.1 Demand control ventilation. *Demand control ventilation* (DCV) shall be provided for spaces larger than 500 square feet (46 m^2) and with an occupant load greater than or equal to ((~~25~~)) 15 people per 1000 square feet (93 m^2) 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.
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 Section 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).~~)) Spaces, including but not limited to dining areas, where more than 75 percent of the space design outdoor airflow is transfer air required for makeup air supplying an adjacent commercial kitchen.

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.

7. Dormitory sleeping areas.

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 m^2) of floor area (as established in Table 403.3.1.1 of the *International Mechanical Code*) that are larger than 500 square feet (46 m^2) 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.

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.

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 set point controls. Controls shall be provided on each HVAC system that are capable of and configured to automatically raise the cooling set point and lower the heating set point by not less than 4°F (2°C) from the occupant set point within 30 minutes after the occupants have left the guestroom. The controls shall be capable of and configured to *automatically* raise the cooling set point to not lower than 80°F (27°C) and lower the heating set point 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 set points to default occupied set points 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 set point 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 pre-occupancy 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.

C403.7.5 Enclosed loading dock, motor vehicle repair garage and parking garage exhaust ventilation system controls. Mechanical ventilation systems for enclosed loading docks, motor vehicle repair garages 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. ((~~Garage~~)) Parking garages, repair 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 operate continuously during unoccupied hours at the minimum ventilation rate required by Section 404 of the International Mechanical Code and shall be activated to the full required ventilation rate 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 to activate the full required ventilation rate.

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~~)) 60 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.

Bellingham Informative Note: In Bellingham, the energy recovery effectiveness is determined typically by the winter heat recovery condition. See example below for how the minimum supply air enthalpy leaving the energy recovery media is calculated for the winter condition:

1. In Bellingham, the winter outdoor design air temperature is 19°F as specified in Appendix C. The registered design professional shall determine the coincident winter wet bulb temperature or percent relative humidity at the anticipated design conditions. Based on these conditions the outdoor design air enthalpy is determined from a psychrometric chart.

2. Determine the return/exhaust air stream enthalpy from a psychrometric chart based on the 70°F (21°C) at 30 percent relative humidity.

3. Calculate the 60% difference between the outside air and return air enthalpies at design winter conditions.

4. See example below:

a. OA Enthalpy at 19°F / 18°F (drybulb / wetbulb) = 8.2 BTU/LB

b. RA/EA Enthalpy at 70°F and 30% RH = 21.9 BTU/LB

c. SA Enthalpy Minimum Leaving Energy Recovery Media

= (8.2 + (21.9 – 8.2)*60%)

= 16.42 BTU/LB

(Note that this example represents 60% enthalpy recovery. For an equivalent sensible-only recovery system, it would take 73.9% effectiveness (increasing from 24°F DB to 58°F DB) to achieve the same enthalpy recovery.)

Exceptions:

1. The energy recovery systems for occupancy type I-2 hospitals, medical office buildings, and buildings that primarily consist of technical laboratory spaces, are permitted to provide a change of enthalpy of the outdoor air and return air of not less than 50 percent of the difference between the outdoor air and return air enthalpies, at design conditions. These occupancies are also permitted to utilize exception #3.

2. The energy recovery systems for R-1 and R-2 occupancies shall have a 60 percent minimum sensible heat recovery effectiveness, in lieu of 60 percent enthalpy recovery effectiveness. The

return/exhaust air stream temperature for heat recovery device selection shall be 70°F (21°C), or as calculated by the registered design professional.

3. 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 capable of reducing 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 set point, cooled to no cooler than 3°F (1.7°C) below room set point, 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 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. Multi-zone systems where the supply airflow rate is less than the values specified in Tables C403.7.6(1) and C403.7.6(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)

CLIMATE ZONE	PERCENT (%) OUTDOOR AIR AT FULL DESIGN AIRFLOW RATE							
	≥ 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 C403.7.6.1(2)

ENERGY RECOVERY REQUIREMENT

(VENTILATION SYSTEMS OPERATING NOT LESS 8,000 HOURS PER YEAR)

CLIMATE ZONE	PERCENT (%) OUTDOOR AIR AT FULL DESIGN AIRFLOW RATE							
	≥ 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

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:

1. Where not less than 75 percent of all the replacement air is transfer air that would otherwise be exhausted.
2. UL 710 listed exhaust hoods that have a design maximum exhaust flow 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.
3. 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 (2,360 L/s) shall include heat recovery systems to preconditioned replacement 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 C403.5.

Exceptions:

1. Variable air volume laboratory exhaust and room supply systems configured to reduce exhaust and make-up air volume to 50% or less of design values; or
2. Direct make-up (auxiliary) air supply equal to at least 75% 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% 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:

$$Q_{ER} \geq Q_{MIN}$$

$$Q_{MIN} = CFM_S \times (T_R - T_O) \times 1.1 \times 0.6$$

$$Q_{ER} = CFM_S \times (T_R - T_O) \times 1.1(A+B)/100$$

Where:

Q_{MIN} = Energy recovery at 60% 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

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 space*s 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.

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 stairway 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~~)) 300 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~~)) 300 cfm (189 L/s).

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 I dampers shall have a maximum leakage rate of 4 cfm/ft^2 (20.3 L/s x m^2) 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/ft^2 where not less than 24 inches (610 mm) in either dimension and 40 cfm/ft^2 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 approve 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 (189 L/s) 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. <

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 (3.7kW) 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 the allowable fan motor horsepower requirements, but must meet the requirements of Section C405.8 for fractional hp fan motors.

TABLE C403.8.1(1)

FAN POWER LIMITATION

	LIMIT	CONSTANT VOLUME	VARIABLE VOLUME
Option 1: Fan system motor nameplate hp	Allowable nameplate motor hp	$hp \le CFM_S \times 0.0011$	$hp \le CFM_S \times 0.0015$
Option 2: Fan system bhp	Allowable fan system bhp	$bhp \le CFM_S \times 0.00094 + A$	$bhp \le CFM_S \times 0.0013 + A$

For SI: 1 bhp = 735.5 W, 1 hp = 745.5 W, 1 cfm = 0.471 L/s.

where:

CFM_S = The maximum design supply airflow rate to *conditioned space*s 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* × CFMD / 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
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 heating	-0.2 inch w.c.

For SI: 1 inch w.c. = 249 Pa, 1 inch.= 25.4 mm.

w.c. .= water column, NC = Noise criterion.

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 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.

8. Fans and fan arrays having a fan energy index (FEI) of not less than 1.00, or 0.95 for VAV systems, at the design point of operation, as determined in accordance with AMCA 208 by an approved, independent testing laboratory and labeled by the manufacturer. The FEI for fan arrays shall be calculated in accordance with AMCA 208 Annex C.

C403.8.4 Group R occupancy ((~~exhaust~~)) ventilation 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 at one or more rating points. Air flow shall be tested in accordance with HVI (Home Ventilating Institute) Standard 916 and listed. Fan efficacy shall be listed or shall be derived from listed power and airflow. Fan efficacy for fully ducted HRV, ERV, balanced, and in-line fans shall be determined at a static pressure of not less than 0.2 inch w.c. Fan efficacy for other exhaust fans shall be determined at a static pressure of not less than 0.1 inch w.c.

.

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 rood 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 ((~~Minimum~~)) (cfm)
Exhaust fan: Bathroom, utility room, whole house	((~~10~~))	2.8	< 90
Exhaust fan: Bathroom, utility room, whole house	((~~90~~))	3.5	((~~Any~~)) ≥ 90
In-line (single-port and multi-port) fans	((~~Any~~))	3.8	Any
ERV, HRV or balanced fan		1.2	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	≥ ¼ hp	Any

◄

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 use 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).

Cooling towers serving chilled water systems shall be selected to maintain a return condenser water temperature to the tower of 86°F (30°C) or less at peak design conditions.

EXCEPTION: In existing buildings where physical constraints preclude a change from the original design, replacement cooling towers of the same or smaller capacity are exempt from this requirement.

Single-pass water cooling systems that use domestic water only one time before dumping it to waste shall not be used for hydronic heat pump and other cooling and refrigeration equipment, including but not limited to icemakers and walk-in coolers.

EXCEPTIONS:

1. Replacement of existing icemakers is exempt from this requirement.
2. Use of single-pass cooling for medical and dental equipment during power outages and other emergencies is exempt from this requirement.

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.

1. **Exceptions**: 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 <u>on-site solar thermal or</u> site recovered energy.

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~~)) <u>heat</u> 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 ft^2 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. The required heat recovery system shall have the capacity to provide the smaller of:

1. 60 percent of the peak heat rejection load at design conditions; or
2. 50 percent of the sum of the service water heating load plus space heating load.

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 (DOAS).

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. *

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	
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 $h \cdot ft^2 \cdot °F/Btu$, 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:

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

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

TABLE C403.10.1.2

SUPPLY, RETURN, EXHAUST, and RELIEF AIR DUCTWORK INSULATION

Duct system	Duct Location and Use	Climate Zone	Minimum Installed Duct Insulation *R*-value [a,b]	Notes
Supply Air or Return Air	Outside the building (outdoors and exposed to weather)[c]	4C	R-8	See Section C403.10.1.2 for details
Supply Air or Return Air	Outside the building (outdoors and exposed to weather)[c]	5B	R-12	See Section C403.10.1.2 for details
Supply Air or Return Air	Unconditioned space (enclosed but not in the building conditioned envelope)	4C and 5B	R-6	See Section C403.10.1.2 for details
Supply Air or Return Air	Unconditioned space where the duct conveys air that is within 15°F of the air temperature of the surrounding unconditioned space	4C and 5B	R-3.3	See IMC Section 603.12 for additional requirements for condensation control at ductwork
Supply Air or Return Air	Where located in a building envelope assembly	4C and 5B	R-16	Duct or plenum is separated from building envelope assembly with 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 $h \cdot ft^2 \cdot °F/Btu$, 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*. For the purposes of this section, longitudinal seams are joints oriented in the direction of airflow. Transverse joints are connections of two duct sections oriented perpendicular to airflow. Duct wall penetrations are openings made by any screw, fastener, pipe, rod or wire. All other connections are considered transverse joints, including but not limited to spin-ins, taps and other branch connections, access door frames and jambs, and duct connections to equipment.

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 ((~~C403.2.10.1~~)) 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 and exterior duct systems. Ducts designed to operate at static pressures equal to or greater than 3 inches water gauge (w.g.) (750 Pa) and all supply and return ductwork located outside the *building thermal envelope* that serves a *conditioned space* shall be

insulated and sealed in accordance with Section ((~~C403.2.10.1~~)) 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, regardless of the Design Construction Pressure Class level, as determined in accordance with Equation 4-9. Ducts shall be tested using a pressure equal to the average operating pressure or the design Duct Construction Pressure Class level in accordance with the SMACNA HVAC Air Duct Leakage Test Manual.

$$CL = F/P^{0.65} \qquad \textbf{(Equation 4-9)}$$

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, other than refrigerant 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 · ft² · °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 11/2 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.

c. For direct-buried heating and hot water system piping, reduction of these thicknesses by 11/2 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~~)) Adhesive tape shall not be permitted.

C403.10.4 Insulation of refrigerant piping. Refrigerant piping, other than piping factory installed in HVAC equipment shall have minimum 1/2-inch insulation within conditioned spaces and 1-inch insulation outside of conditioned spaces, at a conductivity rating of 0.21 to 0.26 Btu x in/(h x ft^2 x °F) with a mean temperature rating of 75°F.

C403.11 Mechanical systems located outside of the building thermal envelope. Mechanical systems providing heat outside of the thermal envelope of a building shall be configured to comply with Section C403.11.1 through C403.11.3.

C403.11.1 Heating outside a building or in unheated spaces. Systems installed to provide heat outside a building or in unheated spaces 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 in the area heated by each individual device for a period not to exceed 20 minutes.

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 shut off when the outdoor temperature 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.

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~~)) option 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 403.3 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 m^2) and with an occupant load greater than or equal to 25 people per 1000 square feet (93 m^2) 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 set point 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 setback room temperature set points 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 handing 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 are 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, Et, 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 ±2°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 able to be accessed by day-to-day operating or service personnel or annunciated 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.

C403.14 Compressed air and vacuum air. Compressed air and vacuum air systems shall comply with all of the following:

EXCEPTION: Compressed air and vacuum air systems used for medical purposes are exempt from this section.

1. Air Compressors (50-150 PSI), General: Air compressors operating at 50-150 PSI shall comply with the following:
   a. All water drains shall be “no air loss” drains.
   b. Timed unheated desiccant air driers shall not be allowed.
2. Rotary Screw Air Compressors over 10 hp (50-150 PSI): Rotary screw air compressors over 10 hp operating at 50-150 PSI shall not rely on modulation control and shall have one of the following:
   a. Receiver capacity greater than three gallons per cfm to allow efficient load/unload control;
   b. Variable speed drive controlled air compressor; or
   c. Multiple air compressors using a smaller trim-air compressor to trim. The trim compressor shall use variable speed drive control, or shall use load/unload control with greater than three gallon receiver capacity per cfm for the trim air compressor.

C403.15 Commercial food service. The following types of equipment within the scope of the applicable Energy Star program shall comply with the energy-efficiency and water-efficiency criteria required to achieve the Energy Star label:

a. Commercial fryers: Energy Star Program Requirements for Commercial Fryers.
b. Commercial hot food holding cabinets: Energy Star Program Requirements for Hot Food Holding Cabinets.
c. Commercial steam cookers: Energy Star Program Requirements for Commercial Steam Cookers.
d. Commercial dishwashers: Energy Star Program Requirements for Commercial Dishwashers.

SECTION C404

SERVICE WATER HEATING AND PRESSURE-BOOSTER SYSTEMS

C404.1 General. This section covers the minimum efficiency of, and controls for, service water-heating equipment and insulation of service hot water piping.

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 intended to be used to provide space heating shall meet the applicable provisions of Table C404.2.

TABLE C404.2

MINIMUM PERFORMANCE OF WATER-HEATING EQUIPMENT

EQUIPMENT TYPE	SIZE CATEGORY (input)	SUBCATEGORY OR RATING CONDITION	PERFORMANCE REQUIRED[a, b]	TEST PROCEDURE
Water heaters, electric	≤ 12 kW[d]	Tabletop[e], ≥20 gal and <120 gal	0.93 – 0.00132*V, EF*	DOE 10 CFR Part 430
		Resistance ≥20 gal and ≤55 gal	0.960 - 0.0003*V*, EF	
		Grid-enabled[f] >75 gal and ≤120 gal	1.06-0.00168*V*, EF	
	> 12 kW[d]	Resistance ≥20 gal	(0.3 + 27/V_m), %/h[g]	Section G.2 of ANSI Z21.10.3
	≤ 24 amps and ≤ 250 volts	Heat pump	2.057 – 0.00113*V*, EF	DOE 10 CFR Part 430
Instantaneous water heaters, electric	All	Resistance	0.93 - 0.00132*V*, EF	DOE 10 CFR Part 430

TABLE C404.2 (continued)

MINIMUM PERFORMANCE OF WATER-HEATING EQUIPMENT

EQUIPMENT TYPE	SIZE CATEGORY (input)	SUBCATEGORY OR RATING CONDITION	PERFORMANCE REQUIRED[a, b]	TEST PROCEDURE
Storage water heaters, gas	≤ 75,000 Btu/h	≥ 20 gal and ≤ 55 gal	0.675 - 0.0015*V*, EF	DOE 10 CFR Part 430
		>55 gal and ≤100 gal	0.8012 – 0.00078*V*, EF	
	> 75,000 Btu/h	< 4,000 Btu/h/gal	80% E_t (Q/800 +110$\sqrt{V}$)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	0.82 - 0.0019*V*, EF	DOE 10 CFR 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$\sqrt{V}$)SL, Btu/h	
Storage water heaters, oil	≤ 105,000 Btu/h	≥20 gal	0.68 - 0.0019*V*, EF	DOE 10 CFR Part 430
	> 105,000 Btu/h	< 4,000 Btu/h/gal	80% E_t (Q/800 +110$\sqrt{V}$)SL, Btu/h	Section G.1 and G.2 of ANSI Z21.10.3
Instantaneous water heaters, oil	≤ 210,000 Btu/h	≥ 4,000 Btu/h/gal and < 2 gal	0.59 - 0.0019V, EF	DOE 10 CFR 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$\sqrt{V}$)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$\sqrt{V}$)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$\sqrt{V}$)SL, Btu/h	
Pool heaters, gas and oil	All	—	82% E_t	ASHRAE 146
Heat pump pool heaters	All	—	4.0 COP	AHRI 1160
Unfired storage tanks[h]	All	—	Minimum insulation requirement R-12.5 (h x ft^2 x °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.

a. Energy factor (EF) and thermal efficiency (*Et*) are minimum requirements. In the EF equation, *V* is the rated volume in gallons.

b. Standby 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.

c. Instantaneous water heaters with input rates below 200,000 Btu/h must comply with these requirements if the water heater is designed to heat water to temperatures 180°F or higher.

d. Electric water heaters with an input rating of 12kW (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.

e. A 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.

f. A 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 non-water 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 lost from the tank while on standby, expressed as a percentage of the total energy in the stored water per hour.

h. In accordance with Section C404.6.1

C404.2.1 High input-rated service water heating systems for other than Group R-1 and R-2 occupancies. In new buildings where the combined input rating of the water-heating equipment serving other than Group R-1 and R-2 occupancies installed in a building is equal to or greater than 1,000,000 Btu/h (293 kW), the combined input-capacity-weighted-average 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 entering 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 procedures in Table C404.2.

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.

7. Electric instantaneous water heaters that serve toilet room handwashing lavatory faucets or kitchenette sink faucets without service water heating circulation systems and without water storage.

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.

Exceptions:

1. 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 water with a rating of 105% of the rated efficiency of Table C404.2.
    2. Electric Heat Pump (10 CFR Part 430): A heat pump water heater rated in accordance with 10 CFR Part 430 with a rating of 105% of the rated efficiency of Table C404.2.
    3. Electric Heat Pump (not listed in accordance with 10 CFR Part 430): A heat pump water heater not rated in accordance with 10 CFR 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°) 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% 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).

C404.2.3 Group R-1 and R-2 occupancies with central service water heating systems. In buildings with central service water heating systems serving four or more Group R-1 or R-2 dwelling or sleeping units, the primary water heating equipment shall not use fossil fuel combustion or electric resistance. Service hot water shall be provided by an air-source heat pump water heating (HPWH) system meeting the requirements of this section. Supplemental service water heating equipment is permitted to use electric resistance in compliance with Section C404.2.3.4.

Exceptions.

1. Solar thermal, wastewater heat recovery, other *approved* waste heat recovery, ground source heat pump, water-source heat pump system utilizing waste heat, and combinations thereof, are permitted to offset all or any portion of the required HPWH capacity where such systems comply with this code and the Uniform Plumbing Code.
2. Systems meeting the requirements of the Northwest Energy Efficiency Alliance (NEEA) Advanced Water Heater Specifications for central service water heating systems.

Bellingham Informative Note: As of the publication of this code, publication of the NEEA AWHS for central service water heating systems is still pending. See https://neea.org/resources/advanced-water-heating-specification for updated information.

C404.2.3.1 Primary heat pump system sizing. The system shall include a primary service minimum output at 40°F outdoor air temperature that provides sufficient hot water for R-1 and/or R-2 occupancy uses as calculated using the equipment manufacturer's selection criteria or another *approved* methodology. Air source heat pumps shall be sized to deliver no less than 50 percent of the calculated demand for hot water production during the peak demand period when entering air temperature is 19°F.

Exception. 50 percent sizing at 19°F is not required for heat pumps located in a below-grade enclosed parking structure or other ventilated and unconditioned space that is not anticipated to fall below 40°F at any time.

Bellingham Informative Note: Estimates of the appropriate heat pump system sizing and hot water storage volume for HPHW systems, calculated per bedroom or per occupant, vary widely, depending on type of use, output capacity of the heat pumps, and other factors.

C404.2.3.2 Primary hot water storage sizing. The system shall provide sufficient hot water, as calculated using a *approved* methodology, to satisfy peak demand period requirements.

C404.2.3.3. System Design. The service water heating system shall be configured to conform to one of the following provisions.

1. For *single-pass* HPWHs, *temperature maintenance* heating provided for reheating return water from the building's heated water circulation system shall be physically decoupled from the primary service water heating system storage tank(s) in a manner that prevents destratification of the primary system storage tanks. *Temperature maintenance* heating is permitted to be provided by electric resistance or a separate dedicated heat pump system.
2. For *multi-pass* HPWHs, recirculated *temperature maintenance* water is permitted to be returned to the primary water storage tanks for reheating.

C404.2.3.3.1 Mixing valve. A thermostatic mixing valve capable of supplying hot water to the building at the user temperature set point shall be provided, in compliance with requirements of the Uniform Plumbing Code and the HPWH manufacturer's installation guidelines. The mixing valve shall be sized and rated to deliver tempered water in a range from the minimum flow of the *temperature maintenance* recirculation system up to the maximum demand for the fixtures served.

C404.2.3.4. Supplemental Water Heaters. Total supplemental electric resistance water heating equipment shall not have an output capacity greater than the primary water heating equipment at 40°F entering air temperature. Supplemental electric resistance heating is permitted for the following uses:

1. *Temperature maintenance* of heated-water circulation systems, physically separate from the primary service water heating system. *Temperature maintenance* heating capacity shall be no greater than the primary water heating capacity at 40°F.
2. Defrost of compressor coils.
3. Heat tracing of piping for freeze protection or for *temperature maintenance* in lieu of recirculation of hot water.

4. Backup or low ambient temperature conditions, where all of the following are true:

    a. The supplemental heating capacity is no greater than the primary service water heating capacity at 40°F.

    b. During normal operations the supplemental heating is controlled to operate only when the entering air temperature at the air-source HPWH is below 40°F, and the primary HPWH compressor continues to operate together with the supplemental heating when the entering air temperature is between 17°F and 40°F.

    c. The primary water heating equipment cannot satisfy the system load due to equipment failure or entering air temperature below 40°F.

5. Supplemental heating downstream from a *multi-pass* HPWH system.

6. Stand-alone electric water heaters serving single zones not served by the central water heating system.

C404.2.3.5 Alarms. The control system shall be capable of and configured to send *automatic* error alarms to building or maintenance personnel upon detection of equipment faults, low leaving water temperature from primary storage tanks, or low hot water supply delivery temperature to building distribution system.

C404.3 Efficient heated water supply piping. Heated water supply piping shall be in accordance with Section C404.3.1 or C404.3.2. The flow rate through 1/4-inch (6.4 mm) piping shall be not greater than 0.5 gpm (1.9 L/m). The flow rate through 5/16-inch (7.9 mm) piping shall be not greater than 1 gpm (3.8 L/m). The flow rate through 3/8-inch (9.5 mm) piping shall be not greater than 1.5 gpm (5.7 L/m). Water heaters, circulating water systems and heat trace temperature maintenance systems shall be considered sources of heated water.

C404.3.1 Maximum allowable pipe length method. The maximum allowable piping length from the nearest source of heated water to the termination of the fixture supply pipe shall be in accordance with the following. Where the piping contains more than one size of pipe, the largest size of pipe within the piping shall be used for determining the maximum allowable length of the piping in Table C404.3.1.

1. For a public lavatory faucet, use the "Public lavatory faucets" column in Table C404.3.1.
2. For all other plumbing fixtures and plumbing appliances, use the "Other fixtures and appliances" column in Table C404.3.1.

TABLE C404.3.1

PIPING VOLUME AND MAXIMUM PIPING LENGTHS

NOMINAL PIPE SIZE (inches)	VOLUME (liquid ounces per foot length)	MAXIMUM PIPING LENGTH (feet)	
		Public lavatory faucets	Other fixtures and appliances
1/4	0.33	6	50
5/16	0.5	4	50
3/8	0.75	3	50
1/2	1.5	((~~2~~)) 8	43
5/8	2	((~~1~~)) 8	32
3/4	3	0.5	21
7/8	4	0.5	16
1	5	0.5	13
11/4	8	0.5	8
11/2	11	0.5	6
2 or larger	18	0.5	4

C404.3.2 Maximum allowable pipe volume method. The water volume in the piping shall be calculated in accordance with Section C404.3.2.1. The volume from the nearest source of heated water to the termination of the fixture supply pipe shall be as follows:

1. For a public lavatory faucet: Not more than 2 ounces (0.06 L).
2. For other plumbing fixtures or plumbing appliances; not more than 0.5 gallon (1.89 L).

C404.3.2.1 Water volume determination. The volume shall be the sum of the internal volumes of pipe, fittings, valves, meters and manifolds between the nearest source of heated water and the termination of the fixture supply pipe. The volume in the piping shall be determined from the "Volume" column in Table C404.3.1. The volume contained within fixture shutoff valves, within flexible water supply connectors to a fixture fitting and within a fixture fitting shall not be included in the water volume determination. Where heated water is supplied by a recirculating system or heat-traced piping, the volume shall include the portion of the fitting on the branch pipe that supplies water to the fixture.

C404.4 Heat traps for hot water storage tanks. 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~~)) such vertical inlets and outlets or shall have pipe-configured 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.

C404.5 Water heater installation. Electric water heaters in unconditioned spaces or on concrete floors shall be placed on an incompressible, insulated surface with a minimum thermal resistance of R-10.

C404.6 Insulation of piping. Piping from a water heater to the termination of the heated water fixture supply pipe shall be insulated in accordance with Table C403.10.3. On both the inlet and outlet piping of a storage hot water heater or heated water storage tank, the piping to a heat trap or the first 8 feet (2438 mm) of piping, whichever is less, shall be insulated. Piping that is heat traced shall be insulated in accordance with Table C403.10.3 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 Section C404.6.

C404.6.1 Storage tank insulation. Unfired storage tanks used to store service hot water at temperatures above 130°F shall be wrapped with an insulating product, installed in accordance with the insulation manufacturer's instructions and providing a minimum of R-2 additional insulation for every 10°F increase in stored water temperature above 130°F. Such additional insulation is also permitted to be integral to the tank. The insulation is permitted to be discontinuous at structural supports.

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 in a location with *access*. Manual controls shall be *i*n 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. Gravity and thermo-syphon circulation systems shall be prohibited. Controls shall start the pump based on the identification of a demand for hot water within the occupancy, according to the requirements of Sections C404.7.1.1 and C404.7.1.2.

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 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. For heated water circulation systems that have multiple risers and use a variable flow circulation pump, each riser shall have a self-actuating thermostatic balancing valve.

C404.7.1.3 Electronic thermostatic mixing valve (TMV). Where a heated water circulation system utilizes an electronic TMV to control the temperature of hot water supplied to the building, the TMV shall be configured so that it either reverts closed (fully COLD) or maintains its current valve position upon power failure or cessation of circulation flow.

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.

C404.7.3.1 Pipe insulation. For heated water circulation systems, both supply and return pipe insulation shall be at minimum 1.0 inch thicker than that required by Table C403.10.3.

Exception. Where piping is centered within a wall, ceiling, or floor framing cavity with a depth at least 4" greater than the diameter of the pipe and that is completely filled with batt or blown-in insulation, additional pipe insulation is not required.

C404.8 Demand recirculation controls. *Demand recirculation water systems* are not permitted. ((~~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)~~)))

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 unit*s 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 unit*s.
2. Sleeping units.
3. Commercial kitchens.
4. Central laundries.

C404.10 Drain water heat recovery units. Drain water heat recovery units shall comply with CSA B55.2. Potable water-side pressure loss shall be less than 10 psi (69 kPa) at maximum design flow. For Group R occupancies, the efficiency of drain water heat recovery unit efficiency shall be in accordance with CSA B55.1.

C404.11 Energy consumption of pools and permanent spas. 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. Pool water heaters using electric resistance heating as the primary source of heat are prohibited for pools over 2,000 gallons. Heat pump pool heaters shall have a minimum COP of 4.0 at 50°F db, 44.2°F wb outdoor air and 80°F entering water, determined in accordance with ((~~ASHRAE Standard 146~~)) AHRI Standard 1160, Performance Rating of Heat Pump Pool Heaters. Other pool heating equipment shall comply with the applicable efficiencies in Section C404.2.

The electric power to all heaters shall be controlled by 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 methods 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 are required to operate solar- and waste-heat-recovery pool heating systems.

C404.11.3 Covers. Heated pools and in-ground 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. Solar water heating systems not claimed in Section C406.5 or Section C407;
2. Dehumidification heat recovery;
3. Waste heat recovery; or
4. A combination of these system sources capable of and configured to provide at least 70 percent of the heating energy required over an operating season.

C404.12 Energy consumption of portable spas. The energy consumption of electric-powered portable spas shall be controlled by the requirements of APSP 14.

C404.13 Service 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 set point 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. Systems 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.

SECTION C405

ELECTRICAL POWER AND LIGHTING SYSTEMS

C405.1 General. 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. Receptacles shall be controlled according to Section C405.10. *Controlled receptacles* and lighting systems shall be commissioned according to Section C405.12. Solar readiness shall be provided according to Section C411 and renewable energy shall be provided according to Section C412.

Dwelling units within multi-family buildings shall comply with Sections C405.1.1 and C405.7. All other *dwelling unit*s in dormitory, hotel and other residential occupancies that are not classified as multi-family 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 systems* 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.

C405.2 Lighting controls. Lighting systems shall be provided with controls that comply with ((~~one~~)) item 1 or item 2 of the following:

1. Lighting controls as specified in Sections C405.2.1 through C405.2.7. In addition, any contiguous open office area larger than 5,000 square feet shall have its general lighting controlled by either:

   1.1. An enhanced digital lighting control system conforming to the requirements of Section C406.4; or

   1.2. Luminaire-level lighting controls (LLLC) conforming to the requirements in Item 2 of this subsection.

2. *Luminaire level lighting controls (LLLC)* for all areas and lighting controls specified in Sections C405.2.1, C405.2.3 and C405.2.5. The *LLLC ((~~luminaire~~)) luminaires* 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. A maximum of 8 fixtures are permitted to be controlled together to maintain uniform light levels within a single *daylight zone*.

   2.3. For each control strategy, be capable of configuration and re-configuration of performance parameters including: bright and dim set points, timeouts, dimming fade rates, sensor sensitivity adjustments, and wireless zoning configuration.

Exception to Section C405.2: 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. Means of egress illumination serving the exit access that does not exceed ((~~0.02~~)) 0.01 watts per square foot of building area is exempt from this requirement..
3. Emergency egress lighting that is normally off.
4. Industrial or manufacturing process areas, as may be required for production and safety.

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. Lounge/breakrooms.
5. Enclosed offices.
6. Open plan office areas.
7. Restrooms.
8. Storage rooms.
9. Locker rooms.
10. Other spaces 300 square feet (28 m^2) or less that are enclosed by floor-to- ceiling height partitions.
11. Warehouse storage areas.
12. Enclosed fire rated stairways.
13. Service corridors.
14. Covered parking areas.

Occupant sensor controls in warehouse storage areas, stairways, corridors and library stacks shall comply with Section C405.2.1.2. 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 sensors in fire rated stairways shall comply with Section C405.2.1.5. 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 if 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 five 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 20 minutes of all occupants leaving the space.
2. They shall be manual on or shall be 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 entrance* areas and lobbies, <u>parking garages,</u> 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, 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 m^2) 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 m^2) 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*s activate open plan office space general lighting or control zone general lighting only when occupancy for the same area is detected.
5. <u>Lighting controls in open plan office areas larger than 5,000 square feet must also comply with Section C405.2(1).</u>

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 3600 square feet.

   Exceptions:

   4.1 Lighting in daylight transition zones and ramps without parking.

   4.2 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.

C405.2.2 Time switch controls. Each area of the building that is not provided with *occupant sensor controls* or digital timer switch controls complying with Section 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 C405.2.3.1, time-switch controls shall not be required for the following:

1. Spaces where patient care is directly provided.
2. Spaces where an *automatic* shutoff would endanger occupant safety or security.
3. Lighting intended for continuous operation.
4. Shop and laboratory classrooms.

C405.2.2.1 Time switch control function. 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 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~~)) 2,500 square feet (((~~465~~)) 232 m^2).

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 healthcare facilities. In all other spaces, time switch controls are allowed to automatically turn on the lighting to not more than 50 percent power.

Exception: Within mall concourses, auditoriums, sales areas, manufacturing facilities, pools, gymnasiums, skating rinks and sports arenas:

1.1. The time limit shall be permitted to be greater than 2 hours provided the switch is a *captive key device*.

1.2. The area controlled by the override switch shall not be limited to 5,000 square feet (465 m^2) provided that such area is less than 20,000 square feet (1860 m^2).

*

C405.2.3 Manual controls. Stairwells and parking garages are not permitted to use manual switches. All other lighting shall have manual controls complying with the following:

1. They shall be 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 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 reduction 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 in three-lamp luminaires independently of the outer lamps.
4. Switching each luminaire or each lamp.

Exceptions:

1. Light reduction controls are not required in *daylight zone*s 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/m^2).
   2.3. Lighting in corridors, lobbies, electrical rooms, restrooms, storage rooms, airport concourse baggage areas, dwelling and sleeping rooms and mechanical rooms.

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. Sidelit zones as defined in Section C405.2.4.2 with more than two general lighting fixtures within the combined primary and secondary sidelit zones.
2. Toplit zones as defined in Section C405.2.4.3 with more than two general lighting fixtures within the *daylight zone*.

Exception: *Daylight responsive control*s are not required for the following:

1. Spaces in health care facilities where patient care is directly provided.
2. Lighting that is required to have specific application control in accordance with Section C405.2.5.
3. Sidelit zones on the first floor above grade in Group A-2 and Group M occupancies where the *fenestration* adjoins a sidewalk or other outdoor pedestrian area, provided that the light fixtures are controlled separately from the general area lighting.
4. *Daylight zone*s 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 control*s 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 sidelit t zones shall be controlled independently of lights in secondary 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 zone*s provided *uniform illumination* can be achieved.

2. Lights in toplit zones in accordance with Section C405.2.4.3 shall be controlled independently of lights in 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 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 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 m^2) and no more than 60 lineal feet (18.3 m) of facade.
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.
10. *Daylight responsive controls* shall be set initially to activate at 30 footcandles (323 lux) or not more than 110 percent of the illuminance level specified on the construction documents.

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 *automatic* 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 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 zone*s 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 Sidelit zone. The 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 sidelit zone includes the primary and secondary *daylight zone*s. 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 *clerestory fenestration* is located in a wall, the 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 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 zone* shall remain the same lateral area but be located between the clerestory and the obstruction, as indicated in Figure C405.2.4.2(2).
3. If the rough opening area of a vertical fenestration assembly is less than 10 percent of the calculated primary sidelit zone area for this fenestration, it does not qualify as a sidelit zone.
4. The visible transmittance of the fenestration is no less than 0.20.
5. In parking garages with floor area adjacent to perimeter wall openings, the 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.

C405.2.4.3 Toplit zone. The toplit zone is the floor area underneath a roof fenestration assembly which complies with the following:

1. The 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 toplit zones overlap with sidelit zones, lights within the overlapping area shall be assigned to the toplit zone.
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 toplit zone is no less than 0.008.
5. Where located under atrium fenestration, the 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(4). The toplit zone area at the top floor is calculated the same as for a toplit zone. Intermediate levels below the top floor that are not directly beneath the atrium are not included.

FIGURE C405.2.4.2(1)

SIDELIT ZONE ADJACENT TO FENESTRATION IN A WALL

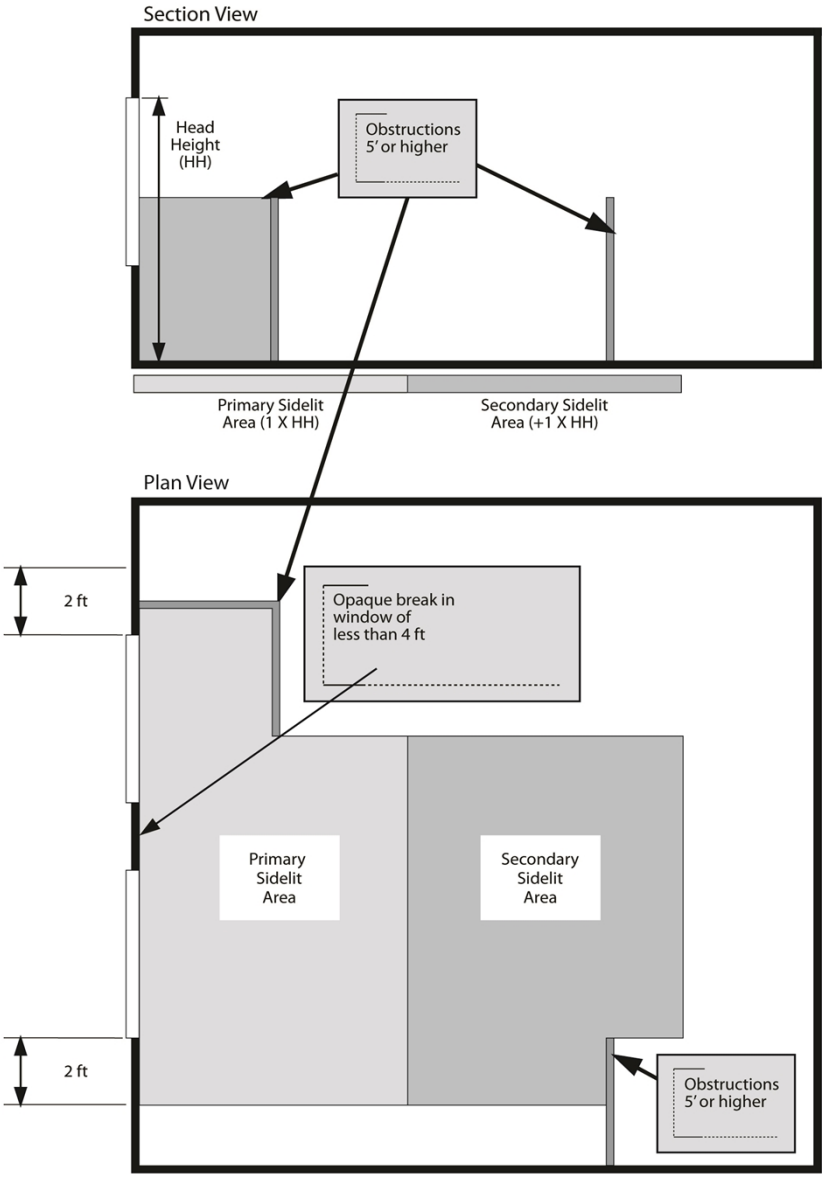
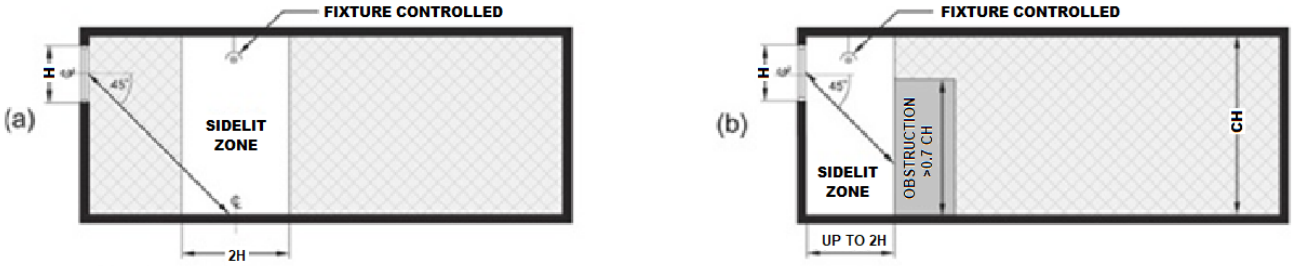


FIGURE C405.2.4.2(2)

SIDELIT ZONE ADJACENT TO CLERESTORY FENESTRATION IN A WALL



(a) Section view
(b) Section view with obstruction

FIGURE C405.2.4.3(1)

TOPLIT ZONE UNDER A ROOFTOP FENESTRATION ASSEMBLY

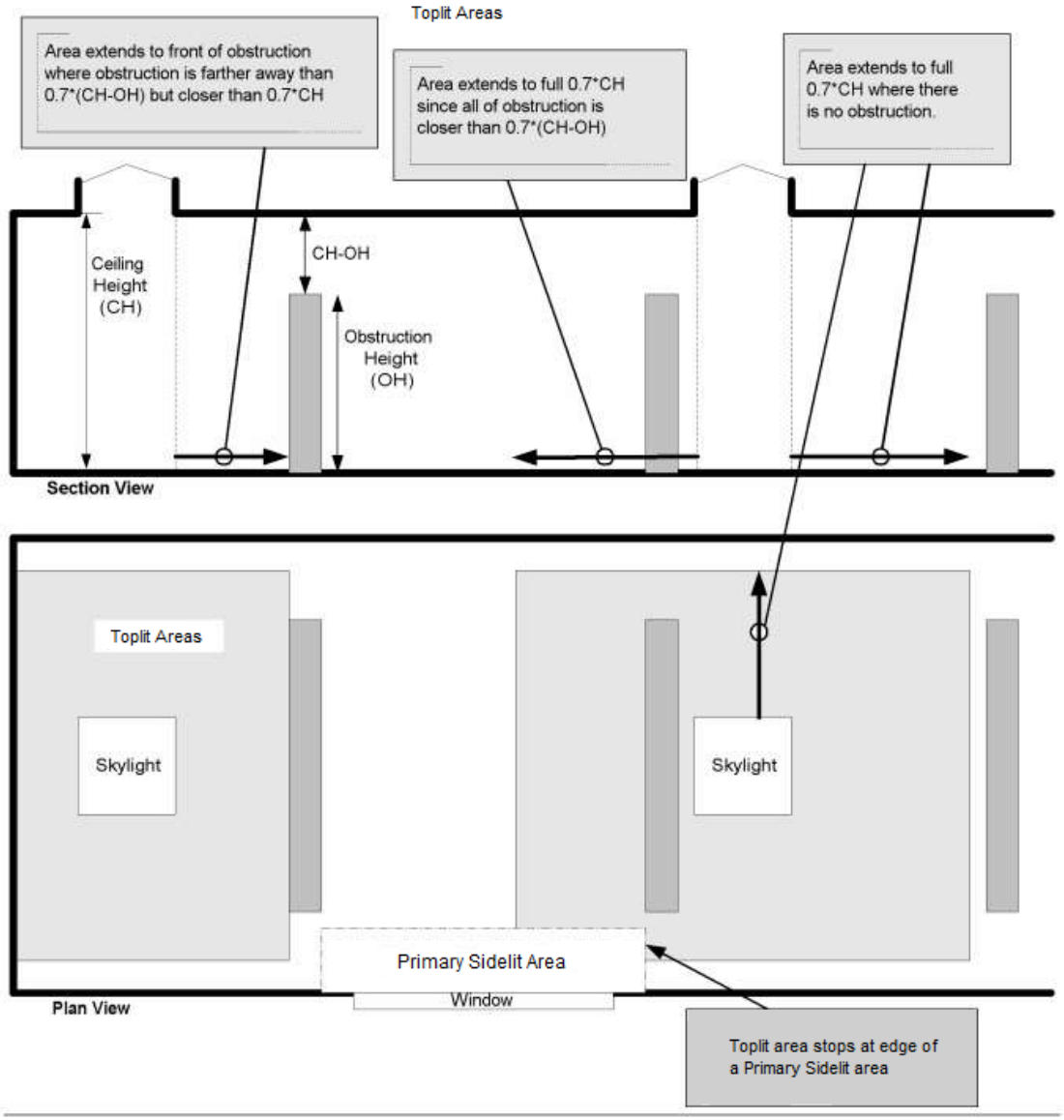
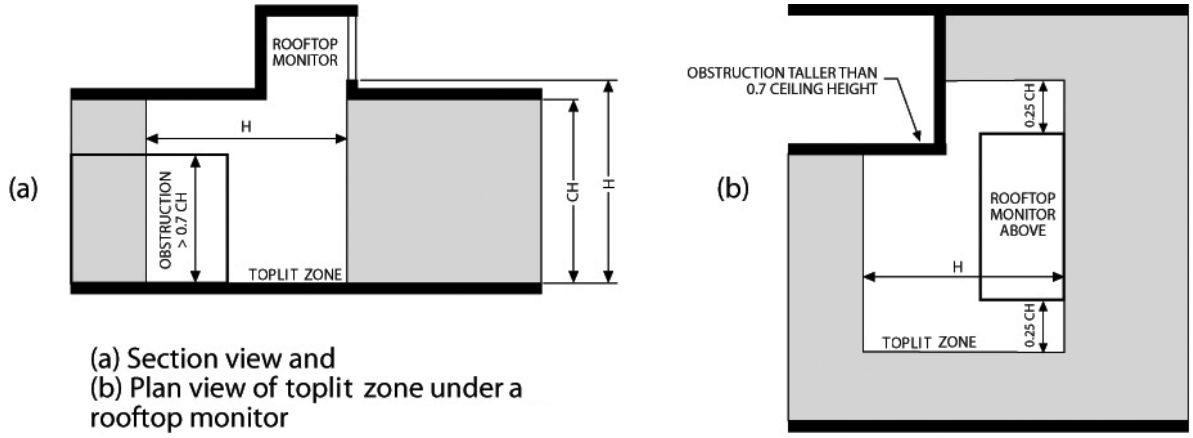


FIGURE C405.2.4.3(2)

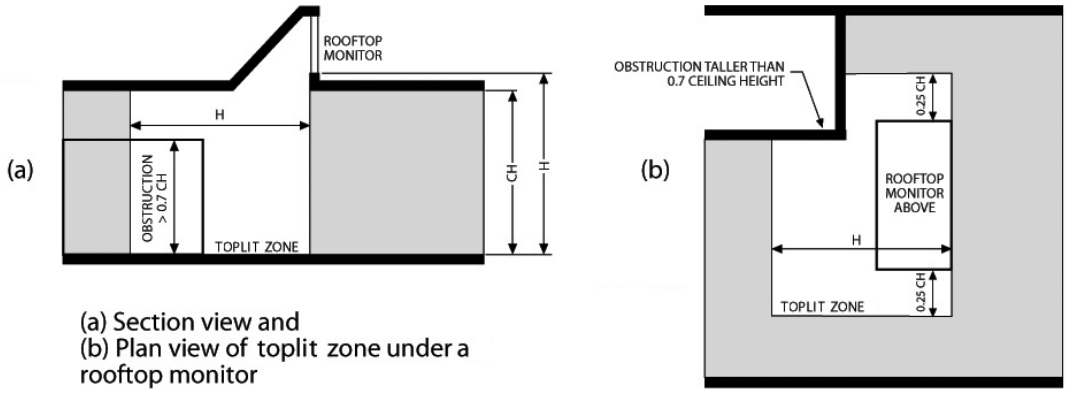
TOPLIT ZONE UNDER A ROOFTOP MONITOR



(a) Section view and
(b) Plan view of toplit zone under a rooftop monitor

FIGURE C405.2.4.3(3)

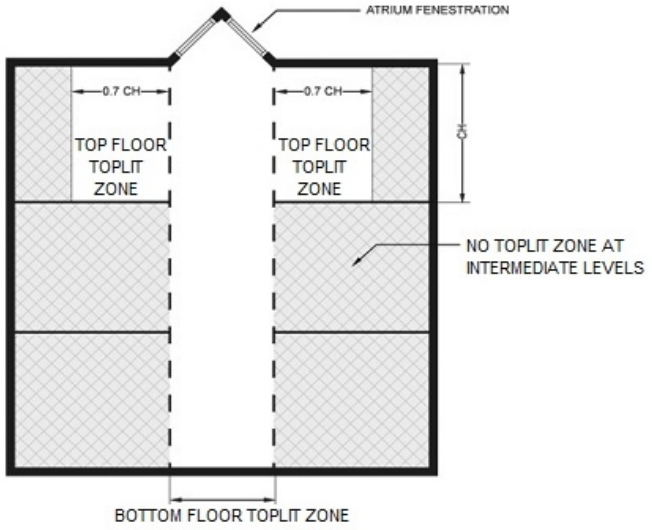
TOPLIT ZONE UNDER A SLOPED ROOFTOP MONITOR



(a) Section view and
(b) Plan view of toplit zone under a rooftop monitor

FIGURE C405.2.4.3(4)

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. The following lighting shall be controlled by an occupant sensor complying with Section C40405.2.3.1

c5.2.1.1 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 devices or systems configured to automatically switch off all permanently installed luminaires and switched receptacles, including those installed within furniture, within 20 minutes after all occupants have left the unit.

Exceptions:
1. Lighting and switched receptacles controlled by card key controls.
2. Spaces where patient care is directly provided.

3. Permanently installed luminaires within *dwelling unit*s shall be provided with controls complying with either Section C405.2.1.1 or C405.2.3.1.

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.~~))

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 emergency 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 unoccupied.

Exception: Means of egress illumination serving the exit access that does not exceed ((~~0.02~~)) 0.01 watts per square foot of building area is exempt from this requirement.

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 unit*s.

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 Facade and landscape lighting shutoff. Building facade and landscape lighting shall be configured to automatically shut off ((~~for a minimum of 6 hours per night or from not later than one hour after business closing to not earlier than one hour before business opening, whichever is less~~)) between midnight or business/facility closing, whichever is later, and 6 a.m. or business/facility opening, whichever is earlier.

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 one hour after business closing to not earlier than one hour before business opening.
3. During any period when no activity has been detected for 15 minutes or more.

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 seven 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.

C405.2.7 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 ft^2.

C405.3 Reserved

C405.4 Interior lighting power requirements. 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.

C405.4.1 Total connected interior lighting power. The total connected interior lighting power shall be determined in accordance with Equation 4-10.

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

(Equation 4-10)

$$TCLP = [LVL + BLL + TRK + POE + \text{Other}]$$

Where:

TCLP = Total connected lighting power (watts)

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 lumen/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 or 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 provided to installed non-lighting devices may be subtracted from the total power rating of the power-over-Ethernet system.

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.

The connected power associated with the following lighting equipment and applications 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~~)) Lighting for plant growth or maintenance where the lamp ((~~efficacy is not less than 90 lumens per watt~~)) has a tested photosynthetic photon efficacy (PPE) per watt of not less than 1.70 micromoles per joule for *greenhouses* and 1.90 micromoles per joule for indoor plant growth spaces.
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.
22. Germicidal lighting that is in addition to and controlled independently from the general lighting.

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 other than covered parking areas 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.

TABLE C405.4.2(1)

INTERIOR LIGHTING POWER ALLOWANCES: BUILDING AREA METHOD

Building Area Type	~~LPD (w/ft²)~~	LPD (w/ft²)
Automotive facility	~~0.64~~	0.58
Convention center	~~0.64~~	0.58
Court house	~~0.79~~	0.71
Dining: Bar lounge/leisure	~~0.79~~	0.71
Dining: Cafeteria/fast food	~~0.72~~	0.65
Dining: Family	~~0.71~~	0.64
Dormitory[a,b]	~~0.46~~	0.41
Exercise center	~~0.67~~	0.60
Fire station[a]	~~0.54~~	0.49
Gymnasium	~~0.75~~	0.68
Health care clinic	~~0.70~~	0.63
Hospital[a]	~~0.84~~	0.84
Hotel/motel[a,b]	~~0.56~~	0.50
Library	~~0.83~~	0.75
Manufacturing facility	~~0.82~~	0.74
Motion picture theater	~~0.44~~	0.40
Multifamily[c]	~~0.41~~	0.37
Museum	~~0.55~~	0.50
Office	~~0.64~~	0.58
Parking garage	~~0.14~~	0.13
Penitentiary	~~0.65~~	0.65
Performing arts theater	~~0.84~~	0.76
Police station	~~0.66~~	0.60
Post office	~~0.65~~	0.59
Religious building	~~0.67~~	0.60

Building Area Type	~~LPD (w/ft²)~~	LPD (w/ft²)
Retail	~~0.84~~	0.76
School/university	~~0.70~~	0.63
Sports arena	~~0.62~~	0.54
Town hall	~~0.69~~	0.62
Transportation	~~0.50~~	0.45
Warehouse	~~0.40~~	0.36
Workshop	~~0.91~~	0.82

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 unit*s are excluded from lighting power calculations by application of Section R404.1, neither the area of the *dwelling unit*s nor the wattage of lighting in the *dwelling unit*s is counted.

c. *Dwelling unit*s are excluded. Neither the area of the *dwelling unit*s nor the wattage of lighting in the dwelling units is counted.

TABLE C405.4.2(2)

INTERIOR LIGHTING POWER ALLOWANCES: SPACE-BY-SPACE METHOD

Common Space-by-Space Types[a]	~~LPD (w/ft2)~~	LPD (w/ft2)
Atrium - Less than 20 feet in height	~~0.39~~	0.35
Atrium - 20 to 40 feet in height	~~0.48~~	0.43
Atrium - Above 40 feet in height	~~0.60~~	0.54
Audience/seating area - Permanent		
In an auditorium	~~0.61~~	0.55
In a gymnasium	~~0.23~~	0.21
In a motion picture theater	~~0.27~~	0.24
In a penitentiary	~~0.67~~	0.67
In a performing arts theater	~~1.16~~	1.04
In a religious building	~~0.72~~	0.65
In a sports arena	~~0.33~~	0.30
Otherwise	~~0.23~~	0.21
Banking activity area[n]	~~0.61~~	0.55
Breakroom (see lounge/breakroom)		
Classroom/lecture hall/training room		
In a penitentiary	~~0.89~~	0.89
Otherwise[m]	~~0.71[m]~~	0.64
Computer room, data center	~~0.94~~	0.85
Conference/meeting/multipurpose	~~0.97~~	0.87
Confinement cell	~~0.70~~	0.63
Copy/print room	~~0.31~~	0.28
Corridor		
In a facility for the visually impaired (and not used primarily by the staff)[b]	~~0.71~~	0.71
In a hospital	~~0.71~~	0.71
In a manufacturing facility	~~0.41~~	0.37
Otherwise[c,q]	~~0.41~~	0.37
Courtroom[c]	~~1.20~~	1.08
Dining area		
In a penitentiary	~~0.42~~	0.42
In a facility for the visually impaired (and not used primarily by the staff)[b]	~~1.27~~	1.27
In a bar/lounge or leisure dining[n]	~~0.86~~	0.77
In cafeteria or fast food dining	~~0.40~~	0.36
In a family dining area[n]	~~0.60~~	0.54
Otherwise	~~0.43~~	0.39

Common Space-by-Space Types[a]	~~LPD (w/ft2)~~	LPD (w/ft2)
Electrical/mechanical	~~0.43~~	0.39
Emergency vehicle garage	~~0.52~~	0.47
Food preparation	~~1.09~~	0.98
Guest room[a,b]	~~0.41~~	0.37
Laboratory		
In or as a classroom	~~1.11~~	1.00
Otherwise	~~1.33~~	1.20
Laundry/washing area	~~0.53~~	0.48
Loading dock, interior	~~0.88~~	0.79
Lobby[c]		
In a facility for the visually impaired (and not used primarily by the staff)[b]	~~1.69~~	1.69
For an elevator	~~0.65~~	0.59
In a hotel	~~0.51~~	0.46
In a motion picture theater	~~0.23~~	0.21
In a performing arts theater	~~1.25~~	1.13
Otherwise	~~0.84~~	0.76
Locker room	~~0.52~~	0.47
Lounge/breakroom[n]		
In a health care facility[n]	~~0.42~~	0.42
Otherwise[n]	~~0.59~~	0.53

Common Space-by-Space Types[a]	~~LPD (w/ft2)~~	LPD (w/ft2)
Office		
Enclosed ≤ 250	~~0.74~~	0.67
Enclosed > 250	~~0.66~~	0.59
Open plan	~~0.61~~	0.55
Parking area, interior	~~0.15~~	0.14
Pharmacy area	~~1.66~~	1.66
Restroom		
In a facility for the visually impaired (and not used primarily by the staff)[b]	~~1.26~~	1.26
Otherwise[n]	~~0.63~~	0.57
Sales area	~~1.05~~	0.95
Seating area, general	~~0.23~~	0.21
((~~Stairway (see space containing stairway)~~))		
Stairwell[n]	~~0.49~~	0.44
Storage room		
< 50 ft^2	~~0.51~~	0.46
50-100 ft^2	~~0.38~~	0.34
All other storage	~~0.38~~	0.34
Vehicular maintenance	~~0.60~~	0.54
Workshop	~~1.26~~	1.13

TABLE C405.4.2(2) (continued)

INTERIOR LIGHTING POWER ALLOWANCES: SPACE-BY-SPACE METHOD

Building Specific Space-by-Space Types[a]	~~LPD (w/ft2)~~	LPD (w/ft2)
Automotive (see vehicular maintenance)		
Convention center - Exhibit space	~~0.61~~	0.55
Dormitory living quarters[a,b]	~~0.50~~	0.45
Facility for the visually impaired[b]		
In a chapel (and not used primarily by the staff)[b]	~~0.70~~	0.70
In a recreation room (and not used primarily by the staff)[b]	~~1.77~~	1.77
Fire stations[g]		
Sleeping quarters	~~0.23~~	0.21
Gymnasium/fitness center		
In an exercise area	~~0.90~~	0.83
In a playing area	~~0.85~~	0.77
Health care facility		
In an exam/treatment room	~~1.40~~	1.40
In an imaging room	~~0.94~~	0.94
In a medical supply room	~~0.62~~	0.62
In a nursery	~~0.92~~	0.92
In a nurse's station	~~1.17~~	1.17
In an operating room	~~2.26~~	2.26
In a patient room[g]	~~0.68~~	0.68
In a physical therapy room	~~0.91~~	0.91

Building Specific Space-by-Space Types[a]	~~LPD (w/ft2)~~	LPD (w/ft2)
In a recovery room	~~1.25~~	1.25
Library		
In a reading area[n]	~~0.96~~	0.86
In the stacks	~~1.10~~	0.99
Manufacturing facility		
In a detailed manufacturing area	~~0.80~~	0.72
In an equipment room	~~0.76~~	0.68
In an extra high bay area (greater than 50-foot floor-to-ceiling height)	~~1.42~~	1.28
In a high bay area (25 - 50-foot floor-to-ceiling height)	~~1.24~~	1.12
In a low bay (< 25-foot floor-to-ceiling height)	~~0.86~~	0.77
Museum		
In a general exhibition area	~~0.31~~	0.28
In a restoration room	~~1.10~~	0.99
Performing arts theater dressing/fitting room	~~0.41~~	0.37
Post office - Sorting area	~~0.76~~	0.69
Religious buildings		
In a fellowship hall[n]	~~0.54~~	0.49
In a worship/pulpit/choir area[n]	~~0.85~~	0.77
Retail facilities		
In a dressing/fitting room	~~0.51~~	0.46
In a mall concourse	~~0.82~~	0.74

Building Specific Space-by-Space Types[a]	~~LPD (w/ft2)~~	LPD (w/ft2)
Sports arena - Playing area		
For a Class 1 facility[i]	~~2.94~~	2.94
For a Class 2 facility[j]	~~2.01~~	2.01
For a Class 3 facility[k]	~~1.30~~	1.30
For a Class 4 facility[l]	~~0.86~~	0.86
Transportation		
In a baggage/carousel area	~~0.39~~	0.35
In an airport concourse	~~0.25~~	0.23
At a terminal ticket counter[n]	~~0.51~~	0.46
Warehouse - Storage area		
For medium to bulky palletized items	~~0.33~~	0.30
For smaller, hand-carried items	~~0.69~~	0.62

Keys to Table C405.4.2(2)

For SI: 1 foot = 304.8 mm, 1 watt per square foot = 11 W/m^2.

Footnotes to Table C405.4.2(2)

a. In cases where both a common space type and a building area specific space type are listed, the building area specific space type shall apply.

b. A facility for the visually impaired is a facility that is licensed or will be licensed by local or state authorities for senior long-term care, adult daycare, senior support or people with special visual needs.

c. For spaces in which lighting is specified to be installed in addition to, and controlled separately from, the general lighting for the purposed of highlighting art or exhibits, provided that the additional lighting power shall not exceed 0.5 W/ft^2 of such spaces.

d. RESERVED.

e. RESERVED.

f. 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 unit*s 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 unit*s is counted.

i. Class I facilities consist of professional facilities; and semi-professional, collegiate or club facilities with seating for 5,000 or more spectators.

j. Class II facilities consist of collegiate and semi-professional 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/lineal foot of white or chalk boards for directional lighting dedicated to white or chalk boards.

n. Additional lighting power allowance of 0.30 W/square foot 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 Watts per square foot 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/square foot for portable lighting, which includes under shelf or furniture-mounted supplemental task lighting qualifies when controlled by a time clock or an occupancy sensor.

q. For corridors, additional lighting power allowance of 0.25 W/square foot for display lighting and decorative lighting where provided for aesthetic purposes. Decorative lighting fixtures in corridors are also permitted to provide general lighting. This additional allowance is not permitted to be used together with the allowance in footnote c for highlighting art or exhibits.

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:

Additional interior lighting power allowance = 500 watts + (Retail Area 1 x 0.45 W/ft^2) + (Retail Area 2 x 0.45 W/ft^2) + (Retail Area 3 x 1.05 W/ft^2) + (Retail Area 4 x 1.87 W/ft^2)

(Equation 4-11)

Where:

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

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

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

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

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

C405.5 Exterior lighting power requirements. 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.

C405.5.1 Exterior building grounds lighting. All exterior building grounds luminaires that operate at greater than 50 watts shall have a minimum efficacy of 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 service.
2. Luminaires controlled by a motion sensor.
3. Luminaires that qualify for one of the exceptions under Section C405.5.2.

C405.5.2 Total connected exterior building lighting power. The total exterior connected lighting power shall be the total maximum rated wattage of all exterior lighting that is powered through the energy service for the building.

Exception: Lighting used for the following applications 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.
5. Advertising signage or directional signage.
6. Integral to equipment or instrumentation and is installed by its manufacturer.
7. Theatrical purposes, including performance, stage, film production and video production.
8. Athletic playing areas.
9. Temporary lighting.
10. Industrial production, material handling, transportation sites and associated storage areas.
11. Theme elements in theme/amusement parks.
12. Lighting integrated within or used to highlight features of art, public monuments and the national flag.
13. Lighting for water features and swimming pools.
14. Lighting that is controlled from within *dwelling unit*s, where the lighting complies with Section R404.1.

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. Covered parking garage lighting is not considered exterior lighting for the purposes of this calculation. 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*.

TABLE 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)) Not used	((~~High-activity commercial districts in major metropolitan areas as designated by the local land use planning authority~~))

TABLE C405.5.3(2)

LIGHTING POWER ALLOWANCES FOR BUILDING EXTERIORS

	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
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
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 exists	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 m^2.

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 (ATM) and night depositories	135 W per location plus 45 W per additional ATM per location			
Uncovered entrances and gatehouse inspection stations at guarded facilities	0.5 W/ft^2			
Uncovered loading areas for law enforcement, fire, ambulance and other emergency service vehicles	0.35 W/ft^2			
Drive-up windows/doors	200 W per drive-through			
Parking near 24-hour retail entrances	400 W per main entry			

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.

C405.5.5 Full cutoff luminaires. For open parking and outdoor areas and roadways, luminaires mounted more than 15 feet above the ground shall have a luminaire light distribution in which zero candela intensity occurs at an angle of 90 degrees above nadir, and all greater angles from nadir.

C405.6 Electrical transformers. 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 CFR 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 CFR 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 CFR 431.
3. Transformers that meet the Energy Policy Act of 2005 exclusions with multiple voltage taps where the highest tap is 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 CFR 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	97.89
25	98.00	30	98.23
37.5	98.20	45	98.40
50	98.30	75	98.60
75	98.50	112.5	98.74
100	98.60	150	98.83
167	98.70	225	98.94
250	98.80	300	99.02
333	98.90	500	99.14
		750	99.23
		1000	99.28

a. kiloVolt-Amp rating.

b. Nominal efficiencies shall be established in accordance with the DOE 10 CFR 431 test procedure for low voltage dry-type transformers.

C405.7 Dwelling unit electrical energy consumption. 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 unit*s in other than Group R-2 apartment 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 unit*s.
2. Sleeping units.
3. Commercial kitchens.
4. Central laundries.

C405.7.1 Electric receptacles at dwelling unit gas appliances. Where *dwelling unit* appliances are served by natural gas, an electrical receptacle and circuit shall be provided at each gas appliance with sufficient capacity to serve a future electric appliance in the same location. The receptacles and circuits shall be included in the electrical service load calculation and shall meet the requirements of items 1 – 3 below. The receptacle for each gas appliance shall be located within 12 inches of the appliance and without obstructions between the appliance and the outlet. An electric receptacle is not required for a decorative gas fireplace.

1. Each gas range, cooktop, or oven, or combination appliance, location shall be served by a dedicated 240/208-volt, 40-amp receptacle connected to the *dwelling unit* electric panel with a 3-conductor branch circuit complying with 210.19(A)(3) of the NEC and a minimum included load of 9600 VA for 240-volt systems or 8000 VA for 208-volt systems.
2. Each gas clothes dryer location shall be served by a dedicated 240/208-volt, 30-amp receptacle connected to the *dwelling unit* electric panel with a 3-conductor branch circuit and a minimum included load of 5000 VA.
3. Each gas domestic water heater location shall be served by a dedicated 240/208 volt, 30-amp outlet connected to the *dwelling unit* electrical panel with a 3-conductor branch circuit and a minimum included load of 4500 VA.

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

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

1. Air-over electric motors.
2. Component sets of an electric motor.
3. Liquid-cooled electric motors.
4. Submersible electric motors.
5. Inverter-only electric motors.

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

Exceptions:

1. Motors that are an integral part of specialized process equipment.
2. Where the motor is integral to a listed piece of equipment for which no complying motor has been *approved*.

3. Motors used as a component of the equipment meeting the minimum efficiency requirements of Section C403.3.2 and Tables C403.3.2(1) through ((~~C403.3.2(12)~~)) C403.3.2(13), provided that the motor input is included when determining the equipment efficiency.
4. Motors in the airstream within fan coils and terminal units that operate only when providing heating to the space served.
5. 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 efficacy requirements of Section C403.8.4.
6. Domestic clothes dryer booster fans, range hood exhaust fans, and domestic range booster fans that operate intermittently.
7. Radon and contaminated soil exhaust fans.
8. Group R heat recovery ventilator and energy recovery ventilator fans that are less than 400 cfm.

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[a,b]

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
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 CFR 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 60HZ[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 CFR 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(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 CFR 431.

TABLE C405.8(4)

MINIMUM AVERAGE FULL LOAD EFFICIENCY FOR CAPACITOR-START CAPACITOR-RUN AND CAPACITOR-START INDUCTION-RUN SMALL ELECTRIC MOTORS[a]

NUMBER OF POLES ►	OPEN MOTORS		
	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 CFR. 431.

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 not 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 de-energize 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 variable voltage drive system that reduces operating voltage in response to light loading conditions ((~~may~~)) is permitted to be provided in ((~~place~~)) lieu of the variable speed function.

C405.9.3 Regenerative drive. An escalators 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.

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 m^2),~~)) Either split receptacles shall be provided, with the top receptacle(s) controlled, or a *controlled receptacle* shall be located within ((~~72~~)) 12 inches

(((~~1.8~~)) 0.3 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 m^2) 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 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 m^2). Override switches *for controlled receptacles* are permitted to control the lighting within the same area.

Exceptions:

1. 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~~)) 12 inches of a *controlled receptacle*.
2. Within a single modular office workstation, non-*controlled receptacles* are permitted to be located more than 12 inches, but not more than 72 inches, from the *controlled receptacles* serving that workstation.

Bellingham Informative Note.

The requirements of this section also apply to rooms and spaces that have substantially similar functions to those listed even when they are labeled with different names. For example, an area designed for office functions that is labeled “work room,” or a room used as a classroom that is labeled “student learning” would each be required to provide *controlled receptacles*.

C405.11 Voltage drop in feeders and branch circuits. The total voltage drop across the combination of feeders and branch circuits shall not exceed five percent.

C405.12 Commissioning. *Controlled receptacles* and lighting systems shall be commissioned in accordance with Section C408.

SECTION C406

EFFICIENCY PACKAGES

C406.1 Additional energy efficiency credit requirements. New buildings and changes in space conditioning, *change of occupancy* and building *addition*s in accordance with Chapter 5 shall comply with sufficient packages from Table C406.1 so as to achieve a minimum number of ((~~six~~)) 8 credits. Each area shall be permitted to apply for different packages provided all areas in the building comply with the requirement for ((~~six~~)) 8 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 ((~~six~~)) 8 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 ((~~three~~)) 4 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 ((~~three~~)) 4 credits.

C406.1.1 Tenant spaces. Initial tenant improvement shall comply with sufficient packages from Table C406.1 to achieve a minimum number of ((~~six~~)) 8 credits when the space is fully built out. 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~~)) 8 credits when the space is fully built-out. This provision only applies to the initial buildout of a tenant space.

Bellingham Informative Note: In this section "tenant space" means any conditioned area within a new building that is constructed for first occupancy under a separate permit from the shell and core permits.

C406.1.1.1 Applicable envelope and on-site renewable energy credits. Where an entire building or building *addition* complies with Section C406.5, C406.10 or C406.11, under an initial tenant improvement permit, tenant spaces within the building qualify for the number of credits assigned to the occupancy type of the tenant space in accordance with Table C406.1.

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					
1. More efficient HVAC performance in accordance with Section C406.2	2.0	3.0	3.0	2.0	1.0	2.0
2. Reduced lighting power: Option 1 in accordance with Section C406.3.1	1.0	1.0	2.0	2.0	3.0	2.0
3. Reduced lighting power: Option 2 in accordance with Section C406.3.2[1]	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
5.1 1/3 of renewable energy required by C406.5	1.0	1.0	1.0	1.0	1.0	1.0
5.2 2/3 of renewable energy required by C406.5	2.0	2.0	2.0	2.0	2.0	2.0
6. Dedicated outdoor air system in accordance with Section C406.6[2]	4.0	((~~4.0~~)) 2.0[4]	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. 8. High-efficiency service water heating in accordance with Sections C406.8.1 and C406.8.2	4.0 NA after 1/1/2022	5.0 NA after 1/1/2022	NA	NA	NA	8.0 NA after 1/1/2022
9. 9. High performance service water heating in ((~~multi-family buildings in~~)) accordance with Section C406.9	7.0 prior to 1/1/2022 5.0 after 1/1/2022	8.0 prior to 1/1/2022 5.0 after 1/1/2022	NA prior to 1/1/2022 3.0 after 1/1/2022[7] Lab only	NA	NA	NA 3.0 after 1/1/2022[6]
10. Enhanced envelope performance in accordance with Section C406.10[3]	3.0	6.0	3.0	3.0	3.0	4.0
11. Reduced air infiltration in accordance with Section C406.11[3]	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)~~

1. Projects using this option may not use Item 2.
2. This option is not available to buildings subject to the prescriptive requirements of Section C403.3.5 or C403.6.

3. Buildings or building areas tha~~t are exe~~mpt f~~rom therm~~al envelope requirements in accordance with Sections C402.1.1 and C402.1.2 do not qualify for this package.
4. 4.0 credits, instead of 2.0 credits, are permitted to be applied to areas of R-2 occupancy buildings other than *dwelling unit*s, including corridors, lobbies and tenant amenity spaces, where those areas comply with the requirements for this credit.
5. Buildings, building additions, building areas, occupancy types, or tenant spaces with a service hot water load of 10 percent or more of total building energy loads, as demonstrated through an energy analysis complying with Section C407, or a minimum service water energy use of 15,000 Btu per square foot per year, as demonstrated through an alternate service hot water load calculation method approved by the code official, are permitted to apply this credit.
6. In Group B occupancies, the high-performance service water heating credit applies only to research and production laboratory spaces, and adjacent circulation serving those laboratory spaces, but not to associated office or other space uses..

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.

C406.2 More efficient HVAC equipment and fan performance. No less than 90 percent of the total HVAC capacity serving the total *conditioned floor area* of the entire building, building *addition*, building area, occupancy type, or tenant space in accordance with Section C406.1.1, shall comply with Sections C406.2.1 through C406.2.3. ((~~For~~)) In addition, systems required to comply with Section C403.1.1, HVAC total system performance ratio, shall exceed the ((~~minimum requirement~~)) HVAC TSPR of the *standard reference design* by 10 percent. This credit shall not be utilized for low energy or semi-heated *space conditioning categories*.

~~((**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. Equipment installed shall be types that are listed in Tables C403.3.2(1) through ((~~C403.3.2(12)~~)) C403.3.2(13) or a combination thereof. Electric resistance heating does not meet this requirement. No HVAC systems incorporating fossil fuel-fired equipment, or heat from district energy systems that are primarily heated by fossil fuel combustion, are permitted to utilize this credit.

~~((**Exception:** Allowed equipment not listed in Tables C403.3.2(1) through ((C403.3.2(12))) C403.3.2(13):~~

~~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 C403.3.2(1) through ((~~C403.3.2(12)~~)) C403.3.2(13) 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 C403.3.2(1) through ((~~C403.3.2(12)~~)) C403.3.2(13) shall utilize the values listed for the largest capacity equipment for the associated equipment type shown in the table.
2. Equipment complying 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 Tables C403.3.2(1) through ((~~C403.3.2(12)~~)) C403.3.2(13), 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 C403.3.2(1) through ((~~C403.3.2(12)~~)) C403.3.2(13) for each performance requirement (SEER, EER/IEER, COP, HSPF, E_t, 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 per the test procedure in 10 CFR 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 a fan efficiency 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.

C406.3 Reduced lighting power. Interior lighting within the whole building, building area, occupancy type, building *addition* or tenant space shall comply with Section C406.3.1 or C406.3.2. *Dwelling unit*s and sleeping units within the building shall comply with Section C406.3.3.

C406.3.1 Reduced lighting power option 1. The total connected interior lighting power calculated in accordance with Section C405.4.1 shall be 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 90 percent or less of the total interior lighting power allowance calculated 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 for the building types, or by using 80 percent or less of the total interior lighting power allowance calculated in accordance with Section C405.4.2.

C406.3.3 Lamp fraction. No less than 95 percent of the permanently installed light fixtures in *dwelling unit*s and sleeping units shall be provided by high efficacy lamps with a minimum efficacy of 65 lumens per watt. Where the conditioned floor area of residential dwelling units or sleeping units is separated from other building occupancies or building areas for the purposes of the C406 area weighted credit calculation, these dwelling or sleeping unit areas receive the credit weighting for reduced lighting power Option 1, referencing Section C406.3.1, in Table C406.1.

Enhanced digital lighting controls. ((~~No~~)) Not less than 90 percent of the total installed interior lighting power within the whole building, building *addition* or tenant space shall comply with Section C406.4.1. Open office areas subject to Section C405.2 (1) are not permitted to take credit for this option,

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 Item 2:

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. 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 control*s 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.
6. These control functions shall be commissioned in accordance with Sections C408.1 and C408.3.

C406.5 On-site renewable energy. ((A)) In addition to the renewable energy required by Section C412 and to renewable energy used to comply with any other requirement of this code, a whole building, building *addition*, building area, occupancy type, or tenant space shall be provided with on-site renewable energy systems with a rated peak renewable energy generating capacity ((~~an annual production per square foot~~)) of no less than ((~~the value specified in Table C406.5~~)) 0.25 watts (or 0.85 BTU/h) per square foot of *conditioned floor area* based on the total *conditioned floor area* of the whole building, building *addition* or tenant space. The on-site renewable energy ((~~used in~~)) provided to comply with this option shall be separate from on-site renewables ((~~used as part of Section C406.7~~)) provided to comply with 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 per year~~	~~kWh per year~~
~~Assembly~~	~~1.8~~	~~0.53~~
~~Dining~~	~~10.7~~	~~3.14~~
~~Hospital~~	~~3.6~~	~~1.06~~
~~Hotel/Motel~~	~~2.0~~	~~0.59~~
~~Multi-family 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~~

~~Building Area Type~~	~~kBTU per year~~	~~kWh per year~~
~~Warehouse~~	~~0.43~~	~~0.13~~))

C406.6 Dedicated outdoor air system (DOAS). No less than 90 percent of the total *conditioned floor area* of the whole building, building area, occupancy type, 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 C403.3.5. This option is not available to buildings subject to the prescriptive requirements of Section C403.3.5. No HVAC systems incorporating fossil fuel-fired equipment, or heat from district energy systems that are primarily heated by fossil fuel combustion, are permitted to utilize this credit.

C406.7 High performance dedicated outdoor air system (DOAS). A whole building, building area, occupancy type, 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 purposes of this section, total combined fan power includes all supply, exhaust, recirculation and other fans utilized for the purpose of ventilation. No HVAC systems incorporating fossil fuel-fired equipment, or heat from district energy systems that are primarily heated by fossil fuel combustion, are permitted to utilize this credit.

C406.8 Reduced energy use in service water heating. Buildings with service hot water heating equipment that serves the whole building, building *addition* or tenant space shall comply with Sections C406.8.1 and C406.8.2. No service water heating systems incorporating fossil fuel-fired equipment, or heat from district energy systems that are primarily heated by fossil fuel combustion, are permitted to utilize this credit.

C406.8.1 Building type. Not less than 90 percent of the *conditioned floor area* of the whole building, building area, occupancy type, building *addition* or tenant space shall be of the following types:

1. Group R-1: Boarding houses, hotels or motels. (Not applicable after 1/1/2022)
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. (Not applicable after 1/1/2022)
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 in buildings 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, where those systems are in addition to the renewable energy required by Section C412 and any renewable energy used to comply with other requirements of this code.

C406.9 High performance service water heating in hotel and multifamily buildings. For a whole building, building area, occupancy type, building *addition*, or tenant space with not less than 90 percent of the *conditioned floor area* being Group R-1 or 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 3.0.~~)) meeting the requirements of Section C404.2.3 plus the following:

1. The refrigerant used in the heat pump system shall have a global warming potential (GWP) no greater than 675.
2. No electric resistance heating capacity shall be provided.
   Exceptions to item 2.
   1. Electric resistance heating is permitted for circulating system *temperature maintenance* and heat tracing of service hot water supply and return piping.
   2. On-demand electric resistance water heaters for hand washing facilities are permitted in public toilet rooms.

C406.10 Enhanced envelope performance. The Proposed Total UA of the thermal envelope of the whole building, building area, occupancy type, 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. Where exception 3 for Section C412 is also being used, the Proposed Total UA shall be 30 percent lower than the Allowable Total UA as defined in Section C402.1.5.

C406.11 Reduced air ((~~infiltration~~)) leakage. Measured air infiltration of the total *conditioned floor area* of the whole building, fully isolated building *addition*, building area, or occupancy type ((~~, or tenant space~~)) shall comply with Section C406.11.1.

C406.11.1 Air leakage testing and verification. Air ((~~infiltration~~)) leakage shall be verified by whole building pressurization testing conducted in accordance with ASTM E779 or ASTM E1827, or an equivalent method *approved* by the *code official*, by an independent third party. The measured air leakage rate of the *building envelope* shall not exceed 0.17 cfm/ft^2 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 ft^2 (25,000 m^2), 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.~~))

((~~**C406.12 Enhanced commercial kitchen equipment.** For buildings and spaces 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.~~))

Bellingham Informative Note: Energy Star commercial kitchen equipment is required for all commercial kitchen projects by Section C403.15.

SECTION C407

TOTAL BUILDING PERFORMANCE

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.

C407.2 Mandatory requirements. Compliance with ((~~this section~~)) Section C407 also requires compliance with those sections shown in Table C407.2.

The building permit application for projects utilizing this method shall include in one submittal all building and mechanical drawings and all information necessary to verify that the building envelope and mechanical design for the project corresponds with the annual energy analysis. If credit is proposed to be taken for lighting energy savings, then an electrical permit application shall also be submitted and *approved* prior to the issuance of the building permit. 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.

C407.3 Performance-based compliance. Compliance 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. This limitation only applies to onsite renewable energy provided in excess of the renewable energy required by Section C412.
    a. The equation PCI + [(PBP$_{nre}$ – PBP)/BBP] – 0.05 < PCIt in Section 4.2.1.1 shall be modified to read PCI + [(PBP$_{nre}$ – PBP)/BBP] – 0.03 < PCIt.
    b. The term PBP$_{nre}$ shall be defined as the proposed building performance without credit for reduced annual energy emissions from on-site renewable energy generation system capacity in excess of that installed to satisfy the requirements of Section C412.
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).
5. Schedules and plug and process loads shall be modeled using the default values listed in Appendix B or in the ASHRAE 90.1 User's Manual and shall be assumed to be identical in the proposed design and baseline building design.

    Exception to item 5. Alternative schedules and plug and process loads shall be permitted where *approved* by the *code official*.
6. Documentation requirements in Section G1.3.2.d shall be replaced by a list showing compliance with the mandatory provisions of Table C407.2.
7. Documentation requirements in Section G1.3.2.e shall be replaced by a list of aspects of the proposed design that are less stringent than the prescriptive requirements of the Energy Code.

8. References to yet-to-be-designed future building components in the Proposed Building Performance column of Table G3.1 shall be modified to reference the corresponding sections of the Energy Code in lieu of the requirements of Standard 90.1, in the following sections of the table:
    1. Design Model, subclause c.
    6. Lighting, subclause c
    11. Service Water-Heating Systems, subclause c.
    12. Receptacle and Other Loads, subclause b.

9. HVAC Systems, subclauses c and d of Table G3.1, shall meet the following requirements:
    a. For yet-to-be-designed systems in office, retail, library, education, and multifamily buildings and occupancies subject to the TSPR requirements of Section C403.1.1, the system type and efficiency parameters shall meet but not exceed those shown in Table D602.11 Standard Reference Design HVAC Systems.
    b. For all other buildings and occupancies, the system type shall be the same as the system modeled in the baseline design, and shall comply with but not exceed the requirements of Section C403 in lieu of Standard 90.1.
    c. For HVAC Systems serving future tenant spaces, where the current building permit applies to only a portion of an HVAC system, and future components will receive HVAC services from systems included in the current building permit, those future components shall be modeled as the type required to complete the HVAC system portions under the current permit and shall meet but not exceed the requirements found in Section C403.

Bellingham Informative Note. The permit applicant is encouraged to schedule a pre-application meeting to discuss the modeling approach for any yet-to-be designed areas that are not included in the C407 permit submissions. In general, future permit submissions should not contribute energy savings to the C407 submission beyond prescriptive code requirements, assuming use of the base building HVAC systems. Future systems must be modeled for the base building permit as being no better than the current prescriptive code, because plans often change and the City does not have a mechanism for ensuring that future tenant projects meet any beyond-code performance modeled in the original C407 submission.

TABLE C407.2

MANDATORY COMPLIANCE MEASURES FOR TOTAL BUILDING PERFORMANCE METHOD

Section	Title	Comments
	Envelope	
C402.5	Air Leakage	
	Mechanical	
C403.1.2	Calculation of heating and cooling loads	
C403.1.3	*Data center*s	
C403.1.4	Use of electric resistance and fossil fuel-fired heating equipment	
C403.2	System design	
C403.3.1	Equipment and system sizing	
C403.3.2	HVAC equipment performance requirements	
C403.3.6	Ventilation for Group R occupancy	
C403.3.7	Hydronic system flow rate	
C403.4	HVAC system controls	
C403.4.1	Thermostatic controls	Except for C403.4.1.4
C403.4.2	Off-hour controls	Except for Group R
C403.4.7	Combustion heating equipment controls	
C403.4.8	Group R-1 hotel/motel guestrooms	See Section C403.7.4
C403.4.9	Group R-2 and R-3 *dwelling unit*s	
C403.4.10	Group R-2 sleeping units	
C403.4.11	Direct digital control systems,	
C403.4.12	Pressure independent control valves	
C403.5.5	Economizer fault detection and diagnostics (FDD)	
C403.7	Ventilation and exhaust systems	Except for C403.7.6
C403.8	Fan and fan controls	
C403.9.1	Heat rejection equipment (partial)	Only the prohibition on single-pass water cooling systems is mandatory
C403.9.1.1	Variable flow controls	For cooling tower fans ≥ 7.5 hp
C403.9.1.2	Limitation on centrifugal fan cooling towers	For open cooling towers
C403.10	Construction of HVAC elements	
C403.11	Mechanical systems located outside of the *building thermal envelope*	
C403.15	Commercial food service	
	Service Water Heating	
C404	Service Water Heating	
	Lighting and Electrical	
C405.1	General	
C405.2	Lighting controls	
C405.3	Exit signs	
C405.4	Interior lighting power	
C405.5	Exterior building lighting power	
C405.6	Electrical transformers	
C405.7	*Dwelling unit* energy consumption	

C405.8	Electric motor efficiency	
C405.9	Vertical and horizontal transportation	
C405.10	*Controlled receptacles*	
C405.11	Voltage drop in feeders	
Other Requirements		

TABLE C407.2

MANDATORY COMPLIANCE MEASURES FOR TOTAL BUILDING PERFORMANCE METHOD

Section	Title	Comments
C407	Total Building Performance	
C408	System commissioning	
C409	Energy metering	
C410	Refrigeration requirements	
C411	Solar readiness	
C412	Renewable energy	All on-site renewable energy production is included in the proposed building performance, but not in the baseline building performance.

TABLE C407.3(1)

CARBON EMISSIONS FACTORS

	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[b]	0.00	

a. District energy systems may use alternative emission factors supported by calculations approved by the code official.

b. The TSPR calculation does not separately account for the use of renewable energy.

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~~)) 0.52
Healthcare/hospital	((~~0.54~~)) 0.49
Hotel/motel	((~~0.64~~)) 0.58
Office	((~~0.56~~)) 0.51
Restaurant	((~~0.70~~)) 0.63
Retail	((~~0.47~~)) 0.43
School	((~~0.36~~)) 0.32
Warehouse	((~~0.48~~)) 0.43
All Others	((~~0.54~~)) 0.49

C407.3.1 Limits on ((~~nonmandatory measures~~)) substandard building envelopes. The Proposed Total UA of the proposed building shall be no more than ((~~20~~ 10)) percent higher than the Allowable Total UA as defined in Section C402.1.5. Where either Section C402.4.1.1.1 or C402.4.1.1.2 is used to establish the maximum allowable fenestration area for compliance with this section, all of the requirements of the selected section shall be met.

SECTION C408

SYSTEM COMMISSIONING

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

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

1. Mechanical systems 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.
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 if they are limited to self-contained units.

C408.1.1 Commissioning in construction documents. Construction documents shall clearly indicate provisions for commissioning 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. The plan shall also include the following:

1. A narrative description of the activities that will be accomplished during each phase of commissioning, including the personnel intended to accomplish each of the activities, systems testing and balancing, functional performance testing, and verification of the building documentation requirements in Section C103.6.
2. Roles and responsibilities of the commissioning team, including the name and statement of qualifications of the *certified commissioning professional*.
3. A listing of the specific equipment, appliances or systems to be tested and a description of the tests to be performed.

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 receptacle*s and lighting control systems in Section C405; equipment, appliances and 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 seven or fewer similar systems, each system shall be tested. For projects with more than seven systems, testing shall be done for each unique combination of controls type. 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 Commissioning report. A commissioning report shall be completed and certified by the *certified commissioning professional* and delivered to the building owner or owner's authorized agent. The report shall be organized with mechanical, service water heating, *controlled receptacle* and lighting control systems, energy metering, and refrigeration findings in separate sections to allow independent review. The report shall record the activities and results of the commissioning process and be developed from the final commissioning plan with all of its attached appendices. The report shall include:

1. Results of functional performance tests.
2. Disposition of deficiencies found during testing, including details of corrective measures used or proposed.
3. Functional performance test procedures used during the commissioning process including measurable criteria for test acceptance, provided herein for repeatability.
4. Commissioning plan.
5. Testing, adjusting and balancing report.

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* shall provide evidence of *building commissioning* in accordance with the provisions of this section.

C408.1.4.1 Commissioning compliance. Buildings, or portions thereof, shall not be considered acceptable for a final inspection pursuant to Section C104.2.6 until the *code official* has received a letter of transmittal from the building owner or owner's representative acknowledging that the building owner or owner's authorized agent has received the Commissioning Report. Completion of Commissioning Compliance Checklist (Figure C408.1.4.1) is deemed to satisfy this requirement. Phased acceptance of 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 Copy of report. The *code official* shall be permitted to require that a copy of the Commissioning Report be made available for review by the *code official*.

C408.2 Mechanical systems commissioning. Mechanical equipment and controls subject to Section C403 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 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.

