2018 Seattle Code Changes Overview

Photo by Tim Durkan

Seattle Department of Construction & Inspections

LUN Committee

January 13, 2021

SDCI PURPOSE AND VALUES

Our Purpose

Helping people build a safe, livable, and inclusive Seattle.

Our Values

- Equity
- Respect
- Quality
- Integrity
- Service

2018 CONSTRUCTION CODE CHANGES

- Building code
- Residential code
- Mechanical code
- **Energy code**
- Fuel gas code
- Plumbing code
- Fire code
- Electrical code
- Boiler code

2018 SEATTLE ENERGY CODE

For “Commercial Buildings”

“2018” Code Timeline

- Nov 2017: IECC published
- Nov 2019: WSEC approved
- **<u>Feb 1, 2021</u>: WSEC effective date**
- Jan – Sept: Seattle public meetings
- Sept – Oct: Review by CCAB
- Dec – Mayoral approval
- Jan – City Council approval
- **March 15, 2021: SEC effective date**

CARBON-NEUTRAL SEATTLE BY 2050

1. Build great envelope
   - Dependable energy savings for decades
2. Eliminate combustion
   - Carbon neutral today, won't need change later
3. Use electricity wisely
   - Don't waste on electric resistance heat
4. Generate power
   - Plus "solar readiness" for larger future system

Build so that no "major surgery" for buildings is required for 2050.

SEVERAL MAJOR ISSUES IN THIS CODE

1. Heat pump space heating
   - Not fossil fuel or electric resistance
2. Heat pump water heating
   - Not fossil fuel or electric resistance
3. Maintain envelope thermal performance
   - When complying using energy modeling
4. 8 efficiency package credits
   - …none of them fossil fuel
   - State code requires 6 credits
5. Modest solar array required
   - Could gift to affordable housing

…plus a few "medium issues"

6. Lighting: 10% less power
7. Electric outlet & circuit at each dwelling unit gas appliance
8. Modestly improved envelope:
   - Fenestration U-values
   - Thermal bridging at conc balconies

