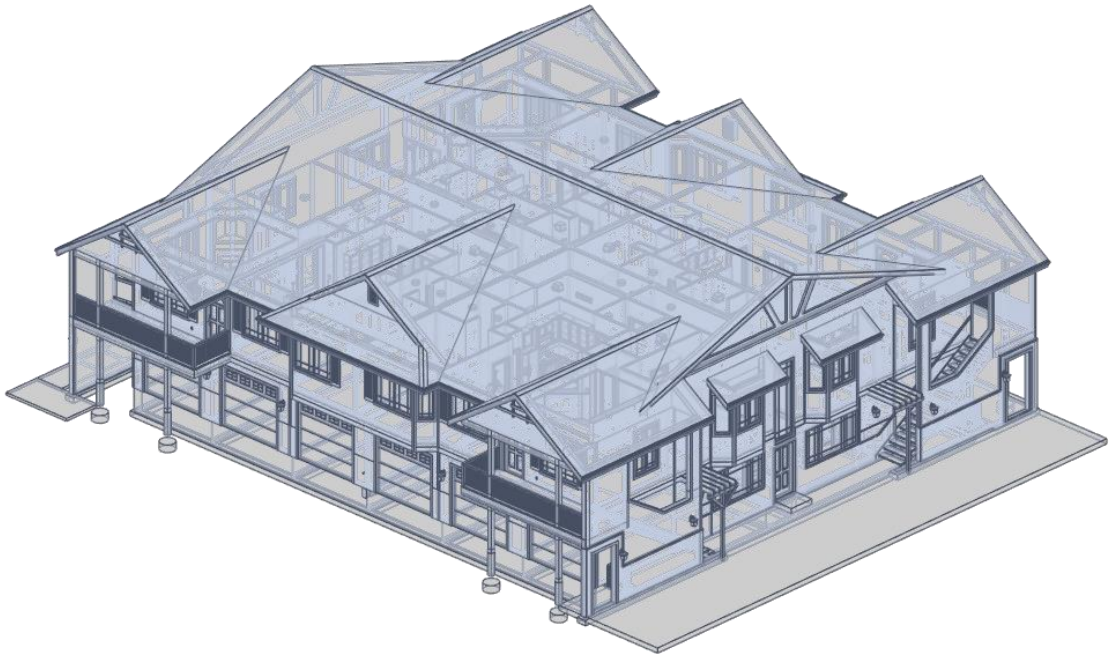
2018 WSEC WORKSHEET – CLIMATE ZONE 4, 5&6

DATE: 10-10-2022
PROJECT#: PHS21.136
PLAN: Copperberry Condominiums

SITE ADDRESS:
4002 10th St Se
Puyallup, WA 98374



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2018 Washington State Energy Code – Residential

Prescriptive Energy Code Compliance for All Climate Zones in Washington

Multifamily (effective February 1, 2021) Version 1.1

These requirements apply to Group R-2 buildings three stories or less in height above grade plane. Other Group R-2 buildings must comply with the commercial energy code.

Project Information	*Contact Information*
Bill Riley Communities	Pacific Home Source llc
Copperberry Condominiums	gabe@pacifichomesource.com

Instructions: This multifamily project will use the requirements of the Prescriptive Path below and incorporate the minimum values listed. Based on the size of the structure, the appropriate number of additional credits are checked as chosen by the permit applicant.

Provide all information from the following tables as building permit drawings: Table R402.1 - Insulation and Fenestration Requirements by Component, Table R406.2 - Fuel Normalization Credits and 406.3 - Energy Credits.

Authorized Representative		*Date*	10/10/2022

All Climate Zones (Table R402.1.1)

	R-Value [a]	U-Factor [a]
Fenestration U-Factor [b]	n/a	0.30
Skylight U-Factor [b]	n/a	0.50
Glazed Fenestration SHGC [b,e]	n/a	n/a
Ceiling [e]	49	0.026
Wood Frame Wall [g,h]	21 int	0.056
Floor	30	0.029
Below Grade Wall [c,h]	10/15/21 int + TB	0.042
Slab [d,f] R-Value & Depth	10, 2 ft	n/a