FIGURE C408.1.4.1
COMMISSIONING COMPLIANCE CHECKLIST

Project Information	**Project Name:**
	Project Address:
	Certified Commissioning Professional:
	Type of ISO Certification and Number:
Supporting Documents	❑ **Manuals, record documents and training have been completed or are scheduled** (Section C103.6) • Building operations and maintenance information (C103.6.2) have been submitted to the owner or scheduled date: _____ • Manuals (C103.6.2.1) have been submitted to the owner or scheduled date: _____ • Compliance documentation (C103.6.3) has been provided to the owner or scheduled date: _____ • System operation training (C103.6.4) has been provided to the owner or scheduled date: _____
Commissioning Plan	❑ **Commissioning Plan was used during construction** (Section C408.1.2)
Commissioning Report	❑ **Commissioning Report has been submitted** (Section C408.1.3)
Commissioned Systems	❑ **Mechanical Systems were included in the commissioning process** (Section C408.2) ❑ Testing, adjusting and balancing is complete (Section C408.2.2)
	❑ There are unresolved deficiencies with the mechanical systems. These are described in the attached Commissioning Report submitted to the Owner.
	❑ **Service Water Heating Systems were included in the commissioning process** (Section C408.3) ❑ There are unresolved deficiencies with the service water heating systems. These are described in the attached Commissioning Report submitted to the Owner.
	❑ ***Controlled receptacle*s and lighting control systems were included in the commissioning process** (Section C408.4) ❑ 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.
	❑ **Additional systems were included in the commissioning process** (Section C408.5) ❑ There are unresolved deficiencies with systems required by C406 or C407. These are described in the attached Commissioning Report submitted to the Owner.
	❑ **Metering systems were included in the commissioning process** (Section C408.6) ❑ There are unresolved deficiencies with the metering system. These are described in the attached Commissioning Report submitted to the Owner. ❑ **Refrigeration systems were included in the commissioning process** (Section C408.7) ❑ There are unresolved deficiencies with systems required by Section C410. These are described in the attached Commissioning Report submitted to the Owner.
Certification	❑ I hereby certify that requirements for Section C408 System Commissioning have been completed in accordance with the Washington State Energy Code, including all items above. --- *Certified Commissioning Professional* Date
	❑ I hereby certify that requirements for Section C408 System Commissioning have been completed in accordance with the Washington State Energy Code, including all items above. --- Building Owner or Owner's Representative Date

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

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 System testing. Functional performance testing shall demonstrate the components, 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, part-load and the following 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.

C408.3 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.

C408.4 Controlled receptacle and lighting control system commissioning. *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 and *controlled receptacles* 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 System testing. Functional performance testing shall demonstrate that occupant sensors, time switches, manual overrides, night sweep-off, *daylight responsive control*, and *controlled receptacle*s 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;
3. Performance of alarms; and
4. Mode of operation upon a loss of power and restoration of power.

C408.5 Systems installed to meet Section C406 or C407. Equipment, components, controls or configuration settings for 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.

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 System testing. Functional performance testing shall 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 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).

C408.7 Refrigeration system commissioning. All installed **r**efrigeration 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.

SECTION C409

ENERGY METERING AND ENERGY CONSUMPTION MANAGEMENT

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~~)) 20,000 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. For Group R-2 buildings, the floor area of *dwelling unit*s and sleeping units shall be excluded from the total *conditioned floor area* for the purposes of determining the 20,000 square foot threshold. *Alterations* and *additions* to existing buildings shall conform to Section C506.

Exceptions:

1. Tenant spaces smaller than ((~~50,000~~)) 20,000 ft^2 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~~)) 10,000 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 or kVA 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~~)) or 2,730 Btu per kVA.

C409.1.3 Dwelling units. See Sections C404.9 and C405.7 for additional metering requirements for Group R-2 dwelling unit*s*.

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 exceptions 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.

Exception: Where site lighting and other exterior non-building electrical loads are served by an electrical service and meter that are separate from the building service and meter, the metering data from those loads is permitted to be either combined with the building's electrical service load data or delivered to a separate *data acquisition system.*

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, and waste heat reclaimed from sewers or other off-site 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.

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 C409.3.7. 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. Healthcare 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~~)) C409.3.6 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 Iand 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. 120 volt equipment.
2. An HVAC branch circuit where the total MCA of equipment served equates to less than 10 kVA.
3. 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 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 electrical 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 non-building 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 multi-tenant 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 of 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.

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 visible display in a location with *ready access*, or a single web page or other electronic document available for *access* to building management or to a third-party energy data analysis service shall be provided in the building available for access to 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 total and ((~~peak~~)) maximum hourly consumption values for any day, week, month and year.

((~~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 total and peak values for any day, week, month and year.~~)) The display shall be capable of and configured to graphically display the energy use data for any source or end use category or any combination of sources and end uses for any selected daily, weekly, monthly or annual time period, and to view the selected time period simultaneously with another selected time period or a reference benchmark time period. The display shall be capable of weather-normalizing data in the comparison time periods, and facilitate display of energy use trends and identification of anomalies.

C409.4.4 Commissioning. Energy metering and energy consumption management systems shall be commissioned in accordance with Section ((~~C408~~)) C408.6.

((~~C409.5 Metering for existing buildings.~~

~~C409.5.1 Existing buildings that were constructed subject to the requirements of this section.~~ ~~Where new or replacement systems or equipment are installed in an existing building that was constructed subject to the requirements of this section, metering shall be provided for such new or replacement systems or equipment so that their energy use is included in the corresponding end-use category defined in Section C409.3. This includes systems or equipment added in conjunction with additions or alterations to existing buildings.~~

~~C409.5.1.1 Small existing buildings.~~ ~~Metering and data acquisition systems shall be provided for additions over 25,000 square feet to buildings that were constructed subject to the requirements of this section, in accordance with the requirements of Sections C409.2 and C409.3.~~))

Bellingham Informative Note: Section C409.5 regarding metering for existing buildings is relocated to Section 506.1.

SECTION C410

REFRIGERATION SYSTEM REQUIREMENTS

C410.1 General. 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 C410.1.1(1) and C410.1.1(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 x V + 2.04	AHRI 1200
Refrigerator with transparent doors		0.12 x V + 3.34	
Freezers with solid doors		0.40 x V + 1.38	
Freezers with transparent doors		0.75 x V + 4.10	
Refrigerator/freezers with solid doors		The greater of 0.12 x V + 3.34 or 0.70	
Commercial refrigerators	Pulldown	0.126 x 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 x TDA + 4.07	AHRI 1200
SVO.RC.M	Semivertical open	Remote condensing	Medium	0.83 x TDA + 3.18	
HZO.RC.M	Horizontal open	Remote condensing	Medium	0.35 x TDA + 2.88	
VOP.RC.L	Vertical open	Remote condensing	Low	2.27 x TDA + 6.85	

EQUIPMENT TYPE				ENERGY USE LIMITS	TEST PROCEDURE
Equipment Class[c]	Family Code	Operating Mode	Rating Temperature	(kWh per day)[a,b]	
HZO.RC.L	Horizontal open	Remote condensing	Low	0.57 x TDA + 6.88	AHRI 1200
VCT.RC.M	Vertical transparent door	Remote condensing	Medium	0.22 x TDA + 1.95	
VCT.RC.L	Vertical transparent door	Remote condensing	Low	0.56 x TDA + 2.61	
SOC.RC.M	Service over counter	Remote condensing	Medium	0.51 x TDA + 0.11	
VOP.SC.M	Vertical open	Self-contained	Medium	1.74 x TDA + 4.71	
SVO.SC.M	Semivertical open	Self-contained	Medium	1.73 x TDA + 4.59	
HZO.SC.M	Horizontal open	Self-contained	Medium	0.77 x TDA + 5.55	
HZO.SC.L	Horizontal open	Self-contained	Low	1.92 x TDA + 7.08	
VCT.SC.I	Vertical transparent door	Self-contained	Ice cream	0.67 x TDA + 3.29	
VCS.SC.I	Vertical solid door	Self-contained	Ice cream	0.38 x V + 0.88	
HCT.SC.I	Horizontal transparent door	Self-contained	Ice cream	0.56 x TDA + 0.43	
SVO.RC.L	Semivertical open	Remote condensing	Low	2.27 x TDA + 6.85	
VOP.RC.I	Vertical open	Remote condensing	Ice cream	2.89 x TDA + 8.7	
SVO.RC.I	Semivertical open	Remote condensing	Ice cream	2.89 x TDA + 8.7	
HZO.RC.I	Horizontal open	Remote condensing	Ice cream	0.72 x TDA + 8.74	
VCT.RC.I	Vertical transparent door	Remote condensing	Ice cream	0.66 x TDA + 3.05	
HCT.RC.M	Horizontal transparent door	Remote condensing	Medium	0.16 x TDA + 0.13	
HCT.RC.L	Horizontal transparent door	Remote condensing	Low	0.34 x TDA + 0.26	
HCT.RC.I	Horizontal transparent door	Remote condensing	Ice cream	0.4 x TDA + 0.31	
VCS.RC.M	Vertical solid door	Remote condensing	Medium	0.11 x V + 0.26	

EQUIPMENT TYPE				ENERGY USE LIMITS (kWh per day)[a,b]	TEST PROCEDURE
Equipment Class[c]	Family Code	Operating Mode	Rating Temperature		
VCS.RC.L	Vertical solid door	Remote condensing	Low	0.23 x V + 0.54	

TABLE C410.1.1(2) (continued)

MINIMUM EFFICIENCY REQUIREMENTS: COMMERCIAL REFRIGERATORS AND FREEZERS

EQUIPMENT TYPE				ENERGY USE LIMITS	TEST PROCEDURE
Equipment Class[c]	Family Code	Operating Mode	Rating Temperature	(kWh per day)[a,b]	
VCS.RC.I	Vertical solid door	Remote condensing	Ice cream	0.27 x V + 0.63	AHRI 1200
HCS.RC.M	Horizontal solid door	Remote condensing	Medium	0.11 x V + 0.26	
HCS.RC.L	Horizontal solid door	Remote condensing	Low	0.23 x V + 0.54	
HCS.RC.I	Horizontal solid door	Remote condensing	Ice cream	0.27 x V + 0.63	
SOC.RC.L	Service over counter	Remote condensing	Low	1.08 x TDA + 0.22	
SOC.RC.I	Service over counter	Remote condensing	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 prefabricated units shall comply with the following. Where they comprise any portion of the thermal envelope of the building, they shall comply with the requirements of Section C402, using the R-values or U-values listed in this Section C410.2. Section C402.1.5 component performance alternative is permitted to be used where *approved* by the *code official*.

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*-0.040. 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 windows 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 windows and reach-in doors for *walk-in coolers* and windows for *walk-in cooler* doors shall be provided with double-pane or triple-pane glass, with interstitial spaces 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 electronically 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/ft^2 (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 turns off the lights within 15 minutes of when the *walk-in cooler* or *walk-in freezer* space is not occupied.

12. Evaporator fans in refrigerated warehouses shall be variable speed, and the speed shall be controlled in response to space conditions.

EXCEPTION: Evaporators served by a single compressor without unloading capability.

C410.2.1 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

Class Description	Class	Maximum Energy Consumption (kWh/day)[a]
Display Door, Medium Temperature	DD, M	0.04 x A_{dd} + 0.41
Display Door, Low Temperature	DD, L	0.15 x A_{dd} + 0.29

a. A_{dd} is the surface area of the display door

TABLE C410.2.1.1(2)

WALK-IN COOLER AND FREEZER NON-DISPLAY DOORS EFFICIENCY REQUIREMENTS

Class Description	Class	Maximum Energy Consumption (kWh/day)[a]
Passage Door, Medium Temperature	PD, M	0.05 x A_{nd} + 1.7
Passage Door, Low Temperature	PD, L	0.14 x A_{nd} + 4.8
Freight Door, Medium Temperature	FD, M	0.04 x A_{nd} + 1.9
Freight Door, Low Temperature	FD, L	0.12 x A_{nd} + 5.6

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

Class Description	Class	Minimum Annual Walk-in Energy Factor AWEF (Btu/hW-h)
Dedicated Condensing, Medium Temperature, Indoor System	DC.M.I	5.61
Dedicated Condensing, Medium Temperature, Indoor System, >9,000 Btu/h Capacity	DC.M.I, >9,000	5.61
Dedicated Condensing, Medium Temperature, Outdoor System	DC.MI	7.60
Dedicated Condensing, Medium Temperature, Outdoor System, >9,000 Btu/h Capacity	DC.M.I, >9,000	7.60

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 nonbusiness 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~~)) compressors and remote condensers not located in a *condensing unit*, shall comply with Sections C410.3.1, C410.3.2, and C403.9.2.3.

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 set point control logic to reset the condensing temperature set point in response to ambient dry-bulb temperature.
   3.2. Refrigeration system condenser control for evaporatively cooled condensers shall use variable set point control logic to reset the condensing temperature set point in response to ambient wet-bulb temperature.
4. Multiple fan condensers shall be controlled in unison.
5. The minimum condensing temperature set point 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 set point of 50°F (10°C) at the exit of the subcooler using either compressor economizer (interstage) 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~~)) C403.10.3.
3. Compressors that incorporate internal or external crankcase heaters shall provide a means to cycle the heaters off during compressor operation.
4. Compressor systems utilized in refrigerated warehouses shall conform to the following:

   4.1. Compressors shall be designed to operate at a minimum condensing temperature of 70°F or less.

   4.2. The compressor speed of a screw compressor greater than 50 hp shall be controllable in response to the refrigeration load or the input power to the compressor shall be controlled to use no more than 60 percent of full load input power when operated at 50 percent of full refrigeration capacity.

EXCEPTION. Refrigeration plants with more than one dedicated compressor per suction group.

C410.4 Commissioning. Refrigeration systems shall be commissioned in accordance with Section C408.

Exception: Self-contained units.

SECTION C411

SOLAR READINESS

C411.1 General. ((~~A~~)) In addition to the requirements of Section C412, a *solar zone* shall be provided on ((~~non-residential~~)) buildings that are 20 stories or less in height above grade plane. 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/ft^2-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 21 at 10am, 11am, 12pm, 1pm, and 2pm 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, mechanical equipment, 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.

Example: A building with a 10,000 SF total roof area, 1,000 SF skylight area, and a 400 Amp, 240 volt single phase electrical service is required to provide a solar zone area of the smaller of the following:

1. [40% x (10,000 SF roof area – 1,000 SF skylights)] = 3,600 SF; or
2. [400 Amp x 240 Volts x 20% / 10 watts per SF] = 1,920 SF

Therefore, a *solar zone* of 1,920 square feet is required.

C411.3 Contiguous area. The *solar zone* is permitted to be comprised of separated sub-zones. Each sub-zone 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. A minimum 2-inch diameter roof penetration conduit shall be provided, with threaded caps above and below the roof deck and minimum R-10 insulation wrapping the lower portion, ((~~, sized to accommodate a conductor and conduit for 10 peak watts per square foot~~)) within each 2,500 square foot section of the required *solar zone* area. 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 the following:

1. *Solar zone* boundaries and access pathways;
2. Location for future inverters and metering equipment; and
3. Route for future wiring between the photovoltaic panels and the inverter, and between the inverter and the main service panel.

SECTION C412
RENEWABLE ENERGY

On-site renewable energy systems. Each new building or *addition* larger than 5,000 square feet of gross *conditioned floor area* shall include a renewable energy generation system consisting of not less than 0.25 watts rated peak photovoltaic energy production per square foot of *conditioned space*.

Exceptions:

1. Increased additional energy credits. Where 3.0 additional energy credits from Table C406.1 are provided in addition to those required by other sections of this code, the on-site renewable energy generation system is not required.

1.1. Where 1.0 additional energy credits from Table C406.1 is provided in addition to those required by other sections of this code, the size of the on-site renewable energy generation system is permitted to be reduced by 1/3.

1.2. Where 2.0 additional energy credits from Table C406.1 are provided in addition to those required by other sections of this code, the size of the on-site renewable energy generation system is permitted to be reduced by 2/3.

1.3 Where approved by Bellingham, interpolation between exceptions 1, 1.1, and 1.2 is permitted.

2. Reduced Building Performance Factor. For projects utilizing the Section C407 Total Building Performance compliance path, the on-site renewable energy generation system is not required where the building performance factor (BPF) is not less than 3 percent lower than the maximum BPF permitted cumulatively by all other sections of this code.

> **Example:** To use this exception, a building with a required BPF of 50 would be required to provide a BPF of (50 x 0.97 =) 48.5 instead.

2.1 Where the BPF is not less than 1 percent lower than the BPF required cumulatively by other sections of this code, the size of the on-site renewable energy generation system is permitted to be reduced by 1/3.

2.1 Where the BPF is not less than 2 percent lower than the BPF required cumulatively by other sections of this code, the size of the on-site renewable energy generation system is permitted to be reduced by 2/3.

3.Transfer to an *affordable housing* project. Where *approved* by Bellingham, all or part of the required on-site renewable energy generation system is permitted to be replaced by construction of a system that is 50 percent of the required system size when located on an existing *affordable housing* project within the City of Bellingham, or 75 percent of the required system size when located on a new construction *affordable housing* project within the City of Bellingham. Documentation demonstrating that the renewable energy generation system has been installed on the *affordable housing* project site, the system is fully operational, and ownership has been transferred to the owner of the *affordable housing* project, must be submitted prior to issuance of the certificate of occupancy.

Bellingham Informative Note: Option 3 will only be available if an affordable housing project is available to accept the renewable energy system. There is no assurance that such a project location will be available. It is the owner's responsibility to locate and coordinate with the affordable housing project, and to ensure that the installation is completed in a timely manner.

4. Transfer to a Washington state agency program. Where *approved* by Bellingham, all or part of the required renewable energy generation system is permitted to be replaced by a contribution of $2.50 for each required watt of installed capacity, to a solar energy fund managed by a Washington state agency that will provide solar energy installations for *affordable housing* projects. Documentation demonstrating that the contribution has been received by the state agency must be submitted prior to issuance of the certificate of occupancy.

Bellingham Informative Note: Option 4 will only be available if a solar energy fund for affordable housing is created by the Housing Trust Fund, Washington State Housing Finance Commission, or another state agency program for which the project is qualified to participate. There is no assurance that such a program will be available.

5. *Affordable housing*. The on-site renewable energy generation system is not required for *affordable housing* projects.

CHAPTER 5
EXISTING BUILDINGS

SECTION 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 retrofits. For existing building projects where an *addition* or *building envelope retrofit* 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 Calculation of mechanical heating and cooling loads for retrofits. 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.

Exception: 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, or 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.

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* using the prescriptive path in Section C401.2, item 1, shall also comply with Sections C402, C403, C404, C405, C406, C409.5, C410 and C502.2. <

C502.1.1 Additional efficiency package options. *Additions* shall comply with Section C406, either for the *addition* only or for the total of the existing building plus *addition*.

Exception: *Additions* smaller than 500 square feet of *conditioned floor area* are not required to comply with Section C406.

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. Component performance alternative with target area adjustment per Section C402.1.5 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~~)) C402. *Additions* with skylights that result in a total building skylight 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 area of the building only~~))
2. Component performance alternative with the target area adjustment per Section C402.1.5 for the *addition* area of the building only.
3. Existing building and *addition* area 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~~)) C405.5.2 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.

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 to the provisions of this code than the existing building or structure was prior to the *alteration*.

Exceptions:

1. 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.
2. *Alterations* are not required to comply with Section C406 except where specifically noted in Sections C503.2, C503.8.3 and C505.1.

C503.2 Change in space conditioning. Any low energy space in accordance with Section C402.1.1.1 that is altered to become *conditioned space* or *semi-heated* space shall be brought into full compliance with this code. Any *semi-heated* space in accordance with Section C402.1.1.2 that is altered to become

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

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: Buildings or spaces that were permitted prior to the 2009 WSEC, 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 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.
3. The addition of cooling equipment serving rooms or spaces totaling less than 2000 square feet in floor area does not trigger the requirement to comply with this section.

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. Where an opaque envelope assembly is altered or replaced, the new assembly shall in no case have a higher overall U-value than the existing.

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 no insulation or 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* 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 in accordance with Section C402.4.1.3 for the new vertical fenestration added, where the calculation of vertical fenestration area and gross *above-grade wall* area shall include either the entire building or, where *approved*, only those areas ((~~in the addition~~)) of the building involved in the *alteration*.
2. ((~~Vertical fenestration alternate in accordance with Section C402.4.1.1 for the area adjacent to the new vertical fenestration added.~~)) (Reserved)
3. Existing building and ((~~alternation~~)) *alteration* area are combined to demonstrate compliance with the component performance alternative with target area adjustment in accordance with Section C402.1.5 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 in accordance with Section C407 for the whole building. 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 in accordance with Section C407.3.

Exception: ((~~Additional~~)) Where *approved* by the *code official*, additional fenestration is permitted where sufficient envelope upgrades beyond those required by other sections of this code are included

in the project so that the addition of vertical fenestration does not cause an increase in the overall energy use of the building. ((~~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. In addition, the area-weighted U-value of the new fenestration shall be equal to or lower than the U-value of the existing fenestration.

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.

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 alternative with target area adjustment in accordance with Section rigerantrefC402.1.5 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 in accordance with Section C407 for the whole building. 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 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:

1. Existing mechanical systems which are altered or where parts of the system are replaced are not required to be modified to comply with Section C403.3.5 as long as mechanical cooling capacity is not added to a system that did not have cooling capacity prior to the *alteration*.
2. 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 make 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)~~)) C403.3.2(13).
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 C403.3.5 or C403.5.

Exceptions:

1. Qualifying small equipment: Economizers are not required for cooling units and split systems serving one *zone* with a total cooling capacity rated in accordance with Section 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 C403.3.2 (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 the building total *air economizer* capacity, whichever is greater.

   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 building or space, or for total building performance.in accordance with Section C407.
   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 C403.3.2(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~~)) 72,000 Btu/h (141 kW) per building, or 20 percent of the building total *air economizer* capacity, whichever is greater.

   Notes and exclusions for Exception ((~~1~~)) 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 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 economizer capacity unless the system complies with either Section C403.3.5 or C403.5. System *alterations* or replacement shall comply with Table C503.4 when either the individual cooling unit capacity ((~~and~~)) or the building total capacity of all cooling equipment without economizer ((~~do~~)) does not comply with Sections C403.3.5 or C403.5.

TABLE C503.4

ECONOMIZER COMPLIANCE OPTIONS FOR MECHANICAL *ALTERATIONS*

Unit Type	Option A Any *alteration* with new or replacement equipment	Option B (alternate to A) Replacement unit of the same type with the same or smaller output capacity	Option C (alternate to A) Replacement unit of the same type with a larger output capacity	Option D (alternate to A) New equipment added to existing system or replacement unit of a different type
1. Packaged Units	Efficiency: min.[a] Economizer: C403.5[b]	Efficiency: min.[a] Economizer: C403.5[b]	Efficiency: min.[a] Economizer: CC403.5[b]	Efficiency: min.[a] Economizer: C403.5[b]
2. Split Systems	Efficiency: min.[a] Economizer: C403.5[b]	For units ≤ 60,000 Btuh, comply with two of two measures: 1. Efficiency: + 10%[e] 2. Economizer: shall not decrease existing economizer capability For all other capacities: Efficiency: min.[a] Economizer: C403.5[b]	For units ≤ 60,000 Btuh replacing unit installed prior to 1991, comply with at least one of two measures: 1. Efficiency: + 10%[e] 2. Economizer: 50%[f] For all other capacities: Efficiency: min.[a] Economizer: C403.5[b]	Efficiency: min.[a] Economizer: C403.5[b]
3. Water Source Heat Pump	Efficiency: min.[a] Economizer: C403.5[b]	For units ≤72,000 Btuh, comply with at least two of three measures: 1. Efficiency: + 10%[e] 2. Flow control valve[g] 3. Economizer: 50%[f] For all other capacities: Efficiency: min.[a] Economizer: C403.5[b]	For units ≤72,000 Btuh, comply with at least two of three measures: 1. Efficiency: + 10%[e] 2. Flow control valve[g] 3. Economizer: 50%[f] (except for certain pre-1991 systems[h]) For all other capacities: Efficiency: min.[a] Economizer: C403.5[b]	Efficiency: min.[a] Economizer: C403.5[b] (except for certain pre-1991 systems[q])
4. *Water Economizer* using Air-Cooled Heat Rejection Equipment (Dry Cooler)	Efficiency: min.[a] Economizer: C403.5[b]	Efficiency: +5%[d] Economizer: shall not decrease existing economizer capacity	Efficiency: min.[a] Economizer: C403.5[b]	Efficiency: min.[a] Economizer: C403.5[b]
5. Air-Handling Unit (including fan coil units) where the system has an air-cooled chiller	Efficiency: min.[a] Economizer: C403.5[b]	Economizer: shall not decrease existing economizer capacity	Efficiency: min.[a] Economizer: C403.5[b] (except for certain pre-1991 systems[q])	Efficiency: min.[a] Economizer: C403.5[b] (except for certain pre-1991 systems[q])
6. Air- Handling Unit (including fan coil units) and Water-	Efficiency: min.[a] Economizer: C403.5[b]	Economizer: shall not decrease existing economizer capacity	Efficiency: min.[a] Economizer: C403.5[b] (except for certain	Efficiency: min.[a] Economizer: C403.5[b] (except for certain

Unit Type	Option A	Option B (alternate to A)	Option C (alternate to A)	Option D (alternate to A)
	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
cooled Process Equipment, where the system has a water-cooled chiller[j]			pre-1991 systems[h] and certain 1991-2016 systems[i].)	pre-1991 systems[h] and certain 1991-2016 systems[i])

TABLE C503.4 (continued)

ECONOMIZER COMPLIANCE OPTIONS FOR MECHANICAL *ALTERATIONS*

Unit Type	Option A	Option B (alternate to A)	Option C (alternate to A)	Option D (alternate to A)
	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
7. Cooling Tower	Efficiency: min.[a] Economizer: C403.5[b]	No requirements	Efficiency: min.[a] Economizer: C403.5[b]	Efficiency: min.[a] Economizer: C403.5[b]
8. Air-Cooled Chiller	Efficiency: min.[a] Economizer: C403.5[b]	Efficiency: + 10%[k] Economizer: shall not decrease existing economizer capacity	Efficiency: Comply with two of two measures: 1. + 10%[k,l] 2. Multistage Economizer: shall not decrease existing economizer capacity	Efficiency: min.[a] Economizer: C403.5[b]
9. Water-Cooled Chiller	Efficiency: min.[a] Economizer: C403.5[b]	Efficiency: Comply with at least one of two measures: 1. Part load IPLV + 15%[n] 2. Plate frame heat exchanger[o] Economizer: shall not decrease existing economizer capacity	Efficiency: Comply with two of two measures: 1. Part load IPLV + 15%[n] 2. Plate frame heat exchanger[o] Economizer: shall not decrease existing economizer capacity	Efficiency: min.[a] Economizer: C403.5[b]

a. Minimum equipment efficiency shall comply with Section C403.3.2 and Tables C403.3.2(1) through ((~~C403.3.2(12)~~)) C403.3.2(13).

b. All separate new equipment and replacement equipment shall have *air economizer* complying with Section C403.5 including both the individual unit size limits and the total building capacity limits on units without economizer. It is acceptable to comply using one of the exceptions to Section C403.5.

c. Reserved.

d. Equipment shall have a capacity-weighted average cooling system efficiency that is 5 percent 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)).

e. Equipment shall have a capacity-weighted average cooling system efficiency that is 10 percent 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)).

f. Minimum of 50 percent *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.

g. Water-source heat pump systems shall have a flow control valve to eliminate flow through the heat pumps that are not in operation and variable speed pumping control complying with Section C403.4.3 for that heat pump.

- When the total capacity of all units with flow control valves exceeds 15 percent of the total system capacity, a variable frequency drive shall be installed on the main loop pump.
- As an alternate to this requirement, the capacity-weighted average cooling system efficiency shall be 5 percent better than the requirements in footnote e for water-source heat pumps (i.e. a minimum of 15 percent better than the requirements in Table C403.3.2(2) (1.15 x values in Table C403.3.2(2)).

h. *Water economizer* equipment shall have a capacity-weighted average cooling system efficiency that is 10 percent 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)).

i. *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.

j. For water-cooled process equipment where the manufacturers specifications require colder temperatures than available with water-side economizer, that portion of the load is exempt from the economizer requirements.

k. The air-cooled chiller shall have an IPLV efficiency that is a minimum of 10 percent greater than the IPLV requirements in EER in Table C403.3.2(7) (1.10 x IPLV values in EER in Table C403.3.2(7)).

l. The air-cooled chiller shall be multistage with a minimum of two compressors.

m. ((~~The water-cooled chiller shall have full load and part load IPLV efficiency that is a minimum of 5 percent greater than the IPLV requirements in Table C403.3.2(7) (1.05 x IPLV values in Table C403.3.2(7)).~~))

n. The water-cooled chiller shall have an IPLV value that is a minimum of 15 percent lower than the IPLV requirements in Table C403.3.2(7), (0.85 ((~~1.15~~)) x IPLV values in Table C403.3.2(7)). Water-cooled centrifugal chillers designed for non-standard conditions shall have an NPLV value that is at least 15 percent lower than the adjusted maximum NPLV rating in kW per ton defined in Section C403.3.2.1 (0.85 ((~~1.15~~)) x NPLV).

o. Economizer cooling shall be provided by adding a plate-frame heat exchanger on the water-side with a capacity that is a minimum of 20% of the chiller capacity at standard AHRI rating conditions.

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.

C503.4.4 Controls for cooling equipment replacement. When space cooling equipment is replaced, controls shall comply with all requirements under Section C403.3.5 and related subsections, 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.

C503.5 Service hot water systems. New service hot water systems that are part of the *alteration* shall comply with Section C404.

Exception. Where only one service hot water appliance is failing and is replaced by another having the same or lesser heating capacity and the same or higher efficiency, no other alterations are made to the central service hot water system, and this exception has not been used within the same building in the previous 24-month period, this provision does not apply.

C503.6 Lighting, ((~~controlled~~)) receptacles and motors. *Alterations* or the addition of lighting, ((~~controlled~~)) receptacles and motors shall comply with Sections C503.6.1 through C503.6.6.

C503.6.1 Luminaire additions and *alterations*. *Alterations* that add, alter or replace ((~~50~~)) 20 percent or more of the luminaires or of the lamps plus ballasts alone in a space enclosed by walls or ceiling-height partitions, replace ((~~50~~)) 20 percent or more of parking garage luminaires, or replace ((~~50~~)) 20 percent or more of the total installed wattage of exterior luminaires shall comply with Sections C405.4 and C405.5. Where less than ((~~50~~)) 20 percent of the fixtures in an interior space enclosed by walls or ceiling-height partitions or in a parking garage are added or replaced, or less than ((~~50~~)) 20 percent of the installed exterior wattage is 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, and C405.2.6, and as applicable 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, 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, C 405.2.2, 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. In no case shall the energy efficiency of the building be decreased.

C503.6.6 Controlled receptacles. Where electric receptacles are added or replaced, *controlled receptacle*s 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 receptacle*s are not required.
2. Where existing systems furniture or partial-height relocatable office cubicle partitions are reconfigured or relocated within the same area, *controlled receptacle*s are not required in the existing systems furniture or office cubicle partitions.
3. Where new or altered receptacles meet ((~~the~~)) exception 1 to Section C405.10, they are not required to be *controlled receptacle*s or be located within 12 inches of non-*controlled receptacle*s.

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.

SECTION C504

REPAIRS

C504.1 General. Buildings and structures, and parts thereof, shall be repaired in compliance with Section C501.3 and this section. Work on nondamaged components that is necessary for the required *repair* of damaged components shall be considered part of the *repair* and shall not be subject to the requirements for *alterations* in this chapter. Routine maintenance required by Section C501.3, ordinary repairs exempt from *permit*, and abatement of wear due to normal service conditions shall not be subject to the requirements for *repairs* in this section.

C504.2 Application. For the purposes of this code, the following shall be considered repairs.

1. Glass only replacements in an existing sash and frame.
2. *Roof repairs*.

((~~3. Air barriers shall not be required for *roof repair* where the repairs to the building do not include *alterations*, renovations or *repairs* to the remainder of the building envelope.~~

~~4. 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.~~))

Bellingham Informative Note: Exceptions 3 and 4 appear in the exceptions to Section C503.1.

~~5.~~ ((~~*Repairs* where only the bulb and/or ballast within the existing luminaires in a space are replaced provided that the replacement does not increase the installed interior lighting power.~~))

Bellingham Informative Note: For exception 5, see Section C503.6.1.

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. *

Exception: Buildings or spaces that were permitted prior to the 2009 WSEC, 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 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. **
3. <u>Where the building or space is altered to become a bakery, commercial kitchen or commercial laundry, and the proposed design uses only all-electric Energy Star-rated process equipment and code compliant all-electric HVAC equipment, improvements to the building envelope immediately adjoining the spaces containing that use shall not be required. For the purposes of</u>

this exception, no fossil fuel burning equipment of any kind may be installed within the building or space undergoing the *change of occupancy*.

Compliance shall include the provisions of Section C406, applied only to the portion of the building undergoing a *change of occupancy* or use. 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.

SECTION C506
METERING FOR EXISTING BUILDINGS

Bellingham Informative Note: Section C506.1 was relocated from Section C409.5.

C506.1 Existing buildings that were constructed subject to the requirements of this section. Where new or replacement systems or equipment are installed in an existing building that was constructed subject to the requirements of this section, metering shall be provided for such new or replacement systems or equipment so that their energy use is included in the corresponding end-use category defined in Section C409.3. This includes systems or equipment added in conjunction with *additions* or *alterations* to existing buildings.

C506.1.1 Small existing buildings. In buildings that were constructed subject to Section C409, metering and *data acquisition system*s shall be provided for *additions* over 10,000 square feet in accordance with the requirements of sections C409.2, C409.3 and C409.4.

C506.2 Metering for the addition or replacement of HVAC equipment in existing buildings. Where HVAC equipment is added or replaced, metering shall be provided according to Sections C506.2.1 or C506.2.2, as applicable.

C506.2.1 Addition or replacement of individual HVAC equipment pieces. Where HVAC equipment is added or replaced, but compliance with Section C506.2.2 is not required, metering shall be provided as follows, and 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.

1. Electrical metering shall be provided for all of the following:
   a. Each new or existing branch circuit serving a new piece of HVAC equipment with minimum circuit ampacity (MCA) that equates to 50 kVA or more. A single meter is permitted to serve multiple circuits of the same sub-metering category from Section C409.3.
   b. Each new or existing branch circuit supplied by a new electrical panel that is dedicated to serving HVAC equipment. It shall be permitted to meter the circuits individually or in aggregate.
   c. Each new HVAC fan or pump on a variable speed drive, where the fan, pump, or variable speed drive are new, unless the variable speed drive is integral to a packaged HVAC unit or the existing variable speed drive does not have the capability to provide electric metering output.
2. Natural gas metering shall be provided for each new natural gas connection that is rated at 1,000 kBTU or higher. A single meter is permitted to serve multiple equipment pieces of the same sub-metering category from Section C409.3; HVAC, water heating or process.

C506.2.2 Addition or replacement of the majority of HVAC equipment in a building. Where permits are issued for new or replacement HVAC equipment that has a total heating and cooling capacity greater than 1,200 kBTU/hour and greater than 50 percent of the building's existing HVAC heating and cooling capacity, within any 12-month period, the following shall be provided for the building:

1. Energy source metering required by Section C409.2.
2. HVAC system end-use metering required by Section C409.3.1

3. Data acquisition and display system per the requirements of Section C409.4.

Each of the building's existing HVAC chillers, boilers, cooling towers, air handlers, packaged units and heat pumps that has a capacity larger than 5 tons or that represents more than 10 percent of the total heating and cooling capacity of the building shall be included in the calculation of the existing heating and cooling capacity of the building. Where heat pumps are configured to deliver both heating and cooling, the heating and cooling capacities shall both be included in the calculation of the total capacity.

Each of the building's existing and new HVAC chillers, boilers, cooling towers, air handlers, packaged units and heat pumps that has a heating or cooling capacity larger than 5 tons or that represents more than 10 percent of the total heating and cooling capacity of the building shall be included in the HVAC system end-use metering.

Construction documents for new or replacement heating and cooling equipment projects shall indicate the total heating and cooling capacity of the building's existing HVAC equipment and the total heating and cooling capacity of the new or replacement equipment. Where permits have been issued for new or replacement heating and cooling equipment within the 12 month period prior to the permit application date, the heating and cooling capacity of that equipment shall also be indicated. For the purpose of this tabulation, heating and cooling capacities of all equipment shall be expressed in kBTU / hour.

C506.3 Tenant space electrical sub-metering for existing buildings. For tenant improvements in which a single tenant will occupy a full floor or multiple floors of a building, the electrical consumption for the tenant space on that floor shall be separately metered, and the metering data provided to the tenant with a display system per the requirements of Section C409.4.3. For the purposes of this section, separate end use categories need not be segregated.

EXCEPTION: Where an existing branch circuit electrical panel serves tenant spaces on multiple full floors of a building, the floors served by that panel are not required to comply with this section.

C506.4 Metering for complete electrical system replacement. If all, or substantially all, of the existing electrical system is replaced under a single electrical permit or within a 12-month period, all of the provisions of Section C409 shall be met.

CHAPTER 6

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 106.

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—17	North American Fenestration Standard/ Specifications for Windows, Doors and Unit Skylights	Table C402.4, C402.4.1.1.2

AHAM

Association of Home Appliance Manufacturers
1111 19th Street, NW, Suite 402
Washington, DC 20036

Standard reference number	Title	Referenced in code section number
ANSI/ AHAM RAC-1—2008	Room Air Conditioners	Table C403.3.2(3)
AHAM HRF-1—2017	Household Refrigerators, Refrigerator-Freezers and Freezers	Table C4410.1(1)(3)

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 (2017)	Water-source Heat Pumps—Testing and Rating for Performance— Part 1: Water-to-air and Brine-to-air Heat Pumps	Table C403.3.2(2)
ISO/AHRI/ASHRAE 13256-2 (2017)	Water-source Heat Pumps—Testing and Rating for Performance— Part 2: Water-to-water and Brine-to-water Heat Pumps	Table C403.3.2(2)
210/240—2016	Unitary Air Conditioning and Air-source Heat Pump Equipment	Table C403.3.2(1), Table C403.3.2(2)
310/380—2014	Standard for Packaged Terminal Air Conditioners and Heat Pumps	Table C403.3.2(3)
340/360—2015	Commercial and Industrial Unitary Air-conditioning and Heat Pump Equipment	Table C403.3.2(1), Table C403.3.2(2)
365—09	Commercial and Industrial Unitary Air-conditioning Condensing Units	Table C403.3.2(1), Table C403.3.2(6)
390—2011	Performance Rating of Single Package Vertical Air Conditioners and Heat Pumps	Table C403.3.2(3)
400—01	Liquid to Liquid Heat Exchangers with Addendum 2	Table C403.3.2(9)
440—08	Room Fan Coil	C403.10.3
460—05	Performance Rating Remote Mechanical Draft Air-cooled Refrigerant Condensers	Table C403.3.2(8)

AHRI --continued

550/590—03	Water Chilling Packages Using the Vapor Compression Cycle—with Addenda .....C403.3.2.1, Table C403.3.2(7)
560—00	Absorption Water Chilling and Water-heating Packages .....Table C403.3.2(7)
920—15	Performance Rating of DX-Dedicated Outdoor Air System Units.....Table C403.3.2(11), Table C403.3.2(12)
1160—2014	Performance Rating of Heat Pump Pool Heaters.....Table C404.2
1200—2014	Performance Rating of Commercial Refrigerated Display Merchandisers and Storage Cabinets..... C410.1.1, Table C410.1.1(1) Table C410.1.1(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	C403.8.3, C406.2.3
220-08 (R2012)	Laboratory Methods of Testing Air Curtain Units	C402.5.6
500D—10	Laboratory Methods for Testing Dampers for Rating	C403.7.8.3

ANSI

American National Standards Institute
25 West 43rd Street
Fourth Floor
New York, NY 10036

Standard reference number	Title	Referenced in code section number
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 C403.3.2(4)

Z83.8/CSA 2.6—09	Gas Unit Heaters, Gas Packaged Heaters, Gas Utility Heaters and Gas-fired Duct Furnaces ..... Table C403.3.2(4)

APSP

The Association of Pool and Spa Professionals
2111 Eisenhower Avenue
Alexandria, VA 22314

Standard reference number	Title	Referenced in code section number
14-2014	American National Standard for Portable Electric Spa Efficiency	C404.8

ASHRAE

American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.
1791 Tullie Circle, NE
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	C403.4.1
Standard 183—2007	Peak Cooling and Heating Load Calculations in Buildings, Except Low-rise Residential Buildings.....	C403.1.2
ANSI/ASHRAE/ASHE Standard 170-2017	Ventilation of Health Care Facilities……	C403.1.1
ASHRAE—2016	ASHRAE HVAC Systems and Equipment Handbook—2004	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 C403.3.2(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 C403.3.2(2)

ASHRAE --continued

90.1—((~~2016~~)) 2019	Energy Standard for Buildings Except Low-rise Residential Buildings..... C402.1.5.1, C407.3
90.4—((~~2016~~)) 2019	Energy Standard for Data Centers C403.1.3
146—2011	Testing and Rating Pool Heaters.....Table C404.2

ASME

American Society Mechanical Engineers
Two Park Avenue
New York, NY 10016-5990

Standard reference number	Title	Referenced in code section number
ASME A17.1/ CSA 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—14	Specification for Load-bearing Concrete Masonry Units	Table C402.1.3
C 518—17	Standard Test Method for Steady-State Thermal Transmission Properties By Means of the Heat Flow Meter Apparatus.....	Table C403.10.1.1
C 1371—11	Standard Test Method for Determination of Emittance of Materials Near Room Temperature Using Portable Emissometers	C303.1.4.1, Table C402.1.4
D 1003—13	Standard Test Method for Haze and Luminous Transmittance of Transparent Plastics.....	C402.4.2.2
E 283—04	Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Differences Across the Specimen	C402.5.8,
E779—10	Standard Test Method for Determining Air Leakage Rate	

by Fan Pressurization C402.5.1.2, C406.11.1

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—17	North American Fenestration Standard/Specification for Windows, Doors and Unit Skylights	Table C402.4, C402.4.1.1.2
CSA B55.1—2012	Test Method for Measuring Efficiency and Pressure Loss of DWHR Units	C404.10
CSA B55.2—2012	Drain Water Heat Recovery Units	C404.10

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 C403.3.2(8)
ATC 105S—2011	Acceptance Test Code for Closed Circuit Cooling Towers	Table C403.3.2(8)
ATC 106—2011	Acceptance Test for Mechanical Draft Evaporative Vapor Condensers	Table C403.3.2(8)
STD 201 RS(15)	Standard for Certification of Water Cooling Towers Thermal Performances.	Table C403.3.2(8)

DASMA

Door and Access Systems Manufacturers Association

1300 Sumner Avenue

Cleveland, OH 44115-2851

Standard	Referenced

reference number	Title	in code section number
105—92 (R2004)—13	Test Method for Thermal Transmittance and Air Infiltration of Garage Doors C303.1.3	

DOE

U.S. Department of Energy
c/o Superintendent of Documents
U.S. Government Printing Office
Washington, DC 20402-9325

Standard reference number	Title	Referenced in code section number
10 CFR, Part 430—1998	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 C403.3.2(4), Table C403.3.2(5),	Table C404.2
10 CFR, Part 430, Subpart B, Appendix N—1998	Uniform Test Method for Measuring the Energy Consumption of Furnaces and Boilers.....C202	
10 CFR, Part 431—2004	Energy Efficiency Program for Certain Commercial and Industrial Equipment: Test Procedures and Efficiency Standards; Final Rules .Table C403.3.2(5), 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 C403.3.2(1), (2), (4)	

HVI

Home Ventilating Institute
1740 Dell Range Blvd., Ste H.450
Cheyenne, WY 82009

Standard reference number	Title	Referenced in code section number
HVI 916—2015	Home Ventilating Institute Airflow Test Procedure 916-2015	C403.8.4

HVI 920—2020	Product Performance Certification Procedure Including Verification and Challenge 920-2020 C403.3.6

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—2018	Uniform Plumbing Code	C201.3, C501.4

ICC

International Code Council, Inc.
500 New Jersey Avenue, NW
6th Floor
Washington, DC 20001

Standard reference number	Title	Referenced in code section number
IBC—18	International Building Code	C201.3, C303.1.1, C303.2, C402.5.3, C402.5.4 Table C403.3.5, C405.2.1.5, C405.2.5, C411.4, C501.4
IEBC—18	International Existing Building Code	C201.3, 501.4
IFC—18	International Fire Code	C201.3, C411.1, C411.6, C501.4
IFGC—18	International Fuel Gas Code	C201.3, C501.4
IMC—18	International Mechanical Code	C106.3, C201.3, C402.5.3, 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, C403.7.8.4, C403.8.4, C403.8.5.1, C403.9.2.4.2, C403.10.1.1, Table C403.10.1.1, C403.10.1.2, Table C403.10.1.2, C403.10.2, C403.10.2.1, C403.10.2.2, C403.12, C406.6, C408.2.2.1, C501.4

IEEE

The Institute of Electrical and Electronic Engineers
Three Park Avenue
New York, NY 10016

Standard reference number	Title	Referenced in code section number
IEEE 515.1—2012	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—2016	Energy Standard for Buildings Except Low-rise Residential Buildings	C402.1.5.1, C407.3

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 (2017)	Water-source Heat Pumps—Testing and Rating for Performance— Part 1: Water-to-air and Brine-to-air Heat Pumps	Table C403.3.2(2)
ISO/AHRI/ASHRAE 13256-2 (2017)	Water-Source Heat Pumps—Testing and Rating for Performance— Part 2: Water-to-water and Brine-to-water Heat Pumps	Table C403.3.2(2)

NEMA

National Electric Manufacturer's Association
1300 North 17th Street
Suite 1753
Rosslyn, VA 22209

Standard reference number	Title	Referenced in code section number
MG1—2014	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—2017	Procedure for Determining Fenestration Products U-factors—Second Edition	C303.1.2, C402.2.1
200—2017	Procedure for Determining Fenestration Product Solar Heat Gain Coefficients and Visible Transmittance at Normal Incidence—Second Edition	C303.1.3, C402.3.1.1
202—2017	Procedure for Determining Fenestration Product Visible Transmittance at Normal Incidence	C202
203—2017	Procedure for Determining Visible Transmittance of Tubular Daylighting Devices	C202, 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	C403.10.2.3

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	C403.7.7.1.2, C403.7.7.1.3
727—06	Oil-fired Central Furnaces—with Revisions through April 2010	Table C403.3.2(4)
731—95	Oil-fired Unit Heaters—with Revisions through April 2010	Table C403.3.2(4)

US-FTC

United States-Federal Trade Commission
600 Pennsylvania Avenue NW
Washington, DC 20580

Standard reference number	Title	Referenced in code section number
CFR Title 16 (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—11	North American Fenestration Standard/Specification for Windows, Doors and Unit Skylights	Table C402.4, C402.4.1.1.2

Appendix A amendments

Table A102.2.6.1[a, d, ~~f,~~ g, h, i, j]

…

Table A102.2.6.2[a, b, e, ~~f,~~ g, h, i, j]

…

Table A102.2.6.3[a, c, ~~e,~~ f, g, h, i, j]

Footnotes

a. Rmax and Rmin are determined along the linearly tapered cross section for the respective ~~**minimum and**~~ maximum **and minimum** thickness values for the roof section being analyzed.

b. For triangular roof sections **with insulation sloping to the center,** Rmax refers to the insulation value along the long edge of the triangle and Rmin to the insulation at the point of the triangle ~~**which assumes that the insulation slopes to the center**~~.

c. **For triangular roof sections with insulation sloping to the perimeter,** Rmax refers to the insulation value at the point of the triangle and Rmin to the insulation along the long edge of the triangle ~~**which assumes that the insulation slopes to the perimeter**~~.

d. Effective ~~**U-factor for**~~ **R-value of** rectangular tapered insulation is calculated as follows:

$$R_{eff} = (R_{max} - R_{min}) \Big/ \ln\left[\frac{R_{max}}{R_{min}}\right]$$

e. Effective ~~**U-factor for**~~ **R-value of** triangular tapered insulation **sloping to the center** is calculated as follows:

$$R_{eff} = \left[\frac{2}{R_{max} - R_{min}}\left[1 + \frac{R_{min}}{R_{max} - R_{min}} \ln\left[\frac{R_{min}}{R_{max}}\right]\right]\right]^{-1}$$

f. Effective R-value of triangular tapered insulation sloping to the perimeter is calculated as follows:

$$\boldsymbol{R_{eff} = \left[\frac{2}{R_{min} - R_{max}}\left[1 + \frac{R_{max}}{R_{min} - R_{max}} \ln\left[\frac{R_{max}}{R_{min}}\right]\right]\right]^{-1}}$$

g. Assembly U-factors include **the effective R-value of the tapered insulation,** an exterior air film (R=0.17) and an interior air film, horizontal with heat flow up (R=0.61).

h. For effective U-factors of roof assemblies with different Rmax or Rmin values not listed in the tables interpolation is allowed. **For effective U-factors of roof assemblies with Rmax greater than the values listed in the tables, the effective U-factor must be calculated using the effective R-value calculations above.**

i. This table shall only be applied to tap insulation that is tapered along only one axis.

j. In areas of differing insulation slopes/configurations, individual U-~~**values**~~**factors** shall be calculated and an area weighted U-~~**value**~~**factor** calculation shall be used to determine the effective value of the roof.

Choose a building block.**Changes to 2018 WA Appendix D ruleset to add multifamily to TSPR:**

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 and *dwelling unit*s and common areas within multifamily buildings. 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:

HVAC TSPR = 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 C407.3(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[b]	0.00	

a. District energy systems may use alternative emission factors supported by calculations *approved* by the *code official*

b. The TSPR calculation does not separately account for the use of renewable energy.

***

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 (multifamily *dwelling unit*, multifamily common area, office, library, education or retail). Therefore, at least one single *block* shall be created for each unique use type.

***

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 multifamily, 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 multifamily, office, retail, library, or school as specified by ASHRAE Standard 90.1 Normative Appendix C.

***

D601.6 Lighting. Interior lighting power density shall be equal to the allowance in Table C405.4.2(1) for multifamily, office, retail, library, or school. The lighting schedule shall be for multifamily, 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 multifamily, 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.

Exceptions.

1. Multifamily dwelling units shall have a miscellaneous load density of 0.42 W/ft^2
2. Multifamily common areas shall have a miscellaneous load density of 0 W/ft^2

***

Table D601.11.2

Proposed Building System Parameters

Category	Parameter	Fixed or User Defined	Required	Applicable Systems
System Operation	Space Temperature Setpoints	Fixed	As specified in ASHRAE Standard 90.1 Normative Appendix C, except multifamily which shall use 68 deg. F heating and 76 deg. F cooling setpoints	1-11
Economizer	Economizer Presence	User Defined	Yes or No	3, 4, 9, 10, 11
	Economizer ((~~High Limit~~)) Control Type	Fixed	((~~75°F fixed~~)) Differential dry-bulb	3, 4, 9, 10, 11

Table D602.11

Standard Reference Design HVAC Systems

Parameter	Building Type				
	Large Office[1]	Small Office and Libraries [1]	Retail	School	Multifamily
System Type	Water-source Heat Pump	Packaged air-source	Packaged air-source	Packaged air-source	Packaged air-source Heat Pump

Parameter	Building Type				
	Large Office[1]	**Small Office and Libraries [1]**	**Retail**	**School**	**Multifamily**
		Heat Pump	Heat Pump	Heat Pump	
Fan control[2]	Cycle on load	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	0.528
Heating/Cooling sizing factor[3]	1.25/1.15	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	<40°F
Modeled cooling COP (Net of fan) [4]	4.46	3.83	4.25	3.83	3.83
Modeled heating COP (Net of fan) [4]	4.61	3.81	3.57	3.81	3.86
Cooling Source	DX (heat pump)	DX (heat pump)	DX (heat pump)	DX (heat pump)	DX (heat pump)
Heat source	Heat Pump	Heat Pump	Heat Pump	Heat Pump	Heat Pump
OSA Economizer[5]	No	No	Yes	Yes	Yes
Occupied ventilation source[6]	DOAS	DOAS	DOAS	DOAS	DOAS
DOAS Fan Power (W/cfm of outside air)	0.819	0.819	0.730	0.742	0.78
DOAS temperature control [7, 8]	Bypass	Wild	Bypass	Bypass	Wild
ERV efficiency (sensible only)	70%	70%	70%	70%	70%
WSHP Loop Heat Rejection	Cooling Tower [9]	NA	NA	NA	NA
WSHP Loop Heat Source	Gas Boiler [10]	NA	NA	NA	NA

Parameter	Building Type				
	Large Office[1]	Small Office and Libraries [1]	Retail	School	Multifamily
WSHP Loop Temperature Control[11]	50°F to 70°F	NA	NA	NA	NA
WSHP circulation Pump W/gpm[12]	16	NA	NA	NA	NA
WSHP Loop Pumping Control[13]	HP Valves & pump VSD	NA	NA	NA	NA

TABLE D601.11.2 (partial)

Category	Parameter	Fixed or User Defined	Required	Applicable Systems
Economizer	Economizer Presence	User Defined	Yes or No	3, 4, 9, 10, 11
	Economizer ((~~High Limit~~)) Control Type	Fixed	((~~75°F fixed~~)) Differential dry-bulb	3, 4, 9, 10, 11

ATTACHMENT #3
Public Comment

Nabbefeld, Kurt D.

From: Miriam Margulies <miminomad@gmail.com>
Sent: Friday, December 3, 2021 2:07 PM
To: Johnston, Eric C.; LaCroix, Renee S.; Vidana, Seth A.; Fogelsong, Clare G.; Fleetwood, Seth M.; Stone, Hannah E.; Knutson, Gene R.; Hammill, Daniel C.; Vargas, Pinky T.; Lilliquist, Michael W.; Huthman, Hollie A.; =?utf-8?Q?=E2=80=8Blaanderson?=@cob.org; electrify.bellingham@gmail.com; Nabbefeld, Kurt D.; Angeley, Sean M.
Subject: Electrify Bellingham Buildings!

Dear Bellingham leaders,

Thank you for sharing your plan to vote on an ordinance adopting new energy codes - which requires electrification of heating and readiness for solar panels for new commercial and large multi-family buildings - by the end of 2021, with plans to implement in 2022. I am excited to see this long-planned measure come to fruition!

Fossil gas powered buildings are a bad idea: for our health, our air, and the climate. When we hook up buildings to fossil gas, we put our health at risk and we fail to take necessary climate action. Burning gas in buildings is the #1 source of climate pollution in Bellingham. We must build without fossil fuels.

I am committed to following City Council's progress and look forward to seeing this ordinance enacted in an accelerated timeline reflecting our community's support of bold climate action.

Sincerely,

Miriam Margulies

Nabbefeld, Kurt D.

From: Melissa <melissaminer@comcast.net>
Sent: Thursday, December 2, 2021 3:36 PM
To: Johnston, Eric C.; LaCroix, Renee S.; Vidana, Seth A.; Fogelsong, Clare G.; Fleetwood, Seth M.; Stone, Hannah E.; Knutson, Gene R.; Hammill, Daniel C.; Vargas, Pinky T.; Lilliquist, Michael W.; Huthman, Hollie A.; Anderson, Lisa A.; electrify.bellingham@gmail.com; Nabbefeld, Kurt D.; Angeley, Sean M.
Subject: Electrify Bellingham Buildings!

Dear Bellingham leaders,

Thank you for sharing your plan to vote on an ordinance adopting new energy codes - which requires electrification of heating and readiness for solar panels for new commercial and large multi-family buildings - by the end of 2021, with plans to implement in 2022. I am excited to see this long-planned measure come to fruition!

Fossil gas powered buildings are a bad idea: for our health, our air, and the climate. When we hook up buildings to fossil gas, we put our health at risk and we fail to take necessary climate action. Burning gas in buildings is the #1 source of climate pollution in Bellingham. We must build without fossil fuels.

I am committed to following City Council's progress and look forward to seeing this ordinance enacted in an accelerated timeline reflecting our community's support of bold climate action.

Sincerely,
Melissa Miner
Bellingham Community Member

Sent from my iPhone

Nabbefeld, Kurt D.

From: Tristan Smith <tristanbsmith@gmail.com>
Sent: Wednesday, December 1, 2021 8:04 PM
To: Johnston, Eric C.; LaCroix, Renee S.; Vidana, Seth A.; Fogelsong, Clare G.; Fleetwood, Seth M.; Stone, Hannah E.; Knutson, Gene R.; Hammill, Daniel C.; Vargas, Pinky T.; Lilliquist, Michael W.; Huthman, Hollie A.; Anderson, Lisa A.; electrify.bellingham@gmail.com; Nabbefeld, Kurt D.; Angeley, Sean M.
Subject: Electrify Bellingham Buildings!

Dear Bellingham leaders,

Thank you for sharing your plan to vote on an ordinance adopting new energy codes - which requires electrification of heating and readiness for solar panels for new commercial and large multi-family buildings - by the end of 2021, with plans to implement in 2022. I am excited to see this long-planned measure come to fruition!

Fossil gas powered buildings are a bad idea: for our health, our air, and the climate. When we hook up buildings to fossil gas, we put our health at risk and we fail to take necessary climate action. Burning gas in buildings is the #1 source of climate pollution in Bellingham. We must build without fossil fuels.

I am committed to following City Council's progress and look forward to seeing this ordinance enacted in an accelerated timeline reflecting our community's support of bold climate action.

Sincerely,

Bellingham Community Member

Nabbefeld, Kurt D.

From: Zenda Boss-Hall <ZendaBoss-Hall@msn.com>
Sent: Tuesday, November 30, 2021 7:43 AM
To: Johnston, Eric C.; LaCroix, Renee S.; Vidana, Seth A.; Fogelsong, Clare G.; Fleetwood, Seth M.; Stone, Hannah E.; Knutson, Gene R.; Hammill, Daniel C.; Vargas, Pinky T.; Lilliquist, Michael W.; Huthman, Hollie A.; electrify.bellingham@gmail.com; Nabbefeld, Kurt D.; Angeley, Sean M.
Subject: Electrify Bellingham Buildings!

Dear Bellingham leaders,

Thank you for sharing your plan to vote on an ordinance adopting new energy codes - which requires electrification of heating and readiness for solar panels for new commercial and large multi-family buildings - by the end of 2021, with plans to implement in 2022. I am excited to see this long-planned measure come to fruition!
Fossil gas powered buildings are a bad idea: for our health, our air, and the climate. When we hook up buildings to fossil gas, we put our health at risk and we fail to take necessary climate action. Burning gas in buildings is the #1 source of climate pollution in Bellingham. We must build without fossil fuels.

I am committed to following City Council's progress and look forward to seeing this ordinance enacted in an accelerated timeline reflecting our community's support of bold climate action.

Sincerely,
Zenda Boss-Hall

Bellingham Community Member
Sent from Mail for Windows

Nabbefeld, Kurt D.

From: Carrie Blackwood <ceblackwood@outlook.com>
Sent: Saturday, November 27, 2021 5:56 PM
To: Johnston, Eric C.; LaCroix, Renee S.; Vidana, Seth A.; Fogelsong, Clare G.; Fleetwood, Seth M.; Stone, Hannah E.; Knutson, Gene R.; Hammill, Daniel C.; Vargas, Pinky T.; Lilliquist, Michael W.; Huthman, Hollie A.; electrify.bellingham@gmail.com; Nabbefeld, Kurt D.; Angeley, Sean M.
Subject: Electrify Bellingham Buildings!

Dear Bellingham leaders,

Thank you for sharing your plan to vote on an ordinance adopting new energy codes - which requires electrification of heating and readiness for solar panels for new commercial and large multi-family buildings - by the end of 2021, with plans to implement in 2022. I am excited to see this long-planned measure come to fruition!

Fossil gas powered buildings are a bad idea: for our health, our air, and the climate. When we hook up buildings to fossil gas, we put our health at risk and we fail to take necessary climate action. Burning gas in buildings is the #1 source of climate pollution in Bellingham. We must build without fossil fuels.

I am committed to following City Council's progress and look forward to seeing this ordinance enacted in an accelerated timeline reflecting our community's support of bold climate action.

Sincerely,

Carrie Blackwood

Bellingham Community Member

Get Outlook for iOS

Nabbefeld, Kurt D.

From: Don Paulson Claudia Callahan <callpaulson@hotmail.com>
Sent: Saturday, November 27, 2021 5:25 PM
To: Johnston, Eric C.; LaCroix, Renee S.; Vidana, Seth A.; Fogelsong, Clare G.; Fleetwood, Seth M.; Stone, Hannah E.; Knutson, Gene R.; Hammill, Daniel C.; Vargas, Pinky T.; Lilliquist, Michael W.; Huthman, Hollie A.; electrify.bellingham@gmail.com; Nabbefeld, Kurt D.; Angeley, Sean M.
Subject: Electrify Bellingham Buildings!

Dear Bellingham leaders,

Thank you for sharing your plan to vote on an ordinance adopting new energy codes - which requires electrification of heating and readiness for solar panels for new commercial and large multi-family buildings - by the end of 2021, with plans to implement in 2022. I am excited to see this long-planned measure come to fruition!

Fossil gas powered buildings are a bad idea: for our health, our air, and the climate. When we hook up buildings to fossil gas, we put our health at risk and we fail to take necessary climate action. Burning gas in buildings is the #1 source of climate pollution in Bellingham. We must build without fossil fuels.

I am committed to following City Council's progress and look forward to seeing this ordinance enacted in an accelerated timeline reflecting our community's support of bold climate action.

Sincerely,

Bellingham Community Member Claudia Callahan

Sent from my iPad

Nabbefeld, Kurt D.

From: BD - Barbara Davidson <barbara33davidson@gmail.com>
Sent: Saturday, November 27, 2021 1:21 PM
To: Johnston, Eric C.; LaCroix, Renee S.; Vidana, Seth A.; Fogelsong, Clare G.; Fleetwood, Seth M.; Stone, Hannah E.; Knutson, Gene R.; Hammill, Daniel C.; Vargas, Pinky T.; Lilliquist, Michael W.; Huthman, Hollie A.; electrify.bellingham@gmail.com; Nabbefeld, Kurt D.; Angeley, Sean M.
Subject: Electrify Bellingham Buildings!

Dear Bellingham leaders,

Thank you for sharing your plan to vote on an ordinance adopting new energy codes - which requires electrification of heating and readiness for solar panels for new commercial and large multi-family buildings - by the end of 2021, with plans to implement in 2022. I am excited to see this long-planned measure come to fruition!

Fossil gas powered buildings are a bad idea: for our health, our air, and the climate. When we hook up buildings to fossil gas, we put our health at risk and we fail to take necessary climate action. Burning gas in buildings is the #1 source of climate pollution in Bellingham. We must build without fossil fuels.

I am committed to following City Council's progress and look forward to seeing this ordinance enacted in an accelerated timeline reflecting our community's support of bold climate action.

Sincerely,
Barbara Davidson
Bellingham Community Member

Nabbefeld, Kurt D.

From: Kelly Krieger <kjkrieger27@gmail.com>
Sent: Friday, November 26, 2021 7:25 PM
To: Johnston, Eric C.; LaCroix, Renee S.; Vidana, Seth A.; Fogelsong, Clare G.; Fleetwood, Seth M.; Stone, Hannah E.; Knutson, Gene R.; Hammill, Daniel C.; Vargas, Pinky T.; Lilliquist, Michael W.; Huthman, Hollie A.; Anderson, Lisa A.; electrify.bellingham@gmail.com; Nabbefeld, Kurt D.; Angeley, Sean M.
Subject: Electrify Bellingham Buildings!

Dear Bellingham Leaders:

Thank you for sharing your plan to vote on an ordinance adopting new energy codes, which requires electrification of heating and readiness for solar panels for new commercial and large multi-family buildings - by the end of 2021, with plans to implement in 2022. I am in full support and cant wait to see this critical measure come to fruition! It's time to cut ties with fossil fuels to power our buildings. It is necessary to take this action NOW to ensure a healthy, carbon free future for our county. We just don't have time to wait on the necessary action, and we know that the number one contributor to climate pollution in Bellingham is the burning of gas in buildings. Thank you for supporting bold climate action!

Kelly Krieger

Sent from my iPad

Nabbefeld, Kurt D.

From: Amanda Oliphant <amandacfrank@hotmail.com>
Sent: Wednesday, November 24, 2021 9:47 PM
To: Johnston, Eric C.; LaCroix, Renee S.; Vidana, Seth A.; Fogelsong, Clare G.; Fleetwood, Seth M.; Stone, Hannah E.; Knutson, Gene R.; Hammill, Daniel C.; Vargas, Pinky T.; Lilliquist, Michael W.; Huthman, Hollie A.; Anderson, Lisa A.; electrify.bellingham@gmail.com; Nabbefeld, Kurt D.; Angeley, Sean M.
Subject: Electrify Bellingham Buildings!

Dear Bellingham leaders,

Thank you for sharing your plan to vote on an ordinance adopting new energy codes - which requires electrification of heating and readiness for solar panels for new commercial and large multi-family buildings - by the end of 2021, with plans to implement in 2022. I am excited to see this long-planned measure come to fruition!

Fossil gas powered buildings are a bad idea: for our health, our air, and the climate. When we hook up buildings to fossil gas, we put our health at risk and we fail to take necessary climate action. Burning gas in buildings is the #1 source of climate pollution in Bellingham. We must build without fossil fuels.

I am committed to following City Council's progress and look forward to seeing this ordinance enacted in an accelerated timeline reflecting our community's support of bold climate action.

Sincerely,
Amanda Oliphant
Bellingham Community Member

Nabbefeld, Kurt D.

From: Andronetta Douglass <andronetta@icloud.com>
Sent: Wednesday, November 24, 2021 7:28 PM
To: Johnston, Eric C.; LaCroix, Renee S.; Vidana, Seth A.; Fogelsong, Clare G.; Fleetwood, Seth M.; Stone, Hannah E.; Knutson, Gene R.; Hammill, Daniel C.; Vargas, Pinky T.; Lilliquist, Michael W.; Huthman, Hollie A.; Anderson, Lisa A.; electrify.bellingham@gmail.com; Nabbefeld, Kurt D.; Angeley, Sean M.
Subject: Electrify Bellingham Buildings!

Dear Bellingham leaders,

Thank you for sharing your plan to vote on an ordinance adopting new energy codes - which requires electrification of heating and readiness for solar panels for new commercial and large multi-family buildings - by the end of 2021, with plans to implement in 2022. I am excited to see this long-planned measure come to fruition!

Fossil gas powered buildings are a bad idea: for our health, our air, and the climate. When we hook up buildings to fossil gas, we put our health at risk and we fail to take necessary climate action. Burning gas in buildings is the #1 source of climate pollution in Bellingham. We must build without fossil fuels.

I am committed to following City Council's progress and look forward to seeing this ordinance enacted in an accelerated timeline reflecting our community's support of bold climate action.

Sincerely,
Andronetta Douglass
255 W Bakerview Rd, apt 105
Bellingham, WA 98226

Bellingham Community Member

Sent from my iPhone

Nabbefeld, Kurt D.

From: Antonella Antonini <anto3@mac.com>
Sent: Wednesday, November 24, 2021 8:00 AM
To: Johnston, Eric C.; LaCroix, Renee S.; Vidana, Seth A.; Fogelsong, Clare G.; Fleetwood, Seth M.; Stone, Hannah E.; Knutson, Gene R.; Hammill, Daniel C.; Vargas, Pinky T.; Lilliquist, Michael W.; Huthman, Hollie A.; Anderson, Lisa A.; electrify.bellingham@gmail.com; Nabbefeld, Kurt D.; Angeley, Sean M.
Subject: Electrify Bellingham Buildings!

Dear Bellingham leaders,

Thank you for sharing your plan to vote on an ordinance adopting new energy codes - which requires electrification of heating and readiness for solar panels for new commercial and large multi-family buildings - by the end of 2021, with plans to implement in 2022. I am excited to see this long-planned measure come to fruition!

Fossil gas powered buildings are a bad idea: for our health, our air, and the climate. When we hook up buildings to fossil gas, we put our health at risk and we fail to take necessary climate action. Burning gas in buildings is the #1 source of climate pollution in Bellingham. We must build without fossil fuels.

I am committed to following City Council's progress and look forward to seeing this ordinance enacted in an accelerated timeline reflecting our community's support of bold climate action.

Antonella Antonini

Sent from my iPhone

Nabbefeld, Kurt D.

From: Davi Weasley <davi@fccb.net>
Sent: Tuesday, November 9, 2021 3:30 PM
To: Johnston, Eric C.; LaCroix, Renee S.; Vidana, Seth A.; Fogelsong, Clare G.; Fleetwood, Seth M.; Stone, Hannah E.; Knutson, Gene R.; Hammill, Daniel C.; Vargas, Pinky T.; Lilliquist, Michael W.; Huthman, Hollie A.; laanderson@cob.org; electrify.bellingham@gmail.com; Nabbefeld, Kurt D.; Angeley, Sean M.
Subject: Electrify Bellingham Buildings!

Dear Bellingham leaders,

Thank you for sharing your plan to vote on an ordinance adopting new energy codes - which requires electrification of heating and readiness for solar panels for new commercial and large multi-family buildings - by the end of 2021, with plans to implement in 2022. I am excited to see this long-planned measure come to fruition!

Fossil gas powered buildings are a bad idea: for our health, our air, and the climate. When we hook up buildings to fossil gas, we put our health at risk and we fail to take necessary climate action. Burning gas in buildings is the #1 source of climate pollution in Bellingham. We must build without fossil fuels.

I am committed to following City Council's progress and look forward to seeing this ordinance enacted in an accelerated timeline reflecting our community's support of bold climate action.

Sincerely,

Rev. Davi Weasley

First Congregational Church of Bellingham

Nabbefeld, Kurt D.

From: Brian Bogart <bdbogart@gmail.com>
Sent: Friday, September 24, 2021 3:27 PM
To: Johnston, Eric C.; LaCroix, Renee S.; Vidana, Seth A.; Fogelsong, Clare G.; Fleetwood, Seth M.; Stone, Hannah E.; Knutson, Gene R.; Hammill, Daniel C.; Vargas, Pinky T.; Lilliquist, Michael W.; Huthman, Hollie A.; electrify.bellingham@gmail.com; Nabbefeld, Kurt D.; Angeley, Sean M.
Subject: Electrify Bellingham Buildings!

Dear Bellingham leaders,

Thank you for sharing your plan to vote on an ordinance adopting new energy codes - which requires electrification of heating and readiness for solar panels for new commercial and large multi-family buildings - by the end of 2021, with plans to implement in 2022. I am excited to see this long-planned measure come to fruition!

Fossil gas powered buildings are a bad idea: for our health, our air, and the climate. When we hook up buildings to fossil gas, we put our health at risk and we fail to take necessary climate action. Burning gas in buildings is the #1 source of climate pollution in Bellingham. We must build without fossil fuels.

I am committed to following City Council's progress and look forward to seeing this ordinance enacted in an accelerated timeline reflecting our community's support of bold climate action.

Sincerely,

Bellingham Community Member

Nabbefeld, Kurt D.

From: Lee Delorme <ld2323@icloud.com>
Sent: Thursday, September 23, 2021 11:30 AM
To: Johnston, Eric C.; LaCroix, Renee S.; Vidana, Seth A.; Fogelsong, Clare G.; Fleetwood, Seth M.; Stone, Hannah E.; Knutson, Gene R.; Hammill, Daniel C.; Vargas, Pinky T.; Lilliquist, Michael W.; Huthman, Hollie A.; Anderson, Lisa A.; electrify.bellingham@gmail.com; Nabbefeld, Kurt D.; Angeley, Sean M.
Subject: Electrify Bellingham Buildings!

Dear Bellingham leaders,

Thank you for sharing your plan to vote on an ordinance adopting new energy codes - which requires electrification of heating and readiness for solar panels for new commercial and large multi-family buildings - by the end of 2021, with plans to implement in 2022. I am excited to see this long-planned measure come to fruition!

Fossil gas powered buildings are a bad idea: for our health, our air, and the climate. When we hook up buildings to fossil gas, we put our health at risk and we fail to take necessary climate action. Burning gas in buildings is the #1 source of climate pollution in Bellingham. We must build without fossil fuels.

I am committed to following City Council's progress and look forward to seeing this ordinance enacted in an accelerated timeline reflecting our community's support of bold climate action.

Sincerely,

Bellingham Community Member

Sent from my iPhone

Nabbefeld, Kurt D.

From: Cameron Vail <currentandfurbish@icloud.com>
Sent: Thursday, September 23, 2021 11:27 AM
To: Johnston, Eric C.; LaCroix, Renee S.; Vidana, Seth A.; Fogelsong, Clare G.; Fleetwood, Seth M.; Stone, Hannah E.; Knutson, Gene R.; Hammill, Daniel C.; Vargas, Pinky T.; Lilliquist, Michael W.; Huthman, Hollie A.; Anderson, Lisa A.; electrify.bellingham@gmail.com; Nabbefeld, Kurt D.; Angeley, Sean M.
Subject: Electrify Bellingham Buildings!

Dear Bellingham leaders,

Thank you for sharing your plan to vote on an ordinance adopting new energy codes - which requires electrification of heating and readiness for solar panels for new commercial and large multi-family buildings - by the end of 2021, with plans to implement in 2022. I am excited to see this long-planned measure come to fruition!

Fossil gas powered buildings are a bad idea: for our health, our air, and the climate. When we hook up buildings to fossil gas, we put our health at risk and we fail to take necessary climate action. Burning gas in buildings is the #1 source of climate pollution in Bellingham. We must build without fossil fuels.

I am committed to following City Council’s progress and look forward to seeing this ordinance enacted in an accelerated timeline reflecting our community’s support of bold climate action.

Sincerely,

Bellingham Community Member

Sent from my iPad

Nabbefeld, Kurt D.

From: Teizeen Mohamedali <teizeen.m@gmail.com>
Sent: Thursday, September 23, 2021 10:18 AM
To: Fogelsong, Clare G.; Hammill, Daniel C.; Johnston, Eric C.; electrify.bellingham@gmail.com; Knutson, Gene R.; Huthman, Hollie A.; Stone, Hannah E.; Nabbefeld, Kurt D.; Lilliquist, Michael W.; Vargas, Pinky T.; LaCroix, Renee S.; Vidana, Seth A.; Angeley, Sean M.; Fleetwood, Seth M.; Anderson, Lisa A.
Subject: Electrify Bellingham Buildings!

Dear Bellingham leaders,

I have lived in Bellingham for over a decade now, and have always been proud of our city's progressive environmental agenda. Raising a family here is a privilege and a responsibility.

Thank you for sharing your plan to vote on an ordinance adopting new energy codes - which requires electrification of heating and readiness for solar panels for new commercial and large multi-family buildings - by the end of 2021, with plans to implement in 2022. I am excited to see this long-planned measure come to fruition!

Fossil gas powered buildings are a bad idea: for our health, our air, and the climate. When we hook up buildings to fossil gas, we put our health at risk and we fail to take necessary climate action. Burning gas in buildings is the #1 source of climate pollution in Bellingham. We must build without fossil fuels.

I am committed to following City Council's progress and look forward to seeing this ordinance enacted in an accelerated timeline reflecting our community's support of bold climate action.

Sincerely,

Teizeen Mohamedali
Bellingham Community Member

Nabbefeld, Kurt D.

From: Betty Barats <bettybarats@gmail.com>
Sent: Thursday, September 23, 2021 10:14 AM
To: Johnston, Eric C.; LaCroix, Renee S.; Vidana, Seth A.; Fogelsong, Clare G.; Fleetwood, Seth M.; Stone, Hannah E.; Knutson, Gene R.; Hammill, Daniel C.; Vargas, Pinky T.; Lilliquist, Michael W.; Huthman, Hollie A.; =?utf-8?Q?=E2=80=8Blaanderson?=@cob.org; electrify.bellingham@gmail.com; Nabbefeld, Kurt D.; Angeley, Sean M.
Subject: Electrify Bellingham Buildings!

Dear Bellingham leaders,

Thank you for sharing your plan to vote on an ordinance adopting new energy codes - which requires electrification of heating and readiness for solar panels for new commercial and large multi-family buildings - by the end of 2021, with plans to implement in 2022. I am excited to see this long-planned measure come to fruition!

Fossil gas powered buildings are a bad idea: for our health, our air, and the climate. When we hook up buildings to fossil gas, we put our health at risk and we fail to take necessary climate action. Burning gas in buildings is the #1 source of climate pollution in Bellingham. We must build without fossil fuels.

I am committed to following City Council's progress and look forward to seeing this ordinance enacted in an accelerated timeline reflecting our community's support of bold climate action.

Sincerely,

Bellingham Community Member

Betty Barats
bettybarats@gmail.com
Be a Voter - Every Vote Counts!

Nabbefeld, Kurt D.

From: James Soares <soares6474@gmail.com>
Sent: Thursday, September 23, 2021 9:23 AM
To: Johnston, Eric C.; LaCroix, Renee S.; Vidana, Seth A.; Fogelsong, Clare G.; Fleetwood, Seth M.; Stone, Hannah E.; Knutson, Gene R.; Hammill, Daniel C.; Vargas, Pinky T.; Lilliquist, Michael W.; Huthman, Hollie A.; electrify.bellingham@gmail.com; Nabbefeld, Kurt D.; Angeley, Sean M.
Subject: Electrify Bellingham Buildings!

Dear Bellingham leaders,

Thank you for sharing your plan to vote on an ordinance adopting new energy codes - which requires electrification of heating and readiness for solar panels for new commercial and large multi-family buildings - by the end of 2021, with plans to implement in 2022. I am excited to see this long-planned measure come to fruition!

Fossil gas powered buildings are a bad idea: for our health, our air, and the climate. When we hook up buildings to fossil gas, we put our health at risk and we fail to take necessary climate action. Burning gas in buildings is the #1 source of climate pollution in Bellingham. We must build without fossil fuels.

I am committed to following City Council's progress and look forward to seeing this ordinance enacted in an accelerated timeline reflecting our community's support of bold climate action.

Sincerely,

Bellingham Community Member

Nabbefeld, Kurt D.

From: Joe Wiederhold <jwiederhold47@gmail.com>
Sent: Thursday, September 23, 2021 9:24 AM
To: Johnston, Eric C.; LaCroix, Renee S.; Vidana, Seth A.; Fogelsong, Clare G.; Fleetwood, Seth M.; Stone, Hannah E.; Knutson, Gene R.; Hammill, Daniel C.; Vargas, Pinky T.; Lilliquist, Michael W.; Huthman, Hollie A.; Anderson, Lisa A.; electrify.bellingham@gmail.com; Nabbefeld, Kurt D.; Angeley, Sean M.
Subject: Electrify Bellingham Buildings!

Dear Bellingham leaders, Thank you for sharing your plan to vote on an ordinance adopting new energy codes - which requires electrification of heating and readiness for solar panels for new commercial and large multi-family buildings - by the end of 2021, with plans to implement in 2022. I am excited to see this long-planned measure come to fruition! Fossil gas powered buildings are a bad idea: for our health, our air, and the climate. When we hook up buildings to fossil gas, we put our health at risk and we fail to take necessary climate action. Burning gas in buildings is the #1 source of climate pollution in Bellingham. We must build without fossil fuels. I am committed to following City Council's progress and look forward to seeing this ordinance enacted in an accelerated timeline reflecting our community's support of bold climate action. Sincerely, Bellingham Community Member

Joe Wiederhold

Nabbefeld, Kurt D.

From: Ronda Good <rondasgood@gmail.com>
Sent: Thursday, September 23, 2021 9:17 AM
To: Johnston, Eric C.; LaCroix, Renee S.; Vidana, Seth A.; Fogelsong, Clare G.; Fleetwood, Seth M.; Stone, Hannah E.; Knutson, Gene R.; Hammill, Daniel C.; Vargas, Pinky T.; Lilliquist, Michael W.; Huthman, Hollie A.; =?utf-8?Q?=E2=80=8Blaanderson?=@cob.org; electrify.bellingham@gmail.com; Nabbefeld, Kurt D.; Angeley, Sean M.
Subject: Electrify Bellingham Buildings!

Dear Bellingham leaders,

Thank you for sharing your plan to vote on an ordinance adopting new energy codes - which requires electrification of heating and readiness for solar panels for new commercial and large multi-family buildings - by the end of 2021, with plans to implement in 2022. I am excited to see this long-planned measure come to fruition!

Fossil gas powered buildings are a bad idea: for our health, our air, and the climate. When we hook up buildings to fossil gas, we put our health at risk and we fail to take necessary climate action. Burning gas in buildings is the #1 source of climate pollution in Bellingham. We must build without fossil fuels.

I am committed to following City Council's progress and look forward to seeing this ordinance enacted in an accelerated timeline reflecting our community's support of bold climate action.

Sincerely,

Bellingham Community Member

Nabbefeld, Kurt D.

From: jerry slingsby <jaslingsby@hotmail.com>
Sent: Thursday, September 23, 2021 9:14 AM
To: Johnston, Eric C.; LaCroix, Renee S.; Vidana, Seth A.; Fogelsong, Clare G.; Fleetwood, Seth M.; Stone, Hannah E.; Knutson, Gene R.; Hammill, Daniel C.; Vargas, Pinky T.; Lilliquist, Michael W.; Huthman, Hollie A.; laanderson@cob.org; electrify.bellingham@gmail.com; Nabbefeld, Kurt D.; Angeley, Sean M.
Subject: Electrify Bellingham Buildings!

Dear Bellingham leaders,

Thank you for sharing your plan to vote on an ordinance adopting new energy codes - which requires electrification of heating and readiness for solar panels for new commercial and large multi-family buildings - by the end of 2021, with plans to implement in 2022. I am excited to see this long-planned measure come to fruition!
Fossil gas powered buildings are a bad idea: for our health, our air, and the climate. When we hook up buildings to fossil gas, we put our health at risk and we fail to take necessary climate action. Burning gas in buildings is the #1 source of climate pollution in Bellingham. We must build without fossil fuels.

I am committed to following City Council's progress and look forward to seeing this ordinance enacted in an accelerated timeline reflecting our community's support of bold climate action.

Sincerely,

Bellingham Community Member
Sent from Mail for Windows

Nabbefeld, Kurt D.

From: Kathy Jenkis <kjenkis@hotmail.com>
Sent: Thursday, September 23, 2021 9:09 AM
To: Johnston, Eric C.; LaCroix, Renee S.; Vidana, Seth A.; Fogelsong, Clare G.; Fleetwood, Seth M.; Stone, Hannah E.; Knutson, Gene R.; Hammill, Daniel C.; Vargas, Pinky T.; Lilliquist, Michael W.; Huthman, Hollie A.; Anderson, Lisa A.; electrify.bellingham@gmail.com; Nabbefeld, Kurt D.; Angeley, Sean M.
Subject: Electrify Bellingham Buildings!

Dear Bellingham leaders,

Thank you for sharing your plan to vote on an ordinance adopting new energy codes - which requires electrification of heating and readiness for solar panels for new commercial and large multi-family buildings - by the end of 2021, with plans to implement in 2022. I am excited to see this long-planned measure come to fruition!

Fossil gas powered buildings are a bad idea: for our health, our air, and the climate. When we hook up buildings to fossil gas, we put our health at risk and we fail to take necessary climate action. Burning gas in buildings is the #1 source of climate pollution in Bellingham. We must build without fossil fuels.

I am committed to following City Council's progress and look forward to seeing this ordinance enacted in an accelerated timeline reflecting our community's support of bold climate action.

Sincerely,
Kathleen Jenkis
Bellingham Community Member

Sent from my iPad

Nabbefeld, Kurt D.

From: John Woll <jlwoll@icloud.com>
Sent: Thursday, September 23, 2021 9:08 AM
To: Johnston, Eric C.; LaCroix, Renee S.; Vidana, Seth A.; Fogelsong, Clare G.; Fleetwood, Seth M.; Stone, Hannah E.; Knutson, Gene R.; Hammill, Daniel C.; Vargas, Pinky T.; Lilliquist, Michael W.; Huthman, Hollie A.; Anderson, Lisa A.; electrify.bellingham@gmail.com; Nabbefeld, Kurt D.; Angeley, Sean M.
Subject: Electrify Bellingham Buildings!

Dear Bellingham leaders,

Thank you for sharing your plan to vote on an ordinance adopting new energy codes - which requires electrification of heating and readiness for solar panels for new commercial and large multi-family buildings - by the end of 2021, with plans to implement in 2022. I am excited to see this long-planned measure come to fruition!

Fossil gas powered buildings are a bad idea: for our health, our air, and the climate. When we hook up buildings to fossil gas, we put our health at risk and we fail to take necessary climate action. Burning gas in buildings is the #1 source of climate pollution in Bellingham. We must build without fossil fuels.

I am committed to following City Council's progress and look forward to seeing this ordinance enacted in an accelerated timeline reflecting our community's support of bold climate action.

Sincerely,

Bellingham Community Member

Sent from my iPhone

Nabbefeld, Kurt D.

From: John Woll <jlwoll@icloud.com>
Sent: Thursday, September 23, 2021 9:08 AM
To: Johnston, Eric C.; LaCroix, Renee S.; Vidana, Seth A.; Fogelsong, Clare G.; Fleetwood, Seth M.; Stone, Hannah E.; Knutson, Gene R.; Hammill, Daniel C.; Vargas, Pinky T.; Lilliquist, Michael W.; Huthman, Hollie A.; Anderson, Lisa A.; electrify.bellingham@gmail.com; Nabbefeld, Kurt D.; Angeley, Sean M.
Subject: Electrify Bellingham Buildings!

Dear Bellingham leaders,

Thank you for sharing your plan to vote on an ordinance adopting new energy codes - which requires electrification of heating and readiness for solar panels for new commercial and large multi-family buildings - by the end of 2021, with plans to implement in 2022. I am excited to see this long-planned measure come to fruition!

Fossil gas powered buildings are a bad idea: for our health, our air, and the climate. When we hook up buildings to fossil gas, we put our health at risk and we fail to take necessary climate action. Burning gas in buildings is the #1 source of climate pollution in Bellingham. We must build without fossil fuels.

I am committed to following City Council's progress and look forward to seeing this ordinance enacted in an accelerated timeline reflecting our community's support of bold climate action.

Sincerely,

Bellingham Community Member

Sent from my iPhone

Nabbefeld, Kurt D.

From: Elizabeth Mulligan <mulliganelizabetha@gmail.com>
Sent: Wednesday, September 22, 2021 9:13 PM
To: Nabbefeld, Kurt D.
Cc: LaCroix, Renee S.; Vidana, Seth A.; Angeley, Sean M.
Subject: Re: Catching up on climate action

This is great info. I really appreciate you taking the time to provide detailed answers.

On Fri, Sep 17, 2021 at 3:55 PM Nabbefeld, Kurt D. <knabbefeld@cob.org> wrote:

> Hello Beth –
>
> Thank you for your interest in the electrification of new buildings and happy to answer your questions! Please see my answers below:
>
> 1. Which council committee will have this ordinance on their agenda prior to being read at the evening meeting?
>
>   *Council committee designations for projects are generally determined by the Mayor and Council President unless they are clear. The electrification changes are somewhat of a blend of climate and planning so I cannot say exactly which committee will review the proposed changes. It might even go to committee of the whole because of the overlap of areas. Additionally, it is possible that the Council will want to conduct a public hearing on the changes before sending it to a committee. As we move closer to bringing this to the Council these decisions will be made.*
>
> 2. When do you expect the ordinance to be on committee and council agendas?
>
>   *We recently hired a new inspector and plans examiner to provide additional staff resource in order to keep pace with permitting and the electrification code changes, with those additions we intend to bring the draft codes to council in December.*
>
> 3. What potential issues or questions do you anticipate may arise in this process and how is staff preparing to respond to them?
>
>   *The most common issue we've heard from the community is the potential impact on housing and building affordability. Staff have been working with Seattle, King County, the BIAWC as well as using our own experience to evaluate the potential cost impacts. Additional concerns expressed are the availability of systems and the needed installation expertise / training for these systems. Seattle has held several workshops to help educate folks and we have tried to include our staff and let other industry professionals know of these trainings. We've also heard about the possible impacts related to building design due to*

additional equipment needed for electrification. For example the installation of multiple individual mini-pumps on the outside of a building could impact the building appearance.

4. Will the policy differ in substance from Seattle's policy and if so, how?

   The City Council directed staff to explore implementing all of the Seattle codes / policies and we continue to evaluate them all as they relate to Bellingham.

5. What constraints does the city have in setting a timeline for implementation?

   The biggest constraints we've faced with this project include staffing and training. As I mentioned we've recently hired new staff and have tried to capitalize on the Seattle training opportunities as well as the knowledge of their dedicated climate staff experts. We are considering a delayed implementation to allow industry professionals the time to learn more about the technology and installation. The delay would also ensure buildings currently under design or being designed close to the time of the code changes are not impacted.

I hope this answers your questions, but please feel free to contact myself or Building Official, Sean Angeley (copied) with other questions.

Kurt Nabbefeld, Development Services Manager,

SEPA Responsible Official

City of Bellingham
Planning and Community Development
Tel: (360) 778.8351
Fax: (360) 778.8302

Email: knabbefeld@cob.org

Tell us how we're doing!

Permit Center survey

My incoming and outgoing email messages are subject to public disclosure requirements per RCW 42.56

From: Elizabeth Mulligan <mulliganelizabetha@gmail.com>
Sent: Friday, September 17, 2021 12:51 PM
To: LaCroix, Renee S. <rlacroix@cob.org>
Cc: Vidana, Seth A. <savidana@cob.org>; Nabbefeld, Kurt D. <knabbefeld@cob.org>
Subject: Re: Catching up on climate action

Thank you, Renee!