…and many minor changes

Including clarifications and corrections

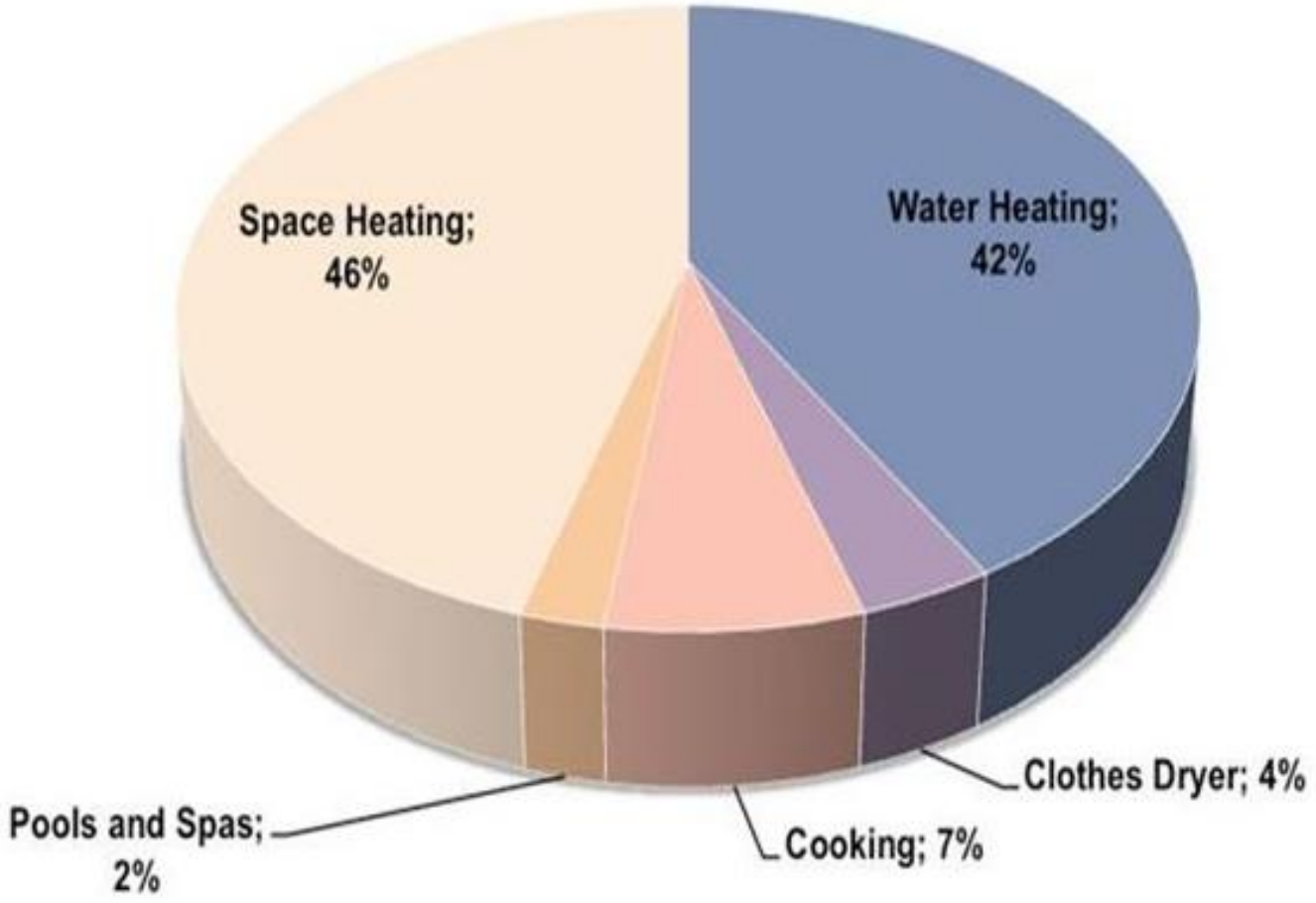
DECARBONIZATION: NOT ALL IN ONE JUMP

Start with the big chunks:

- **Space heating**
- **Water heating**

Leave the minor gas uses, pending further technical development :

- Gas cooking
- Gas fireplaces



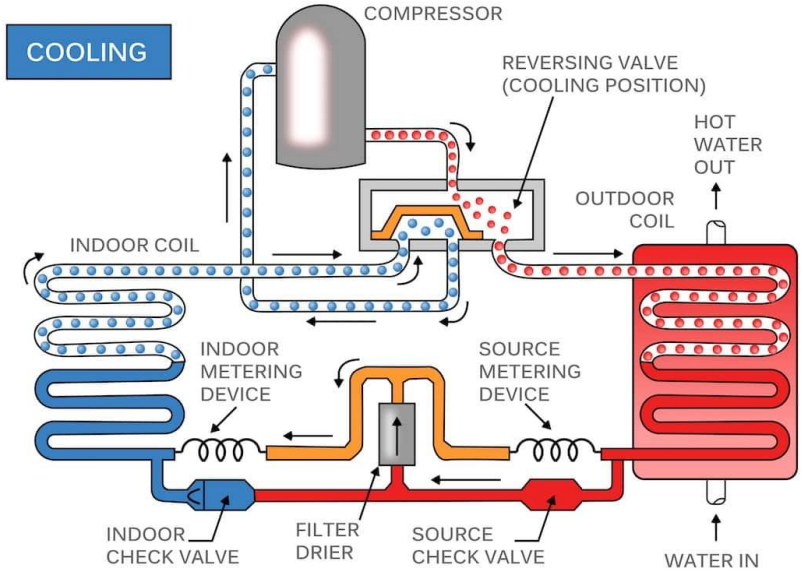
SEATTLE: SPACE HEATING

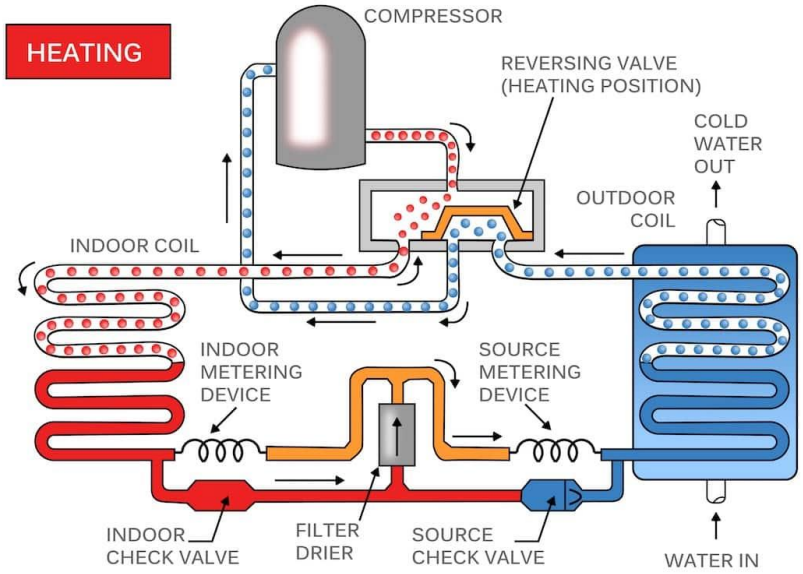
No electric resistance or fossil fuel combustion for space heating.