a	*R*-values are minimums. *U*-factors and SHGC are maximums. When insulation is installed in a cavity that is less than the label or design thickness of the insulation, the compressed *R*-value of the insulation from Appendix Table A101.4 shall not be less than the *R*-value specified in the table.
b	The fenestration *U*-factor column excludes skylights.
c	"10/15/21 +5TB" means R-10 continuous insulation on the exterior of the wall, or R-15 continuous insulation on the interior of the wall, or R-21 cavity insulation plus a thermal break between the slab and the basement wall at the interior of the basement wall. "10/15/21 +5TB" shall be permitted to be met with R-13 cavity insulation on the interior of the basement wall plus R-5 continuous insulation on the interior or exterior of the wall. "5TB" means R-5 thermal break between floor slab and basement wall.
d	R-10 continuous insulation is required under heated slab on grade floors. See Section R402.2.9.1.
e	For single rafter- or joist-vaulted ceilings, the insulation may be reduced to R-38 if the full insulation depth extends over the top plate of the exterior wall.
f	R-7.5 continuous insulation installed over an existing slab is deemed to be equivalent to the required perimeter slab insulation when applied to existing slabs complying with Section R503.1.1. If foam plastic is used, it shall meet the requirements for thermal barriers protecting foam plastics.
g	For log structures developed in compliance with Standard ICC 400, log walls shall meet the requirements for *climate zone* 5 of ICC 400.
h	Int. (intermediate framing) denotes framing and insulation as described in Section A103.2.2 including standard framing 16 inches on center, 78% of the wall cavity insulated and headers insulated with a minimum of R-10 insulation.

For Building Officials Only

Each dwelling unit ***in a residential building*** shall comply with sufficient options from Table R406.2 (fuel normalization credits) and Table 406.3 (energy credits) so as to achieve the following minimum number of credits:

- **Multifamily R2 Dwelling Unit: 4.5 credits**

Before selecting your credits on this Summary table, review the details in Table 406.3 (Multifamily), on page 3.

Summary (Table R406.2 and 406.3)

Heating Options	Fuel Normalization Descriptions	Credits - select ONE heating option		User Notes
1	Combustion heating minimum NAECA[b]	0.0	☐	
2	Heat pump[c]	1.0	◉	
3	Electric resistance heat only - furnace or zonal	-1.0	☐	
4	DHP with zonal electric resistance per option 3.4	na	☐	
5	All other heating systems	-0.5	☐	
Energy Options	**Energy Credit Option Descriptions**	**Credits - select ONE energy option from each category [d]**		
1.1	Efficient Building Envelope	0.5	☐	
1.2	Efficient Building Envelope	1.0	☐	
1.4	Efficient Building Envelope	1.0	☐	
1.5	Efficient Building Envelope	1.5	☐	
1.6	Efficient Building Envelope	2.0	☐	
1.7	Efficient Building Envelope ☐	0.5	☐	
2.1	Air Leakage Control and Efficient Ventilation	1.0	☐	
2.2	Air Leakage Control and Efficient Ventilation	1.5	☐	
2.3	Air Leakage Control and Efficient Ventilation	2.0	☐	
2.4	Air Leakage Control and Efficient Ventilation ☐	2.5	☐	
3.1[a]	High Efficiency HVAC	1.0	☐	
3.3[a]	High Efficiency HVAC	1.0	☐	
3.4	High Efficiency HVAC	2.0	☐	
3.6[a]	High Efficiency HVAC ☐	3.0	◉	
4.1	High Efficiency HVAC Distribution System	0.5	☐	
5.1[d]	Efficient Water Heating	0.5	☐	
5.2	Efficient Water Heating	0.5	◉	
5.3	Efficient Water Heating	1.0	☐	
5.4	Efficient Water Heating	2.0	☐	
5.5	Efficient Water Heating	2.5	☐	
5.6	Efficient Water Heating ☐	3.0	☐	
6.1[e]	Renewable Electric Energy (3 credits max)	1.0	☐	
7.1	Appliance Package	1.5	☐	
	Total Credits		4.5	Calculate Total Clear Form

a. An alternative heating source sized at a maximum of 0.5 W/sf (equivalent) of heated floor area or 500 W, whichever is bigger, may be installed in the dwelling unit.
b. Equipment listed in Table C403.3.2(4) or C403.3.2(5)
c. Equipment listed in Table C403.3.2(1) or C403.3.2(2)
d. You cannot select more than one option from any category EXCEPT in category 5. Option 5.1 may be combined with options 5.2 through 5.6. See Table 406.3.
e. 1.0 credit for each 1,200 kWh of electrical generation provided annually, up to 3 credits max. See Table R406.2 for full requirements and complete option descriptions.
f. Use the single radiobutton in the upper right of the second column to deselect radiobuttons in that group.

Please print only pages 1 and 2 of this worksheet for submission to your building official.