Sent from my iPhone

> On Sep 17, 2021, at 12:46 PM, LaCroix, Renee S. <rlacroix@cob.org> wrote:
>
> Hi Elizabeth,
>
> Sorry for the delay in responding. Your questions are best answered Kurt Nabbefeld in the Planning Dept. since the building codes are under their purview. I've cc'd him on this email so he can respond.
>
> Thanks,
>
> Renee
>
> ***Renee LaCroix***
>
> Assistant Public Works Director
>
> Natural Resources Division
>
> City of Bellingham
>
> (360) 778-7966
>
> rlacroix@cob.org
>
> *My incoming and outgoing emails are subject to public disclosure requirements per RCW 42.56*

From: Elizabeth Mulligan <mulliganelizabetha@gmail.com>
Sent: Thursday, September 9, 2021 7:08 AM
To: LaCroix, Renee S. <rlacroix@cob.org>
Cc: Vidana, Seth A. <savidana@cob.org>
Subject: Re: Catching up on climate action

Hello Renee and Seth,

Many thanks for this detailed response. I appreciate your time!

I have a few follow up questions for you regarding an ordinance implementing CATF recommendation B5, electrification of new commercial and large multifamily buildings.

1. Which council committee will have this ordinance on their agenda prior to being read at the evening meeting?

2. When do you expect the ordinance to be on committee and council agendas?

3. What potential issues or questions do you anticipate may arise in this process and how is staff preparing to respond to them?

4. Will the policy differ in substance from Seattle's policy and if so, how?

5. What constraints does the city have in setting a timeline for implementation?

Thanks again for your time. I'd be happy to discuss these questions on the phone if that is more convenient for you.

Beth Hartsoch

360.305.5624

On Fri, Jul 30, 2021 at 10:56 AM LaCroix, Renee S. <rlacroix@cob.org> wrote:

Elizabeth,

Thank you for your email and interest in the City of Bellingham's progress on climate action. Community interests have formed the foundation of City climate initiatives beginning in 2005 with Council's approval of the Cities for Climate Protection Program. This was followed by Council adoption of the 2007 Climate Action Plan (CAP) and the update in 2018. Non-policy documents, such as the Climate Task Force Report (CTFR), have informed our current pathway and priorities toward Bellingham's carbon pollution goals.

In 2020, staff led a process to identify which initiatives from the CAP and the CTFR would produce the greatest carbon emissions reduction over the shortest amount of time and maximize benefits to our community. The top items from that process were drafted into the Climate Action Plan Implementation Plan (IP) for 2021, which guides staff work and focus. Council approved the Implementation Plan in February 2021. It is attached to this email.

In June 2021, staff provided a progress update to Council on city initiatives included in the IP. You can watch the presentation by clicking this link. Below are responses to the specific measures you asked about:

- Measure B1, which requires energy efficiency requirements be met at point of sale. When will this be brought to council?

  Response: This measure was not included in the 2021 Implementation Plan but remains on the list for future years.

- Measure B5, which recommends all new buildings must use only electric systems and appliances immediately. Eighteen months later there is still not an ordinance to this effect. When and how will this be implemented?

  Response: This initiative was included in the IP for 2021, focused specifically on commercial and large multi-family buildings. State law disallows cities from creating local energy codes for residential buildings. City staff are reviewing commercial and large multifamily energy codes recently passed by the City of Seattle for potential adoption in Bellingham. Those codes include all-electric space and water heating, building envelope improvements, and readiness for solar panels among other changes. Progress with this initiative will be assisted by the addition of staff in Planning and Community Development currently underway. We anticipate a public hearing and vote on this ordinance by the end of 2021 and an effective date in late 2022.

- Measure T1, which recommends banning the internal combustion engine by 2034. This could start as a small section of the city and expand. Who is working on this?

  Response: This initiative was not included in the IP for 2021. Staff is focusing attention on systemic solutions regarding the issue of ICE vehicles through CAFT Measure T2: Encourage a statewide ban on the sale of internal combustion engine (ICE) vehicles by 2030. We anticipate a letter in support of this initiative to the state legislature by the end of the year, hopefully in concert with other local governments. We are encouraged by progress made at the state level with HB 1287 which sets a non-binding goal for all new vehicle sales in WA to be electric by 2030.

- Measure T10, which urges the city to prioritize physical bike lane separation. What are the plans for this?

  Response: In the implementation of the adopted Bicycle Master Plan, the City looks for opportunities for physical bike lane separation with every bike facility we install. We are constrained by things like right-of-way width which can limit buffers, as well as parking, driveways, WTA routes, and maintenance of these narrower lanes. As the City updates the Bicycle Master Plan beginning this year, we will certainly be looking for opportunities for new separated bicycle facilities - where physical space allows.

Moving forward, we will be soliciting community input on the Implementation Plan for 2022. While many of the multi-year items that we are currently working on are not complete and will be included in the next iteration of the IP, we will seek community perspectives on how we can best reach our goals over the next year. Please be on the lookout for an event to be held during Climate Week, Sept. 20-26. We hope to see you there. You can learn more about the City's effort on the Engage Bellingham website and the City of Bellingham's climate webpage. Thank you again for your support for climate action.

Sincerely,

Renee

Renee LaCroix

Assistant Public Works Director

Natural Resources Division

City of Bellingham

(360) 778-7966

rlacroix@cob.org

My incoming and outgoing emails are subject to public disclosure requirements per RCW 42.56

From: Elizabeth Mulligan <mulliganelizabetha@gmail.com>
Sent: Friday, July 23, 2021 5:45 PM
To: Johnston, Eric C. <ecjohnston@cob.org>; LaCroix, Renee S. <rlacroix@cob.org>; Vidana, Seth A. <savidana@cob.org>; Fogelsong, Clare G. <cfogelsong@cob.org>; Fleetwood, Seth M. <smfleetwood@cob.org>; Stone, Hannah E. <hestone@cob.org>; Knutson, Gene R. <gknutson@cob.org>; Hammill, Daniel C. <dchammill@cob.org>; Vargas, Pinky T. <ptmvargas@cob.org>; Lilliquist, Michael W. <mlilliquist@cob.org>; Huthman, Hollie A. <hahuthman@cob.org>
Subject: Catching up on climate action

Dear City of Bellingham,

The Bellingham Climate Action Task Force finished its recommendations for Bellingham City in December 2019, and these recommendations enjoyed broad public support. https://cob.org/wp-content/uploads/Climate-Task-Force-FINAL-Report-12_2_19.pdf

While I understand COVID-19, homelessness, racial justice and economic recovery have been at the top of the City's agenda, it's time to catch up on addressing climate change. I would like to know what your plans are for some of the recommendations from the Climate Action Task Force including:

- Measure B1 which requires energy efficiency requirements be met at point of sale. When will this be brought to council?

- Measure B5 which recommends all new buildings must use only electric systems and appliances immediately. Eighteen months later there is still not an ordinance to this effect. When and how will this be implemented?

- Measure T1 which recommends banning the internal combustion engine by 2034. This could start as a small section of the city and expand. Who is working on this?

- Measure T10 which urges the city to prioritize physical bike lane separation. What are the plans for this?

Are there other recommendations that you are prioritizing? What has been done to implement them?
There are many more recommendations in the CATF report, these are simply four I have not yet seen action on and I would like to see more. These bold and concrete actions will have substantial climate impacts while improving the liveability of our city. I understand that these actions are not politically easy, but they are necessary and need your leadership.
Addressing climate change will require standing up to special interests, ignoring fossil fuel industry propaganda and truly caring for the earth and its inhabitants. I understand the City has been working on the problems brought up in 2020, but it is no longer acceptable for climate action to wait.
Our community needs real-time access to the status of these critical projects, and timelines for major phases and completion. The city's current update (https://cob.org/services/environment/climate/emissions-reduction-measures) is not even dated, and lacks basic details such as the expected emission reductions from each measure. Additionally, the update includes terms such as "ongoing" and "incomplete" which provide no tangible idea of where this is on the track for completion. **Please respond with detailed updates on the status of each of these actions, and on how the city plans to dramatically accelerate progress on the Climate Action Task Force recommendations.**
Bellingham resident Beth Hartsoch

Bellingham City Council

Public Comment for a Public Hearing to consider amendments to BMC 17.10 - Building Codes, modifying the recently adopted 2018 state energy code to require electrification of space and water heating, incremental improvements in energy efficiency, and solar installation or readiness measures in certain multi-family and commercial buildings, received by the City Council from December 1, 2021 through December 8, 2021

From: dketter@whidbey.com <dketter@whidbey.com>
Sent: Wednesday, December 1, 2021 8:36 PM
To: CC - Shared Department (ccmail@cob.org) <ccmail@cob.org>
Subject: Electrify Bellingham Buildings!

Dear Bellingham leaders,

I want to express my thanks to city staff for all of their work in creating and bringing forth for a vote an ordinance adopting new energy codes - which requires electrification of heating and readiness for solar panels for new commercial and large multi-family buildings - on December 13th, 2021, with plans to implement in 2022. I am excited to see this long-planned measure come to fruition!

A preponderance of evidence now tells us that fossil gas powered buildings are a bad idea: for our health, our air, and the climate. When we hook up buildings to fossil gas, we put our health at risk and we fail to take necessary climate action. Burning gas in buildings is the #1 source of climate pollution in Bellingham. We must build without fossil fuels.

I look forward to seeing this ordinance enacted in an accelerated timeline reflecting our community's support of bold climate action. Thank you again for your bold action to decarbonize Bellingham and, in so doing, serve as a leader while inspiring other municipalities and the state to follow suit.

Sincerely,
David Ketter
Bellingham Community Member

From: Lisa CITRON <lisacitron@icloud.com>
Sent: Monday, December 6, 2021 10:58 AM
To: CC - Shared Department (ccmail@cob.org) <ccmail@cob.org>
Subject: Electrification

City Councilmembers:

I support taking bold and decisive steps to STOP building new fossil fuel facilities in Bellingham!

Lisa Citron

Sent from my iPhone

Public Comment

Name

League of Women Voters, Bellingham/Whatcom County

Full name or organization

Your name is required for identification as a part of the public record.

Choose Topic

City Council - Public Hearing Testimony (topic specific per the agenda)

Topics available for online public comment are listed above. If no topics are listed, there may be opportunities for public comment on various topics through email, letters, and public comment periods during meetings.

Meeting Date

12/13/2021

Please check cob.org/meetings for future meeting dates and related agenda items.

Public Hearings

City Council Regular Meeting - 12/13/2021 - BMC 17.10 - Building Codes (electrification of space and water heating)

If no topics appear in the drop-down list then there are either no Public Hearings scheduled for the next meeting or they have not been announced yet. If your comment is not related to any of these topics please choose General Public Comment above. For more information about Public Hearings please refer to the agenda published on cob.org/meetings.

Comment or Testimony

Honorable Members of the Bellingham City Council,

I'm providing this testimony on behalf of the League of Women Voters of Bellingham and Whatcom County. The National League's Position Statement on Climate Change Policy, as announced by the National Board, January 2019, is that "The League believes that climate change is a serious threat facing our nation and our planet. The League supports climate goals and policies that are consistent with the best available climate science and that will ensure a stable climate system for future generations." Consistent with these goals, the local League confirms it's strong support of building electrification in Bellingham as an important step to help maintain the livability of our planet. We urge rapid adoption and implementation. The ongoing 2021 severe weather events here in the Pacific Northwest have made it very clear that climate change is already upon us. There is no time to lose.

Thank you,
Vicki Thomas Co-Chair Climate Issues Committee LWVBWC

Files
Documents or images related to your comments.

Email

vicki.kagi@gmail.com

Your email address will only be used to send you a copy of this comment and any official notifications related to this topic.

Date

12/8/2021

Draft Building Decarbonization Ordinance for Commercial and Large Multi-Family Buildings

Planning and Community Development
and Public Works Departments

December 13, 2021

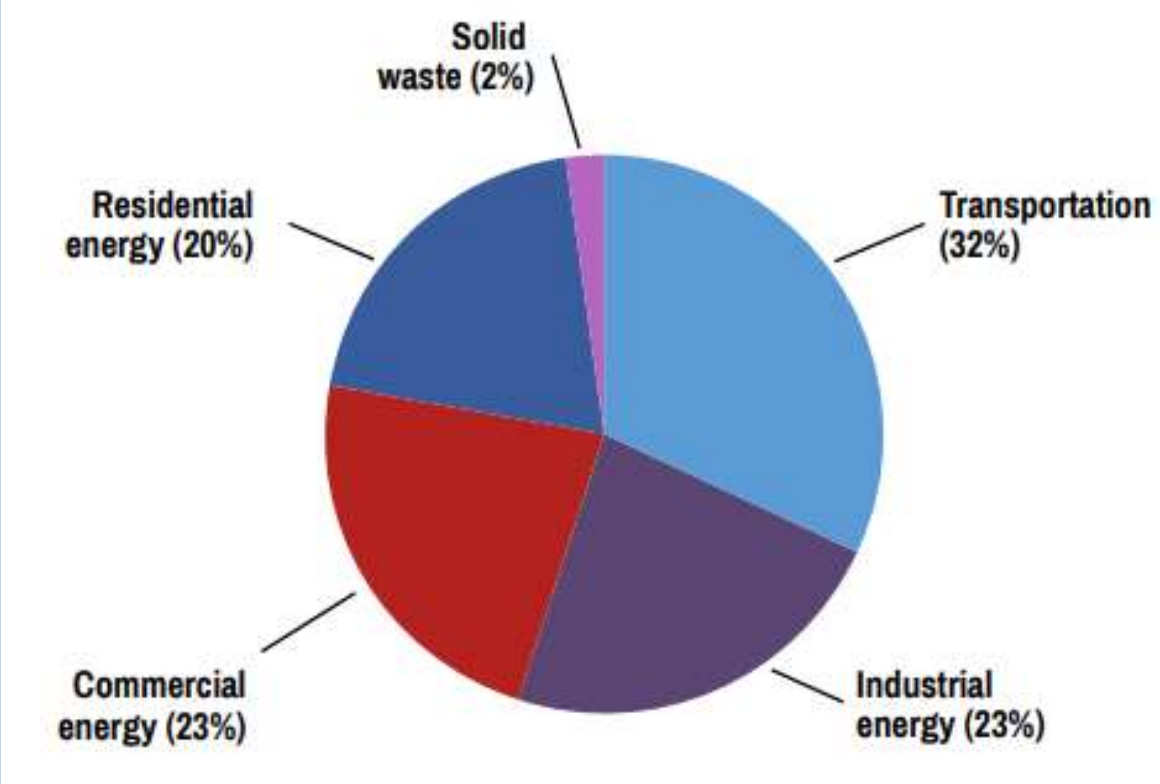
Bellingham Carbon Pollution Targets

	2012 *Target*	2015 *Actual Emissions*	2020 *Target*	2030 *Target*	2050 *Target*
Municipal **reduction measures:** 3 completed, 20 long-term ongoing	-64% emissions from 2000 *exceeded (-69.5%)*	-68.3% from 2000	-70% from 2000	-85% from 2000	-100% from 2000
Community **reduction measures:** 5 completed, 43 long-term ongoing	-7% emissions from 2000 *exceeded (-17%)*	-10.4% from 2000	-28% from 2000	-40% from 2000	-85% from 2000

Bellingham Carbon Pollution Targets

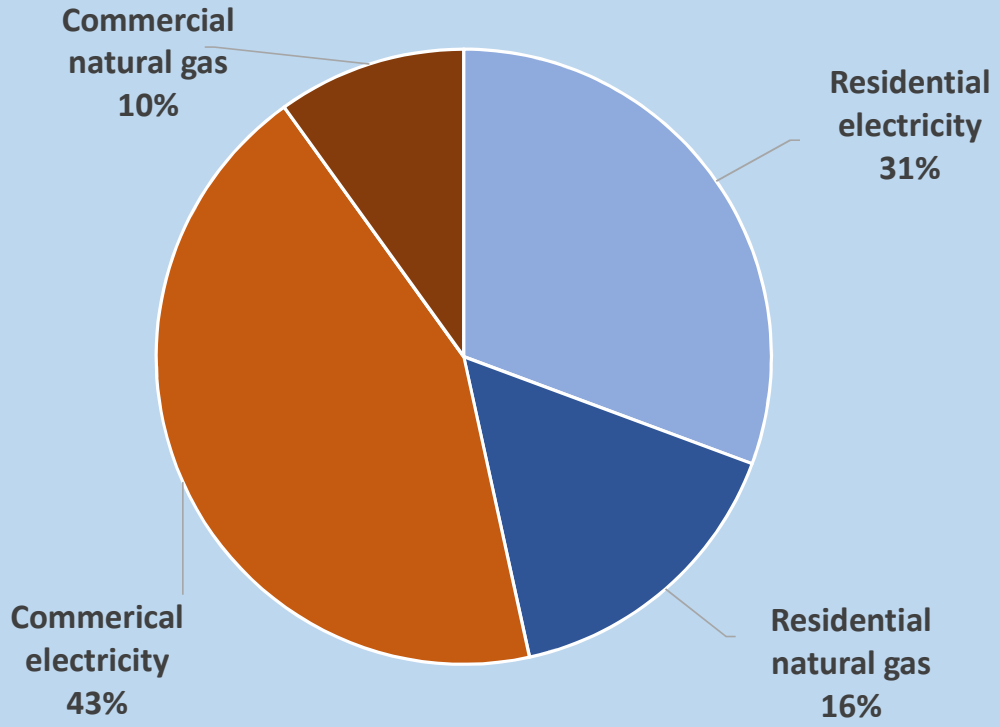
	2012 *Target*	2015 *Actual Emissions*	2020 *Target*	2030 *Target*	2050 *Target*
Municipal **reduction measures:** 3 completed, 20 long-term ongoing	-64% emissions from 2000 *exceeded (-69.5%)*	-68.3% from 2000	-70% from 2000	-85% from 2000	-100% from 2000
Community **reduction measures:** 5 completed, 43 long-term ongoing	-7% emissions from 2000 *exceeded (-17%)*	-10.4% from 2000	-28% from 2000	-40% from 2000	-85% from 2000
Science-Based Targets for the Community via Race to Zero				-59% from 2000	-100% from 2000

Bellingham community CO2e pollution by sector (2015)



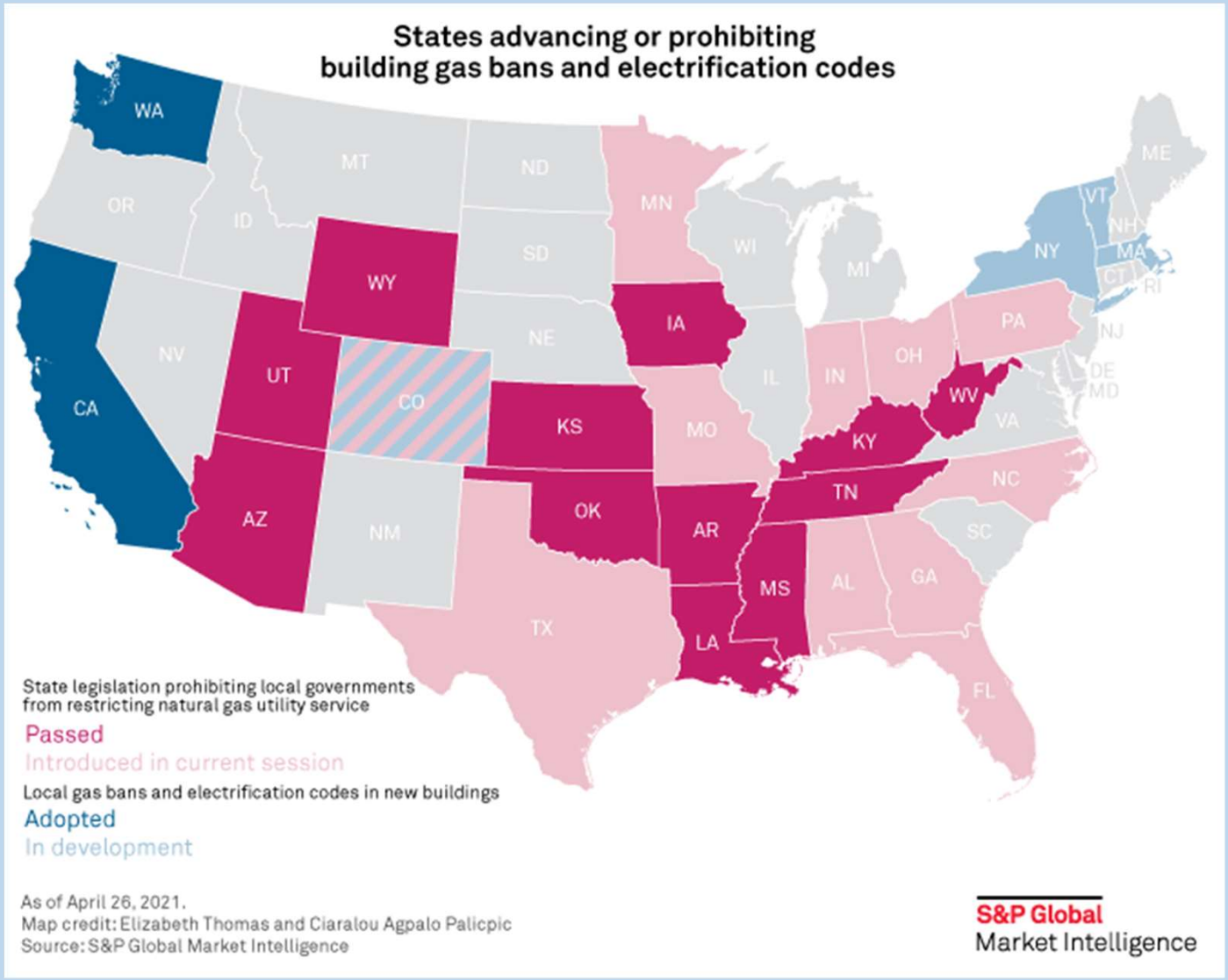
Bellingham community CO2e pollution from residential and commercial buildings (2015)

Residential and commercial buildings compose 43% of all community CO2e



National Natural Gas Legislation

- Passed Legislation
  - Seattle (Feb ‘21)
  - Shoreline (Dec ‘21)
  - 48 cities in CA: San Jose, San Francisco, Oakland, Sacramento & more
- Considering Legislation
  - King County
  - New York City
  - Burlington, VT
  - Brookline, MA


States advancing or prohibiting
building gas bans and electrification codes
WA
OR
CA
ID
NV
MT
WY
UT
AZ
CO
NM
ND
SD
NE
KS
OK
TX
MN
IA
MO
AR
LA
WI
IL
MS
MI
IN
KY
TN
AL
OH
WV
GA
FL
SC
NC
VA
PA
NY
VT
NH
ME
MA
CT
RI
NJ
DE
MD
State legislation prohibiting local governments from restricting natural gas utility service
Passed
Introduced in current session
Local gas bans and electrification codes in new buildings
Adopted
In development
As of April 26, 2021.
Map credit: Elizabeth Thomas and Ciaralou Agpalo Palicpic
Source: S&P Global Market Intelligence
S&P Global
Market Intelligence

Proposed Regulations

- Focus on:
  - Electrification
  - Efficiency
  - Solar Ready
- The proposed updates will apply to multifamily residential ≥4 stories and most all commercial buildings
- The solar ready provisions will apply to ALL commercial buildings and one- and two-family dwellings including townhouses up to 3 stories (appendix T)
- Key amendments
  - Efficiencies regarding; building envelope, space/water heating, lighting and controls, energy credits, and solar readiness
  - Modeled on Seattle, King County and Shoreline

Electrification

- Prohibits the use of natural gas to heat water for domestic central water heating in commercial (hotels) and multifamily buildings
- Eliminates all gas and most electric resistance space heating systems in commercial and multifamily buildings
- Require electrical infrastructure (including outlets/circuits) necessary for future conversion of any gas appliances in multifamily buildings
- Allows for use of electric resistance heat in multifamily dwellings and sleeping units which have a heating capacity no greater than 750/1000 watts depending on room location

Efficiency

- 10% higher efficiency for lighting & windows
- 10% higher efficiency for Building Performance Pathway
- Eliminates substandard building envelopes in energy modeling
- 10% higher efficiency for air-to-air energy recovery for indoor/outdoor ventilation
- Increases the number of energy efficiency credits required per project (from 6 to 8)
- Disallows gas equipment from claiming efficiency credits

Solar Ready

- Solar Readiness applies to all buildings as adopted by the State
- One-and two-family residential - (IRC) Appendix T for buildings (300 sf of available roof space for single-family, 150 sf for townhouse).
- For ALL Commercial buildings (including multi-family) 20 story buildings or less: Designate a *solar ready* zone that covers either (1) 40% of the roof, or (2) 20% of the electrical load
- Commercial buildings, 0.25 watt per square foot of *installed solar*, affordable housing exempt
  - 2-story building = Less than 4% of total roof space
  - 4-story building = 11% of total roof space
  - 8-story building = 15% of total roof space

Cost Impacts

Code Proposals: Multifamily Housing Cost Impact Estimates		
Measure	**Range of costs per unit**	**Notes**
■ **Efficiency**		
10% more efficient lighting and windows	$100 to $500	Cost varies according to number of windows.
10% more efficient if use Building Performance Path	$0	
Elimination of Substandard Envelope	$0	
Reduced thermal bridging	$0 to $1000	Depends on design choice e.g. presence of cantilevered decks
Require 8 instead of 6 energy credits	$0	
■ **Electrification**		
Electrical outlets for gas appliances	$0 to $750	Varies depending on # of appliances. $250 per appliance.
No fossil fuel space heating	$0 to $1000	Efficient envelope will allow use of low-cost resistance heating; $1000 assumes units require triple-pane windows.
Heat pump water heating	$900 to $1,900	Depends on technology chosen
■ **Solar**		
Multifamily solar readiness	$0	Requires minimal additional attention during design
Installed solar (affordable housing exempted)	$0 to $650	Highest cost assumes 100 unit building. Cost after tax credits.
■ **TOTAL - RANGE**	$1000 to $5,800	
Source: Cost estimates provided by King County with the exception of space heating estimate provided by the City of Seattle.		

Plan Implementation

- ✓ Climate Action Task Force – Electrify new buildings, heat pump and solar installation

- ✓ Climate Action Plan – Reduce greenhouse gas emissions
  - ✓ Strategies - Energy efficiency and conservation / renewable energy

- ✓ Comprehensive Plan – Reduce contributions to climate change
  - ✓ Goal EV-8, Policies EV-42, 45, 46 and 47

Next Steps

- Public testimony
- City Council work session(s) and direction
- Delayed implementation

Draft Building Decarbonization Ordinance for Commercial and Large Multi-Family Buildings

Planning and Community Development
and Public Works Departments

December 13, 2021

BELLINGHAM CITY COUNCIL
210 Lottie Street, Bellingham, Washington 98225
Telephone (360) 778-8200 Fax (360)778-8101
Email: ccmail@cob.org Website: www.cob.org

BELLINGHAM CITY COUNCIL
NOTICE OF PUBLIC HEARING

Notice is hereby given that the Bellingham City Council will hold a Public Hearing on **December 13, 2021 at 7:00 PM** or as soon thereafter as possible during their Regular City Council meeting, which will take place remotely, to take public comment on the following:

To consider amendments to BMC 17.10 - Building Codes, modifying the recently adopted 2018 state energy code to require electrification of space and water heating, incremental improvements in energy efficiency, and solar installation or readiness measures in certain multi-family and commercial buildings.

Detailed information can be found at: meetings.cob.org five days prior to the public hearing.

Staff Contact: Kurt Nabbefeld, Development Services Manager, knabbefeld@cob.org, 360-778-8351

Anyone wishing to comment on this item is invited to do so. Advanced testimony is encouraged and can be presented to the Council online (https://cob.org/ccsignup), by telephone (360-778-8200), or by mail (210 Lottie Street, Bellingham, WA 98225). Comment received prior to 10:00 AM on December 08 2021, will be included in the agenda packet. Comment received after that will be distributed to Council but not included in the published packet. Anyone wishing to testify live during the public hearing can do so by registering at the following link: https://cob.org/ccsignup. Pre-registration is encouraged. Anyone wishing to join the public hearing on December 13, 2021 may do so via the following link: https://cob.org/cczoom.

Those who would like to listen in by phone can do so using any of the following phone numbers:

- (253) 215-8782
- (346) 248-7799
- (669) 900-6833
- (301) 715-8592
- (312) 626-6799
- (929) 205-6099

Meeting ID: **941 9601 5179**

Password: **9**

Publication date: **December 03, 2021**

HANNAH STONE	GENE KNUTSON	DANIEL HAMMILL	PINKY VARGAS	LISA ANDERSON	MICHAEL LILLIQUIST	HOLLIE HUTHMAN
Council Member	Council Member	Council Member	Council Member	Council Member	Council Member	Council Member
1st Ward	2nd Ward	3rd Ward	4th Ward	5th Ward	6th Ward	At Large
778-8211	734-4686	778-8213	778-8210	778-8217	778-8212	778-8216
hetsone@cob.org	gknutson@cob.org	dchammill@cob.org	ptvargas@cob.org	laanderson@cob.org	mlilliquist@cob.org	hahuthman@cob.org

City Council Agenda Bill

23194

Bill Number

Subject: **Mayor's Reappointment of Robin Williams to the Civil Service Commission (Approval)**

Summary Statement: The Mayor reappoints Robin Williams to her final term, which will expire on January 1, 2027.

The Commission provides for classification of over 500 civil service employees and for open and competitive examinations at both entry and promotional levels.

Previous Council Action: **N/A**

Fiscal Impact: **None**

Funding Source: **None**

Attachments:

Meeting Activity	Meeting Date	Recommendation	Presented By	Time
Mayor's Report - Appointment - For Approval	12/13/2021	Approve Appointment	Mayor Seth Fleetwood	0 minutes

Recommended Motion:

Council Committee:

Agenda Bill Contact:
Tracy Lewis, Mayor's Office

Reviewed By	Department	Date
Brian M. Heinrich	Executive	12/06/2021
Alan A. Marriner	Legal	12/07/2021
Seth M. Fleetwood	Executive	12/07/2021

Council Action:

City Council Agenda Bill

23195

Bill Number

Subject: **Mayor's Reappointment of Garrett Leque to the Lake Whatcom Watershed Advisory Board (Approval)**

Summary Statement: The Lake Whatcom Watershed Advisory Board is authorized by BMC 2.90.010.

The Mayor reappoints Garrett Leque to his second term, which will expire on December 3, 2024, at which time he may be reappointed.

The Lake Whatcom Watershed Advisory Board provides advice concerning land acquisitions.

Previous Council Action: **N/A**

Fiscal Impact: **None**

Funding Source: **None**

Attachments:

Meeting Activity	Meeting Date	Recommendation	Presented By	Time
Mayor's Report - Appointment - For Approval	12/13/2021	Approve Appointment	Mayor Seth Fleetwood	0 minutes

Recommended Motion:

Council Committee:

Agenda Bill Contact:
Tracy Lewis, Mayor's Office

Council Action:

Reviewed By	Department	Date
Brian M. Heinrich	Executive	12/06/2021
Alan A. Marriner	Legal	12/07/2021
Seth M. Fleetwood	Executive	12/07/2021

City Council Agenda Bill

23196

Bill Number

Subject: **Mayor's Appointments to the Greenway Advisory Committee (Approval)**

Summary Statement: The Greenway Advisory Committee is authorized by Resolution 2001-14.

The Mayor appoints Dina Dickerson to her first partial term, which will expire on March 11, 2022, at which time she may be reappointed. The Mayor appoints Aleksey Chayka and Jacob Stewart to their first terms, which will expire on December 13, 2024, at which time they may be reappointed.

The Greenway Advisory Committee shall identify, develop, review and recommend selection criteria, general project priorities and specific actions relating to the expenditure and allocation of Greenway Levy Funds. The Committee shall work in cooperation with the Parks & Recreation Department staff per Council Ordinance 2006-09-096.

Previous Council Action: **N/A**

Fiscal Impact: **None**

Funding Source: **None**

Attachments:
1. DICKERSON APPLICATION
2. CHAYKA APPLICATION
3. STEWART APPLICATION

Meeting Activity	Meeting Date	Recommendation	Presented By	Time
Mayor's Report - Appointment - For Approval	12/13/2021	Approve Appointment	Mayor Seth Fleetwood	0 minutes

Recommended Motion:

Council Committee:

Agenda Bill Contact:
Tracy Lewis, Mayor's Office

Reviewed By	Department	Date
Brian M. Heinrich	Executive	12/06/2021
Alan A. Marriner	Legal	12/07/2021
Seth M. Fleetwood	Executive	12/07/2021

Council Action:

Lewis, Tracy L.

From: noreply@cob.org on behalf of City of Bellingham <noreply@cob.org>
Sent: Wednesday, November 3, 2021 3:03 PM
To: Lewis, Tracy L.
Subject: Boards and Commissions Application - Dina Dickerson
Attachments: DKD Resume November 2021.pdf

City of Bellingham

Boards and Commissions Application

Entry Details

WHICH BOARD OR COMMISSION ARE YOU INTERESTED IN?	Greenways Advisory Board
NAME	Dina Dickerson
EMAIL	[redacted]
PRIMARY PHONE	[redacted]
SECONDARY PHONE	
MAILING ADDRESS	[redacted], Bellingham, Washington
IS YOUR HOME ADDRESS THE SAME AS YOUR MAILING ADDRESS?	Yes
DO YOU LIVE WITHIN BELLINGHAM CITY LIMITS?	Yes
HOW LONG HAVE YOU LIVED IN BELLINGHAM?	4.5 years
WHAT NEIGHBORHOOD DO YOU LIVE IN?	Samish

CURRENT (OR FORMER IF RETIRED) OCCUPATION	Retired Public Health Informaticist
HIGHEST LEVEL OF EDUCATION	Masters of Public Health
PROFESSIONAL / COMMUNITY ACTIVITIES YOU ARE INVOLVED IN	Samish Neighborhood Association Board Member North Cascades Audubon Society Member
QUALIFICATIONS RELATED TO THIS POSITION	I have experience serving on councils and boards so understand the process involved in reaching consensus on a plan. Most importantly, I am an avid hiker and trail explorer and would bring my passion for those activities to the council.
DESCRIBE WHY YOU ARE INTERESTED IN SERVING ON THIS BOARD OR COMMISSION	I live on the northeast side of Samish Way and walk my dog to Lake Padden 0.8 mile away 4-5 times per week. Unfortunately, there is no safe place to cross Samish Way to get to Lake Padden between Elwood and 48th Street, a distance of 3.3 miles. Residents on the northeast side of Samish Way tend to drive their cars to Lake Padden rather than walk or bike the short distance because of the danger of speeding cars and trucks and lack of protected crossings.
DO YOU OR YOUR SPOUSE HAVE A FINANCIAL INTEREST IN, OR ARE YOU AN EMPLOYEE OR OFFICE OF ANY BUSINESS OR AGENCY WHICH DOES BUSINESS WITH THE CITY OF BELLINGHAM?	No

References (Preferred)

Reference 1

NAME	Steve Abell
EMAIL	
PHONE	

Reference 2

NAME	Susan Madura

EMAIL	[redacted]
PHONE	[redacted]
UPLOAD FILES	DKD Resume November 2021.pdf

Diana Kay (Dina) Dickerson, MPH

Retired Senior Health Informaticist and Data Scientist

Over four decades experience solving problems of capture, use and sharing of data in health information venues including primary and specialty care medical practice, academic medicine, public health and social services

EMPLOYMENT

Oregon Health Authority Center for Prevention & Health Promotion	Senior Informaticist	2011-2015
State of Oregon Medicaid Health Information Network	Public Health HIT/HIE Informaticist	2010-2011
State of Oregon Office of Family Health, Portland OR	Manager, Informatics	2007-2010
Verinform Systems, Inc., Portland OR	CEO and Founder	2001-2006
Dickerson & Associates Consulting, Portland OR	Information Management Consultant	1984-2001
Oregon Health & Science University, Portland OR	Research Assistant	1978-1983
RAND Corporation, Santa Monica CA	Assistant Information Scientist	1975-1978
M.D. Anderson Hospital and Tumor Institute, Houston TX	Data Manager	1971-1975

EDUCATION

Master of Public Health (MPH), University of Washington School of Public Health, Seattle WA 1996
Thesis: *Natural Language Processing of Medical Narrative Text Using Noun Phrases*
Bachelor of Science, Economics (BS), Portland State University, Portland OR 1982

CAREER HIGHLIGHTS

Health Data Harmonization, Standardization and Information Exchange (HIE)

- Served on Health Resources and Services Administration (HRSA) Maternal and Child Health (MCH) Bureau workgroup to define and standardize the required minimum dataset for MCH Title 5 programs
- Served on Office of the National Coordinator (ONC) for HIT Standards & Interoperability (S&I) Framework Public Health Reporting Initiative (PHRI) Data Modeling and Terminology Harmonization Sub-Workgroup to consolidate user stories, identify common core, program-specific and jurisdictional data elements, and create implementation guides for health information exchange (HIE) between Electronic Health Records (EHRs) and Public Health
- Worked with Public Health Data Standards Consortium (PHDSC) to conduct Phase 1 pilot HIE of newborn hearing screening data using the constrained Clinical Document Architecture (CDA) between EHRs and the Oregon Early Hearing Detection and Intervention (EHDI) registry using a test harness for source data
- Served on Structured Data Capture (SDC) Public Health Tiger Team to establish criteria for selecting HIE pilots
- Led Phase 2 pilot of EHDI CDA using live data and the Integrating the Healthcare Enterprise (IHE) Hearing Plan of Care (HPoC)

Health Data and Workflow Modeling and Enterprise Information Architecture

- Led HIE project using national data and transport standards to share newborn hearing screening data from hospital electronic health record (EHR) with state tracking and surveillance system
- Designed metadata model to integrate data silos in MCH home visiting and other state programs to address the problem of interoperability
- Developed Public Health Shared Services Model to eliminate redundancy and streamline workflow
- Designed governance model for Oregon Division of Public Health information technology projects
- Authored Information Architecture chapter for 2nd edition of Public Health Informatics and Information Systems textbook for use in informatics training programs

Leadership

- Founded Verinform, a web-based medical software company, and raised seed and Angel funding rounds
  - Served on the Board of Directors and led the company for six years
  - Acquired a competitor's assets and successfully transitioned their customers to Verinform
  - Orchestrated merger with a competitor company
  - Built strong working relationships with clinical and executive leadership at more than 40 teaching hospitals, first to sell the Verinform solution and then to ensure that the implementation supported organizational goals
- Established the Informatics Unit to serve Oregon MCH programs with data capture, management, sharing and

governance expertise and to harmonize and standardize data and practice protocols
- Led Oregon statewide initiative to adopt a metadata model to integrate data silos initially for disparate home visiting and early childhood programs and subsequently to expand to other state programs

Information Management and Clinical Decision Support

- Operationalized evidence-based, best and promising practice protocols to enable decision support for quality and process measures
- Led development and marketing of online software applications for healthcare including *VerinformRM*, an enterprise system to manage Graduate Medical Education programs and to maximize reimbursement from the Centers for Medicare and Medicaid Services for patient care by residents
- Worked with Adolescent Health and partners to implement EHRs in School-based Health Centers
- Developed 40+ software applications for healthcare while serving as an information management consultant including:
  - Patient registries for primary and specialty care
  - Clinical trials
  - Graduate and undergraduate medical education
  - Employee health and immunization management
  - Emergency medical transport
  - Laboratory staff scheduling
  - Financial management and reimbursement
  - Community outreach, fundraising and membership
  - Regulatory compliance and administrative reporting
  - Grants management

TECHNICAL EXPERTISE

Data harmonization and standardization, metadata models, workflow optimization, SQL, HL7, CDA, vocabularies and value sets, relational database management, HTML, XML, MS-Excel, -Word, -Visio and -PowerPoint, EHRs

AWARDS AND HONORS

- *Public Health Information Network Conference* 2009 Poster Competition: 2nd Place for A Flea Pushing a Boulder: Informatics Enters Public Health
- *Oregon Entrepreneur's Foundation* 2003 Finalist for Early Stage Company of the Year
- *The Association for Women in Communications* 1997 Clarion Award for radio documentary Scarves of Many Colors: Muslim Women and the Veil
- *National Federation of Community Broadcasters* 1994 Community Radio Awards: Local Documentary Silver Reel for American Apsara: Portraits of Cambodian American Women

BIBLIOGRAPHY AND PRESENTATIONS

- *EHDI Annual Meeting* 2015, Louisville KY, Poster: Moving Data from EHRs to the EHDI Registry: Oregon Pilot Test Using the Hearing Plan of Care (HPoC) Clinical Document Architecture (CDA). Dickerson D, Swafford M, Yu C, Nguyen T, Morrow-Almeida H, Bingham C.
- *Public Health Informatics and Information Systems*, Springer Verlag London, 2014 Dickerson D, Yao P: Chapter 6: Information Architecture.
- *Health Resources and Services Administration Maternal and Child Health Bureau Implementation Guide for Core and Minimum Data Sets, 2014*
- *Maternal & Child Health Symposium at the Council of State and Territorial Epidemiologists Annual Conference, Nashville, TN 2014*
  - *Keynote Speaker*: Dickerson D: Harnessing the Power of a Data Warehouse and Applications for Maternal and Child Health
- *Public Health Informatics Conference, Atlanta, GA 2014*
  - *Panelist*: Public Health Reporting Initiative
  - *Panelist*: Structured Data Capture Workgroup
  - *Panelist*: Leveraging Data Standards and Standards-based Data Sharing to Support the Life Course Model
- *Standards & Interoperability Framework Public Health Reporting Initiative/ Public Health Tiger Team Educational Series 2014*
  - *Panelist*: Why Should Public Health Care About Standards and What Standards Does Public Health Need?
  - *Panelist*: Data Standards: Vocabulary and Terminology Standards for Public Health
  - *Panelist*: From Silos to Systems Interoperability
- *American Medical Informatics Association Public Health Informatics Working Group Webinar Series 2014*

- *Panelist*: Electronic Public Health Case Reporting – Is There a Path Forward?
- *Public Health Data Standards Consortium Annual Meeting, Hyattsville, MD 2013*
  - PHDSC 2013: Dickerson D: Dealing with Uncertainties: HIT Standardization.
- *US Department of Health & Human Services Office of the National Coordinator for Health IT Standards & Interoperability Framework Public Health Reporting Initiative:* Data Harmonization Profile Version 2.0 February 13, 2013.
- *Council of State and Territorial Epidemiologists Annual Conference, Pasadena, CA*
  - CSTE 2013: Kriseman J, Lipsky N, Merrick R, Dickerson D, Brown L, Pupo E, Colletta M, Abellara J: Harmonizing Content of Public Health Surveillance Systems: Lessons Learned from the ONC Standards and Interoperability (S&I) Public Health Reporting Initiative (PHRI)
- *Oregon Public Health Association Annual Conference, Corvallis, OR*
  - OPHA 2013: Yu C, Dickerson D, Morrow-Almeida H, Swafford M: Health Information Exchange Among Early Hearing Detection and Intervention Partners.
  - OPHA 2012: Dickerson D, Messick S, Yu C: Two Similar Statewide Initiatives: Home Visiting and Early Learning Council Data Systems.
- *American Public Health Association, San Francisco, CA, 2013.* Dickerson D. Public Health Shared Services Model: Applying Public Health Standards to Health Department Services and Functions (poster)
- *ONC Standards & Interoperability Framework, Public Health Reporting Initiative, 2013, contributor to the following:*
  - Reference Implementation Framework Guide
  - Data Harmonization Profile
  - Functional Requirements
- *Public Health Information Network (PHIN) Annual Conference, Atlanta, GA*
  - PHIN 2011: Dickerson D, Modesitt S: Public Health Shared Services Model: Applying Public Health Standards to Health Department Services and Functions.
  - PHIN 2009: Dickerson D: A Flea Pushing a Boulder: Informatics Enters Public Health.
  - PHIN 2009: Yao P, Dickerson D: Administrator Dashboards: Information for Real-Time Decision-Making.
  - PHIN 2008: Dickerson D: From Silo to Data Mart to Data Warehouse.
- *Second International Conference on the Clinical Document Architecture,* Acapulco, Mexico, 2004. Lincoln T, Cooney T, Girard D, Dickerson D, Lincoln J: Augmenting the Effectiveness of Medical Education. Documentation By Association with the Clinical Document Architecture: An XML Approach to Efficient and Consistent Graduate Medical Education Documentation.
- *Medinfo2004 Proceedings*, San Francisco, 2004. Lincoln T, Cooney T, Girard D, Dickerson D: An XML Approach to the Consistent Documentation of Graduate Medical Education and Residency Programs.
- *Scarves of Many Colors: Muslim Women and the Veil,* 2000. Radio documentary by Bohorfoush J and Dickerson D. Social Studies Curriculum by Bigelow B, Childs S, Diamond N, Dickerson D, and Haaken J.
- *American Journal of Respiratory Diseases* 129:557,1984. Wall, MA; Misley, MC; Dickerson, DK: Partial Expiratory Flow Volume Curves in Young Children.
- *Child Abuse and Neglect* 6:359,1982. Tufts, E; Blank, E; Dickerson, D: Periosteal Thickening as a Manifestation of Trauma in Infancy.

PROFESSIONAL ASSOCIATIONS

American Public Health Association 2013-2015
Oregon Public Health Association 2007-2015
American Medical Informatics Association 2000-2006

COMMUNITY SERVICE

- *Free Geek*, Board Chairperson, 2011-present
- *Portland State University*, Walk of the Heroines, Thousand Thanks Club Board Member 2006-2011
- *Joan Hawkinson Bohorfoush Memorial Fund*, Scarves of Many Colors Curriculum Distribution and Account Manager 2000-2011
- *Metropolitan Learning Center*, Technology Committee and Volunteer Computer Science Teacher, 1996-2002
- *Ben Linder Memorial Fund*, Volunteer Database Programmer, 1987-2007

PERSONAL GRANTS

- Oregon Council for the Humanities 1995
  Project Title: American Hijab: Women and Islam
- Washington Commission for the Humanities # 16G-3890 *and* Oregon Commission for the Humanities 1990-91
  Project Title: A Promise for All: Ethnic Settlement in the Pacific Northwest

Dina Dickerson, MPH

PROJECT LIST

Oregon Health Authority, Center for Prevention and Health Promotion 2011-present
800 NE Oregon, Portland, OR 97232
Data and workflow harmonization and standardization for home visiting programs statewide
Metadata model to integrate data and functionality across home visiting and other MCH programs
Phase 1 pilot of RFD technology for HIE between EHRs and Oregon EHDI program registry
S&I Public Health Reporting Initiative co-lead
Phase 2 pilot of S&I Structured Data Capture for HIE between hospital EHRs and EHDI registry
HRSA MCHB minimum data set workgroup
Oregon Health Authority Shared, Standards-Based Data Model
School-based Health Centers standardized practice and reporting system

Oregon Division of Public Health, Office of Family Health 2007-2011
800 NE Oregon, Portland, OR 97232
Child Health Profile to create integrated view of client data from database silos
MCH Performance Measure Dashboards
Public Health Information Technology Governance Model
Public Health Accreditation Board Shared Services Model
Public Health Informatics Institute Business Case Model for Oregon
Performance Measures Information Management System
Operational Data Store for State Program Data

HealthCo Information Systems, Inc. 2006-2007
7657 SW Mohawk, Tualatin, OR 97062
Commercial Software Application
SHOTS: Employee Health Information Management

Verinform Systems, Inc. 2001-2006
6327 SW Capitol Hwy, #247, Portland, OR 97239
CEO & Founder
Commercial Software Applications
VerinformRM: Graduate Medical Education Information Management
VerinformPM: Healthcare Protocol Management

Dickerson & Associates Consulting 1984-2001
1010 SW Mitchell Street, Portland, OR 97239
Commercial Software Applications
Pediatric and Neonatal Emergency Medical Transport
Employee Health Immunization Management
Neonatal Intensive Care Unit Patient Reporting

The RAND Corporation 1975-1978
1776 Main Street, Santa Monica, CA 90401-3208
CLINFO, system for database management and analysis of clinical research information
- User services and system testing
- Train clinical investigators in use of CLINFO
- Backup Systems Administrator

M.D. Anderson Hospital & Tumor Institute 1971-1974
1515 Holcombe Drive, Houston, TX 77030
Continuous Medical Data Analysis (CMDA) Project
Data management and analysis for Phase 1 testing of developmental therapeutics

Clients and Projects

Oregon Health Sciences University 1984-2001
3181 SW Sam Jackson Park Road, Portland, Oregon 97239

Department of Student Health
- Student Vaccination and Exposure Management System

Department of Employee Health
- OHSU Employee Vaccination and Exposure Management System

Department of Occupational Health
- Agency Employee Vaccination and Exposure Management System

Department of Obstetrics and Gynecology
- Clinical Procedures Management System

Department of Medicine, Primary Care Division
- Residency Management System
- Medical Student Survey Management System
- Medical Student Evaluation System

Department of Pediatrics, Administration
- Personnel Management System
- Residency Management System
- Financial and Grants Management System
- Community Physician Communication System
- Clinical Faculty Promotion Management
- Graduate Medical Education Seminar Attendance Management

Department of Pediatrics, Outpatient Clinic
- Continuity Clinic Patient and Provider Tracking
- Child Abuse Registry Patient Tracking
- Feeding Clinic Patient Tracking
- Welfare Patient Lead Level Tracking

Department of Pediatrics, Pulmonary Division
- Cystic Fibrosis Database Management System

Department of Pediatrics, Neonatal Intensive Care Unit (NICU)
- NICU Patient Registry

Department of Pediatrics, Nephrology
- Renal Patient Registry

Department of Clinical Nutrition
- Clinic Services Billing System
- Aproprotein Laboratory Management and Billing System

Department of Neurology
- Parkinson's Disease Registry
- Stroke Registry

Portland Veteran's Affairs Medical Center 1990-1999
PO Box 1034, Portland, Oregon 97207

Health Services Research and Development
- Medical Malpractice Prevention System
- Budgetary Tracking and Reporting System
- Gulf War Veterans Database Management System

Behavioral Medicine Clinic
- Behavioral Medicine Clinic Patient Tracking and Provider Utilization System

Oregon Stroke Center
- Stroke Registry and Patient Tracking System
- Red Blood Cell Aggregation System

Research and Education Group 1990

Montgomery Park Plaza, Portland, Oregon 97217
Research and Education Group
- DDI Clinical Trial for AIDS patients

Center for Health Research 1990
4610 SE Belmont, Portland, Oregon 97217
Research and Operations
- Needs Assessment for Automation of Employee Annual Survey

Oregon Public Health Association 1990-1991
3400 N Interstate Avenue, Portland, Oregon 97217
Administration
- Oregon Public Health Association Membership Tracking System

Pacific Power and Light 1990-1991
920 SW Sixth, Portland, Oregon 97201
Power Marketing
- Cogeneration Analysis System

Dubal, Beck, Harris and Associates 1986-1989
13500 SW 72nd Avenue, Suite 250, Portland, OR 97223-8013
Wood Products Mill Maintenance Management
- Equipment Maintenance Management
- Spare Parts Inventory Control
- Downtime Reporting
- Preventive Maintenance
- Purchase Order Management
- Work Order Control

Northwest Kaiser-Permanente 1985-1987
3400 N Interstate Avenue, Portland, Oregon 97217
Graduate Medical Education
- Housestaff Scheduling and Evaluation System

Continuing Medical Education
- Continuing Medical Education Event and Provider Continuing Medical Education Credit Tracking System

Clinical Laboratories
- Clinical Laboratories Staff Scheduling System

Long Term Care Facility
- Long Term Care Facility Patient Management System

Employee Relations
- Employee Relations Merit Review System

Print Shop
- Information Processing Needs Assessment and Automation Cost/Benefit Analysis

American Lung Association of Oregon 1986
1776 SW Madison St., Portland, Oregon 97201
Financial Development Division
- Financial Development and Donor Tracking System

Ben Linder Memorial Fund
2545 SW Terwilliger Blvd, Portland, OR 97201
- Donor Tracking and Management

Lewis, Tracy L.

From: noreply@cob.org on behalf of City of Bellingham <noreply@cob.org>
Sent: Tuesday, October 19, 2021 2:45 PM
To: Lewis, Tracy L.
Subject: Boards and Commissions Application - Aleksey Chayka

City of Bellingham
Boards and Commissions Application

Entry Details

WHICH BOARD OR COMMISSION ARE YOU INTERESTED IN?	Greenway, Parks & Rec
NAME	Aleksey Chayka
EMAIL	
PRIMARY PHONE	
SECONDARY PHONE	
MAILING ADDRESS	., Bellingham, Washington
IS YOUR HOME ADDRESS THE SAME AS YOUR MAILING ADDRESS?	Yes
DO YOU LIVE WITHIN BELLINGHAM CITY LIMITS?	Yes
HOW LONG HAVE YOU LIVED IN BELLINGHAM?	5
WHAT NEIGHBORHOOD DO YOU LIVE IN?	Barkley

CURRENT (OR FORMER IF RETIRED) OCCUPATION	Financial Analyst
HIGHEST LEVEL OF EDUCATION	BA from Gonzaga
PROFESSIONAL / COMMUNITY ACTIVITIES YOU ARE INVOLVED IN	Soccer Coach, Church Treasury, I'm looking to get involved into more.
QUALIFICATIONS RELATED TO THIS POSITION	- 9 years of applicable Financial Analytical experience and Planning Expirience - 6 years of directing community youth camps
DESCRIBE WHY YOU ARE INTERESTED IN SERVING ON THIS BOARD OR COMMISSION	When I first move to Bellingham it was a 2 year plan. we fell in love with the city that has strong presence of green spaces programs as well as awesome parks development. My kids are in parks and on trails every single day- we love what our city has to offer. My wife and I have 2 boys and I would love to contribute to the city where they will be growing up in. I love improving programs, processes and most of all I love setting up generations for success.
DO YOU OR YOUR SPOUSE HAVE A FINANCIAL INTEREST IN, OR ARE YOU AN EMPLOYEE OR OFFICE OF ANY BUSINESS OR AGENCY WHICH DOES BUSINESS WITH THE CITY OF BELLINGHAM?	No

References (Preferred)

Reference 1

NAME	Andrey Muzychenko
EMAIL	
PHONE	
UPLOAD FILES	

Lewis, Tracy L.

From: noreply@cob.org on behalf of City of Bellingham <noreply@cob.org>
Sent: Saturday, October 16, 2021 7:51 PM
To: Lewis, Tracy L.
Subject: Boards and Commissions Application - Jacob Stewart

City of Bellingham

Boards and Commissions Application

Entry Details

WHICH BOARD OR COMMISSION ARE YOU INTERESTED IN?	Greenways Advisory
NAME	Jacob Stewart
EMAIL	[redacted]
PRIMARY PHONE	[redacted]
SECONDARY PHONE	
MAILING ADDRESS	[redacted], Bellingham, Washington 98225
IS YOUR HOME ADDRESS THE SAME AS YOUR MAILING ADDRESS?	Yes
DO YOU LIVE WITHIN BELLINGHAM CITY LIMITS?	Yes
HOW LONG HAVE YOU LIVED IN BELLINGHAM?	15 years
WHAT NEIGHBORHOOD DO YOU LIVE IN?	Columbia

CURRENT (OR FORMER IF RETIRED) OCCUPATION	Chief Compliance Officer and Ant-Money Laundering Officer @Saturna Capital
HIGHEST LEVEL OF EDUCATION	BA English Lit
PROFESSIONAL / COMMUNITY ACTIVITIES YOU ARE INVOLVED IN	None! I want to get involved
QUALIFICATIONS RELATED TO THIS POSITION	Since I was a kid I have loved maps and exploring. I think I have been on just about every trail in the city limits, and maybe the western part of the county. I excel in quickly assimilating large volumes of technical information. I enjoy researching obscure issues. I really, really like maps and catography. Involved in Greater Bellingham Running Club and local bike racing scene for many years.
DESCRIBE WHY YOU ARE INTERESTED IN SERVING ON THIS BOARD OR COMMISSION	I literally read COB master plans and DNR geology reports for fun. And I'm passionate about trails, and sharing our wonderful trails with my two kids. I'd like to help!
DO YOU OR YOUR SPOUSE HAVE A FINANCIAL INTEREST IN, OR ARE YOU AN EMPLOYEE OR OFFICE OF ANY BUSINESS OR AGENCY WHICH DOES BUSINESS WITH THE CITY OF BELLINGHAM?	No

References (Preferred)

Reference 1

NAME	Sonja Max
EMAIL	
PHONE	
UPLOAD FILES	

City Council Agenda Bill

23197

Bill Number

Subject: **Mayor's Appointments to the Immigration Advisory Board (Approval)**

Summary Statement: The Immigration Advisory Board is authorized by Ordinance 2019-11-033.

The Mayor appoints Tarnjot Brar to his first partial term, which will expire on June 23, 2022, at which time he may be reappointed.
The Mayor appoints Homero Israel Jose Garrido to his first partial term, which will expire on April 12, 2023, at which time he may be reappointed.
The Mayor appoints Sierra Green to her first term as Alternate, which will expire on December 13, 2023, at which time she may be reappointed.

Previous Council Action: **N/A**

Fiscal Impact: **None**

Funding Source: **None**

Attachments:
1. BRAR APPLICATION
2. GARRIDO APPLICATION
3. GREEN APPLICATION

Meeting Activity	Meeting Date	Recommendation	Presented By	Time
Mayor's Report - Appointment - For Approval	12/13/2021	Approve Appointment	Mayor Seth Fleetwood	0 minutes

Recommended Motion:

Council Committee:

Agenda Bill Contact:
Tracy Lewis, Mayor's Office

Council Action:

Reviewed By	Department	Date
Brian M. Heinrich	Executive	12/07/2021
Alan A. Marriner	Legal	12/07/2021
Seth M. Fleetwood	Executive	12/08/2021

Lewis, Tracy L.

From: noreply@cob.org on behalf of City of Bellingham <noreply@cob.org>
Sent: Monday, July 26, 2021 12:52 PM
To: Lewis, Tracy L.
Subject: Boards and Commissions Application - Tarnjot Brar
Attachments: resume.docx

City of Bellingham

Boards and Commissions Application

Entry Details

WHICH BOARD OR COMMISSION ARE YOU INTERESTED IN?	Immigration Advisory Board
NAME	Tarnjot Brar
EMAIL	
PRIMARY PHONE	
SECONDARY PHONE	
MAILING ADDRESS	Lynden, Washington 98264
IS YOUR HOME ADDRESS THE SAME AS YOUR MAILING ADDRESS?	Yes
DO YOU LIVE WITHIN BELLINGHAM CITY LIMITS?	No
HOW LONG HAVE YOU LIVED IN BELLINGHAM?	11
WHAT NEIGHBORHOOD DO YOU LIVE IN?	not in city limit

CURRENT (OR FORMER IF RETIRED) OCCUPATION	Realtor
HIGHEST LEVEL OF EDUCATION	B-Tech
PROFESSIONAL / COMMUNITY ACTIVITIES YOU ARE INVOLVED IN	I am Realtor serving Whatcom county working with people from different communities, I am also member of a Group known as Chardi Kala Project which serves the a bridge between Sikh community and other communities, while also helping homeless community through various Sikh temples in the area.
QUALIFICATIONS RELATED TO THIS POSITION	I have been involved in serving people of my and other communities by educating other people about Punjabi / Sikh culture and religion. As being immigrant myself I can understand the problems they go through and want to help them.
DESCRIBE WHY YOU ARE INTERESTED IN SERVING ON THIS BOARD OR COMMISSION	I want to better serve my community and be a part of program which can help immigrants like me.
DO YOU OR YOUR SPOUSE HAVE A FINANCIAL INTEREST IN, OR ARE YOU AN EMPLOYEE OR OFFICE OF ANY BUSINESS OR AGENCY WHICH DOES BUSINESS WITH THE CITY OF BELLINGHAM?	No

References (Preferred)

Reference 1

NAME	Satpal Sidhu
EMAIL	
PHONE	
UPLOAD FILES	resume.docx

Tarnjot Singh Brar

Lynden, WA 98264

Education

2007-2010 Swami Vivekanand Institute of Engineering and Technology
Chandigarh, India
Bachelors of Technology in Electronics and Communication Engineering

2004-2007 Mehr Chand Polytechnic College
Jalandhar, India
Diploma in Electronics and Communication Engineering

Work Experience

SecurityNational Mortgage Company October 2020 – Present
Lynden, WA
Mortgage Loan Orignator

Weichert Realtors January 2017 - Present
Bellingham, WA
Realtor

TMG Logistics, Inc. July 2012 – Present
Blaine, WA
Office Manager, Dispatcher

Blue Sea Systems February 2012- September 2012
Bellingham, WA
Production Assembler

Target November 2011- January 2012
Bellingham, WA
Flow Control, Cashier

Office of the Mayor
City Hall, 210 Lottie Street
Bellingham, WA 98225
Phone (360) 778-8100 Fax (360) 778-8101

RECEIVED

EXECUTIVE DEPARTMENT

APPLICATION FOR APPOINTMENT TO CITY OF BELLINGHAM BOARDS AND COMMISSIONS
(Please Type or Print Clearly)

Candidates must presently live within Bellingham City limits and have done so for at least one year, unless otherwise specified. Elected City officials, city officers and employees, and residents having conflicts of interest are ineligible for appointments to City advisory boards. Complete, sign and return this application to the Mayor's Office, City Hall, 210 Lottie Street, Bellingham, WA 98225.

Note: As a candidate to a public board or commission, this information may be made available to the public.

I am interested in serving on the: Immigration Advisory Board
(Board / Commission)

Name: Homero Israel Jose Garrido

Mailing Address: [redacted] Rd Ferndale WA Zip Code: 98248

Street Address (if different): _____

Phone Numbers: Home: _____ Cell: [redacted] Work: _____

Email Address: [redacted]

Are you a resident of the City of Bellingham (live within the city limits)? YES ☑ NO ☐

How long have you lived in Bellingham? _____

Neighborhood in which you reside Ferndale

Current Occupation: Mechanic

OR – If retired, former occupation: _____

Education: high school (Mexico, Oaxaca)

Professional / Community Activities: _____

Qualifications Related to Position: Activist, Immigrant my self, self employ for 17 year, very indipent to perform task

Describe why you are interested in serving on this Board or Commission: as an immigrant I can have more understanding of the problem we face every day and with some time I can provide ideas for solutions

*Please feel free to submit any additional documentation (resumé, explanation of experience specifically related to this board/commission).

Do you or your spouse have a financial interest in, or are you an employee or officer of any business or agency which does business with the City of Bellingham? YES ☑ NO ☐

If yes, please explain: _____

June 14th 2021
Today's Date

Signature of Applicant

Lewis, Tracy L.

From: noreply@cob.org on behalf of City of Bellingham <noreply@cob.org>
Sent: Monday, December 6, 2021 5:01 PM
To: Lewis, Tracy L.
Subject: Boards and Commissions Application - Sierra Green

City of Bellingham

Boards and Commissions Application

Entry Details

WHICH BOARD OR COMMISSION ARE YOU INTERESTED IN?	Immigration Advisory Board
NAME	Sierra Green
EMAIL	
PRIMARY PHONE	
SECONDARY PHONE	
MAILING ADDRESS	Bellingham, Washington 98226
IS YOUR HOME ADDRESS THE SAME AS YOUR MAILING ADDRESS?	Yes
DO YOU LIVE WITHIN BELLINGHAM CITY LIMITS?	Yes
HOW LONG HAVE YOU LIVED IN BELLINGHAM?	2
WHAT NEIGHBORHOOD DO YOU LIVE IN?	Sunnyland

CURRENT (OR FORMER IF RETIRED) OCCUPATION	Community Researcher for Community to Community
HIGHEST LEVEL OF EDUCATION	High School Diploma and some college
PROFESSIONAL / COMMUNITY ACTIVITIES YOU ARE INVOLVED IN	I'm currently a community researcher and the database entry lead for Community to Community (Whatcom County). I'm also involved in a Dean Search committee for the Human Services Program at Western Washington University.
QUALIFICATIONS RELATED TO THIS POSITION	I'm well versed in the current status of immigration issues within Whatcom County due to my work with Community to Community which focuses on helping migrant farmworkers and undocumented folk. Through the Human Services Program at Western, I've gained a specific set of skills that would be applicable to IAB: facilitation skills, conflict resolution, active listening, and other interpersonal skills.
DESCRIBE WHY YOU ARE INTERESTED IN SERVING ON THIS BOARD OR COMMISSION	I'm applying as Australia Toubon's alternate while she goes on maternity leave. Australia has discussed this with Hannah Stone and Nalini Margaitis. In addition to that, I'm interested to see the work done around policy with respect to immigration and curious to see Bellingham's approach.
DO YOU OR YOUR SPOUSE HAVE A FINANCIAL INTEREST IN, OR ARE YOU AN EMPLOYEE OR OFFICE OF ANY BUSINESS OR AGENCY WHICH DOES BUSINESS WITH THE CITY OF BELLINGHAM?	No

References (Preferred)

Reference 1

NAME	Australia Toubon
EMAIL	
PHONE	

Reference 2

NAME	Kimberly Elias
EMAIL	
PHONE	

Reference 3

NAME	Jennifer Gonzalez
EMAIL	
PHONE	

UPLOAD FILES

City Council Agenda Bill

23198

Bill Number

Subject: **Mayor's Appointment of Katy Scherrer to the Transportation Commission (Approval)**

Summary Statement: The Transportation Commission is authorized by BMC 2.44.010.

The Mayor appoints Katy Scherrer to her first term, which will expire on January 11, 2025, at which time she may be reappointed.

Previous Council Action: **N/A**

Fiscal Impact: **None**

Funding Source: **None**

Attachments: 1. APPLICATION

Meeting Activity	Meeting Date	Recommendation	Presented By	Time
Mayor's Report - Appointment - For Approval	12/13/2021	Approve Appointment	Mayor Seth Fleetwood	0 minutes

Recommended Motion:

Council Committee:

Agenda Bill Contact:
Tracy Lewis, Mayor's Office

Council Action:

Reviewed By	Department	Date
Brian M. Heinrich	Executive	12/06/2021
Alan A. Marriner	Legal	12/07/2021
Seth M. Fleetwood	Executive	12/07/2021

Lewis, Tracy L.

From: noreply@cob.org on behalf of City of Bellingham <noreply@cob.org>
Sent: Sunday, March 14, 2021 3:46 PM
To: Lewis, Tracy L.
Subject: Boards and Commissions Application - Katy Scherrer

City of Bellingham

Boards and Commissions Application

Entry Details

WHICH BOARD OR COMMISSION ARE YOU INTERESTED IN?	Transportation Commission
NAME	Katy Scherrer
EMAIL	
PRIMARY PHONE	
SECONDARY PHONE	
MAILING ADDRESS	Bellingham, Washington 98225
IS YOUR HOME ADDRESS THE SAME AS YOUR MAILING ADDRESS?	No
HOME ADDRESS	, Bellingham, Washington 98225
DO YOU LIVE WITHIN BELLINGHAM CITY LIMITS?	Yes
HOW LONG HAVE YOU LIVED IN BELLINGHAM?	22 years (born and raised here then moved back 3years ago)

WHAT NEIGHBORHOOD DO YOU LIVE IN?	South Hill
CURRENT (OR FORMER IF RETIRED) OCCUPATION	Landscape Architect/Urban Designer
HIGHEST LEVEL OF EDUCATION	Masters in Landscape Architecture from University of Washington
PROFESSIONAL / COMMUNITY ACTIVITIES YOU ARE INVOLVED IN	Professional Landscape Architect and International Masterclass Program Co-Founder, COurban Design Collective www.courban.co Landscape Architect/Consultant, Katy Scherrer Landscape Design www.katyscherrerlandscapedesign.com Volunteer Community Outreach Committee, Lummi Island Heritage Trust www.liht.org Happy Valley R.O.W. Landscape Plan, Collaboration with COurban and Happy Valley Neighborhood Committee
QUALIFICATIONS RELATED TO THIS POSITION	For the past four years, I have led professional study tour educational programs focused on urban livability, multi-modal transportation, public-life and urban design. One of our recent study tours for the City and Port of Bellingham focused on Urban Regeneration and Connectivity and the Downtown Waterfront Sub Area Plan. Since this trip, I have been working as a volunteer and consultant with the Port of Bellingham. I also work locally as a landscape architect, urban designer and consultant.
DESCRIBE WHY YOU ARE INTERESTED IN SERVING ON THIS BOARD OR COMMISSION	As a walker and bike commuter, I would like to help the City and Whatcom County improve and promote healthy transportation options and choices for all citizens. I have recently been researching children's health and air quality and how it relates to transportation for the City of Copenhagen. I would like to advocate for similar evidence-based transportation planning methods that help improve our community health and infrastructure.

DO YOU OR YOUR SPOUSE HAVE A FINANCIAL INTEREST IN, OR ARE YOU AN EMPLOYEE OR OFFICE OF ANY BUSINESS OR AGENCY WHICH DOES BUSINESS WITH THE CITY OF BELLINGHAM?	No

References (Preferred)

Reference 1

NAME	Mark Buehrer
EMAIL	
PHONE	
UPLOAD FILES	

City Council Agenda Bill

23199

Bill Number

Subject: **Mayor's Reappointment of Mary Hooker to the Bellingham Sister Cities Board (Information)**

Summary Statement: The Bellingham Sister Cities Board is authorized by BMC 2.82.

The Mayor reappoints Mary Hooker to her first full term, which will expire on January 1, 2025, at which time she may be reappointed.

Previous Council Action: **N/A**

Fiscal Impact: **None**

Funding Source: **None**

Attachments:

Meeting Activity	Meeting Date	Recommendation	Presented By	Time
Mayor's Report - Appointment - For Information	12/13/2021	Information/Discussion	Mayor Seth Fleetwood	0 minutes

Recommended Motion:

Council Committee:

Agenda Bill Contact:
Tracy Lewis, Mayor's Office

Council Action:

Reviewed By	Department	Date
Brian M. Heinrich	Executive	12/06/2021
Alan A. Marriner	Legal	12/07/2021
Seth M. Fleetwood	Executive	12/07/2021

City Council Agenda Bill

23200

Bill Number

Subject: **Mayor's Reappointment of Sara Holliday and Appointment of Marc Blake to the Tourism Commission (Information)**

Summary Statement: The Tourism Commission is authorized by BMC 2.80.020.

The Mayor reappoints Sara Holliday to her third term, which will expire on December 31, 2024, at which time she may be reappointed.
The Mayor appoints Marc Blake to his first term, which will expire on December 31, 2024, at which time he may be reappointed.

Previous Council Action: **N/A**

Fiscal Impact: **None**

Funding Source: **None**

Attachments: 1. APPLICATION

Meeting Activity	Meeting Date	Recommendation	Presented By	Time
Mayor's Report - Appointment - For Information	12/13/2021	Information/Discussion	Mayor Seth Fleetwood	0 minutes

Recommended Motion:

Council Committee:

Agenda Bill Contact:
Tracy Lewis, Mayor's Office

Reviewed By	Department	Date
Brian M. Heinrich	Executive	12/06/2021
Alan A. Marriner	Legal	12/07/2021
Seth M. Fleetwood	Executive	12/07/2021

Council Action:

Lewis, Tracy L.

From: noreply@cob.org on behalf of City of Bellingham <noreply@cob.org>
Sent: Monday, February 15, 2021 5:12 PM
To: Lewis, Tracy L.
Subject: Boards and Commissions Application - Marc Blake

City of Bellingham

Boards and Commissions Application

Entry Details

WHICH BOARD OR COMMISSION ARE YOU INTERESTED IN?	Tourism Commission
NAME	Marc Blake
EMAIL	r
PRIMARY PHONE	
SECONDARY PHONE	
MAILING ADDRESS	, Bellingham, Washington 98226
IS YOUR HOME ADDRESS THE SAME AS YOUR MAILING ADDRESS?	Yes
DO YOU LIVE WITHIN BELLINGHAM CITY LIMITS?	Yes
HOW LONG HAVE YOU LIVED IN BELLINGHAM?	10 Years and 7 Months
WHAT NEIGHBORHOOD DO YOU LIVE IN?	Barkley

CURRENT (OR FORMER IF RETIRED) OCCUPATION	Business Owner
HIGHEST LEVEL OF EDUCATION	BMath - University of Waterloo, CMA - Society of Management Accountants (Canada)
PROFESSIONAL / COMMUNITY ACTIVITIES YOU ARE INVOLVED IN	-Active volunteer and participant for many Bellingham events -Founder/Host of Lake Whatcom Triathlon -Race Director/Owner of Bellingham Traverse -Founder of Pacific Multisports (Race Event Support Organization) -WHWS School Board of Trustees Member and Treasurer
QUALIFICATIONS RELATED TO THIS POSITION	- See Professional / Community activities above. - Former Controller and Financial Analyst for Honeywell Aerospace. - Principal of Information Technology company. - Accounting and IT skills.
DESCRIBE WHY YOU ARE INTERESTED IN SERVING ON THIS BOARD OR COMMISSION	Help guide the decision-making of the Tourism Commission as tourism to the City of Bellingham recovers from the economic downturn due to the pandemic.
DO YOU OR YOUR SPOUSE HAVE A FINANCIAL INTEREST IN, OR ARE YOU AN EMPLOYEE OR OFFICE OF ANY BUSINESS OR AGENCY WHICH DOES BUSINESS WITH THE CITY OF BELLINGHAM?	Yes
DETAILS OF FINANCIAL INTEREST OR BUSINESS RELATIONSHIP	Former recipient of LTAC funds.

References (Preferred)

Reference 1

NAME	Ralph Weiche
EMAIL	
PHONE	

Reference 2

NAME	Courtney McBean
EMAIL	
PHONE	
UPLOAD FILES	

City Council Agenda Bill

23201

Bill Number

Subject: **Mayor's Appointments to the Parks & Recreation Advisory Board (Information)**

Summary Statement: The Parks & Recreation Advisory Board is authorized by BMC 2.19.020. The Mayor appoints Zarah Manju to her first partial term, which will expire on August 8, 2022, at which time she may be reappointed. The Mayor appoints Lucky Blue to his first term, which will expire on December 6, 2024, at which time he may be reappointed.

The Bellingham Parks & Recreation Advisory Board shall advise the City Council, Mayor, Director of Parks & Recreation, as well as other City Departments. A major Parks & Recreation Advisory Board objective is to develop public interest in the Parks & Recreation Department's activities and to solicit to the fullest extent possible, participation of community groups, the general public, and public and private agencies.

Previous Council Action: **N/A**

Fiscal Impact: **None**

Funding Source: **None**

Attachments:
1. MANJU APPLICATION
2. BLUE APPLICATION

Meeting Activity	Meeting Date	Recommendation	Presented By	Time
Mayor's Report - Appointment - For Information	12/13/2021	Information/Discussion	Mayor Seth Fleetwood	0 minutes

Recommended Motion:

Council Committee:

Agenda Bill Contact:
Tracy Lewis, Mayor's Office

Reviewed By	Department	Date
Brian M. Heinrich	Executive	12/06/2021
Alan A. Marriner	Legal	12/07/2021
Seth M. Fleetwood	Executive	12/07/2021

Council Action:

Lewis, Tracy L.

From: noreply@cob.org on behalf of City of Bellingham <noreply@cob.org>
Sent: Monday, September 13, 2021 3:13 PM
To: Lewis, Tracy L.
Subject: Boards and Commissions Application - Zarah Manju

City of Bellingham

Boards and Commissions Application

Entry Details

WHICH BOARD OR COMMISSION ARE YOU INTERESTED IN?	Parks and Recreation Advisory Board
NAME	Zarah Manju
EMAIL	
PRIMARY PHONE	
SECONDARY PHONE	
MAILING ADDRESS	.., Bellingham, Washington 98229
IS YOUR HOME ADDRESS THE SAME AS YOUR MAILING ADDRESS?	Yes
DO YOU LIVE WITHIN BELLINGHAM CITY LIMITS?	Yes
HOW LONG HAVE YOU LIVED IN BELLINGHAM?	20 years
WHAT NEIGHBORHOOD DO YOU LIVE IN?	Alabama Hill Neighborhood

CURRENT (OR FORMER IF RETIRED) OCCUPATION	Recent graduate
HIGHEST LEVEL OF EDUCATION	BA in Geography from the University of Washington
PROFESSIONAL / COMMUNITY ACTIVITIES YOU ARE INVOLVED IN	I have volunteered for trail clean ups with the Bellingham Parks and Recreation Department, and am a frequent visitor at numerous Bellingham city parks and trails.
QUALIFICATIONS RELATED TO THIS POSITION	I have a BA in geography, with a focus on public spaces and how they are related to community engagement.
DESCRIBE WHY YOU ARE INTERESTED IN SERVING ON THIS BOARD OR COMMISSION	I am passionate about community involvement, and would like to do my part to contribute to preserving and planning a bright future for the beautiful parks of Bellingham.
DO YOU OR YOUR SPOUSE HAVE A FINANCIAL INTEREST IN, OR ARE YOU AN EMPLOYEE OR OFFICE OF ANY BUSINESS OR AGENCY WHICH DOES BUSINESS WITH THE CITY OF BELLINGHAM?	No

References (Preferred)

Reference 1

NAME	Faith LaCroix
EMAIL	
PHONE	
UPLOAD FILES	

Lewis, Tracy L.

From: noreply@cob.org on behalf of City of Bellingham <noreply@cob.org>
Sent: Sunday, September 5, 2021 9:22 PM
To: Lewis, Tracy L.
Subject: Boards and Commissions Application - Lucky Blue

City of Bellingham

Boards and Commissions Application

Entry Details

WHICH BOARD OR COMMISSION ARE YOU INTERESTED IN?	PRAB, BAC,
NAME	Lucky Blue
EMAIL	[redacted]
PRIMARY PHONE	[redacted]
SECONDARY PHONE	
MAILING ADDRESS	[redacted], Bellingham, Washington 98229
IS YOUR HOME ADDRESS THE SAME AS YOUR MAILING ADDRESS?	Yes
DO YOU LIVE WITHIN BELLINGHAM CITY LIMITS?	Yes
HOW LONG HAVE YOU LIVED IN BELLINGHAM?	3 years 6 months
WHAT NEIGHBORHOOD DO YOU LIVE IN?	Samish Ward 5

CURRENT (OR FORMER IF RETIRED) OCCUPATION	IT Executive
HIGHEST LEVEL OF EDUCATION	MGAGM APC from University of Maryland
PROFESSIONAL / COMMUNITY ACTIVITIES YOU ARE INVOLVED IN	IT Professional for the State of North Dakota
QUALIFICATIONS RELATED TO THIS POSITION	Greenbelt, Maryland Labor Day Festival Committee, PRAB, Arts Advisory Commission Limited Duration Task Force, County to City Transfer Limited Duration Task Force. Single Again, Crofton, Maryland Chairman of the Board City of Greenbelt Recreation Employee Maryland National Capital Parks and Planning Employee Olympic swimming qualifier and coach Multi-Ironman participant and multi marathon runner Advanced degrees in Art, artist and art teacher
DESCRIBE WHY YOU ARE INTERESTED IN SERVING ON THIS BOARD OR COMMISSION	Past interest, experience and ability to make a contribution that makes a difference to the community in which I live and the citizens that I live with. Long and strong history with community service as a direct employee for Parks and Recreation, and Arts. Long and strong history with community service in citizen action boards. Improves my abilities to interact with the community in which I live to build social connections.
DO YOU OR YOUR SPOUSE HAVE A FINANCIAL INTEREST IN, OR ARE YOU AN EMPLOYEE OR OFFICE OF ANY BUSINESS OR AGENCY WHICH DOES BUSINESS WITH THE CITY OF BELLINGHAM?	No

References (Preferred)

Reference 1

NAME	Dorie Guidon

City Council Agenda Bill

23202

Bill Number

Subject: **Donation of Real Property for City Ownership and Maintenance of Stormwater Facilities Located Thereon**

Summary Statement: The City is seeking to assume ownership and maintenance of a stormwater detention pond serving the Glengary Estates subdivision at the northwest corner of James Street and Telegraph Road. The stormwater tract was never transferred from the developer to the homeowners of Glengary Estates. As a result, the pond has not been maintained. The developer is deceased. Mr. Tiderington is the sole beneficiary under the decedent's will. Mr. Tiderington has offered to quitclaim his interest in the stormwater parcel to the City at no cost. Per City code, real property donations must be accepted by City Council ordinance. Acceptance of this stormwater facility is consistent with the previous actions of the City regarding ownership and operation of stormwater facilities in single family residential neighborhoods.

Previous Council Action: **None**

Fiscal Impact: **$3,000 to $4,000 per year to maintain**

Funding Source: **Stormwater Fund (430)**

Attachments:
1. STAFF MEMO
2. DONATION ORDINANCE
3. DONATION ORDINANCE EXHIBIT A
4. QUITCLAIM DEED

Meeting Activity	Meeting Date	Recommendation	Presented By	Time
Committee Briefing - Vote Requested	12/13/2021	Pass Ordinance	Eric Johnston, PW Director	2 minutes

Recommended Motion:

Council Committee:
Public Works and Natural Resources Committee

Agenda Bill Contact:
Matt Gossett 360-778-7980

Council Action:

Reviewed By	Department	Date
Eric C. Johnston	Public Works	12/07/2021
Matthew T. Stamps	Legal	12/07/2021
Seth M. Fleetwood	Executive	12/07/2021

City of Bellingham
210 Lottie Street
Bellingham, WA 98225

STAFF REPORT

TO: CITY COUNCIL

FROM: ERIC JOHNSTON, PUBLIC WORKS DIRECTOR

CC: MAYOR SETH FLEETWOOD

SUBJECT: DONATION OF 0.3 ACRE STORMWATER FACILITY

DATE: DECEMBER 13, 2021

BACKGROUND:

The City is seeking to assume ownership and maintenance of a stormwater detention pond serving the Glengary Estates subdivision at the northwest corner of James Street and Telegraph Road. The stormwater tract was never transferred from the developer to the homeowners of Glengary Estates. As a result, the pond has not been maintained. The developer is deceased. Mr. Tiderington is the sole beneficiary under the decedent's will. Mr. Tiderington has offered to quitclaim his interest in the stormwater parcel to the City at no cost. Per City Code, real property donations must be accepted by City Council ordinance.

Staff recommends approval, consistent with the City's practice of assuming ownership and maintenance of stormwater facilities serving single-family residential development in Bellingham.

Annual costs associated with maintenance and upkeep will be between $3,000 and $4,000.

EVALUATION:

The City performed a Phase 1 Environmental Assessment and found no contaminants on site.

RECOMMENDATION ACTION:

Pass ordinance accepting the donation.

ORDINANCE NO. _____

AN ORDINANCE ACCEPTING THE DONATION OF REAL PROPERTY AND IMPROVEMENTS KNOWN AS THE GLENGARY ESTATES SUBDIVISION STORMWATER TRACT

WHEREAS, Bellingham Municipal Code ("BMC") 4.90.020 provides that City Council may, by ordinance, accept any real property donated, devised or bequeathed to the City of Bellingham (the "City"); and

WHEREAS, the stormwater tract addressed in this ordinance is located within the Glengary Estates Subdivision at the corner of Telegraph Road and James Street, as more particularly described in Exhibit A hereto ("Stormwater Tract"); and

WHEREAS, the developer of the Glengary Estates Subdivision did not transfer title to the Stormwater Tract to the homeowners of the Glengary Estates Subdivision following completion of construction of the development, as is customary; and

WHEREAS, the detention pond located on the Stormwater Tract has not been maintained and requires maintenance to assure proper functionality for the protection of the environment; and

WHEREAS, Ken Tiderington Sr., the sole owner of the development company, Crown Point Development (Bellingham), Inc., is deceased; and

WHEREAS, Ken Tiderington Jr. is the sole beneficiary under the last will and testament of his father, Ken Tiderington Sr., and, therefore, is believed to have inherited the Stormwater Tract; and

WHEREAS, Ken Tiderington Jr. has offered to donate the Stormwater Tract to the City for ownership and maintenance; and

WHEREAS, acceptance of the donation is consistent with the City's current practice of accepting ownership and maintenance of stormwater ponds serving new single family residential development; and

WHEREAS, acceptance of the Stormwater Tract will have incidental benefit in so far as the City requires a small portion of the Stormwater Tract to install a traffic signal as part of the upcoming Telegraph Road Project ES-0537.

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

NOW, THEREFORE, THE CITY OF BELLINGHAM DOES HEREBY ORDAIN AS FOLLOWS:

Pursuant to Section 4.90.020 of the Bellingham Municipal Code, the City hereby accepts the donation of the Stormwater Tract, legally described in Exhibit A hereto. The Stormwater Tract shall be conveyed by deed in a form approved by the Office of the City Attorney.

PASSED by the Council this _____ day of _____, 2021.

_____
Council President, Daniel Hammill

APPROVED by me this ___ day of _____, 2021.

_____
Mayor Seth Fleetwood

ATTEST:

_____
Finance Director

APPROVED AS TO FORM:

_____
Office of the City Attorney

Published:

_____

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

EXHIBIT A

ORDINANCE NO. _____

LEGAL DESCRIPTION

TRACT A, PLAT OF GLENGARY ESTATES, ACCORDING TO THE PLAT THEREOF, RECORDED UNDER AUDITOR'S FILE NO. 2000200385, RECORDS OF WHATCOM COUNTY, WASHINGTON.

SITUATE IN WHATCOM COUNTY, WASHINGTON.

… END OF EXHIBIT "A" …

AFTER RECORDING RETURN DOCUMENT TO:

City of Bellingham – Public Works, Engineering
104 W. Magnolia Street, Suite 109
Bellingham, WA 98225

DOCUMENT TITLE:	QUIT CLAIM DEED
GRANTOR:	KENNETH G. TIDERINGTON JR.
GRANTEE:	CITY OF BELLINGHAM
ABBREVIATED LEGAL DESCRIPTION:	TRACT A, PLAT OF GLENGARY ESTATES (SEE PAGE 5 FOR COMPLETE LEGAL DESCRIPTION)
ASSESSOR'S PARCEL #:	380318 556443 0000

QUIT CLAIM DEED

Grantor, KENNETH G. TIDERINGTON JR., an individual and sole beneficiary under the last will and testament of his father, Kenneth M. Tiderington Sr., the sole owner of Crown Point Development (Bellingham), Inc., a dissolved Washington corporation and owner of record of the real estate herein conveyed, hereby conveys and quitclaims as a gift, without warranties, to Grantee, the CITY OF BELLINGHAM, a first-class city of the state of Washington, any and all interest that he may have in the real estate described in Exhibit A.

EXECUTED this 17 day of NOVEMBER, 2021.

Kenneth G. Tiderington Jr.

ACCEPTED this _____ day of _____, 2021 for the **CITY OF BELLINGHAM** by:

Departmental Approval

_____
Mayor Seth Fleetwood

_____
Eric Johnston
Public Works Director

Attest

Approved as to Form

_____
Andy Asbjornsen
Finance Director

_____
Matt Stamps
Office of the City Attorney

ACKNOWLEDGEMENT
GRANTOR

STATE OF WASHINGTON)
) ss.
COUNTY OF WHATCOM)

I CERTIFY that I know or have satisfactory evidence that **KENNETH G. TIDERINGTON, JR.** is the person who appeared before me, and said person acknowledged that he signed this instrument, on oath stated that he was authorized to execute the instrument and acknowledged it as his free and voluntary act for the uses and purposes mentioned in the instrument.

NOVEMBER 17, 2021
DATED

SIGNATURE OF NOTARY PUBLIC

MATT GOSSETT
NOTARY PUBLIC #2086
STATE OF WASHINGTON
COMMISSION EXPIRES
JULY 29, 2023

MATT GOSSETT
NAME PRINTED

JULY 29, 2023
MY APPOINTMENT EXPIRES

ACKNOWLEDGEMENT
GRANTEE

STATE OF WASHINGTON)
) ss.
COUNTY OF WHATCOM)

I CERTIFY that I know or have satisfactory evidence that **SETH FLEETWOOD** is the person who appeared before me, and said person acknowledged that he signed this instrument, on oath stated that he was authorized to execute the instrument and acknowledged it as the **MAYOR** of the **CITY OF BELLINGHAM** to be the free and voluntary act of such party for the uses and purposes mentioned in the instrument.

_____
DATED

_____
SIGNATURE OF NOTARY PUBLIC

_____
NAME PRINTED

_____
MY APPOINTMENT EXPIRES

EXHIBIT A

LEGAL DESCRIPTION

TRACT A, PLAT OF GLENGARY ESTATES, ACCORDING TO THE PLAT THEREOF, RECORDED UNDER AUDITOR'S FILE NO. 2000200385, RECORDS OF WHATCOM COUNTY, WASHINGTON.

SITUATE IN WHATCOM COUNTY, WASHINGTON.

... END OF EXHIBIT "A" ...

City Council Agenda Bill

23203

Bill Number

Subject: **Post Point Sludge Pumping System Replacement**

Summary Statement: The Post Point Sludge Pumping System pumps dewatered solids from the centrifuge hopper to the top of the multi-hearth incinerators at the City of Bellingham's Resource Recovery Plant. This project is to replace the failing sludge pumping system with a new pumping system, start-up and training on operation. The City received one bid which was publicly opened on November 9, 2021. Award Construction from Ferndale, Washington was the responsible bidder who submitted the lowest responsive bid of $1,846,336 including any applicable Washington State Sales or Use Tax.