(Usually means "Heat with heat pumps")

Exceptions allow <u>electric resistance heat</u> for:

1. Permits applied for before 1/1/2022
2. Dwelling units: Max 750 W per habitable room (1000 W for corner room)
3. Other space types: Max 2.5 W/sf total installed heating (The "Passive House" rule)
4. Heat pump auxiliary heat in cold weather
5. Buildings smaller than 2,500 sf
6. …etc





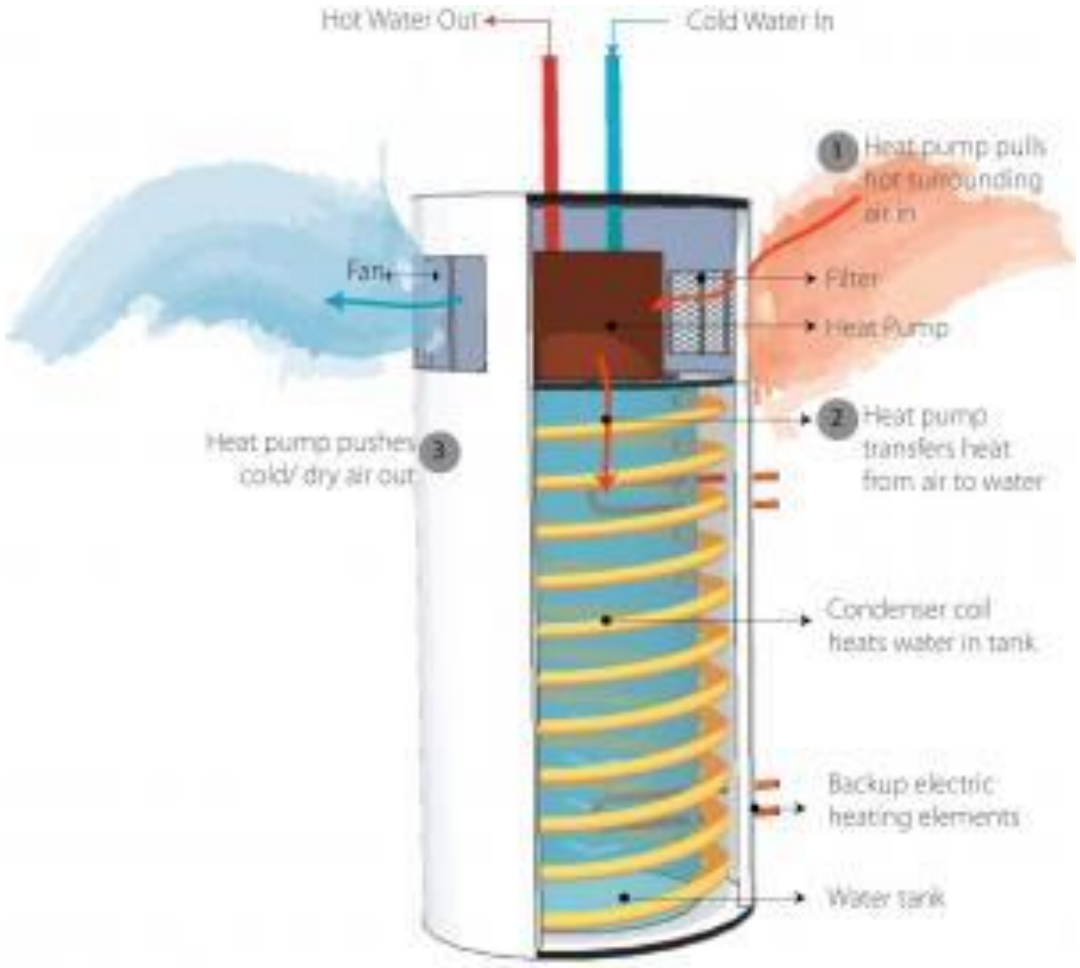
Heat pumps squeeze warmth out of cold air.