Table 406.3 – Energy Credits (Multifamily)		
Option	**Description**	**Credits: MF**
1. EFFICIENT BUILDING ENVELOPE OPTIONS Only one option from Items 1.1 through 1.7 may be selected in this category. Compliance with the conductive UA targets is demonstrated using Section R402.1.4, Total UA alternative, where [1-(Proposed UA/Target UA)] > the required %UA reduction.		
1.1	Prescriptive compliance is based on Table R402.1.1 with the following modifications: **Vertical fenestration U = 0.24**	0.5
1.2	Prescriptive compliance is based on Table R402.1.1 with the following modifications: **Vertical fenestration U = 0.20**	1.0
1.4	Prescriptive compliance is based on Table R402.1.1 with the following modifications: **Vertical fenestration U = 0.25** Wall R-21 plus R-4 ci Floor R-38 Basement wall R-21 int plus R-5 ci Slab on grade R-10 perimeter and under entire slab Below grade slab R-10 perimeter and under entire slab **or** Compliance based on Section R402.1.4: Reduce the Total conductive UA by 15%	1.0
1.5	Prescriptive compliance is based on Table R402.1.1 with the following modifications: **Vertical fenestration U = 0.22** Ceiling and single-rafter or joist-vaulted R-49 advanced Wood frame wall R-21 int plus R-12 ci Floor R-38 Basement wall R-21 int plus R-12 ci Slab on grade R-10 perimeter and under entire slab Below grade slab R-10 perimeter and under entire slab **or** Compliance based on Section R402.1.4: Reduce the Total conductive UA by 30%	1.5
1.6	Prescriptive compliance is based on Table R402.1.1 with the following modifications: **Vertical fenestration U = 0.18** Ceiling and single-rafter or joist-vaulted R-60 advanced Wood frame wall R-21 int plus R-16 ci Floor R-48 Basement wall R-21 int plus R-16 ci Slab on grade R-20 perimeter and under entire slab Below grade slab R-20 perimeter and under entire slab ***or*** Compliance based on Section R402.1.4: Reduce the Total conductive UA by 40%.	2.0
1.7	Advanced framing and raised heel trusses or rafters Vertical Glazing U-0.28 R-49 Advanced (U-0.020) as listed in Section A102.2.1, *Ceilings below a vented attic* ***and*** R-49 vaulted ceilings with full height of uncompressed insulation extending over the wall top plate at the eaves.	0.5

Window, Skylight and Door Schedule

Project Information

Copperberry
BRC Family
Puyallup, WA

Contact Information

Pacific Home Source
253.312.5523
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	Ref.	U-factor	Qt.	Width Feet	Width Inch	Height Feet	Height Inch	Area	UA
Exempt Swinging Door (24 sq. ft. max.)								0.0	0.00
Exempt Glazed Fenestration (15 sq. ft. max.)								0.0	0.00

Vertical Fenestration (Windows and doors)

Component Description	Ref.	U-factor	Qt.	Width Feet	Width Inch	Height Feet	Height Inch	Area	UA
Entry Door	A	0.30	1	3	0	6	8	20.0	6.00
Dining	A	0.30	1	6	0	5	0	30.0	9.00
Mbed	A	0.30	1	2	0	5	0	10.0	3.00
Mbed	A	0.30	1	6	0	5	0	30.0	9.00
Bedroom 2	A	0.30	1	6	0	5	0	30.0	9.00
Living Room	A	0.30	1	6	0	6	0	36.0	10.80
Entry Door	D	0.30	1	3	0	6	8	20.0	6.00
Living Room	D	0.30	1	6	0	6	0	36.0	10.80
Bedroom 2	D	0.30	1	6	0	5	0	30.0	9.00
Mbed	D	0.30	1	2	0	5	0	10.0	3.00
Mbed	D	0.30	1	6	0	5	0	30.0	9.00
Entry Door	B	0.30	1	3	0	6	8	20.0	6.00
Den/Bedroom	B	0.30	1	6	0	5	0	30.0	9.00
MBed	B	0.30	1	2	0	5	0	10.0	3.00
Bbed	B	0.30	1	6	0	5	0	30.0	9.00
Bedroom	B	0.30	1	6	0	4	6	27.0	8.10
Living Room	B	0.30	1	4	0	6	0	24.0	7.20
Living Room	B	0.30	1	6	0	6	0	36.0	10.80
Entry Door	E	0.30	1	3	0	6	8	20.0	6.00
Living Room	E	0.30	1	6	0	6	0	36.0	10.80
Living Room	E	0.30	1	4	0	6	0	24.0	7.20
Bedroom	E	0.30	1	6	0	5	0	30.0	9.00
Mbed	E	0.30	1	2	0	5	0	10.0	3.00
Mbed	E	0.30	1	6	0	5	0	30.0	9.00
Den/Bedroom	E	0.30	1	6	0	5	0	30.0	9.00
Entry Door	F	0.30	1	3	0	6	8	20.0	6.00
Dining	F	0.30	1	6	0	5	0	30.0	9.00
Mbed	F	0.30	1	2	0	5	0	10.0	3.00
Mbed	F	0.30	1	6	0	5	0	30.0	9.00
Bedroom 2	F	0.30	1	6	0	5	0	30.0	9.00
Entry Door	C	0.30	1	3	0	6	8	20.0	6.00
Living Room	C	0.30	1	6	0	6	0	36.0	10.80
Living Room	C	0.30	1	5	0	4	6	22.5	6.75
Bedroom	C	0.30	1	6	0	4	6	27.0	8.10
Mbed	C	0.30	1	2	0	5	0	10.0	3.00