Previous Council Action: **Approval of 2021-2022 Budget**

Fiscal Impact: **$1,846,336**

Funding Source: **Sewer Fund (420)**

Attachments:
1. STAFF MEMO
2. 53B-2021 FINAL BID OPENING REPORT
3. 53B-2021 MBRC AWARD

Meeting Activity	Meeting Date	Recommendation	Presented By	Time
Committee Briefing - Vote Requested	12/13/2021	Vote to Approve	Eric Johnston, PW Director	2 minutes

Recommended Motion:

Council Committee:
Public Works and Natural Resources Committee

Agenda Bill Contact:
Eric Johnston, PW Director, 360-778-7710

Council Action:

Reviewed By	Department	Date
Eric C. Johnston	Public Works	12/07/2021
Connie C. Allen	Purchasing	12/07/2021
Andrew D. Asbjornsen	Finance	12/07/2021
Matthew T. Stamps	Legal	12/07/2021
Seth M. Fleetwood	Executive	12/07/2021

City of Bellingham
210 Lottie Street
Bellingham, WA 98225

STAFF REPORT

TO:	CITY COUNCIL
FROM:	ERIC JOHNSTON, PUBLIC WORKS DIRECTOR
CC:	MAYOR SETH FLEETWOOD
SUBJECT:	BID AWARD POST POINT SLUDGE PUMPING SYSTEM REPLACEMENT
DATE:	DECEMBER 13, 2021

BACKGROUND:

The Post Point Sludge Pumping System pumps dewatered solids from the centrifuge hopper to the top of the multi-hearth incinerators at the City of Bellingham's Resource Recovery Plant. This project is to replace the failing sludge pumping system with a new pumping system and includes start-up and training on operation. The current system dates to 1992 and is very labor intensive due to the age and wear. The City received one bid which was publicly opened on November 9, 2021. Award Construction from Ferndale, Washington was the responsible bidder who submitted the lowest responsive bid of $1,846,336.00 including any applicable Washington State Sales or Use Tax.

The completed Work will provide the City with a new reliable sludge pumping system that will last through the planned plant upgrade. Staff has consulted with design engineers and these sludge pumps will be compatible with the future plant upgrades. The Work includes layout and design activities, furnishing of equipment, construction of ancillary improvements, integration of instrumentation and controls, and startup and testing of the new system.

EVALUATION:

The City held a public bidding process which was opened on November 9, 2021. The city received one responsive bids. Award Construction from Ferndale, Washington submitted the lowest responsive bid of $1,846,336.00.

RECOMMENDATION ACTION:

A motion to award the agreement Award Construction as the lowest responsive bidder.

CITY OF BELLINGHAM

FINAL BID OPENING REPORT

MARK SCHORR-PROJECT MANAGER

NATE KINCAID,
AARON MCELROY- BUYERS

BID NAME	BID NUMBER	DATE OPENED
Post Point Sludge System Replacement	53B-2021	11/9/2021

Company Name	CITY/STATE		TOTAL BID AMOUNT INCLUDING TAX
Award Construction	Ferndale, WA	Total W/ 8.8% TAX	$ 1,846,336.00
		Total Alternate W/ 8.8% TAX	no bid

MANDATORY BIDDER RESPONSIBILITY CHECKLIST

Bid Number: 53B-2021	Bid Submittal Deadline: 11/09/21
Project Name: Post Point Sludge Pump System Replacement	Project Number: NA
Bidder's Business Name: Award Construction, Inc	City Business Registration Number: ~~To Be Obtained~~ 029519 Active? Yes ☒ No ☐

CONTRACTOR REGISTRATION
https://secure.lni.wa.gov/verify/

License Number: AWARDCI970M9	License Active? X Yes ☒ No ☐
Effective Date: 7/29/2003	Expiration Date: 8/02/~~2022~~ 2023

UBI/TAX REGISTRATION NUMBER
https://secure.dor.wa.gov/gteunauth/ (go to Business Lookup)

UBI/TAX Registration Number: 602 310 080	Account: Open ☒ Closed ☐

INDUSTRIAL INSURANCE COVERAGE
https://fortress.wa.gov/lni/crpsi/MainMenu.aspx

Account Number: 163,857-00	Account Current? Yes ☒ No ☐

EMPLOYMENT SECURITY DEPARTMENT

Employment Security Department Number: 235129-00 0	
Has Bidder provided account number on the Bid Form?	Yes ☒ No ☐

NOT DISQUALIFIED FROM BIDDING
https://secure.lni.wa.gov/debarandstrike/ContractorDebarList.aspx

Is the Bidder listed on the "Debarred Contractors List" list of the Washington State Department of Labor and Industries Website?	Yes ☐ No ☒ *Attach printout from website*

https://www.SAM.gov/ (go to Search Records)

Is the bidder listed on the current debarred or suspended bidder list available on the U.S. General Services Administration's System for Award Management ("SAM") website?	Yes ☐ No ☒ *Attach printout from website*

BIDDER CERTIFICATIONS

1. The bidder hereby certifies under penalty of perjury under the laws of the State of Washington that, within the 3-year period immediately preceding the bid solicitation date, the bidder is not a "willful" violator, as defined in RCW 49.48.082, of any provision of RCW 49.46, 49.48, or 49.52, as determined by a final and binding citation and notice of assessment issued by the Department of Labor and Industries or through a civil judgment entered by a court of limited or general jurisdiction.

2. The undersigned further certifies that bidder (check one):
   - ☐ Has received training on the requirements related to public works and prevailing wage as mandated in RCW 39.04.350(1)(f) or
   - ☒ Is exempt from such training because it has completed three or more public works projects and has had a valid business license in Washington for three or more years.

3. The undersigned further certifies that all other information provided by or on behalf of bidder on this form is ~~true~~ and correct.

Signature of Authorized Official	11/9/2021 Date
B. Todd Vasey, President Print Name & Title	Ferndale, WA Place of Execution (City & State)

CITY VERIFICATION

Wendi Gow, C.P.M., CPPO, CPCM, NIGP-CPP City Purchasing Manager or Designee	11/18/21 Date
Has bidder satisfied applicable supplemental responsibility criteria?	Yes ☒ No ☐ *Documentation on file*

City Council Agenda Bill

23204

Bill Number

Subject: **Report from the December 1, 2021 Lake Whatcom Policy Group Meeting**

Summary Statement: The Lake Whatcom Policy Group, consisting of representatives from the Lake Whatcom Water and Sewer District, the Whatcom County Council, the Sudden Valley Community Association, and the Bellingham City Council, meets regularly to discuss policy issues regarding Lake Whatcom. The Public Works and Natural Resources Committee chair will provide a briefing on the discussion and recommendations from the December 1, 2021 Policy Group Meeting.

Previous Council Action: **7/20/2020, Council Adopted Lake Whatcom Management Program 2020-2024 Work Plan**

Fiscal Impact: **Total Lake Whatcom Management Program Estimated 2020-2024 Costs $60.18M**

Funding Source: **City (Multiple Funds); County and LWWSD**

Attachments: 1. LAKE WHATCOM POLICY GROUP MEETING SUMMARY

Meeting Activity	Meeting Date	Recommendation	Presented By	Time
Committee Briefing - Information Only	12/13/2021	Information/Discussion	Council Member Michael Lilliquist	5 minutes

Recommended Motion:

Council Committee:
Public Works and Natural Resources Committee

Agenda Bill Contact:
Mark Gardner, 778-8204

Council Action:

Reviewed By	Department	Date
Mark J. Gardner	Council Administration	12/06/2021
Alan A. Marriner	Legal	12/07/2021
Seth M. Fleetwood	Executive	12/07/2021

Lake Whatcom Policy Group
December 1, 2021 Meeting
Brief Digest of Presentations and Discussion

Policy Group members in attendance: Michael Lilliquist, Gene Knutson (Bellingham City Council); Todd Donovan (Whatcom County Council); Leslie McRoberts (Lake Whatcom Water and Sewer District Board); Nancy Alyanak (Sudden Valley Community Association). Other Council or Board members present: John Carter, Lake Whatcom Water and Sewer District.

1. Total Maximum Daily Load (TMDL) Model revision process

County staff and consultants provided an overview of the historical process used to model the Lake Whatcom phosphorus TMDL, and the current activities to revise and improve the model. Monitoring from the WWU Institute for Watershed Studies showed a steady decline in dissolved oxygen over time, and the lake was placed on the list of impaired water bodies by the Department of Ecology. Dissolved oxygen must be brought back to within 0.2 mg/liter of natural conditions that existed when the area was heavily forested. Achieving this goal is likely to take decades.

The original models used to develop the TMDL were designed to simulate both phosphorus loading into the lake and its response to that phosphorus. The loading model, called the Hydrological Simulation Program—Fortran (HSPF) loading model, was developed with limited data from the 2002-03 period. This means it did not reflect likely variations in phosphorus loads over time and could not capture long-term trends. The original TMDL issued by Ecology called for continued data gathering and a reassessment of the model every 10 years. If a reassessment indicates that the new model deviates from the old by 10% or more, Ecology will submit a request to the EPA for a TMDL revision. Additional data has been collected for a number of years for this purpose. For example, 1,900 water samples have been collected from over 30 tributaries under varying flow conditions.

A plan to reassess the TMDL models was submitted to Ecology for review and was approved. A new model, called the Hydrocomp Forecast and Analysis Model (HFAM), was developed to replace the HSPF model. This model simulates phosphorus and sediment loading into Lake Whatcom.

The results of the HFAM model will be used as inputs into a new lake response model, called CE-QUAL-W2, which will allow us to understand the implications of phosphorus loading in the lake. Simulations can be run for forested conditions and the 2002-2015 period after lake development. This is a hydrodynamic and water quality model and takes into account a number of variables including lake water levels, currents, mixing, and organic material sedimentation. Other inputs include wind speed and direction, precipitation, groundwater inflow, solar radiation, and tributary inflows and withdrawals. The model is run and the results are compared with actual data. When completed the model can be used to predict outcomes such as chlorophyll, total phosphorus, and dissolved oxygen.

	Next steps include additional calibration of the model against data such as temperature and dissolved oxygen levels. A series of water quality goal simulations can be selected and modelled to help guide policy decisions. The two models taken together will allow the TMDL to be recalibrated if the results warrant. Phosphorus impacts from the Nooksack diversion dam, which transports water from the Nooksack to Lake Whatcom, are not modeled as part of the TMDL because the diversion dam is exempt from regulation under the TMDL and it is considered part of the background conditions. Diversion falls outside the TMDL regulatory process because it implicates the City of Bellingham's water right. The city is committed to reducing phosphorus impacts on the lake and the overall diversion of water has been reduced as much as possible, and care is taken to minimize diversion when there are high levels of phosphorus in the Nooksack. Data collected and analyzed a few years back show that the diversion results in less phosphorus into the lake than was assumed during the original TMDL model development.
2. Topics for upcoming meetings	
	Topics for the February 2022 meeting will include: • Review the agenda for the annual Lake Whatcom meeting • Policy Group suggestions for inputs into the policy scenarios for the CE-QUAL model. Other topics for 2022 meetings include: • A request from Whatcom Mountain Bike Coalition (WMBC) to be exempt from seasonal land disturbance rules to repair trails • Aquatic Invasive Species program reports • Annual stormwater project overview We will schedule quarterly meetings for February, June, September, and December. The annual joint legislative meeting will likely be held in March.

Next meeting: February 2022, 3:00 PM; data and location TBD.

City Council Agenda Bill

23205

Bill Number

Subject: **Emergency Repairs Resulting from November Flood**

Summary Statement: A series of intense and significant rainfall events between November 14 and December 2, 2021 caused widespread flooding in Whatcom County and within City limits. Within the City, numerous roadways, City parks and trails were flooded. A single lane bridge crossing Chuckanut Creek at 19th Street was damaged beyond repair. As the single access point, homes on the far side of the creek were inaccessible. City crews and contractors completed installation of temporary bridge to provide access; however, a permanent replacement with all appropriate permitting will be needed. In accordance with BMC 4.80.010, since the costs for the repair to the bridge and costs to repair for damages at other locations will exceed $40,000, a Council resolution declaring the emergency is needed. A proposed resolution is attached.

Previous Council Action: **None**

Fiscal Impact: **Costs for emergency temporary repairs may be in excess of $200,000 for the bridge at 19th Street. Permanent replacement may exceed $2.5 million. Repair costs for damages at other locations are still being gathered.**

Funding Source: **General Fund 001, Street Fund 111**

Attachments: 1. EMERGENCY RESOLUTION 19TH ST. BRIDGE

Meeting Activity	Meeting Date	Recommendation	Presented By	Time
Committee Briefing - Vote Requested	12/13/2021	Vote to Approve	Eric Johnston, Public Works Director	10 minutes

Recommended Motion:

Council Committee:
Public Works and Natural Resources Committee

Agenda Bill Contact:
Eric Johnston, Public Works Director 360-778-7710

Council Action:

Reviewed By	Department	Date
Eric C. Johnston	Public Works	12/07/2021
Connie C. Allen	Purchasing	12/08/2021
Andrew D. Asbjornsen	Finance	12/08/2021
Matthew T. Stamps	Legal	12/08/2021
Seth M. Fleetwood	Executive	12/08/2021

RESOLUTION NO. _____

A RESOLUTION OF THE CITY OF BELLINGHAM, WASHINGTON DECLARING AN EMERGENCY AND WAIVING COMPETITIVE BIDDING REQUIREMENTS FOR REMOVEAL OF A FAILED BRIDGE AND INSTALLATION OF A TEMPORARY BRIDGE AT 19TH STREET AND RAINER AVENUE CROSSING CHUCKANUT CREEK.

WHEREAS, Bellingham Municipal Code 4.80.010(E)(5), RCW 35.22.620(6), and RCW 39.04.280 authorize the City of Bellingham to waive its normal competitive bidding processes when an emergency requires the immediate execution of a public work; and

WHEREAS, if a contract is awarded without competitive bidding due to an emergency, RCW 39.04.280 provides that a written finding of the existence of an emergency must be made by the governing body and duly entered of record no later than two weeks following the award of the contract; and

WHEREAS, the term "emergency" is defined in state law, RCW 39.04.280(3), as unforeseen circumstances beyond the control of the municipality that either (a) present a real, immediate threat to the proper performance of essential functions or (b) will likely result in material loss or damage to property, bodily injury, or loss of life if immediate action is not taken; and

WHEREAS, the bridge crossing Chuckanut Creek at 19th Street and Rainier Avenue was damaged beyond repair due the extremely heavy rains and resultant flooding that occurred between November 14 and December 2, 2021; and

WHEREAS, it was determined that the leaving the failed bridge in place had the potential to block the stream channel and cause further damage to adjacent properties and the Right-of-Way; and

WHEREAS, the failed bridge was the sole access for at least four occupied homes on South side of Chuckanut Creek and that a temporary bridge was needed in the interest of public health and safety; and

WHEREAS, Staff awarded an emergency contract to Ram Construction to remove the old bridge and assist Public Works staff with the installation of a temporary bridge on an emergency basis without soliciting competitive bids; and

WHEREAS, Contracts for materials and supplies, including the bridge deck were procured without soliciting competitive bids; and

WHEREAS, Damage assessments at other locations caused by the significant rain and flooding are still be gathered but are currently unknown.

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

NOW THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF BELLINGHAM:

Having reviewed the facts described in the recitals to this Resolution, and having heard from staff during the open public meeting on this matter, City Council hereby finds that the bridge failure at 19th Street and Rainier Avenue and other damages created an emergency situation that required immediate repair without following normal competitive bidding procedures.

PASSED by the Council this _____ day of _____, 2021.

_____
Council President

APPROVED by me this _____ day of _____, 2021.

_____
Mayor

ATTEST:_____
Finance Director

APPROVED AS TO FORM:

_____
Office of the City Attorney

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

City Council Agenda Bill

23069

Bill Number

Subject: **Broadband Advisory Workgroup Update #2**

Summary Statement: This is the second update from the Broadband Advisory Workgroup which has been meeting monthly since February 2, 2021. A member of the Workgroup will present a summary of efforts and status. Council Resolution #2020-31 in section 4 directs the work to be completed by December 2021. Additional time to complete the work is needed due to delays in the work related to City staff availability and the impacts of COVID. Staff's recommendation is for the completion of work outlined in the resolution be extended by Council motion to September 2022.

Previous Council Action: **AB #22007 - Resolution; AB #22869 Appointments and approved by Council; AB# 23069 - Update**

Fiscal Impact: **The current Budget includes $100,000 for the Workgroup effort and consultant**

Funding Source: **General Fund**

Attachments: 1. PRESENTATION

Meeting Activity	Meeting Date	Recommendation	Presented By	Time
Committee Briefing - Direction Requested	12/13/2021	Provide Direction	Kris Keillor, Broadband Advisory Workgroup Member	25 minutes

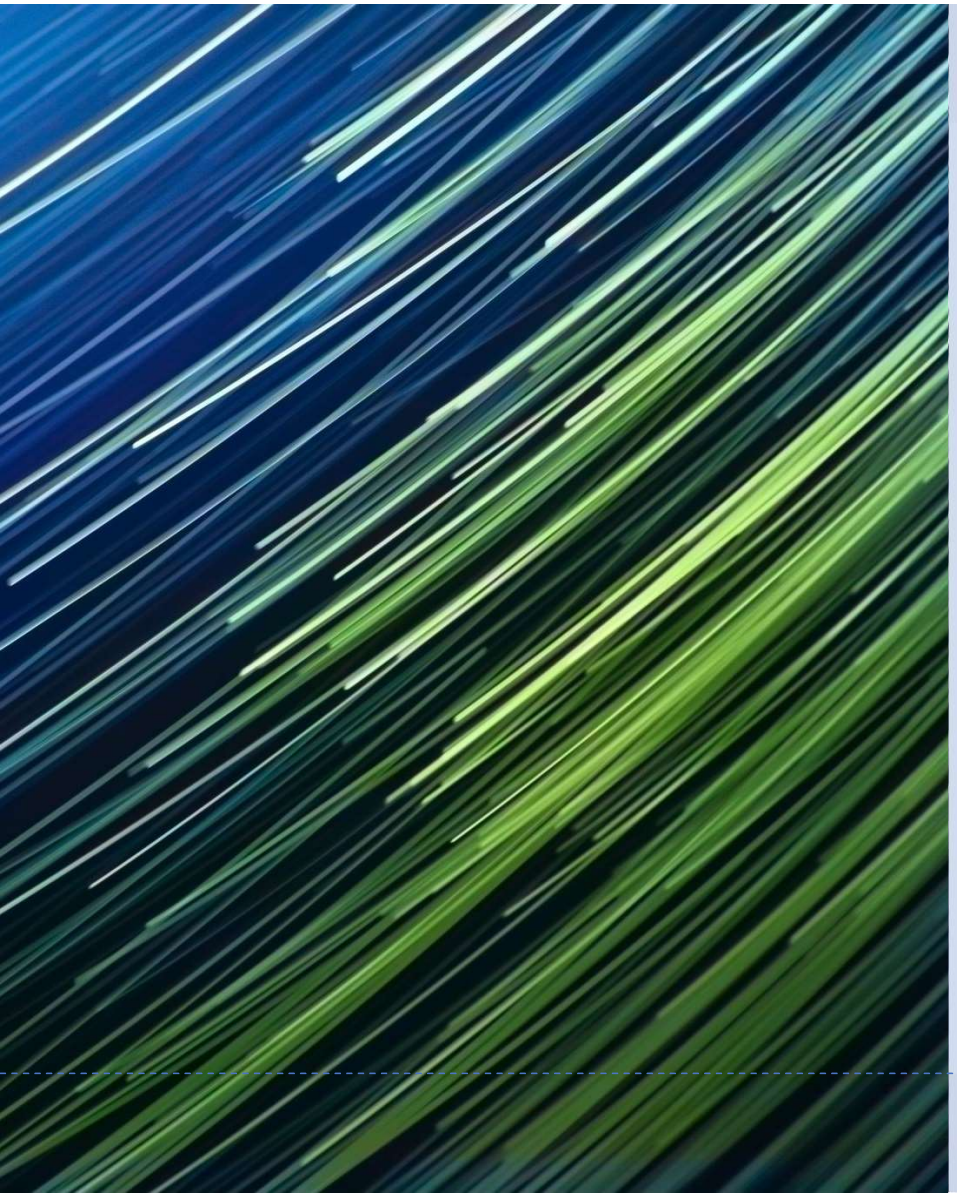
Recommended Motion: A motion extending the date for completion of the work outlined in Council Resolution #2020-31 to September of 2022.

Council Committee:
Public Works and Natural Resources Committee

Agenda Bill Contact:
Eric Johnston, Public Works Director 360-778-7710

Council Action:

Reviewed By	Department	Date
Eric C. Johnston	Public Works	12/07/2021
Matthew T. Stamps	Legal	12/07/2021
Seth M. Fleetwood	Executive	12/07/2021



Broadband Advisory Workgroup

Update to Bellingham City Council

December 13, 2021

Workgroup Accomplishments

Since July:

1. Magellan Consulting presented their capabilities and developed the Bellingham broadband survey with Workgroup input.
2. Ex Officios presented their ISP's response to Covid-19, future plans, equity and access efforts, desired public/private synergies, and other considerations.
3. Mr. Kim Kleppe from Mt. Vernon presented on the city's open-access, hybrid-model fiber network.
4. Ms. Gina Stark and Mr. Atul Deshmane presented the Port and PUD's broadband efforts.
5. Plus Codes presentation from workgroup member RB Tewksbury.

- **Planned Topics and Presenters** include:
  - Engage Bellingham and other methods for public feedback.
  - Christopher Mitchell from the Institute for Local Self Reliance.
  - Christopher Yoo from University of Pennsylvania.

Magellan Advisors

All of Magellan's data will be left to the city, including GIS data.

Magellan hopes for **500** or more responses to achieve statistical accuracy.

Discussion groups will be held for business, NGOs, non-profits, and other orgs.

Magellan Advisors is bimonthly with the Workgroup.

Magellan's work plan includes the following tasks:

- Community Survey
- Market Analysis
- Asset Inventory
- Conceptual Network Design
- Business Model Analysis
- Financial Analysis
- Final Analysis & Recommendations

Private Sector Presentations

1. Wave with David Brinn and Kevin Stamey

   "In new HOAs and developments, the city should force them to put in a new conduit. Right now, you are boxing these houses in, potentially limiting their services. Mesh systems will come in in the future. But if the city can force anyone doing underground work to install conduit say as part of your permit fee this will keep options open."

2. Comcast with Terry Davis

   "We are also approved vendors for the EBB (*Emergency Broadband Benefit*) as well as the *Emergency Connection Fund* for libraries and schools through the FCC. This program is not going away, we will continue to invest in it."

3. Lumen Technologies with David Namura

   "When it comes down to public/private partnerships, we seek predictability in terms of time, cost, construction, outcomes, goals, and longevity of program. A long-term, long-range vision is the big thing we look for."

Quotations are from the Workgroup Meeting Notes 10.5.2021, not directly quoting Ex Officios.

Mt. Vernon Presentation

Mr. Kim Kleppe, IS Director for Mt. Vernon, presented the history of Mount Vernon's broadband system.

Lessons learned:

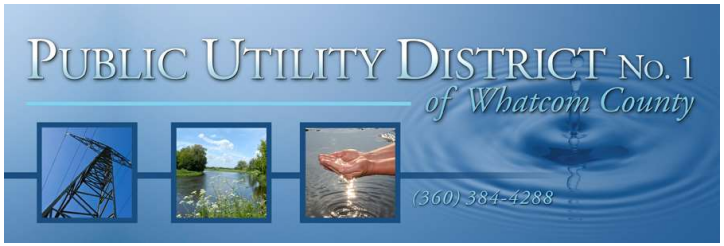
- Community buy-in from businesses, government, education, tech sector; the important of community champions; making it work for everyone.
- Having development and business plans, revenue requirements, and obtaining funding.
- Documentation, record-keeping, and maintenance.

Statistics:

- City-owned passive optical network
- 20% government use, 7% dark fiber leasing
- City performs all installations and maintenance, but not customer service

Port and PUD Joint Presentation

PORT OF BELLINGHAM
Washington State



Plus Codes

plus.codes/

- Like street addresses for people or places that don't have one.
- Based on latitude and longitude, but quickly displayed as numbers and letters.
- Receive deliveries, access social and emergency services, on Google Maps – a platform in widespread use.
- Open source and free to create and use.
- Could be used alongside current addressing systems to help locate unhoused members and connect them with services.
- Can also be used for asset management.

Bellingham Internet Availability Survey

- Intent is to assess internet availability in City Limits
- Paper versions available through Bellingham Public Library
- English and Spanish versions

- https://survey.alchemer.com/s3/6560249/Bellingham-Internet-Survey

Resources/ Questions

Other resources are available on the Broadband Advisory Workgroup page

Questions: Email us at g.proj.broadbandadvisoryworkgroup@cob.org

City Council Agenda Bill

23206

Bill Number

Subject: **Inter-Agency Agreement for Paramedic Training Class**

Summary Statement: The Fire Department continues to partner with Whatcom County and Bellingham Technical College to provide a paramedic training program. This agreement is updated to reflect the needs for the 2022 class.

Previous Council Action: **Support for the 2016 EMS Levy, Approval of previous training contracts, #2019-0197, C2000836, and C2100348**

Fiscal Impact: **$865,478.00**

Funding Source: **EMS Levy through Medic One Fund**

Attachments:
1. STAFF MEMO
2. AGREEMENT

Meeting Activity	Meeting Date	Recommendation	Presented By	Time
Committee Briefing - Vote Requested	12/13/2021	Vote to Approve	Chief Bill Hewett	5 minutes

Recommended Motion:

Council Committee:
Public Health, Safety, and Justice Committee

Agenda Bill Contact:
Chief Bill Hewett, Fire Department

Reviewed By	Department	Date
Bill C. Hewett	Fire Department	12/06/2021
Andrew D. Asbjornsen	Finance	12/07/2021
Matthew T. Stamps	Legal	12/07/2021
Seth M. Fleetwood	Executive	12/07/2021

Council Action:

City of Bellingham
210 Lottie Street
Bellingham, WA 98225

MEMORANDUM

TO:	**CITY COUNCIL**
FROM:	BILL HEWETT, FIRE CHIEF
CC:	MAYOR FLEETWOOD
SUBJECT:	INTER-AGENCY AGREEMENT FOR LATERAL PARAMEDIC TRAINING
DATE:	DECEMBER 6, 2021

The Fire Department continues to partner with Whatcom County and Bellingham Technical College to provide an initial paramedic training program. This contract reflects the cost of providing the instructor for the class, the learning materials for the students and wage replacement for our Fire Department's students.

The 2022 class is planned to start in January of 2022 with a total of 8 students, 4 of them from the Fire Department.

Whatcom County Contract No.
202111024

Inter-Agency Agreement
Between Whatcom County and City of Bellingham

This agreement, pursuant to RCW 39.34.080, is entered into between **Whatcom County (County) and the City of Bellingham, operating through the Bellingham Fire Department (Department).** The Parties, in consideration of the terms, conditions, covenants included herein, agree as follows:

The purpose of this agreement regarding paramedic training (hereinafter "Agreement") sets forth the organization, responsibilities, and administration of a program of paramedic training (hereinafter the "Program") conducted as a cooperative effort between the Department and the County.

The term of this Agreement shall be in effect for the 2022 class cycle.

The maximum consideration for this agreement shall not exceed $865,478. The Contract Number, set forth above, shall be included on all billings or correspondence in connection therewith.

1. **Scope of Services**:
   The Parties agree to provide the services presented in Exhibit A.
2. **Program Administration**:
   A. It is understood that the parties shall remain independent governmental entities in carrying out their responsibilities as set forth herein, that the parties shall remain responsible for the direct supervision of their respective employees, and that nothing in this Agreement will interfere with the employer/employee relationships of the parties.
   B. The Program shall be administered in accordance with the terms of this Agreement as set forth below and as detailed in Exhibit A.
3. **Invoice and Payment Procedures:**
   A. Whatcom County shall reimburse the Department, using the Whatcom County Emergency Medical Services Fund, for Program expenses, as specified in attached Exhibit B
   B. Department will invoice the County monthly for actual costs of the program, supported by general ledger detail. Payment will be considered timely if made within 30 days of receipt of approved invoice.
4. **Minimum Service Requirement**

   The Department will encourage that each successful paramedic training graduate, sponsored by the Department, will serve a minimum of five years on a County-sponsored ALS unit.
5. **Compliance with the Health Insurance Portability Accountability Act of 1996 (HIPAA)**

   The Parties shall comply with all applicable provisions of HIPAA as well as all applicable provisions of the Health Information Technology for Economic and Clinical Health Act.

Termination:

A. Termination for Convenience. Either party may terminate this Agreement, in whole or in part, at any time, by at least thirty days prior written notice. The Department shall be paid for work performed and expenses incurred to date of termination.

B. Termination for Cause. If the Department fails to perform in the manner called for in the Agreement, or it the Department fails to comply with any other provisions of the Agreement and fails to correct such noncompliance within five days written notice thereof, the County may terminate this Agreement for cause. Termination shall be effected by serving a notice of termination on the Department setting forth the manner in which the Department is in default. The Department will be paid for services already performed in accordance with the manner of performance set forth in the Agreement, up to the date of termination.

6. Maintenance and Inspection of Records

A. The Parties shall maintain books, records and documents, which sufficiently and properly reflect all work related to the performance of the Agreement. In addition, the Department shall maintain all accounting records in a form necessary to assure proper accounting of all funds paid pursuant to this Agreement. All of the above shall be subject at all reasonable times to inspection, review, or audit by the County, its authorized representative, the State Auditor, or other governmental officials authorized by law to monitor this Agreement.

B. The Parties shall retain all books, records, documents and other material relevant to this Agreement for four years after its expiration. The Department agrees that the County or its designee shall have full access and right to examine any of said materials at all reasonable times during said period; and that the Department shall have similar access to said materials maintained by the County pursuant to this agreement.

7. Dispute Resolution, Jurisdiction, and Venue

A. In the event of a dispute between the Parties arising from this Agreement or any obligations hereunder, the dispute shall first be referred to the operational officers or representatives designated by the Parties to have the responsibility of administering this Agreement. Said officers or representatives shall meet as soon as possible, and in any event the initial meeting shall be held within thirty (30) days of either Party's request for a meeting to resolve the dispute. The Parties covenant to make a good faith attempt to resolve the dispute at this meeting.

B. In the event that the Parties are unable to resolve any dispute arising under this Agreement, or other dispute or disagreement arising from the implementation of the terms of the Agreement, the Parties agree that mediation will be a condition precedent to any litigation. The Parties agree to jointly select a mediator. If the Parties are unable to agree upon a mediator, the Parties shall jointly obtain a list of five mediators from a reputable dispute resolution organization and alternately strike mediators on that list until one remains. The Parties agree to share equally in the cost of mediation.

C. In the event that mediation is unsuccessful and litigation ensues, each Party shall bear its own costs and expenses. The venue for any action hereunder shall be in the Superior Court for Whatcom County, Washington. This Agreement has been and shall be

construed as having been made and delivered within the State of Washington and it is agreed by each party hereto that this Agreement shall be governed by the laws of the State of Washington, both as to interpretation and performance.

8. Liability and Indemnification:

The Parties agree to the following distribution and allocation of liability and indemnification:

A. Neither party to this Agreement will be considered the agent of the other nor does either party assume any responsibility to the other party for the consequences of any act or omission of any person or entity not a party to this Agreement. Each party shall insure its own employees.

B. Each party agrees to be responsible and assume tort liability for its own wrongful acts or omissions, or those of its officers, employees, volunteers or agents to the fullest extent required by law, and agrees to save, indemnify, defend and hold the other party harmless from any such tort liability. In the event of concurrent liability, the parties shall have the right of contribution in proportion to the respective liability of each party. Nothing contained in this section shall be deemed to waive immunities established pursuant to state statutes or to create third party rights or immunities.

9. Miscellaneous Provisions:

A. *Severability*. If any provision of this Agreement is held to be invalid, illegal or unenforceable for whatever reason, that shall not affect or impair, in any manner, the validity, legality or enforceability of the remainder of this Agreement.

B. *Waivers*. A waiver or failure by either party to enforce any provision of this Agreement shall not be construed as a continuing waiver of such provisions, nor shall the same constitute a waiver of any other provision of this Agreement.

C. *Status of Agreement*. This Agreement is in addition to, and is not intended to replace, substitute, modify or otherwise amend any other agreement between the Parties. Those other agreements continue in effect according to the terms of those agreements.

D. *Rights and Remedies*. The rights and remedies provided in this Agreement are in addition to any other rights and remedies that may be provided by law.

E. *Third Parties*. The Parties do not intend to create any rights or benefits in any entity, organization or person that is not a party hereto.

F. *Compliance with Laws*. The Parties, in performance of this Agreement, agree to comply with all applicable local, State and/or Federal laws and ordinances, including standards for licensing, certification and operation of facilities, programs and accreditation, and licensing of individuals and any other standards or criteria as described in this Agreement to assure quality of services.

G. *Assignment*. The Parties hereto shall not assign or delegate any or all duty, obligation, right or interest in this Agreement.

H. *Nondiscrimination*. There will be no discrimination against any participant covered under the Agreement because of race, color, religion, national origin, sex (including pregnancy and parenting status), disability, age, veteran status, sexual orientation, gender identity or expression, marital status or genetic information in programs or activities including employment, admissions, and educational programs. The parties

shall comply with all federal and state nondiscrimination laws and regulations and policies.

I. *Force Majeure*. The obligations of the parties under this Agreement shall be suspended and excused if the performance of either is prevented or delayed by acts of nature, earthquakes, fire, flood, or the elements, malicious mischief, insurrection, riots, strikes, lockouts, boycotts, picketing, labor disturbances, war, compliances with any directive, order or regulation of any governmental authority or representative thereof made under claim or color of authority or for any reason beyond the control of either party whether or not similar to the foregoing.

10. Notice:

All notices, demands, requests, consents and approvals which may, or are required to, be given by any party to any other party hereunder, shall be in writing and shall be deemed to have been duly given when delivered personally, sent by facsimile, sent by a nationally recognized overnight delivery service, or if mailed or deposited in the United States mail and sent by registered or certified mail, return receipt requested, postage prepaid to:

To: Bellingham Fire Department
1800 Broadway
Bellingham, WA 98225
Attention: Chief Bill Hewett
Telephone: (360) 778-8400
Email: bchewett@cob.org

To: Whatcom County EMS
800 Chestnut Street, Suite 3C
Bellingham, WA 98225
Attn: Mike Hilley, EMS Manager
360-927-1155
mhilley@co.whatcom.wa.us

11. Whole Agreement:

This Agreement is the complete and exclusive statement of the Agreement between the parties relevant to the purpose described above and supersedes all prior agreements or proposals, oral or written, and all other communications between the parties related to the subject matter of this Agreement. No modification of this Agreement will be binding on either party except as a written addendum signed by an authorized agent of both parties.

IN WITNESS WHEREOF, the parties have executed this Agreement this ____ day of _____, 20

WHATCOM COUNTY:

Approved as to form:

_____
Prosecuting Attorney Date

Approved:
Accepted for Whatcom County:

By: _____
Satpal Sidhu, Whatcom County Executive

STATE OF WASHINGTON)
)SS
COUNTY OF WHATCOM)

On this _____ day of _____2021, before me personally appeared Satpal Sidhu, to me known to be the Executive of Whatcom County, who executed the above instrument and who acknowledged to me the act of signing and sealing thereof.

_____
NOTARY PUBLIC in and for the State of Washington, residing at _____. My commission expires _____.

City of Bellingham signature page for agreement with _____.

Dated this _____ day of _____, 2021, for the CITY OF BELLINGHAM:

_____
Seth Fleetwood, Mayor

Attest:

_____
Finance Director

Department Approval:

_____

Approved as to Form:

_____
Office of the City Attorney

Exhibit A
Scope of Services

The Department will operate the 2022 Paramedic Training Program in accordance with Washington State Department of Health and Commission on Accreditation of Allied Health Education Programs (CAAHEP) standards and requirements. Oversight will be provided by the County's Paramedic Training Course Director. Program will be managed by the Paramedic Lead Instructor.

The Department

Department will be responsible to:

A. Obtain concurrence from the County on selection of the person to be appointed as the Paramedic Lead Instructor. Duties of the Lead Instructor are further detailed below.

B. Develop and maintain agreements with all physicians, college instructors, and paramedic instructors as needed.

C. Manage the accreditation process and develop the self-study for accreditation required by the State of Washington Department of Health and the Commission on Accreditation of Allied Health Education Programs (CAAHEP) for ongoing accreditation support. Coordinate the Committee on Accreditation of Educational Programs for the Emergency Medical Services Profession (COAEMP) site visit and pay the related fee.

D. Select Department sponsored students for admission to the Program. Provide appropriate admission and registration information and maintain copies of Program records.

E. Facilitate clinical agreements between the Department and those sites participating in clinical oversight of the paramedic students. Coordinate and schedule all classes, field experience and training activities. Provide preceptors and evaluations for all paramedic students.

F. Develop and maintain Program curriculums in accordance with state and national standards.

G. Provide classroom, equipment, and storage space as necessary to support the program.

H. Select and contract with pre-course anatomy and physiology instructor.

I. Complete Washington State Department of Health training program and course applications and student completion forms.

J. Participate as a member of the Paramedic Program Advisory Committee.

The County

The County will be responsible to:

A. Appoint and supervise a Paramedic Training Course Director. who will provide oversight to ensure the Program is being operated in accordance with Washington State Department of Health and Commission on Accreditation of Allied Health Education Programs standards and requirements.

B. Ensure contracts with Bellingham Technical College and pre-course anatomy & physiology instructor are in place and current prior to the start date of the class.

C. Secure budget authority from the Whatcom County Council to fund the 2022 Program costs for paramedic training.

D. Support the accreditation process as needed.

E. Provide any records and program information required from the County as needed for ongoing Program accreditation support.

F. Participate as a member of the Paramedic Program Advisory Committee.

Department Paramedic Lead Instructor

The Program Lead Instructor will be a certified Department Paramedic, who has earned an Associate's degree or higher from an accredited institution, and will meet all requirements for vocational instructor certification as defined in WAC 131.16.070-095. Lead Instructor will be responsible, under the oversight of the Paramedic Training Course Director, to operate the 2022 Paramedic Training Class and manage the accreditation process. Duties include but are not limited to the following:

A. Develop and implement the class schedule and ensure that all program objectives are met.

   1. The class schedule shall be submitted to the Medical Services Officer (MSO), Medical Program Director/Training Physician, and College supervisor for approval.

B. Coordinate and supervise all class presentations, instructors and field exercises.

C. Develop examinations based on the Program curriculum and ensure Medical Program Director and Training Physician approval for all examination content.

D. Review and obtain approval for textbooks and supplemental educational materials used as part of the Program.

E. Coordinate the COAEMP site visit and manage the accreditation process.

F. Other duties as assigned.

County Paramedic Training Course Director

The Paramedic Training Course Director will be a certified Paramedic, who has earned a Bachelor's degree or higher from an accredited institution. Director will provide oversight of the 2022 Paramedic Training Class and accreditation process. Duties include but are not limited to the following:

A. Assist Lead Instructor with class development and operation as needed.

B. Serve as Program liaison between the Department and Bellingham Technical College.

C. Review class schedules, student progress, and other program maintenance schedules as needed.

D. Maintain required documentation related to the course.

Exhibit B
Compensation

Item	Description	Per Student	Total
Preceptor Fees	Assigned Student Paramedic Preceptors (5 student - BFD & NWFR)	$ 5,000	$ 25,000
Evaluation Fee-BFD	Formal Evaluation Reports (4 students)	$ 1,100	$ 4,400
Evaluation Fee-NW	Formal Evaluation Reports (1 student)	$ 1,600	$ 1,600
Student Equipment, etc	Books, Stethoscopes, calipers, IV supplies, Disposable mannequin supplies, physiology training anatomy dissection parts, Platinum Program, PALS/NRET testing, CAAHEP, Clinical Training Site visit, Safety Clothing for clinical (8 students - BFD, FD7, NWFR)	$ 6,350	$ 50,800
Student Wages & Benefits-BFD only	Student class & patient contact hours (4 students)	$ 113,000	$ 452,000
Lead Instructor	Training Coordinator		$ 184,453
Adminstrative Costs	COAEMP Required Fee & Site Visit, Admin support- class schedules, software set-up/data entry/student training, program supply/equip ordering, assistance with CAEHEP accreditation process.		$ 33,000
Anatomy & Physiology Instructor	Pre-Course Anatomy & Physiology		$ 6,225
Skills Lab	Procedure Skills Lab		$ 37,000
Program Instructors	Physicians, College Instructors, Paramedic Instructors		$ 56,000
Facilities	Classroom and office space		$ 15,000
Total Contract			$ 865,478

Invoicing

The Department shall submit itemized invoices for actual costs in a format approved by the County. Invoices shall be supported by general ledger detail for all costs. The Department shall submit invoices to Mike Hilley, EMS Manager on a monthly basis.

Payment by the County will be considered timely if it is made within 30 days of the receipt and acceptance of billing information from Department.

Duplication of Billed Costs or Payments for Service: The Department shall not bill the County for costs incurred under this contract, and the County shall not pay the Department, if the Department has been or will be paid by any other source, including grants, for those costs. The Department is responsible for any audit exceptions or disallowed amounts paid as a result of this contract.

City Council Agenda Bill

23207

Bill Number

Subject: **Inter-Agency Agreement for Lateral Paramedic Training**

Summary Statement: The Fire Department has hired 6 nationally certified paramedics. This agreement will provide funding from the County-Wide EMS Levy to provide training for these nationally certified paramedics to become Washington State certified and approved to practice in Whatcom County.

Previous Council Action: **Support for the 2016 County-wide EMS Levy**

Fiscal Impact: **$364,116.00**

Funding Source: **County EMS Levy through Medic One Fund**

Attachments:
1. STAFF MEMO
2. LATERAL MEDIC AGREEMENT

Meeting Activity	Meeting Date	Recommendation	Presented By	Time
Committee Briefing - Vote Requested	12/13/2021	Vote to Approve	Chief Bill Hewett	5 minutes

Recommended Motion:

Council Committee:
Public Health, Safety, and Justice Committee

Agenda Bill Contact:
Chief Bill Hewett, Fire Department

Council Action:

Reviewed By	Department	Date
Bill C. Hewett	Fire Department	12/06/2021
Andrew D. Asbjornsen	Finance	12/07/2021
Matthew T. Stamps	Legal	12/07/2021
Seth M. Fleetwood	Executive	12/07/2021

City of Bellingham
210 Lottie Street
Bellingham, WA 98225

MEMORANDUM

TO:	**CITY COUNCIL**
FROM:	BILL HEWETT, FIRE CHIEF
CC:	MAYOR FLEETWOOD
SUBJECT:	INTER-AGENCY AGREEMENT FOR LATERAL PARAMEDIC TRAINING
DATE:	DECEMBER 6, 2021

The fire department has hired six certified paramedics in our last two hiring processes. While these firefighters have nationally recognized paramedic certifications, they are required to achieve Washington State certification including approval of the Whatcom County Medical Program Director. This local training process can take up to six months to achieve final approval.

This contract will provide for funding for wage reimbursement and training costs to support the training of these firefighters. The funding for this contract will come from Whatcom County through the county-wide EMS levy.

Whatcom County
Contract # 202111023

INTERAGENCY AGREEMENT
Between
City of Bellingham Fire Department
and
Whatcom County Emergency Medical Services/Whatcom County

The City of Bellingham, through Bellingham Fire Department, (hereinafter the "Department"), Whatcom County, through Whatcom County Emergency Medical Services, (hereinafter the "County"), in consideration of the mutual covenants herein, agree as follows:

I. Purpose: The Department and the County recognize the financial benefit and reduced training time required when hiring an employee that holds a national or state paramedic licensure. When the Department hires an employee that already has experience as a firefighter/paramedic this is deemed a “lateral hire.” This agreement outlines the responsibilities of the Department and the County when training lateral paramedic employees.

II. Program Administration: It is understood that the County and Department shall be responsible for the direct supervision of their respective employees and that nothing in this Agreement will interfere with the employer/employee relationship or the functioning of the County and Department herein named. In compliance with applicable law and State records guidelines, both parties will maintain documentation and/or records relevant to the program in this Agreement.

III. Financial Agreement: Financial responsibility for training lateral paramedics shall be the responsibility of the County through the County EMS Levy. The County shall pay costs, up to $364,116, associated with the preceptorship of lateral Paramedics, including administrative costs for formal evaluations, salaries and wages for up to six (6) Department employees who hire through the lateral Paramedic process, not to exceed 6 months in duration. The Department will pay the costs of all other training associated with the duties and responsibilities required to be employed as a City of Bellingham Firefighter/Paramedic. The Department will submit monthly invoices to the County Contract Administrator with supporting documentation as required in Exhibit A. County payment will be considered timely if made within 30 days of receipt of approved invoice.

IV. <u>Responsibilities of the Department:</u>

A. Select lateral paramedic applicants, as available, through the approved Department process.

B. Ensure the lateral paramedic candidate is in good standing with the accrediting agency or body they are transferring from.
C. Assign and provide a preceptor to the lateral paramedic candidate.
D. Work with the County Medical Program Director and Department Supervising Physician to ensure the lateral paramedic candidate completes MPD mandated training, testing, and field internships to become a Whatcom County certified paramedic.
E. Ensure all forms and paperwork are correctly submitted to the State of Washington for final credentialing.
F. Communicate with the County, County MPD, and Supervising Physician of the lateral paramedic candidates progress during the training process.
G. Develop performance improvement plans, as necessary, to correct any deficiencies related to successful completion of the lateral training requirements.
H. Notify the County of any circumstance that will prevent a lateral paramedic candidate from successfully completing their training to achieve certification or be able to perform as a Whatcom County EMS system paramedic.

V. Responsibilities of the County

A. Provide financial reimbursement to the department for monthly and non-recurring training costs as outlined in "Exhibit A."
B. Work with the Department to complete testing and credentialing paperwork associated with the lateral paramedic process.
C. Ensure all lateral paramedic training tasks and processes are approved by the County MPD and the Department Supervising Physician.

VI. Nondiscrimination:

There will be no discrimination against any participant covered under the Agreement because of race, color, religion, national origin, sex (including pregnancy and parenting status), disability, age, veteran status, sexual orientation, gender identity or expression, marital status or genetic information in programs or activities including employment, admissions, and educational programs.

VII. Liability:

Each party to this Agreement will be responsible for the negligent or willful acts or omissions of its own employees, officers, volunteers or agents in the performance of this Agreement. Neither party will be considered the agent of the other nor does neither party assume any responsibility to the other party for the consequences of any act or omission of any person, firm, or corporation not a party to this Agreement.

VIII. Term of the Agreement:

This Agreement will take effect on January 1, 2022 and will terminate on December 31, 2022 unless terminated earlier by either party. Termination of this Agreement shall be effective thirty (30) days following written notice of termination provided by either party.

IX. Entire Agreement: This Agreement constitutes the entire agreement between the parties, and supersedes all prior oral or written agreements, commitments, or understandings concerning the matters provided for herein. If modifications to this Agreement are deemed necessary, such changes shall be approved by the Department and County by written amendment.

X. Notice:

Any notices or communications required or permitted to be given by this Contract must be (i) given in writing and (ii) personally delivered or mailed, by prepaid, certified mail or overnight courier, or transmitted by electronic mail transmission (including PDF), to the party to whom such notice or communication is directed, to the mailing address or regularly-monitored electronic mail address of such party as follows:

To: Bellingham Fire Department
1800 Broadway
Bellingham, WA 98225
Attention: Chief Bill Hewett
Telephone: (360) 778-8400
Email: bchewett@cob.org

To: Whatcom County EMS
800 Chestnut Street, Suite 3C
Bellingham, WA 98225
Attn: Mike Hilley, EMS Manager
360-927-1155
mhilley@co.whatcom.wa.us

WHATCOM COUNTY:

Approved as to form:

_____
Prosecuting Attorney Date

Approved:
Accepted for Whatcom County:

By: _____
Satpal Sidhu, Whatcom County Executive

STATE OF WASHINGTON)
)SS
COUNTY OF WHATCOM)

On this _____ day of _____2021, before me personally appeared Satpal Sidhu, to me known to be the Executive of Whatcom County, who executed the above instrument and who acknowledged to me the act of signing and sealing thereof.

_____
NOTARY PUBLIC in and for the State of Washington, residing at _____.
My commission expires _____.

City of Bellingham signature page for agreement with _____.

Dated this _____ day of _____, 2021, for the CITY OF BELLINGHAM:

_____

Seth Fleetwood, Mayor

Attest:

_____
Finance Director

Department Approval:

_____

Approved as to Form:

_____
Office of the City Attorney

EXHIBIT A

CONTRACT BUDGET

Cost Item	Documentation Required	Monthly Amount per Student	Per Student Maximum	Contract Maximum
Wages & Benefits	GL Detail	$ 9,416	$ 56,496	$ 338,976
Preceptor Premium	GL Detail	$ 515	$ 3,090	$ 18,540
Formal Evaluations	GL Detail	N/A	$ 1,100	$ 6,600
Totals				$ 364,116

City Council Agenda Bill

23208

Bill Number

Subject: **A Presentation of the Whatcom County Community & Economic Development Strategy**

Summary Statement: The Comprehensive Economic Development Strategy (CEDS) is a long-term planning document that outlines county-wide economic development priorities, goals, and strategies. The strategy document lays out a five-year work plan for the economic development staff at the Port of Bellingham and the project list provides eligibility for many grant funds. The Whatcom County CEDS for 2022-2026 was unanimously approved by County Council on October 26, 2021. The 2021 process was led by the Port of Bellingham's economic development team, supervised by an External Review Committee comprised of staff from the County, seven cities, Port, and both Nooksack and Lummi Tribes, and informed by broad public, private, and nonprofit stakeholder engagement.

The CEDS can be found on the Port of Bellingham's website.
www.portofbellingham.com/DocumentCenter/View/10571/Whatcom-County-CEDS-2022-2026-11052021

Previous Council Action: **None**

Fiscal Impact: **None**

Funding Source: **None**

Attachments:

Meeting Activity	Meeting Date	Recommendation	Presented By	Time
Committee Briefing - Information Only	12/13/2021	Information/Discussion	Don Goldberg and Jennifer Noveck, Port of Bellingham	20 minutes

Recommended Motion:

Council Committee:
Community and Economic Development Committee

Agenda Bill Contact:
Tara Sundin, Planning and Community Development, 360-778-8300

Council Action:

Reviewed By	Department	Date
Gregory R. Aucutt	Planning & Community Development	12/06/2021
Amy B. Kraham	Legal	12/06/2021
Seth M. Fleetwood	Executive	12/07/2021

City Council Agenda Bill

23209

Bill Number

Subject: **Update on a New Pathway for Families with Children that are Experiencing Homelessness**

Summary Statement: Staff are working with the Opportunity Council, Lydia Place and Whatcom County, with financial support from the Mount Baker Foundation, to conduct a feasibility study for a new purpose-built facility that will be a much needed alternative to the motel stay program for local families without housing. The purpose of the project and program is to provide necessary services to help families stabilize, and offer a healthy, safe place for families to stay while awaiting placement into permanent housing. Staff will present the initial findings of the study and next steps.

Previous Council Action: **Voted to accept Strategies on May 24, 2021**

Fiscal Impact: **The feasibility study is approx. $80,000 and funded by Mount Baker Foundation. If feasible, it will cost approx. $13M to construct, and more to operate.**

Funding Source: **City (ARPA, HOME, Affordable Housing Sales Tax), County, other sources needed**

Attachments: 1. STAFF MEMO

Meeting Activity	Meeting Date	Recommendation	Presented By	Time
Committee Briefing - Information Only	12/13/2021	Information/Discussion	Tara Sundin, PCDD	10 minutes

Recommended Motion:

Council Committee:
Community and Economic Development Committee

Agenda Bill Contact:
Tara Sundin, Planning and Community Development, 360-778-8300

Council Action:

Reviewed By	Department	Date
Gregory R. Aucutt	Planning & Community Development	12/06/2021
Amy B. Kraham	Legal	12/06/2021
Seth M. Fleetwood	Executive	12/07/2021

City of Bellingham
210 Lottie Street
Bellingham, WA 98225

MEMORANDUM

TO: **BELLINGHAM CITY COUNCIL**

FROM: TARA SUNDIN, COMMUNITY & ECONOMIC DEVELOPMENT MANAGER

CC: MAYOR SETH FLEETWOOD

SUBJECT: A NEW PATHWAY FOR FAMILIES WITH CHILDREN EXPERIENCING HOMELESSNESS

DATE: DECEMBER 6, 2021

The City Council accepted the Interim Housing Implementation Strategies at your May 24, 2021 meeting, as recommended by the Homeless Strategies Workgroup and accepted by County Council. One of those recommendations included exploring an alternative to the motel stay program as a shelter solution for families experiencing homelessness.

The City, County, Lydia Place and Opportunity Council, with financial support from the Mt Baker Foundation, are currently scoping and conducting a feasibility analysis for a purpose-built facility for families experiencing homelessness.

Background: Whatcom County had nearly reached its goal of getting to "functional zero" in the number of families with children experiencing homelessness, meaning that when families with children did experience homelessness, it was brief. However, the number of families with children experiencing homelessness in Whatcom County surged soon after the start of the Covid-19 pandemic, doubling from 49 (in February 2020) to 113 (in February 2021). The rate of homelessness for families with children outpaced that of other groups, with a 2020 to 2021 year-over-year increase of 50%.

The City of Bellingham and Whatcom County responded to the surge by expanding their existing winter-only "motel stay" program to shelter families with children year-round. At peak levels in February 2021, 87 families were in motel stays in Whatcom County.

The Project: A new purpose-built facility that will be a much-needed alternative to the motel stay program for local families without housing. It will provide necessary services to help families stabilize, and offer a healthy, safe place for families to stay while awaiting placement into permanent housing.

Phase 1 Feasibility Recommendations: The City and Mount Baker Foundation hired a consultant team to assist the local team in analyzing local data, researching best practices, including interviews with professionals operating similar programs, and interviewing households with lived experience. This work has led the core team down the following pathway:

This will be a two-phase project. A 25-30 Unit Facility in Bellingham (estimated at $9M) and then another 10-15 Units in the Small Cities (estimated at $4.5M).

The feedback received by community stakeholders and families with lived experience emphasized the need for a private space large enough for their whole family, including:

· A private unit with a private bathroom;
· A place to cook nutritious meals for their families;
· Space where the whole family can fit yet have privacy for family members; &
· Case management & other services.

Key Principles of the Project/Program

+ Trauma-Informed Care—The principles of trauma-informed care will be integrated into all aspects of the program model and facility. Families that experience homelessness have often lived through multiple stressors that can cause trauma.

+ Culturally Competent Service Delivery—Partners are committed to incorporating cultural competency into all aspects of the program model and facility design. 55% of school children experiencing homelessness in Whatcom county are People of Color.

+ Professional and Fairly Compensated Staffing Model—A well trained staff is critical to the success of a trauma-informed care model. A commitment to maintain a healthy workload and a living wage compensation is paramount.

+ Serves Families in their Communities—A Bellingham + Small Cities strategy will be used to better serve families in need. A Bellingham-centric model takes families out of their communities and possibly their schools. 40% of families in need are from the Small Cities and unincorporated Whatcom County.

Next Steps: Conduct the feasibility analysis on facility operations which will include working with the Opportunity Council and Lydia Place on the program design and have conversations about developer and operator capacity.

City Council Agenda Bill

23210

Bill Number

Subject: **Assessment of Downtown Services and Description of New Initiatives Underway**

Summary Statement: The City is committed to supporting a clean, safe and welcoming downtown environment. Staff recently conducted an assessment of downtown services to identify gaps and opportunities for improvement. Staff will provide an overview and update on the results of the assessment and describe new initiatives being advanced by the City, in collaboration with partners.

Previous Council Action: **Adoption of Downtown Plan (2014), 2021-2022 Biennial Budget approval, review of ARPA expenditure approach (Sept), and approval of Homeless Outreach Team expansion (Oct)**

Fiscal Impact: **$400,000 for Safety Ambassador Program**

Funding Source: **ARPA**

Attachments: 1. PRESENTATION

Meeting Activity	Meeting Date	Recommendation	Presented By	Time
Committee Briefing - Information Only	12/13/2021	Information/Discussion	Darby Cowles, PCDD	10 minutes

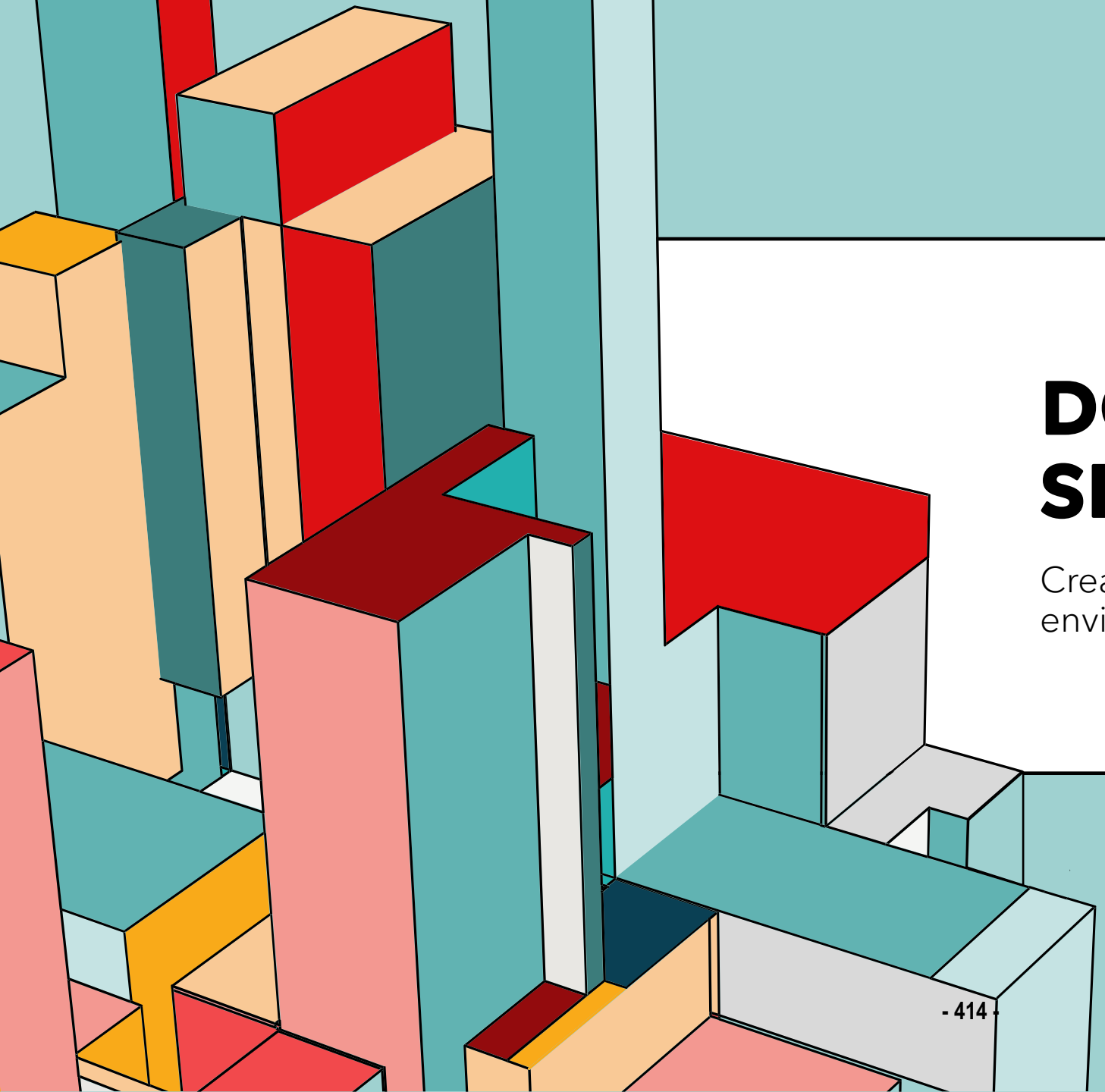
Recommended Motion:

Council Committee:
Community and Economic Development Committee

Agenda Bill Contact:
Darby Cowles, Planning and Community Development, 360-778-8300

Reviewed By	Department	Date
Gregory R. Aucutt	Planning & Community Development	12/06/2021
Amy B. Kraham	Legal	12/06/2021
Seth M. Fleetwood	Executive	12/07/2021

Council Action:



DOWNTOWN SERVICES

Creating a clean, safe and welcoming environment

FRAMING THE ISSUES

CLEANLINESS AND VANDALISM

Litter and cleaning has become difficult to manage. Increase in graffiti and vandalism is notable.

HOMELESSNESS

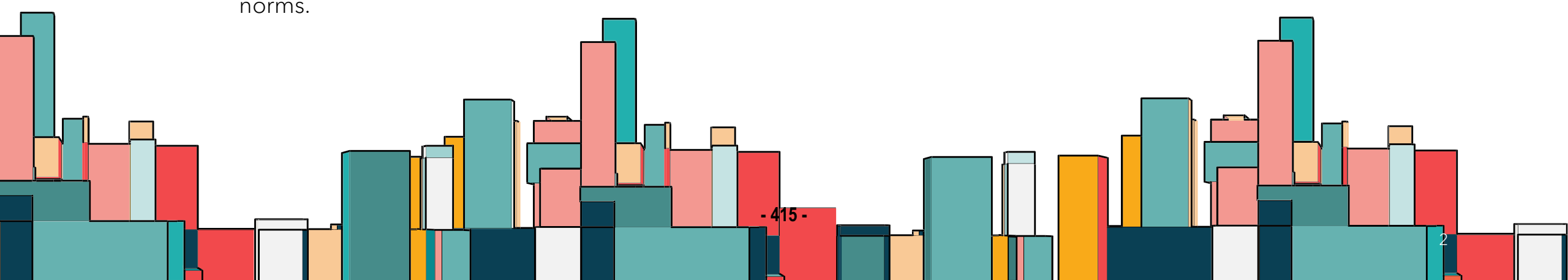
More people experiencing homelessness. Proliferation of street life and camps downtown.

MENTAL HEALTH & SUBSTANCE ABUSE

Mental health needs exceed overburdened resources. Behavioural outbursts have become more aggressive, partially due to increased methamphetamine use and change in societal norms.

COMMUNICATION CHALLENGES

Lack of clarity on available resources/who to call. Complexity and challenge of various responses.



ONGOING EFFORT

2014 Community Solutions Workgroup:

Business and agency leaders identified possible solutions to downtown issues.

Top Priority Needs and Solutions:	STATUS
Create a staffed 24-hour youth drop-in center	Day center opened
Provide supportive housing citywide	Francis Place, 22N
Provide increased social services and outreach coordination between agencies as well as coordinated intensive case management	GRACE
Create a Mental Health Court	Complete
Create a 24-hour mobile crisis response system	Underway; MCOT, HOT team
Provide police training on how to triage mental health and alcohol issues	Complete, ongoing
Increase presence of police patrols during hours of need	Fluctuates
Implement Maritime Heritage Park development plan	Underway; CPTED, slide
Adjust municipal codes and staffing to allow effective intervention and enforcement of the most common infractions	Not approved
Market and support the BPD's Crime Prevention Through Environmental Design (CPTED)	Limited scope
Support initiatives to approve a Business Improvement District or Main Street program	Main Street approved
Initiate a Downtown Ambassador Program	Not completed
Create an Alcohol Impact Area	Deemed ineffective
Support the "Homeless in Bellingham" video education series	Complete

CURRENT SERVICE CONTRACTS

CLEANING AND LITTER

$85,250

Parking fund/GF

Cascade Connections ($35k) / LMM ($50k)

LANDSCAPING

$125,400

Parking fund

Downtown Bellingham Partnership

HOMELESS OUTREACH

$210,000

General Fund

OppCo HOT team

SOCIAL SERVICES

$280,000+

General Fund/Housing Levy

GRACE, NWYS Ground Floor program

DOWNTOWN SERVICES

GAPS AND NEEDS

INCREASED COORDINATION

Various services scheduled independently. Staff not always aware of how they fit into the “big picture.

ADDITIONAL CLEANING SERVICES

Cleaning (including human waste), graffiti removal & litter services are inadequate. Gaps filled ad hoc by Public Works or DBP.

EDUCATION AND ENGAGEMENT

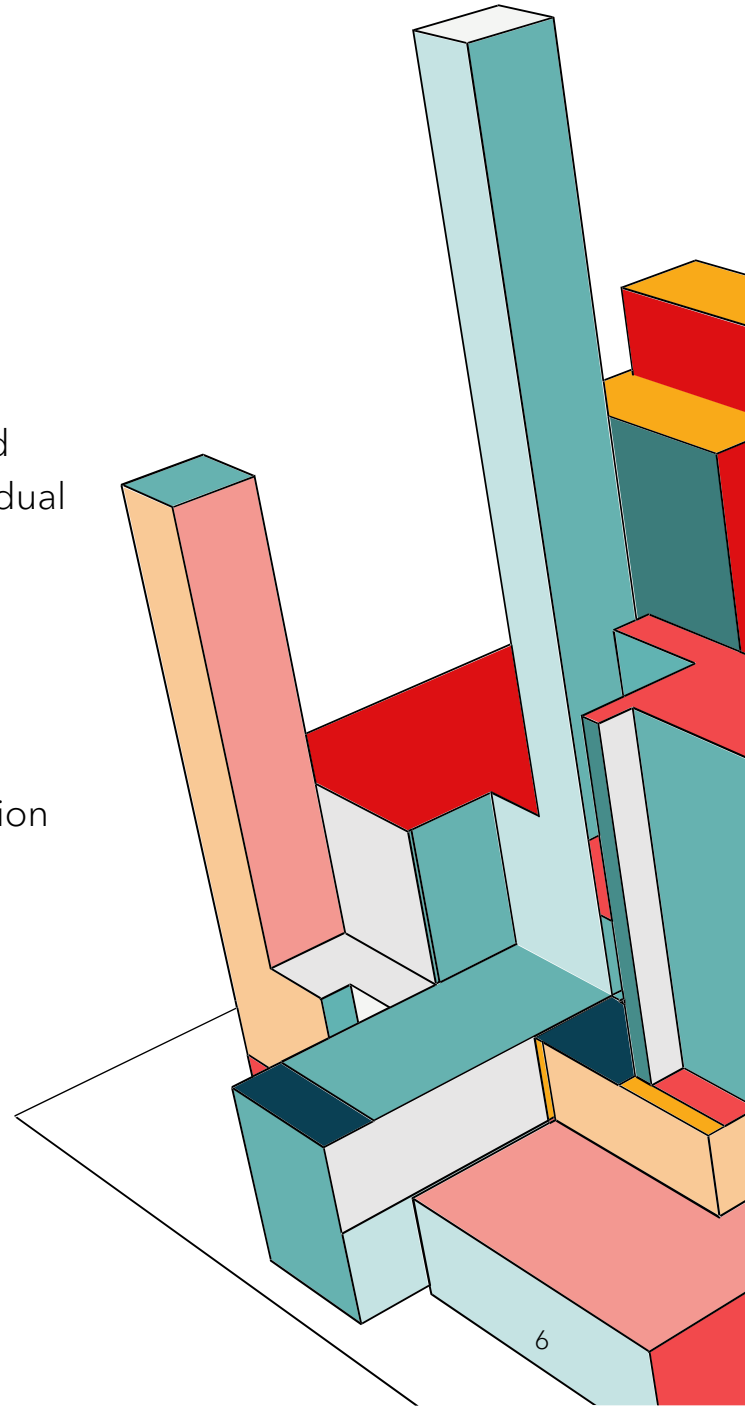
Adjust expectations around service realities. Share info on resources and service requests. Encourage property/business owner participation.

LEGAL CONSTRAINTS

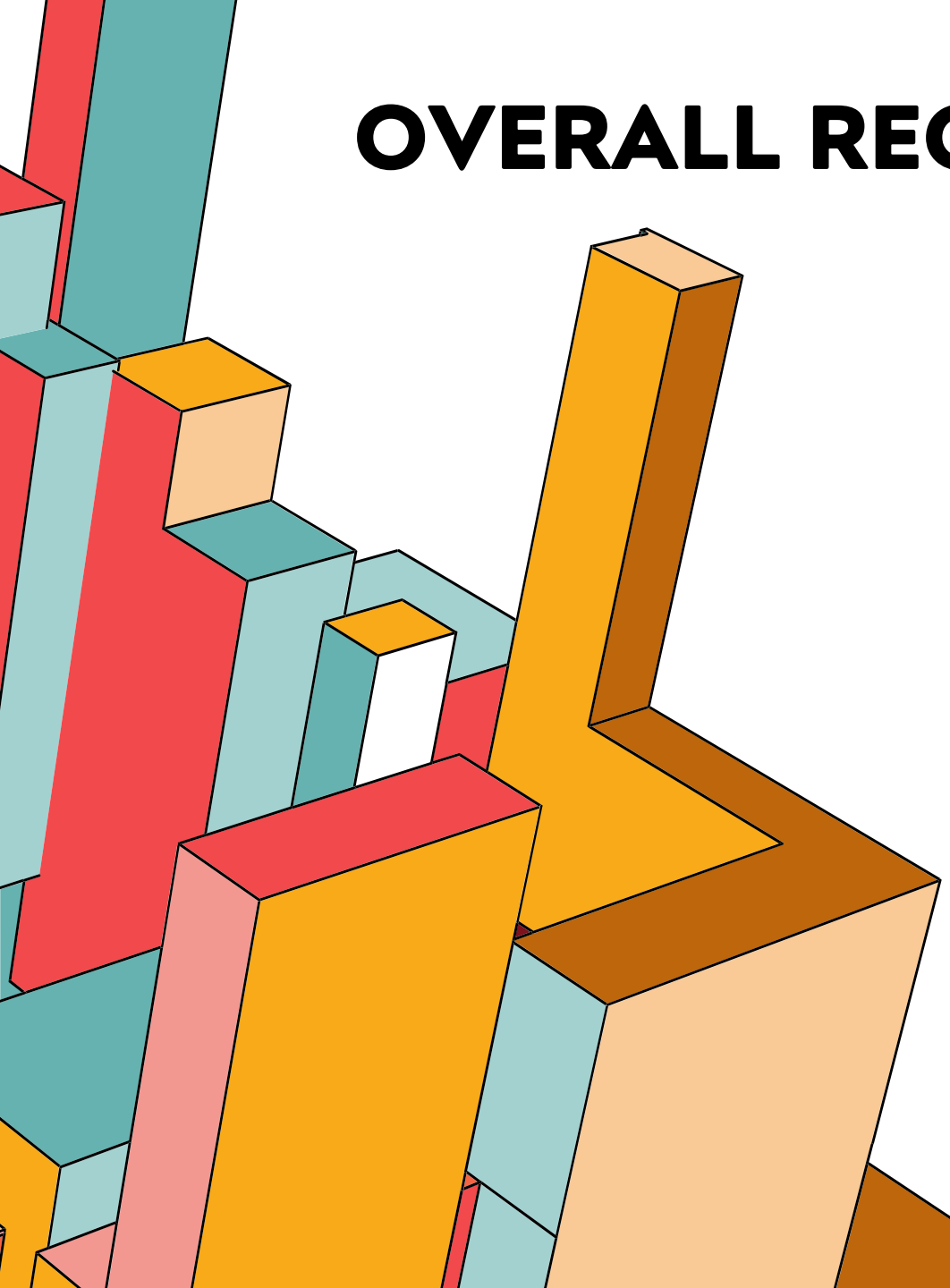
Changes in police response has elevated concerns. Freedom of speech and individual liberties prohibit some requested enforcement actions.

WORKFORCE AND FUNDING

Workforce issues make hiring and retention a challenge. Stressors lead to burnout. Limited available funding.



OVERALL RECOMMENDATIONS



ADDITIONAL CLEANING

Expanded and centralized contracting of cleaning for more responsive services. Additional baseline services provided by Public Works

COORDINATED BEHAVIORAL HEALTH RESPONSE

24-hour alternative response team with centralized dispatch. Coordinated schedules and communication among service providers.

INCREASED EYES ON THE STREET

Expanded HOT team contract. Increased BPD patrols. Private security pilot. Safety ambassador team pilot.

ENHANCED COMMUNICATION AND OUTREACH

Block Program. Outreach/phone tree of available services. WWU student trash campaign. Additional education regarding services.

ACTIONS AND RESOURCES

EXISTING PROGRAMS

- Expand the Homeless Outreach Team (HOT) - 2021
- Private security pilot (Depot/MHP) - 2021
- Consolidate cleaning / landscaping contracts - 2022
- Additional Public Works staff / hours - 2022
- Continue GRACE program (BHO)
- Continue Basecamp
- Additional BPD patrols - 2022

NEW INITIATIVES

- Safety ambassador program: 2-year pilot (~$400k) – 2022-2023
- Alternative Response Team (Fire/Health) – 2022
- Legislative advocacy – 2021-2022
- Block Program (with DBP) - 2022
- WWU campaign – 2021
- Webpage/outreach/education – 2021

City Council Agenda Bill

23211

Bill Number

Subject: **Update on Outdoor Dining Areas in the Public Right-of-Way**

Summary Statement: Guidelines and standards for commercial uses of the right-of-way, including parklets and streateries, were adopted in 2019 (BMC 13.14). This became a critical option for restaurants and other businesses closed or limited by the COVID-19 related health restrictions. Over 30 right-of-way use permits were processed in 2020-2021, many under temporary guidelines for overhead coverings and other weatherization efforts. This fall, final guidelines were adopted to allow for the safe continuation of streatery structures.

Previous Council Action: **Adoption of Bellingham Municipal Code 13.14 (2019)**

Fiscal Impact: **None**

Funding Source: **N/A**

Attachments: 1. GUIDE TO COMMERCIAL USE IN THE ROW

Meeting Activity	Meeting Date	Recommendation	Presented By	Time
Committee Briefing - Information Only	12/13/2021	Information/Discussion	Darby Cowles, PCDD	10 minutes

Recommended Motion:

Council Committee:
Community and Economic Development Committee

Agenda Bill Contact:
Darby Cowles, Planning and Community Development, 360-778-8300

Council Action:

Reviewed By	Department	Date
Gregory R. Aucutt	Planning & Community Development	12/06/2021
Amy B. Kraham	Legal	12/06/2021
Seth M. Fleetwood	Executive	12/07/2021

VERSION 6
12/1/21

City of Bellingham WASHINGTON

Commercial Right-of-Way Use Permits

A guide to food trucks, mobile food vendors, parklets, streateries, sidewalk cafes, street vendors and other commercial uses of the public right-of-way.

Table of Contents

Introduction **3**
Definitions 4
Licensing 4
General Requirements 5
Specific Requirements
- Food Trucks and Mobile Food Vendors 8
- Parklets and Streateries 9
- Sidewalk Cafes 10
- Sidewalk Vendors 11

Additional Links and Attachments:

Public Works Permit Application

Fee Schedule

Signature Approval/Notification Form

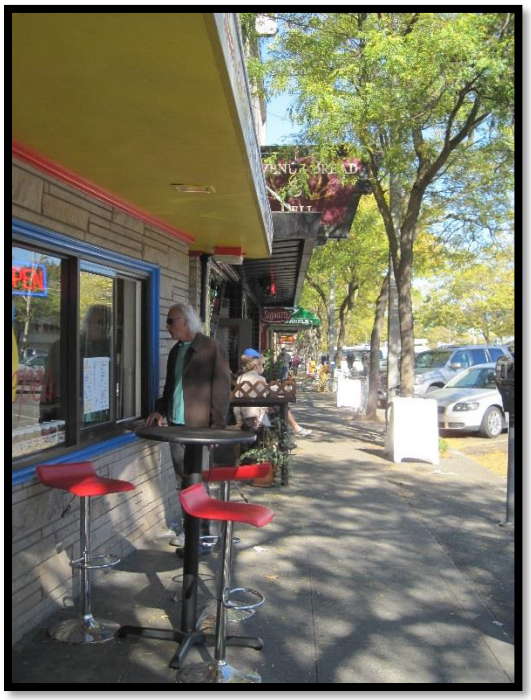
Insurance Requirements

Indemnification and Insurance Form

Version 5 updates:

- Updated definition of “parklet”
- Added definition and requirements of “streateries”
- Added requirements for streatery and parklet covers
- Updated demarcation requirements for barrier-free sidewalk cafes
- Added building and fire permit application requirements
- Food Truck page, added line about complying with IFC 319

Introduction



Activity on or adjacent to the sidewalk is an essential component to a healthy retail district. One way to encourage this activity is to allow strategic use of the public right-of-way for commercial uses, such as sidewalk vendors, sidewalk cafés, food trucks, parklets and streateries.

These uses bring vibrancy to Bellingham's streets, increasing enjoyment and enhancing character and quality of life. They also provide economic opportunity for entrepreneurs testing a concept, preparing for a brick and mortar investment, or for established businesses wishing to expand their operations.

When these activities occur in the right-of-way, locating them appropriately and regulating the size, frequency and operating hours helps maintain sidewalks and streets as safe and accessible places for all sidewalk users. These restrictions also protect existing businesses whose owners have made an investment in a storefront location.

This guide provides the steps and requirements necessary for approval to use the public right-of-way. This is based on three key factors:

- Obtaining permission from the abutting business or property owner(s);
- Designing the space to keep the path clear for pedestrians and maintain safe and accessible passage for all users; and
- Following all licensing, operating, and safety requirements.

Additional information is available at the City's permit center (www.cob.org/permits):

210 Lottie Street
Bellingham, WA 98225

Phone: (360) 778-8300 **TTY:** (360) 778-8382
Email: permits@cob.org

Definitions

Area of operation: The part of the sidewalk or street included in the right-of-way use permit.

Curb line: The raised area creating a boundary between a street and sidewalk.

Food truck/mobile food vendor: A truck or trailer licensed as a vehicle and approved by L&I equipped with facilities for cooking and/or selling food.

Parklet: A segment of right-of-way, typically one or two parking spaces, that has been converted for public space for all to enjoy.

Right-of-way (ROW): Land acquired or dedicated for public roads, streets, alleys and/or sidewalks, regardless of whether these facilities have been constructed.

Sidewalk café: Tables, seating or other amenities such as umbrellas, landscaping or fencing adjacent to a business and located in the public right-of-way, maintained by the business owner for the use of their customers.

Sidewalk vendor: A person, not associated with an adjacent business, engaged in selling, offering for sale or distributing food or other products on a public sidewalk.

Streatery: A combination of a parklet and sidewalk café. Provides converted parking space(s) or drive lane(s) for table service and is used by an abutting business.

Licensing

The City of Bellingham requires all business to be licensed with the city if they are located within city limits OR conducting business within the city limits. Other agencies may also require licensing or additional reviews. **It is the applicant's responsibility to make sure approval from outside agencies is granted prior to operating in the public right-of-way.** These agencies may include, but not be limited to:

City of Bellingham Business Registration: http://bls.dor.wa.gov/cities/bellingham.aspx
Whatcom County Health Department: http://www.co.whatcom.wa.us/867/Food-Safety
Washington State Department of Labor and Industries:
http://www.lni.wa.gov/main/smallbusiness/BusinessRequirements.asp?&source=FF
https://www.lni.wa.gov/licensing-permits/manufactured-modular-mobile-structures/food-trucks-trailers/
Washington State Liquor and Cannabis Board: https://lcb.wa.gov/

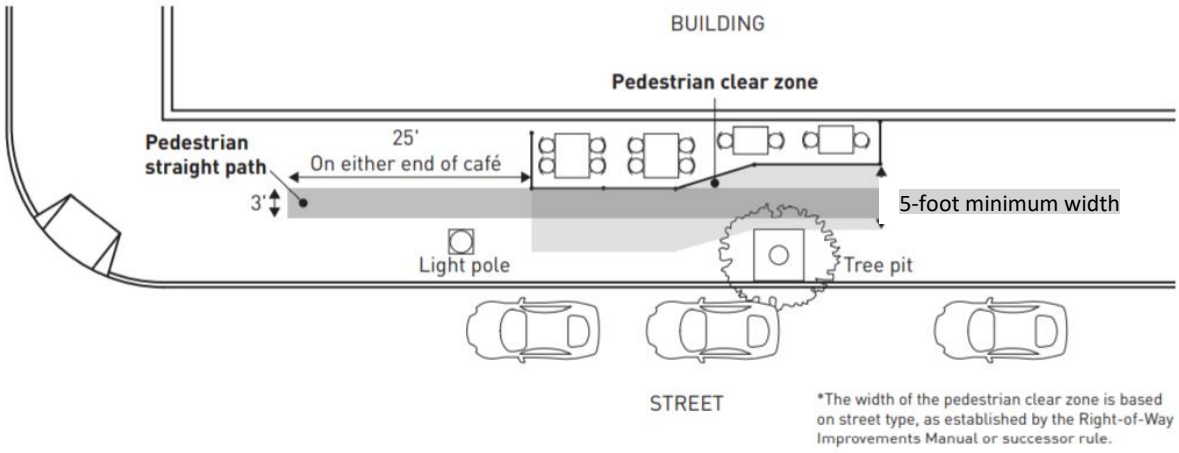
General Requirements

The following general requirements apply to all commercial uses of the right-of-way described in this document. Uses of the right-of-way associated with Special Events, as defined in Bellingham Municipal Code 13.13, are regulated under the rules of that chapter and not required to obtain an additional right-of-way use permit.

Accessibility

All uses of the right-of-way must maintain a minimum five (5) foot unobstructed clear walking path on the sidewalk between the area of operation and the curb and roadside features. See Figure 2 below. The clear path of travel shall be generally straight with no abrupt turns that impair pedestrian circulation. Obstructions include street furniture, such as signposts, lampposts, etc. street trees or grates, meter posts, and any other protuberance into the area.

FIGURE 2. PEDESTRIAN CLEAR ZONE AND PEDESTRIAN STRAIGHT PATH



Annual Renewal

Permits are valid for one year from date of issue and may be renewed based on proof of compliance with all conditions of issuance and payment of the renewal fee. Failure to renew the permit may result in civil penalties.

Application Submittal Requirements

The following information must be submitted to obtain a right-of-way use permit:

1) Public Works temporary right-of-way use permit application– Complete all required fields.
2) Site plan - Show the proposed area of operation and additional required information. See Site Plan, below.
3) Building permit application – Required for proposals that include a structure or overhead covering greater than 120 square feet. The Fire Department will also review any covered structures.
4) Electrical permit application – Required for proposals that include electrical wiring.

5) Signature approval/notification form– All uses require approval and/or notification of the abutting business (or property owner, if no business is present). Some uses may require approvals or notifications beyond this area.
6) Indemnification and insurance form – Applicants must sign this form agreeing to hold the City harmless for any claims or liabilities related to the permitted activity and to obtain and maintain general liability insurance for the use. See Insurance section below.
7) Associated permit fees - See Fees section below.

Area of Operation

The area of operation is the specific location where the use has been authorized within the right-of-way. Permits are issued for a single location and are not transferrable to other locations or operators.

In reviewing the proposed area of operation, the City will consider:

- Width of the sidewalk. A minimum of 5-feet of pedestrian clearance must be maintained. The presence of appurtenances within the right-of-way (parking meters, vehicle exiting, etc) may require additional clearance.
- A minimum of 8-foot high clearance above the sidewalk is required for awnings or other protuberances.
- Proximity to existing street furniture and buildings.
- Configuration and conditions of existing drive lanes and on-street parking stalls.
- Presence of sign posts, light poles, parking meters, bus shelters, street furniture, public art, street trees, loading zones, fire hydrants, and other obstructions located on the sidewalk.

These considerations will determine whether the proposed use would result in pedestrian or street congestion, compliance with ADA requirements, and whether the required clearance may be maintained. After the right-of-way use permit application is reviewed, staff will mark on the sidewalk at each corner of the approved area of operation to locate the boundaries. It is the applicant's responsibility to ensure that all operations, furniture, and other obstructions remain within this area.

Fees

A permit fee will be charged upon approval of the permit. Fees are adopted by City Council resolution and based on the area occupied and duration of the permit. See the attached fee schedule for additional detail. Application fees are non-refundable, including situations where the use of the right-of-way terminates before the permit expiration date.

Insurance

All applicants must submit an indemnification form and obtain and maintain commercial liability insurance to cover property damage, personal injury, and death, with minimum limits of not less than $1,000,000 per occurrence. See the attached Insurance Requirements summary. It is the applicant's responsibility to ensure that the City has a current and valid copy of the applicant's Certificate of Liability Insurance at all times. Updated certificates are required to be submitted by the applicant before the term of the current certificate lapses. If at any time the City does not have a current and valid Certificate of Liability Insurance, the permit is considered incomplete and the ROW use is unpermitted and may be required to be removed

Nuisances

If complaints are received regarding nuisances caused by the use (e.g. noise, odors, etc), further conditions may be added to the permit to mitigate the nuisance. If conditions do not mitigate the nuisance, the permit may be revoked.

Notification

All applications require the notification and signature of the adjacent business owner (or property owner(s), if no business is present). Some uses may require additional notification and/or approvals, as outlined in the specific use sections in this guide.

Revocability

The applicant is responsible for maintaining the permitted use of the right-of-way in accordance with all conditions of the issued permit and requirements of this Guide and Bellingham Municipal Code 13.14. Failure to comply with these conditions and requirements may result in revocation of the permit and civil penalties.

Signs

Signs must comply with the minimum standards within the commercial district they are located. Off-premise signs are not permitted anywhere within city limits.

Site Plan

A site plan must be submitted as part of the permit application and include the following information, as applicable:

- Abutting street names
- Abutting business(s) names and addresses (or property owner, if no business is present)
- Footprint, dimensions and setbacks of the proposed activity, including areas for queuing, seating, awnings, landscaping, waste receptacles, etc.
- Compliance with design requirements, if required in the specific requirements of the use.
- Existing street and sidewalk features within 20-feet of the proposed area of operation, including:

- Property lines,
- Sidewalk width,
- Parking spaces (with dimensions),
- Utility covers/boxes/poles,
- Signs,
- Parking meters,
- Fire hydrants,
- Street lights,
- Bike racks,
- Trees,
- Sidewalk furniture,
- Public art,
- Curb cuts, driveways,
- Bike lanes and auto traffic lane, and
- Any other physical features in the vicinity.

Storage of Materials

Storage of materials or vehicles in the right-of-way is prohibited. All furniture and other obstructions permitted by the right-of-way use permit must be removed within 7 days when not in use. Furniture and other obstructions may remain overnight or on days that the business is regularly closed.

Furniture may be secured to structures that are controlled by the operator of the adjacent business or, with permission, by the owner of the adjacent property. Furniture should be secured to allow for quick removal, such as with a cable and lock.

Transferability

Permits are not transferrable to other operators or locations.

Waste Management

The area of operation shall be maintained free of litter (including wind-blown litter). The operator shall provide container(s) for placement of food waste, recycling and/or other trash. City on-street waste receptacles shall not be used for this purpose. Waste receptacles must maintain the required pedestrian clearance at all times.

Zoning

All uses under this guide must comply with the underlying zoning.

Requirements for Food Trucks and Mobile Food Vendors

Food trucks/mobile food vendors are trucks or trailers licensed as a vehicle with Labor and Industries insignia and equipped with facilities for cooking and/or selling food.

In addition to the General Requirements above, a food truck/mobile food truck or trailer, and meet the following requirements:

1. Food trucks are only permitted where zoning allows eating establishments.
2. Food trucks must comply with International Fire Code Section 319, where applicable.
3. Approval of the abutting business(s) (or property owner, if no business is present) and any existing eating establishment(s) located within 50-feet (measured from the point of the parcel nearest to the eating establishment in a straight line along the sidewalk to the area of operation).
4. Notification of all other ground-floor businesses (or property owners) on the block and facing block, including corner lots that may have an address on an intersecting street.
5. Verification of approval from Washington State Labor and Industries (photo of tag).
6. Minimum of 10-foot separation from buildings.
7. Verification that the location can safely accommodate the food truck/mobile food trailer without impacting the traveled way.
8. Displacement of handicapped accessible stalls is prohibited.
9. Food trucks on private property (e.g. parking lot) may also be approved, subject to Fire Department review. Long-term or problem displacement of required onsite parking may require review and approval of a parking waiver or other mitigating measures. Notification of surrounding businesses is not required for onsite applications.

Upon approval to operate within a metered parking area, the permit holder must post temporary No Parking signs 24-hours in advance of the closure. The date and time of prohibited parking, name of food truck, contact phone number, permit number and Bellingham Police Department number for the closure must be listed on the sign. See example here: https://www.cob.org/Documents/planning/applications-forms/special-events/no-parking-sign-example.pdf

Upon displacement of ten (10) parking stalls within a single zoning designation (e.g. commercial area of an urban village) a temporary moratorium will be placed on the issuance of additional permits to allow for the evaluation of parking impacts. Changes to the codes and policies may be issued prior to the lifting of the moratorium. [NOTE: THE MAXIMUM PARKING DISPLACEMENT HAS BEEN PLACED ON HOLD DURING THE COVID-19 PANDEMIC]

Requirements for Parklets and Streateries

Parklets and streateries convert parking stall(s) and or drive lane(s) to public space, sidewalk cafes or other uses. They typically incorporate landscaping, art, or other amenities.

In addition to the General Requirements above, parklets and streateries must meet the following requirements:

LOCATION

1. Parklets and streateries function best in areas with existing high-level of pedestrian activity. Areas of lower activity/visibility will be reviewed on a case-by-case basis.
2. The location must not have a grade greater than 5% or a speed limit above 25 mph.
3. Approval of the abutting business(s) (or property owner, if no business is present) is required, and notification of all other ground-floor businesses (or property owners) on the block and facing block, including corner lots that may have an address on an intersecting street.
4. Use of handicapped accessible stalls is prohibited.
5. The parklet or streatery may not block stormwater drainage areas or other street side utilities or amenities.

