Only amended sections and subsections are shown. Text amended by this ordinance (as opposed to amendments Seattle has already made to the *International Energy Code*) is in red.

CHAPTER 2 [CE]

DEFINITIONS

SECTION C202
GENERAL DEFINITIONS

* * *

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 commissioning processes, or a licensed professional engineer in Washington State. ((~~The individual's accredited certification required by the referenced standard provides a measured level of experience and competence with the various whole *building commissioning* processes and the ability to deliver quality service. Accredited organizations include, but are not limited to, ((AABC, BCA and NEBB)) Building Commissioning Certification Board (BCCB), providers of the Certified Commissioning Professional (CCP) designation, and ASHRAE, providers of the Commissioning Process Management Professional (CPMP) designation. The engineer of record for the project may be considered the *certified commissioning professional* if she/he is qualified to perform commissioning services for the entire commissioning process.~~))

* * *

CHAPTER 5 [CE]

EXISTING BUILDINGS

**

SECTION C503
ALTERATIONS

* * *

C503.8.3 Energy Efficiency. Buildings undergoing substantial alterations shall comply with Section C503.4.6 and one of the following:

1. **Full code compliance.** Fully comply with the requirements of this code for new construction, including Section C406.
2. **Envelope thermal performance within 15 percent of code.** Demonstrate that heat loss through the building envelope is no more than 15 percent greater than allowed by the Seattle Energy Code, using the Component Performance Building Envelope Option in Section C402.1.5, and meet all other prescriptive requirements of the Seattle Energy Code for new construction.

   2.1. **Default U-values.** The values listed in Appendix A and Section C303 shall be used as the default U-values for existing building envelope components. For buildings whose original construction permits were applied for after January 1, 1992, existing building envelope components are deemed to meet the minimum U-values required by the edition of the Seattle Energy Code in effect at the time of permit application, where visual inspection by the *code official* reveals that those components appear to be equal to or better than code-compliant components.

   2.2. **Disproportionality.** Where *approved* by the code official, the cost of required thermal improvements to the building envelope ((~~are~~)) is not required to exceed 20 percent of the valuation of the substantial alterations project, determined in accordance with the Fee Subtitle, when using this envelope thermal performance compliance method. Envelope improvement costs shall be documented using standard cost estimating software and methodology.
3. **Total building performance within 10 percent of code.** Demonstrate that the building energy consumption will be less than 10 percent higher than that of the standard reference design (SRD) using the Total Building Performance methodology in Section C407 of the Seattle Energy Code, as follows.
   1. Less than 97 percent of SRD when no C406 options are included in the project and the Proposed Design.
   2. Less than 100 percent of SRD when one C406 option is included in the project and the Proposed Design.
   3. Less than 103 percent of SRD when two C406 options are included in the project and the Proposed Design.
4. **Operating energy alternative.** The *code official* is permitted to allow calculated building energy consumption 20 percent greater than the standard reference design calculated in accordance with the Total Building Performance methodology in Section C407, provided that:
   a. The applicant demonstrates that constructability, economic, or historic preservation considerations preclude conformance with any of the above options; and
   b. The owner agrees to operate the building at or below the annual energy use level predicted for that calculated energy performance during a period of 12 consecutive months, concluding no later than three years after issuance of the certificate of occupancy, adjusted as allowed by Sections C401.3.6 through C401.3.10, and to meet the requirements of Sections C401.3.11 through ((~~C401.1.5.13~~)) C401.3.13, substituting the energy consumption standard in option 4 of this Section C503.8.3 for the energy consumption targets set out in Section C401.3.2.

   4.1. Reporting. The building owner shall report the energy consumption in kBTU/square foot using automated reporting directly from utilities via Energy Star Portfolio Manager, and shall authorize the *code official* to view the reports directly in Portfolio Manager during the demonstration period.

*** * ***

APPENDIX E

TOTAL BUILDING PERFORMANCE REPORTING FORMAT

* * *

REPORTING FORMAT OUTLINE
(See detailed description below)

* * *

I. Executive Summary

The executive summary is the condensed version of the text. This is usually several paragraphs long, never more than ((~~one page~~)) two pages, and includes:

1. A brief description of the project with name, address, number of stories, and total square footage, as well as a listing of the various uses and the square footage of each use.
2. An explanation about why the systems analysis compliance option was chosen (i.e. what elements of the Proposed Design do not comply with the prescriptive option).
3. A listing of the key energy efficiency features that are being used to compensate for the elements that do not comply.
4. The Additional Efficiency Package Options selected from Section C406 (if any), and the target for the proposed design (87, 90, or 93 percent of Standard Reference Design).