Mbed	C	0.30	1	6	0	5	0	30.0	9.00
Back doors	A-F	0.30	6	3	0	6	8	120.0	36.00
								0.0	0.00
								0.0	0.00
								0.0	0.00
								0.0	0.00
								0.0	0.00

Sum of Vertical Fenestration Area and UA	1024.5	307.35
Vertical Fenestration Area Weighted U = UA/Area		0.30

Overhead Glazing (Skylights)

Component Description	Ref.	U-factor	Qt.	Width Feet	Width Inch	Height Feet	Height Inch	Area	UA
								0.0	0.00
								0.0	0.00
								0.0	0.00
								0.0	0.00
								0.0	0.00
								0.0	0.00

Sum of Overhead Glazing Area and UA	0.0	0.00
Overhead Glazing Area Weighted U = UA/Area		0.00

Total Sum of Fenestration Area and UA ***(for heating system sizing calculations)*** 1024.5 307.35

Simple Heating System Size: Washington State

This heating system sizing calculator is based on the Prescriptive Requirements of the 2018 Washington State Energy Code (WSEC) and ACCA Manuals J and S. This tool will calculate heating loads only. ACCA procedures for sizing cooling systems should be used to determine cooling loads.

Please complete the green drop-downs and boxes that are applicable to your project. As you make selections in the drop-downs for each section, some values will be calculated for you. If you do not see the selection you need in the drop-down options, please contact the WSU Energy Program at energycode@energy.wsu.edu or (360) 956-2042 for assistance.

Project Information	*Contact Information*
Copperberry Condominiums	Pacific Home Source
BRC Family	253.312.5523
Puyallup, WA	gabe@pacifichomesource.com

Heating System Type: ○ All Other Systems ◉ Heat Pump

To see detailed instructions for each section, place your cursor on the word "Instructions"

Design Temperature

Instructions: Puyallup

Design Temperature Difference (ΔT) 51

ΔT = Indoor (70 degrees) - Outdoor Design Temp

Area of Building

Conditioned Floor Area

Instructions — Conditioned Floor Area (sq ft): 6,848

Average Ceiling Height

Instructions — Average Ceiling Height (ft): 9.0

Conditioned Volume: 61,632

Glazing and Doors

Instructions: U-0.28

U-Factor	X	Area	=	UA
0.280		1,025		286.86

Skylights

Instructions

U-Factor	X	Area	=	UA
0.50				---

Insulation

Attic

Instructions: R-49

U-Factor	X	Area	=	UA
0.026		5,517		143.44

Single Rafter or Joist Vaulted Ceilings

Instructions: No Vaulted Ceilings in this project.

U-Factor	X	Area	UA

Above Grade Walls *(see Figure 1)*

Instructions: R-21 Intermediate

U-Factor	X	Area	UA
0.056		4,932	276.19

Floors

Instructions: R-38

U-Factor	X	Area	UA
0.025		5,517	137.93

Below Grade Walls *(see Figure 1)*

Instructions: No Below Grade Walls in this project.

U-Factor	X	Area	UA
0.028			

Slab Below Grade *(see Figure 1)*

Instructions: No Slab Below Grade in this project.

F-Factor	X	Length	UA
0.303			---

Slab on Grade *(see Figure 1)*

Instructions: No Slab on Grade in this project.

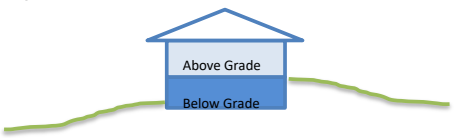
F-Factor	X	Length	UA

Location of Ducts

Instructions: Conditioned Space

Duct Leakage Coefficient
1.00

Figure 1.



Sum of UA	844.42	
Envelope Heat Load	43,065	Btu / Hour
Sum of UA x ΔT		
Air Leakage Heat Load	33,947	Btu / Hour
Volume x 0.6 x ΔT x 0.018		
Building Design Heat Load	77,012	Btu / Hour
Air leakage + envelope heat loss		
Building and Duct Heat Load	77,012	Btu / Hour
Ducts in unconditioned space: sum of building heat loss x 1.10		
Ducts in conditioned space: sum of building heat loss x 1		
Maximum Heat Equipment Output	96,265	Btu / Hour
Building and duct heat loss x 1.40 for forced air furnace		
Building and duct heat loss x 1.25 for heat pump		