Upon displacement of ten (10) parking stalls within a single commercial area (e.g. commercial area of an urban village), a temporary moratorium will be placed on the issuance of additional permits to allow for the evaluation of parking impacts. Changes to the codes and policies may be issued prior to the lifting of the moratorium. [NOTE: THE MAXIMUM PARKING DISPLACEMENT HAS BEEN PLACED ON HOLD DURING THE COVID-19 PANDEMIC]

STREATERIES

Table service within a parklet is permitted. However, streateries should be open and welcoming to passersby during non-business hours. If alcohol will be consumed within the streatery, additional endorsements to the liquor license may be required. Contact the Washington State Liquor and Cannabis Board for more information and additional requirements. Alcohol consumption is prohibited within a public parklet.

ACCESS AND REMOVAL

Because parklets and streateries may sit on top of critical infrastructure and utilities such as gas lines, sewer and water mains, they need to be designed for easy removal in case of an emergency.
Parklets and streateries are reviewed according to the NACTO design guidelines: *https://nacto.org/publication/urban-street-design-guide/interim-design-strategies/parklets/*. Additional traffic safety features may be required, depending on the specific conditions at the proposed parklet or streatery location.

ACCESSIBILITY/ADA COMPLIANCE

Parklets and streateries must be ADA compliant, including at least one entrance leading into the area being a minimum of 3-feet wide. If there is a change of grade, a ramp with a non-skid surface, a minimum 3-feet in width and slope not greater than 1:12 shall be provided by the operator.

REGISTERED PLANS FOR MODULAR DESIGNS

Plan sets developed by a licensed engineer for outdoor coverings may be reviewed and registered by the Building Division. Applicants wishing to use a registered plan shall first contact the plan owner and coordinate the construction documents for the proposed site. The applicant should submit the stamped, approved plans with their specific application. The City provides no assurance that the modular design will meet the City's building and Fire codes until a review occurs based on your specific site plan.

REQUIREMENTS FOR COVERINGS/STRUCTURES WITHIN THE RIGHT-OF-WAY

Interim solutions for weather protection of parklets and streateries were permitted during the beginning of the COVID-19 pandemic. Renewal of previously issued permits and approval of new parklets and streateries will be based on compliance with the following requirements:

BUILDING PERMIT REQUIREMENTS:

- Construction or installation of any structure greater than 120 square feet requires a Building Permit. Building Permits for all covered structures will include a Fire Department review line.
- All structures constructed or installed in the public right of way shall be constructed of rigid materials and shall not have the appearance of a temporary tent or tent-like structure.
- Structures with sidewall and overhead elements must be accompanied with wind resistance calculations. In addition, structures shall be properly weighted, anchored, or secured to the ground without penetration (staking, drilling, etc.) into the public parkway, sidewalk, or street. Engineering may be required.
- Any fabric or tent-like material serving as walls or overhead weather protection shall have a manufacturer's fire-resistance certification or flame certification attached to the material element. Spray-on or rolled-on flame-resistance treatments will not be accepted.
- If the structure will have non-fabric overhead weather protection, the overhead material shall be non-combustible (i.e. sheet metal).
- A structure's framework must be sufficient in size, spacing, and strength to accommodate the effects of all anticipated loads. All framing intersection/joints shall be mechanically anchored to one another creating a secure connection. Engineering may be required.
- Structures may not block or impede the main entrances of the business or adjacent businesses and a clear path for egress must be always maintained. Exits shall be apparent.
- All temporary power installations must be code compliant and require an electrical permit. Electrical cords located on public sidewalks and pathways will not be permitted.

- Accessibility shall be provided into the dining area with an elevation difference no greater ½". If utilized, ramps shall have a slope no greater than 1:12, be slip resistant and maintain a minimum of 36" width between obstructions and/or handrails.

- Parklets and streateries shall not interrupt existing public right of way ADA provisions and/or street drainage. A Public Works final inspection will be performed under the building permit or right-of-way use permit.

- Parklet and streatery structures shall not block or impede the use of fire hydrants or a building's fire department connection.

HEATING ELEMENTS:

- All heating elements shall be listed for the intended use and used/maintained in accordance with manufacturer's instructions.

- Vented, non-portable fuel-fired heaters (propane, natural gas) are prohibited within parklets and streateries. Use within sidewalk cafes will be evaluated on a case-by-case basis.

- Unvented portable fuel-fired heat sources (i.e., propane patio heaters, propane fire tables, infrared propane heaters, etc) shall not be permitted indoors, within any enclosed structure, within 5 feet of a building or exit, or beneath or closer than 5 feet to combustible decorations, overhangs, awnings, sun shades or attachments to buildings.

- Installation of exterior outlets and/or non-portable electric heating equipment is allowable and shall be reviewed under an Electrical Permit obtained from the Building Services Division. Radiant heating installed overhead with conduit is an ideal solution for providing heat. Electric heating equipment shall comply with the National Electrical Code (NFPA 70).

- Portable electric heaters are allowed. Portable heaters shall have a UL or other NRTL listing, over-temperature protection, tip-over switch, and maintain clearances required by the manufacturer, but in no case less than 3 feet from any person or combustible material. The heater shall utilize a single, UL-listed outdoor extension cord rated for the amperage and provided with GFCI protection or be provided with a temporary power supply approved by the Building Services Division. Cords and other power supply elements may not pass-through building openings (windows, doors, etc) or cross the sidewalk and must be installed overhead with a minimum of 8-feet of clearance.

Requirements for Sidewalk Cafés

Sidewalk cafés provide open-air seating for eating or drinking establishments. Sidewalk cafes are often located partially on private property and spill out into the sidewalk or may be established within an approved parklet ("streatery"), subject to certain conditions.

In addition to the General Requirements above, a sidewalk cafe must meet the following requirements:

LOCATION

1. Permitted adjacent to an approved eating or drinking establishment, with business owner approval.
2. A minimum of 8-feet of open public sidewalk must be available (5-feet for an ADA-compliant walkway and 3-feet for roadside features) before a sidewalk café may be considered.
3. In areas with a sidewalk width less than 8-feet, a streatery may be constructed to accommodate the sidewalk café (see specific requirements for parklets and streateries).

ALCOHOL SERVICE

- If alcohol will be consumed within the sidewalk café, additional endorsements to the liquor license may be required. Contact the Washington State Liquor and Cannabis Board for more information and additional requirements, including options for barrier-free sidewalk cafes.
- Consumption of alcohol will require an additional alcohol endorsement on the Certificate of Liability Insurance. See attached Insurance Requirements summary.
- Barrier-free sidewalk cafes shall place diverters on either end of the café footprint that are between 30-40 inches tall, extend the entire length of the footprint, and abut the adjacent building extending at a 90-degree angle from the building face.
- Demarcations for barrier-free cafes must be approved by the State Liquor Control Board.
    - Maximum lip height is ¼", or ½" if beveled appropriately; and
    - Any installation should be removable without damaging the sidewalk.

DESIGN /ADA COMPLIANCE

- Sidewalk café covers or structures located within the public right-of-way must comply with the "Coverings and Structures" requirements within the parklet/streatery chapter, above.
- Seating must be detectable to those with disabilities. Before purchasing fencing or furniture, consider its accessibility and design to those with vision impairment or mobility devices.
- If fencing is used, it shall be 30-42" in height (42" if alcohol is served).
- Fencing must be cane-detectable using one of the following elements (See Figures 9-11 below):
    - Toe rail with top edge a minimum of 6" in height and bottom edge no higher than 2" above ground surface (Figure 9), or
    - Continuous, firm barrier at 27" or less above the ground (Figure 10), or
    - Landscaped planters at least 30" tall, spaced no more than 24" apart (Figure 12).

- The entrances/exits to the café shall be parallel to the building face, not in line with the straight path of travel, to avoid pedestrians who are blind or low vision inadvertently entering the café.
- At least one entrance into the café area shall be a minimum of 3-feet wide and easily accessible from any point within the sidewalk café, parklet or streatery.
- All installations shall be easily removable. Bolt-down features with threaded studs protruding from the sidewalk, and other similar permanent features, are not permitted.

FIGURE 9. FENCING DESIGN FOR CANE DETECTABILITY: TOE RAIL

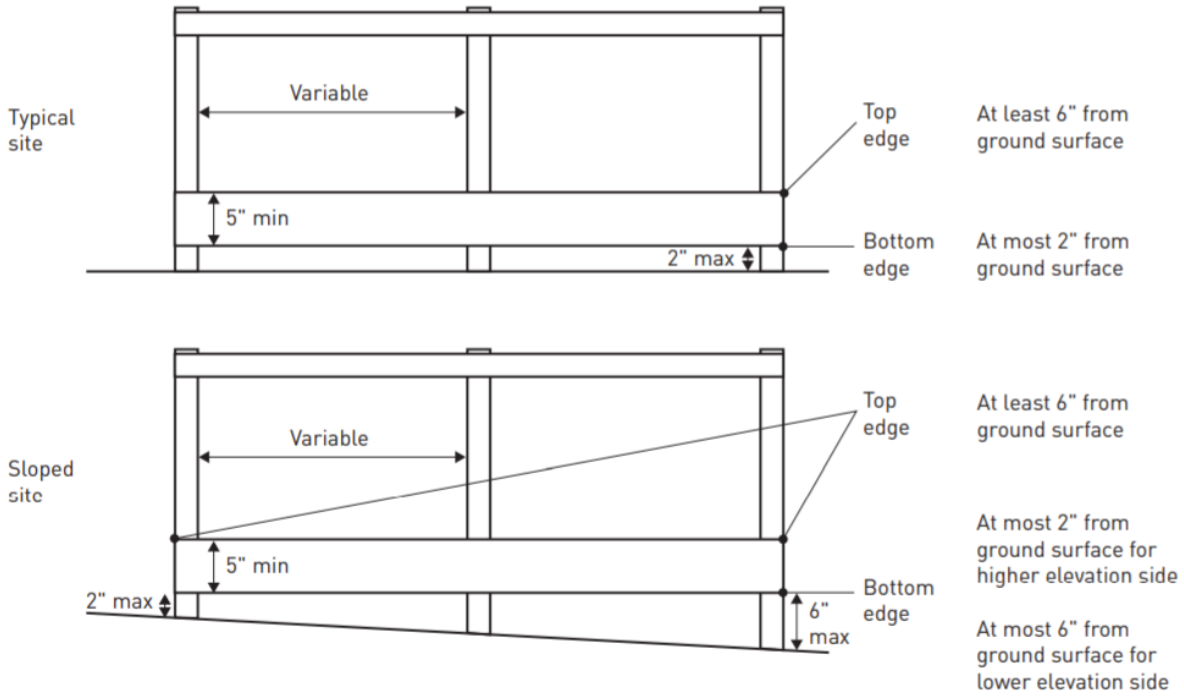


FIGURE 10. FENCING DESIGN FOR CANE DETECTABILITY: 27-INCH TALL RAILING

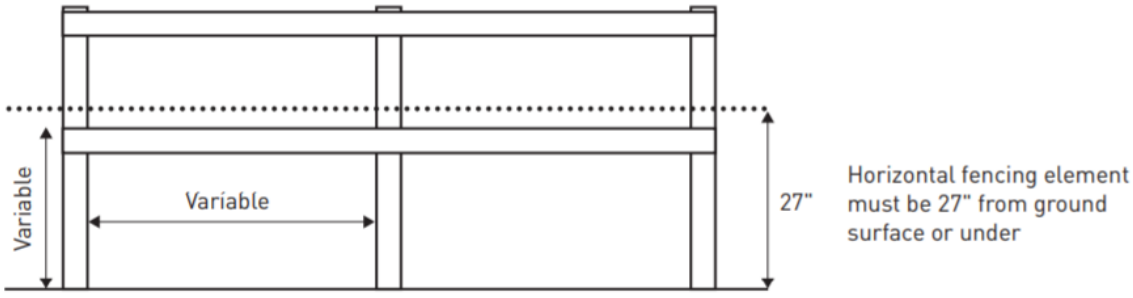


FIGURE 11. CANE DETECTABILITY OF OBJECTS PROTRUDING FROM FENCING

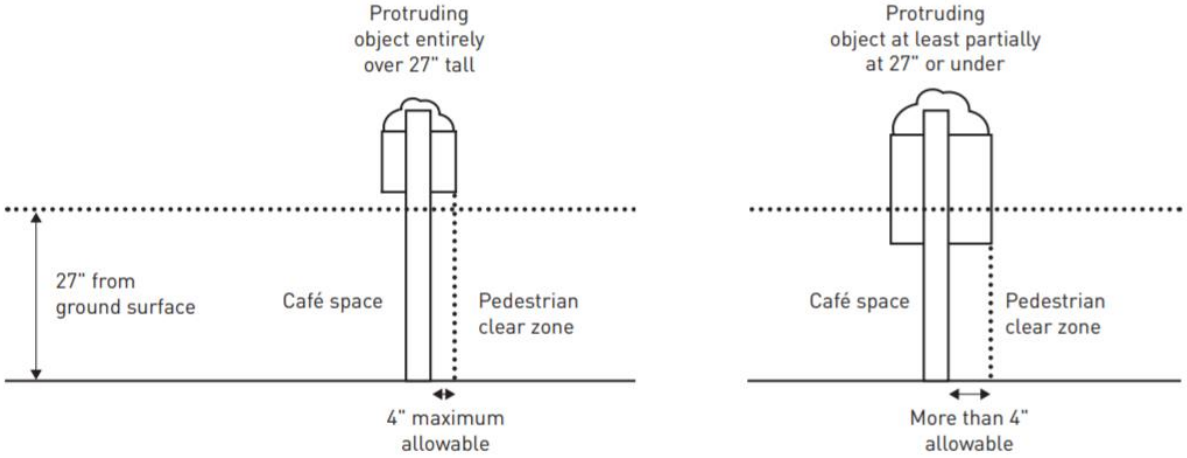
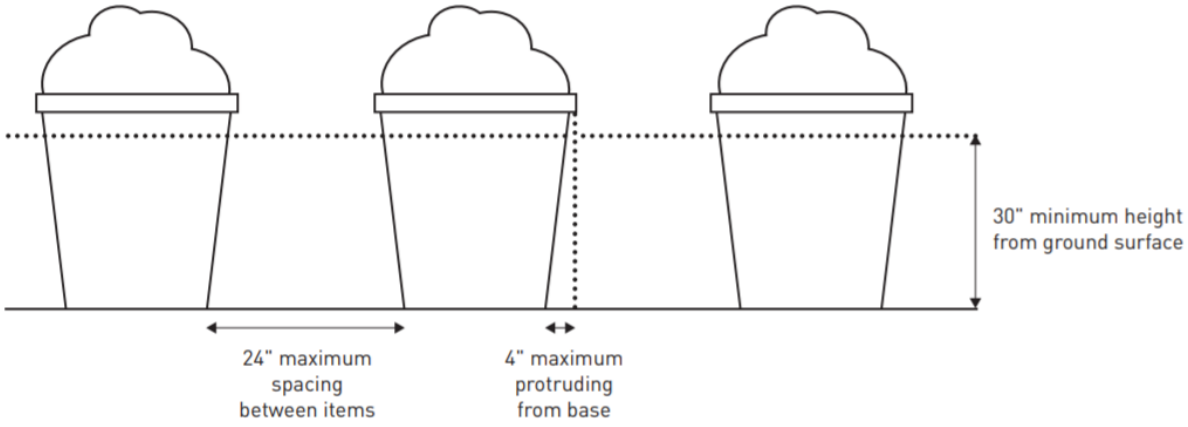


FIGURE 12. PLACEMENT REQUIREMENTS FOR PLANTERS USED IN LIEU OF FENCING



Requirements for Sidewalk Vendors

A sidewalk vendor sells or distributes food or other products on the public sidewalk. It is different from a food truck/mobile food vendor in that the cart is easily and quickly moved by one operator and is not licensed as a vehicle for roadway use.

In addition to the General Requirements above, a sidewalk vendor must meet the following requirements:

LOCATION

1) Approval of the abutting business(s) (or property owner, if no business is present) is required.
2) If food is being sold, approval of any eating establishment within 50-feet (measured from the point of the parcel nearest to the eating establishment in a straight line along the sidewalk to the area of operation) is required.
3) Notification of all other businesses (or property owners) on the block and facing block, including corner lots that may have an address on an intersecting street, is also required.

ITEMS OR SERVICES FOR SALE

- Items or services shall involve a short transaction period to complete the sale or render the service.
- Items must be immediately consumable or easily carried by pedestrians.
- Persons selling produce and other food products produced by themselves, as exempt by RCW **36.71.090** and businesses selling items adjacent to their business do not require a permit.

City Council Agenda Bill

23212

Bill Number

Subject: **Return to City Facilities Planning**

Summary Statement: Since March 2020, approximately 20% of the City's workforce has utilized remote work in the delivery of City services to the public. The Administration will present its plan to return those City employees currently telecommuting to City facilities. The vaccination requirement, continued indoor mask requirements, and updated telecommuting policy will allow employees to continue to provide high quality service to the community in City facilities. The Administration will also present its directive to Boards and Commissions as well as it's recommendation that City Council continue to meet remotely.

Previous Council Action: **N/A**

Fiscal Impact: **N/A**

Funding Source: **N/A**

Attachments: 1. STAFF MEMO

Meeting Activity	Meeting Date	Recommendation	Presented By	Time
Mayor's Report - Direction Requested	12/13/2021	Provide Direction	Brian Heinrich, Deputy Administrator	5 minutes

Recommended Motion:

Council Committee:
Committee Of The Whole

Agenda Bill Contact:
Brian Heinrich, Exec, x8117

Council Action:

Reviewed By	Department	Date
Brian M. Heinrich	Executive	12/06/2021
Alan A. Marriner	Legal	12/07/2021
Seth M. Fleetwood	Executive	12/07/2021

City of Bellingham
210 Lottie Street
Bellingham, WA 98225

MEMORANDUM

TO: **BELLINGHAM CITY COUNCIL**

FROM: **BRIAN HEINRICH, JANICE KELLER, ALAN MARRINER, ELIZABETH MONAHAN, NICOLE OLIVER, SCOTT ELSNER**

CC: **MAYOR SETH FLEETWOOD, DEPARTMENT HEADS**

SUBJECT: **RETURN TO CITY FACILITIES**

DATE: **DECEMBER 13, 2021**

This memo describes the Administration's plan for returning City employees to City facilities and conducting ongoing Board and Commission meetings, and recommends City Council continue meeting remotely.

1. **Employee return to city facilities:**

    a. Employees will return to City facilities on Monday, January 3, 2022. Some employees may utilize the telecommuting policy that allows employees (with supervisor and Department Head approval) to continue remote work for up to three days a week subject to City business needs.

    b. The Administration believes that in order to provide the high level of service required to effectively deliver city services, our employees need to be at city facilities. Additionally, we are at nearly 100% vaccination status for City employees with appropriate accommodations made for those that didn't get vaccinated and do not have a public interfacing position. Indoor mask mandates, which are still in effect, add another layer of protection. Finally, appropriate use of the Telecommuting policy will potentially limit the number of individuals in any given workspace.

2. **Boards and Commissions:**

    a. Boards and Commissions will continue to meet remotely for an indefinite time.

    b. Vaccine requirements apply to City volunteers, but we are not prepared to accommodate submission of proof of vaccinations at this time. Additionally, continuing remote Boards and Commissions meetings will lessen the burden on City staff who will be returning to facilities.

3. City Council meetings:

a. Council has three options for conducting Council meetings and we are recommending that you continue to meet remotely in the near-term. You could, however, choose to meet in-person or in a hybrid model, but we wouldn't recommend either option prior to your Monday, January 24, 2022 meeting.

b. Considerations for Council discussion and direction are not limited to the following but include:
    i. If the hybrid model is chosen, either one or both the City Council president and Council president pro tem need to be in attendance in Chambers
    ii. For either hybrid or in-person meetings, we need to plan for in-person public attendance and revisit protocols for disruption and adjournment
    iii. If the hybrid model is chosen, we need to plan for both remote and in-person testimony at public hearings
    iv. Under all three scenarios, Council needs to decide what their plans are for resuming public comment, if any.

4. Other considerations:

a. We acknowledge that the return to city facilities will be much more difficult than when we left our offices in March of 2020. All our plans are made with the knowledge that the situation is dynamic. There are many logistics involved with returning more than 100 employees to in-person work. Further, the global pandemic appears to be far from subsiding, with reports of another surge and the Omicron variant now emerging. We remain flexible, we will keep lines of communication open for changing circumstances, and we will move forward with flexibility, patience and kindness as our guiding principles.

City Council Agenda Bill

23213

Bill Number

Subject: **Adoption of the 2021 Whatcom County Multi-jurisdictional Natural Hazards Mitigation Plan**

Summary Statement: The Fire Department's Office of Emergency Management has been working with Whatcom County Emergency Management to update the Whatcom County Multi-Jurisdictional Natural Hazards Mitigation Plan (NHMP). The update of the plan is now complete and has received preliminary approval from FEMA. To reach final approval, the plan must be adopted by the participating jurisdictions. The proposed resolution included in the packet contains a web address to the 2021 Plan hosted on the County website.

Previous Council Action: **Update on the NHMP Planning Process March 22, 2021**

Fiscal Impact: **Completed plan allows the City to apply for funding for future mitigation projects.**

Funding Source: **N/A**

Attachments:
1. STAFF MEMO
2. RESOLUTION

Meeting Activity	Meeting Date	Recommendation	Presented By	Time
Committee Briefing - Vote Requested	12/13/2021	Pass Resolution	Chief Bill Hewett	10 minutes

Recommended Motion:

Council Committee:
Committee Of The Whole

Agenda Bill Contact:
Chief Bill Hewett, Fire Department

Council Action:

Reviewed By	Department	Date
Bill C. Hewett	Fire Department	12/07/2021
Matthew T. Stamps	Legal	12/07/2021
Seth M. Fleetwood	Executive	12/07/2021

City of Bellingham
210 Lottie Street
Bellingham, WA 98225

MEMORANDUM

TO: Bellingham City Council

FROM: Bill Hewett, Fire Chief

CC: Mayor Fleetwood

SUBJECT: Natural Hazards Mitigation Plan

DATE: 11/16/2021

The update of the 2011-2016 Whatcom County Multi-jurisdictional Natural Hazards Mitigation Plan (Plan) began in January of 2021 with participation from all Whatcom County cities and some special purpose districts. The initial phase of the process included public meetings, news releases and social media outreach. The City of Bellingham's Emergency Manager met with staff from multiple City of Bellingham (City) departments to solicit revisions. By June 2021 the revised City section was part of the Plan submitted to Federal Emergency Management Agency (FEMA) for initial review and comments. The Plan was resubmitted In September with responses to comments generated during FEMA's review. FEMA has now committed to approving the Plan pending approval of the participating jurisdictions.

The City section of the Plan (City's Plan) has been reorganized to reduce duplication of actions and to improve access to the information. Actions that recognize the influence of climate change on the intensity and/or frequency of natural hazards have been clarified or added. The City's Plan is the first part of Section 3. Jurisdiction Profiles and Mitigation Action Plans …. Page 189.

The City's Plan includes sections on hazard presence and impacts, hazard maps, areas and assets exposed, a report on 2016-2020 actions, the Bellingham Hazard Mitigation Strategy for 2021-2025, and Hazard Specific Action Items 2021-2025 report format.

RESOLUTION NO. _____

RESOLUTION TO ADOPT THE 2021 WHATCOM COUNTY MULTI-JURISDICTIONAL NATURAL HAZARDS MITIGATION PLAN

WHEREAS, identifying natural hazards and making plans to reduce or eliminate risk to human life, property, and the environment results in a safer community; and

WHEREAS, the Disaster Mitigation Act of 2000 (P.L. 106-390/44 CFR Parts 201.6) reinforce the importance of mitigation planning and emphasizes planning for disasters before they occur; and

WHEREAS, states and communities must have an approved mitigation plan in place prior to receiving post-disaster Federal Emergency Management Agency (FEMA) Hazard Mitigation Assistance grants; and

WHEREAS, the planning process used is intended to facilitate cooperation between state and local authorities and encourages local input; and

WHEREAS, Bellingham participated in the Whatcom County Multi-Jurisdictional Natural Hazards Mitigation Plan ("Whatcom County NHMP") up-date process by updating the Bellingham specific Section 3 of the plan; and

WHEREAS, an updated version of the NHMP was completed and submitted to the FEMA Region 10 in September 2021 ("2021 Whatcom County NHMP"); and

WHEREAS, the FEMA Region 10 completed a pre-adoption review of the 2021 Whatcom County NHMP ; and

WHEREAS, the FEMA Region 10 has declared the commitment to approve the 2021 Whatcom County NHMP upon receiving documentation of its adoption by participating jurisdictions.

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF BELLINGHAM DOES HEREBY RESOLVE AS FOLLOWS:

The Bellingham City Council hereby adopts the 2021 Whatcom County Multijurisdictional Natural Hazards Mitigation Plan, available on the Whatcom County website at: https://www.whatcomcounty.us/3569/2021-Natural-Hazards-Mitigation-Plan.

PASSED by the Council this _____ day of _____, 2021.

_____
Council President

APPROVED by me this ____ day of _____2021.

_____
Mayor

ATTEST:

_____
Finance Director

APPROVED AS TO FORM:

_____
Office of the City Attorney

Published:

_____

City Council Agenda Bill 23180

Bill Number

Subject: **Continued Review of an Ordinance Amending the Infill Housing Toolkit Provisions of the Bellingham Municipal Code**

Summary Statement: The Infill Housing Toolkit (ITK) was enacted in 2009 to allow and encourage the development of alternative housing forms and ownership opportunities. Staff have proposed a number of targeted amendments to the ITK provisions in BMC Titles 20, 21 and 23.

The City Council held a Public Hearing on December 6, 2021 and assigned the matter to committee for further review.

Previous Council Action: **2009 adoption of Infill Housing Toolkit provisions of the BMC**

Fiscal Impact: **2021-2022 Budget**

Funding Source: **General Fund**

Attachments: 1. DRAFT ORDINANCE WITH EXHIBIT A

Meeting Activity	Meeting Date	Recommendation	Presented By	Time
Committee Briefing - Direction Requested	12/13/2021	Provide Direction	Greg Aucutt, Kathy Bell, Chris Koch, PCDD	5 minutes

Recommended Motion:

Council Committee:
Committee Of The Whole

Agenda Bill Contact:
Greg Aucutt, Planning and Community Development, 360-778-8300

Reviewed By	Department	Date
Gregory R. Aucutt	Planning & Community Development	12/06/2021
James E. Erb	Legal	12/07/2021
Seth M. Fleetwood	Executive	12/07/2021

Council Action:

Attachment 1

ORDINANCE NO. _____

AN ORDINANCE OF THE CITY OF BELLINGHAM AMENDING TITLES 20 AND 21 OF THE BELLINGHAM MUNICIPAL CODE REGARDING INFILL HOUSING PROVISIONS.

WHEREAS, the infill housing chapter, Chapter 20.28 BMC, was established in 2009 to introduce innovative housing types meant to offer alternative housing forms in addition to the city's familiar and typical single and multifamily development; and

WHEREAS, between 2009 and 2015, the city received few applications under these provisions;

WHEREAS, since 2015, the city has seen an increased interest to utilize the infill housing provisions and continues to process a significant number of land use applications for these housing types; and

WHEREAS, zoning and development codes are intended to be amended periodically to implement the visions, goals and policies of the comprehensive plan. The infill housing provisions have been modified only a few times as necessary to address new land use regulations concerning ADUs, stormwater, land division and the RM Project and have not been amended to address beneficial code refinements; and

WHEREAS, the intent of this ordinance is to implement minor amendments to the Infill Housing chapter to address identified site planning and bulk and mass limitations to further the city's goals and policies of establishing development with pedestrian oriented design, encourage reliance on alternative modes of transportation, utilize the remaining developable land more efficiently and create opportunities for more housing choice, home ownership, and affordable housing; and

WHEREAS, the responsible official reviewed the proposed amendments under the procedures of the State Environmental Policy Act and issued a non-project Determination of Non-Significance (SEP2021-0044) on October 20, 2021; and

WHEREAS, as required by RCW 36.70A.106, notice of the City's intent to adopt the proposed Comprehensive Plan amendments was sent the Department of Commerce on October 27, 2021; and

WHEREAS, after mailed and published notice as required by the Bellingham Municipal Code, the Planning Commission held a public hearing on the proposed amendments on November 4, 2021 and a work session on November 18, 2021; and

WHEREAS, the Planning Commission determined that the proposed amendments comply with and will implement the goals and policies of the 2016 Bellingham Comprehensive Plan; and

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

WHEREAS, the Planning Commission considered the staff report and public comments and thereafter made Findings of Fact, Conclusions and Recommendations for approval of the proposed amendments by a 6 - 1 vote; and

WHEREAS, after mailed and published notice as required by the BMC, the City Council held a public hearing on the proposed amendments on December 6, 2021; and

WHEREAS, the City Council conducted a work session on December 13, 2021; and

WHEREAS, the City Council has considered the recommendation of the Planning Commission, the staff report, other meeting materials, and all public comments and hereby adopts the Findings of Fact, Conclusions and Recommendations of the Planning Commission; and

WHEREAS, the City Council finds that the proposed amendments are consistent with the Growth Management Act, the Bellingham Municipal Code, and the 2016 Bellingham Comprehensive Plan.

NOW, THEREFORE, THE CITY OF BELLINGHAM DOES ORDAIN:

Section 1. Bellingham Municipal Code, Section 20.00.200 concerning Attachment 1 is hereby amended as follows:

Residential development in Area 8 is limited to:

1. Attached and detached accessory dwelling units subject to the provision in BMC 20.10.036.

2. Infill housing subject to the provisions in Chapter 20.28 BMC, and further limited to the following infill housing forms and standards:

~~a. BMC 20.28.060, Smaller house.~~

a~~b~~. BMC 20.28.070, Small lot~~house~~.

b~~e~~. BMC 20.28.080, Cottage.

c~~d~~. BMC 20.28.140, Townhouse. Maximum of two units may be attached with each unit located on a "fee simple lot." Townhouses are not permitted along Illinois Street.

~~3. Single floor area limits specified in Chapter 20.28 BMC may be exceeded on the first story of a dwelling unit, provided the maximum floor area ratio allowed for each housing type is not exceeded.~~

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

Section 2. Bellingham Municipal Code, Section 20.12.030(E) concerning Landscaping is hereby amended as follows:

E. *Green Factor Measurement.* The following standards apply to certain areas and uses that require landscaping to meet a minimum green factor score.

1. The green area factor score for a lot is determined by:

a. Multiplying the square feet, or equivalent square footage where applicable, of each of the existing and proposed landscape elements in Table 20.12.030 by the green area multiplier shown for that element~~.~~; and

b. Adding together all the products computed under subsection (E)(1)(a) of this section to determine the total green area factor~~.~~; and

c. Divide the total green area factor by the lot area to determine the green area factor score~~.~~ or

d. Green factor landscaping for infill housing development per Chapter 20.28 BMC is determined on the net portion of the parent site that is exclusive of all critical areas regulated by Chapter 16.55 BMC which are not proposed to be impacted as a result of the development.

2-7. [No Change]

Section 3. Bellingham Municipal Code, Section 20.25.020 Applicability is hereby amended as follows:

The following areas and developments are subject to design review under this chapter. No building or sign permit shall be issued for projects regulated under this chapter until design review approval has been issued unless the activity is exempt from design review under subsection (A) of this section. Buildings and activities which are exempt from the design review process shall comply with adopted site lighting standards regarding shielded outdoor lighting. The provisions of Chapter 20.14 BMC regarding nonconformance establish which of the standards and criteria in this chapter apply to developed sites. In addition, some standards in this chapter specify the level of development that requires full compliance.

A. The following activities are exempt from design review:

1. Single-family detached dwelling units unless specified otherwise in an adopted urban village regulated under this chapter or Chapter 20.28 BMC.

2. Single-family attached dwelling units consisting of less than three attached units and not located in an adopted urban village regulated under this chapter.

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

3. A duplex on a site that is not located in an adopted urban village regulated under this chapter or regulated by Chapter 20.28 BMC.

4-10. [No Change]

B. *Multifamily Residential Projects and Mixed Uses in Residential Multi Zones.*

1. The following development activities shall obtain design review approval when located in any use district except within an urban village design district listed in subsections (C) and (D) of this section, institutional general use types that are governed by an adopted institutional master plan, or when exempt by subsection (A) of this section:

a. Single-family attached residential development consisting of three or more attached units;

b. Residential development consisting of three or more dwelling units on a site;

c. Projects involving any use that is allowed as a "mixed use" by the use qualifier in residential multi zones;

d. All infill housing development pursuant to Chapter 20.28 BMC;

e. Accessory buildings for any of the developments listed above;

fe. Any additions or exterior alterations to buildings of the types listed above and/or to their associated site improvements. The design standards apply only to the proposed additions or alterations to the extent feasible while allowing the flexibility to accommodate the design of the existing improvements.

2-3. [No Change]

4. *Decision Criteria.* For projects listed in subsections (B)(1) and (2) of this section, the director shall base his or her decision on consistency with the provisions of the adopted multifamily residential design handbook.

C-G. [No Change]

DRAFT

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

Section 4. Bellingham Municipal Code, Section 20.28.010 Purpose is hereby amended as follows:

20.28.010 Purpose and intent.

A. This chapter establishes special development regulations for a series of housing forms that are ~~different than the traditional~~ in addition to the standard detached single-family ~~dwelling unit~~ and multi-family housing types. These regulations are intended to implement comprehensive plan goals and policies encouraging infill development, more efficient use of the remaining developable land, protection of environmentally sensitive areas, ~~and~~ creating opportunities for more affordable housing and increasing housing choice and diversity. ~~The housing forms listed in this chapter are intended for use in city neighborhoods, urban villages, and in Bellingham's urban growth areas as described in BMC 20.28.020.~~

B. Development and design standards in this chapter emphasize pedestrian oriented design with street oriented front porches, entries, and windows, and architectural and landscape features that add human scale visual interest and compliment building and site design. These design principals are also applied equally to lesser streets called lanes, and to common pedestrian corridors when used in lieu of streets or lanes. An intent of these design details is that they collectively contribute to and enhance the public realm, create a sense of place, foster social interaction, and make alternative transportation options more attractive, inviting, and safe to use, and thereby more likely to be used. Guiding principles are 1) parking should not be located between dwelling units and the street or lane, and 2) when garages front on a street or lane, they should be proportionally subordinate to the width of the dwelling unit, and 3) Fronting housing units on an existing street should be prioritized over fronting units internally off a new lane or common pedestrian corridor.

Figure 20.28.010 – Examples of pedestrian oriented design

DRAFT

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

C. Flexibility in applying standards to site and building design is encouraged when the proposal is consistent with the broad intent of implementing strong pedestrian-oriented design. Larger scale projects and green field development may necessitate unique design solutions and exceptions to standards that were not specifically contemplated by this chapter. This may include increased allowance in height, floor area, and other standards, especially when creating entirely new neighborhoods.

Section 5. Bellingham Municipal Code, Section 20.28.020 Applicability is hereby amended as follows:

20.28.020 Applicability.

~~A. The housing types in this chapter are not permitted in residential single zones, except as permitted in cluster subdivision pursuant to BMC Title 23, neighborhood commercial zones or property regulated by Chapter 16.80 BMC, Lake Whatcom Reservoir Regulatory Provisions, except in those areas that were annexed into the city after 1995 with a "mixed" qualifier that allows multifamily residential, and in Area 8 of the Sunnyland neighborhood. The housing types in this chapter are permitted in all other zones that allow residential, including specifically designated areas of urban villages. In the residential multi-transition zone, all forms of attached housing shall be limited to no more than 4 attached units in a single building.~~

A. The housing types in this chapter are not permitted in:

1. Residential single zones, except as permitted in:

a. Cluster subdivision pursuant to BMC Title 23,

b. Those areas that were annexed into the city after 1995 with a "mixed" qualifier that allows multifamily residential, and

c. Area 8 of the Sunnyland neighborhood,

2. Neighborhood commercial zones, or

3. Property regulated by Chapter 16.80 BMC, Lake Whatcom Reservoir Regulatory Provisions.

B. The housing types in this chapter are permitted in all other zones that allow residential uses, including specifically designated areas of urban villages.

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

C. In the residential multi-transition zone, all forms of attached housing shall be limited to no more than 4 attached units in a single building.

D If the provisions of this chapter conflict with any other provision in BMC Title 20, 21 or 23, the provisions of this chapter shall apply.

Section 6. Bellingham Municipal Code Section 20.28.030 Process is hereby amended as follows:

20.28.030 Process.

A. In accordance with Chapter 21.10 BMC, all housing forms will use either a Type I or II process, and all land use applications may be consolidated under the highest type. Design review applies as outlined in Chapter 20.25 BMC with additional design standards and guidelines as specified under each housing type.

B. Modifications – General: Applicants may request minor modifications to the ~~general parameters~~ development and design standards set forth in this chapter. The planning director or hearing examiner, when the hearing examiner makes the final decision on a design review application consolidated pursuant to BMC 21.10.060, may modify the requirements if all ~~of~~ the following criteria are met:

1. a. The site is constrained due to unusual shape, topography, easements, ~~or~~ sensitive areas~~.~~, the location of pre-existing improvements, or other extraordinary situation or condition, or

~~2. The modification is consistent with the purpose of this chapter.~~

~~3.~~ b. The granting of the modification ~~will not result in a development that is less compatible with neighborhood land uses.~~ establishes a better development pattern found to be compatible with adjacent development (existing and anticipated) including, but not limited to, pedestrian oriented development, setbacks, lot orientation, or other contextual elements associated with the proposed development; and

2. The modification is consistent with the purpose and intent of this chapter.

C. Modifications – Mixed Housing. When proposing a mix of housing types and/or uses within a project, including multifamily and commercial development when allowed by the underlying zoning, general development standards applicable to each use and housing type may be modified at the discretion of the Planning Director to account for conflicts between standards for each use and/or housing type. Examples include:

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

1. When multifamily under BMC 20.32 is proposed as a mixed use with townhouses under BMC 20.28.140, there is no internal setbacks between buildings, minimum lot sizes, or minimum lot dimensions and open space and parking areas may be consolidated.

2. Internal setbacks, open space, usable space, lot coverage, and other standard requirements may be averaged or reduced to the minimum allowed by any housing type or use proposed within a development. In some cases, the Director, may require the maximum or increased standards to mitigate a reduction in other standards.

The objective for granting administrative modifications in this subsection (C) shall be to facilitate a unified internal design that minimizes the presence of private surface parking, is compatible with abutting development (existing or anticipated), reduces conflict and redundancy in regulations and is consistent with the purpose and intent of this chapter.

D. Modification - Front Porches. The minimum sizes of front porches as specified for each housing type in this chapter may be averaged within a project when consistent with a plan to provide greater diversity and individuality in housing designs.

E. Property ownership may be held in common, through a subdivision or a binding site plan.

Section 7. Bellingham Municipal Code, Section 20.28.040 Definitions is hereby amended as follows:

20.28.040 Definitions.

The following definitions apply to this chapter:

"Alley, private" means, a private hard-surfaced facility for use by vehicles, utilities, and/or other necessary service functions, but which affords only a secondary means of access.

"Common pedestrian corridor" means a defined space containing a hard-surface facility with the primary intent of providing non-motorized pedestrian access from multiple dwelling units to an abutting street or to on- or off-site amenities(s).

"Common shared structure" means a building or structure designed and intended for the common use of the residents of the cottage housing.

~~"Cottage housing" means a coordinated grouping of four to eight small detached single-family dwellings clustered around common open space and having shared parking.~~

DRAFT

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

"Design guidelines" means guidelines for meeting the intention of the ordinance.

"Design standards" means requirements related to the design of the project. Developments are required to meet the design standards in this chapter.

~~"Duplex" means a building containing only two dwelling units.~~

~~"Garden court housing" means four to eight dwelling units clustered around a common open space or courtyard.~~

"Lane" means a private street that provides both pedestrian and vehicle access designed with a change of material, that may include a unique paving pattern, that serves as visual ques for reducing or slowing the flow of traffic and within which pedestrians and cyclists have priority over motorists.

"Parent site" means all area within the boundaries of the subject property included in the land use application.

~~"Shared court housing" means four to six dwelling units oriented to a shared courtyard providing access for both vehicles and pedestrians but designed to give priority to pedestrians.~~

~~"Small house" means detached single-family dwelling units on lots over 3,000 square feet but not more than 5,000 square feet in size.~~

~~"Smaller house" means detached single-family dwelling units on lots 1,800 square feet to 3,000 square feet in size.~~

~~"Townhouse" means a dwelling in a row of units in which each unit has its own front and rear access to the outside, no unit is located over another unit, and each unit is separated from any other unit by one or more vertical common walls.~~

~~"Triplex" means a building containing only three dwelling units.~~

Section 8. Bellingham Municipal Code, Section 20.28.050 General Standards is hereby amended as follows:

A. *Pedestrian oriented design*. All development in this chapter shall incorporate the following pedestrian oriented design standards and guidelines:

1. Fronting infill housing units on existing improved streets shall be prioritized over fronting units internally off a new street, lane, or common pedestrian corridor. Gaps may occur as necessary for

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

building setbacks, vehicular and pedestrian access, and features that contribute to the pedestrian realm.

2. Parking shall not be located between dwelling units and the street or lane except as allowed in this chapter.

3. Site design shall prioritize locating parking off an alley to minimize pedestrian/auto conflicts with cars backing out across pedestrian facilities such as city sidewalks and lanes.

4. When alley access is not available or feasible, and street/lane loaded garages are necessary:

   a. The width of the garages and driveways accessing a street or lane shall be proportionally less than the width of the dwelling unit. See Figures 20.28.050(A) and (B).

   b. The maximum width of a driveway serving an individual unit that crosses a pedestrian facility associated with a street or lane shall not be more than twelve feet (12'). See Figure 20.28.050(A).

   c. Architectural and landscaping details shall be embellished to minimize the visual presence of the garages and any open driveway parking. See Figures 20.28.050(B) and (C).

   d. Parking shall only be located between the dwelling units and the street or lane when in conjunction with a driveway access to a garage.

Figure 20.28.050(A)

DRAFT

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

Figure 20.28.050(B) – Design strategies to minimize garages and driveways

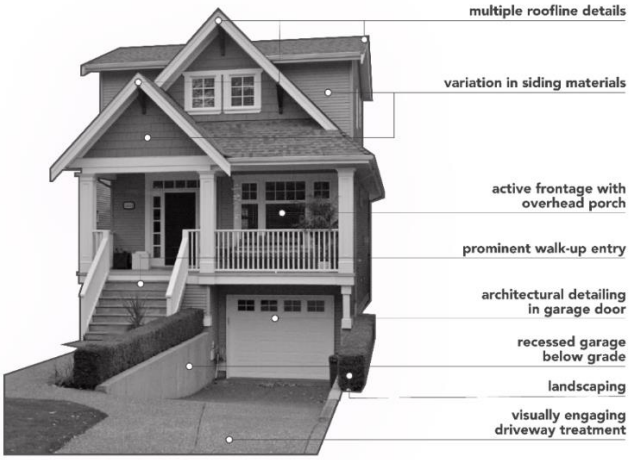


Figure 20.28.050(C) - The figures below show an example of townhouses that incorporate the design principles detailed in Figure 20.28.050(B) above, and how the visibility of their garages is diminished as viewed from different angles.

Images courtesy of Matt Remsbecher, Slab Design Inc.

~~A~~B. *Density.* Density shall be as specified in the associated area in the zoning table. If there is more than one density listed, the highest listed density for any housing type specified in the applicable neighborhood subarea pursuant to zoning tables in Chapter 20.00 BMC shall be considered the maximum possible density. The maximum density may be exceeded through the density bonus provisions pursuant to BMC 20.32.040(B)(5) and BMC 23.08.040(C).

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

~~B~~C. *Lot Requirements.* There are no minimum lot dimensions, lot sizes or minimum street frontage requirements unless otherwise specified in this chapter. All infill housing development shall provide access to a public right-of-way whether directly, by easement, or other means acceptable to the Planning Director. ~~Up to eight dwelling units may take access from a single private lane in place of public street frontage.~~

~~C~~D. *Subdivision.*

1. Infill housing units approved as part of a cluster subdivision in single-family zoning subareas with a cluster, cluster detached, and cluster attached shall be located on separate, fee simple lots. All cluster subdivisions that include infill housing types shall comply with the lot transition provision pursuant to BMC 23.08.060(F)(1).

2. Sites with duplex, triplex, fourplex, cottage, shared court, garden court, and townhouse types in all other zoning areas permitting infill housing types may be subdivided into lots that do not comply with development standards in BMC Titles 20 or 23 individually, as long as the parent site as a whole complies with this chapter. Where allowed by zoning, this provision also applies to subdivision of individual commercial, multifamily, and other uses onto separate lots when proposed as mixed uses with an infill housing development. Subsequent alterations to buildings are subject to review and approval of plans such that they are consistent with the regulations in this chapter that were previously applied to this site.

3. The plat shall contain notice of any associated land use approvals. ~~Subsequent alterations to buildings are subject to review and approval of plans such that they are consistent with the regulations in this chapter that were previously applied to this site.~~

~~D~~E. *Common Facilities.* Legal documents identifying the rights and responsibilities of property owners and/or the homeowners' association for use and maintenance of common facilities shall be submitted for approval by the planning director and recorded. When part of a subdivision they shall be noted on the plat.

~~E~~F. *Encroachments and common wall development ~~into Required Setbacks~~.* ~~The following architectural features are permitted to project two feet into the required setback: bay windows, chimneys, porches, balconies, facade treatment and other architectural features approved by the planning director.~~

1. Encroachments into required yards are allowed as specified in BMC 20.10.080(B).

2. For common wall development such as townhouses and detached garages, and encroachments over property lines such as eaves, a joint agreement must be approved as to form by the City of

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

Bellingham and recorded with the Whatcom County auditor's office and thereafter filed with the city.

3. Required building setbacks from streets may be reduced to be consistent with that allowed by the underlying zoning for other permitted housing types such as apartments in multifamily zoning.

~~F~~G. *Private Lanes, Common Pedestrian Corridors, and Alleys.* The following applies to the design and development of private transportation facilities within a development.

1. Each lot must abut a street, ~~or~~ lane, or common pedestrian corridor except lots for individual units in ~~cottage,~~ shared court~~, and garden court~~. Each dwelling unit must abut and have access to a pedestrian facility that provides access to a street or lane.

2. Lanes and common pedestrian corridors shall be considered streets for frontage, setback and design purposes.

~~2. Private lanes and alleys must be surfaced with a hard material such as concrete or asphalt. The use of permeable pavement shall be used for hard surface ground cover areas unless infeasible per the infeasibility criteria listed within BMP T5.15 of the Ecology Manual. Projects that include less than 2,000 square feet of new or replaced impervious surface are exempt from this requirement. Gravel or loose material is prohibited.~~

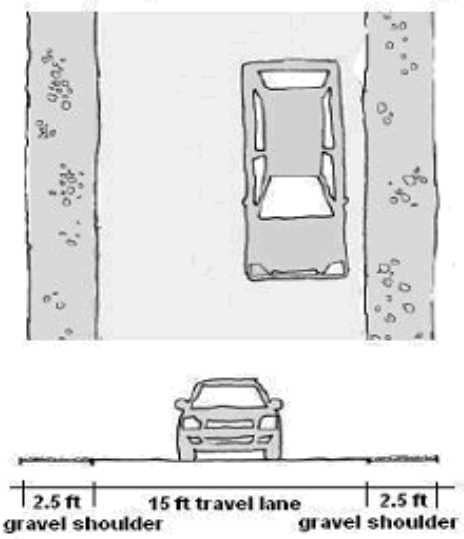
~~3. Lanes and alleys must be maintained to city standards, and legal documents regarding common facilities and maintenance must be submitted for approval by the planning director and recorded.~~

~~4.~~3. Lanes, common pedestrian corridors, and alleys must be constructed and maintained to the following minimum improvement standards:

Table 20.28.050

	Travel Lane Width	Pedestrian Path Width	Total Width
Small Lane (one to two dwelling units)	9 feet	N/A	9 feet
Medium Lane (three to five dwelling units	11 feet	4 feet, one side	15 feet
Large Lane (six plus dwelling units and lanes over 100 feet long)	12 feet	4 feet, both sides	20 feet
Alleys	15 feet	N/A	~~20~~ 15 feet
Common Pedestrian Corridor	N/A	4 feet	10 feet

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270



~~Figure 20.28.050(A) Typical Alley Plan and Section~~

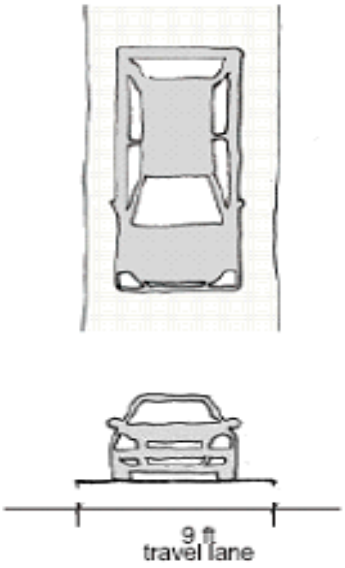


Figure 20.28.050(DB) Small Lane Plan and Section

DRAFT

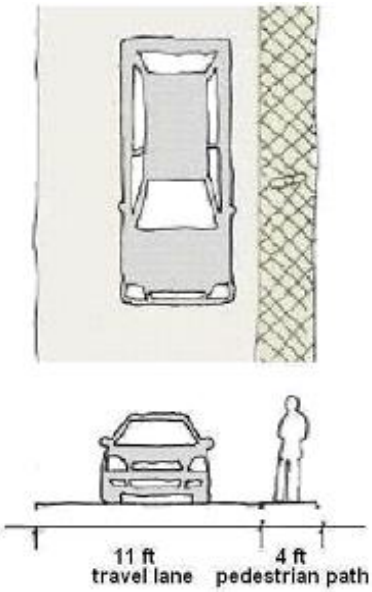


Figure 20.28.050(E~~C~~) Medium Lane Plan and Section

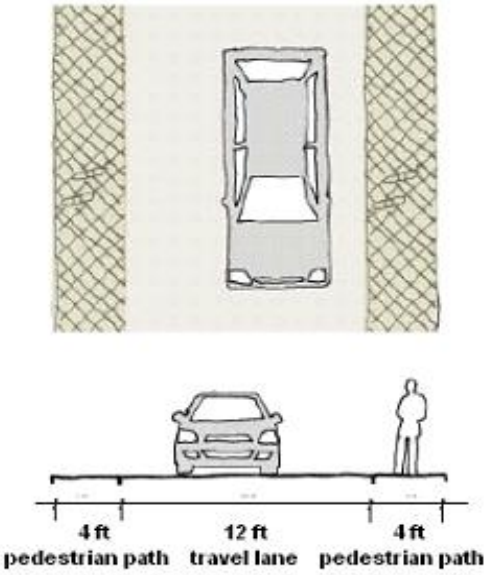


Figure 20.28.050(F~~D~~) Large Lane Plan and Section

4. Lanes, common pedestrian corridors, and alleys must be:

   a. Surfaced with a hard material such as concrete or asphalt, except that asphalt shall not be used for common pedestrian corridors. The use of permeable pavement shall be used for hard surface ground cover areas unless infeasible per the infeasibility criteria listed within BMP

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

T5.15 of the Ecology Manual. Projects that include less than 2,000 square feet of new or replaced impervious surface are exempt from this requirement. Gravel or loose material is prohibited.

b. Maintained to city standards, and legal documents regarding common facilities and maintenance must be submitted to the city for review and approval.

5. Pedestrian paths within a lane must be delineated with a change in material, color or pattern.

6. Pedestrian paths within a lane or fire apparatus road must be flush with the travel lane.

7. No single lane may serve more than eight dwelling units unless emergency access can be provided compliant with Title 17 BMC.

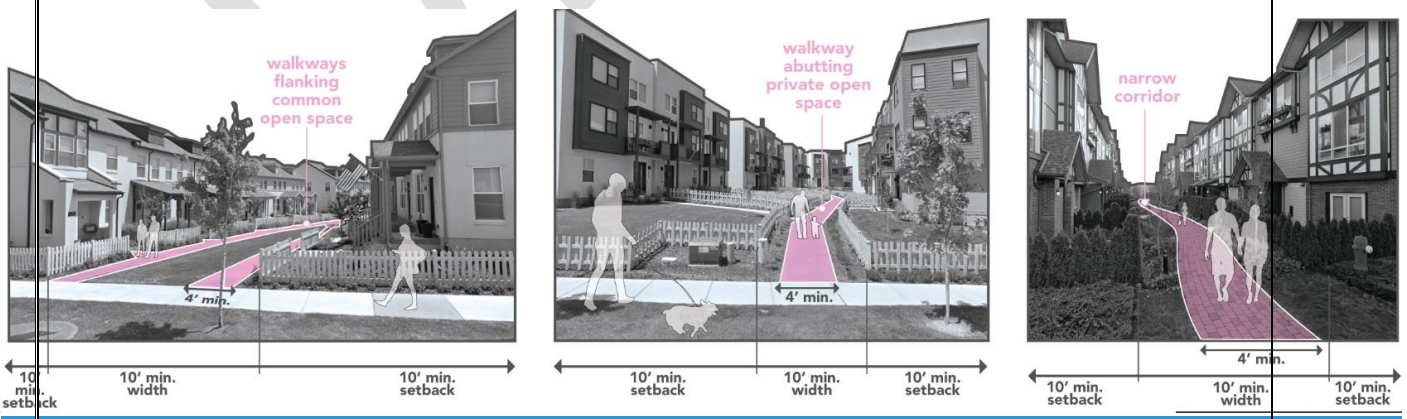
~~7~~8. Parking is not allowed within the lane width but may be allowed in a parallel pocket abutting a lane.

~~8. Lanes longer than 150 feet must either connect to an improved public street or provide a turnaround sufficient for emergency access.~~

~~9. Private lanes shall be considered streets for frontage, setback and design purposes.~~

~~10~~9. ~~Private lanes and alleys are not included in FAR and Open Space calculations.~~ Pedestrian paths within common pedestrian corridors shall be separated from property lines, fences, walls and hedges by a minimum of two feet (2'). See Figure 20.28.050(G).

Figure 20.28.050(G) – Common Pedestrian Corridors



DRAFT

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

H. *Parking*. All housing types shall provide parking in accordance with the following standards:

1. Number of spaces.

   a. Infill housing: Dwelling units less than 1,000 square feet shall provide one on-site parking stall. Units of 1,000 square feet or greater shall provide two on-site parking stalls.

   b. Guest parking. When a site contains 20 or more units and lacks on-street parking abutting or parking within the parent site, the planning director may require additional guest parking. Guest parking may be improved on site, or in the public right-of-way with approval of the city engineer.

2. Parking stall dimensions. When parking for individual units is in separate garages or carports, parking stalls shall be at least 9 feet by 18 feet. Open parking and group parking may use dimensional parking standards in BMC 20.12.010.

3. Parking setbacks. The required setbacks for open parking are as follows:

   a. Streets: The parking shall be set back at least 25' from a front street and 10' from a side flanking street, except that one tandem stall may be located in a driveway that provides access to a garage or carport.

   b. Side and rear: 5', except none for side and rear yard when parking is perpendicular to and accessed directly from the alley.

4. Tandem parking. Tandem parking is allowed when:

   a. No more than two spaces are parked in tandem.

   b. One tandem space per tandem pair is in a structure.

5. Access and maneuvering.

   a. If a platted alley exists, parking shall be accessed via the alley except when the planning director determines that alley access is impractical or environmentally constrained.

   b. If a lane exists, but no alley, parking shall be accessed via the lane.

   c. The maneuvering area between the back of parking (or a garage/carport entry) and an alley or lane shall not be greater than 10 feet or less than 18 feet to prevent parked cars from overhanging into a lane or alley. See Figure 20.28.050(H).

Figure 20.28.050(H)

DRAFT

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

6. Parking may be consolidated for all housing types except small lot.

7. The planning director may reduce parking requirements based on applicant's demonstration of site-specific factors that justify a lower standard consistent with the purpose and intent of this chapter.

I. *Landscaping and fencing*. Development shall provide landscaping in accordance with BMC 20.12.030 except as provided herein and as specified under each housing type.

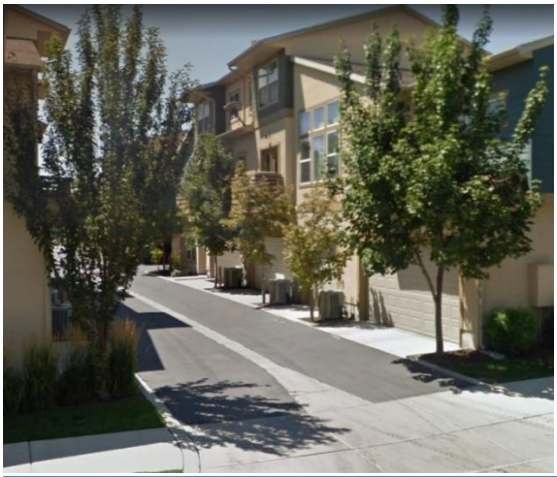
1. One tree shall be required for every 40 feet of street or lane frontage. Trees required along a lane or common pedestrian corridor shall be installed adjacent to the lane, or adjacent to or within the pedestrian corridor.

2. Landscaping shall be provided between each housing unit and abutting streets, lanes, alleys, and common pedestrian corridors except where driveway and walkway crossings occur.

3. Along streets, lanes and alleys, landscaping shall be provided to separate the parking and driveways between individual dwelling units, or the director may approve an alternative approach that breaks up parking and provides visual interest to parking facilities. See Figure 20.28.050(I).

Figure 20.28.050(I) - Examples of alley landscaping between driveways

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270



4. All fences in the front and side street setbacks are limited to 42 inches in height and may be no more than 60 percent opaque. Chain link or cyclone fencing is not allowed in the front or side street setback.

Section 9. Bellingham Municipal Code, Section 20.28.060 concerning Smaller House is hereby repealed in its entirety.

Section 10. Bellingham Municipal Code, Section 20.28.070 Small House is hereby amended as follows:

20.28.070 Small lot~~house~~.

A. *Description.* Small lots~~houses~~ consist of ~~detached~~ single-family lots~~dwelling units on lots over 3,000~~ with a site area ~~square feet and up to~~ less than or equal to 5,000 square feet.

B. *Site Requirements and Setbacks.*

1. Lot size: ~~minimum 3,001 square feet and~~ maximum 5,000 square feet.

2. The required setbacks are as shown in Figures 20.28.070(A) ~~and (B)~~, except ~~garage and carport setbacks from an alley shall be as needed to provide a 20-foot parking backup distance (including alley width)~~ detached accessory buildings may be located in a rear yard and in the rear 22 feet of an interior side yard. Garages and carports shall be set back at least four feet (4') from the street

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

face of the dwelling unit (excluding front porches). Buildings shall be placed within the shaded areas shown in the figures except as provided above.

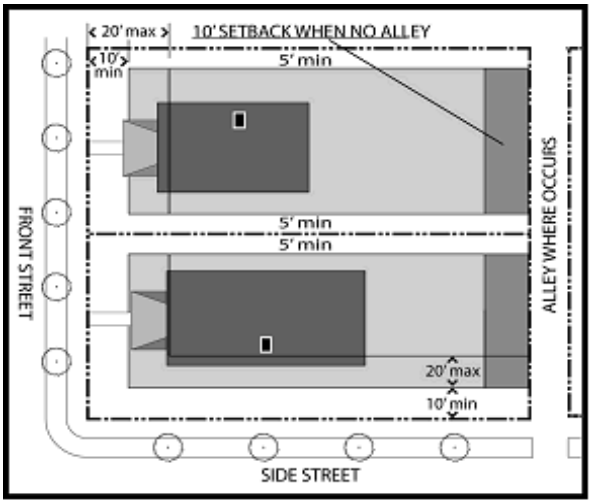
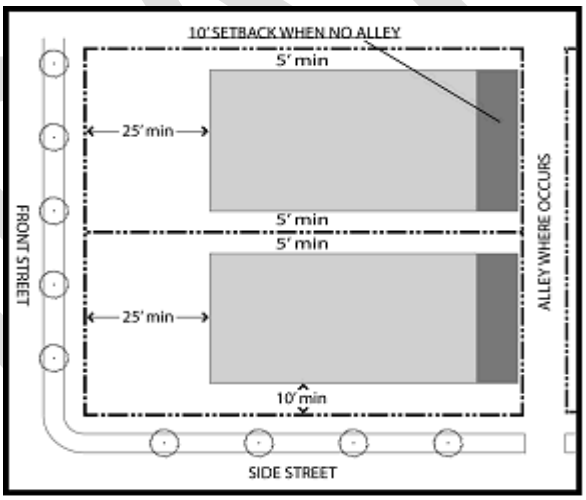


Figure 20.28.070(A) Setbacks – Main Building



~~Figure 20.28.070(B) Setbacks – Garages and Carports~~

C. *Bulk and Massing.*

1. Maximum floor area ratio (FAR): 0.35~~, or 0.5 with an~~ or 1,200 square feet, whichever is greater. An accessory dwelling unit (ADU) pursuant to BMC 20.10.036 is exempt from FAR. ~~Attached garages are included in FAR. Detached garages up to 220 square feet, or 440 square feet with an ADU, are exempt from FAR.~~ For housing under 1,000 square feet, garage floor area in excess of

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

300 square feet shall count towards the FAR. For housing at or above 1,000 square feet, garage floor area in excess of 500 square feet shall count towards the FAR.

~~2.~~ 2 ~~No single floor shall be greater than 800 square feet.~~

~~3~~. Maximum height is 25 feet under BMC 20.08.020, height definition No. 1 and 20~~15~~ feet under definition No. 2.

D. *Usable Space, Open Space and Landscaping*.

1. A minimum of ~~60~~ 40 percent of the site area shall be in open space consisting of landscaping and permeable materials (may include permeable paving, landscape-based LID BMPs, and green roofs). Exceptions may be made in erosion hazard zones or areas with shallow bedrock as determined by the planning director.

2. A green factor landscaping score of 0.3 is required (see BMC 20.12.030).

E. *Parking*. All parking shall be provided pursuant to BMC 20.28.050(H).

~~1. Dwelling units less than 1,000 square feet shall provide one on-site parking stall. Units of 1,000 square feet or larger shall provide two on-site parking stalls. The planning director may reduce parking requirements based on applicant's demonstration of site-specific factors that justify a lower standard. Parking stalls shall be at least nine feet by 18 feet, unless adjacent to landscaping, as specified in Figure 20.12.030(A).~~

~~2. Tandem parking is allowed (may be exterior or interior).~~

~~3. If an alley exists, parking shall be accessed via the alley unless the planning director determines that alley access is impractical or environmentally constrained.~~

~~4. If a lane exists, but no alley, parking shall be accessed via the lane.~~

~~5. Adjacent properties may share a driveway upon approval of a shared access and maintenance agreement.~~

~~6. Detached garages may share a common wall along a property line if a shared maintenance agreement is in place.~~

~~7. Parking accessed from the public street shall be limited to one driveway of 20 feet maximum width.~~

~~8. Parking setbacks from property line:~~

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

DRAFT

~~Front:~~	~~25 feet~~
~~Side street:~~	~~10 feet~~

~~9. All common shared driveway, common wall or any common facility needs to be approved by the planning director. Final documents are required to be recorded.~~

F. *Design Standards.*

1. Shall have a covered front porch with an area of ~~60~~ 40 square feet or more, with no dimension less than five feet. This is in addition to the open space requirement.

2. Dwelling units that front the public street or lane shall have entrances facing the public street or lane.

~~3. All fences in the front and side street setbacks are limited to 42 inches in height and may be no more than 60 percent opaque. Chain link or cyclone fencing is not allowed in the front or side street setback.~~

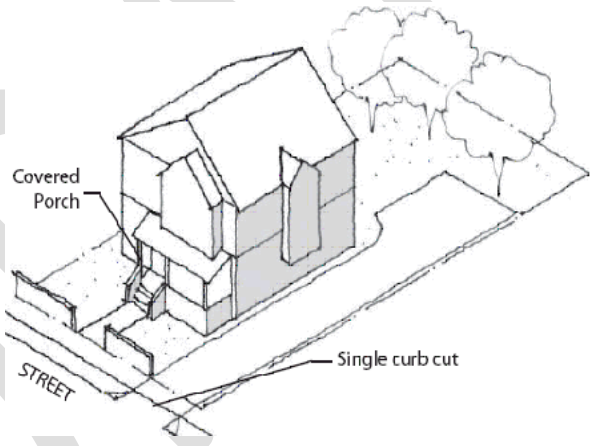


Figure 20.28.070(B~~C~~) Annotated Graphic of Small ~~House~~ Lot

G. *Design Guidelines.* Use context-sensitive site design and building details to help ensure that new infill development will enhance the neighborhood and respect the scale and character of the existing houses on a street.

1. *Building Design.*

a. Single story massing elements should be emphasized on the front facades, using porches and bays seen from the street or lane.

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

b. Roof forms that~~Gable roofs~~ emphasize vertical proportions and~~,~~ create modulation ~~and~~ are strongly encouraged.

c. The massing should be varied with elements such as bays, dormers, etc.

d. A change of materials, colors or textures on different elements is encouraged to provide further articulation and adds variety and character.

e. Homes should minimize the impact of the garage on the streetscape by minimizing blank garage doors, through the use of windows and/or architectural detail on the garage door.

2. *Site Design.*

~~a. Front yard parking aprons are not allowed.~~

a~~b~~. Back yards should be designed for privacy from neighbors.

b~~e~~. Fencing, especially when seen from the street, should be designed to integrate into the architecture of the building and add visual interest in its detail, materials or color.

Section 11. Bellingham Municipal Code, Section 20.28.080 Cottage is hereby amended as follows:

A. *Description.* Cottage housing is a grouping of small compact, detached single-family dwelling units clustered around a common usable area and developed with a shared plan for access and parking, and a coordinated design for the buildings and site.

B. *Site Requirements and Setbacks.*

1. Cottages may be located on a separate (fee simple) lot or several units may be located on a common parcel. A cottage unit with an ADU must be located on a separated lot.

2. The required setbacks are as shown in Figure 20.28.080(A), except ~~garage and carport setbacks from an alley shall be as needed to provide a 20-foot parking backup distance (including alley width)~~ detached accessory buildings may be located in a rear yard and in the rear 22 feet of an interior side yard. Garages and carports shall be set back at least four feet (4') from the street face of residential buildings (excluding front porches). Buildings shall be placed within the shaded areas shown in the figure except as provided above.

C. *Bulk and Massing.*

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

1. The minimum is four dwelling units and the maximum is eight dwelling units in a ~~single development~~ cottage cluster.

2. No structure shall be larger than 1,200~~1,000~~ square feet ~~and no single floor area shall be larger than 600 square feet~~.

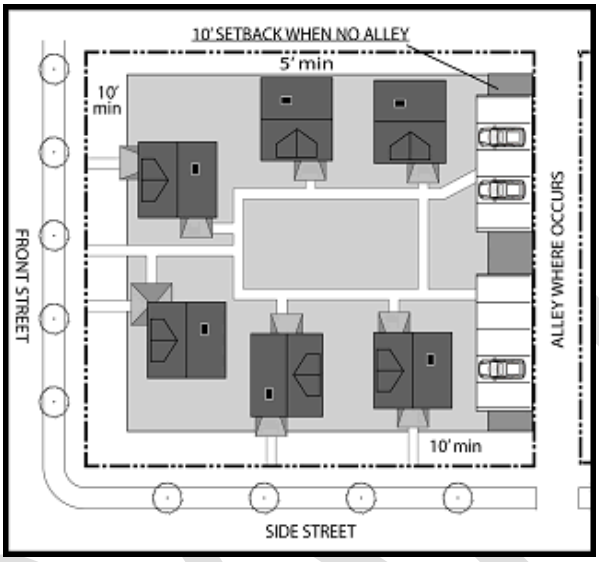


Figure 20.28.080(A) Setbacks for Cottage

3. Maximum floor area ratio (FAR) is ~~0.4~~ 0.6. An accessory dwelling unit (ADU) pursuant to BMC 20.10.036 is exempt from FAR.

4. Common shared structures are allowed, limited to the same bulk and mass restrictions as dwelling units, and are exempt from FAR.

5. The height limit is 25 feet under BMC 20.08.020, definition No. 1 or 20~~15~~ feet under definition No. 2.

D. *Usable Space, Open Space and Landscaping*.

1. Each dwelling unit shall have at least 100 square feet of private usable ~~open~~ space with no dimension less than five feet. Up to 50 square feet of the private usable space may be provided in ~~D~~decks and patios ~~may be included~~.

2. Private usable ~~open~~ space must be directly accessible from the dwelling unit, and be separated from shared spaces or paths and other units through the use of landscaping and/or fencing.

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

3. Common usable ~~open~~ space equivalent to 200~~500~~ square feet per dwelling unit shall be provided. It shall be consolidated, with a minimum average dimension of 20 feet~~No single dimension shall be less than 20 feet~~, exclusive of parking or lanes except for emergency access. All units shall have direct access to common~~shared~~ open space.

4. A minimum of ~~60~~ 40 percent of the site area shall be in open space consisting of landscaping or permeable materials (may include permeable paving, landscape-based LID BMPs, and green roofs). Exceptions may be made in erosion hazard zones or areas with shallow bedrock as determined by the city.

5. A green factor landscaping score of 0.3 is required (see BMC 20.12.030).

E. *Parking.* All parking shall be provided pursuant to BMC 20.28.050(H).~~1. The project shall include at least one on-site parking stall per unit. The planning director may reduce parking requirements based on applicant's demonstration of site-specific factors that justify a lower standard. Parking stalls shall be at least nine feet by 18 feet, unless adjacent to landscaping, as specified in Figure 20.12.030(A).~~

~~2. Parking may not be located between structures or front directly upon a street.~~

~~3. If an alley exists, parking shall be accessed via the alley except when the planning director determines that alley access is impractical or environmentally constrained.~~

~~4. Parking shall be consolidated in areas not less than four spaces.~~

~~5. Parking accessed from the public street shall be limited to one driveway of 20-foot maximum width.~~

~~6. Parking shall be screened from the public street by landscape feature or fence.~~

F. *Design Standards.*

1. A front porch with a minimum of ~~60~~ 40 square feet and no dimension less than five feet is required for each dwelling unit. This is in addition to the private usable space requirement ~~(in addition to private open space requirements)~~.

2. Dwelling units that front a public street or lane shall have a porch that faces the street or lane. Units that face the shared open space shall have a porch that faces the open space. In some cases, units will require two front porches to satisfy this criteria.

DRAFT

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

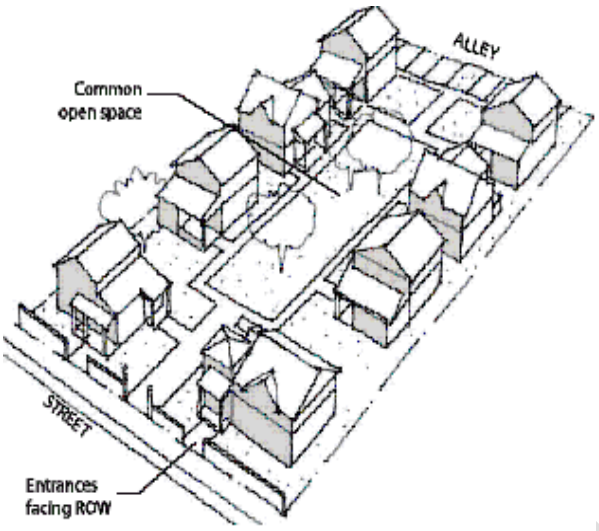


Figure 20.28.080(B) Annotated Illustration of Cottage

3. ~~All fences in the front and side street setbacks, or between the common areas and the dwelling units, are limited to 42 inches in height and may be no more than 60 percent opaque. Chain link or cyclone fencing is not allowed in the front or side street yard.~~ Garbage/recycling areas shall be consolidated, unless the local refuse provider approves otherwise, and screened from public view.

G. *Design Guidelines.* Cottage housing developments should architecturally blend into existing neighborhoods through careful attention to the design of the units, open spaces, parking and landscaping. Well proportioned cottage houses, with porches, small gardens, varied roof lines and dormers can fit comfortably into surrounding neighborhoods of older, detached homes.

1. *Building.*

a. Buildings should employ variety in orientation, design, and layout between cottages while maintaining a similar character to help distinguish units and support a neighborhood feel.

b. Cottages should reflect common neighborhood design features such as porches, dormers, gables, and architectural detailing.

c. Changes in materials, colors or textures and colors to add visual interest and character to the development are encouraged.

2. *Site Design.*

a. Provide small private open spaces in conjunction with a large common~~shared~~ open space.

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

b. Provide generous use of landscape structures such as trellises, gate houses, decks, patios, and raised beds to provide plenty of usable outdoor space with a variety of environments. Use planting materials and elements such as fencing to unify the overall site design.

c. Shared driveways are preferred.

d. Walkways should connect all dwelling units to the commonshared open space and consolidated parking and should utilize pervious materials.

Section 12. Bellingham Municipal Code, Section 20.28.110 Duplex/Triplex is hereby amended as follows:

20.28.110 Duplex/triplex/fourplex.

A. *Description.* A duplex/triplex/fourplex is a single structure comprised of two, or three, or four dwelling units on a single lot, either side by side, or on different floors, or a combination thereof.

B. *Site Requirements and Setbacks.*

1. The required setbacks are as shown in Figures 20.28.110(A) and (B), except garage and carport setbacks from an alley shall be as needed to provide a 20-foot parking backup distance (including alley width) detached accessory buildings may be located in a rear yard and in the rear 22 feet of an interior side yard. Garages and carports shall be set back at least four feet (4') from the street face of the residential building (excluding front porches). Buildings shall be placed within the shaded areas shown in the figures except as provided above.

C. *Bulk and Massing.*

1. Maximum floor area ratio (FAR) is 0.50.6.

2. Maximum dwelling unit size is 1,000 square feet.

3. The height limit is 25 feet under BMC 20.08.020, definition No. 1 or 2015 feet under definition No. 2. The height may be increased to 35 feet under BMC 20.08.020, definition No. 1 when in residential-multi, multiple and commercial zoning designations.

DRAFT

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

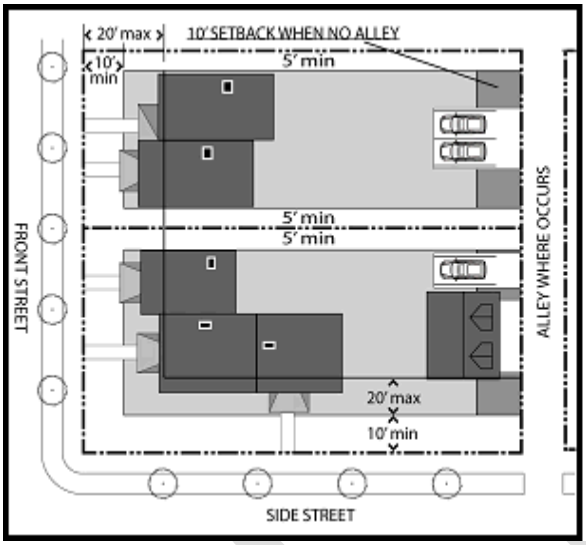
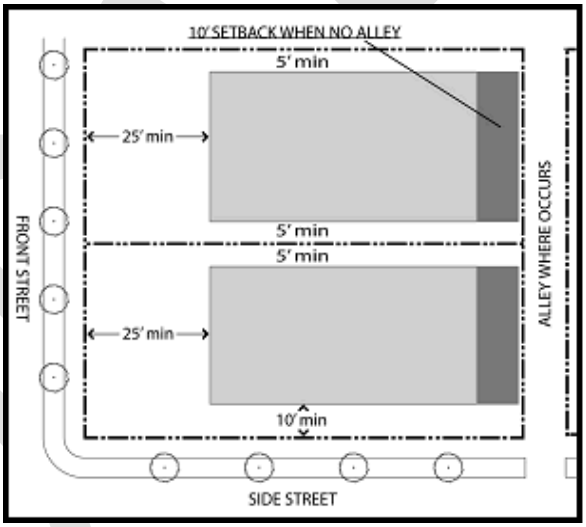


Figure 20.28.110(A) Setbacks – Main Building



~~Figure 20.28.110(B) Setbacks – Garages and Carports~~

D. *Usable Space, Open Space and Landscaping*.

1. Each dwelling unit shall have 75 square feet of private usable~~open~~ space with no dimension less than five feet. ~~It~~ No more than 50 square feet may be accommodated with a deck or porch.

2. Private usable space may be consolidated and provided as common usable space with minimum dimensions of 10 feet by 10 feet. All units shall have direct access to usable space.

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

3. No less than ~~40~~ 30 percent of the site area shall be in open space consisting of landscaping or permeable material (may include permeable paving, landscape-based LID BMPs, and green roofs). Exceptions may be made in erosion hazard zones or areas with shallow bedrock as determined by the city.

3. A green factor landscaping score of 0.4 is required (see BMC 20.12.030).

E. *Parking.* All parking shall be provided pursuant to BMC 20.28.050(H).

~~1. Each dwelling unit shall provide at least one on-site parking stall. The planning director may reduce parking requirements based on applicant's demonstration of site-specific factors that justify a lower standard. Parking stalls shall be at least nine feet by 18 feet, unless adjacent to landscaping, as specified in Figure 20.12.030(A).~~

~~2. Parking setbacks from property line:~~

~~Front:~~	~~25 feet~~
~~Side street:~~	~~10 feet~~

~~3. If an alley exists, parking shall be accessed via the alley except when the planning director determines that alley access is impractical or environmentally constrained.~~

~~4. Parking accessed from the public street or lane shall be limited to one driveway per street or lane with a maximum width of 20 feet.~~

F. *Design Standards.*

1. At least one entrance must be visible from the public street.

2. Ground level ~~D~~dwelling units that front the public street shall each have ~~entrances~~ a covered front porch facing the public street. Said porches shall be no less than 40 square feet with no dimension less than five feet. A shared front porch entry no less than 60 square feet with no dimension less than five feet may be provided in lieu of private entries. Front porches are in addition to the private usable space requirement.

3. ~~All fences in the front and side street setbacks are limited to 42 inches in height and may be no more than 60 percent opaque. Chain link or cyclone fencing is not allowed in the front or side street setback.~~ Garbage/recycling areas shall be consolidated, unless the local refuse provider approves otherwise, and screened from public view.

DRAFT

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

G. *Design Guidelines.* A duplex/triplex should be designed as either a larger, single-family composition or as distinct separate units.

1. *Building Design.*

a. The design should break the home's facades into several distinct elements.

b. Roof forms that~~Gable roofs~~ emphasize vertical proportions and~~,~~ create modulation ~~and~~ are strongly encouraged.

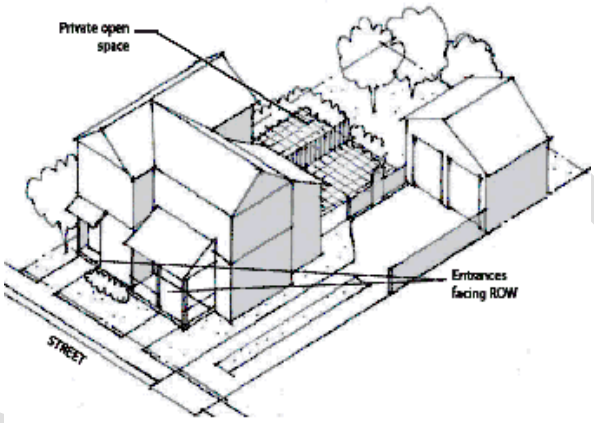


Figure 20.28.110(B~~C~~) Annotated Illustration of Duplex/Triplex/Fourplex

c. The massing should be varied with elements such as bays, dormers, etc.

d. A change of materials, colors or textures on building elements is encouraged to provide further articulation and additional variety and craftsmanship.

e. Buildings should minimize the impact of garages on the streetscape by utilizing garage doors with windows or other architectural features.

2. *Site Design.*

~~a. Front yard parking aprons are not allowed.~~

~~b.~~a. Back yards should be designed for privacy from neighbors.

Section 13. Bellingham Municipal Code, Section 20.28.120 Shared Court is hereby amended as follows:

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

A. *Description.* A shared court is a multifamily development that shares a courtyard that also allows vehicular access to parking. The structure(s) is arranged ~~in a "U" shape~~ around a central shared court. Design details, paving and landscape should create the impression of a small, intimate courtyard when viewed from the street.

B. *Site Requirements and Setbacks.*

1. Shared court units may be located on a separate (fee simple) lot or several units may be located on a common parcel. A shared court unit with an ADU must be located on a separated lot.

2. The required setbacks are as shown in Figures 20.28.120(A) ~~and (B)~~, except ~~garage and carport setbacks from an alley shall be as needed to provide a 20-foot parking backup distance (including alley width)~~ detached accessory buildings may be located in a rear yard and in the rear 22 feet of an interior side yard. Garages and carports shall be set back at least four feet (4') from the street face of residential buildings (excluding front porches). Buildings shall be placed within the shaded areas shown in the figures except as provided above.

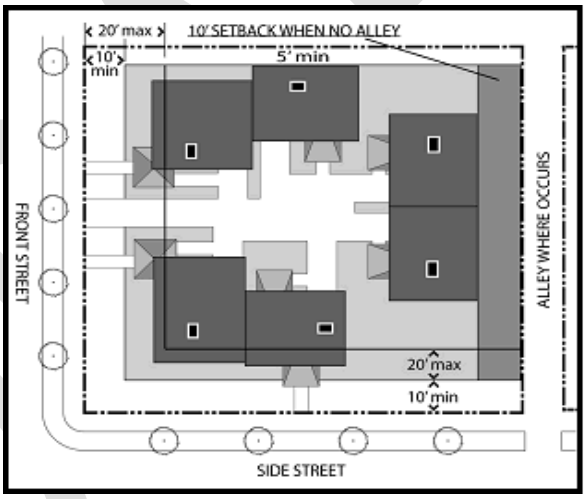
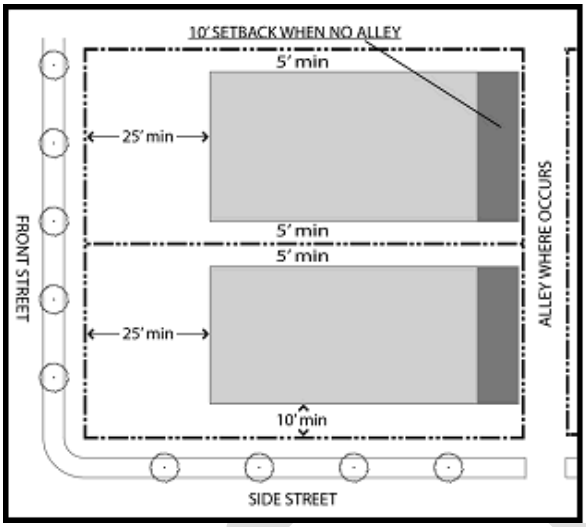


Figure 20.28.120(A) Setbacks – Main Building(s)

DRAFT

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270



~~Figure 20.28.120(B) Setbacks – Garages and Carports~~

C. *Bulk and Massing.*

1. There shall be a maximum of six dwelling units and a minimum of four dwelling units clustered around a shared court.

2. Maximum floor area ratio (FAR) is ~~0.5~~0.6. An accessory dwelling unit (ADU) pursuant to BMC 20.10.036 is exempt from FAR. ~~Projects meeting green factor requirements in section (D)(4) of this section may request additional FAR up to 0.7 with approval by the planning director.~~

3. The maximum dwelling unit size is 2,000 square feet.

~~4. No single floor area shall be larger than 1,000 square feet per dwelling unit.~~

~~5.~~4. The height limit is 25 feet under BMC 20.08.020, definition No. 1 or 20~~15~~ feet under definition No. 2. The height may be increased to 35 feet under BMC 20.08.020, definition No. 1 when in residential-multi, multiple and commercial zoning designations.

D. *Usable Space, Open Space and Landscaping*.

1. Each dwelling unit shall have at least 100~~50~~ square feet of private usable~~open~~ space with no dimension less than five feet. Some or all of this~~e~~ requirement may be accommodated in a deck.

2. All private usable~~open~~ space must be directly accessible from the dwelling unit and shall be separated from shared pathways, driveways, and other units through the use of landscaping and/or fencing.

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

3. No less than 30 ~~40~~ percent of the site area shall be in open space consisting of landscaping or permeable material (may include permeable paving, landscape-based LID BMPs, and green roofs). Exceptions may be made in erosion hazard zones or areas with shallow bedrock as determined by the city.

4. ~~Use of the green factor is strongly encouraged. When used as a FAR bonus option in subsection (C)(2) of this section, a~~ A green factor landscaping score of ~~0.6~~ 0.4 is required (see BMC 20.12.030).

E. *Parking.* All parking shall be provided pursuant to BMC 20.28.050(H).

~~1. Dwelling units less than 1,000 square feet shall provide at least one on-site parking stall. Units of 1,000 square feet or larger shall provide two on-site parking stalls. The planning director may reduce parking requirements based on applicant's demonstration of site-specific factors that justify a lower standard. Parking stalls shall be at least nine feet by 18 feet, unless adjacent to landscaping, as specified in Figure 20.12.030(A).~~

~~2. Parking shall not be located between structures and a public street.~~

~~3. Parking accessed from a public street or lane shall be limited to driveway with a maximum width of 20 feet.~~

F. *Design Standards.*

1. Each dwelling unit must have a separate, ground-related entrance. Units that front the public street shall have entrances facing the public street; all other units shall have entrances facing the shared open space.

~~2. No roof pitch shall be less than 2:12 (may be shed type) except for green roofs.~~

2~~3~~. Each dwelling unit shall have a covered front porch no less than ~~50~~ 40 square feet with no dimension less than five feet~~.~~, ~~this~~ This is in addition to the private usable ~~open~~ space requirement.

3~~4~~. Garbage/recycling areas shall be consolidated, unless the local refuse provider approves otherwise, and screened from public view.

~~5. All fences in the front and side street setbacks, or between the common areas and the dwelling units, are limited to 42 inches in height and may be no more than 60 percent opaque. Chain link or cyclone fencing is not allowed in the front or side street setback.~~

DRAFT

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

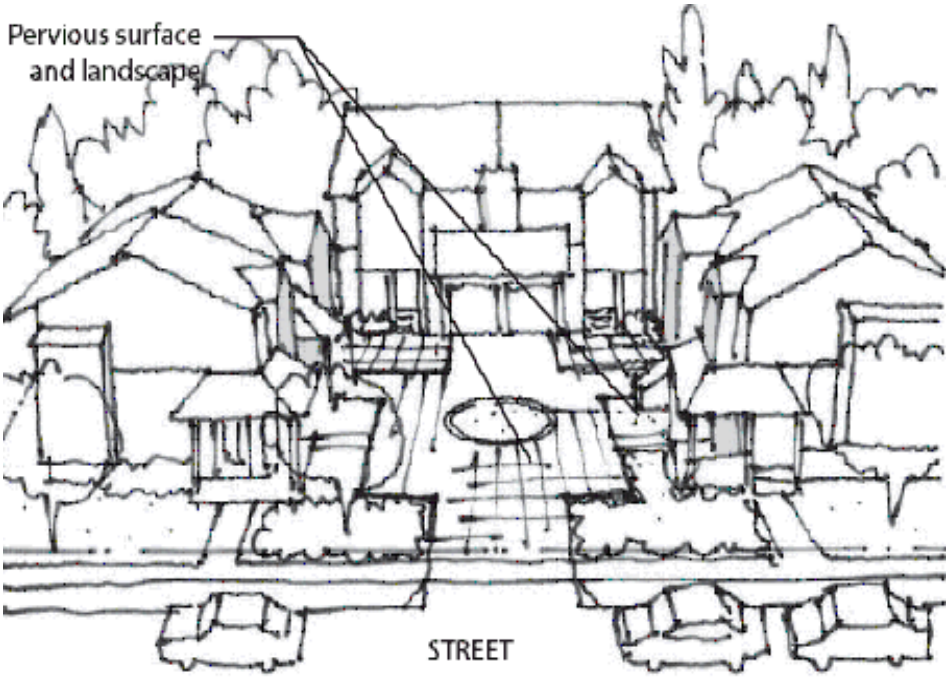


Figure 20.28.120(B~~C~~) Annotated Illustration of Shared Court

~~6.~~4. The following design standards shall be met to define the shared courtyard space, enhance the function as a shared, attractive, and usable open space, and unify site elements through the use of paving and landscape materials:

a. Provide clear direction to primary building entries and enhance circulation paths with trees, lighting, and plant materials.

b. At least 35 percent of the total shared court area shall be landscaped.

c. Poured surfaces (e.g., asphalt or concrete) may be used for vehicle treaded areas up to 10 feet in width but are not acceptable for area paving. The remaining unplanted areas shall be paved with unit pavers (e.g., brick, concrete, or tile) set or covered with gravel. Permeable pavements are acceptable paving options for all unplanted, shared court area.

d. The incorporation of courtyard amenities is required. Courtyard areas shall include at least two of the following elements:

i. Benches, bench-type edges for planters.

ii. Fountain or other water feature.

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

iii. Ornamental shrubbery and landscape trees.