((~~4~~)) 5. The total energy consumption on a Btu-per-conditioned-square-foot-per-year basis for both the Standard Reference Design and the Proposed Design, and the percentage ratio of the Proposed Design to the Standard Reference Design (i.e. what the energy efficiency improvement has been).

II. Project Description

The project description is a detailed summary of the project. First is the name and the street address as well as adjacent cross-streets or streets on all four sides of the building if it is a full-block development. Indicate the number of stories and total square footage. A listing of the various uses and square footage of each use should be done on a floor-by-floor or a system-by-system basis. Thus, for mixed-use floors, specify how much is office and how much is retail, or how much is office and how much is lab. Include parking garage number of floors and area in the listing. The description should also include information on the energy efficiency of the Proposed Design systems, and whether any of those systems are designed to comply with Section C406 requirements.

1. For the building envelope: indicate the glazing area, and how the fenestration U-factor and SHGC compare with the Standard Reference Design requirements; and point out any opaque component U-factors or R-values which are better than the Standard Reference Design requirements.
2. For each HVAC system: provide an explanation of the system including area served, key features, economizer percentage, control strategies, etc. Indicate any differences between the Standard Reference Design and the Proposed Design, such as equipment efficiency.
3. For the lighting: indicate whether any tradeoffs are included in this analysis, and, if so, what they are.
4. For other end-uses: indicate any differences between the Standard Reference Design and the Proposed Design. It is intended that the material in this section be descriptive, supporting calculations are to be included in the appendices.

* * *

Appendices (Supporting Materials)

A. Energy Analysis Summary Form (required)

1. Complete the Energy Consumption by End-use portion of the form for each project. Where a project has multiple buildings ((~~which~~)) that are individually analyzed, complete the form for each building as well as for the overall project. (An automated electronic spreadsheet version of this page is on the ((~~DPD~~)) SDCI Seattle Energy Code website at: ((~~www.seattle.gov/dpd/energy~~)) www.seattle.gov/dpd/codesrules/codes/energy/forms.)
2. Complete the Design Parameter Comparison portion of the form for each project. Where a project has multiple HVAC systems, complete the HVAC information for each system. (An electronic version of these pages is on the ((~~DPD~~)) SDCI Seattle Energy Code website at: ((~~www.seattle.gov/dpd/energy~~)) http://www.seattle.gov/dpd/codesrules/codes/energy/overview/default.htm.)

B. General Information

1. Site Plan (required) – provide site plan (8½ x 11 preferred) showing location and height, in feet or stories, of all adjacent buildings and also any other buildings and topography which would provide significant shading of the proposed building.

2. HVAC zoning diagram used in the modeling process (required) – provide zoning diagram indicating zone lines and with zones labeled to match the modeling, plus takeoff sheets with area inputs for ((~~DPD~~)) SDCI review.)

C. Building Envelope

1. Glazing and opaque doors, including windows, skylights, sliding/swinging/rollup doors, glass block (required):
   a. U-factor, with basis for information (NFRC ((~~Certification Authorization~~)) CMA Bid Report, simulation report or approved alternate source).
   b. Solar Heat Gain Coefficient (SHGC), with basis for information (NFRC ((~~Certification Authorization~~)) CMA Bid Report, simulation report or approved alternate source)
2. Opaque roof, wall, floor (required):
   a. provide cross-sections and U-factor calculations for each different assembly where default U-factors from Chapter 3 and Appendix A have not been used;
   b. if multiple elements (e.g., three wall types) are combined into one value for modeling purposes, provide calculations used to determine weighted-average value.
3. Shading diagrams (required):
   a. provide information on how shading by adjacent buildings and topography has been modeled,
   b. provide wall and roof sections showing overhangs and setbacks for glazing to justify the shading modeled.
4. Building air leakage:
   a. the standard reference design building air leakage test rate shall equal that required by Section ((~~C402.4.1.2.3~~)) C402.5.1.2,
   b. provide calculation showing how the building air leakage test rate at the standard rating conditions in Section ((~~C402.4.1.2.3~~)) C402.5.1.2 has been converted to an air leakage test rate appropriate for the energy modeling,
   c. for modeling, indicate:
      i. what percentage of air leakage is modeled for the hours when the building fan system is off and
      ii. what percentage of air leakage is modeled for the hours when the building fan system is on.