SEATTLE: MULTIFAMILY HEAT PUMP HOT WATER

Effective **January 2022**

Only for hotel & multifamily buildings with central domestic water heating:

- No electric resistance or fossil fuel water heating equipment.
  - Typically, use heat pumps instead
- Some auxiliary heat OK below 40 F
- Elec resistance OK to reheat circulating water



LIGHTING POWER

- WA – Reduce interior LPAs (lighting power allowances) 11% overall
  - But many smaller rooms get *larger* LPA
  - From ASHRAE 90.1 - 2019
- Seattle: Interior LPAs **10% below WA**
  - Was 10% below WA in 2015 code also
- Elec outlets at gas appliances
  - In dwelling units
  - For future “plug & play” conversion

C406 EFFICIENCY PACKAGE CREDITS

Moving towards all-electric

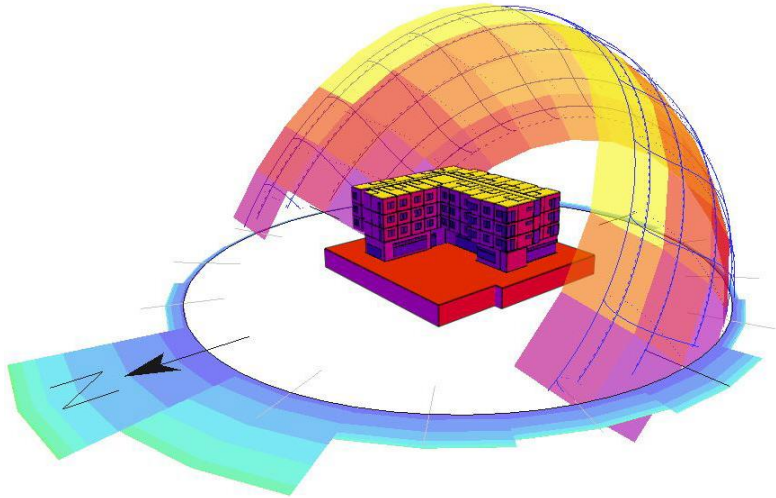
1. HVAC efficiency
2. **Lighting 10%**
3. **Lighting 20%**
4. **Lighting controls**
5. **Renewable energy**
6. DOAS
7. High-perf DOAS
8. Water heating
9. High-perf water heat
10. Envelope
11. Air infiltration
12. ~~Kitchen appliance~~

- WA: 6 credits required
- **Seattle: 8 credits required**
  - Gas equip doesn't qualify

	R1	R2	B	E	M	Other
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[a]	2.0	3.0	4.0	4.0	6.0	4.0

ENERGY MODELING – WHOLE NEW SYSTEM

- Carbon emissions compared with 2004 ASHRAE 90.1 standard
- 10% *lower* than WA code
  - To align models with more stringent Seattle Energy Code requirements



SEATTLE 10% lower									
Building Area Type	Multi family	Health care	Hotel	Office	Rest.	Retail	School	Ware house	Others
Building Performance Factor	~~0.56~~ 0.50	~~0.54~~ 0.49	~~0.64~~ 0.58	~~0.54~~ 0.49	~~0.73~~ 0.66	~~0.47~~ 0.42	~~0.36~~ 0.32	~~0.48~~ 0.43	~~0.54~~ 0.49

LIMITS ON SUB-STANDARD ENVELOPE

- **WA**: Modeled envelope heat loss cannot be more than **20% worse** than prescriptive
- **Seattle**: Modeled envelope heat loss cannot be more than **10%** worse than prescriptive

SEATTLE: RENEWABLE ENERGY

- **0.25 W/sf**, based on area of all floors
  - Instead of 0.07 W/square foot
  - Instead of just largest 5 floors
- Affordable housing **exempted**
- Option: Gift to affordable housing
  - Projects can donate turnkey system to Seattle affordable housing.
  - Or to state agency solar program
- “Solar-ready” roof and main panel

HOW BIG IS 0.25W/SF?