G. *Design Guidelines.*

1. *Site Design.*

a. Provide for the functional and visual integration of buildings, vehicular access and parking, and the "outdoor room" function of the shared court.

b. Define and contain the shared court space through a combination of building, landscape, and other site furnishings.

c. Provide a walkway from each dwelling unit to the shared court and street.

2. *Building Design.*

a. The design should break the facades into several distinct elements.

b. Roof forms that ~~Gable roofs~~ emphasize vertical proportions and~~,~~ create modulation ~~and~~ are strongly encouraged.

c. The massing should be varied with elements such as bays, dormers, etc.

d. Changing materials, colors or textures on building elements is encouraged to provide further articulation and add variety and craftsmanship.

e. Buildings should minimize the impact of garages on the streetscape by utilizing garage doors with windows or other architectural features.

Section 14. Bellingham Municipal Code, Section 20.28.130 Garden Court is hereby amended as follows:

A. *Description.* A garden court is a multifamily development that shares a landscaped courtyard. The structures are ~~is~~ arranged ~~in a "U" shape~~ around the garden court, a common usable space area, with parking typically consolidated and located to the side or rear of the development.

B. *Site Requirements and Setbacks.*

1. Garden court units may be located on a separate (fee simple) lot or several units may be located on a common parcel. A garden court unit with an ADU must be located on a separated lot.

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

2. The required setbacks are as shown in Figures 20.28.130(A) ~~and (B)~~, except ~~garage and carport setbacks from an alley shall be as needed to provide a 20-foot parking backup distance (including alley width)~~ detached accessory buildings may be located in a rear yard and in the rear 22 feet of an interior side yard. Garages and carports shall be set back at least four feet (4') from the street face of residential buildings (excluding front porches). Buildings shall be placed within the shaded areas shown in the figures except as provided above.

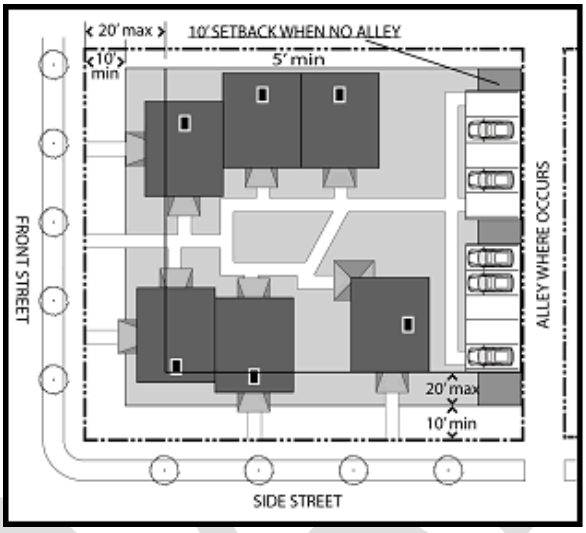
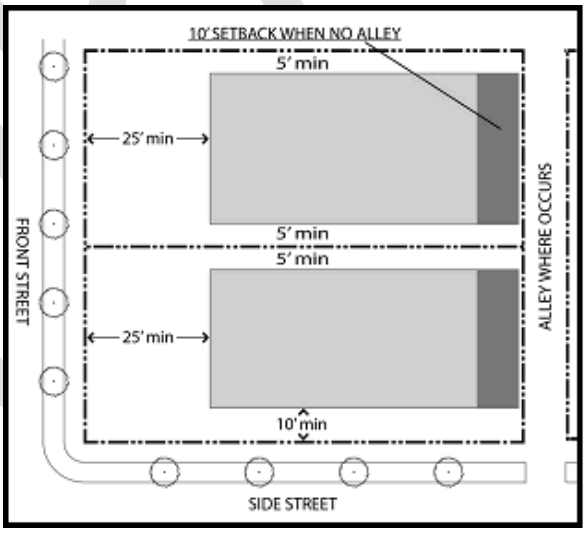


Figure 20.28.130(A) Setbacks – Main Building(s)



~~Figure 20.28.130(B) Setbacks – Garages and Carports~~

C. *Bulk and Massing.*

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

1. There shall be a maximum of eight dwelling units and a minimum of four dwelling units clustered around a shared open space.

2. Maximum floor area ratio (FAR) is 0.6. An accessory dwelling unit (ADU) pursuant to BMC 20.10.036 is exempt from FAR. ~~Projects meeting green factor requirements in subsection (D)(4) of this section may request additional FAR up to 0.75 with approval by the planning director.~~

3. No dwelling units may be larger than 2,000 square feet.

4. ~~The single floor area is limited to 1,000 square feet per dwelling unit.~~

~~5.~~ The height limit is 25 feet under BMC 20.08.020, definition No. 1 or 20~~15~~ feet under definition No. 2. The height may be increased to 35 feet under BMC 20.08.020, definition No. 1 when in residential-multi, multiple and commercial zoning designations.

D. *Usable Space, Open Space and Landscaping*.

1. Common usable ~~Shared open~~ space equivalent to~~shall be provided in the amount of~~ 200 square feet for each dwelling unit shall be provided. It shall be consolidated, with a minimum average dimension of 20 feet, exclusive of parking or lanes except for emergency access. All units shall have direct access to common open space.

2. Each dwelling unit shall have at least 100 square feet of private usable~~open~~ space with no dimension less than five feet. Up to 50 square feet of the private usable space may be provided in either a deck or patio~~space may be included~~.

3. Private usable~~open~~ space must be delineated~~separated~~ from public rights-of-way, shared paths, shared open space, and lanes through the use of landscaping and/or fencing.

4. A minimum of 40 percent of the site shall be in open space consisting of landscaping or permeable materials (may include permeable paving, landscape-based LID BMPs, and green roofs). Exceptions may be made in erosion hazard zones or areas with shallow bedrock as determined by the city.

5. ~~Use of the green factor is strongly encouraged. When used as a FAR bonus option in subsection (C)(2) of this section, a~~ A green factor landscaping score of 0.5~~0.6~~ is required (see BMC 20.12.030).

E. *Parking*. All parking shall be provided pursuant to BMC 20.28.050(H).

~~1. Dwelling units less than 1,000 square feet shall provide at least one on-site parking stall. Units of 1,000 square feet or larger shall provide two on-site parking stalls. The planning director may~~

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

~~reduce parking requirements based on applicant's demonstration of site-specific factors that justify a lower standard. Parking stalls shall be at least nine feet by 18 feet, unless adjacent to landscaping, as specified in Figure 20.12.030(A).~~

~~2. Parking generally shall be located to the rear or side only, but 20 percent of parking may be located between structures, but may not be located between structures and a public street.~~

~~3. Parking may be consolidated.~~

~~4. Parking accessed from a street or lane shall be limited to one driveway with a maximum width of 20 feet.~~

F. *Design Standards.*

1. Each dwelling unit must have a separate, ground-related entrance. Units that front the public street shall have entrances facing the public street; all other units shall have entrances facing the shared open space.

2. Each dwelling unit shall have a covered front porch no less than ~~50~~ 40 square feet with no dimension less than five feet; this is in addition to the private usable~~open~~ space requirement.

3. Garbage/recycling areas shall be consolidated, unless the local refuse provider approves otherwise, and screened from public view.

~~4. No roof pitch shall be less than 2:12 (may be shed type) except for green roofs.~~

~~5. All fences in the front and side street setbacks, or between the common areas and the dwelling units, are limited to 42 inches in height and may be no more than 60 percent opaque. Chain link or cyclone fencing is not allowed in the front or side street setback.~~

DRAFT

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

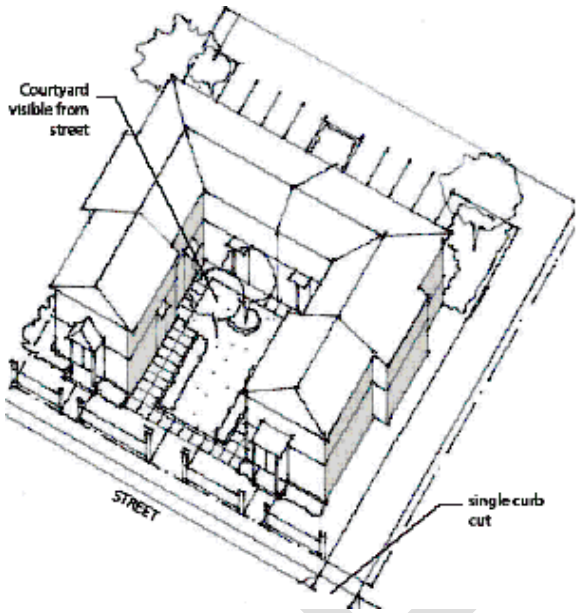


Figure 20.28.130(BC) Annotated Illustration of Garden Court

G. *Design Guidelines.*

1. *Site Design.*

a. The courtyard should address the street, and be easily accessible from the street, with a spacious, clearly defined entry.

b. At least a portion of the courtyard should be visible from the street. The courtyard is best located at street level, or a foot or two above or below the street.

c. Create opportunities for exposure to, and shade from sun as well as weather protection.

d. Define the garden court space through a combination of building, landscape, and other site furnishings.

e. Provide a walkway from each dwelling unit to the garden court and street.

2. *Building Design.*

a. The design should break the facades into several distinct elements.

b. Roof forms that~~Gable roofs~~ emphasize vertical proportions and~~,~~ create modulation ~~and~~ are strongly encouraged.

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

c. The massing should be varied with elements such as bays, dormers, etc.

d. Changing materials, colors or textures on building elements is encouraged to provide further articulation and add variety and craftsmanship.

Section 15. Bellingham Municipal Code, Section 20.28.140 Townhouse is hereby amended as follows:

A. *Description.* A townhouse is one of a row of homes sharing common walls, each with its own front and rear access to the outside.

B. *Site Requirements and Setbacks.*

1. Townhouses may be located on a separate (fee simple) lot or several units may be located on a common parcel. A townhouse with an ADU must be located on a separated lot.

2. The required setbacks are as shown in Figures 20.28.140(A) ~~and (B)~~, except ~~garage and carport setbacks from an alley shall be as needed to provide a 20-foot parking backup distance (including alley width)~~ detached accessory buildings may be located in a rear yard and in the rear 22 feet of an interior side yard. Garages and carports shall be set back at least four feet (4') from the street face of residential buildings (excluding front porches). Buildings shall be placed within the shaded areas shown in the figures except as provided above.

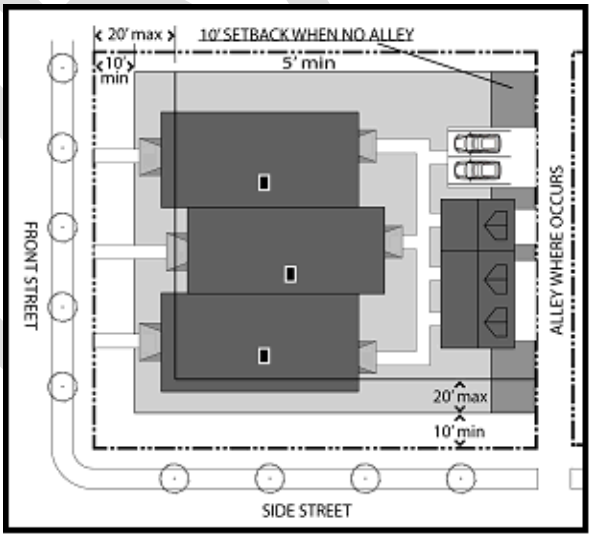
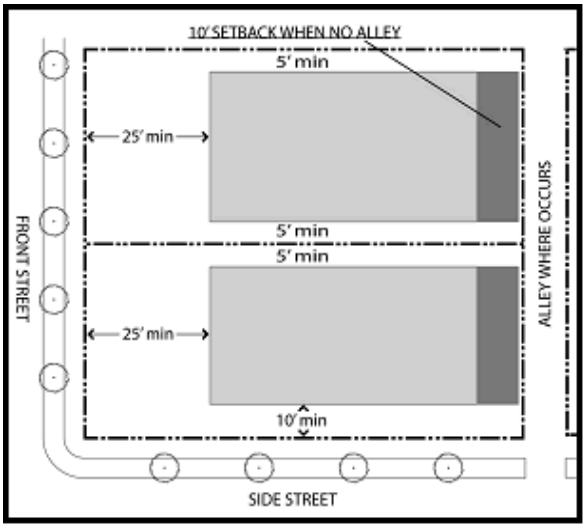


Figure 20.28.140(A) Setbacks – Main Building(s)

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270



~~Figure 20.28.140(B) Setbacks – Garages and Carports~~

C. *Bulk and Massing.*

1. Maximum attached dwelling units is eight.

2. Maximum Floor Area Ratio (FAR) is 0.75. An accessory dwelling unit (ADU) pursuant to BMC 20.10.036 is exempt from FAR.

3. The height limit is 35 feet under BMC 20.08.020, definition No. 1 or 20 feet under definition No. 2.

D. *Usable Space, Open Space and Landscaping.*

1. Each dwelling unit shall have 200 square feet of private usable~~open~~ space with no dimension less than five feet. Up to 100 square feet of deck, patio or structure may be included. Private usable space may be consolidated and provided as common usable space with minimum dimensions of 10 feet by 10 feet. All units shall have direct access to usable space.

2. Private usable~~open~~ space must be directly accessible from the dwelling unit. All ground level usable space delineated ~~screened~~ from public right-of-way, paths, and lanes through the use of landscaping and/or fencing.

3. ~~Private open space must be directly accessible from the dwelling unit.~~A minimum of 30 percent of the site area shall be in open space consisting of landscaping or permeable materials (may include permeable paving, landscape-based LID BMPs, and green roofs). Exceptions may be made in erosion hazard zones or areas with shallow bedrock as determined by the city.

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

4. A green factor landscaping score of ~~0.6~~ 0.4 is required (see BMC 20.12.030).

E. *Parking.* All parking shall be provided pursuant to BMC 20.28.050(H).

~~1. Dwelling units less than 1,000 square feet shall provide at least one on-site parking stall. Units of 1,000 square feet or larger shall provide two on-site parking stalls. The planning director may reduce parking requirements based on applicant's demonstration of site-specific factors that justify a lower standard. Parking stalls shall be at least nine feet by 18 feet, unless adjacent to landscaping, as specified in Figure 20.12.030(A).~~

~~2. Parking may be consolidated.~~

~~3. Parking accessed from a street or lane shall be limited to one driveway with a maximum width of 20 feet. Individual driveways may access a private lane.~~

F. *Design Standards.*

1. Each townhouse unit shall front a street, ~~or~~ lane, or common pedestrian corridor, and have an entrance that faces a street, ~~or~~ lane, or common pedestrian corridor.

2. Entrances for each unit shall be separate.

3. Each unit shall have direct access to both the public street, ~~or~~ lane, or common pedestrian corridor and parking.

4. Each unit must have a covered, main entry-related porch or stoop area of at least ~~50~~ 40 square feet with no dimension less than five feet. This is in addition to the private usable space requirement.

5. Buildings must be modulated along the public street at least every 30 feet. Building modulations must step the building wall back or forward at least four feet, or at least two feet when architectural detailing is used to clearly delineate the individuality of each unit.

~~6. All fences in the front and side street setbacks, or between the common areas and the units, are limited to 42 inches in height and may be no more than 60 percent opaque. Chain link or cyclone fencing is not allowed in the front or side street setback.~~

~~7.~~6. Garbage/recycling areas shall be consolidated, unless the local refuse provider approves otherwise, and screened from public view.

DRAFT

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

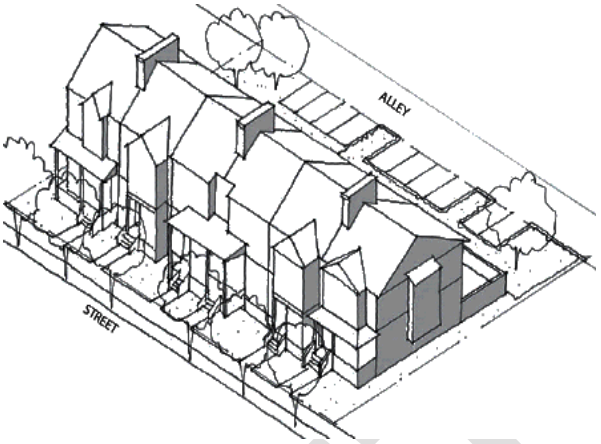


Figure 20.28.140(BC) Annotated Illustration of Townhouse

G. *Design Guidelines.*

1. *Building Design.*

a. Reduce the potential impact of new townhouse development on established and historic neighborhoods by incorporating elements and forms from nearby buildings of character. This may include reference to architectural details, building massing, proportionality, and use of high-integrity materials such as wood, brick, and stone. References to period architecture can be made in a contemporary manner.

b. *Use lines and rhythms to create a human scale streetscape.* These may include vertical and horizontal patterns as expressed by bays, belt lines, doors and windows.

2. *Site Design.*

a. Front yard parking aprons are not allowed.

b. Provide generous use of planting materials and landscape structures such as trellises, raised beds and fencing to unify the overall site design.

Section 16. Bellingham Municipal Code, Section 20.37.120 Samish Way urban village Table 20.37.120 Permitted Uses is hereby amended as follows:

DRAFT

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

P = Permitted # = See note C = Conditional Use N = Not allowed					
Land Use Classification	**Area**				
	Commercial Core	**Commercial Approach**	**Commercial Transition 1 and 2**	**Residential Transition 1**	**Residential Transition 2**
1 -26. [No Change]					
27. Chapter 20.28 BMC, Infill Housing					
a. *Repealed*~~Smaller House~~	~~N~~	~~P(5)~~	~~P(5)~~	~~P(5)~~	~~P(5)~~
b. Small Lot~~House~~	N	P(5)	P(5)	P(5)	P(5)
c. Cottage	N	P(5)	P(5)	P(5)	P(5)
d. Duplex/Triplex/Fourplex	P(5)	P(5)	P(5)	P(5)	P(5)
e-g. [No Change]					
28-44. [No Change]					

Section 17. Bellingham Municipal Code, Section 20.37.220 Fountain district urban village Table 20.37.220 Permitted Uses is hereby amended as follows:

P = Permitted # = See note C = Conditional Use N = Not allowed				
Land Use Classification	**Area**			
	Commercial Core	**Commercial Transition**	**Residential Transition 1**	**Residential Transition 2**
1-29. [No Change]				
30. Chapter 20.28 BMC, Infill Housing.				
a. *Repealed*~~Smaller House~~	~~P(5)~~	~~P(5)~~	~~P(5)~~	~~N~~
b. Small Lot~~House~~	P(5)	P(5)	P(5)	N
c. Cottage	P(5)	P(5)	P(5)	N
d. Duplex	P(5)	P(5)	P(5)	N
e. Triplex/Fourplex	P(5)	P(5)	N	N
f-h. [No Change]				

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

P = Permitted # = See note C = Conditional Use N = Not allowed				
Land Use Classification	**Area**			
	Commercial Core	**Commercial Transition**	**Residential Transition 1**	**Residential Transition 2**
31-48. [No Change				

Section 18. Bellingham Municipal Code, Section 21.10.040 Types of land use decisions is hereby amended as follows:

A - B. [No Change]

C. *Type II.* A Type II review process is an administrative review and decision by the director. Public notice is required. Appeals of Type II decisions are decided by the hearing examiner. The following are Type II decisions:

1. Accessory dwelling unit;

2. Design review for projects that:

   a. Require a SEPA threshold decision; or

   b. Include construction of a new building; or

   c. Include an exterior nonresidential addition to an existing building; or

   d. Include an exterior addition of one or more residential units; or

   e. Consist of more than 4 infill housing units pursuant to Chapter 20.28 BMC;

3 -12. [No Change]

13. Repealed ~~Infill housing projects under Chapter 20.28 BMC~~;

14 - 18. [No Change]

D - J. [No Change]

Section 19. City administration and the codifiers of this ordinance are authorized to make necessary clerical corrections including, but not limited to, the correction of scrivener's/clerical

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

errors, references, ordinance numbering, section/subsection numbers and any reference thereto.

Section 20. The City Council agrees with and adopts the Findings of Fact, Conclusions and Recommendations of the Planning Commission attached as **Exhibit A** and incorporated by reference.

PASSED by the Council this _____ day of _____, 2021

_____
Council President

APPROVED by me this _____ day of _____, 2021

_____
Mayor

ATTEST: _____
Finance Director

APPROVED AS TO FORM:

_____
Office of the City Attorney

Published: _____

DRAFT

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

Exhibit A

BELLINGHAM PLANNING COMMISSION FINDINGS OF FACT, CONCLUSIONS, AND RECOMMENDATIONS

NOVEMBER 4, 2021

SUMMARY
Following the public hearing and deliberation on the proposed amendments to the infill housing provisions (commonly referred to as the "infill toolkit or ITK) in BMC Titles 20 and 21, the Bellingham Planning Commission has determined that the proposed changes comply with, and will implement, the goals and policies of the Bellingham Comprehensive Plan.

I. FINDINGS OF FACT

1. Proposal Description:

The proposed amendments were developed by the Planning and Community Development Department staff as a result of our experience with a number of ITK projects over the past few years. A refinement of new codes after a period of time is often desirable. This project includes targeted amendments intended to improve the use and implementation of the ITK. It is focused on changes to the development and design regulations and permit processing pursuant to BMC Chapters 20.25, 20.28 and 21.10. It includes the following components:

- The chapter's "Purpose and Intent" statements are revised to emphasize pedestrian oriented design, satisfying comprehensive plan goals to create walkable neighborhoods and increase transportation mode shift to alternative transportation modes;
- The current allowance of minor modifications from standards is expanded to allow greater flexibility when a proposed project includes a strong pedestrian-oriented design, a better development pattern, and/or a mix of housing types;
- Some of the chapter's dimensional standards have been revised to encourage use of the ITK to achieve intended densities and to encourage a mix of housing types and good design. Examples include increasing floor area ratios and building height limits, amending and/or adding green factor landscaping requirements to all housing types, balancing the open space and private usable space standards with the floor area ratios and green factor landscaping requirements;

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

- The review process requirements are revised so that infill housing project applications use the design review process pursuant to proposed amendments in Chapter 20.25;
- The Smaller and Small House housing types are consolidated to eliminate inconsistencies and redundancies between them; and
- Additional minor changes are proposed throughout the land use code as needed to achieve project objectives.

The overall objective of the amendments is to establish code provisions that result in pedestrian oriented development, create flexibility to achieve this objective for both infill and greenfield development, amend some development regulations for infill housing types to be more consistent with other permitted housing types in the same zoning designation, and streamline the application review process for small projects.

Staff is proposing these changes because current code provisions are not achieving pedestrian oriented design. In response to the code deficiencies, development proposals frequently include requests for the same minor modifications. This adds time to the review process for applicants and staff. The code deficiencies should be addressed through this amendment process to avoid modification requests from becoming more common rather than the occasional request. Without the amendments, the code is likely not sufficient to achieve the overall objectives. The proposed amendments will also further the implementation of recent code provisions in the RM project and the land division ordinance update that seek to encourage a variety of housing forms in new developments through use of the ITK.

The proposal also includes amendments to other sections of the municipal code that are necessary to support the intent of the project. For example, currently all infill housing proposals are reviewed using a Type II application process, requiring notice to all property owners within 500 feet of the proposal's boundaries. Staff proposes to change the review process for infill projects consisting of 4 or fewer units to Type I process when no other land use decisions of a higher process type are required. Developers and property owners interested in small infill projects have reported that the current review process discourages use of the ITK, and public comments received in response to notices are less directed to the infill housing provisions and more to general concerns, such as traffic, drainage, density, etc. Therefore, staff believes that revising the process type for small infill projects will encourage use of the ITK for projects with little or no impact on the surrounding neighborhood. This change is consistent with what would otherwise be allowed for a standard 4-lot subdivision for detached single family housing with no design standards.

The proposal does NOT include any expansion of the areas or zones where use of ITK is currently allowed.

2. Background Information/Procedural History:

2009: BMC Chapter 20.28 Infill Housing was adopted.

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

October 3, 2021: A notice of Planning Commission public hearing was issued.

October 20, 2021: A non-project SEPA Determination of Nonsignificance was issued.

November 4, 2021: Planning Commission public hearing.

November 18, 2021: Planning Commission work session to finalize a recommendation on the draft ordinance. The Planning Commission's recommendation includes the following revisions to the draft ordinance:

a. Retain the reference to affordability in the Purpose and Intent statement.
b. Add figures throughout the draft ordinance intended to provide examples of the written code.
c. Include additional language in the modification criteria section to clarify and emphasis intent.
d. Include a definition for private alley.
e. Revise the floor area ratio for Small Lot infill units.
f. Revise design standard language for roof forms and designs for many housing types.
g. Other code clean-ups.

The proposal includes amending the provisions and application review process of the City's infill housing toolkit (often referred to as the "infill toolkit" or ITK).

The infill housing chapter, BMC Chapter 20.28, was established in 2009 to allow and encourage the development of alternative housing forms and ownership opportunities in addition to the city's familiar and typical single and multifamily development. Housing types allowed under these provisions can include small lot single family housing, cottage housing, townhomes, zero lot line housing, duplexes, triplexes and accessory dwelling units.

Between 2009 and 2015, the City received few applications under these provisions. Since 2015, interest in using the infill housing code provisions by private developers has increased substantially. Staff is currently processing several land use applications that include infill toolkit housing types. This increase is due in part to the changing demographics of the city, market demand for these housing types, the few early projects being completed proving a market exists for such housing and creating greater awareness and interest among developers, and recent code changes that have sought to increase opportunities to use the infill housing forms.

In 2018, the land division (subdivision) ordinance was updated. It established a 50% density bonus when development includes at least 50% of the total dwelling units as infill housing types.

The RM Project, recently approved by City Council, established minimum density requirements and restricted the development of detached single-family homes in residential-multi areas to no more than 25% of the allowed density. However, the 25% restriction does not apply to infill housing forms. This was done specifically to encourage a diversity of

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

housing types other than apartment buildings and as a way of meeting the new minimum density requirements.

3. Public Comment:

Notice of the Planning Commission public hearing was mailed to neighborhood representatives, neighborhood associations, and other parties with an interest in this topic. Notice was also published in the Bellingham Herald 30 days prior to the hearing.

Public comments were submitted prior to the public hearing and public testimony was taken at the Planning Commission hearing and the Commissioners duly considered it.

4. State Environmental Policy Act (SEPA) Determination:

A non-project SEPA Determination of Non-Significance (DNS) was issued on October 20, 2021. Notice was mailed to the appropriate agencies, parties of record and published in the Bellingham Herald and on the City's website. No public comment was submitted on the DNS prior to publication of the meeting packet.

5. Consistency with the Bellingham Comprehensive Plan:

Zoning and development regulations should be reviewed and amended periodically to address changing circumstances and to implement the goals and policies of the comprehensive plan. The infill housing provisions of the BMC were originally adopted in 2009, prior to the approval of the 2016 version of the Bellingham Comprehensive Plan. The proposed amendments are intended to address the comprehensive plan goals and policies that encourage infill development, development of alternative (or "missing middle") housing forms, good design, and increase opportunities for home ownership as established in the following goals and policies.

GOAL H-1 **Ensure that Bellingham has a sufficient quantity and variety of housing types and densities to accommodate projected growth and promote other community goals.**

Policy H-2 Encourage mixed housing types for new development on greenfield sites, a benefit of which is the integration of people from various socio-economic backgrounds.

Policy H-3 Encourage well-designed infill development on vacant or underutilized properties.

Policy H-4 Continue to support implementation of the Infill Housing Toolkit, which permits innovative housing forms such as small and smaller lot single-family homes, cottages, duplexes, triplexes, common courtyards and townhomes.

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

GOAL H-2 **Foster housing that is safe, healthy, livable, and affordable for all income levels in all neighborhoods.**

Policy H-24 Continue streamlining the regulatory review and building permit process and reviewing the cost of infrastructure improvements and their impact on housing costs.

GOAL LU-1 **Support sense of place in neighborhoods.**

Policy LU-4 Protect the unique character and qualities of existing neighborhoods, while identifying opportunities for improved livability, safety, and housing affordability and diversity.

Policy LU-7 Periodically review and update the City's residential zoning regulations and design standards to promote quality development that considers and complements existing neighborhoods.

GOAL CD-1 **Promote streetscapes that enhance the economic vitality and overall visual quality of the City, support the circulation network, and support pedestrian-scale streets and patterns of activity.**

Policy CD-2 Ensure that land use, fire, and street standards are coordinated to provide greater pedestrian comfort and safety and more attractive alternative modes of transportation. Implementation strategies include:

- Where possible, install physical buffers between the sidewalk and traffic such as site-appropriate street trees and landscaping, street furniture, rain gardens or other low impact development techniques, and on-street parking.
- Orient new development to streets, and effectively frame in the streetscape.
- Restrict parking to the side or rear of development, or within a structure.
- Consider allowing on-street parking to count toward off-street requirements in selected mixed-use areas to encourage compact, pedestrian-oriented development and to lessen the size and impacts of large parking lots.
- Encourage the use of alleys for vehicle access and utility installation.
- Coordinate placement of physical features between streets and buildings to accommodate staging areas for emergency response vehicles, including aerial apparatus.

DRAFT

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

GOAL CD-2 **Express the City's distinct community identity and sense of place through improvements to the appearance of new development, commercial centers, urban villages, transit corridors and streetscapes.**

Policy CD-7 Ensure that new development is of a type, scale, orientation, and design that maintains or improves the character, aesthetics, and livability of neighborhoods. While compatibility is more of an issue in established neighborhoods, new development needs to take into account the context of the area and should result in an improvement to the surrounding neighborhood.

Policy CD-12 Periodically review and update the City's zoning regulations, design standards and design review process to ensure they promote quality development and result in projects that consider and complement existing neighborhoods. Specific recommendations include:

- Require the installation and maintenance of adequate landscaping and screening in commercial, industrial and multi-family (including duplex) projects.
- Allow open space to be satisfied with innovative and flexible applications of landscaping in denser development, including green walls and roofs and more intense landscaping of smaller open spaces, to allow more efficient use of the land for buildings.
- Review auto parking standards to reduce the impacts of parking on urban form, adjacent uses, housing affordability, pedestrian mobility, and the natural environment. Continue to pursue parking management best practices.

Policy CD-14 Provide builders, developers and architects with a set of clear objectives and performance goals which promote the highest attainable standard of quality consistent with economic feasibility for new development.

DRAFT

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

GOAL CD-4 **Provide a well-designed, pedestrian-friendly, and community-oriented environment.**

Policy CD-21 Maintain a system of design review that applies more intense levels of review where the scope of the project has greater potential impacts to the community. Implement this system through a formal design review board process in conjunction with administrative review.

Policy CD-22 Use design standards and design review to accomplish the following:

- Ensure elements of design, proportion, rhythm, scale and massing are appropriate for proposed structures and sites and contextually compatible with surrounding development.
- Consolidate on-site landscaped areas to be large enough to balance the scale of development and functional enough for leisure and recreation.

GOAL CD-6 **Encourage contextually-appropriate infill development projects and property renovations.**

Policy CD-32 Provide development standards that are adaptable to a variety of conditions to allow for diversity in building styles within districts and neighborhoods.

Policy CD-33 Encourage the construction of innovative small-scale housing types that fit the context of single-family neighborhoods such as accessory dwelling units, cottage housing, cohousing, townhomes, zero lot line homes, and small lot housing.

Policy CD-34 Emphasize pedestrian-oriented development that includes building facades that relate to the street and clear pedestrian entries.

Policy CD-35 Allow flexible setback, parking and lot coverage requirements in older neighborhoods with established lots, so that infill housing can conform to the existing neighborhood structures. In established neighborhoods, for example, new buildings should be the same distance from the street as neighboring buildings.

DRAFT

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

Integration of Land Use and Transportation Planning

Due to Bellingham's status as the largest population, employment, and service center in Whatcom County, the local multimodal transportation network is significantly affected by regional traffic generated from outside the City limits. The affordability of housing options, individual choice to live in the county or another city and commute to work in Bellingham, and the attraction of Canadian shoppers from lower mainland British Columbia just 20 miles to the north all contribute vehicle traffic generated from outside the City. This presents Bellingham with significant challenges in using land use and transportation planning policies to encourage infill development, maintain a compact urban area, and promote transportation mode shift, while also managing increasing vehicle traffic congestion on the Citywide multimodal transportation system.

GOAL T-1 Limit urban sprawl by linking land use and transportation planning.

GOAL T-3 Increase infrastructure for bicycles, pedestrian, and non-single-occupancy vehicle modes of transportation.

Policy T-16 Employ Transportation Demand Management (TDM) and Transportation System Management (TSM) strategies, including, but not limited to, those listed below to increase the safety, efficiency, and long-term sustainability of the Citywide multimodal transportation system. TDM Actions:

- Implement urban village plans and Multifamily Design Review Guidelines to encourage development to be transit supportive, pedestrian oriented, and bicycle friendly;
- Encourage compact land use patterns that reduce vehicle trips and vehicle miles traveled;
- Monitor U.S. Census data and report annual progress in the TRAM toward achieving transportation mode shift goals for increasing the share of work trips made by bicycle, pedestrian, and transit trips and reducing work trips made by SOVs;

The proposed code amendments, as amended by the Planning Commission, are consistent with the Housing, Land Use, Community Design and Transportation goals and policies referenced.

II. CONCLUSIONS

The Planning Commission finds that proposed amendments will:

1. Foster pedestrian-oriented development by establishing appropriate design and development standards.

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

DRAFT

2. Protect the unique character and qualities of existing neighborhoods, while identifying opportunities for improved livability, safety, and housing affordability and diversity.

3. Encourage mixed housing types for new development on greenfield sites.

4. Establish flexibility in code provisions to achieve most efficient use of land and better site design.

5. Streamline the application review process for small infill housing projects.

6. Implement the goals and policies of the Bellingham Comprehensive Plan.

III. RECOMMENDATION

After careful consideration of all public comments, the staff report, other meeting materials, and the Findings and Conclusions, the Planning Commission recommends, with a 6-1 vote, that the City Council approve the proposed amendments to the Bellingham Municipal Code as shown in the draft ordinance.

ADOPTED this _____day of_____, 2021.

_____
Planning Commission Chairperson

ATTEST:_____
Recording Secretary

APPROVED AS TO FORM:

_____
City Attorney

DRAFT

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

Exhibit A

BELLINGHAM PLANNING COMMISSION FINDINGS OF FACT, CONCLUSIONS, AND RECOMMENDATIONS

NOVEMBER 4, 2021

SUMMARY
Following the public hearing and deliberation on the proposed amendments to the infill housing provisions (commonly referred to as the "infill toolkit or ITK) in BMC Titles 20 and 21, the Bellingham Planning Commission has determined that the proposed changes comply with, and will implement, the goals and policies of the Bellingham Comprehensive Plan.

I. FINDINGS OF FACT

1. Proposal Description:

The proposed amendments were developed by the Planning and Community Development Department staff as a result of our experience with a number of ITK projects over the past few years. A refinement of new codes after a period of time is often desirable. This project includes targeted amendments intended to improve the use and implementation of the ITK. It is focused on changes to the development and design regulations and permit processing pursuant to BMC Chapters 20.25, 20.28 and 21.10. It includes the following components:

- The chapter's "Purpose and Intent" statements are revised to emphasize pedestrian oriented design, satisfying comprehensive plan goals to create walkable neighborhoods and increase transportation mode shift to alternative transportation modes;
- The current allowance of minor modifications from standards is expanded to allow greater flexibility when a proposed project includes a strong pedestrian-oriented design, a better development pattern, and/or a mix of housing types;
- Some of the chapter's dimensional standards have been revised to encourage use of the ITK to achieve intended densities and to encourage a mix of housing types and good design. Examples include increasing floor area ratios and building height limits, amending and/or adding green factor landscaping requirements to all housing types, balancing the open space and private usable space standards with the floor area ratios and green factor landscaping requirements;
- The review process requirements are revised so that infill housing project applications use the design review process pursuant to proposed amendments in Chapter 20.25;
- The Smaller and Small House housing types are consolidated to eliminate inconsistencies and redundancies between them; and
- Additional minor changes are proposed throughout the land use code as needed to achieve project objectives.

The overall objective of the amendments is to establish code provisions that result in pedestrian oriented development, create flexibility to achieve this objective for both infill and greenfield development, amend some development regulations for infill housing types to be more consistent with other permitted housing types in the same zoning designation, and streamline the application review process for small projects.

Staff is proposing these changes because current code provisions are not achieving pedestrian oriented design. In response to the code deficiencies, development proposals frequently include requests for the same minor modifications. This adds time to the review process for applicants and staff. The code deficiencies should be addressed through this amendment process to avoid modification requests from becoming more common rather than the occasional request. Without the amendments, the code is likely not sufficient to achieve the overall objectives. The proposed amendments will also further the implementation of recent code provisions in the RM project and the land division ordinance update that seek to encourage a variety of housing forms in new developments through use of the ITK.

The proposal also includes amendments to other sections of the municipal code that are necessary to support the intent of the project. For example, currently all infill housing proposals are reviewed using a Type II application process, requiring notice to all property owners within 500 feet of the proposal's boundaries. Staff proposes to change the review process for infill projects consisting of 4 or fewer units to Type I process when no other land use decisions of a higher process type are required. Developers and property owners interested in small infill projects have reported that the current review process discourages use of the ITK, and public comments received in response to notices are less directed to the infill housing provisions and more to general concerns, such as traffic, drainage, density, etc. Therefore, staff believes that revising the process type for small infill projects will encourage use of the ITK for projects with little or no impact on the surrounding neighborhood. This change is consistent with what would otherwise be allowed for a standard 4-lot subdivision for detached single family housing with no design standards.

The proposal does NOT include any expansion of the areas or zones where use of ITK is currently allowed.

2. Background Information/Procedural History:

2009: BMC Chapter 20.28 Infill Housing was adopted.

October 3, 2021: A notice of Planning Commission public hearing was issued.

October 20, 2021: A non-project SEPA Determination of Nonsignificance was issued.

November 4, 2021: Planning Commission public hearing.

November 18, 2021: Planning Commission work session to finalize a recommendation on the draft ordinance. The Planning Commission's recommendation includes the following revisions to the draft ordinance:

a. Retain the reference to affordability in the Purpose and Intent statement.
b. Add figures throughout the draft ordinance intended to provide examples of the written code.
c. Include additional language in the modification criteria section to clarify and emphasis intent.
d. Include a definition for private alley.
e. Revise the floor area ratio for Small Lot infill units.
f. Revise design standard language for roof forms and designs for many housing types.
g. Other code clean-ups.

The proposal includes amending the provisions and application review process of the City's infill housing toolkit (often referred to as the "infill toolkit" or ITK).

The infill housing chapter, BMC Chapter 20.28, was established in 2009 to allow and encourage the development of alternative housing forms and ownership opportunities in addition to the city's familiar and typical single and multifamily development. Housing types allowed under these provisions can include small lot single family housing, cottage housing, townhomes, zero lot line housing, duplexes, triplexes and accessory dwelling units.

Between 2009 and 2015, the City received few applications under these provisions. Since 2015, interest in using the infill housing code provisions by private developers has increased substantially. Staff is currently processing several land use applications that include infill toolkit housing types. This increase is due in part to the changing demographics of the city, market demand for these housing types, the few early projects being completed proving a market exists for such housing and creating greater awareness and interest among developers, and recent code changes that have sought to increase opportunities to use the infill housing forms.

In 2018, the land division (subdivision) ordinance was updated. It established a 50% density bonus when development includes at least 50% of the total dwelling units as infill housing types.

The RM Project, recently approved by City Council, established minimum density requirements and restricted the development of detached single-family homes in residential-multi areas to no more than 25% of the allowed density. However, the 25% restriction does not apply to infill housing forms. This was done specifically to encourage a diversity of housing types other than apartment buildings and as a way of meeting the new minimum density requirements.

3. Public Comment:

Notice of the Planning Commission public hearing was mailed to neighborhood representatives, neighborhood associations, and other parties with an interest in this topic. Notice was also published in the Bellingham Herald 30 days prior to the hearing.

Public comments were submitted prior to the public hearing and public testimony was taken at the Planning Commission hearing and the Commissioners duly considered it.

4. State Environmental Policy Act (SEPA) Determination:

A non-project SEPA Determination of Non-Significance (DNS) was issued on October 20, 2021. Notice was mailed to the appropriate agencies, parties of record and published in the Bellingham Herald and on the City's website. No public comment was submitted on the DNS prior to publication of the meeting packet.

5. Consistency with the Bellingham Comprehensive Plan:

Zoning and development regulations should be reviewed and amended periodically to address changing circumstances and to implement the goals and policies of the comprehensive plan. The infill housing provisions of the BMC were originally adopted in 2009, prior to the approval of the 2016 version of the Bellingham Comprehensive Plan. The proposed amendments are intended to address the comprehensive plan goals and policies that encourage infill

development, development of alternative (or "missing middle") housing forms, good design, and increase opportunities for home ownership as established in the following goals and policies.

GOAL H-1 **Ensure that Bellingham has a sufficient quantity and variety of housing types and densities to accommodate projected growth and promote other community goals.**

Policy H-2 Encourage mixed housing types for new development on greenfield sites, a benefit of which is the integration of people from various socio-economic backgrounds.

Policy H-3 Encourage well-designed infill development on vacant or underutilized properties.

Policy H-4 Continue to support implementation of the Infill Housing Toolkit, which permits innovative housing forms such as small and smaller lot single-family homes, cottages, duplexes, triplexes, common courtyards and townhomes.

GOAL H-2 **Foster housing that is safe, healthy, livable, and affordable for all income levels in all neighborhoods.**

Policy H-24 Continue streamlining the regulatory review and building permit process and reviewing the cost of infrastructure improvements and their impact on housing costs.

GOAL LU-1 **Support sense of place in neighborhoods.**

Policy LU-4 Protect the unique character and qualities of existing neighborhoods, while identifying opportunities for improved livability, safety, and housing affordability and diversity.

Policy LU-7 Periodically review and update the City's residential zoning regulations and design standards to promote quality development that considers and complements existing neighborhoods.

GOAL CD-1 **Promote streetscapes that enhance the economic vitality and overall visual quality of the City, support the circulation network, and support pedestrian-scale streets and patterns of activity.**

Policy CD-2 Ensure that land use, fire, and street standards are coordinated to provide greater pedestrian comfort and safety and more attractive alternative modes of transportation. Implementation strategies include:

- Where possible, install physical buffers between the sidewalk and traffic such as site-appropriate street trees and landscaping, street furniture, rain gardens or other low impact development techniques, and on-street parking.
- Orient new development to streets, and effectively frame in the streetscape.

- Restrict parking to the side or rear of development, or within a structure.
- Consider allowing on-street parking to count toward off-street requirements in selected mixed-use areas to encourage compact, pedestrian-oriented development and to lessen the size and impacts of large parking lots.
- Encourage the use of alleys for vehicle access and utility installation.
- Coordinate placement of physical features between streets and buildings to accommodate staging areas for emergency response vehicles, including aerial apparatus.

GOAL CD-2 **Express the City's distinct community identity and sense of place through improvements to the appearance of new development, commercial centers, urban villages, transit corridors and streetscapes.**

Policy CD-7 Ensure that new development is of a type, scale, orientation, and design that maintains or improves the character, aesthetics, and livability of neighborhoods. While compatibility is more of an issue in established neighborhoods, new development needs to take into account the context of the area and should result in an improvement to the surrounding neighborhood.

Policy CD-12 Periodically review and update the City's zoning regulations, design standards and design review process to ensure they promote quality development and result in projects that consider and complement existing neighborhoods. Specific recommendations include:

- Require the installation and maintenance of adequate landscaping and screening in commercial, industrial and multi-family (including duplex) projects.
- Allow open space to be satisfied with innovative and flexible applications of landscaping in denser development, including green walls and roofs and more intense landscaping of smaller open spaces, to allow more efficient use of the land for buildings.
- Review auto parking standards to reduce the impacts of parking on urban form, adjacent uses, housing affordability, pedestrian mobility, and the natural environment. Continue to pursue parking management best practices.

Policy CD-14 Provide builders, developers and architects with a set of clear objectives and performance goals which promote the highest attainable standard of quality consistent with economic feasibility for new development.

GOAL CD-4 Provide a well-designed, pedestrian-friendly, and community-oriented environment.

Policy CD-21 Maintain a system of design review that applies more intense levels of review where the scope of the project has greater potential impacts to the community. Implement this system through a formal design review board process in conjunction with administrative review.

Policy CD-22 Use design standards and design review to accomplish the following:

- Ensure elements of design, proportion, rhythm, scale and massing are appropriate for proposed structures and sites and contextually compatible with surrounding development.
- Consolidate on-site landscaped areas to be large enough to balance the scale of development and functional enough for leisure and recreation.

GOAL CD-6 Encourage contextually-appropriate infill development projects and property renovations.

Policy CD-32 Provide development standards that are adaptable to a variety of conditions to allow for diversity in building styles within districts and neighborhoods.

Policy CD-33 Encourage the construction of innovative small-scale housing types that fit the context of single-family neighborhoods such as accessory dwelling units, cottage housing, cohousing, townhomes, zero lot line homes, and small lot housing.

Policy CD-34 Emphasize pedestrian-oriented development that includes building facades that relate to the street and clear pedestrian entries.

Policy CD-35 Allow flexible setback, parking and lot coverage requirements in older neighborhoods with established lots, so that infill housing can conform to the existing neighborhood structures. In established neighborhoods, for example, new buildings should be the same distance from the street as neighboring buildings.

Integration of Land Use and Transportation Planning

Due to Bellingham's status as the largest population, employment, and service center in Whatcom County, the local multimodal transportation network is significantly affected by regional traffic generated from outside the City limits. The affordability of housing options, individual choice to live in the county or another city and commute to work in Bellingham, and the attraction of Canadian shoppers from lower mainland British Columbia just 20 miles to the north all contribute vehicle traffic generated from outside the City. This presents Bellingham with significant challenges in using land use and transportation planning policies to encourage infill development, maintain a compact urban area, and promote transportation mode shift, while also

managing increasing vehicle traffic congestion on the Citywide multimodal transportation system.

GOAL T-1 **Limit urban sprawl by linking land use and transportation planning.**

GOAL T-3 **Increase infrastructure for bicycles, pedestrian, and non-single-occupancy vehicle modes of transportation.**

Policy T-16 Employ Transportation Demand Management (TDM) and Transportation System Management (TSM) strategies, including, but not limited to, those listed below to increase the safety, efficiency, and long-term sustainability of the Citywide multimodal transportation system. TDM Actions:

- Implement urban village plans and Multifamily Design Review Guidelines to encourage development to be transit supportive, pedestrian oriented, and bicycle friendly;
- Encourage compact land use patterns that reduce vehicle trips and vehicle miles traveled;
- Monitor U.S. Census data and report annual progress in the TRAM toward achieving transportation mode shift goals for increasing the share of work trips made by bicycle, pedestrian, and transit trips and reducing work trips made by SOVs;

The proposed code amendments, as amended by the Planning Commission, are consistent with the Housing, Land Use, Community Design and Transportation goals and policies referenced.

II. CONCLUSIONS

The Planning Commission finds that proposed amendments will:

1. Foster pedestrian-oriented development by establishing appropriate design and development standards.

2. Protect the unique character and qualities of existing neighborhoods, while identifying opportunities for improved livability, safety, and housing affordability and diversity.

3. Encourage mixed housing types for new development on greenfield sites.

4. Establish flexibility in code provisions to achieve most efficient use of land and better site design.

5. Streamline the application review process for small infill housing projects.

6. Implement the goals and policies of the Bellingham Comprehensive Plan.

III. RECOMMENDATION

After careful consideration of all public comments, the staff report, other meeting materials, and the Findings and Conclusions, the Planning Commission recommends, with a 6-1 vote, that the City Council approve the proposed amendments to the Bellingham Municipal Code as shown in the draft ordinance.

ADOPTED this 18TH day of November, 2021.

Planning Commission Chairperson

ATTEST:
Recording Secretary

APPROVED AS TO FORM:

City Attorney

City Council Agenda Bill

23214

Bill Number

Subject: **Resource Recovery Project Update and Loan Application**

Summary Statement: This update will include two items. The first item is to present the sewer utility rate forecast and the results of the utility affordability analysis. The analyses were both performed in the context of the Post Point Resource Recovery Biosolids Project (Project) as well as the future nutrient removal upgrades planned for the facility. The intent of the presentation is to start the discussion related to necessary sewer rate increases. The second item is to share with Council the path forward for the Post Point Resource Recovery Plant (Post Point) Biosolids Project (Project). This is intended to be a big picture summary and to inform Council of upcoming milestones and corresponding Council actions. Recommended action for the meeting will be authorization to submit an application to the US EPA for a Water Infrastructure Financing Investment Act (WIFIA) loan for $136 million.

Previous Council Action: **Approval of 2019-2020 Budget. Council Briefings on 12/06/2021, 09/09/2019, 01/28/2019, 7/24/2017, 4/10/2017, and 10/24/2016 adoption of the 2018 Climate Action Plan**

Fiscal Impact: **The project is expected to cost more than $220 million**

Funding Source: **Wastewater Fund (420)**

Attachments:
1. POST POINT RESOURCE RECOVERY_STAFF MEMO_PATH FORWARD
2. POST POINT RESOURCE RECOVERY_STAFF MEMO_RATES & AFFORDABILITY
3. POST POINT RESOURCE RECOVERY_FINANCIAL PLAN & AFFORDABILITY ANALYSIS
4. POST POINT RESOURCE RECOVERY_PATH FORWARD

Meeting Activity	Meeting Date	Recommendation	Presented By	Time
Committee Briefing - Direction Requested	12/13/2021	Provide Direction	Eric Johnston, Public Works Director.	60 minutes

Recommended Motion: Authorize staff to submit the WIFIA loan application.

Council Committee:
Committee Of The Whole

Agenda Bill Contact:
Eric Johnston, Public Works Director

Council Action:

Reviewed By	Department	Date
Eric C. Johnston	Public Works	12/07/2021
Matthew T. Stamps	Legal	12/07/2021
Seth M. Fleetwood	Executive	12/07/2021

City of Bellingham
210 Lottie Street
Bellingham, WA 98225

MEMORANDUM

TO: CITY COUNCIL

FROM: ERIC JOHNSTON, PUBLIC WORKS DIRECTOR

CC: MAYOR SETH FLEETWOOD

SUBJECT: RESOURCE RECOVERY PROJECT PATH FORWARD

DATE: DECEMBER 13, 2021

The Post Point Resource Recovery project continues to progress. The purpose of this agenda item is to share with Council the path forward for the Post Point Resource Recovery Plant (Post Point) Biosolids Project (Project). This is intended to be a big picture summary and to inform Council of upcoming milestones and corresponding topics.

Project Schedule Overview

The Project is currently in the facility planning stage, which will be completed following Ecology and Council approvals in 2022. Preliminary design is currently underway and detailed design is planned to finish in 2024. Construction is planned begin in late 2023 and with completion in 2027.

Future Milestones and Topics

The future milestones are categorized into four primary topic categories: Informational, Financial, Delivery, and Beneficial Use. At each milestone, City staff will indicate whether the purpose is to inform Council or to request Council action for key Project questions or issues needing resolution. These milestones will occur in 2022 through 2024.

Informational milestones will focus on the Biosolids Facility Plan and overall Project Progress Updates.

Financial milestone topics include sewer rate forecast update, Water Infrastructure Finance and Innovation Act (WIFIA) loan application submission and loan agreement, and sewer rate adjustment approval.

Delivery milestone topics will focus on the Project procurement and delivery process, including General Contractor/Construction Manager delivery method approval, design phase contract authorizations for the design consultant and construction contractor, and construction phase contract authorizations for the design consultant and construction contractor.

Beneficial Use topics relate to the Class A biosolids and biogas resources that will be recovered by Post Point. The City has solicited proposals from the market to prepare the final biosolids product and determine beneficial use(s). The outcome of the Request for Proposals will give Council more information to decide what the beneficial end use(s) of the biosolids product will be and whether a partnership with an “off-site” biosolids service provider is desirable to the Council.

Future milestone updates will cover biosolids procurement (Phase 1 and Phase 2), biogas end use procurement, and agreements for ultimate biosolids and biogas end uses.

City of Bellingham
210 Lottie Street
Bellingham, WA 98225

MEMORANDUM

TO: CITY COUNCIL

FROM: ERIC JOHNSTON, PUBLIC WORKS DIRECTOR

CC: MAYOR SETH FLEETWOOD

SUBJECT: RESOURCE RECOVERY PROJECT RATES AND AFFORDABILITY

DATE: DECEMBER 13, 2021

The Post Point Resource Recovery project continues to progress. The purpose of this agenda item is to present the sewer utility rate forecast and the results of a utility affordability analysis. The analyses were both performed in the context of the Post Point Resource Recovery Biosolids Project (Project) as well as the future nutrient removal upgrades planned for the facility. The intent of the presentation is to inform Council ahead of next year's sewer rate increases.

Rate Study Background and Results

The rate study was performed in February 2021 to determine the financial impact of the Post Point upgrades. The capital investments planned for Post Point include the biosolids upgrades to replace the existing solids incineration system as well as the future nutrient removal improvements necessary to respond to anticipated State water quality requirements. At the time of the rate study, Department of Ecology's regulations were not finalized so "moderate" and "worst case" regulatory scenarios were evaluated. The financial impact analysis uses an 18-year horizon (2021 – 2039) and three funding scenarios. The analysis forecasted a need for 12% rate increases starting in 2022, with the number of years of 12% increases varying depending on the funding scenario.

Scenario A – Biosolids Upgrades Only. 12% rate increases needed for 5 years, through 2026, followed by one year of an 8% increase. No further rate increases needed.

Scenario B – Biosolids Upgrades and Nutrient Removal Upgrades (moderate requirements). 12% sewer rate increases necessary over a 9-year period through 2030, followed by 2% annual increases for an additional six years (through 2036). No further increases in 2037 and beyond.

Scenario C – Biosolids Upgrades and Nutrient Removal Upgrades (worst case requirements). 12% sewer rate increases necessary over an 11-year period through 2032, followed by 1% increase in 2033. No further increases in 2034 and beyond.

Affordability Analysis Background and Results

Based on the sewer rate forecast, the City of Bellingham evaluated the affordability of the collective sewer, water, and stormwater utility rates compared to residents' income. The analysis uses four metrics to evaluate affordability. Two of the metrics, monthly utility cost relative to minimum wage and 40th percentile household income (40%HI), are proposed as the most

appropriate. The affordability analysis also compares Bellingham to other mid-sized and large Washington cities and evaluates customer assistance programs.
After completion of the biosolids and nutrient removal upgrades projects, City of Bellingham's combined utility rates would be the highest relative to current rates by other cities in the region.

Next Steps
No action is requested from Council at this time. City Council will need to adopt a multi-year schedule of sewer rate increases in spring 2021 in order to be effective by July 2022. The first rate increase (12%) is recommended to occur in July 2022 and then annually every January thereafter. The affordability issue is a policy discussion for the City. Council may consider changes to customer assistance programs to offset sewer rate impacts for low-income groups.

Wastewater Financial Plan & Affordability Analysis

Gordon Wilson, FCS GROUP

December 13, 2021

FCS GROUP
Solutions-Oriented Consulting

Purpose of Presentation

- **Sewer rate forecast**
  - » Incorporates major capital projects at treatment plant
    - – Resource Recovery project (biosolids)
    - – Future nutrient removal
  - » Forecast is being updated, but main message is the same
- **Utility affordability analysis**
  - » Water, sewer, and stormwater combined rates
  - » Affordability metrics, comparison with other Washington cities
    - – Includes projected changes in utility affordability over time
  - » Research into potential policy response to affordability issue

Sewer Rate Forecast

FCS GROUP
Solutions-Oriented Consulting

Key Forecast Assumptions

Metric	Assumption
Rate & capital funding forecast	2022-2039
Capital funding - grants	$0 (just borrowing and cash reserves)
Capital funding - revenue bonds *	30 years at 4% beginning in 2024
Annual system development charges	~$2.2 million / year
Lake Whatcom Water & Sewer District	Assumes LWWSD responsible for 4.8% of treatment capital costs
Debt service coverage	City policy is 2.0 debt service coverage; forecast assumes exceptions allowed

* *Approval of WIFIA loan to be incorporated into next update of forecast*

Capital Project Assumptions

- **Routine capital**
  - » $20.5 million in identified projects 2020-2022
  - » $4 million/year for collection & transmission projects

- **Resource Recovery project**
  - » Construction 2024-2026, $200 million in 2020 dollars,
  - » Plus, net increase $1 million annual O&M costs

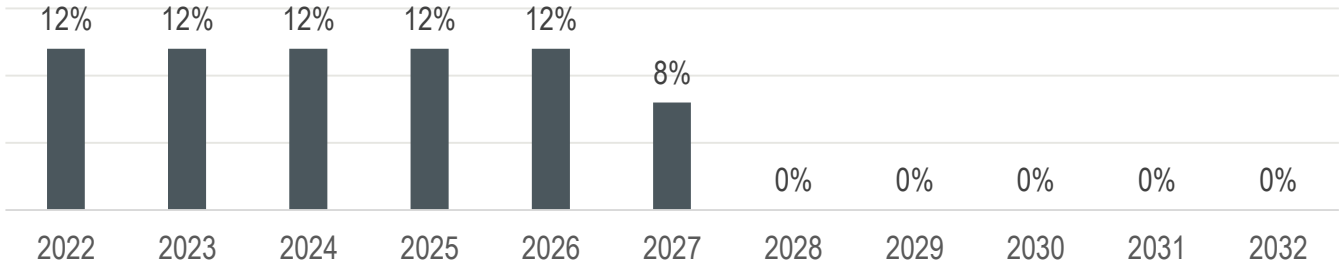
- **Nutrient removal projects (two phases)**
  - » Construction 2027-35, costs depend on final regulations
  - » Moderate case: $294 million (2020 $), +$1.8 million/yr. O&M
  - » Worst case: $322 million (2020 $), +7 million/yr. O&M

Scenarios

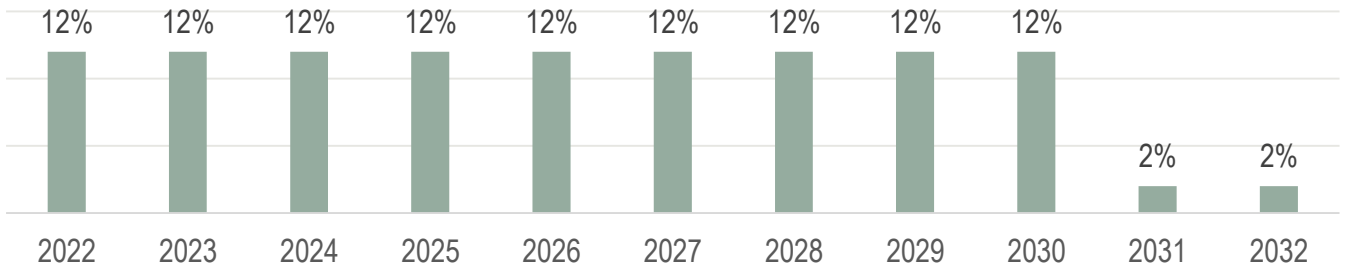
- **Base Case**
  - 2020 operating budget plus inflation
  - Routine capital only
  - 1%/year rate increases, no debt
  - Scenario is shown for comparison only – not a real option
- **Scenario A**
  - Routine capital plus biosolids improvements only
  - Scenario is shown for comparison – not a real option, since nutrient removal requirements are forthcoming
- **Scenario B**
  - Routine capital plus biosolids improvements
  - Assumes nutrient removal improvements – moderate case
- **Scenario C**
  - Routine capital plus biosolids improvements
  - Assumes nutrient removal improvements – worst case

Rate Forecast through 2032

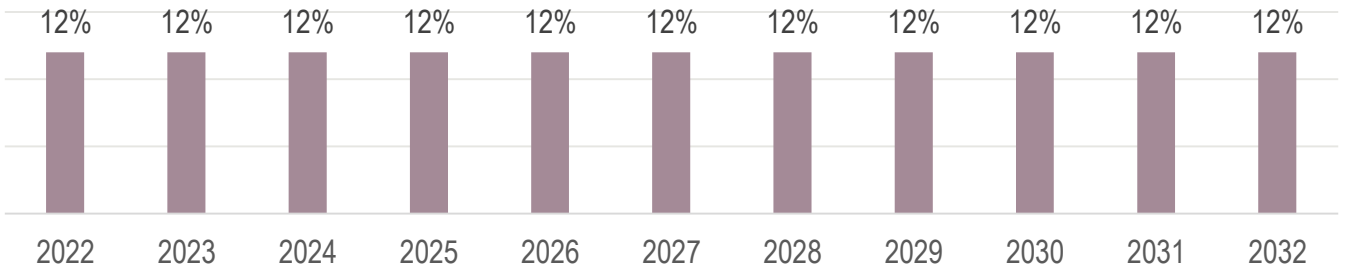
Scenario A
Biosolids Only
$163 million debt



Scenario B
Biosolids plus
Moderate Case
Nutrient Removal
$393 million debt



Scenario C
Biosolids plus
Worst Case
Nutrient Removal
$418 million debt

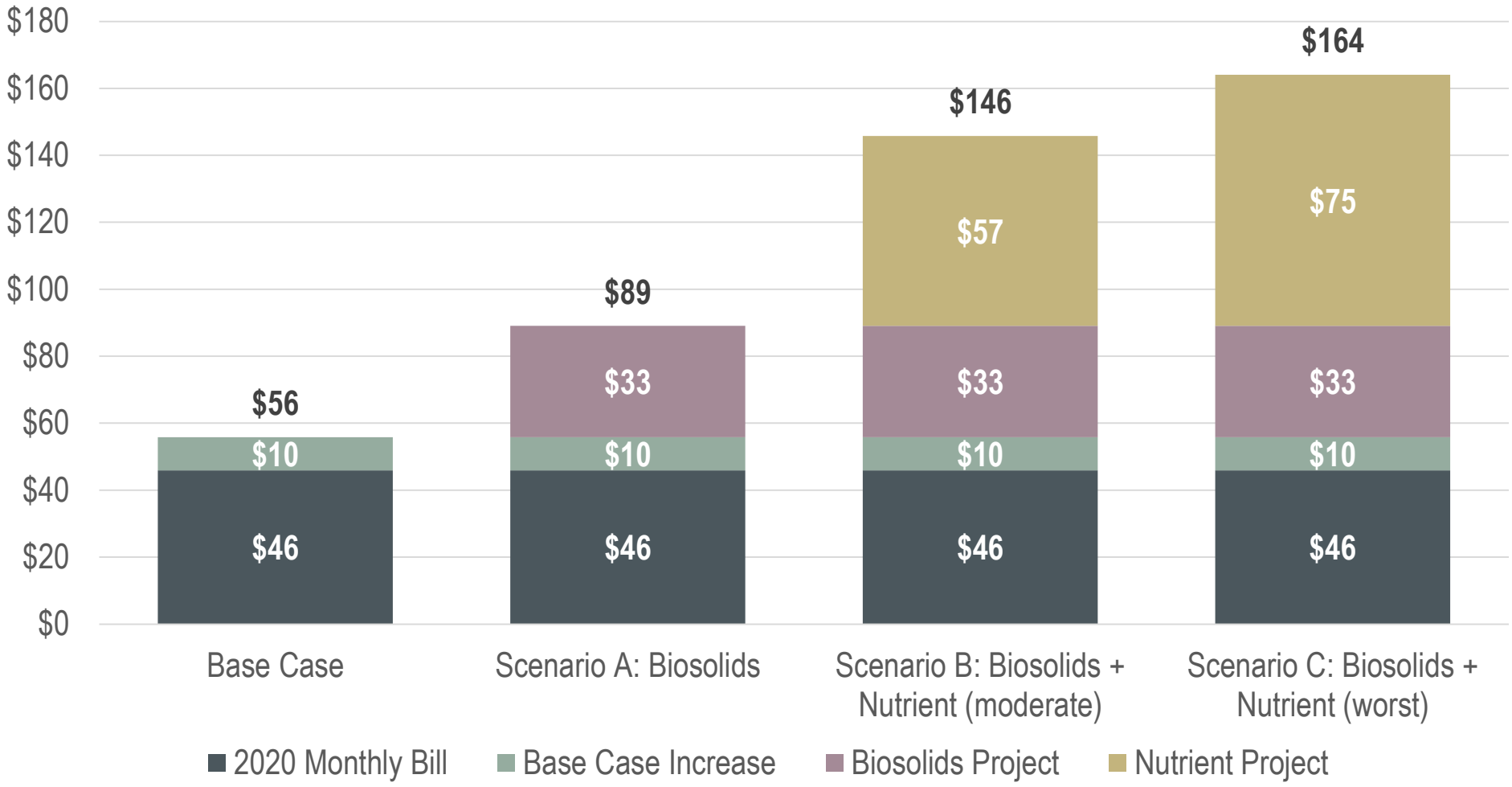


Rate and Debt Forecast through 2039

Year	Scenario A Biosolids Only				Scenario B (Biosolids + Nitrogen) Moderate Case				Scenario C (Biosolids + Nitrogen) Worst Case			
	Rate Increase	SFR Monthly Bill	Annual Capital	Debt Issues	Rate Increase	SFR Monthly Bill	Annual Capital	Debt Issues	Rate Increase	SFR Monthly Bill	Annual Capital	Debt Issues
2020		$46	$ 11,800,000	$ -		$46	$ 11,800,000	-		$46	$ 11,800,000	$ -
2021	1.6%	$47	14,500,000	-	1.6%	$47	14,500,000	-	1.6%	$47	14,500,000	-
2022	12.0%	$52	17,700,000	-	12.0%	$52	17,700,000	-	12.0%	$52	17,700,000	-
2023	12.0%	$59	14,500,000	-	12.0%	$59	20,100,000	-	12.0%	$59	20,600,000	-
2024	12.0%	$66	64,900,000	108,000,000	12.0%	$66	70,600,000	127,000,000	12.0%	$66	71,100,000	130,000,000
2025	12.0%	$73	87,500,000	-	12.0%	$73	93,400,000	-	12.0%	$73	94,000,000	-
2026	12.0%	$82	68,800,000	55,000,000	12.0%	$82	74,900,000	80,000,000	12.0%	$82	75,500,000	87,000,000
2027	8.0%	$89	4,900,000	-	12.0%	$92	33,700,000	-	12.0%	$92	36,500,000	-
2028	0.0%	$89	5,100,000	-	12.0%	$103	34,700,000	50,000,000	12.0%	$103	37,600,000	62,000,000
2029	0.0%	$89	5,200,000	-	12.0%	$116	56,100,000	-	12.0%	$116	61,000,000	-
2030	0.0%	$89	5,400,000	-	12.0%	$129	57,800,000	50,000,000	12.0%	$129	62,800,000	62,000,000
2031	0.0%	$89	5,500,000	-	2.0%	$132	48,700,000	-	12.0%	$145	52,900,000	-
2032	0.0%	$89	5,700,000	-	2.0%	$135	25,000,000	34,000,000	12.0%	$162	26,800,000	42,000,000
2033	0.0%	$89	5,900,000	-	2.0%	$137	67,000,000	-	1.0%	$164	72,800,000	-
2034	0.0%	$89	6,100,000	-	2.0%	$140	53,300,000	52,000,000	0.0%	$164	57,800,000	35,000,000
2035	0.0%	$89	6,200,000	-	2.0%	$143	54,900,000	-	0.0%	$164	59,500,000	-
2036	0.0%	$89	6,400,000	-	2.0%	$146	6,400,000	-	0.0%	$164	6,400,000	-
2037	0.0%	$89	6,600,000	-	0.0%	$146	6,600,000	-	0.0%	$164	6,600,000	-
2038	0.0%	$89	6,800,000	-	0.0%	$146	6,800,000	-	0.0%	$164	6,800,000	-
2039	0.2%	$89	7,000,000	-	0.0%	$146	7,000,000	-	0.0%	$164	7,000,000	-
Total			**$ 356,500,000**	**$ 163,000,000**			**$ 761,000,000**	**$ 393,000,000**			**$ 799,700,000**	**$ 418,000,000**
Cumulative 2039	**94%**				**217%**				**257%**			

- **In all scenarios, borrowing begins in 2024, so significant rate increases are needed before then to fund new debt service**

2039 Monthly Single-Family Rates for Scenarios



Scenario C in Inflation-Adjusted Dollars

Real Impact of Scenario C (Inflation-adjusted)	
Assuming incomes rise with inflation	
2.50%	Assumed CPI increase per year
19	years between 2020 and 2039
1.60	2039 as multiple of 2020 costs & incomes
$45.93	SFR monthly bill in 2020
Real Impact of Scenario C (inflation-adjusted):	
$164.00	Projected SFR monthly bill in 2039, Scenario C
$102.59	Equivalent in 2020
123%	Real increase in SFR rate from 2020 to 2039

- **Assuming incomes rise by same rate as inflation:**
  - » Real rate increase of 123% by 2039, equivalent to $102.59 in 2020

Recommended Rate Strategy

- **Goal: a smooth pattern of rate increases**
- **Move rates up to a high enough level to meet increased debt service without a rate spike in a year following debt issue**
- **Uncertainty about magnitude and timing of nutrient removal requirements (long term), but more certainty about Resource Recovery project (near term)**
- **Forecast is being updated to incorporate:**
  - » Another year of history, updated capital costs
  - » Approval of WIFIA loan
  - » Implementation of first rate increase in July instead of January
- **Recommended rate strategy: 12%/year for some number of years appears to be the best way to achieve a smooth pattern of increases even with future uncertainties.**
  - » July 2022 and every January thereafter, at least through 2027
  - » Re-evaluate rate increases during 2026, using the latest information about nutrient removal requirements

Utility Affordability Analysis

FCS GROUP
Solutions-Oriented Consulting

Utility Affordability Analysis

- **Given the upward pressure on sewer rates, we were asked to analyze the issue of *utility affordability***

- **Focused on combined utility rates (water, sewer, stormwater)**
  - » Assumed 7 ccf/month for water (year-round average)
  - » Assumed 5 ccf/month for sewer (winter average)
  - » Bellingham future rates are for 2030 (the last year of 12% increases under Sewer Scenario B), expressed in 2021 dollars

- **Income estimates rely on U.S. Census Bureau American Community Survey (ACS)**

- **Comparative research among the 12 largest Washington cities with single water provider**
  - » Spokane Valley excluded because it has 5 water providers

RCW 74.38.070

- **Washington has explicit statutory authorization for reduced utility rates for low-income citizens**

Affordability Metrics

- **%MHI**
  - » Monthly utility cost as % of median household income
    - – Traditional measure, but doesn't focus on low-income
- **%20HI**
  - » Monthly utility cost as % of 20th percentile household income
    - – Focuses on lowest-income, but data may not be reliable
- **%40HI**
  - » Monthly utility cost as % of 40th percentile household income
    - – Focuses on low-income, probably more reliable data
- **HM**
  - » Monthly utility cost as multiple of hourly minimum wage
    - – Minimum wage is nearly uniform across state (except Seattle and SeaTac), so comparative view is not sensitive to income

Income Comparison

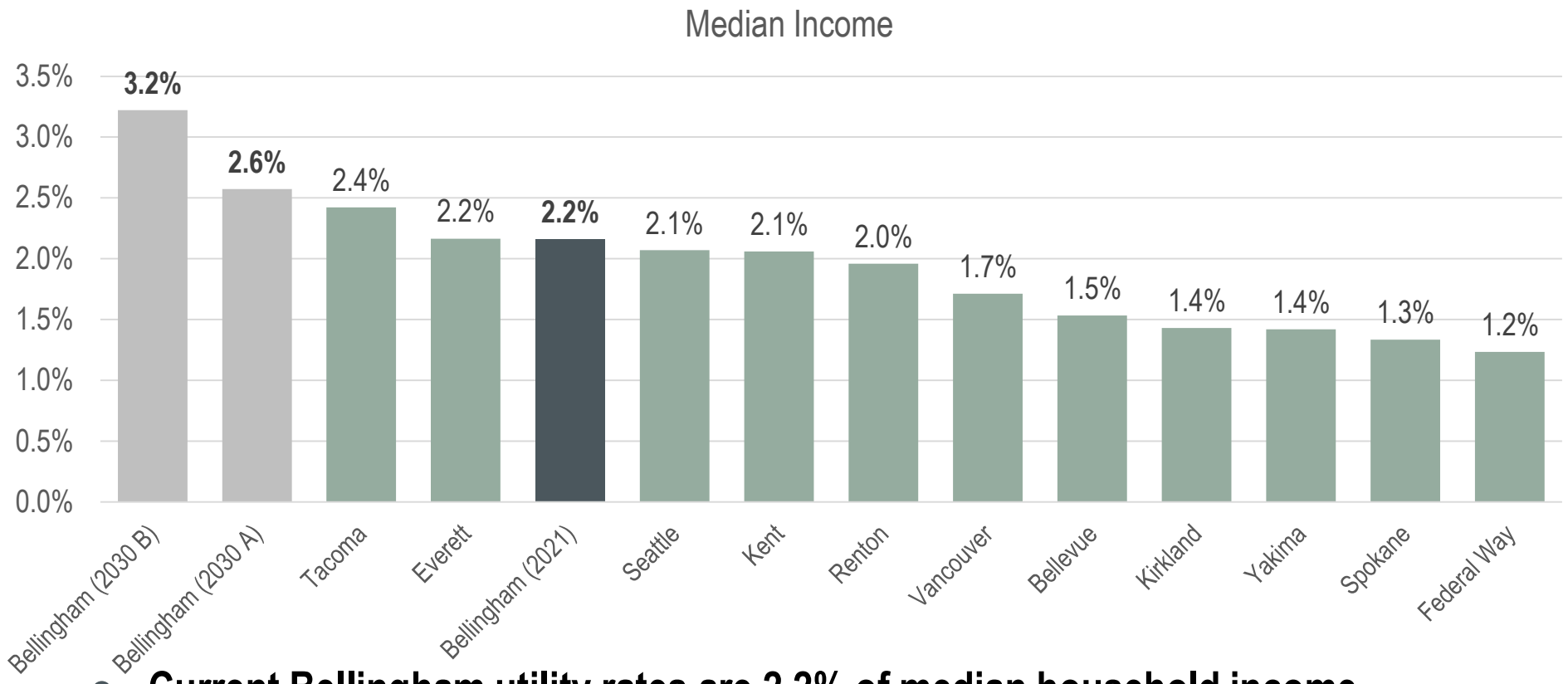
Population Rank	Jurisdiction	Median Income	Median Rank	20th Percentile Income	20th Percentile Rank	40th Percentile Income	40th Percentile Rank
1	Seattle	$ 8,036	3	$ 1,669	5	$ 5,041	3
2	Spokane	$ 4,382	13	$ 1,090	11	$ 2,921	13
3	Tacoma	$ 5,431	7	$ 1,457	8	$ 3,756	7
4	Vancouver	$ 5,375	8	$ 1,636	6	$ 3,755	8
5	Bellevue	$ 10,491	1	$ 2,805	1	$ 6,941	1
6	Kent	$ 6,276	5	$ 1,885	4	$ 4,503	4
7	Everett	$ 5,292	9	$ 1,267	9	$ 3,286	9
8	Renton	$ 6,771	4	$ 1,897	3	$ 4,343	5
9	Federal Way	$ 5,866	6	$ 1,572	7	$ 3,911	6
10	Yakima	$ 3,915	14	$ 1,205	10	$ 2,478	14
11	Bellingham (2021)	$ 5,129	10	$ 1,082	12	$ 3,054	10
12	Kirkland	$ 10,207	2	$ 2,608	2	$ 6,253	2

Source: 2019 ACS 5-Year Estimates; TableID: S1901

- **According to City staff, Bellingham has a "two-humped" income distribution—many people at the low end, many people at the high end, not as many in the middle**

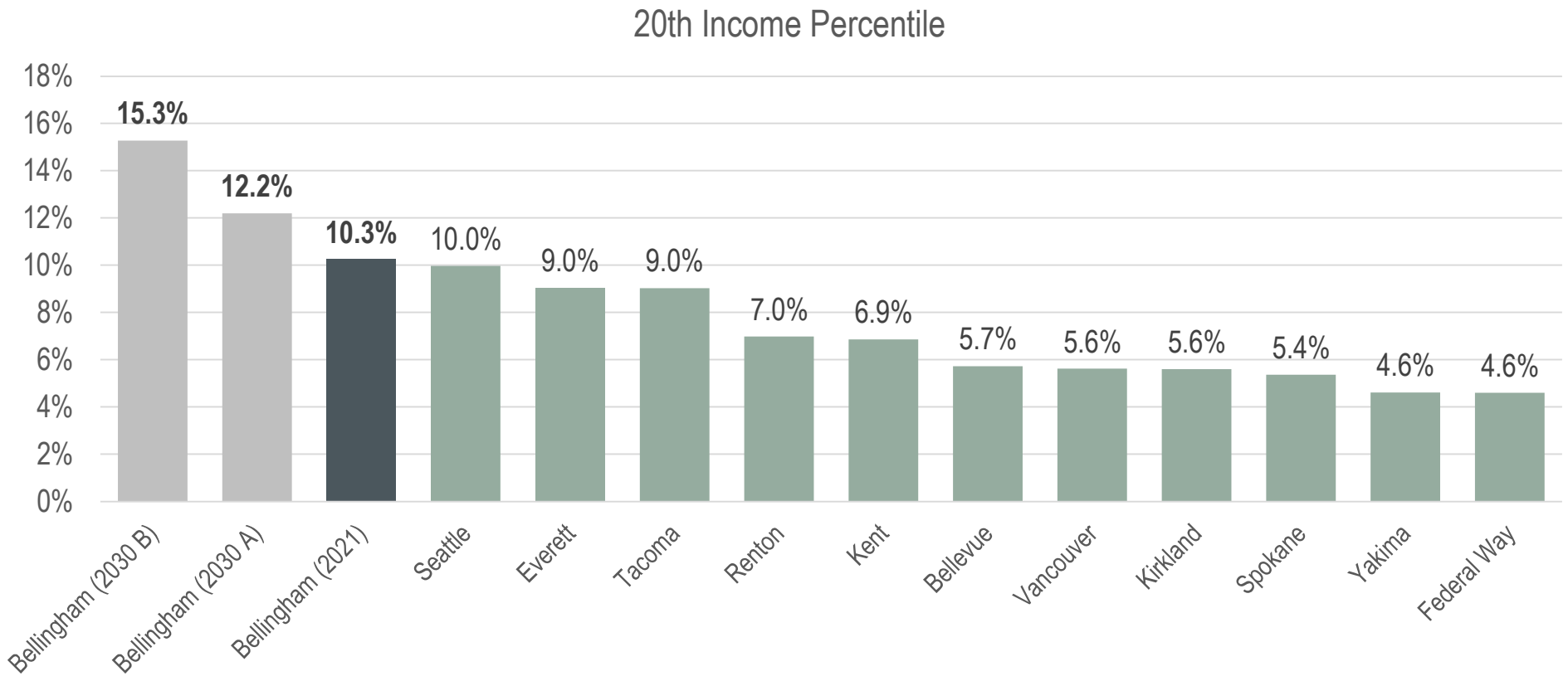
Bellingham's median, 20th percentile and 40th percentile incomes are among the lowest in this group of the State's largest cities

Comparative Results - %MHI



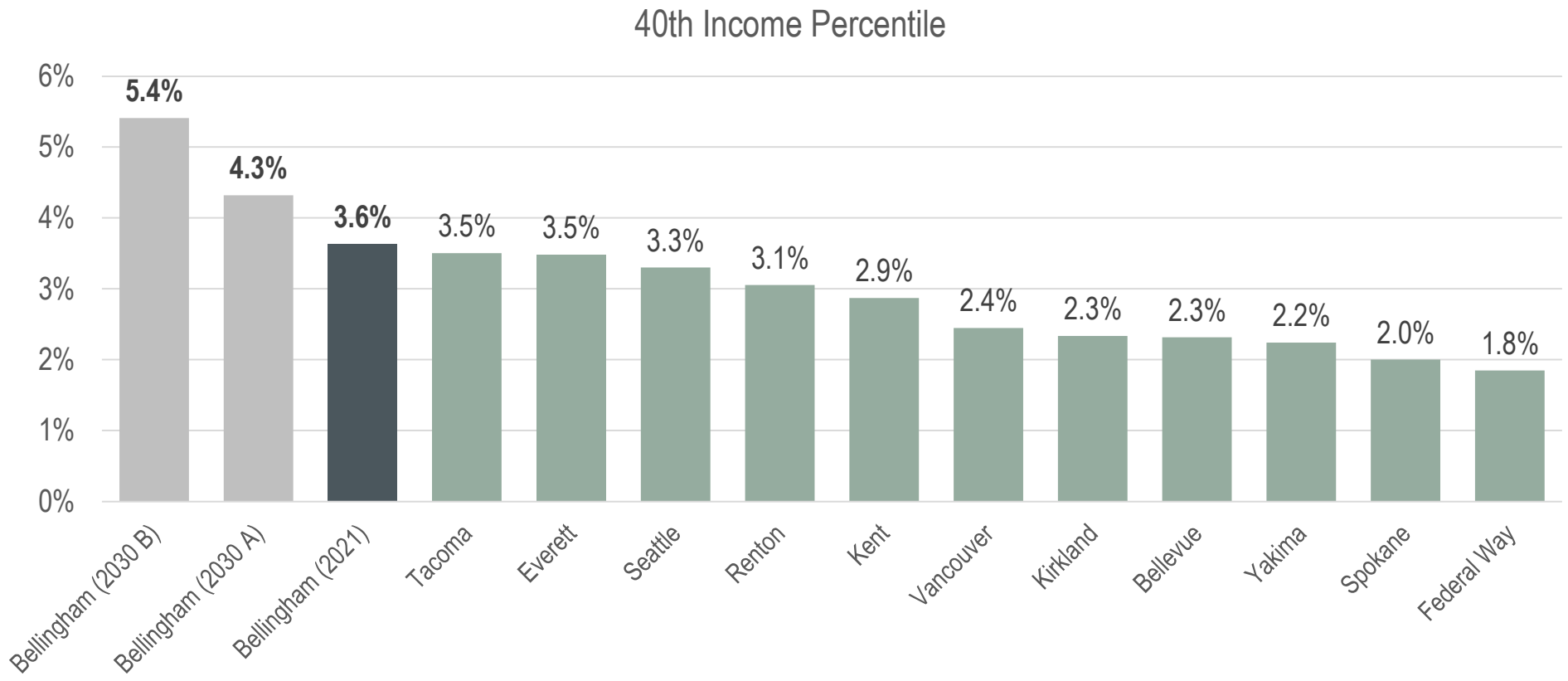
- **Current Bellingham utility rates are 2.2% of median household income**
  - » Currently near the middle of survey group, but 2030 rate forecast (in 2021 dollars) would push Bellingham to the highest in the group
    - – Note: By 2030, other utilities may have also rate increases above inflation

Comparative Results - %20HI



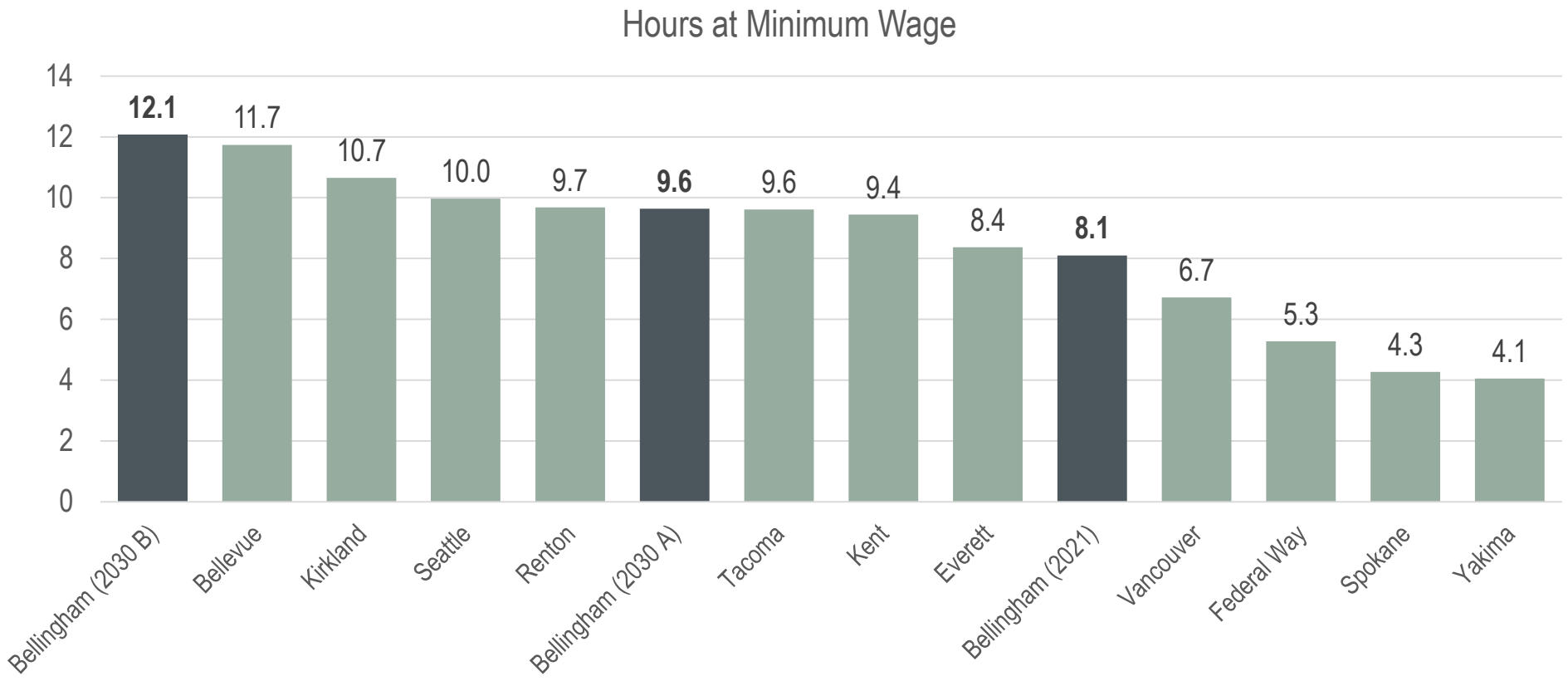
- **As a percentage of 20th percentile income, current Bellingham utility rates are already the highest of the survey group**
- **2030 rate forecast (in 2021 dollars) would push Bellingham even higher**

Comparative Results - %40HI



- **Current Bellingham utility rates are the highest of the survey group as a percentage of the 40th percentile income**
- **2030 rate forecast (in 2021 dollars) would push Bellingham even higher**

Comparative Results - HM



- **When income is not a factor, Bellingham utility rates are in lower half of survey group**
- **Scenario 2030A (after biosolids) would still leave Bellingham in the middle of the group**
- **Scenario 2030B (with biosolids and nutrient projects), City at top of group**
  - » However, nutrient removal costs will be faced by other utilities as well

Policy Response to Affordability Issue

Policy Intervention	Jurisdiction
Reduced Rates funded by utility	Bellevue, Bellingham, Everett, Kent, Kirkland, Renton, Seattle, Spokane, Tacoma
Reduced Rates funded by donations	Federal Way (Lakehaven WSD), Vancouver
Referral to nonprofit assistance	Yakima
Renter Assistance	Bellevue, Seattle, Tacoma
Two-pronged reduced rate approach	Bellevue, Everett
Emergency assistance	All surveyed jurisdictions except Yakima

- **Variety of potential responses to affordability issue**
- **Bellingham has a bill discount program with three income tiers, offering up to 75% discount on utility costs**

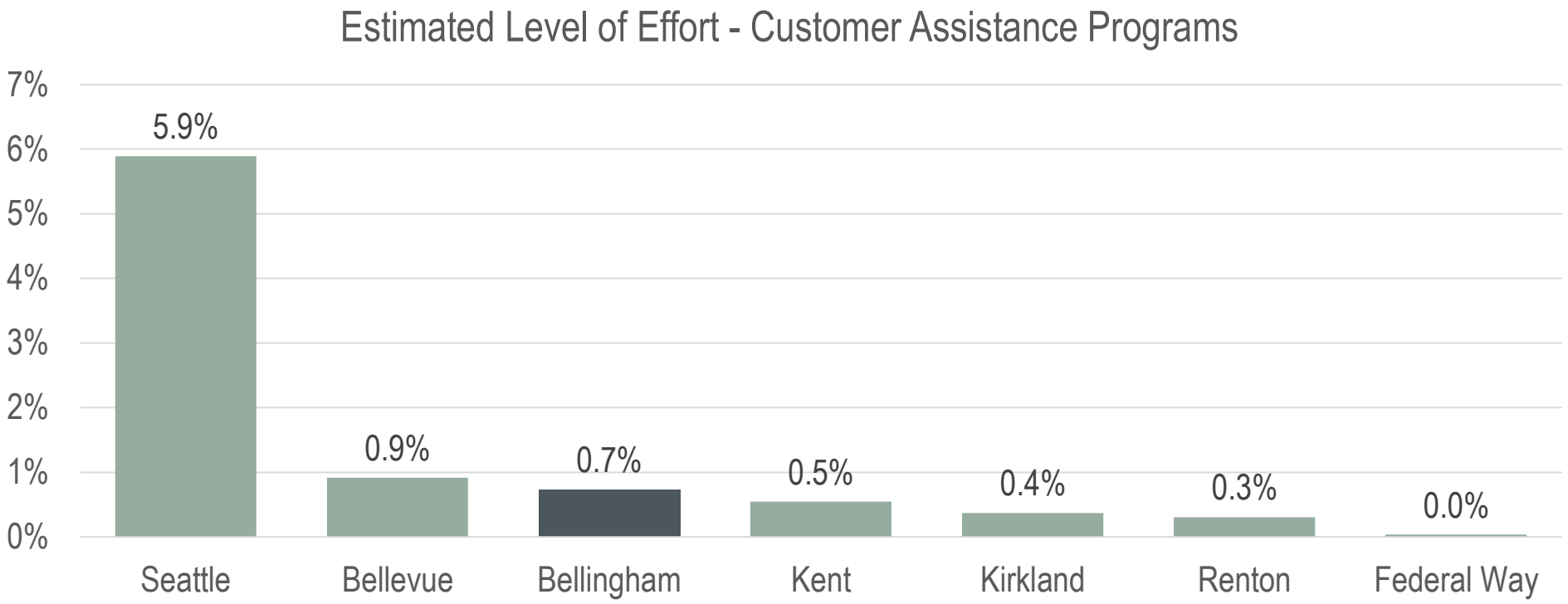
2021 Single-Family Combined Utility Rates

- **In general, the cities with the lowest rates also have the most limited customer assistance programs**
- **Yakima, Federal Way, and Vancouver are the only cities without a utility-funded bill discount program**

2021 Residential Water, Sewer and Stormwater Monthly Rates *	
Jurisdiction	**Total**
Seattle	**$166.32**
Bellevue	**$160.72**
Kirkland	**$145.91**
Renton	**$132.55**
Tacoma	**$131.56**
Kent	**$129.29**
Everett	**$114.54**
Bellingham (2021)	**$110.94**
Vancouver	**$91.95**
Federal Way	**$72.27**
Spokane	**$58.47**
Yakima	**$55.52**

** Assumes 7 ccf/mo year-round for water and 5 ccf/mo winter for sewer*

Level of Effort



- **Level of effort was estimated where data was available**
  - » "Level of effort" = foregone revenue divided by revenue requirement
- **Other than Seattle, the utilities' level of effort for customer assistance programs was less than 1% of total revenue requirement**

Implications for Bellingham

- **Compared with other cities, Bellingham's combined utility rates are below the median**
  - » However, average incomes are lower, meaning that Bellingham has a larger utility affordability issue than other cities
  - » Because of required sewer capital investment, this issue will be increasing over the next decade
- **Conversion to monthly billing (currently underway) will make utility bills more manageable for low-income households**
- **At the same time, less than 5% of Bellingham's low-income households currently receive utility bill discounts**
  - » Current bill discount program is limited to seniors and disabled citizens, and it is not designed to reach renters

Implications for Bellingham

- **Whether to increase support for low-income customers is a policy decision for the City**
  - » If the City wants to do that, it could consider expanding the eligibility criteria to include all low-income customers, regardless of age or disability status
  - » An additional step would be to design a way to reach renters
- **In deciding whether to expand its utility customer assistance program, the City should take into account the cost of staffing**
  - » Using order-of-magnitude estimates, the administrative cost of the current program is about 15% of the benefits to low-income customers

Summary

FCS GROUP
Solutions-Oriented Consulting

Summary

- **Action that will be needed by the City Council by April 2022:**
  - » Adopt multi-year schedule of sewer rate increases that will begin July 2022 and then contains increases every January through 2027
    - – Current forecast shows these increases at 12%/year
    - – Forecast will be updated by March 2022 to reflect most recent costs and financing terms
  - » Uncertainty about specific nutrient removal standards does not change the need for this schedule of rate increases
    - – The sooner the City starts the rate push, the more likely it is to avoid even more disruptive increases later
    - – Rate forecast should be re-evaluated in 2026.
- **For consideration by the Council:**
  - » Whether to direct staff to develop a proposal for a stronger low-income customer assistance program
    - – If so, may eventually lead to changes in design of bill discount program and further revisions to rate schedule

Questions?

Gordon Wilson
Senior Program Manager
gordonw@fcsgroup.com
(425) 336-1865

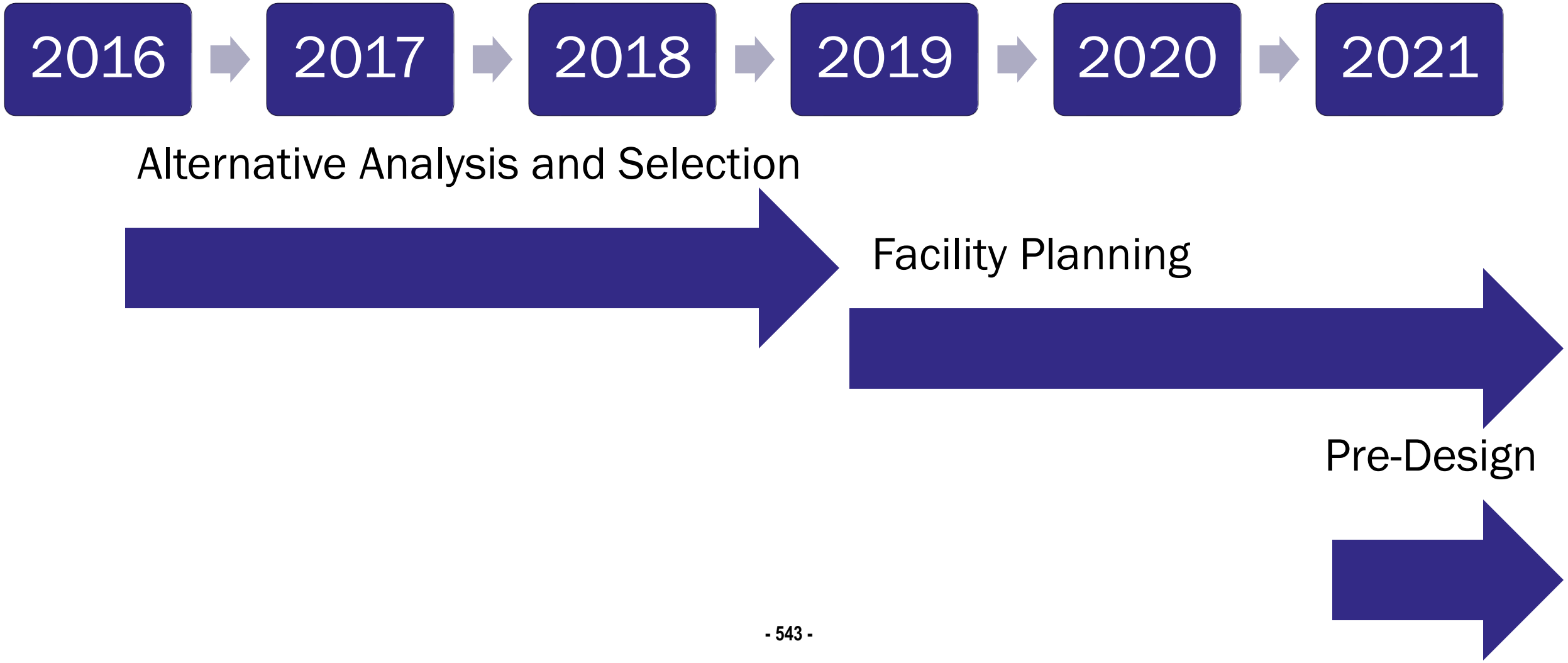
FCS GROUP
Solutions-Oriented Consulting

City of Bellingham

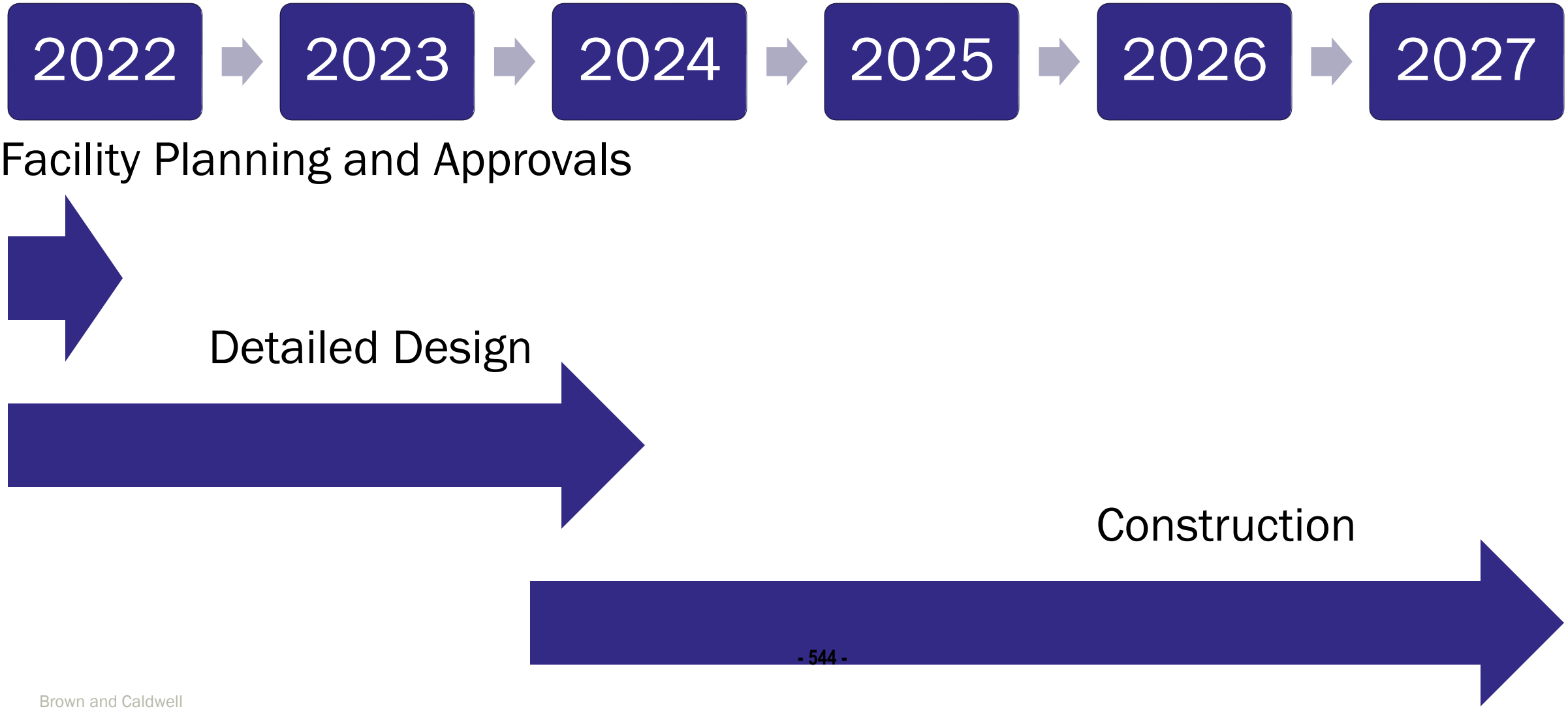
Post Point Resource Recovery Project Path Forward

December 13, 2021

Big Picture - What's been Completed



Big Picture – Looking Forward



Milestone Topics for Council

- Informational
  - Facility Plan, Progress Updates
- Financial
  - Sewer Rates, Loan Application
- Post Point Delivery
  - GC/CM Contractor, Consultant Services
- Off-Site Delivery
  - End use for Biosolids and Biogas

Informational Topics for Council

Milestone	Purpose	Key Questions to be Answered / Key Issues to be Resolved	Approximate Date
Biosolids Facility Plan	Action	• Approve Facility Plan for Implementation • Cost and Rate Impacts • Public Amenity Features	Spring / Summer 2022
Updates	Informational	• As Required (ex. PFAS Testing)	TBD

Financial Topics for Council

Milestone	Purpose	Key Questions to be Answered / Key Issues to be Resolved	Approximate Date
Sewer Rate Outlook	Informational	• Overview of Rate Scenarios	Dec. 13, 2021
WIFIA Loan Application	Action	• Approve Submitting Application for Loan, including $100k Loan Application Fee	Dec. 13, 2021
Sewer Rate Adjustment	Action	• Approve Sewer Rate Adjustments	Spring 2022
WIFIA Loan Submission	Informational	• Notification that Application was Submitted	Summer 2022
WIFIA Loan Agreement	Action	• Approve Entering Loan Agreement	Early 2023

Post Point Delivery Topics for Council

Milestone	Purpose	Key Questions to be Answered / Key Issues to be Resolved	Approximate Date
GCCM Approval	Informational	• Notification of GC/CM Delivery Acceptance by CPARB	Spring 2022
Consultant Contract – Design Phase	Action	• Approve Amendment for Design Services	Spring / Summer 2022
Post Point Contractor – Design Phase	Action	• Approve Agreement for Design Phase Services for GC/CM	Summer / Fall 2022
Consultant Contract – Construction Phase	Action	• Approve Amendment for Services During Construction	Late 2023 / Early 2024
Post Point Contractor – Construction Bid	Action	• Approve Agreement for Construction Bid	Early 2024

Offsite Delivery Topics for Council

Milestone	Purpose	Key Questions to be Answered / Key Issues to be Resolved	Approximate Date
Biosolids Procurement – Phase 1	Action	• Approve Phase 1 RFP	Early 2022
Biogas End Use Procurement	Informational	• Overview of Biogas Recommendation	Summer 2022
Biosolids Procurement – Phase 2	Informational	• Overview of Phase 2 RFP and Potential Agreement with 3rd Party	Late 2023
Biogas End Use Agreement	Action	• Approve Entering Agreement for Biogas End Use	2024
Biosolids Procurement – Phase 2	Action	• Approve Entering Agreement for Biosolids End Use	2024

Thank you.
Questions?

Brown AND
Caldwell

City Council Agenda Bill

23215

Bill Number

Subject: **Authorization of A/P Transactions Issued November 25, 2021 through December 02, 2021**

Summary Statement: In accordance with state law, approval is requested for the payments issued for City goods and services received.

A/P EFT and EDI transactions, and check(s) #557214 through #557293, were issued during the pay period of November 25, 2021 through December 02, 2021, in the amount of $2,451,259.33.

Previous Council Action: **2021-2022 Adopted Budget**

Fiscal Impact: **Payments issued for amounts shown above are within legally appropriated budget.**

Funding Source: **Citywide Funds**

Attachments:

Meeting Activity	Meeting Date	Recommendation	Presented By	Time
Consent Agenda	12/13/2021	Authorize Accounts Payable	N/A	0 minutes

Recommended Motion:

Council Committee:

Agenda Bill Contact:
Karla Stave

Council Action:

Reviewed By	Department	Date
Andrew D. Asbjornsen	Finance Department	12/07/2021
Matthew T. Stamps	Legal	12/07/2021
Seth M. Fleetwood	Executive	12/07/2021

City Council Agenda Bill 23216

Bill Number

Subject: **2022 Interlocal Agreement with Whatcom County for Use of Bellingham's Vactor Waste Transfer Facility**

Summary Statement: The interlocal agreement is for the continued use of the Vactor Waste Transfer Facility by Whatcom County Public Works. Currently the City's Vactor Waste Transfer Facility is the only facility in Whatcom County that is an approved solid waste transfer facility for this type of solid waste. Each user pays for the transfer costs as well as a proportionate share of all operating and maintenance costs for this facility.

Previous Council Action: **2016 Interlocal #2016-0297**

Fiscal Impact: **Use of facility produces revenue for the Surface and Stormwater Fund**

Funding Source: **Surface and Stormwater Fund (430)**

Attachments: 1. ILA_WHATCOM_COUNTY_VACTOR_WASTE_2022

Meeting Activity	Meeting Date	Recommendation	Presented By	Time
Consent Agenda	12/13/2021	Vote to Approve	Eric Johnston, PW Director	0 minutes

Recommended Motion:

Council Committee:

Agenda Bill Contact:
Steve Bradshaw, PW Superintendent, 360-778-7892

Reviewed By	Department	Date
Eric C. Johnston	Public Works	12/07/2021
Matthew T. Stamps	Legal	12/07/2021
Seth M. Fleetwood	Executive	12/07/2021

Council Action:

INTERLOCAL AGREEMENT
CITY OF BELLINGHAM – WHATCOM COUNTY
VACTOR WASTE FACILITY USE

Pursuant to the **Washington State Interlocal Cooperative Act, RCW Chapter 39.34,** and to other provisions of law, this Interlocal Agreement is entered into by and between THE CITY OF BELLINGHAM (City), a municipal corporation of the State of Washington, and WHATCOM COUNTY (County), a municipal corporation of the State of Washington located in Whatcom County, Washington, for the purpose of utilization of certain operational services, to the mutual advantage of each jurisdiction.

WHEREAS, the County desires to utilize the City's vactor waste facility located at 2140 Division Street, Bellingham, Washington for the purposes of disposing or recycling of their street sweeping and vactor waste,

WHEREAS, the City has available capacity at this time to store and process the County's street sweeping and vactor waste,

WHEREAS, the County is being required by the Department of Ecology (DOE) and Whatcom County Department of Health (DOH) to dispose of this waste in a manner deemed appropriate by those agencies,

WHEREAS, RCW 39.34 permits governmental entities to enter into Interlocal Agreements to accomplish mutually beneficial purposes in the public interest;

NOW, THEREFORE, THE CITY OF BELLINGHAM AND WHATCOM COUNTY AGREE AS FOLLOWS:

1. PURPOSE: The purpose of the Interlocal Agreement is to authorize and to define the terms under which the City will provide certain services to the County as further delineated herein.

2. TERM: The term of this Interlocal Agreement shall commence on January 1, 2022 and upon full execution of this document by all parties and the filing of this Interlocal Agreement as set forth in RCW 39.34.040. This Interlocal Agreement shall terminate on the 31st Day of December, 2022, unless terminated or renewed as elsewhere provided in the Interlocal Agreement.

3. RENEWAL: Unless terminated sooner as otherwise provided herein, this Interlocal Agreement shall remain valid until December 31, 2022. Five (5), one (1) year (annual) renewals are allowed with mutual written agreement by both parties as to term of extension and any adjustments in Cost for Service.

4. SCOPE OF SERVICES: The scope of services is as provided in Exhibit "A" of this Interlocal Agreement, which is attached and incorporated herein, as may be amended from time to time.

5. PAYMENT: Payment to the City for services will be on a per ton basis and as outlined in Exhibit A, which is attached and incorporated herein, as may be amended from time to time.

Upon receipt of an invoice from the City, the County shall remit the above amount on a monthly basis to the City of Bellingham, Finance Department, 210 Lottie Street, Bellingham, Washington, 98225 for the duration of the Term of this Interlocal Agreement.

The County shall be responsible for payment of any taxes due to the Washington State Department of Revenue on any payments made under this Interlocal Agreement.

The City shall submit invoices to The County on a monthly basis for services performed the prior month. The invoice shall reference this Interlocal Agreement.

The City shall keep clearly detailed records covering all services authorized under this Interlocal Agreement.

6. RELATIONSHIP TO THE PARTIES: The parties agree that they are each independent entities operating pursuant to the terms and conditions of this Interlocal Agreement. No agent, employee, servant or representative of any party shall be deemed to be an employee, agent, servant or representative of any other party for any purpose. Each party will be solely and entirely responsible for its acts and for the acts of its agents, employees, and servants during the term of this Interlocal Agreement.

7. MUTUAL INDEMNITY: Each of the parties, shall protect, defend, indemnify, and save harmless the other party, its officers, officials, employees, and agents from any and all costs, claims, judgment and/or awards of damages, arising out of, or in any way resulting from, that party's own negligent acts or omissions which may arise in connection with its performance under this Agreement. No party will be required to indemnify, defend, or save harmless the other party if the claim, suit or action for injuries, death, or damages is caused by the sole negligence of the other party. Where such claims, suits, or actions result from the concurrent negligence of the parties, the indemnity provisions provided herein shall be valid and enforceable only to the extent of a party's own negligence. Each of the parties agrees that its obligations under this subparagraph extend to any claim, demand and/or cause of action brought by, or on behalf of, any of its employees or agents. FOR THIS PURPOSE, EACH OF THE PARTIES, BY MUTUAL NEGOTIATION, HEREBY WAIVES, WITH RESPECT TO THE OTHER PARTY ONLY, ANY IMMUNITY THAT WOULD OTHERWISE BE AVAILABLE TO IT AGAINST SUCH CLAIMS UNDER THE INDUSTRIAL INSURANCE PROVISION OF TITLE 51 RCW. In any action to enforce the provisions of the Section, the prevailing party shall be entitled to recover its reasonable attorney's fees and costs incurred from the other party. The obligations of this Section shall survive termination of this Agreement. For purposes of this Section, the term "party" includes the party itself as well as its officials, employees, agents, and contractors.

8. EXTENT OF AGREEMENT: This Interlocal Agreement contains all of the terms and conditions agreed upon by the parties. The parties agree that there are no other understandings, oral or otherwise, regarding the subject matter of this Interlocal Agreement.

9. MODIFICATION: No changes or modifications of this Interlocal Agreement shall be valid or binding upon either party to this Interlocal Agreement unless such changes or modifications are in writing and executed by authorized representatives of both parties.

10. RESPONSIBLE PERSONS: The persons responsible for administration of this Interlocal Agreement on behalf of each party shall be the Bellingham Director of Public Works, and the Whatcom County Director of Public Works. All correspondence, letters or other notices shall be directed to the foregoing parties at the following addresses/phone numbers, or to their established agency designee:

Superintendent of Maintenance City of Bellingham Public Works 2221 Pacific Street Bellingham, WA 98229 (360) 778-7700	Superintendent of Maintenance Whatcom County Public Works 901 West Smith Road Bellingham, WA 98226 (360) 778-6400

11. TERMINATION: This Interlocal Agreement may be terminated by either party upon the giving of ninety (90) days' written notice to the other, at which time any remaining financial obligations for services rendered prior to termination shall be paid in full.

12. CONSEQUENTIAL DAMAGES: In no event and under no circumstances shall the City be liable to The County for any interest, loss of anticipated revenue, increased expense of operations, loss by reason of shutdown or non-operation, or for any consequential, indirect or special damages.

13. DIRECTION AND CONTROL: The parties hereto do not intend to create any separate or legal administrative entity by this Interlocal Agreement but, rather, intend for this mutual Interlocal Agreement to govern for the purposes contained herein.

14. PROPERTY AND EQUIPMENT: The ownership of all property and equipment utilized in association with this Interlocal Agreement shall remain with the original owner unless specifically and mutually agreed to by both parties.

15. STATUS OF AGREEMENT: This Interlocal Agreement is in addition to, and is not intended to replace, substitute, modify or otherwise amend any other agreement between the City and The County. This Interlocal Agreement is only limited to the purposes stated herein. Any other agreements continue in effect according to the specific terms of those agreements.

16. COMPLIANCE WITH LAW: All parties to this Interlocal Agreement shall comply with all applicable federal, state and local laws, rules and regulations in carrying out the terms and conditions of this Interlocal Agreement.

17. FURTHER COOPERATION: The parties shall fully and completely cooperate with one another in good faith at all times, so that the terms and spirit of this Interlocal Agreement may be fully implemented. All parties have had the ability to negotiate the terms of this Interlocal

Agreement on an equal basis. This Interlocal Agreement shall be reasonably interpreted and not weighed in favor of or against any party.

18. SURVIVABILITY: All covenants, promises, and performances which are not fully performed as of the date of termination shall survive termination as binding obligations.

19. WAIVER: No failure by any of the foregoing parties to insist upon the strict performance of any covenant, duty, agreement, or condition of this Interlocal Agreement, or to exercise any right or remedy consequent upon a breach thereof, shall constitute a waiver of any such breach or any other covenant, agreement, term or condition. Any party hereto, by notice, and only by notice as provided herein may, but shall be under no obligation to, waive any of its rights or any conditions to its obligations hereunder, or any duty, obligation or covenant of any other party hereto. No waiver shall affect or alter this Interlocal Agreement, and each and every covenant, agreement, term, and condition of this Interlocal Agreement shall continue in full force and effect with respect to any other then existing or subsequent breach thereof.

20. SEVERABILITY: If any provision of this Interlocal Agreement is held to be invalid, illegal or unenforceable for any reason, that holding shall not affect or impair, in any manner, the validity, legality or enforcement of the remainder of this Interlocal Agreement.

CITY OF BELLINGHAM

Dated this ____ day of _____20____

_____
Seth Fleetwood, Mayor

Attest:

_____
Finance Director

Department Approval:

_____
Director of Public Works

Approved as to form:

_____
Office of the City Attorney

WHATCOM COUNTY

Dated this ____ day of _____20____

_____
Satpal Singh Sidhu, County Executive

Department Approval:

_____
Director of Public Works

Approved as to form:

_____
Civil Deputy Prosecuting Attorney

STATE OF WASHINGTON
COUNTY OF WHATCOM } **ss**

I CERTIFY that I know or have satisfactory evidence that **SETH FLEETWOOD** is the person who appeared before me, and said person acknowledged that she signed this instrument, on oath stated that she was authorized to execute the instrument and acknowledged it as the **MAYOR** of the **CITY OF BELLINGHAM** to be the free and voluntary act of such party for the uses and purposes mentioned in the instrument.

_____
DATED

_____
SIGNATURE OF NOTARY PUBLIC

_____
NAME PRINTED

Notary Public
TITLE

_____
MY APPOINTMENT EXPIRES

STATE OF WASHINGTON
COUNTY OF WHATCOM } **ss**

I CERTIFY that I know or have satisfactory evidence that **SATPAL SINGH SIDHU** is the person who appeared before me, and said person acknowledged that he signed this instrument, on oath stated that he was authorized to execute the instrument and acknowledged it as the **EXECUTIVE** of **WHATCOM COUNTY** to be the free and voluntary act of such party for the uses and purposes mentioned in the instrument.

_____
DATED

_____
SIGNATURE OF NOTARY PUBLIC

_____
NAME PRINTED

Notary Public
TITLE

_____
MY APPOINTMENT EXPIRES

EXHIBIT "A"

Vactor Waste Facility Use

In consideration for the use of the City of Bellingham's ("City") Vactor Waste Facility ("Facility"), Whatcom County , located at 901 West Smith Road, Bellingham, WA 98226 (hereinafter the "User"), covenants and agrees to comply with the following terms and conditions:

"Users":
Contact Person: _____

Phone Number: _____

Email Address: _____

Section 1 – Purpose

The purpose of this Interlocal Agreement is to allow public sector use of the Facility. As further described herein, User's ability to use the Facility requires full compliance with this Interlocal Agreement's terms and conditions, including but not limited to:

- Dumping only "ACCEPTABLE WASTE" (Section 2 – ACCEPTABLE WASTE)
- Dumping in an appropriate manner (Section 3 – DUMPING OPERATION)
- Obtaining Training (Section 4 – REQUIRED TRAINING)
- Complying with Safety Rules and Regulations (Section 5 – SAFETY)
- Payment (Section 6 – COST OF SERVICE)
- Such other terms and conditions as contained herein.

Section 2 – Acceptable Waste

2.1 User shall be solely responsible to ensure that only Acceptable Waste is deposited at the facility. For purposes of this Interlocal Agreement "Acceptable Waste" is defined herein as:

- Street sweepings are wastes collected by utilizing a street sweeper to collect grit, dirt, vegetative waste and litter from roadway surfaces.
- Vactor wastes includes, grit, dirt and vegetative waste collected by an eductor truck during the cleaning of storm water catch basins.

2.2 Any materials that are odorous or are from a chemical spill are specifically not considered Acceptable Waste products and shall not be deposited at the Facility.

2.3 In the event unacceptable waste or materials are dumped at the Facility, the responsible party shall pay all costs associated with the proper removal and deposition of the contaminated materials. Removal and deposing of unacceptable waste or materials shall

be in accordance with the approved practices and regulations of the State of Washington, including but not limited to the Washington State Department of Ecology, and the Whatcom County Health Department.

2.4 The City reserves the right to find any waste or material unacceptable in its sole discretion. Disposing of unacceptable materials may result in the loss of the privilege to use the Facility.

Section 3 – Dumping Operation

3.1 The Facility has a limited capacity to accept Acceptable Waste products and User acknowledges that the City, State of Washington and Whatcom County, as the primary public users, have preference over all other users. In the event that the Facility capacity should become an issue all other users will be directed to cease usage of the site. The City shall have no obligation or duty to provide advance warning of this circumstance or to provide alternate dumping facilities. This contract is in no way a guarantee of service. The City of Bellingham may at any time and for any reason cease to offer this service to any and all users.

3.2 When depositing Acceptable Waste at the Facility, User agrees to follow the following "dumping operation":

3.2.1 The user truck shall be weighed to obtain the net weight of the material. A copy of the weight slip shall be placed in the drop box for every load dumped at the facility. Weight slips shall clearly identify username, vehicle number, gross weight, tare weight, and billable weight. Weight slips will be checked against the gate entry log. If there is no slip, the customer will be charged for a full load based upon the capacity of the vehicle. Users are not to use the site other than to dump. Gate access shall be monitored for billing purposes. If a user accesses the facility and there is no weight slip present for that access the user will be billed for a full load of the vehicle assigned to that access card; AND

3.2.2 After obtaining the weight of the load, trucks shall back into the Facility to decant excess water into the settling trough. After the excess water is removed, the truck will dump the remainder of the load on the floor as far back in the facility as is practical to limit the amount of material that may spew out into the parking lot.

3.3 In addition to any other remedies that may be available to the City, the City may terminate this Interlocal Agreement and bar User from any future use of the Facility for failure to follow the procedures outlined in Section 3.2.

Section 4 – Required Training

In order to ensure the proper and safe use of the Facility, training is required prior to use of the Facility. Training consists of a walkthrough of the Facility with a representative of the City to explain how the Facility operates and what is expected from those who use the Facility. The City shall issue a letter of fulfillment ("Letter") that documents that the User has completed the

training requirement. User shall not be allowed to use the Facility until completing this training and receiving the Letter. Further, User shall not allow any of its employees or agents to use the Facility without receiving the training and Letter required hereunder.

Section 5 – Safety

All personal injury, including first aid incidents, or damage to vehicles or buildings must be reported immediately to the Safety Specialist at Bellingham Public Works (778-7700). Users shall follow all Washington State safety policies and regulations while inside the Facility. It is encouraged that a ground guide be used whenever operating a vehicle inside the Facility. The City shall not be responsible in any manner for User's use of the Facility, except to the extent of the City's sole negligence.

Section 6 – Cost for Service

The cost of depositing one ton of Acceptable Wastes is $169.69 for 2022. This amount is subject to change at the end of the term of the Permit. The User will be billed monthly and User agrees to pay the bill in full within 30 calendar days of the date of the bill. Late payments will be charged a late fee of $25 and returned checks are subject to a $20 fee. In addition to any other remedies that may be available, User's failure to pay the bill after 60 calendar days shall automatically terminate this Permit and cause User to forfeit the privilege to use the Facility.

City Council Agenda Bill

23217

Bill Number

Subject: **Term Extension of United States Geological Survey Collaborative Agreement for the Coastal Storm Surge Modeling System Project**

Summary Statement: In partnership with Whatcom County and the Port of Bellingham, the City contracted with the United States Geological Survey (USGS) for the development of the Coastal Storm Surge Modeling System Project (CoSMoS). The model predicts storm surge based on a number of seal level rise scenarios. The contracted deliverables have been received. However, USGS is requesting a 6-month extension of the collaborative agreement in order to provide additional support to City, County and Port staff in the evaluation and application of CoSMoS, including assistance with using the USGS model interface, known as Hazards Exposure and Reporting Analytics Tools, which was recently adapted for use in this area. Since the agreement is an interlocal agreement, Council approval of the extension is required.

Previous Council Action: **Approval of Contract #2019-0685**

Fiscal Impact: **None**

Funding Source: **Wastewater Fund #420**

Attachments: 1. COSMOS CONTRACT MODIFICATION

Meeting Activity	Meeting Date	Recommendation	Presented By	Time
Consent Agenda	12/13/2021	Vote to Approve	Eric Johnston, PW Director	0 minutes

Recommended Motion:

Council Committee:

Agenda Bill Contact:
Clare Fogelsong, Natural Resources Policy Manager, 360-778-7965

Reviewed By	Department	Date
Eric C. Johnston	Public Works	12/07/2021
Matthew T. Stamps	Legal	12/07/2021
Seth M. Fleetwood	Executive	12/07/2021

Council Action:

MODIFICATION TO INTERLOCAL AGREEMENT
PS-COSMOS TO INFORM CITY OF BELLINGHAM ADAPTATION PLANNING
CONTRACT # 2019-0685

The **CITY OF BELLINGHAM**, a first-class municipal corporation of the State of Washington (hereinafter the "City"), and **UNITED STATES GEOLOGICAL SURVEY - DEPARTMENT OF THE INTERIOR** (hereinafter the "USGS"), in consideration of the mutual covenants herein, agree as follows:

1. **EXISTING AGREEMENT MODIFIED:** The City and the USGS entered into City Contract # 2019-0685, (USGS Collaborative Agreement # 20ZPCOLL120319), dated 11/25/19 which is incorporated herein by this reference (hereinafter the "Agreement"). The parties hereby modify that Agreement.

2. **MODIFICATIONS TO EXISTING AGREEMENT:** The Agreement is modified in the following respects:

   2.1 TERM The expiration date of this Agreement shall be extended to June 30, 2022

3. **TERMS AND CONDITIONS OF EXISTING AGREEMENT REMAIN THE SAME:** The parties agree that, except as specifically provided in this modification, the terms and conditions of the Agreement continue in full force and effect.

EXECUTED, this the _____ day of _____, 2021, for **UNITED STATES GEOLOGICAL SURVEY - DEPARTMENT OF THE INTERIOR:**

_____
Dr. Eric Grossman

EXECUTED, this the _____ day of _____, 2021, for the **CITY OF BELLINGHAM**:

Departmental Approval:

Mayor

Department Head

Attest:

Approved as to Form:

Finance Director

Office of the City Attorney

City Council Agenda Bill

23179

Bill Number

Subject: **An Ordinance Extending a Franchise to Comcast Cable Communications Management, LLC to Operate and Maintain a Cable System in the City of Bellingham; Setting forth Conditions Accompanying the Grant of Franchise; and Providing for City Regulation and Administration of the Cable System**

Summary Statement: In 2011, City Council entered into a 10-year Cable television franchise agreement with Comcast. That ten-year franchise term expires this year. Comcast officials have requested an extension of the franchise term, pursuant to Section 2.3 of the Franchise Agreement. The City and Comcast have reached a tentative agreement to extend the franchise with the same terms and conditions as the 2011 Franchise Agreement for five (5) additional years.

Previous Council Action: **Council adopted Ordinance No. 2011-10-059 on October 26, 2011 granting a non-exclusive cable franchise to Comcast**

Fiscal Impact: **Continue to receive Comcast cable franchise fee revenue and PEG fee revenue for capital equipment purchases**

Funding Source: **Franchise fee revenue - General Fund; PEG fee revenue - specially designated fund**

Attachments:
1. ORDINANCE
2. EXHIBIT 1

Meeting Activity	Meeting Date	Recommendation	Presented By	Time
Public Hearing - Vote Requested	12/06/2021	Vote to Approve	Sarah Chaplin, Sr. Assistant City Attorney	10 minutes

Recommended Motion:

Council Committee:

Agenda Bill Contact:
Sarah Chaplin, Sr. Assistant City Attorney, 360-778-8270

Council Action: Knutson/Hammill Moved for 1st & 2nd. MOTION CARRIED 5-1-1, Lisa Anderson opposed, and Hannah Stone excused. 12/06/2021

Reviewed By	Department	Date
Sarah W. Chaplin	Legal	11/30/2021
Seth M. Fleetwood	Executive	11/30/2021

ORDINANCE NO. _____

AN ORDINANCE EXTENDING A FRANCHISE TO COMCAST CABLE COMMUNICATIONS MANAGEMENT, LLC TO OPERATE AND MAINTAIN A CABLE SYSTEM IN THE CITY OF BELLINGHAM; SETTING FORTH CONDITIONS ACCOMPANYING THE GRANT OF FRANCHISE; AND PROVIDING FOR CITY REGULATION AND ADMINISTRATION OF THE CABLE SYSTEM.

WHEREAS, the City of Bellingham ("the City") entered into a non-exclusive cable television franchise agreement ("Franchise Agreement") with Comcast Cable Communications Management, LLC ("Comcast"), formerly known as Comcast of Washington IV, Inc. as authorized by Ordinance No. 2011-10-059 on Oct 26, 2011; and

WHEREAS, pursuant to section 2.3 of the above referred to agreement, that agreement is ten (10) years in duration but may be extended by mutual written consent; and

WHEREAS, the City and Comcast Cable Communications Management, LLC have reached a tentative agreement to amend the non-exclusive cable television franchise agreement and extend with the same terms and conditions for five (5) additional years; and

WHEREAS, pursuant to Bellingham Municipal Code 6.17.070, a public hearing was held on the 6th day of December, 2021;

NOW THEREFORE, THE CITY OF BELLINGHAM DOES ORDAIN:

Section 1. The Franchise Agreement with Comcast Cable Communications Management, LLC referred to in Ordinance No. 2011-10-059 shall be extended for a period of five (5) years, expiring five (5) years from the effective date of this ordinance.

Section 2. The Franchise Agreement, attached hereto and incorporated by reference as Exhibit "1," shall be extended for a period of five (5) years with the same terms and conditions as the Franchise Agreement referred to in Ordinance No. 2011-10-059 except for the effective date and termination dates, which shall be as set forth in this ordinance.

Section 3. If any provision of this ordinance and/or the attached Exhibit "1" is determined to be invalid or unenforceable for any reason by federal, state, or local law, the remaining provisions of this ordinance and/or the provisions set forth in the attached Exhibit "1" will remain in force and effect.

Section 4. Upon the approval of the City Attorney, the City Clerk is authorized to make any necessary corrections to this ordinance including, but not limited to, the correction of scrivener's/clerical errors, references, ordinance numbering, section/subsection numbers, and any reference thereto.

Section 5. Neither party waives any rights which it enjoys under law as a result of agreeing to this extension.

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

Section 6. This ordinance shall take effect fifteen (15) days from date of final passage by City Council; provided, however, that Comcast shall have 60 days from the date this ordinance was passed by Council to accept the Franchise and comply with all conditions for such acceptance. This Franchise shall be voidable at the City's discretion if Comcast fails to accept within 60 days.

PASSED by the Council this _____ day of _____, 2021.

_____
Council President

APPROVED by me this _____ day of _____, 2021.

_____
Mayor

ATTEST:_____
Finance Director

APPROVED AS TO FORM:

_____
Office of the City Attorney

Published:

_____

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

FRANCHISE ACCEPTANCE

This acceptance of the Franchise is made unconditionally and without reservation. Grantee (Comcast Cable Communications Management, LLC) accepts all the rights and privileges of the Franchise subject to all the terms, conditions, duties, and obligations of the Franchise.

ACCEPTED DATE: _____

COMCAST CABLE COMMUNICATIONS MANAGEMENT, LLC

By: _____

Name: _____

Title: _____

STATE OF _____)
) ss.
COUNTY OF _____)

I certify that I know or have satisfactory evidence that _____ is the person who appeared before me, and said person acknowledged that he/she signed this instrument, on oath stated that he/she was authorized to execute the instrument and acknowledged it as the _____ of COMCAST CABLE COMMUNICATIONS MANAGEMENT, LLC to be the free and voluntary act of such party for the uses and purposes mentioned in this instrument.

DATED this ____ day of _____, 2021.

_____
NOTARY PUBLIC in and for the State of _____
My appointment expires: _____

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

EXHIBIT 1

City of Bellingham, Washington, and

Comcast of Washington IV, Inc.

Cable Television Franchise

ORDINANCE NO. 2011-10-059

AN ORDINANCE RENEWING THE GRANT OF A FRANCHISE TO COMCAST OF WASHINGTON IV, INC. TO OPERATE AND MAINTAIN A CABLE SYSTEM IN THE CITY OF BELLINGHAM; SETTING FORTH CONDITIONS ACCOMPANYING THE GRANT OF FRANCHISE; PROVIDING FOR CITY REGULATION AND ADMINISTRATION OF THE CABLE SYSTEM; AND TERMINATING ORDINANCE NO. 10709.

WHEREAS, Comcast of Washington IV, Inc., ("Grantee") desires to continue operation of a Cable System in the rights-of-way of the City of Bellingham under the authority of Chapter 6.17 of the Bellingham Municipal Code; and

WHEREAS, negotiations between Grantee and the City have been completed and the franchise renewal process followed in accordance with the guidelines established by the City Code and the federal Cable Act (47 U.S.C. 546); and

WHEREAS, the City Council has reviewed the qualifications of Grantee and the adequacy of its provision of services in the City of Bellingham; and

WHEREAS, the franchise granted by Ordinance No. 10709 shall be terminated and be replaced by this Franchise; and

WHEREAS, pursuant to Section 11.08 of the City Charter, this Franchise was filed with the Finance Director and published once a week for four successive weeks in the City official newspaper; and

WHEREAS, pursuant to Bellingham Municipal Code 6.17.070, a hearing was held on the 26th day of September, 2011;

NOW, THEREFORE, THE CITY OF BELLINGHAM DOES ORDAIN that a franchise is hereby granted to Comcast of Washington IV, Inc. to operate and maintain a Cable System in the City of Bellingham upon the following terms and conditions:

City of Bellingham
Comcast Cable Television Franchise Agreement
Table of Contents

ORDINANCE NO. 2011-10-059 i

Section 1. DEFINITIONS 1

1.1 "Access," "PEG Access," or "PEG Use" 1
1.2 "Access Channel" 1
1.3 "Access Facilities" 1
1.4 "Access Provider" 2
1.5 "Applicable Law" 2
1.6 "Basic or Basic Service" 2
1.7 "BTV10" 2
1.8 "Cable Service" 2
1.9 "Cable Act" 2
1.10 "Cable System" 2
1.11 "Channel" 3
1.12 "City" 3
1.13 "City Code" 3
1.14 "Grantee" 3
1.15 "Day" 3
1.16 "Demarcation Point" 3
1.17 "Digital Services" 3
1.18 "Effective Date" 3
1.19 "Expanded Basic Service" 4
1.20 "Franchise" 4
1.21 "Franchise Fee" 4
1.22 "Gross Revenues" 4
1.23 "Headend" 4
1.24 "Indefeasible Right of Use" 5
1.25 "Institutional Facilities" 5
1.26 "Leased Access" 5
1.27 "Municipal buildings" 5
1.28 "MVPD" 5
1.29 "Normal Business Office Hours" 5
1.30 "Normal Operating Conditions" 5
1.31 "Premium Service" 5
1.32 "PEG" 5
1.33 "Person" 6
1.34 "Subscriber" 6
1.35 "State" 6
1.36 "Street" 6
1.37 "Transfer" 6
1.38 "Video Services" 6

Section 2. FRANCHISE 7

2.1 Grant of Franchise 7
2.2 Police Powers 7
2.3 Franchise Term 7
2.4 Franchise Area 7

2.5 Franchise Nonexclusive 7
2.6 Competition from Wireline MVPD 8
2.7 Franchise Renewal or New Franchise 8
2.8 Periodic Public Review of Franchise 8
2.9 Transfer or Change of Control 9
2.10 Renewal 10
2.11 Conditions of Sale 10
2.12 Right to Require Removal of Property 10
2.13 Continuity of Service Mandatory 10

Section 3. CONSTRUCTION AND OPERATION IN STREETS AND RIGHTS-OF-WAY 12

3.1 Use of Streets 12
3.2 Construction or Alteration 12
3.3 Non-Interference 12
3.4 Consistency with Designated Use 12
3.5 Undergrounding 12
3.6 Maintenance and Restoration 13
3.7 Tree Trimming 13
3.8 Relocation 13
3.9 Movement of Buildings 14

Section 4. CABLE SYSTEM CAPACITY and Complimentary Service 15

4.1 Cable System Capacity 15
4.2 Complimentary Cable Service in City 15
4.3 Equal and Uniform Service 16
4.4 Cable System Specifications 16
4.5 Technical Standards 16
4.6 Performance Testing 16

Section 5. PROGRAMMING AND SERVICES 17

5.1 Categories of Programming Service 17
5.2 Changes in Programming Services 17
5.3 Basis for Programming Decisions 17
5.4 Obscenity 17
5.5 Parental Control Device 18
5.6 Closed Captioning 18

Section 6. PUBLIC, EDUCATIONAL AND GOVERNMENTAL ACCESS 19

6.1 Access Channels 19
6.2 Control and Administration 19
6.3 Cable Guide for PEG 19
6.4 Noncommercial Use of PEG 19
6.5 Indemnification 19
6.6 PEG Channel Location 20
6.7 PEG Fees 20
6.8 Transition to HD Format for BTV10 21
6.9 Fiber Return Lines 22
6.10 Construction of New Fiber Return Lines 22
6.11 Continued Use of Network 22
6.12 PEG Signals and Equipment 22
6.13 Technical Quality of PEG Channel Signals 23
6.14 Change in Technology 24
6.15 Relocation of Grantee's Headend 24

Section 7. REGULATORY PROVISIONS 25

7.1 Intent 25
7.2 Delegation of Authority to Regulate 25
7.3 Areas of Administrative Authority 25
7.4 Regulation of Rates and Charges 25
7.5 Franchise Violations, Remedies, and Revocation 26
7.6 Liquidated Damages 28
7.7 Removal of Cable Following Termination of Franchise 29
7.8 Failure to Enforce 29
7.9 Alternative Remedies 30
7.10 Compliance with the Laws; Eminent Domain 30

Section 8. REPORTING REQUIREMENTS 31

8.1 Monthly Revenue Report 31
8.2 Quarterly Trouble Call Report 31
8.3 Quarterly Report 31
8.4 Annual Report 31
8.5 Ascertainment Process 32
8.6 Monitoring and Compliance Reports 32
8.7 Additional Reports and Information 32
8.8 Grantee Report of Communications with State Regulatory Bodies or Committees 32

Section 9. CUSTOMER SERVICE POLICIES 33

9.1 Response to Customers and Cooperation with City 33
9.2 Definition of "Complaint" 33
9.3 Customer Service Agreement 33
9.4 Customer Service 34
9.5 Customer Bills 35
9.6 Notification of Complaint Procedure 35
9.7 Grantee Identification 36

Section 10. LINE EXTENSION POLICY 37

10.1 Service and Installation 37
10.2 Annexed Areas and Requirements 37

Section 11. COMPENSATION AND FINANCIAL PROVISIONS 39

11.1 Franchise Fees 39
11.2 Franchise Fees for Government and Education Access Operation 39
11.3 City Annual Report to Grantee of PEG Fee Purchases 40
11.4 Auditing and Financial Records 40
11.5 Performance Bond 41
11.6 Validity of Bond 41
11.7 Indemnification by Grantee 41
11.8 Grantee Insurance 42

Section 12. Miscellaneous Provisions 43

12.1 Posting and Publication 43
12.2 Guarantee of Performance 43
12.3 Entire Agreement 43
12.4 Consent 43
12.5 Resolutions Terminated 43
12.6 Franchise Acceptance 43
12.7 Force Majeure 43

12.8 Work of Contractors and Subcontractors 43
12.9 Severability 44
12.10 Counterparts 44
12.11 No Waiver of Rights 44
12.12 No Third Party Beneficiaries 44
12.13 Modification 44
12.14 Governing Law 44
12.15 Notices 45

EXHIBIT A – Franchise Fee payment worksheet 47

EXHIBIT B - FCC Customer Service Standards 48

EXHIBIT C - Checklist of notices and reports 50

SECTION 1. DEFINITIONS

For the purposes of this Ordinance, the following terms, phrases, words, and their derivations shall have the meaning given herein. When not inconsistent with the context, words used in the present tense include the future, words in the plural number include the singular number, words in the singular number include the plural number, and the use of any gender shall be applicable to all genders whenever the sense requires. The words "shall" and "will" are mandatory and the word "may" is permissive. Where a term in the Franchise is not defined in this section and there is a definition for the term in the Cable Act, the Cable Act definition shall apply. Other terms in the Franchise which are not defined in this section shall be given their common and ordinary meaning.

1.1 "Access," "PEG Access," or "PEG Use"

refers to the availability, for non-commercial purposes, of a channel, or channels, on the Cable System for Public, Education or Government programming by various agencies, institutions, organizations, groups, and individuals, including the City.

(a) "Public Access" or "Public Use"

means access where organizations, groups, or individual members of the general public, on a non-discriminatory basis, are the primary or designated programmers or users having editorial control over their programming;

(b) "Education Access" or "Education Use"

means access where accredited educational institutions are the primary or designated programmers or users having editorial control over their programming; and

(c) "Government Access" or "Government Use"

means access where government institutions or their designees are the primary or designated programmers or users having editorial control over their programming.

1.2 "Access Channel"

means any channel or portion of a PEG channel utilized for Video Services , whether by Grantee or in cooperation with, by or through the City, where any resident of the City or any non-commercial organization whose members reside in the City may be a programmer, either without charge or in a non-profit manner, on a non-discriminatory basis.

1.3 "Access Facilities"

means a facilities designated for PEG Use, and equipment, including, but not limited to, modulators, demodulators and transmitters, as well as production facilities and equipment for PEG Use of PEG Channels.

1.4 "Access Provider"

means an entity designated by the City to provide PEG programming and the provision of any facilities, equipment or other services for the purpose of facilitating such programming.

1.5 "Applicable Law"

means any federal, State or local statute, law, regulation, or other final legal authority governing any of the matters addressed in this Franchise.

1.6 "Basic or Basic Service"

means a service tier that includes, at a minimum, all signals of domestic television broadcast stations provided to any Subscriber (except a signal secondarily transmitted by satellite carrier beyond the local service area of such station, regardless of how such signal is ultimately received by the Cable System) any public, educational, and governmental programming required by this Franchise to be carried on the Basic tier, and any additional video programming signals or service added to the Basic tier by the Grantee.

1.7 "BTV10"

Means, the City's PEG channel in existence on the Effective Date of this Franchise, and identified as a government and education access channel.

1.8 "Cable Service"

means:

(a) The one-way transmission to Subscribers of (1) video programming, or (2) other programming services; and
(b) Subscriber interaction, if any, which is required for the selection or use of such video programming or other programming services.

1.9 "Cable Act"

means the Cable Communications Policy Act of 1984, 47 U.S.C. §§ 521 et seq., as amended by the Cable Television Consumer Protection and Competition Act of 1992, as further amended by the Telecommunications Act of 1996, as further amended from time to time.

1.10 "Cable System"

means a facility, consisting of closed transmission paths and associated signal generation, reception, and control equipment that is designated to provide Cable Service which includes video programming and which is provided to multiple Subscribers within the City, but such term does not include (A) a facility that serves only to retransmit the television signals of 1 or more television broadcast stations; (B) a facility that serves Subscribers without using any public right-of-way; (C) a facility of a common carrier which is subject, in whole or in part, to the provisions of subchapter II of the Cable Act, except that such facility shall be considered a Cable System (other than for purposes of

section 541(c) of the Cable Act) to the extent such facility is used in the transmission of video programming directly to Subscribers, unless the extent of such use is solely to provide interactive on-demand service; (D) an open video system that complies with Section 573 of the Cable Act; or (E) any facilities of an electric utility used solely for operating its electric system. For the purposes of this Franchise, Cable System means Grantee's system serving the City.

1.11 "Channel"
means a portion of the electromagnetic frequency spectrum which is used in a cable system and which is capable of delivering a television channel (as television channel is defined by the Commission by regulation).

1.12 "City"
means the City of Bellingham of the State of Washington and all the territory within its present and future boundaries.

1.13 "City Code"
means the Municipal Code of the City of Bellingham, Washington, as may be amended from time to time.

1.14 "Grantee"
means Comcast of Washington IV, Inc., a Washington Corporation and permitted successors and assigns.

1.15 "Day"
unless otherwise specified shall mean a calendar day.

1.16 "Demarcation Point"
means the physical point at which the Cable System enters a subscriber's home or building.

1.17 "Digital Services"
means services offered over the Cable system including the transmission of audio and video by discrete (digital) signals including standard definition and high definition signals consistent with the standards developed by the Advanced Television Systems Committee for digital television transmission over terrestrial, cable, and satellite networks.

1.18 "Effective Date"
means this Franchise granted by this Ordinance shall be effective 15 days from date of final passage by City Council; provided, however, that Grantee shall have 60 days to accept the Franchise and comply with all conditions for such acceptance. This Franchise shall be voidable at the City's discretion if Grantee fails to accept within 60 days.

1.19 "Expanded Basic Service"

Refers to the next tier of service above the Basic Service tier excluding premium or pay-per-view services.

1.20 "Franchise"

means this Ordinance and conditioned as set forth herein.

1.21 "Franchise Fee"

means the fee the City may assess in accordance with Section 622 (g) of the Cable Act (47 U.S.C. 542(g)).

1.22 "Gross Revenues"

means all revenue derived by Grantee, or any affiliate of Grantee or any other person who would constitute a cable operator of the Cable System under the Cable Act, from the operation of the Cable System to provide Cable Service in the City. Gross Revenues include, by way of illustration and not limitation, monthly fees charged Subscribers for any tier of Cable Services including Basic Service, optional Premium Service or Digital Services; pay-per-view services;, installation, disconnection, reconnection and change-in-service fees, Leased Access channel fees, all Cable Service lease payments from the Cable System to provide Cable Services in the City, late fees and administrative fees, payments or other consideration received by Grantee from programmers for carriage of programming on the Cable System and accounted for as revenue under GAAP; revenues from rentals or sales of converters or other Cable System equipment; advertising sales revenues booked in accordance with Applicable Law and GAAP; revenues from program guides and electronic guides, additional outlet fees, Franchise Fees required by this Franchise, revenues from home shopping and other revenue-sharing arrangements.

Gross revenues shall not include any taxes on services furnished by Grantee, which taxes are imposed directly on a Subscriber or user by a city, county, State or other governmental unit, and collected by Grantee for such entity. The Franchise fee is not such a tax. Gross revenues shall not include amounts which cannot be collected by Grantee and are identified as bad debt; provided that if amounts previously representing bad debt are collected, then those amounts shall be included in gross revenues for the period in which they are collected. Gross revenues shall not include payments received by the Grantee from the City in payment for construction of fiber for City PEG use.

Gross Revenues shall include revenue received by any entity other than Grantee where necessary to prevent evasion or avoidance of the obligation under this Franchise to pay the Franchise Fees, however, amounts included in gross revenues shall not be counted more than once; therefore, amounts included once in Grantee's gross revenues shall not be added to gross revenues again if they are received by an affiliate of Grantee in payment for programming or other goods or services supplied to Grantee.

1.23 "Headend"

means the control center of the Cable System where incoming signals are amplified, converted, processed, and combined for transmission to the Subscriber.

1.24 "Indefeasible Right of Use"
means the exclusive, irrevocable right to use specified fiber subject to the terms and conditions of this Franchise, and any extensions or renewals thereof.

1.25 "Institutional Facilities"
means libraries, police stations (not including incarceration facilities) and fire stations but shall not include buildings or sites owned by City such as storage facilities or other facilities not used for administrative purposes, or those buildings owned by the City but leased to third parties at which government administrative employees are not regularly stationed.

1.26 "Leased Access"
means Channel capacity designated for commercial use by Persons unaffiliated with Grantee, in accordance with section 612 of the Cable Act.

1.27 "Municipal buildings"
means those buildings owned or leased and occupied by the City for government administrative purposes

1.28 "MVPD"
means "multichannel video programming distributor." As used in this Franchise MVPD means a cable operator or a multichannel multipoint distribution service, that makes available for purchase, by Subscribers, multiple Channels of video programming.

1.29 "Normal Business Office Hours"
means those hours during which most similar businesses in the community are open to serve customers. In all cases, ''normal business hours'' must include some evening hours at least one night per week and/or some weekend hours.

1.30 "Normal Operating Conditions"
means those Service conditions which are within the control of Grantee. Those conditions which are not within the control of Grantee include, but are not limited to, natural disasters, civil disturbances, power outages, telephone network outages, and severe or unusual weather conditions. Those conditions which are ordinarily within the control of Grantee include, but are not limited to, special promotions, pay-per-view events, rate increases, regular peak or seasonal demand periods, and maintenance or upgrade of the Cable System.

1.31 "Premium Service"
means a Cable Service (such as movie channels or pay-per-view programs) offered to Subscribers on a per-channel, per-program, or per-event basis.

1.32 "PEG"
means public, educational and governmental.

1.33 "Person"

means any individual, corporation, partnership, association, joint venture or organization of any kind and the lawful trustee, successor, assignee, transferee or personal representative thereof.

1.34 "Subscriber"

means any person who legally receives Grantee's Cable Services over the Cable System.

1.35 "State"

means The State of Washington

1.36 "Street"

means the surface of and the space above and below the right of way of any public street, road, highway, freeway, easement, lane, path, alley, court, sidewalk, parkway, or driveway now or hereafter existing as such within all incorporated areas of the City.

1.37 "Transfer"

means any transaction in which:

(a) All or a portion of the Cable System is sold or assigned (except a sale or assignment that results in removal of a particular portion of the facility from the Streets);
(b) There is any change, acquisition, or direct or indirect transfer of control of the Grantee;
(c) The rights and/or obligations held by the Grantee under the Franchise are transferred, sold, assigned, or leased, in whole or in part, directly or indirectly, to another party; or
(d) The transfer of stock in a corporation so as to create a new controlling interest constitutes a "transfer." The term "controlling interest" is not limited to majority stock ownership, but includes actual working control in whatever manner exercised.

1.38 "Video Services"

means programming provided by, or generally considered comparable to programming provided by a cable operator as the term "cable operator" is defined in the Cable Act.

SECTION 2. FRANCHISE

2.1 Grant of Franchise

The City hereby authorizes Grantee to occupy or use the City's Streets subject to (A) the provisions of this non-exclusive Franchise to provide Cable Service within the City; and (B) all applicable provisions of the City Code. Said Franchise shall constitute both a right and an obligation to provide Cable Services as required by the provisions of this Franchise. Nothing in this Franchise shall be construed to prohibit Grantee from providing services other than Cable Services to the extent not prohibited by Applicable Law. The City hereby reserves all of its rights to regulate such other services to the extent consistent with Applicable Law and no provision herein shall be construed to limit or give up any right to regulate.

2.2 Police Powers

The Grantee, through this Franchise, is granted the right to operate its Cable System using the Streets within the Franchise Area in compliance with the City Code, as may be amended periodically. The Grantee specifically agrees to comply with the lawful provisions of the City Code and lawful applicable regulations of the City, and subject to the police power exception below, in the event of a conflict between the lawful provisions of the City Code or lawful applicable regulations of the City and this Franchise, the express provisions of this Franchise shall govern. Subject to express federal and State preemption, the material terms and conditions contained in this Franchise may not be unilaterally altered by the City through subsequent amendment to the City Code or any regulation of City, except in the lawful exercise of City's police power. Grantee acknowledges that the City may modify its generally applicable regulatory policies by lawful exercise of the City's police powers throughout the term of this Franchise. Grantee agrees to comply with such lawful modifications. Grantee reserves all rights it may have to challenge such lawful modifications whether arising in contract or at law. The City reserves all of its rights and defenses to such challenges whether arising in contract or at law.

2.3 Franchise Term

The term of the Franchise shall be ten (10) years, unless extended by mutual written consent or terminated sooner in accordance with this Franchise.

2.4 Franchise Area

The Franchise Area shall be that area within the present or future corporate limits of the City. Cable Service shall be provided to all Persons subject to the service and installation policy outlined in this Franchise Section 10.1.

2.5 Franchise Nonexclusive

The Franchise granted herein shall be nonexclusive. The City specifically reserves the right to grant, at any time, such additional franchises for a Cable System as it deems

appropriate provided, however, such additional grants shall not operate to materially modify, revoke, or terminate any rights previously granted to Grantee. If any other wireline MVPD enters into any agreement with the City to provide Video Services to Subscribers in the City, the City, upon written request of the Grantee, shall permit the Grantee to construct and/or operate its Cable System and provide Video Services to Subscribers in the City under a substantively similar agreement as applicable to the new MVPD, if permissible under Applicable Law. Within one hundred and twenty (120) Days after the Grantee submits a written request to the City, the Grantee and the City shall enter into an agreement or other appropriate authorization (if necessary) containing the exact same terms and conditions as are applicable to the new wireline MVPD.

2.6 Competition from Wireline MVPD

If there is a change in federal, state or local law that provides for a new or alternative form of authorization for a wireline MVPD to provide Cable Service or Video Service to Subscribers in the City, or that otherwise changes the nature or extent of the obligations that the City may request from or impose on a wireline MVPD providing Cable Service or Video Service to subscribers in the City, the City agrees that if another wireline MVPD avails itself of such new law and provides Cable Service or Video Service in the City, upon Grantee's written request, the City shall permit the Grantee to terminate this Franchise and, subject to Applicable Law, provide Cable Service or Video Service to Subscribers in the City on substantively similar terms and conditions as are applicable to the other wireline MVPD under the changed law. The City and the Grantee shall implement the provisions of this Section within one hundred and twenty (120) Days after the Grantee submits a written request to the City. The City shall have the same right of termination of this Franchise should the changed law be more advantageous to the City, in the City's sole discretion.

2.7 Franchise Renewal or New Franchise

The City may establish appropriate requirements for new franchises or franchise renewals consistent with Applicable Law.

2.8 Periodic Public Review of Franchise

The City may, at approximately three-year intervals during the term of the Franchise, and at such other times as the City deems appropriate, conduct a public review of the Franchise. The purpose of the review shall be to ensure, with the benefit of full opportunity for public comment, that the Franchise continues to effectively serve the public in the light of new developments in cable law and regulation, cable technology, cable company performance, local regulatory environment, community needs and interests, and other such factors. Both the City and Grantee agree to make a full and good faith effort to participate in the review in a manner that accomplishes this end. It is not intended that the Franchise be modified as a result of such review, except as a last resort for achieving the purpose of the review. The City shall establish a procedure for ensuring orderly review, full discussion of any proposed policy changes between the City and Grantee, and full public hearing regarding all matters discussed during the review.

Matters appropriate for discussion at the public reviews in accordance with this section include, without limitation:

(a) Grantee's overall compliance with the Franchise;

(b) Policies and practices necessary to ensure continued support for public, educational and government access at substantially the same level provided for in the Franchise;

(c) System upgrade and rebuild requirements; and

(d) The resolution of any evident patterns of existing customer service problems.

If so ordered by a resolution of the City Council, following public review under this Section 2.8 and after the Eighth (8th) year of the Effective Date of the Franchise, Grantee shall agree to meet to discuss and plan with the City a rebuild or upgrade of the system such that the system as upgraded or rebuilt shall represent the then-current, non-experimental state-of-the-art in system technical capacity and performance, as well as provide general parity of overall Cable Service with the most advanced Cable Service provided by Grantee and other operators in Washington and Oregon.

The periodic public reviews described in this section may be but need not be made coincident with public reviews involved in the consideration of Grantee requests for franchise renewal, franchise extension, or approval of transfer of system ownership.

2.9 Transfer or Change of Control

Neither the Grantee nor any other Person may Transfer the Cable System or the Franchise without the prior written consent of the City, which consent shall not be unreasonably withheld. No consent shall be required, however, for (i) a transfer in trust, by mortgage, hypothecation, or by assignment of any rights, title, or interest of the Grantee in the Franchise or in the Cable System in order to secure indebtedness, or (ii) a transfer to an entity directly or indirectly owned or controlled by Comcast Corporation. If Grantee submits an application for approval of any Transfer in accordance with federal regulations (47 C.F.R. Section 76.502) the City shall process said application in accordance with those regulations. Applications for approval of any Transfer shall also be filed, and the City shall process such applications, in accordance with procedures set out in the City Code so long as they are not in conflict with Applicable Law. A Transfer without the prior written approval of the City is a material violation of this Franchise and shall make the Franchise subject to termination by the City.

For the purposes of determining whether it shall consent to a Transfer, the City, or its agents, may inquire into all qualifications of the prospective Transferee and such other matters subject to applicable law. The Grantee and any prospective transferees shall

assist the City in any such inquiry, and if they fail to do so, the request for Transfer may be denied.

In making a determination as to whether to grant, deny, or grant subject to conditions an application for a Transfer of a Franchise, the City shall consider the legal, financial, and technical qualifications of the transferee to operate the Cable System; any potential impact of the Transfer on Subscriber services; whether the Grantee is in compliance with its Franchise and, if not, the proposed transferee's commitment to cure such noncompliance; and whether operation by the transferee or approval of the Transfer would adversely affect Subscribers, the public, or the City's interest under this Franchise, or other Applicable Law.

No application for a Transfer of a Franchise shall be granted unless the transferee agrees in writing that it will abide by and accept all lawful terms of this Franchise, and that it will assume the obligations, liabilities, and responsibility for all acts and omissions, known and unknown, of the Grantee under this Franchise for all purposes, including renewal, unless the City, in its sole discretion, expressly waives this requirement in whole or in part.

Approval by the City of a Transfer of a Franchise does not constitute a waiver or release of any of the rights of the City under this Franchise, whether arising before or after the date of the Transfer.

2.10 Renewal

This Franchise shall be renewed in accordance with 47 U.S.C. 546.

2.11 Conditions of Sale

The City may acquire the Cable System as provided 47 U.S.C. 547.

2.12 Right to Require Removal of Property

At the expiration of the term for which the Franchise is granted provided no renewal is granted, or upon its forfeiture or revocation as provided for herein, the City shall have the right to require Grantee to remove at Grantee's own expense all or any part of the Cable System from all streets and public ways within the Franchise area. If Grantee fails to do so, the City may perform the work and collect the cost thereof from Grantee. The actual cost thereof, including direct and indirect administrative costs, shall be a lien upon all plant and property of Grantee effective upon filing of the lien with the Whatcom County Auditor.

2.13 Continuity of Service Mandatory

Grantee shall make its best effort to ensure that all Subscribers receive continuous uninterrupted Cable Service so long as their financial obligations to Grantee are honored, In the event of purchase, lease-purchase, acquisition, sale, lease, or other transfer to any

other Person, including any other operator of a cable communications franchise. Grantee shall cooperate fully to operate the Cable System in accordance with the terms and conditions of this agreement through the transition, to maintain continuity of service to all Subscribers.

SECTION 3. CONSTRUCTION AND OPERATION IN STREETS AND RIGHTS-OF-WAY

3.1 Use of Streets

Grantee may, subject to the terms of this Franchise, erect, install, construct, repair, replace, reconstruct and retain in, on, over, under, upon, across and along the Streets within the City such lines, cables, conductors, ducts, conduits, vaults, manholes, amplifiers, appliances, pedestals, attachments and other property and equipment as are necessary and appurtenant to the operation of a Cable System within the City. Without limiting the foregoing, Grantee expressly agrees that it will construct, operate and maintain its Cable System in compliance with, and subject to Applicable Law.

3.2 Construction or Alteration

Subject to Section 2.2 herein, in connection with the construction, operation or repair of the Cable System, Grantee shall, in all cases, comply with the City Code.

3.3 Non-Interference

Grantee shall exert its best efforts to construct and maintain a Cable System so as not to interfere with other use of Streets. Grantee shall, where possible in the case of above ground lines, make use of existing poles and other facilities available to Grantee. When residents receiving underground service or who will be receiving underground service will be affected by proposed construction or alteration, Grantee shall provide at least seventy-two (72) hours advance notice of the same to such affected residents.

3.4 Consistency with Designated Use

Notwithstanding the above grant to use Streets, no Street shall be used by Grantee if the City, in its sole opinion, determines that such use is inconsistent with the terms, conditions or provisions by which such street was created or dedicated, or presently used under Applicable Laws.

3.5 Undergrounding

Grantee shall place underground all of its transmission lines which are located or are to be located above the streets of the City in the following cases:

(a) All other existing utilities are required to be placed underground by statute, resolution, policy or other Applicable Law;

(b) Grantee is unable to get pole clearance;

(c) Underground easements are obtained from developers of new residential areas; or

(d) Utilities are overhead but residents prefer underground service drops (underground service drops provided at cost).

If an ordinance is passed creating a local improvement district which involves placing underground certain utilities including Grantee's cable plant which is then located overhead, Grantee shall participate in such underground project and shall remove poles, cables and overhead wires within such district if requested to do so and place facilities underground. If such undergrounding of Grantee facilities is part of such a project, the costs thereof shall be included in such local improvement district.

Grantee shall use conduit or its functional equivalent to the greatest extent possible for undergrounding, except for drops from pedestals to Subscribers' homes and for cable on other private property where the owner requests that conduit not be used. Grantee shall use, in conjunction with other utility companies or providers, common trenches for underground construction wherever available.

3.6 Maintenance and Restoration

(a) Restoration to Prior Condition

Consistent with Section 6.17.230 of the City Code, in case of any disturbance of any Street, pavement, sidewalk, driveway or other surfacing, the Grantee shall, at its own cost and expense and in a manner approved by the City, replace and restore all paving, sidewalk, driveway, landscaping or surface, in as good condition as before said work was commenced and in accordance with standards for such work set by the City and the City Code.

(b) Disputes

In any dispute over the adequacy of restoration or maintenance relative to this section, final determination shall be the prerogative of the City of Bellingham Department of Public Works subject to appeal by Grantee to Hearings Examiner consistent with Section 7.5 herein.

3.7 Tree Trimming

Grantee shall have the authority, pursuant to Sections 6.17.230 and 13.40.060 of the City Code, to trim trees upon and overhanging Streets, alleys, sidewalks, and public ways so as to prevent the branches of such trees from coming in contact with the wires and cables of Grantee.

3.8 Relocation

(a) Relocation of Facilities

In the event that at any time during the period of the franchise, the city, county or state shall lawfully elect to alter or change the grade of any street, alley, or other public ways, the Grantee, upon reasonable notice by the proper governmental entity, shall remove or relocate as necessary its poles, wires, cables, underground conduits, manholes and other fixtures within the public right-of-way at its own expense.

(b) Failure by Grantee to Remove or Relocate

If Grantee fails, neglects or refuses to remove or relocate its facilities as directed by the City; or in emergencies or where public health and safety or property is endangered, the City may do such work or cause it to be done, and the cost thereof to the City shall be paid by Grantee.

(c) Procedure for Removal of Cable

Grantee shall not remove any underground cable or conduit which requires trenching or other opening of the streets along the extension of cable to be removed, except as hereinafter provided. Grantee may remove any underground cable from the streets which has been installed in such a manner that it can be removed without trenching or other opening of the streets along the extension of cable to be removed. Subject to the City Code and other Applicable Law, Grantee shall remove, at its sole cost and expense, any underground cable or conduit by trenching or opening of the streets along the extension thereof or otherwise which is ordered to be removed by the City based upon a determination, in the sole discretion of the City, that removal is required in order to eliminate or prevent a hazardous condition. Underground cable and conduit in the streets which is not removed shall be deemed abandoned and title thereto shall be vested in the City.

3.9 Movement of Buildings

Grantee shall, upon request by any person holding a building moving permit, franchise or other approval issued by the City, temporarily remove, raise or lower its wire to permit the movement of buildings. The expense of such removal, raising or lowering shall be paid by the person requesting same, and Grantee shall be authorized to require such payment in advance. The City shall require all building movers to provide not less than 15 days' notice to the cable company to arrange for such temporary wire changes.

SECTION 4. CABLE SYSTEM CAPACITY AND COMPLIMENTARY SERVICE

4.1 Cable System Capacity

During the term of this Franchise the Grantee's Cable System shall be capable of providing a minimum of 85 channels of video programming to its customers in the Franchise Area, including Basic Cable.

4.2 Complimentary Cable Service in City

As a voluntary initiative, the Grantee shall continue to provide free of charge to the City and schools, Cable Service (consisting of the 2011 Basic Service tier and the 2011 Expanded Basic Service tier, or their reasonable functional equivalent) to each Municipal Building, Institutional Facility and each State accredited public and private K-12 school, not including "home schools," or incarceration facilities, located in the Franchise Area. This service is offered throughout the term of the Franchise by Grantee at its sole discretion.

(a) City or school responsibilities

In instances wherein the City or school is leasing and occupying the building, the City or school shall be responsible for acquiring any necessary right of entry agreement and paying any associated fees that may be required by the building's owner. The Cable Service provided shall not be used for commercial purposes.

(b) New Installations

For new installations or relocation of installations, if the drop line to such building exceeds a Standard Installation drop of one hundred twenty-five (125) feet, the Grantee will accommodate the drop up to two hundred fifty (250) feet if the City or other agency provides the necessary attachment point for aerial service or conduit pathway for underground service. If the necessary pathway is not provided the City or other agency agrees to pay the incremental cost of such drop in excess of one hundred twenty-five (125) feet or the necessary distribution line extension of the Cable System, including the cost of such excess labor and materials.

(c) Alternate Wireline Service Provider

In the event that there is another wireline service provider (or providers) providing Cable Service within the City, the decision of which service provider will provide the complimentary service shall be decided on a case by case basis, in City's sole discretion, in an effort to maintain equitable burdens on each provider.

4.3 Equal and Uniform Service

Grantee shall provide access to equal and uniform Cable Service throughout the franchise area.

4.4 Cable System Specifications

(a) Cable System Maintenance

In all its construction and service provision activities, Grantee shall meet or exceed the construction, technical performance, extension and service requirements set forth in this Franchise agreement.

(b) Emergency Alert Capability

Grantee shall provide and maintain an Emergency Alert System (EAS) consistent with applicable Federal law and regulations including 47 C.F.R., Part 11, and any Washington State Emergency Alert System.

(c) Standby Power

Grantee shall provide standby power generating capacity at the Cable System control center and at all hubs. Grantee shall maintain standby power supplies, rated at least at two hours' duration, throughout the trunk and distribution networks. In addition, Grantee shall have in place throughout the Franchise term a plan, and all resources necessary for implementation of the plan, for dealing with outages of more than two hours. This outage plan and evidence of requisite implementation resources shall be presented to the City upon request.

4.5 Technical Standards

The Federal Communications Commission (FCC) Rules and Regulations, Part 76, Subpart K (Technical Standards), as now or hereafter constituted, shall apply. The City may establish reasonable technical standards for the performance of the Cable System if permitted to do so under Applicable law.

4.6 Performance Testing

Grantee shall perform all Cable System tests at the intervals required by the FCC, and all other tests reasonably necessary to determine compliance with technical standards required by this Franchise. Written records of all Cable System test results performed by or for Grantee shall be maintained and available for City inspection upon request.

The tests may be witnessed by representatives of the City, and Grantee shall inform the City of the time and place of each test no less than three weeks prior to the scheduled compliance test. Written test reports of compliance testing shall be submitted to the City. If more than one of the locations tested fail to meet the performance standards, Grantee shall be required to indicate what corrective measures have been taken, and the entire test shall be repeated at the locations which failed. If a second test results in failure of one or more sites, then the City may seek remedies in accordance with sections 7.5 and 7.6 unless the circumstances of the failure are caused by conditions which are beyond Grantee's control, as determined, acknowledged and verified by the City.

SECTION 5. PROGRAMMING AND SERVICES

5.1 Categories of Programming Service

Grantee shall provide video programming services in at least the following broad categories:

News and Information
Sports
General Entertainment
Arts/Performance/Humanities
Science/Technology
Children/Family/Seniors
Foreign Language/Ethnic Programming
Public, Educational and Governmental Access Programming

5.2 Changes in Programming Services

Grantee shall not delete or so limit as to effectively delete any broad category of programming within its control without notifying the City. Further, Grantee shall provide at least thirty (30) days' prior written notice to Subscribers and to the City of Grantee's intent to effectively delete any broad category of programming or any channel within its control, including all proposed changes in channel allocation, including any new equipment requirements that may occur as a result of these changes.

Subscribers will be notified by Grantee of any changes in programming services or channel positions as soon as possible in writing. Notice must be given to Subscribers a minimum of thirty (30) days in advance of such changes if the change is within the control of the Grantee. The Grantee shall also give 30 days' written notice to both Subscribers and the City before implementing any service change. When the change involves the addition or deletion of channels, each channel added or deleted must be separately identified. For purposes of the carriage of digital broadcast signals, the operator need only identify for Subscribers, the television signal added and not whether that signal may be multiplexed during certain day-parts.

5.3 Basis for Programming Decisions

Upon request, Grantee shall meet with the City to discuss all documents and records pertaining to the basis for programming decisions, including, but not limited to, all customer surveys and survey results, individual requests, inquiries and complaints regarding program changes and types of programming. An explanation of local programming policies guiding Grantee's programming decisions shall be provided as a part of each year's annual report. Upon request, Grantee shall provide a copy of any survey results requested by the City.

5.4 Obscenity

Grantee shall not transmit over the Cable System programming which is obscene or otherwise unprotected by the Constitution of the United States; provided, however,

Grantee shall in no way be responsible for programming over which it has no editorial control, including public, educational and governmental access programming.

5.5 Parental Control Device

Upon request by any Subscriber, Grantee shall make available a parental control or lockout device that will enable the Subscriber to block all access to any and all channels without affecting those not blocked. Grantee shall inform Subscribers of the availability of the lockout device at the time of original subscription and annually thereafter.

5.6 Closed Captioning

Grantee shall at all times comply with the requirements of 47 C.F.R. § 79.1 by providing services for the disabled, including, but not limited to, passing through closed captioning for local programming if provided by City or Access Provider.

SECTION 6. PUBLIC, EDUCATIONAL AND GOVERNMENTAL ACCESS

6.1 Access Channels

Grantee shall make available for City's use up to three (3) Channels on the Cable System for PEG access purposes. Upon the Effective date, Grantee shall provide one (1) Channel to the City for PEG uses as determined in City's sole discretion. Either of the additional two (2) PEG channels shall be added to the Cable System by Grantee upon ninety (90) days advance written notice from the City. The additional PEG channels may be programmed by the City in City's sole discretion.

6.2 Control and Administration

The control and administration of the PEG access Channels shall rest with the City and the City may delegate, from time to time over the term of this Franchise, such control and administration to various entities as determined in City's sole discretion.

6.3 Cable Guide for PEG

Grantee agrees that if it utilizes a cable guide under its control on its Cable System for all Channels, the PEG Channels shall be treated in a non-discriminatory fashion consistent with Applicable Law so that Subscribers will have ready access to PEG Channels. This shall not be construed to require Grantee to pay any third party fees that may result from this obligation.

6.4 Noncommercial Use of PEG

PEG Channels are for noncommercial programming to be promoted and administered by the City as allowed under Applicable Law. Permitted noncommercial uses of the PEG Channels shall include by way of example and not limitation: (A) the identification of financial supporters similar to what is provided on public broadcasting stations; or (B) the solicitation of financial support for the provision of PEG programming by the City or third party users for charitable, educational or governmental purposes; or (C) programming offered by accredited, non-profit, educational institutions which may offer telecourses over a PEG Channel.

6.5 Indemnification

The City shall require, through the mutually agreed upon use requirements related to the protection of copyrighted material, that all public access users indemnify and hold the Grantee and the City harmless from all liability of any kind whatsoever, including the costs of legal defense arising from the use of facilities, channel(s) or access time by the user. To the extent allowed by law, the City agrees to indemnify, save and hold harmless the

Grantee from and against any and all liability resulting from the City's use of the PEG Channels required herein.

6.6 PEG Channel Location

Upon the Effective Date of this Franchise, the initial PEG access channel required in Section 6.1 shall be located on Channel 10 on Grantee's Cable System until such time as a move is mandated by Federal law or this Franchise.

Any additional PEG Channels required by the City shall be located by Grantee in channel locations consistent with the regional channel lineup in existence upon the Effective Date of this Franchise.

The PEG Channels will be located reasonably close in proximity to other broadcast Channels and/or other commercial video Channels, excluding pay-per-view programming offered by Grantee in the City.

In conjunction with any occurrence of PEG Channel(s) relocation, Grantee shall provide a minimum of $9,000 of in-kind air time on advertiser supported Channels (e.g. USA, TNT, TBS, Discovery Channel, or other comparable Channels) for the purpose of airing City's (or City's designee's) pre-produced 30-second announcement explaining the change in location.

Grantee will give City at least 90 day notice prior to changing any PEG channel location or number.

6.7 PEG Fees

(a) PEG Fee Amounts

Grantee shall collect fees to support PEG obligations on a per subscriber per month basis.

Upon the Effective Date of this Franchise, Grantee shall collect on behalf of City a per Subscriber fee of fifty cents ($.50) per month ("PEG Fee").

Subject to the preceding requirements of this Section 6.7(a), the City may, at any time over the term of this Franchise, provide Grantee ninety (90) days advance written notice and increase or decrease the PEG Fee as determined in City's sole discretion. In no event may any PEG Fee exceed fifty cents ($.50)/Subscriber/month.

Any PEG fees collected and shown on Subscriber bills shall appear in a single line on the bill.

(b) City's use of PEG Fees

In no event shall the City use any portion of the PEG Fee in a manner inconsistent with 47 U.S.C. § 542(g)(2)(C) or any other applicable provisions of the Cable Act and FCC regulations.

The City and Grantee agree that the PEG Fee is in addition to the Franchise Fee, and falls within one or more of the exceptions in 47 U.S.C. § 542. Such costs may be categorized, itemized, and passed through to Subscribers as permissible, in accordance with 47 U.S.C. §542 or other Applicable Law.

(c) Grantee payment of PEG Fees

Grantee shall pay the PEG Fee to the City monthly at the same time as the payment of franchise fees under Section 11.1 of this Franchise. Grantee agrees that it will not offset or reduce its payment of past, present or future Franchise fees required as a result of its obligation to remit the PEG Funds or the PEG Fee.

Should Grantee continue to provide Cable Service after the scheduled expiration of this Franchise, until and unless this Franchise is superseded by a renewed franchise in accordance with Applicable Law, Grantee shall continue to make monthly PEG Fee payments for, and in support of PEG Channels as specified hereinabove.

Any PEG Access capital support amounts owing pursuant to this Franchise which remain unpaid more than thirty (30) Days after the date the payment is due shall be delinquent and shall thereafter accrue interest at twelve (12) percent per annum or the prime lending rate published by the Wall Street Journal plus two percent on the day the payment was due, whichever is greater.

6.8 Transition to HD Format for BTV10

At such time as Grantee no longer provides Basic Service in an analog format, the City may, upon ninety (90) days advance written notice to Grantee, require that Grantee transmit BTV10 (the government access channel), in high definition (HD) format so long as City provides an HD signal to Grantee. City acknowledges that upon Grantees provision of an HD channel the City programming will no longer be carried in standard format and that only those customers with an HD converter and HD capable television, who pay Grantee's regular and customary charges associated with HD services, will be able to view the City programming via Grantees Cable system.

Upon request, Grantee shall provide information to the City regarding the subscriber trends in HD viewing capability.

Grantee shall also retain full discretion to locate BTV10 in an HD channel location consistent with channel location objectives described in Section 6.6.among its HD tier of services.

6.9 Fiber Return Lines

Grantee shall maintain free of charge to the City throughout the life of this Franchise the existing fiber return line at the Bellingham Municipal Court building in order to enable the distribution of PEG access programming to Grantee's residential Subscribers. Grantee shall ensure that the Cable System is capable of transporting PEG programming (i.e. program origination capability) from the Bellingham Municipal Court building.

6.10 Construction of New Fiber Return Lines.

The City may direct Grantee to construct new fiber return lines to facilitate transport of PEG origination programming ("Origination Fiber") to specified termination locations within the City at any time over the term of the Franchise ("Fiber Construction").

After receiving a request for Fiber Construction, Grantee will promptly and in no event longer than forty-five (45) days, provide the City with a written estimate of the costs, calculated on a time and material basis with no cost mark up added by the Grantee ("Direct Costs"), associated with the proposed Fiber Construction. In preparing the written estimate of costs, the Grantee will identify the closest technically feasible point on Grantee's Cable System where a fiber connection (via a fiber termination panel) can be made so as to minimize the Direct Costs to be incurred by the City.

If the City then directs Grantee to perform the work, Grantee will perform it. Any such work shall be performed and completed within One Hundred and Twenty (120) Days after the City directs that the work be performed, unless the Parties agree to a different completion date.

Grantee will transport PEG programming from the current City Access programming origination site to the Grantee's head end free of charge.

6.11 Continued Use of Network.

The Grantee shall maintain ownership of the PEG Fiber despite the fact that City will pay all Direct Costs. Therefore, the Grantee grants the City an Indefeasible Right of Use for all PEG Fiber which the City has paid for under Section.

6.12 PEG Signals and Equipment

All PEG Channels shall be provided as part of Basic Service in accordance with applicable law. All PEG Channels may be delivered by the City to Grantee in standard digital format (or in an HD format for BTV10 in accordance with Section 6.8 herein).

Any and all costs associated with any modification of the PEG Channels or signals after the PEG Channels/signals leave the Access Provider's side of fiber termination panel, or any designated playback center authorized by the City, shall be borne entirely by Grantee and provided free of charge to the City and its designees.

Grantee shall not cause any programming to override PEG programming on any PEG Channel, except by oral or written permission from the City, with the exception of emergency alert system signals.

6.13 Technical Quality of PEG Channel Signals

(a) PEG channel signals

PEG channel signals will not be intentionally degraded in any way that would reduce signal quality of the signals delivered by the City or the Access Providers to the Grantee. Grantee shall be responsible for all equipment, including head end equipment, on Grantee's side of fiber termination panel. Grantee shall not impose any additional charges on City or any Access Providers after the signal is handed off to Grantee.

Grantee shall maintain its Cable System in accordance with FCC Technical Standards so that PEG Channels and return lines are at the same level of technical quality and reliability as other commercial signals carried by Grantee, so long as the signal comes to Grantee at that level of quality.

Grantee agrees not to encrypt the PEG Channels any differently than other commercial Channels available on the Cable System. There shall be no significant deterioration in signal from the point of origination to the customer premise equipment on the Cable System. All processing equipment used by Grantee for processing PEG signals will be of similar quality to the processing equipment used for other commercial Channels.

The City shall ensure PEG Channels and signals leaving the City's playback facilities, or the playback facilities of the Access Providers, are in compliance with applicable FCC technical standards.

Grantee will transport PEG programming from the City's playback facilities, or the playback facilities of the Access Providers, to the Grantee's headend free of charge.

(b) PEG Signal – Technical support from Grantee

Within 24 hours of a call from City to the Grantee identifying a technical problem and requesting assistance, Grantee will provide technical assistance or diagnostic services to determine whether or not a problem with a PEG signal is the result of matters for which Grantee is responsible and if so, Grantee will take prompt corrective action. If the problem persists and there is a dispute about the cause,

then the parties shall meet with engineering representation from Grantee and the City in order to determine the course of action to remedy the problem.

6.14 Change in Technology

In the event Grantee makes any change in the Cable System and related equipment and facilities or in its signal delivery technology, which requires the City to obtain new equipment in order to be compatible with such change, Grantee shall, reimburse the City for such equipment as may be necessary.

6.15 Relocation of Grantee's Headend

In the event Grantee relocates its headend, Grantee will be responsible for replacing or restoring the existing dedicated connection at Grantee's cost so that all the functions and capacity remain available, operate reliably and satisfy all applicable technical standards without additional costs to the City.

SECTION 7. REGULATORY PROVISIONS

7.1 Intent

In accordance with the provisions of Chapter 6.17 BMC, the City retains the right to administer and regulate activities under the Franchise up to the full extent permitted by Applicable Law.

7.2 Delegation of Authority to Regulate

The City reserves the right to delegate its regulatory authority wholly or in part to agents of the City, including, but not limited to, an agency which may be formed to regulate several franchises in the Whatcom County region.

7.3 Areas of Administrative Authority

In addition to any other regulatory authority granted to the City by law or franchise, the City shall have administrative authority in the following areas:

(a) Administering and enforcing the provisions of this Franchise agreement, including the adoption of administrative rules and regulations to carry out this responsibility.

(b) Coordinating the operation of PEG Channel programming.

(c) Planning expansion and growth of public access programming.

(d) Formulating and recommending long-range cable communications policy for the Franchise area.

(e) Disbursing and utilizing Franchise revenues paid to the City.

Grantee shall cooperate fully in facilitating the City's discharge of its administrative authority.

7.4 Regulation of Rates and Charges

(a) **Right to Regulate.** The City reserves the right to regulate rates and charges for any Cable Service within the limits of Applicable Law.

(b) **Notice of Change in Rates and Charges**. Throughout the term of this Franchise, Grantee shall give the City and all Subscribers within the City of Bellingham at least thirty (30) days' notice of any intended change to Subscriber rates or charges. Nothing in this Subsection shall be construed to prohibit the reduction or waiving of rates or charges in conjunction with promotional campaigns for the purpose of attracting Subscribers.

(c) **Rate Discrimination Prohibited**. Within any category of Subscribers, Grantee shall not discriminate among Subscribers with regard to rates and charges made for any Cable Service based on considerations of race, color, creed, sex, marital or economic status, national origin, sexual

preference, or neighborhood of residence, except as otherwise provided herein; and for purposes of setting rates and charges, no categorization of Subscribers shall be made by Grantee on the basis of those considerations.

(d) Low Income Senior/Disabled Discount Program. As a voluntary initiative Grantee agrees to provide throughout the term of this Franchise a discount of 30% from its published rate card to Basic Service Subscribers who are:

low income, and aged 65 years or older or disabled provided that such individual(s) are the legal owner or lessee/tenant of their dwelling unit and that their combined disposable income from all sources meets Grantee then-applicable income standards for participant.