- Assume all floors same size
- Area includes space between PV rows

Thanks to FSI Engineers

Building Stories	Roof Area Required
1	1.8%
2	3.6%
4	7.2%
6	10.9%
8	14.5%
10	18.1%
12	21.7%
14	25.4%
16	29.0%
18	32.6%
20	36.2%

MAJOR CHANGES IN 2018 SBC

- Format – single column
- Mass timber
- Occupied roofs
- Efficiency dwelling units
- Gender-neutral toilet facilities
- High rise shaft pressurization
- Tsunami loads
- Increased seismic

CHAPTER 6

TYPES OF CONSTRUCTION

User note:

About this chapter: Chapter 6 establishes five types of construction in which each building must be categorized. This chapter looks at the materials used in the building (combustible or noncombustible) and the extent to which building elements such as building frame, roof, wall and floor can resist fire. Depending on the type of construction, the specific building element and its proximity to a lot line, fire resistance of 1 to 3 hours is specified.

SECTION 601
GENERAL

601.1 Scope. The provisions of this chapter shall control the classification of buildings as to type of construction.

SECTION 602
CONSTRUCTION CLASSIFICATION

602.1 General. Buildings and structures erected or to be erected, altered or extended in height or area shall be classified in one of the five construction types defined in Sections 602.2 through 602.5. The building elements shall have a *fire-resistance rating* not less than that specified in Table 601 and exterior walls shall have a *fire-resistance rating* not less than that specified in Table 602. Where required to have a *fire-resistance rating* by Table 601, building elements shall comply with the applicable provisions of Section 703.2. The protection of openings, ducts and air transfer openings in building elements shall not be required unless required by other provisions of this code.

602.1.1 Minimum requirements. A building or portion thereof shall not be required to conform to the details of a type of construction higher than that type which meets the minimum requirements based on occupancy even though certain features of such a building actually conform to a higher type of construction.

[W] TABLE 601
FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS)

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV				TYPE V	
	A	B	A	B	A	B	A	B	C	HT	A	B
Primary structural frame[f] (see Section 202)	3[a,b]	2[a,b]	1[b]	0	1[b]	0	3[a]	2[a]	2[a]	HT	1[b]	0
Bearing walls Exterior[e,f] Interior	3 3[a]	2 2[a]	1 1	0 0	2 1	2 0	3 3	2 2	2 2	2 1/HT	1 1	0 0
Nonbearing walls and partitions Exterior	See Table 602											
Nonbearing walls and partitions Interior[d]	0	0	0	0	0	0	0	0	0	See Section 2304.11.2	0	0
Floor construction and associated secondary members (see Section 202)	2[a]	2[a]	1	0	1	0	2	2	2	HT	1	0
Roof construction and associated secondary members (see Section 202)	1 1/2[b]	1[b,c]	1[b,c]	0[c]	1[b,c]	0	1 1/2	1	1	HT	1[b,c]	0

For SI: 1 foot = 304.8 mm.
a. Roof supports: Fire-resistance ratings of primary structural frame and bearing walls are permitted to be reduced by 1 hour where supporting a roof only.
b. Except in Group F-1, H, M and S-1 occupancies, fire protection of structural members in roof construction shall not be required, including protection of primary structural frame members, roof framing and decking where every part of the roof construction is 20 feet or more above any floor immediately below. Fire-retardant-treated wood members shall be allowed to be used for such unprotected members.
c. In all occupancies, heavy timber complying with Section 2304.11 shall be allowed where a 1-hour or less fire-resistance rating is required.
d. Not less than the fire-resistance rating required by other sections of this code.
e. Not less than the fire-resistance rating based on fire separation distance (see Table 602).
f. Not less than the fire-resistance rating as referenced in Section 704.10.
Note: See Sections 1019, 1023 and 603.1 item 27 for stairway construction.
g. The fire-resistance rating for mezzanines constructed in accordance with Section 505.2 need not exceed 1 hour.

MASS TIMBER

Since July 2019, Seattle has allowed use of the WA State-adopted standards for mass timber.

In the 2018 SBC, Seattle formally adopts mass timber provisions.

New Construction Types:

- Type IV-A
- Type IV-B
- Type IV-C

Maintains legacy type heavy timber: IV-HT

HABITABLE SPACE IN DWELLING UNITS

NEW

	Single Room (net floor area)	Other Habitable / Occupiable Spaces (net floor area)	Natural Light	Food Prep Area	Bathroom	Closet	Storage	Gross Unit Size
Dwelling Unit	≥ 120 SF	≥ 70 SF**	No*	Yes	Yes	No	No	N/A
EDU SBC 1208.4	**≥190 SF**	N/A	No*	Yes	Yes	Yes	No	N/A
SEDU DR9-2017	< 190 SF ≥ 120 SF	≥ 30 SF**	Yes	Yes	Yes	Yes	Yes	≤ 320 SF