Grantee shall administer the discount program. City shall refer potential qualifying customers to Grantee.

Upon request, Grantee shall provide City with the number of Subscribers participating in the discount program.

7.5 Franchise Violations, Remedies, and Revocation

(a) Remedies

The City shall have the right to assert the remedies set out below in the event Grantee violates any provision of this Franchise. These remedies are intended to embody the City's and/or the public's rights under City Charter Article 11.04 to the extent permitted by Applicable Law.

(1) To the extent the City deems necessary to remedy the default, proceeding against all or any part of any security provided under the City Code or this Franchise, including, without limitation, any bonds, security funds, or other surety, Grantee shall be responsible for all direct and actual costs related to the enforcement action including, but not limited to, legal and administrative costs;

(2) Impose liquidated damages as set forth in Section 7.6, but only after the due process provisions outlined herein have been completed;

(3) Commencing an action at law for monetary damages or seeking equitable relief, including specific performance; or

(4) In the case of a Grantee's default as to a material provision of the Franchise, undertake the proceeding to revoke the Franchise.

In determining which remedy or remedies for Grantee's violation are appropriate, the City shall take into consideration the nature and extent of the violation, the

remedy needed to prevent such violations in the future, whether Grantee has a history of previous violations of the same or similar kind, and such other considerations as are appropriate under the circumstances.

(b) Revocation

The City has the right to revoke this Franchise, and all rights and privileges pertaining thereto, in the event that:

(1) Grantee is in violation of any material provision of the Franchise agreement or has demonstrated a pattern of Franchise violations and fails to correct the violation(s) after written notice of the violation(s) and proposed forfeiture and a reasonable opportunity thereafter to correct the violation(s) as noted in section 7.5 (c); or

(2) Grantee becomes insolvent, unable or unwilling to pay its debts, or is adjudged bankrupt, to the extent permitted by Applicable Law; or

(3) Grantee is found to have engaged in any or attempted fraud or deceit upon the City, Persons, or Subscribers; or

(4) Grantee fails to post a performance bond as required under the terms of this Franchise.

(c) Enforcement Procedures

(1) Notice of Violation or Default. In the event the City believes that the Grantee has not complied with the material terms of the Franchise or has demonstrated a pattern of Franchise violations, it shall first make contact with Grantee to informally discuss the issue. This informal discussion may be via telephone, email or other electronic means and is intended as a courtesy to Grantee prior to issuing a notice of violation. Thereafter the City shall notify the Grantee in writing with specific details regarding the exact nature of the alleged noncompliance or default ("Violation Notice").

(2) Grantee's Right to Cure or Respond. The Grantee shall have thirty (30) days from the receipt of the Violation Notice to: (A) to respond to the City, contesting the assertion of noncompliance or default; or (B) to cure such default; or (C) in the event that, by nature of the default, such default cannot be cured within the thirty (30) day period, initiate reasonable steps to remedy such default and notify the City of the steps being taken and the projected date that they will be completed. The City shall not unreasonably refuse to accept the Grantee's proposed cure date but such decision shall be the City's alone to make.

(3) Contested Hearings. In the event the Grantee fails to respond to the Violation Notice or in the event that the alleged default is not remedied as required under this Section 7.5 (c), the City may refer the matter to the City's hearing examiner in accordance with Section 2.56 of the City Code. The Grantee will be provided an opportunity to present evidence to contest the alleged violation. City shall notify Grantee of the hearing in writing. The determination as to whether Grantee is in default of this Franchise shall be determined by the hearing examiner, but any such written decision shall be subject to appeal to a court of competent jurisdiction. Such appeal to the appropriate Court shall be filed within thirty (30) Days of the issuance of the written decision of the hearing examiner. City shall receive notice from Grantee of any appeal concurrent with any filing to a court of competent jurisdiction.

(4) In the event the hearing examiner determines that Grantee is in non-compliance with any provision of the Franchise, the City may impose any of the remedies set out in section 7.

7.6 Liquidated Damages

(a) Because Grantee's failure to comply with the provisions of this Franchise will result in damage to the City and because it will be impractical to determine the actual amount of such damages, the City and Grantee hereby agree upon and specify certain amounts set forth hereafter in this section which represent both parties' best estimate of the damages.

(b) The City shall specify any damages subject to this section and shall include such information in the Violation Notice sent to Grantee required under Section 7.5(c)(1). Such Violation Notice may provide for damages sustained prior to the Violation Notice where so provided, and subsequent thereto pending compliance by Grantee.

(c) To the extent that the City elects to assess liquidated damages as provided in this section and such liquidated damages have been paid, the parties agree that the assessment of liquidated damages does not constitute a waiver by the City of any other right or remedy it may have under the Franchise or Applicable Law.

(d) Unless otherwise provided, liquidated damages shall accrue once the thirty (30) day cure period has expired following Grantee's receipt of the Violation Notice, unless the City has agreed to extend the thirty (30) day cure period. If Grantee fails to cure within the thirty (30) days, then the liquidated damages accrue from the date of the Violation Notice for a maximum of one hundred-twenty (120)

days, whereupon the City shall pursue alternate remedies as provided herein. Nothing in this section prevents the parties from settling any dispute relating to liquidated damages by mutual stipulation.

(e) Grantee may cure the breach or violation within the time specified in Section 7.5(c)(2) to the City's satisfaction, whereupon no liquidated damages are assessed.

(f) Schedule of Liquidated Damages. Nothing requires the City to assess liquidated damages, acting in its sole discretion, but such non-assessment does not operate as waiver or estoppel upon the City. Liquidated damages are set as follows.

1. For failure to provide data, documents, reports and information as required by this Franchise or to cooperate with the City during a system review, One Hundred Fifty and No/100 Dollars ($150) per day, or part thereof, per each separate violation.

2. For failure to provide the services required by this Franchise, including, but not limited to, the implementation and utilization of the PEG Channels, performance of required tests, and compliance with customer service standards, Two Hundred Fifty and No/100 Dollars ($250) per day for each day, or part thereof, such failure occurs or continues.

3. For failure to comply with any of the material provisions of the Franchise, for which a liquidated damage is not otherwise specified, the liquidated damages shall be Two Hundred and No/100 ($200) per day for each day, or part thereof, such failure occurs or continues.

7.7 Removal of Cable Following Termination of Franchise

Any order by the City to remove cable or conduit shall be mailed to Grantee not later than thirty (30) calendar days following the final determination of revocation of Grantee's right to occupy public right of way. Grantee shall file written notice with the City not later than 30 calendar days following the date of termination of the Franchise of its intention to remove cable and a schedule for removal by location. The schedule and timing of removal shall be subject to approval and regulation by the City. Removal shall be completed no later than 12 months following the date of expiration of the Franchise.

7.8 Failure to Enforce

Grantee shall not be relieved of any of its obligations to comply promptly with any provision of the Franchise by reason of any failure of the City to enforce prompt compliance, and City's failure to enforce shall not constitute a waiver of rights or acquiescence in Grantee's conduct.

7.9 Alternative Remedies

(a) As an alternative to the remedy set forth herein, the parties may mutually agree to submit any alleged violation of the provisions of this franchise to arbitration. The matter shall be determined by a board of three arbitrators, all of whom shall be citizens and taxpayers of the State of Washington, and shall be selected as follows: one by the City Council, one by the Grantee, and one by the two so appointed. Should the two arbitrators be unable to name a third, such third arbitrator shall be named by a judge of the Superior Court for Whatcom County. Said board shall make its decision in writing and file its decision with the parties within 60 days from the date of the appointment of the final arbitrator. The decision of the board shall be by a majority vote and signed by at least two arbitrators. The written decision shall be final and binding upon the parties.

(b) No provision of this Franchise shall be deemed to bar the right of the parties to seek or obtain judicial relief from a violation of any provision of the Franchise or any rule, regulation, requirement or directive promulgated thereunder. Neither the existence of other remedies identified in the Franchise nor the exercise thereof shall be deemed to bar or otherwise limit the right of the parties to recover monetary damages (except where liquidated damages are otherwise prescribed) for such violation by Grantee, or to seek and obtain judicial enforcement of Grantee's obligations by means of specific performance, injunctive relief or mandate, or any other judicial remedy at law or in equity.

7.10 Compliance with the Laws; Eminent Domain

Grantee shall comply with all applicable federal and State laws and regulations, including regulations of any administrative agency thereof, as well as all generally applicable ordinances, resolutions, rules and regulations of the City heretofore or hereafter adopted or established during the term, of this Franchise. Nothing in the Franchise shall expand or limit the City's right of eminent domain under State law. Nothing in the Franchise shall be deemed to waive the requirements of any lawful code, ordinance or resolution of the City requiring permits, fees to be paid, or regulation of construction.

SECTION 8. REPORTING REQUIREMENTS

8.1 Monthly Revenue Report

Grantee shall submit to the City along with its franchise fee payment a report showing the basis for computation of such fees showing the basis for the computation of the franchise fees and PEG fees paid during that period in a form and substance substantially equivalent to Exhibit A attached hereto. This report shall separately indicate revenues received by Grantee within the City including, but not limited to such items as listed in the definition of "Gross Revenues" at Section 1.22 of this Franchise.

8.2 Quarterly Trouble Call Report

Grantee shall, consistent with the current practice on the effective date of this franchise, maintain a log of all Subscriber trouble calls and make this log available for City inspection. The log shall include the street name portion of the address, city, zip, job type, trouble call reason, drop type, date entered, time entered, schedule date, customer request yes-no, date completed, time completed, resolution.

The log shall be submitted on a quarterly basis to the City or person or agency designated by the City. The City may request the log more frequently if it is deemed necessary.

Upon request, Grantee agrees to provide the Trouble Call report in a .pdf format rather than in a paper format.

8.3 Quarterly Report

Grantee shall, provide City with information which shall describe in detail Grantee's compliance with customer service standards.

8.4 Annual Report

On or before May 31st of each year during the term of this Franchise, Grantee shall present a written report to the City which shall include:

(a) A summary of gross revenue and franchise fee calculations for the previous year.

(b) An unaudited financial statement for Comcast of Washington IV, Inc. The City shall have the right one (1) time during the Term of this Franchise to require that the Grantee provide the City with an audited financial statement for any one fiscal year of the Grantee.

(c) A summary of the previous year's activities for the Franchise area served by Grantee including, but not limited to, the total number of Subscribers for each category of service, the number of homes passed, miles of overhead and underground cable plant.

(d) A description of all significant changes and modifications to the system or services that have been implemented in the previous year.

8.5 Ascertainment Process

Grantee shall:

(a) Every third year, beginning in 2014, using a methodology approved by the City, provide a systematic ascertainment of the community's views regarding the nature and adequacy of Grantee's services, and of the cable related needs and interests of the community and the preferences of customers in the City of Bellingham.

(b) At least sixty (60) days prior to beginning ascertainment survey, Grantee and City shall meet to discuss proposed survey questions and Grantee shall provide City with a draft copy of the proposed survey questions. The City shall have the right to add up to 10 questions to the survey or refine questions based on Grantee's draft survey to address issues related to Cable Services or PEG channel viewing in the City. The parties agree to collaborate so that survey can be conducted in timely manner.

8.6 Monitoring and Compliance Reports

Upon request, but no more than once a year, Grantee shall provide FCC proof of performance test results. Upon request, Grantee shall make available for City's review, any other technical testing results related to the system serving the City.

8.7 Additional Reports and Information

Grantee shall prepare and the City may review, at the times and in the form prepared by Grantee in its normal course of business, such additional reports with respect to its operation, transactions, or property, as may be reasonably necessary to ensure compliance with the terms of this Franchise.

Upon request, Grantee will provide updated route map to City. City shall have right to inspect detailed system maps at Grantee's local office.

8.8 Grantee Report of Communications with State Regulatory Bodies or Committees

Grantee shall notify the City whenever the Grantee names the City in any filings which Grantee may submit to the State of Washington that bear relevance on the terms of this Franchise. Upon request, copies of responses from the State of Washington related to Grantees submittal pertaining to the Cable System serving the City shall likewise be filed.

In addition, Grantee shall within 10 days of any communication to or from any judicial or regulatory agency regarding any alleged or actual violation of a law, regulation or other requirement relating to the City's administration of this Franchise, provide the City a copy of the communication.

SECTION 9. CUSTOMER SERVICE POLICIES

9.1 Response to Customers and Cooperation with City

Grantee shall promptly respond to all requests for service, repair, installation and information from Subscribers. Grantee acknowledges the City's interest in the prompt resolution of all cable complaints and shall work in close cooperation with the City to resolve complaints.

9.2 Definition of "Complaint"

For the purposes of section 9, with the exception of Subsection 9.3, a "complaint" shall mean any communication to Grantee or to the City by a Subscriber or a Person who has; requested cable service, and is expressing dissatisfaction with any service, performance, or lack thereof, by Grantee under the obligations of this Franchise and has not found resolution through normal Grantee processes.

9.3 Customer Service Agreement

Grantee shall provide to Subscribers a comprehensive service agreement and a customer packet for use in establishing Subscriber service. This packet shall, at a minimum, contain the following information:

(a) Services to be provided and rates for such services.

(b) Billing procedures.

(c) Service termination procedure.

(d) Change in service notifications.

(e) Liability specifications.

(f) Converter/Subscriber equipment policy.

(g) Breach of Agreement specification.

(h) How complaints are handled including Grantee's procedure for investigation and resolution of Subscriber complaints.

(i) The name and address, of the City identified as the local franchising authority This information shall be contained in the packet A copy of the customer service agreement sball be provided to each Subscriber at the time of initial connection and any subsequent reconnection. Thereafter, if the packet is modified to reflect material changes in policy an updated copy of the packet shall be sent to all Subscribers within 30 days of such modification.

9.4 Customer Service

(a) Customer Service Location

Grantee shall maintain a convenient local customer service and bill payment location for matters such as receiving Subscriber payments, handling billing questions, equipment replacement and customer service information.

(b) Customer Service Standards

The City hereby adopts the customer service standards set forth in §76.309 of the FCC's rules and regulations, as included in Exhibit B.

(c) Customer Service procedures regarding television signal quality

Consistent with §76.1602 of the FCC's rules and regulations, Grantee will provide written information on each of the following areas at the time of installation of service, at least annually to all Subscribers, and at any time upon request:

(1) Products and Services offered;

(2) Prices and options for programming services and conditions of subscription to programming and other services;

(3) Installation and service maintenance policies;

(4) Instructions on how to use the cable service;

(5) Channel positions of programming carried on the system; and

(6) Billing and complaint procedures, including the address and telephone number of the City's cable office.

Subscribers shall be advised of the procedures for resolution of complaints about the quality of the television signal delivered by Grantee, including the address of the responsible officer of the City.

(d) Customer Service Rate and Service Changes

Consistent with §76.1603 of the FCC's rules and regulations, subscribers will be notified of any changes in rates, programming services or channel positions as soon as possible in writing. Notice must be given to subscribers a minimum of thirty (30) days in advance of such changes if the change is within the control of the Grantee.

Grantee shall give 30 days' written notice to both subscribers and local franchising authorities before implementing any rate or service change. Such notice shall state the precise amount of any rate change and briefly explain in readily understandable fashion the cause of the rate change (e.g., inflation, changes in external costs or the addition/deletion of channels). When the change

involves the addition or deletion of channels, each channel added or deleted must be separately identified.

(e) Information on Subscriber Bills

Consistent with §76.1619 of the FCC's rules and regulations,

(1) Bills will be clear, concise and understandable. Bills must be fully itemized, with itemizations including, but not limited to, basic and premium service charges and equipment charges. Bills will also clearly delineate all activity during the billing period, including optional charges, rebates and credits.

(2) In case of a billing dispute, Grantee must respond to a written complaint from a Subscriber within thirty (30) days.

(f) Refund Policy

If a Subscriber's Cable Service is interrupted or discontinued, without cause, for twenty-four (24) or more consecutive hours, Grantee shall, upon request by the Subscriber, credit such Subscriber pro rata for such interruption. For this purpose, every month will be assumed to have thirty (30) days.

(g) Late Fees

Grantee shall comply with all applicable state and federal laws with respect to any assessment, charge, cost, fee or sum, however characterized, that Grantee imposes upon a Subscriber for late payment of a bill.

(h) Disputes

In the event a subscriber has a complaint related to Grantees service or performance and Grantee has failed to resolve the issue Subscribers may then direct complaints, regarding Grantee's service or performance to the chief administrative officer of the City or the chief administrative officer's designee, which may be a board or commission of the City.

9.5 Customer Bills

Customer bills shall be designed in such a way as to present the information contained therein clearly and comprehensibly to Customers, and in a way that (A) is not misleading and (B) does not omit material information. Grantee may, in its sole discretion, consolidate costs on Customer bills as may otherwise be permitted by Section 622(c) of the Cable Act (47 U.S.C. §542(c)).

9.6 Notification of Complaint Procedure

Grantee shall have printed clearly and prominently on each Subscriber bill and in- the customer service agreement provided for in section 9.3, the 24-hour Grantee phone number for Subscriber inquiries.

9.7 Grantee Identification

Grantee shall provide all customer service technicians and all other Grantee employees entering private property with appropriate picture identification so that Grantee employees may be easily identified by the property owners and Subscribers.

SECTION 10. LINE EXTENSION POLICY

10.1 Service and Installation

Grantee shall make service available at standard installation and service rates, for every potential subscriber, pursuant to the following requirements:

(a) In newly developing underground service areas, where a shared trench is provided, Grantee shall extend and make cable television service available to every dwelling unit in areas having at least thirty-two (32) dwelling units per trench mile, or any proportionate subset thereof, as measured from the existing system, and shall extend its system simultaneously with the installation of utility lines when this density requirement is met.

(b) In any area served by overhead facilities Grantee shall extend and make cable television service available to every dwelling unit in areas having at least thirty-two (32) dwelling units per strand mile, or any proportionate subset thereof, as measured from the existing system, and shall extend its system simultaneously with the installation of utility lines when this density requirement is met.

(c) In any area served by underground facilities that has existing homes that are not served by Grantee, Grantee shall extend and make cable television service available to every dwelling unit in areas having at least one-hundred twenty (120) dwelling units per trench mile, or any proportionate subset thereof, as measured from the existing system.

(d) Grantee must extend and make cable television service available to any resident requesting connection at the standard connection charge if the connection to the resident would require no more than a standard 125' aerial drop line.

(e) With respect to requests for connection requiring an aerial drop line in excess of 125', the Grantee must extend and make available cable television service to such residents at a connection charge not to exceed the actual installation costs incurred by the company for the distance exceeding 125'.

(f) The Grantee, in its application, may propose a line extension policy which will result in serving more residents of city than as required.

10.2 Annexed Areas and Requirements

(a) City Notice of Annexation

In the event the City annexes any area which is being provided cable service by Grantee, the City shall provide to Grantee, within (10) ten working days of passage by City Council, a copy of the City ordinance, legal description ,if not found in the ordinance, addresses and a map defining the annexed area.

(b) Grantee Update of Subscriber Information Following Annexation

Grantee shall provide written notice to the City, within one hundred-twenty (120) days following an annexation, indicating that subscriber addresses within the annexation area have been updated to reflect the City as the franchising authority. Grantee shall provide revenue for new subscribers effective from the date of annexation.

(c) Grantee service to newly annexed areas

Upon the annexation of any additional land area by the City, the following conditions apply:

(1) If the annexed area is not currently served by a cable operator, Grantee will be subject to the other provisions of this franchise.

(2) If the annexed area is served by a cable operator other than Grantee, the Grantee has the option to extend its Cable System to the newly annexed area if Grantee determines that it is economically feasible to do so.

SECTION 11. COMPENSATION AND FINANCIAL PROVISIONS

11.1 Franchise Fees

During the term of the Franchise, Grantee shall pay to the City a franchise fee of 5% of Gross Revenues. If any such law, regulation or valid rule alters the 5% franchise fee enacted by the Cable Act, then the City shall have the authority to increase or decrease the franchise fee accordingly, provided such change is for purposes not inconsistent with Applicable Law. In the event franchise fee is modified by the City, City agrees to provide Grantee with prompt written notice of such modification. In the event Grantee bundles or combines Cable Services (which are subject to the franchise fee) with non-Cable Services (which are not subject to the franchise fee) so that Subscribers pay a single fee for more than one class of service resulting in a discount on Cable Services, Grantee agrees that for the purpose of calculation of the franchise fee, it shall allocate Cable Service revenue no less than a pro rata share of the revenue received for the bundled or combined services. The pro rata share shall be computed on the basis of the published charge for each service in the bundled or combined classes of services when purchased separately.

(a) Franchise fees shall be paid monthly not later than 45 days following the end of a given month. In accordance with Section 8.1 of this Franchise, and not later than the date of each payment, Grantee shall file with the City on a monthly basis a franchise fee payment report which identifies Gross Revenues earned by Grantee during the prior month. No acceptance of any payment shall be construed as an accord that the amount paid is, in fact, the correct amount, nor shall such acceptance of payment be construed as a release of any claim which the City may have for further or additional sums payable under the provisions of this section.

(b) Neither current nor previously paid franchise fees shall be subtracted from the Gross Revenue amount upon which franchise fees are calculated and due for any period, unless otherwise required by Applicable Law. Nor shall copyright fees or other license fees paid by Grantee be subtracted from Gross Revenues for purposes of calculating franchise fees.

(c) Any franchise fees owing pursuant to this Franchise which remain unpaid more than 45 days after the dates specified herein shall be delinquent and shall thereafter accrue interest at 12% per annum or 2% above prime lending rate as quoted by major Seattle banks, whichever is greater.

11.2 Franchise Fees for Government and Education Access Operation

During the term of the Franchise, the City shall place no less than 1.25% of Franchise fees received in a fund to support BTV10 operations.

11.3 City Annual Report to Grantee of PEG Fee Purchases

City shall provide to Grantee, within ninety (90) days following the end of each calendar year, a report detailing the City's PEG related capital expenditures.

If Grantee alleges that City has inappropriately used PEG fees, Grantee agrees to first notify the City of its concern prior to taking any legal action or withholding payment against any other fees owed City.

11.4 Auditing and Financial Records

Grantee shall manage all of its operations in accordance with a policy of keeping relevant books and records open and accessible to the City. The City shall have the right as necessary for effectively enforcing the Franchise, to inspect at any time during Normal Business Office Hours upon reasonable notice, all books, records, maps, plans, financial statements, service complaint logs, performance test results, records required to be kept by Grantee and any parent company pursuant to the rules and regulations of the FCC and other regulatory agencies, and other like materials of Grantee and any parent company which relate to the enforcement of the Franchise. Access to the aforementioned records shall not be denied by Grantee to representatives of the City on the basis that said records contain "proprietary" information. However, to the extent allowed by Washington law, the City shall protect the trade secrets and other confidential information of Grantee and any parent company. All books and records relating to Grantee's activities under the Franchise shall be, or upon request be made, available in the City of Bellingham.

Grantee agrees to meet with representatives of the City upon request to review its methodology of record-keeping, financial reporting, computing franchise fee obligations, and other procedures the understanding of which the City deems necessary for understanding the meaning of reports and records.

The City or its authorized agent may at any time and at the City's own expense conduct an independent audit of the revenues of Grantee in order to verify the accuracy of franchise fees paid to the City. Grantee and each parent company of Grantee shall cooperate fully in the conduct of such audit. Any such audit shall take place within three (3) years from the date the City receives such payment, after which period any such payment shall be considered final.

Upon the completion of any such audit by the City, the City shall provide to the Grantee a final report setting forth the City's findings in detail, including any and all substantiating documentation. Enforcement of any overpayment or underpayment shall be undertaken in accordance with Section 7.5 of this Franchise. In the event Grantee has underpaid the City by an amount greater than five percent (5%) underpayment, Grantee agrees to pay the cost of the audit in an amount up to fifteen thousand dollars ($15,000). No such payment shall be required of Grantee until Grantee has exhausted all of its Legal and administrative remedies.

In the event of an overpayment by Grantee, the City shall have the option of reimbursing Grantee within forty-five (45) days or of requesting in writing within forty-five (45) days

that Grantee withhold fifty percent (50%) of each future Franchise Fee payment until such time as said overpayment is recovered and thereafter remitting the full amounts to the City.

The City agrees to request access to only those books and records, in exercising its rights under this section, which it deems reasonably necessary for the enforcement of the Franchise.

11.5 Performance Bond

Within 30 days after the Grantee's acceptance of this Franchise, Grantee shall post a performance bond, in the amount of two hundred fifty thousand dollars ($250,000.00), to ensure Grantee's faithful performance of the terms of this Franchise.

Neither the provisions of this section, any bond accepted by the City pursuant thereto, nor any damages recovered by the City thereunder shall be construed to excuse faithful performance by Grantee or to limit liability of Grantee under the Franchise or for damages, either to the full amount of the bond or otherwise, except as otherwise provided herein.

11.6 Validity of Bond

If, at any time during the term of the Franchise, the condition of the entity issuing the bond shall change in such a manner as to render the bond unsatisfactory to the City, Grantee shall replace such bond by a bond of like amount and similarly conditioned, issued by an entity satisfactory to the City.

11.7 Indemnification by Grantee

Grantee shall, at its sole expense, fully indemnify, defend and hold harmless the City, and in their capacity as such, the officers and employees thereof, from and against any and all claims, suits, actions, liability and judgments for damage or otherwise except those arising wholly from negligence on the part of the City or its employees; for actual or alleged injury to persons or property, including loss of use of property due to an occurrence, whether or not such property is physically damaged or destroyed, in any way arising out of or through or alleged to arise out of or through the acts or omissions of Grantee or its officers, agents, employees, or contractors or to which Grantee's or its officers, agents, employees or contractors acts or omissions in any way contribute, and whether or not such acts or omissions were authorized or contemplated by this Franchise or Applicable Law; arising out of, or alleged to arise out of, any claim for damages for Grantee's invasion of the right of privacy, defamation of any person, firm or corporation, or the violation of infringement of any copyright, trademark, trade name, service mark or patent, or of any other right of any person, firm or corporation; arising out of or alleged to arise out of Grantee's failure to comply with the provisions of any statute, regulation or resolution of the United States, State of Washington or any local agency applicable to Grantee in its business. Nothing herein shall be deemed to prevent the City, its officers, or its employees, from participating in the defense of any litigation by their own counsel, at such parties expense. Such participation shall not, under any circumstances, relieve

Grantee from its duty of defense against liability, or of paying any judgment entered against the City, its officers, or its employees.

Notwithstanding, this Section (11.7) does not include PEG Access programming, operations, or administration, Access Channel(s), Access Facilities, or Access Provider(s), all of which is the City's sole responsibility.

11.8 Grantee Insurance

Grantee shall maintain, throughout the term of the Franchise, liability insurance in the minimum amounts of:

(a) $2,000,000 for personal injury or death to any one person and $5,000,000 aggregate for personal injury or death per single accident or occurrence.

(b) $2,000,000 for property damage to any one person and $5,000,000 aggregate for property damage per single accident or occurrence.

(c) $2,000,000 for all other types of liability, including claims for damages for invasion of the right of privacy; for defamation of any person, firm, or corporation; for the violation or infringement of any copyright, trademark, trade name, service mark or patent; or, for damage to any other person, firm, or corporation arising out of or alleged to arise out of failure to comply with the provisions of any statute, regulation or resolution of the United States, State of Washington, or any local agency with jurisdiction.

Such insurance shall specifically name as additional insured the City of Bellingham, its officers, employees and agents, shall further provide that the policy shall not be modified or canceled during the life of this Franchise without giving 30 days' written notice to the City.

Grantee shall file with the City a certificate of insurance showing up-to-date coverage and additional insured coverage, as set forth above. Coverage shall not be changed or canceled without approval of the City.

SECTION 12. MISCELLANEOUS PROVISIONS

12.1 Posting and Publication

Grantee shall assume the cost of posting and publication of this Franchise as such posting and publication is required by law and such is payable upon Grantee's filing of acceptance of this Franchise.

12.2 Guarantee of Performance

Grantee agrees that it enters into this Franchise voluntarily in order to secure and in consideration of the grant from the City of a 10-year Franchise. Performance pursuant to the terms and conditions of this Franchise agreement is guaranteed by Grantee.

12.3 Entire Agreement

This Franchise agreement contains the entire agreement between the parties, supersedes all prior agreements or proposals except as specifically set forth herein, and cannot be changed orally but only by an instrument in writing executed by the parties.

12.4 Consent

Wherever the consent or approval of either Grantee or the City is specifically required in this agreement, such consent or approval shall not be unreasonably withheld.

12.5 Resolutions Terminated

The cable television franchises as originally granted by Ordinance No. 10709 is hereby terminated.

12.6 Franchise Acceptance

This Franchise granted by this Ordinance shall be effective 15 days from date of final passage by City Council; provided, however, that Grantee shall have 60 days to accept the Franchise and comply with all conditions for such acceptance. This Franchise shall be voidable at the City's discretion if Grantee fails to accept within 60 days.

12.7 Force Majeure

In the event that either party is prevented or delayed in the performance of any of its obligations, under this Agreement by reason of acts of God, floods, fire, hurricanes, tornadoes, earthquakes, or other unavoidable casualties, insurrection, war, riot, vandalism, strikes, sabotage, boycotts, lockouts, labor disputes, shortage of qualified labor, freight embargoes, shortages or unavailability of materials or supplies, unusually severe weather conditions, acts or omissions of the other party, or any other similar event beyond the reasonable control of that party, it shall have a reasonable time under the circumstances to perform such obligation under this Agreement, or to procure a substitute for such obligation to the reasonable satisfaction of the other party.

12.8 Work of Contractors and Subcontractors

Work by contractors and subcontractors is subject to the same restrictions, limitations and conditions as if the work were performed by Grantee. Grantee shall be responsible for all

work performed by its contractors and subcontractors, and others performing work on its behalf as if the work were performed by it and shall ensure that all such work is performed in compliance with this Franchise, the City Code and other Applicable Law, and shall be jointly and severally liable for all damages and correcting all damage caused by them. It is Grantee's responsibility to ensure that contractors, subcontractors or other Persons performing work on Grantee's behalf are familiar with the requirements of this Franchise, the City Code and other Applicable Laws governing the work performed by them.

12.9 Severability

If any Section, subsection, paragraph or provision of this Franchise is determined to be illegal, invalid or unconstitutional by any court of competent jurisdiction, such determination shall have no effect on the validity of any other Section, subsection, paragraph or provision of this Franchise, all of which will remain in full force and effect for the term of the Franchise.

12.10 Counterparts

This Franchise Agreement may be executed in several counterparts, each of which when so executed shall be deemed to be an original copy, and all of which together shall constitute one agreement binding on all parties hereto, notwithstanding that all parties shall not have signed the same counterpart.

12.11 No Waiver of Rights

Nothing in this Franchise shall be construed as a waiver of any rights, substantive or procedural, either City or Grantee may have under Federal or state law unless such waiver is expressly stated herein.

12.12 No Third Party Beneficiaries

Nothing in this Franchise is or was intended to confer third-party beneficiary status on any member of the public to enforce the terms of this Franchise.

12.13 Modification

No provision of this Franchise shall be amended or otherwise modified, in whole or in part, except by an instrument, in writing, duly executed by the City and the Grantee, which amendment shall be authorized on behalf of the City through the adoption of an appropriate resolution or order by the City, as required by applicable law.

12.14 Governing Law

Franchise shall be deemed to be executed in the State of Washington, and shall be governed in all respects, including validity, interpretation and effect, and construed in accordance with, the laws of the State of Washington, as applicable to contracts entered into and performed entirely within the State.

12.15 Notices

All notices shall be in writing and shall be sufficiently given and served upon the other party by hand delivery, first class mail, registered or certified, return receipt requested, postage prepaid, or by reputable overnight courier service and addressed as follows:

To the City:

City of Bellingham
210 Lottie Street
Bellingham, WA 98225
Attn: Finance Director

Non-binding courtesy copy to:

City of Bellingham
210 Lottie Street
Bellingham, WA 98225
Attn: I.T. Director

To the Grantee:

Comcast of Washington IV, Inc.
15815 25th Ave. W.
Lynnwood, WA 98087
Attn: Government Affairs Dept.

Non-binding courtesy copy to:

Comcast Cable Communications, Inc.
1525 75th St. S.W.
Everett, WA 98203
Attn.: Government Affairs Dept.

PASSED by Council this 24th day of October, 2011.

Council President

EXECUTED, this the 2nd day of December, 2011, for the Grantee:

Name	*Signature*	*Title*
		Timothy T. Nester SVP - Finance and Accounting

EXECUTED, this the 26th day of October, 2011, for the **CITY OF BELLINGHAM**:

Mayor

Departmental Approval:

Department Head

Attest:

Finance Director

Approved as to Form:

Office of the City Attorney

EXHIBIT A – FRANCHISE FEE PAYMENT WORKSHEET

	Month/Year	Month/Year	Month/Year	Total
[redacted]				
Basic Service				
Expanded Basic Service				
Bad Debt/Write-offs				
Bulk Revenue				
Digital Cable/Services				
Equipment Revenue				
FCC Fee Revenue				
Franchise Fee Revenue				
Guide Revenue				
Inside Wiring				
Installation Charge				
Late Fee Revenue				
Other Revenue				
Premium Service				
Pay-per-view				
Processing Fees				
Allocated Revenue				
Home Shopping Revenue				
Leased Access				
Other Revenue				
Tower & Rental Income				
Local Advertising				
National Advertising				
Bad Debt on Advertising				
TOTAL REVENUE				
Fee Calculated				

Fee Factor: 5%

Note: PEG fees paid will be described in a separate monthly report.

EXHIBIT B - FCC CUSTOMER SERVICE STANDARDS

Grantee shall comply in all respects with the following customer service requirements established by the §76.309 of the FCC's rules and regulations:

(1) Cable System office hours and telephone availability:

(i) The cable operator will maintain a local, toll-free or collect call telephone access line which will be available to its Subscribers twenty-four (24) hours a day, seven (7) days a week.

(A) Trained company representatives will be available to respond to customer telephone inquiries during Normal Business Hours.

(B) After Normal Business Hours, the access line may be answered by a service or an automated response system, including an answering machine. Inquiries received after Normal Business Hours must be responded to by a trained company representative on the next business day.

(ii) Under Normal Operating Conditions, telephone answer time by a customer representative, including wait time, shall not exceed thirty (30) seconds when the connection is made. If the call needs to be transferred, transfer time shall not exceed thirty (30) seconds. These standards shall be met no less than ninety percent (90%) of the time under Normal Operating Conditions, measured on a quarterly basis.

(iii) The operator shall not be required to acquire equipment or perform surveys to measure compliance with the telephone answering standards above unless an historical record of complaints indicates a clear failure to comply.

(iv) Under Normal Operating Conditions, the customer will receive a busy signal less than three percent (3%) of the time.

(v) Customer service center and bill payment locations will be open at least during Normal Business Office Hours and will be conveniently located.

(2) Installations, Outages and Service Calls. Under Normal Operating Conditions, each of the following standards will be met no less than ninety five percent (95%) of the time measured on a quarterly basis:

(i) Standard Installations will be performed within seven (7) business days after an order has been placed. "Standard" Installations are those that are located up to one hundred twenty-five (125) feet from the existing distribution system.

(ii) Excluding conditions beyond the control of the operator, the cable operator will begin working on "Service Interruptions" promptly and in no event later than twenty-four (24) hours after the interruption becomes known. The cable operator must begin actions to correct other Service problems the next business day after notification of the Service problem.

(iii) The "appointment window" alternatives for Installations, Service calls, and other Installation activities will be either a specific time or, at maximum, a four (4) hour time block during Normal Business Hours. (The operator may schedule Service calls and other Installation activities outside of Normal Business Hours for the express convenience of the customer.)

(iv) An operator may not cancel an appointment with a customer after the close of business on the business day prior to the scheduled appointment.

(v) If a cable operator representative is running late for an appointment with a customer and will not be able to keep the appointment as scheduled, the customer will be contacted. The appointment will be rescheduled, as necessary, at a time which is convenient for the customer.

(3) Communications between Cable operators and Subscribers:

(i) Refunds. Refund checks will be issued promptly, but no later than either:

(A) The customer's next billing cycle following resolution of the request or thirty (30) days, whichever is earlier, or

(B) The return of the equipment supplied by the cable operator if service is terminated.

(ii) Credits. Credits for Service will be issued no later than the customer's next billing cycle following the determination that a credit is warranted.

EXHIBIT C- CHECKLIST OF NOTICES AND REPORTS

This Exhibit provides excerpts from this agreement related to regular notice and reporting requirements of this document. Other less-routine notice requirements are described in relevant sections of this agreement and are not listed below.

Reports and notice requirements – Cross-reference – Grantee to City

Section 4.6 – Performance Testing – Grantee shall inform the City of the time and place of each test no less than three weeks prior to the scheduled compliance test

Section 5.2 – Changes in Programming Services – Grantee shall provide at least thirty (30) day's prior written notice to Subscribers and to the City of Grantee's intent to effectively delete any broad category of programming or any channel… including all proposed changes in channel allocation, including any new equipment requirements…. The Grantee shall also give 30 days' written notice to both Subscribers and the City before implementing any service change.

Section 5.3 – Basis for Programming Decisions – An explanation of local programming policies guiding Grantee's programming decisions shall be provided as part of each year's annual report.

Section 6.6 – PEG Channel Location – Grantee will give the City at least 90 day notice prior to changing any PEG channel location or number.

Section 7.4 – Regulation of Rates and Charges – Grantee shall give the City and all Subscribers within the City of Bellingham at least thirty (30) days' notice of any intended change to Subscriber rates or charges.

Section 8.1 – Monthly Revenue Report

Section 8.2 – Quarterly Trouble Call Report

Section 8.4 – Annual Report

Section 8.5 – Ascertainment Process – Every third year, beginning in 2013, using a methodology approved by the City, provide a systematic ascertainment of the community's views… At least sixty (60) days prior to beginning ascertainment survey, Grantee and City shall meet to discuss proposed survey questions…

Section 8.8 – Grantee report of communications with State regulatory bodies or committees - Grantee shall notify the City whenever the Grantee names the City in any filings which Grantee may submit to the State of Washington that bear relevance on the terms of this Franchise… Grantee shall within 10 days of any communication to or from any judicial or regulatory agency regarding any alleged or actual violation of a law, regulation or other requirement relating to the City's administration of this Franchise, provide the City a copy of the communication

Section 10.2 – Annexed Areas and Requirements - Grantee shall provide written notice to the City, within one hundred-twenty (120) days following an annexation, indicating that

subscriber addresses within the annexation area have been updated to reflect the City as the franchising authority.

Reports and notice requirements – Cross-reference – City to Grantee

Section 10.2 – Annexed Areas and Requirements - In the event the City annexes any area which is being provided cable service by Grantee, the City shall provide to Grantee, within (10) ten working days of passage by City Council, a copy of the City ordinance, legal description, if not found in the ordinance, addresses and a map defining the annexed area.

Section 11.3 – City annual report to Grantee of PEG fee purchases - City shall provide to Grantee, within ninety (90) days following the end of each calendar year, a report detailing the City's PEG related capital expenditures.

CABLE FRANCHISE BOND

Bond 09057483

KNOW ALL BY THESE PRESENTS: That COMCAST OF WASHINGTON IV, INC.

15815 25th Avenue, W Lynnwood WA 98097 , as Principal,

and FIDELITY AND DEPOSIT COMPANY OF MARYLAND , as Surety, are

held and firmly bound unto CITY OF BELLINGHAM, WA

, as Obligee,

in the sum of Two Hundred Fifty Thousand and 00/100 ,

DOLLARS ($ 250,000.00), to the payment whereof well and truly to be made to the Obligee, we bind ourselves, our successors and assigns, firmly by these presents. Sealed with our seals and dated this 12th day of December , 2011 .

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH, That whereas the Obligee has granted unto the Principal, a franchise beginning November 8th , 2011 , and whereas the said Principal is required to execute a bond in the penal sum of Two Hundred Fifty Thousand and 00/100

($ 250,000.00) in favor of the Obligee, conditioned upon its performance of the obligations of the grantee under said franchise;

NOW, THEREFORE, if the above bounden Principal shall perform the obligations of the grantee under said franchise, then this obligation to be void otherwise to remain in full force and virtue. This bond may be canceled by the Surety upon thirty days notice to the Obligee by registered mail.

ATTEST:

COMCAST OF WASHINGTON IV, INC.
(Principal)

BY:

ARTHUR R. BLOCK
Senior Vice President

FIDELITY AND DEPOSIT COMPANY OF MARYLAND

Wayne G. McVaugh Attorney-in-Fact

Power of Attorney
FIDELITY AND DEPOSIT COMPANY OF MARYLAND

KNOW ALL MEN BY THESE PRESENTS: That the FIDELITY AND DEPOSIT COMPANY OF MARYLAND, a corporation of the State of Maryland, by M. P. HAMMOND, Vice President, and GREGORY E. MURRAY, Assistant Secretary, in pursuance of authority granted by Article VI, Section 2, of the By-Laws of said Company, which are set forth on the reverse side hereof and are hereby certified to be in full force and effect on the date hereof, does hereby nominate, constitute and appoint **Richard G. DICCIANI, Darella E. WHITE, Douglas R. WHEELER, Richard A. JACOBUS, Mary C. O'LEARY, Sandra E. BRONSON, Maureen MCNEILL, Wayne G. MCVAUGH and Nancy K. WALLACE, all of Philadelphia, Pennsylvania, EACH** its true and lawful agent and Attorney-in-Fact, to make, execute, seal and deliver, for, and on its behalf as surety, and as its act and deed: **any and all bonds and undertakings,** and the execution of such bonds or undertakings in pursuance of these presents, shall be as binding upon said Company, as fully and amply, to all intents and purposes, as if they had been duly executed and acknowledged by the regularly elected officers of the Company at its office in Baltimore, Md., in their own proper persons. This power of attorney revokes that issued on behalf of Richard G. DICCIANI, Darella E. WHITE, Douglas R. WHEELER, Richard A. JACOBUS, Mary C. O'LEARY, Sandra E. BRONSON, Maureen E. MCNEILL, Wayne G. MCVAUGH, Nancy K. WALLACE, dated June 13, 2006.

FOR YOUR PROTECTION
FOR CLOSE EXAMINATION AND VERIFICATION

The said Assistant Secretary does hereby certify that the extract set forth on the reverse side hereof is a true copy of Article VI, Section 2, of the By-Laws of said Company, and is now in force.

IN WITNESS WHEREOF, the said Vice-President and Assistant Secretary have hereunto subscribed their names and affixed the Corporate Seal of the said FIDELITY AND DEPOSIT COMPANY OF MARYLAND, this 20th day of June, A.D. 2006.

ATTEST:

FIDELITY AND DEPOSIT COMPANY OF MARYLAND

By:

Gregory E. Murray Assistant Secretary *M. P. Hammond Vice President*

State of Maryland }
City of Baltimore } ss:

On this 20th day of June, A.D. 2006, before the subscriber, a Notary Public of the State of Maryland, duly commissioned and qualified, came M. P. HAMMOND, Vice President, and GREGORY E. MURRAY, Assistant Secretary of the FIDELITY AND DEPOSIT COMPANY OF MARYLAND, to me personally known to be the individuals and officers described in and who executed the preceding instrument, and they each acknowledged the execution of the same, and being by me duly sworn, severally and each for himself deposeth and saith, that they are the said officers of the Company aforesaid, and that the seal affixed to the preceding instrument is the Corporate Seal of said Company, and that the said Corporate Seal and their signatures as such officers were duly affixed and subscribed to the said instrument by the authority and direction of the said Corporation.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my Official Seal the day and year first above written.

Maria D. Adamski *Notary Public*
My Commission Expires: July 8, 2015

EXTRACT FROM BY-LAWS OF FIDELITY AND DEPOSIT COMPANY OF MARYLAND

"Article VI, Section 2. The Chairman of the Board, or the President, or any Executive Vice-President, or any of the Senior Vice-Presidents or Vice-Presidents specially authorized so to do by the Board of Directors or by the Executive Committee, shall have power, by and with the concurrence of the Secretary or any one of the Assistant Secretaries, to appoint Resident Vice-Presidents, Assistant Vice-Presidents and Attorneys-in-Fact as the business of the Company may require, or to authorize any person or persons to execute on behalf of the Company any bonds, undertaking, recognizances, stipulations, policies, contracts, agreements, deeds, and releases and assignments of judgements, decrees, mortgages and instruments in the nature of mortgages,...and to affix the seal of the Company thereto."

CERTIFICATE

I, the undersigned, Assistant Secretary of the FIDELITY AND DEPOSIT COMPANY OF MARYLAND, do hereby certify that the foregoing Power of Attorney is still in full force and effect on the date of this certificate; and I do further certify that the Vice-President who executed the said Power of Attorney was one of the additional Vice-Presidents specially authorized by the Board of Directors to appoint any Attorney-in-Fact as provided in Article VI, Section 2, of the By-Laws of the FIDELITY AND DEPOSIT COMPANY OF MARYLAND.

This Power of Attorney and Certificate may be signed by facsimile under and by authority of the following resolution of the Board of Directors of the FIDELITY AND DEPOSIT COMPANY OF MARYLAND at a meeting duly called and held on the 10th day of May, 1990.

RESOLVED: "That the facsimile or mechanically reproduced seal of the company and facsimile or mechanically reproduced signature of any Vice-President, Secretary, or Assistant Secretary of the Company, whether made heretofore or hereafter, wherever appearing upon a certified copy of any power of attorney issued by the Company, shall be valid and binding upon the Company with the same force and effect as though manually affixed."

IN TESTIMONY WHEREOF, I have hereunto subscribed my name and affixed the corporate seal of the said Company,

this 12th day of December, 2011.

Assistant Secretary

Comcast Cable
15815 25th Ave West
Lynnwood, WA 98087

December 14, 2011

Sent Via Overnight Mail

Mr. John Carter
Director of Finance
City of Bellingham
625 Halleck Street
Bellingham, WA 98225

Re: Cable Television Franchise Renewal

Dear Mr. Carter:

Enclosed please find one (1) fully executed copy of the Cable Television Franchise Agreement between the City of Bellingham, WA (hereinafter, "the City") and Comcast of Washington IV, Inc. (hereinafter, "Comcast"), and the deliverables as required.

- The Certificate of Insurance No. CLE-003744919-01 as required by Section 11.8 of the franchise agreement. Please replace the certificate of insurance previously issued.
- Cable Performance Bond No. 09057483 in the amount of two hundred and fifty thousand dollars ($250,000) as required by Section 11.5 of the franchise agreement. And the Programming Channel Guide side letter agreement.

If you have any questions concerning any of the above-referenced documents, please feel free to call me at (425) 741-5752 or Stan Finley at (425) 263-5314.

Sincerely,

Ann Svensson
Franchise Contracts Administrator
Comcast - WA Market

Enclosures

cc: Stan Finley, Comcast - with enclosures
Marty Mulholland, City of Bellingham with enclosures
Franchise File, Comcast

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 12/12/2011

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER
MARSH USA INC.
TWO LOGAN SQUARE
PHILADELPHIA, PA 19103-2797
Attn: Comcast.Certs@marsh.com Fax: 212-948-0360

05194 -ALL-GAWU-11-12 COMCA LYNNW WA NO NO

INSURED
COMCAST OF WASHINGTON IV, INC.
15815 25TH AVENUE W.
LYNNWOOD, WA 98087

CONTACT NAME:
PHONE (A/C, No, Ext): **FAX (A/C, No):**
E-MAIL ADDRESS:

INSURER(S) AFFORDING COVERAGE		NAIC #
INSURER A :	ACE American Insurance Company	22667
INSURER B :	ACE Property And Casualty Ins Co	20699
INSURER C :	Indemnity Ins Co Of North America	43575
INSURER D :		
INSURER E :		
INSURER F :		

COVERAGES **CERTIFICATE NUMBER:** CLE-003744919-01 **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS		
A	GENERAL LIABILITY X COMMERCIAL GENERAL LIABILITY CLAIMS-MADE X OCCUR X $100,000 SIR GEN'L AGGREGATE LIMIT APPLIES PER: X POLICY PRO-JECT LOC			XSL G25532867	12/01/2011	12/01/2012	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG	$ $ $ $ $ $	4,900,000 4,900,000 10,000 4,900,000 25,000,000 6,000,000
A	AUTOMOBILE LIABILITY X ANY AUTO ALL OWNED AUTOS SCHEDULED AUTOS HIRED AUTOS NON-OWNED AUTOS			ISA H08692506	12/01/2011	12/01/2012	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident)	$ $ $ $	10,000,000
B	X UMBRELLA LIAB X OCCUR EXCESS LIAB CLAIMS-MADE DED RETENTION $			XOO G25833892	12/01/2011	12/01/2012	EACH OCCURRENCE AGGREGATE	$ $	5,000,000 5,000,000
C A A A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory In NH) Y/N: N If yes, describe under DESCRIPTION OF OPERATIONS below	N/A		WLRC46771473 (AOS) WLRC46771485 (CA) WLRC46771497 (MN) SCFC46771503 (WI)	12/01/2011 12/01/2011 12/01/2011 12/01/2011	12/01/2012 12/01/2012 12/01/2012 12/01/2012	X WC STATU-TORY LIMITS OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	$ $ $	2,000,000 2,000,000 2,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD 101, Additional Remarks Schedule, if more space is required)

RE. FRANCHISE AGREEMENT
THE CITY OF BELLINGHAM, ITS OFFICERS, EMPLOYEES AND AGENTS, ARE INCLUDED AS ADDITIONAL INSURED WITH RESPECT TO GENERAL LIABILITY POLICY AND AUTOMOBILE LIABILITY POLICY WHERE REQUIRED BY WRITTEN CONTRACT WITH THE NAMED INSURED. $100,000 PER OCCURRENCE SELF INSURED RETENTION APPLIES ONLY TO THE ABOVE GENERAL LIABILITY POLICY.

CERTIFICATE HOLDER

CITY OF BELLINGHAM
210 LOTTIE STREET
BELLINGHAM, WA 98225

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE
of Marsh USA Inc.

Manashi Mukherjee Manashi Mukherjee

© 1988-2010 ACORD CORPORATION. All rights reserved.

ADDITIONAL INSURED - DESIGNATED PERSON OR ORGANIZATION

Named Insured COMCAST CORPORATION			Endorsement Number
Policy Symbol XSL	Policy Number G25532867	Policy Period 12/01/11- 12/01/12	Effective Date of Endorsement 12/1/11
Issued By (Name of Insurance Company) ACE AMERICAN INSURANCE COMPANY			

Insert the policy number. The remainder of the information is to be completed only when this endorsement is issued subsequent to the preparation of the policy.

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

This endorsement modifies insurance provided under the following:

EXCESS COMMERCIAL GENERAL LIABILITY POLICY

SCHEDULE

Name of Person or Organization:

All where required by written or oral contract.

XS-6W25 (09/95) Ptd. In U.S.A.

City Council Agenda Bill

23183

Bill Number

Subject: **An Ordinance Relating to Land Use and Zoning, Amending Bellingham Municipal Code Sections 20.08.020, 20.10.030, 20.10.036, 20.10.037, and 20.12.040, and Chapter 20.52 to Improve the City's Code Enforcement Procedures by Making Violation of the City's Short-Term Rental, Accessory Dwelling Unit, and Sign Ordinances and Other Sections of Title 20 a Civil Infraction and by Authorizing the City to Record a Notice of Violation Against a Property that is in Violation of the Bellingham Municipal Code**

Summary Statement: The majority of the current land use enforcement code in Chapter 20 is not well defined and is inconsistent between sections making enforcement challenging in some cases. In addition, it is lacking flexibility, as a violation of the land use code requires criminal misdemeanor charges if a property owner cannot or will not cooperate. This proposal will clarify specific violations, improve the enforcement process, make initial violations of the land use code an infraction, and reserve criminal charges for repeat or more willful offenses. It also provides an additional option of recording a notice of violation against the title of the property if the violation remains unresolved.

Previous Council Action: **Adoption of the 2021-2022 Budget**

Fiscal Impact: **Staff time to process the proposed code amendment is included in the PCDD Budget**

Funding Source: **Development Services Fund**

Attachments: 1. ORDINANCE

Meeting Activity	Meeting Date	Recommendation	Presented By	Time
Committee Briefing - Vote Requested	12/06/2021	Pass Ordinance	Jennifer Kilmer, PCDD	15 minutes

Recommended Motion:

Council Committee:
Planning Committee

Agenda Bill Contact:
Jennifer Kilmer, Planning and Community Development, 360-778-8300

Reviewed By	Department	Date
Gregory R. Aucutt	Planning & Community Development	11/29/2021
Alan A. Marriner	Legal	11/30/2021
Seth M. Fleetwood	Executive	11/30/2021

Council Action: Anderson/Hammill Moved for 1st & 2nd. MOTION CARRIED 6-0-1, Hannah Stone excused. 12/06/2021

ORDINANCE NO. _____

AN ORDINANCE RELATING TO LAND USE AND ZONING, AMENDING BELLINGHAM MUNICIPAL CODE SECTIONS 20.08.020, 20.10.030, 20.10.036, 20.10.037, AND 20.12.040, AND CHAPTER 20.52 TO IMPROVE THE CITY'S CODE ENFORCEMENT PROCEDURES BY MAKING VIOLATION OF THE CITY'S SHORT-TERM RENTAL, ACCESSORY DWELLING UNIT, AND SIGN ORDINANCES AND OTHER SECTIONS OF TITLE 20 A CIVIL INFRACTION AND BY AUTHORIZING THE CITY TO RECORD A NOTICE OF VIOLATION AGAINST A PROPERTY THAT IS IN VIOLATION OF THE BELLINGHAM MUNICIPAL CODE.

WHEREAS, the City desires to improve its code enforcement procedures to help ensure that property owners comply with the City's land use and zoning regulations and maintain their properties free of public nuisances;

WHEREAS, some sections of the City's Land Use Development Code, Title 20 of the Bellingham Municipal Code (BMC), do not specifically define a violation of the code;

WHEREAS, the City desires to define violations of its Land Use Development Code and to make convictions for such offenses civil infractions;

WHEREAS, BMC Chapter 20.52 Violations – Penalty currently makes a violation of Title 20, unless otherwise specified, either a misdemeanor or a civil penalty; and

WHEREAS, the City desires to make convictions for violations of Title 20, unless otherwise specified, civil infractions for the first two offenses and a misdemeanor for subsequent offenses; and

WHEREAS, the City desires to authorize the Director of the Planning & Community Development Department to record a Notice of Violation against a property that is in violation of the Bellingham Municipal Code;

NOW THEREFORE, THE CITY OF BELLINGHAM DOES ORDAIN:

Section 1: Bellingham Municipal Code (BMC) 20.08.020 is amended to add the following two definitions:

> "Illegal dwelling unit" means any unpermitted residence within a building or a portion of a building that includes sleeping, sanitation, and cooking facilities.
>
> "Unpermitted use" means a use of property that is neither an outright permitted use under the zoning classification for the property or as determined by the Department nor a use for which the City has issued a conditional use permit.

Section 2: Bellingham Municipal Code (BMC) 20.10.030 is amended as follows:

20.10.030 Use of manufactured homes, ~~and recreational~~ vehicles and trailers.

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

A. through B. [No Change].

C. No recreational vehicle, automobile, other vehicle, or trailer, unless located in a safe parking area as defined by BMC Chapter 20.15 or an improved right of way, shall be used as a residence. "Recreational vehicles" as defined in BMC 20.08.020 shall not be occupied for any commercial use, except when permitted as a watchman's quarters at a construction site or other temporary structure pursuant to Section R107 of the International Residential Code.

D. Violation. Any person using a manufactured home, recreational vehicle, automobile, other vehicle, or trailer as a residence in violation of this section shall be subject to the penalties in BMC Chapter 20.52.

Section 3: BMC 20.10.036(A) is amended as follows:

1. through 3. [No Change].

4. Any property owner with an unpermitted ADU on its property shall be in violation of this subsection and subject to the penalties in BMC Chapter 20.52.

5. Any property owner with an ADU on its property that is in violation of any standard in subsection B shall be in violation of this subsection and subject to the penalties in BMC Chapter 20.52.

Section 4: BMC 20.10.037 is amended as follows:

A. through D. [No change].

E. Violation – Penalty

1. Any person operating a short-term rental without a required permit as described in subsection C above shall be in violation of this subsection and subject to the penalties in BMC Chapter 20.52.

2. Any person operating a short-term rental in violation of any standard outlined in subsections B and D above shall be in violation of this subsection and subject to the penalties in BMC Chapter 20.52 and permit revocation under subsection D. 17.

Section 5: BMC 20.12.040 is amended as follows:

A. through F. [No Change].

G. Any property owner with an unpermitted sign on its property or off premises shall be in violation of this subsection and subject to the penalties in BMC Chapter 20.52.

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

H. Any property owner with a sign on its property or in the adjacent public right of way that is in violation of any standard in subsections A. through F. shall be in violation of this subsection and subject to the penalties in BMC Chapter 20.52.

Section 6: BMC 20.52.010 is amended as follows:

20.52.010~~20.52.010 Misdemeanors~~Violations – Penalty.

A. Any person violating any provision of this title, unless otherwise specified, is ~~shall be~~ guilty of a civil infraction~~misdemeanor~~ and upon conviction thereof shall be punished by a fine not exceeding $500 for the first offense and not more than $1,000 for the second offense. Each violation shall be a separate offense, and in the case of continuing violation, each day's continuance shall be deemed a separate and distinct violation~~may be imprisoned for 90 days, fined a sum not to exceed $1,000, or both imprisoned and fined~~.

B. A person violating any provision of this title, upon conviction for a third or subsequent offense, and unless otherwise specified, shall be guilty of having committed a misdemeanor and shall be punished by a fine not to exceed $1,000 or imprisonment not to exceed 90 days, or by both such fine and imprisonment.

Section 7: BMC 20.52.020 is amended as follows:

20.52.020 Miscellaneous Violations Defined~~Civil penalty~~.

~~In addition to any other sanction or remedial injunctive procedure which may be available at law or equity, any person failing to comply with the final order issued by the hearing examiner, planning director, or city council shall be subject to cumulative civil penalty in an amount not to exceed $100.00 per day from the date set for compliance till such order is complied with. Such civil penalty shall be collected by civil action brought in the name of the city. The affected body shall notify the city attorney in writing the name of any such person subject to such penalty in the amount thereof; such officer shall take appropriate action to collect the same.~~

A. Permit or hearing examiner condition violation. Any person failing to comply with a condition of a permit or hearing examiner decision issued under BMC Titles 16, 17, 20, 21, 22, or 23 shall be in violation of this chapter and subject to the penalties in this chapter, or in the alternative, the applicable penalties in BMC Titles 16,17, 20, 21, 22, or 23.

B. Illegal dwelling unit. Any person constructing, operating, or living in an illegal dwelling unit shall be in violation of this section and subject to the penalties in this chapter.

C. Unpermitted use. Use of property that is neither an outright permitted use under the zoning classification for the property nor a use for which the City has issued a conditional use permit shall be a violation of this section and subject to the penalties in this chapter.

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

Section 8: A new section BMC 20.52.030 is adopted as follows:

20.52.030 Notice of Violation.

A. For purposes of BMC 20.52.030, "responsible party" means any individual or entity that controls or possesses the property or may have a duty to remedy the alleged violation of BMC Titles 16, 17, 20, 21, 22, or 23 or applicable state law. A "responsible party" may include, but is not limited to, the property owner, lessor, lessee, landlord, tenant, occupant, or financial institution with an interest in the property.

B. Notice of Violation. Whenever the Director determines that a property is in violation of the BMC Titles 16, 17, 20, 21, 22, or 23 or applicable state law, the Director may issue a notice of violation to a responsible party which may include the property owner and/or a financial institution with an interest in the property. The notice of violation shall include the following information:

1. The street address or assessor's parcel number of the property;
2. The name of the property's owner of record;
3. The code sections in violation;
4. A description of the property's condition which violates the applicable codes;
5. A list of necessary corrections to bring the property into compliance;
6. A deadline or specific date to correct the violations listed in the notice of violation;
7. Reference to the potential consequences should the property remain in violation after the expiration of the compliance deadline including, but not limited to, administrative abatement, civil penalties and infractions, revocation of permits, recordation of the notice of violation, the withholding of future municipal permits, criminal prosecution, and civil injunction.

C. Once the Director has issued a notice of violation to a responsible party and the property remains in violation after the deadline established in the notice of violation, the Director may record a notice of violation with the Auditor of Whatcom County.

1. Before recordation, the Director shall provide to the responsible party and the property owner a letter stating that a notice of violation will be recorded, unless a written request to appeal pursuant to the procedures outlined in subsection E is filed. The letter shall be served pursuant to any of the methods of service set forth in subsection D. The Director may also send a courtesy copy of the letter to any applicable financial institution.
2. If the Director does not receive a timely written request to appeal pursuant to the procedures set forth below, the Director may record the notice of violation if the violation remains.

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

3. The recorded notice of violation shall include the name of the property owner, the property's assessor's parcel number, the parcel's legal description, and a copy of the latest notice of violation.

D. A copy of the recorded notice of violation shall be served on the responsible party and property owner by posting a notice in a conspicuous place on or in front of the property in question and by either one of the following methods:

1. By personal service on the owner(s); or
2. By registered or certified mail addressed to the owner(s) of the property at their last-known address. If there is no known address for the owner, the notice shall be sent to the property address. Service shall be completed at the time of deposit into the United States mail.

E. Appeal to the Hearing Examiner.

1. The Director's letter to record the notice of violation may be appealed in accordance with the procedures set forth in BMC 21.10.250. The failure of any responsible party or property owner to file a timely appeal shall constitute a waiver of the right to an administrative hearing and shall not affect the validity of the recorded notice of violation.
2. If the hearing examiner affirms the Director's decision, the Director may proceed to record the notice of violation.
3. If the hearing examiner reverses the Director's decision that the property is in violation of City Codes or applicable State Codes, the hearing examiner shall invalidate the Director's decision to record the notice of violation.

F. Notice of Compliance.

1. When the violations listed on the notice of violation have been corrected, the responsible party or property owner may file with the Director a written request for a notice of compliance.
2. Once the Director receives this request, the Director shall re-inspect the property within thirty (30) calendar days to determine whether the violations listed in the notice of violation have been corrected and whether all necessary permits have been issued and final inspections have been performed and approved.
3. The Director shall serve a notice of compliance on the responsible party or property owner in the manner provided in subsection D of this chapter if the Director determines that:
    a. All violations listed in the recorded notice of violation have been corrected;
    b. All necessary permits have been issued and finalized; and
    c. The responsible party or property owner requesting the notice of compliance has reimbursed the city for all administrative costs including all costs incurred in the investigation, inspection, re-inspection, title search,

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

appeal hearing, and any other processing costs associated with the violations specified on the notice of violation.

G. If the Director denies a request to issue a notice of compliance, the Director shall serve the responsible party or property owner with a written explanation setting forth the reasons for the denial. The written explanation shall be served by any of the methods of service set forth in subsection D of this section. The Director's decision denying a request to issue a notice of compliance constitutes the final decision in the matter and is not appealable to the hearing examiner.

H. If a request to appeal has not been timely filed or after the hearing examiner affirms the Director's decision to record a notice of violation, the city may withhold land use permits or permits for any alteration, repair or construction pertaining to any existing or new structures or signs on the property identified in the notice of violation or any permits pertaining to the use and development of the real property or the structure. The city may withhold permits until a notice of compliance has been issued by the Director. The city may not withhold permits which are necessary to obtain a notice of compliance or which are necessary to correct serious health and safety violations.

I. The Director shall issue a signed notice of compliance stating that it cancels the notice of violation once all violations have been corrected, all necessary permits have been issued and finalized, and all administrative costs have been paid. The notice of compliance shall be recorded by the property owner at the property owner's expense. The recordation of the notice of compliance shall have the effect of canceling the recorded notice of violation.

PASSED by the Council this _____ day of _____, 2021.

_____
Council President

APPROVED by me this _____ day of _____, 2021.

_____
Mayor

ATTEST:_____
Finance Director

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

APPROVED AS TO FORM:

_____
Office of the City Attorney

Published:

_____

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

City Council Agenda Bill

23145

Bill Number

Subject: **An Ordinance Amending the 2021-2022 Biennial Budget, Providing for Adoption of the Mid-Biennium Adjustments to the Biennial Budget Pursuant to the Terms of RCW 35.34.130**

Summary Statement: The attached ordinance is the culmination of the 2021-2022 Mid-Biennium Budget adjustment process that began in early October. It adds new Citywide revenues of $64.9M, including $12.6M in the General Fund, and Citywide expenditures of $66M, including $8.9M in the General Fund. It also adds, removes and changes budgeted positions throughout the City for a net increase of 49.5 full time equivalents.

Previous Council Action: **Adoption of the 2021-2022 Biennial Budget; Mid-Biennium Adjustment Introduction October 11th; Work Sessions October 25th, November 8th and 22nd; Public Hearing November 8th and 22nd**

Fiscal Impact: **The Mid-Biennium Adjustment adds Citywide expenditures of $66M, including $8.9M in the General Fund**

Funding Source: **Citywide Funds**

Attachments: 1. ORDINANCE

Meeting Activity	Meeting Date	Recommendation	Presented By	Time
Committee Briefing - Vote Requested	12/06/2021	Pass Ordinance	Forrest Longman, Deputy Finance Director	2 minutes

Recommended Motion:

Council Committee:
Committee Of The Whole

Agenda Bill Contact:
Forrest Longman, 360-778-8005

Reviewed By	Department	Date
Andrew D. Asbjornsen	Finance Department	11/30/2021
Matthew T. Stamps	Legal	11/30/2021
Seth M. Fleetwood	Executive	11/30/2021

Council Action: Lilliquist/Knutson Moved for 1st & 2nd. MOTION CARRIED 6-0-1, Hannah Stone excused. 12/06/2021

ORDINANCE NO. _____

AN ORDINANCE AMENDING THE 2021-2022 BIENNIAL BUDGET, PROVIDING FOR ADOPTION OF THE MID-BIENNIUM ADJUSTMENTS TO THE BIENNIAL BUDGET PERSUANT TO THE TERMS OF RCW 35.345.130

WHEREAS, proposals for adjusting the budget were compiled and presented to the Bellingham City Council on October 11, 2021; and

WHEREAS, the City Council has conducted work sessions to review and evaluate proposed budget adjustments; and

WHEREAS, a Public Hearing on the City of Bellingham's 2021-2022 Revenue Forecast was held on October 11, 2021: and

WHEREAS Public Hearings on the City of Bellingham's 2021-2022 Mid-Biennium Adjustments were held on November 8 and November 22, 2021.

NOW THEREFORE, THE CITY OF BELLINGHAM DOES ORDAIN:

Section 1 – The City of Bellingham's 2021-2022 Biennial Budget is hereby amended by the mid-biennium adjustment on file with the City Clerk totaling $66,021,979 for an amended total budget of $ 780,364,311 over the biennium.

Section 2 – The estimated revenues and appropriations for the following funds are adjusted by increasing the estimated revenues and appropriations by the amounts below:

Fund or Department	Estimated Beginning Reserve	Change In Revenue	New 2021-2022 Revised Revenue	Changes In Expenditure	New 2021-2022 Revised Expenditure	Estimated Ending Reserve
GF - Non-Departmental		9,507,483	160,353,995	3,813,739	10,994,694	
GF - Mayor			1,137,218	260,432	2,587,207	
GF - City Council			672,665	11,236	1,328,070	
GF - Hearing Examiner			44,000	5,237	270,581	
GF - Museum			10,000	12,892	2,785,448	
GF - Library			134,200	152,546	11,453,138	
GF - Finance Department			2,954,896	290,861	5,430,925	
GF - Human Resources			1,579,181	161,044	4,636,790	
GF - ITSD			2,612,377	386,406	6,852,555	
GF - Legal			1,866,719	360,651	4,371,365	
GF - Municipal Court		(300,000)	2,196,900	131,049	5,191,670	
GF - Parks and Rec.			2,578,235	664,301	18,339,288	

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

GF – Planning & CD			218,000	287,310	10,002,026	
GF - Fire		2,600,000	13,657,083	1,782,523	48,233,684	
GF - Police		776,797	7,087,263	593,713	59,419,819	
001 General Fund Subtotal	**32,233,376**	**12,584,280**	**197,102,732**	**8,913,940**	**191,897,262**	**37,438,846**
111 Street	12,050,372	3,165,304	44,366,522	2,233,819	46,976,963	9,439,932
126 Library Gift	217,692	100,000	200,000	100,000	373,328	44,365
136 Environ. Remediation	6,945,492	1,400,000	4,971,830	544,938	5,588,727	6,328,595
141 1st 1/4% REET	8,084,229		3,369,396	350,000	9,388,333	2,065,292
142 2nd 1/4% REET	9,279,451		3,476,790	250,000	4,579,164	8,177,076
151 Police Federal Equit.	111,739		72,998		66,921	117,815
152 Asset Forfeiture	105,116		2,077		14,408	92,785
153 Criminal Justice	121,394		783,560		744,413	160,541
160 Public Safety Dispatch	1,464,497	253,147	16,676,185	508,284	17,340,958	799,725
161 Transportation Fund	7,926,806	1,058,490	26,190,542		27,893,047	6,224,301
162 Pub. Educ & Gov Acc TV	290,258		556,202		767,683	78,777
163 PEG Fund	692,552		267,986		224,736	735,802
173 Greenways III	9,166,994		12,084,297	(1,638,000)	11,825,886	9,425,406
177 Park Impact	9,273,889		3,869,764	2,375,000	11,223,346	1,920,308
178 Sportsplex	57,604		1,542		0	59,145
180 Tourism	676,007	750,700	3,404,963	500,000	2,851,770	1,229,200
181 Low Income Housing	8,479,887		8,329,706	(800,000)	16,785,790	23,803
182 Aff. Housing Sales Tax			4,497,710	50,625	3,050,625	1,447,085
190 CDBG		1,750,000	5,466,181	1,750,000	5,466,181	
191 HOME		750,000	4,543,363	750,000	4,543,363	
224 2004 Sportsplex Acq. LTGO			580,000		559,225	20,775
225 2004 PFD/Civic Field LTGO			1,548,239		1,548,239	
226 2011 QEC Bond	4,113,552		854,613			4,968,165
227 2016 PFD Ref. Bonds			2,148,963		2,148,963	
228 2014 Solid Waste LTGO			1,315,146		1,315,146	
235 Debt Service			1,234,443		1,234,443	
245 LID Guaranty Fund	78,145		2,026			80,172
371 Waterfront Const.	8,526,591		2,293,482			10,820,073
410 Water Fund	12,714,850		46,379,370	208,613	57,049,426	2,044,795
411 Watershed Fund	11,881,653		11,413,587	5,000,000	15,706,537	7,588,703
420 Wastewater Fund	50,836,297	38,006,427	86,221,049	38,645,098	130,743,712	6,313,634
430 Storm Water	7,018,962	300,000	24,830,073	57,183	29,467,087	2,381,948
456 Cemetery	314,788		721,949	3,661	905,495	131,242
460 Golf Course	47,803	310,000	3,073,940	326,987	3,118,196	3,546

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

465 Parking Services	2,344,527		4,697,972	9,021	5,661,342	1,381,157
470 Medic One	140,570	2,627,110	19,793,863	2,546,671	19,759,832	174,600
475 Development Services	7,350,970		6,941,050	54,918	8,742,716	5,549,304
510 Fleet Administration	8,704,661	111,000	9,738,267	348,434	14,073,647	4,369,281
511 Radio Comm.	1,205,955		2,640,825	120,211	2,178,332	1,668,448
520 Purchasing	502,877		7,112,321	(94,929)	6,736,314	878,884
530 Facilities	1,531,347	700,000	36,090,877	712,419	37,524,735	97,489
540 Tech and Telecom	439,861		1,408,585		1,067,579	780,866
541 Technology Repl	2,168,341		693,203		2,695,255	166,289
542 CIRF	816,647		3,627,999	125,000	4,157,737	286,909
543 GIS Fund	43,358		915,137		906,284	52,210
550 Claims & Litigation	3,797,592	1,000,000	4,102,938	1,480,000	4,389,302	3,511,228
561 Unemployment	586,077		298,915		351,145	533,848
562 Workers Comp	1,177,770		1,130,325		1,683,142	624,953
565 Health Benefits Fund	4,008,964		32,160,740	24,215	36,089,339	80,366
570 PW Administration	2,403,603		15,918,423	263,401	17,141,450	1,180,576
612 Firefighter's Pensions	17,265,866		4,559,236	1,235	3,680,429	18,144,673
613 Police Off. Pensions	10,373,314		333,794	1,235	2,114,076	8,593,032
701 Greenways Endowment	5,274,666		1,867,047		1,483,432	5,658,281
702 Nat Res Protect & Restore	3,943,732		412,063	300,000	571,518	3,784,277
965 Public Facilities District	1,912,714		3,103,240		3,957,330	1,058,625
Grand Total	**278,703,410**	**64,866,458**	**680,398,048**	**66,021,979**	**780,364,311**	**178,737,147**

Section 3 – The mid-biennium budget adjustment net increases the City of Bellingham's full time equivalent (FTE) positions by 49.5, for a total of 997.8.

Section 4 – Changes to FTE count and classifications by department are shown below:

Classification	FTE Change	Comments
Finance Department		
Office Assistant 2	(1.00)	Reclassified
Accounting Assistant 2	1.00	
Finance - Total FTE Change	**0.00**	
Legal Department		
Office Technician	(0.50)	Reclassified
Legal Assistant	0.50	
Assist. City Attorney Sr.	0.25	Increased 0.8 to 1.0
Legal - Total FTE Change	**0.25**	
Fire Department		
Captain	0.00	Term Limit Removed
Dispatch Supervisor	1.00	New

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

Firefighter	13.00	New
Paramedic	10.00	New
Fire - Total FTE Change	**24.00**	
Human Resources Department		
Financial Technician 1	(0.80)	Reclassified
Payroll Assistant	1.00	
Financial Technician 2	(1.00)	Reclassified
Payroll Assistant	0.80	
Program Manager 2	(1.00)	Reclassified
HR Generalist	1.00	
Program Manager 2	(1.00)	Reclassified
Program Manager 1	1.00	
HR Analyst	1.00	New - 3-year term
Human Resources - Total FTE Change	**1.00**	
Information Technology Services		
Office Assistant 2	(1.00)	Reclassified
Office Assistant 3	1.00	
IT Specialist	1.00	New
Sr. Network Analyst	1.00	New
System Process Analyst	1.00	New
Information Tech. Svcs. - Total FTE Change	**3.00**	
Library		
Library Specialist 2	(1.00)	Reclassified
Education Program Activities Coord.	1.00	
Library Assistant	0.625	New
Library Assistant	0.625	New
Library Assistant	0.625	New
Library Assistant	0.625	New
Library Clerk	(1.00)	
Library Clerk	0.625	New increase
Library Clerk	0.625	
Library - Total FTE Change	**2.75**	
Mayor's Office		
Assistant Communications Director	1.00	New
Mayor's Office - Total FTE Change	**1.00**	
Planning and Community Development Department		
Planner 1	(1.00)	Reclassified
Planner 2	1.00	
Communications Coordinator	1.00	New
Planning and Comm. Dev. - Total FTE Change	**1.00**	
Police Department		
Dispatcher	3.00	New
IT Specialist	1.00	New
Public Information Officer	1.00	New
Police - Total FTE Change	**5.00**	
Parks and Recreation Department		
Volunteer Coordinator	(1.00)	Reclassified

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

Parks Technician	1.00	
Office Assistant 3	(2.00)	Reclassified
Administrative Secretary	2.00	
Park Worker	(1.00)	Reclassified
Parks Technician	1.00	
Custodial Maintenance Worker	(1.00)	Reclassified
Park Worker	1.00	
Accounting Tech	1.00	New
Volunteer Coordinator	1.00	New
Maintenance Aide III	(0.75)	New increase/reclassification
Park Worker	1.00	
Maintenance Aide III	(0.75)	New increase/reclassification
Park Worker	1.00	
Maintenance Aide III	(0.75)	New increase/reclassification
Park Technician	1.00	
Maintenance Aide III	(0.75)	New increase/reclassification
Park Worker	1.00	
Maintenance Aide III	(0.75)	New increase/reclassification
Park Worker	1.00	
Maintenance Aide III	(0.75)	New increase/reclassification
Park Worker	1.00	
Maintenance Aide III	(0.75)	New increase/reclassification
Park Worker	1.00	
Parks and Recreation - Total FTE Change	**3.75**	
Public Works		
Accounting Assistant 2	(1.00)	Reclassified
Accounting Technician	1.00	
Maintenance Worker 3	(7.00)	Reclassified
Facilities Maintenance Worker	7.00	
Custodial Maintenance Worker 1	(2.00)	Reclassified
Custodial Maintenance Lead	2.00	
Warehouse Worker	(1.00)	Reclassified
Fleet Service Specialist	1.00	
Facilities Maintenance Worker	(2.00)	Reclassified
Facilities Maintenance Technician	2.00	
Service Writer	(1.00)	Reclassified
Fleet Service Specialist	1.00	
Office Assistant 3	(1.00)	Reclassified
Administrative Secretary	1.00	
Natural Resources Prog. Tech 1	(1.00)	Reclassified
Natural Resources Prog. Tech 2	1.00	
NPDES Coordinator	(1.00)	Reclassified
Program Coordinator	1.00	
AIS Program Staff	(1.50)	Reclassified
AIS Program Lead	1.50	
Plant Operator	2.00	New
Education Prog. Coordinator	0.25	Increase 0.5 to 0.75 FTE
Education Prog. Coordinator	0.25	Increase 0.5 to 0.75 FTE
Education Prog. Coordinator	0.25	Increase 0.75 to 1.0 FTE
Solid Waste Manager	1.00	New
Fiber Engineer	1.00	New
Sr. Project Engineer	1.00	New

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

Utility Worker	2.00	New
Public Works - Total FTE Change	**7.75**	
CITYWIDE FTE CHANGE	**49.50**	

Section 3 – The related pay plans for the City of Bellingham, adjusting employees' pay rates to reflect annual cost of living increases, are hereby adopted.

Section 4 – All employees who are members of a bargaining unit shall receive such pay and benefits as are provided for in the appropriate collective bargaining agreement.

Section 5 – The budget adjustment amends the Capital Facilities Plan to include capital projects included in this budget adjustment, as well projects approved by ordinance during the year and amends the Bellingham Comprehensive Plan. The list of projects contained in the Capital Facilities Plan shall be considered a part of the Capital Facilities Element of the Comprehensive Plan.

Section 6 – If and provision of this ordinance or the application to any person or circumstance is held invalid, the remainder of this ordinance, or the application of the provision to other persons or circumstances, shall not be affected.

PASSED by the Council this _____ day of _____, 2021.

_____
Council President

APPROVED by me this _____ day of _____, 2021.

_____
Mayor

ATTEST:_____
Finance Director

APPROVED AS TO FORM:

_____

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

Office of the City Attorney

Published:

_____

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

City Council Agenda Bill

23191

Bill Number

Subject: **Resolution Honoring Councilmember Pinky Vargas**

Summary Statement: This resolution recognizes Councilmember Pinky Vargas for her many accomplishments while on the City Council and sends the Council's best wishes to Ms. Vargas in her next endeavors.

Previous Council Action: **N/A**

Fiscal Impact: **N/A**

Funding Source: **N/A**

Attachments: 1. RESOLUTION

Meeting Activity	Meeting Date	Recommendation	Presented By	Time
Evening Presentation	12/13/2021	Pass Resolution	Council President, Hannah Stone	5 minutes

Recommended Motion:

Council Committee:

Agenda Bill Contact:
Nalini Margaitis 360-778-8202

Council Action:

Reviewed By	Department	Date
Nalini I. Margaitis	Council Administration	12/07/2021
Alan A. Marriner	Legal	12/07/2021
Seth M. Fleetwood	Executive	12/07/2021

RESOLUTION NO. _____

A RESOLUTION HONORING PINKY VARGAS FOR HER SERVICE TO THE CITY OF BELLINGHAM

WHEREAS, Pinky Vargas has served on the Bellingham City Council for 8 years; and

WHEREAS, Pinky has represented the 4th Ward of Bellingham; and

WHEREAS, Pinky was elected by her fellow Council Members to serve as Council President in 2016; and led the Council through the City of Bellingham's 2016 Comprehensive plan; and

WHEREAS, Pinky has served under two Mayors and as Mayor Pro Tempore in 2020 and 2021; and

WHEREAS, Pinky voluntarily served on numerous external boards and committees beyond her service on City Council; and

WHEREAS, Pinky served as Council representative on the City of Bellingham Tourism Commission and the Lodging Tax Advisory Committee in 2014, 2019, 2020 and 2021; and

WHEREAS, Pinky served as the Council representative on the Whatcom County Tourism Board for 7 years (2015 – 2021); and

WHEREAS, Pinky served as the Council representative to the Bellingham/Whatcom Chamber of Commerce for 3 years (2017 – 2019); and

WHEREAS, Pinky served as the Council representative to the Downtown Bellingham Partnership in 2017; and

WHEREAS, Pinky served as the Council representative to the Whatcom Council of Governments in 2020 and 2021; and

WHEREAS, Pinky demonstrated her passion for music and the arts by passing 1% funding for the arts in 2016; and

WHEREAS, Pinky served as the Council representative to the Mount Baker Theatre Board for 5 years (2014, 2015, 2019, 2020, and 2021); and

WHEREAS, Pinky served as Chair of the Climate Action Committee in 2021, and was a leader on municipal climate-change legislation; and

WHEREAS, Pinky has tirelessly advocated for projects to promote sustainability initiatives, including a renewed commitment to the Paris Climate Accord and support for a Climate Action Plan; and

WHEREAS, Pinky was a champion on environmental issues related to climate change and helped the Council understand energy production and regulation; and

WHEREAS, Pinky was instrumental in bringing the Georgetown University Energy Prize (GUEP) Competition to the City of Bellingham, a two-year nationwide competition involving 50 communities rethinking the way America's small and medium-sized towns and cities use energy, and the City of Bellingham won 3rd place; and

WHEREAS, Pinky supported extensive Lake Whatcom drinking water protections through strategic property acquisition and state-of-the-art stormwater facility upgrades; and

WHEREAS, Pinky supported the creation of new parks on the northside of Bellingham; and

WHEREAS, Pinky served as a voice for women, and authored the resolution of safety and support for the Mt. Baker Planned Parenthood; and

WHEREAS, Pinky provided endless support and enthusiasm for the priority community initiatives, including protecting quality of life, promoting economic vitality, communication and public engagement in City decision-making, championing social and gender justice, fostering environmental preservation and protection, supporting healthy watersheds and a connections to our water resources, as well as supporting housing, energy efficiency, arts, technology, outdoor recreation, and tourism; and

WHEREAS, Pinky acted on her values of service to the community and served constituents during one of the most challenging times to hold local elected office; and

WHEREAS, Pinky used her voice to stand up for the people of Bellingham; and

WHEREAS, Pinky has a passion for her community, and we wish her the best in her retirement from the Council; and

WHEREAS, Council is hopeful that Pinky will continue to be active in community issues and certain that the City of Bellingham will be better for it; and

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF BELLINGHAM, WASHINGTON:

The Bellingham City Council hereby expresses its gratitude for Councilmember Pinky Vargas and honors her for her leadership, public service, and dedication to the City of Bellingham and to our wider community.

PASSED by the Council this 13th day of December, 2021.

_____
Council President

APPROVED by me this _____ day of _____, 2021.

_____
Mayor

ATTEST: _____
Finance Director

APPROVED AS TO FORM:

_____
Office of the City Attorney

City Council Agenda Bill

23192

Bill Number

Subject: **Resolution Honoring Councilmember Gene Knutson**

Summary Statement: This resolution recognizes Councilmember Gene Knutson, the longest serving Councilmember in the history of the City of Bellingham, for his many accomplishments while on the City Council and sends the Council's best wishes to Mr. Knutson in his retirement.

Previous Council Action: **N/A**

Fiscal Impact: **N/A**

Funding Source: **N/A**

Attachments: 1. RESOLUTION

Meeting Activity	Meeting Date	Recommendation	Presented By	Time
Evening Presentation	12/13/2021	Pass Resolution	Council President, Hannah Stone	5 minutes

Recommended Motion:

Council Committee:

Agenda Bill Contact:
Nalini Margaitis, Legislative Staff, 360-778-8202

Council Action:

Reviewed By	Department	Date
Nalini I. Margaitis	Council Administration	12/07/2021
Alan A. Marriner	Legal	12/07/2021
Seth M. Fleetwood	Executive	12/07/2021

RESOLUTION NO. _____

A RESOLUTION HONORING GENE KNUTSON FOR HIS SERVICE TO THE CITY OF BELLINGHAM

WHEREAS, Gene Knutson is the longest-serving Bellingham City Council member in the history of Bellingham, including all Councils from the founding of the City in 1903, and including its predecessor cities Fairhaven and New Whatcom, having served on the Council for 28 years; and

WHEREAS, Gene represented the 2nd Ward; and

WHEREAS, Gene has served under five Mayors, Tim Douglas, Mark Asmundson, Dan Pike, Kelli Linville, and Seth Fleetwood; and

WHEREAS, Gene has served as Mayor Pro Tempore on numerous occasions, helping ensure leadership continuity during Mayoral absences; and

WHEREAS, Gene served with 26 council members, Lisa Anderson, Bruce Ayers, April Barker, Joan Beardsley, Louise Bjornson, Terry Bornemann, Barry Buchanan, Grant Deger, Seth Fleetwood, Don Gischer, Bob Hall, Daniel Hammill, Arne Hanna, Hollie Huthman, Cathy Lehman, Michael Lilliquist, Roxanne Murphy, Leslie Richardson, Pat Rowe, Barbara Ryan, Bob Ryan, Stan Snapp, Hannah Stone, Pinky Vargas, John Watts and Jack Weiss; and

WHEREAS, Gene was elected by his fellow Council Members to serve as Council President in 1995, 1999, 2006, 2010, 2015 and 2020; and

WHEREAS, Gene served as Council president and his steadfast leadership steered the Council through an extremely challenging year of COVID and remote meetings in 2020; and

WHEREAS, Gene has served as member of the former Finance and Personnel Committee (now the Finance Committee, and the Community & Economic Development Committee); and

WHEREAS, Gene has served as member and Chair of the Public Works and Natural Resources Committee; and

Bellingham City Council
210 Lottie Street
Bellingham, Washington 98225
360-778-8200

WHEREAS, Gene served as member and Chair of the former Public Safety Committee (now the Public Health, Safety, & Justice Committee); and

WHEREAS, Gene served as member and Chair of the Parks and Recreation Committee; and

WHEREAS, Gene served as member and Chair of the Planning & Community Development Committee (now the Planning Committee, and the Community & Economic Development Committee); and

WHEREAS, Gene voluntarily served as a member of numerous committees and boards serving the City of Bellingham and the wider community; and

WHEREAS, Gene served as Council representative on the Bellingham International Airport Advisory Committee, the Cable Franchise Working Group, the Port of Bellingham Marina Advisory Committee, and the Tourism Commission; and

WHEREAS, Gene served as Council representative on the Museum Society, and the Sister Cities Advisory Board; and

WHEREAS, Gene served as Council representative to the EMS Oversight Board, the Firefighters Pension Board, and the Police Pension Board; and

WHEREAS, Gene served as a Council representative to the Parks and Recreation Advisory Board, and the Lake Whatcom Policy Group; and

WHEREAS, Gene served as Council liaison to the Bellingham School District and been a tireless advocate for youth; and

WHEREAS, Gene has been an ardent advocate for the development of facilities that serve the community, including the Civic Field renovation, the purchase of the Sportsplex for ice skating and soccer, and the Depot Market Square building; and

WHEREAS, Gene has been a strong advocate for the redevelopment of Bellingham downtown and waterfront; and

WHEREAS, Gene's wealth of institutional knowledge is unparalleled with a detailed historical memory of critical decisions, events involving the Council and the City, including specific years and the names of involved decision-makers, has proven to be an invaluable resource during his time on the Council, and is a gift that will be missed in coming years; and

Bellingham City Council
210 Lottie Street
Bellingham, Washington 98225
360-778-8200

WHEREAS, Gene is dedicated to constituent service and is extremely effective in helping to ensure that all members of the Bellingham community are promptly and equitably served by the City of Bellingham; and

WHEREAS, Gene has been a strong supporter of and advocate for City staff during his time on the Council; and

WHEREAS, Gene has been an accessible Council Member, always available for a phone call or conversation with constituents; and

WHEREAS, Gene acted on his values of service to the community and served constituents during one of the most challenging times to hold local elected office; and

WHEREAS, Gene has a passion for his community, and we wish him the best in his retirement from the Council; and

WHEREAS, the Bellingham City Council is hopeful that Gene will continue to be active in community issues and certain that the City of Bellingham will be better for it.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF BELLINGHAM, WASHINGTON:

The Bellingham City Council hereby expresses its gratitude for Councilmember Gene Knutson and honors him for his leadership, public service, and dedication to the City of Bellingham and to our wider community.

PASSED by the Council this 13th day of December, 2021.

_____

Council President

Bellingham City Council
210 Lottie Street
Bellingham, Washington 98225
360-778-8200

APPROVED by me this _____ day of _____, 2021.

_____
Mayor

ATTEST:_____
Finance Director

APPROVED AS TO FORM:

_____
Office of the City Attorney

Bellingham City Council
210 Lottie Street
Bellingham, Washington 98225
360-778-8200