GENDER-NEUTRAL RESTROOMS

Where provided:

- Can’t reduce the number of fixtures based on separate facilities
- Full height walls
- Securable
- Egress from the room cannot be locked
- Compartment is not required in a locked single occ toilet room

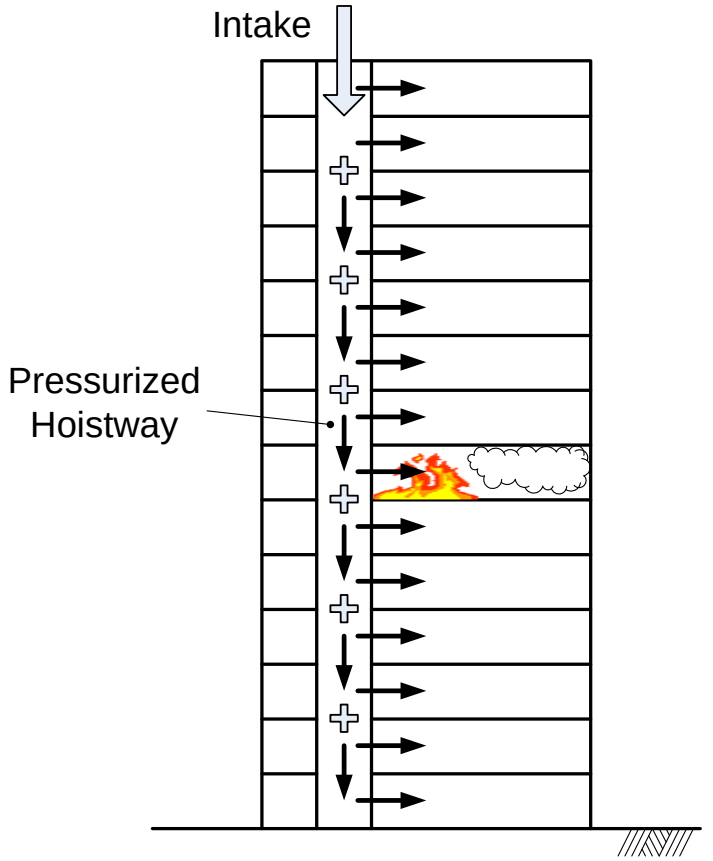
HIGH RISE SHAFT PRESSURIZATION

Testing and Submittals

Submittal and testing requirements for stairway and hoistway pressurization have been enhanced and clarified.

Smoke Control Conference is required prior to arch submittal. This is in ADDITION to the HR 403 Presubmittal conference.

Special Inspection requirements by a design professional to verify the entire system operates as designed.



SIGNIFICANT CHANGES – CHAPTER 16

1615 – Tsunami Loads

- Risk Category **III** and **IV** buildings and structures
- Located in the Tsunami Design Zones
- Design in accordance with Chapter 6 of ASCE 7

"<u>Increased</u> Seismic Load"

- Mapped Acceleration Parameters (S_s, S_1)
- Site Class Coefficients (F_a, F_v)
- Site Specific Procedures requirements--Site Class D
  - Perform site-specific response analysis… or…
  - Take penalty to the prescriptive response spectral seismic demand

MAJOR CHANGES TO THE RESIDENTIAL CODE

- Townhouse Automatic Sprinklers
- Habitable Attic Changes
- Sleeping Lofts
- Tiny Houses

R313.1 TOWNHOUSE AUTOMATIC SPRINKLERS

- Requires P2904 or NFPA 13D system in all new townhouse units
- Exception for existing units
- Allows for reductions in table 302.1(2) FSD

APPENDIX Q – TINY HOUSES

- Single dwelling unit 400sf or less
  - Excludes sleeping lofts
- 6’-8” ceiling heights at habitable spaces
- 6’-4” at kitchens and bathrooms
  - Excludes sleeping lofts

MAJOR CHANGES, OTHER 2018 SEATTLE CODES

Mechanical Code

- Smoke filtration–Air handlers greater than 500CFM accommodate a minimum MERV 13 filter.

Electrical Code

- Calculated Electric Load--Modify Article 220.84 to prevent calculated excess service capacity when using advanced heat pump systems.
- Electric Vehicle Charging Infrastructure--Modifies Article 220.57 and 625. 27 to align EV charging infrastructure requirements with the Land Use Code.

Plumbing Code

- Air admittance valve--This change identifies the allowable locations and installation requirements for air admittance valves.

QUESTIONS?

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