D. Lighting

((~~1. Interior lighting (as applicable):~~
   ~~a. explain any special assumptions about interior lighting,~~
   ~~b. discuss lighting inputs to account for any exempt lighting (e.g. retail, kitchen).~~
~~2. Parking/outdoor areas lighting (as applicable):~~
   ~~a. provide calculation of areas for parking garages, then multiply by allowed Watts/square foot; provide calculation of areas for surface parking, and other lighted outdoor areas, then multiply by allowed Watts/square foot to obtain Standard Reference Design;~~
   ~~b. provide supporting information for Proposed only if different from Standard Reference Design;~~
   ~~c. if program does not list parking/outdoor area lighting energy consumption separately, then provide calculation of annual energy consumption for this end-use.~~
~~3. Façade lighting (required):~~
   ~~a. provide calculation of building façade, then multiply by allowed Watts/square foot to obtain Standard Reference Design;~~
   ~~b. provide supporting information for Proposed only if different from Standard Reference Design;~~
   ~~c. if program does not list facade lighting energy consumption separately, then provide calculation of annual energy consumption for this end-use.~~))

1. Interior lighting:
   a. state whether the lighting power density is based on the building area method or space-by-space method;
   b. explain any special assumptions about interior lighting;
   c. identify any additional retail display lighting allowances or ceiling height adjustments used;
   d. discuss lighting inputs to account for any exempt lighting (e.g., retail, kitchen, plan growth);
   e. separately identify lighting for covered parking areas.
2. Uncovered parking and other tradable exterior lighting (as applicable):
   a. identify the exterior lighting zone for the site;
   b. provide calculation of areas for uncovered surface parking and other exterior "tradable areas," and multiply by the allowances.
3. Facade and other non-tradable exterior lighting (as applicable):
   a. identify any non-tradable exterior lighting areas;
   b. provide calculation of lighted building facade and other non-tradable areas, and multiply by the allowances.

E. Space Heating and Space Cooling Equipment and Plant

1. provide manufacturer's specifications for equipment efficiency,
2. provide ((~~calculations~~)) energy efficiency ratings (COP, EER, IPLV, etc.) per AHRI standards ((~~for COP, EER, IPLV~~)),
3. provide list of equipment and size and calculations to justify if Proposed Design includes multiple pieces of equipment and a weighted average equipment efficiency is used in the energy analysis,
4. provide calculations to justify the equipment size for the Standard Reference Design
   a. provide calculations of ratio of Proposed Design equipment size to Proposed Design design heating load and design cooling load,
   b. provide calculations of ratio of Standard Reference Design equipment size to Standard Reference Design design heating load and design cooling load.

F. Ventilation - interior (required):

1. provide W/CFM calculations for the ventilation system for the Proposed Design and for the Standard Reference Design to justify inputs for the Standard Reference Design,
2. if program does not list energy consumption for interior ventilation separately in the output, then provide calculation of annual energy consumption for this end-use.

G. Interior Exhaust Fans (as applicable):

1. where multiple toilet exhaust and relief fans are to be installed, provide listing of capacity for each and total for the interior exhaust fans,
2. if program does not list energy consumption for interior exhaust fans separately in the output, then provide calculation of annual energy consumption for this end-use.

H. Parking Garage Fans (as applicable):

1. where multiple parking garage fans are to be installed, provide listing of capacity for each and total for the parking garage fans,
2. if program does not list energy consumption for parking garage fans separately in the output, then provide calculation of annual energy consumption for this end-use.

I. Service Water Heating (required):

1. provide calculations ((~~used to size equipment~~)) of water heating loads and type and size of equipment simulated in the analysis (see Appendix B, Table B102, for default assumptions for service hot water quantities in Btuh per person),
2. if program does not list energy consumption for service water heating separately in the output, then provide calculation of annual energy consumption for this end-use.

J. Other End-uses

1. Office/miscellaneous equipment (as applicable):
   a. if program requires an input of total equipment capacity rather than capacity on a square foot basis, then provide calculations used to size equipment (see Appendix B, Table B102, for default assumptions for ((~~service hot water quantities~~)) receptacle power density in Watts/square foot),
   b. if program does not list energy consumption for office/miscellaneous equipment separately in the output, then provide calculation of annual energy consumption for this end-use.
2. Elevators and escalators (as applicable):
   a. where multiple elevators and escalators are to be installed, provide listing of capacity for each and total for the system,
   b. if program does not list energy consumption for elevators and escalators separately in the output, then provide calculation of annual energy consumption for this end-use.
3. Refrigeration - food, etc. (as applicable):
   a. where multiple units are to be installed for refrigeration other than for comfort cooling, provide listing of capacity for each and total for the system,
   b. if program does not list energy consumption for refrigeration other than for comfort cooling separately in the output, then provide calculation of annual energy consumption for this end-use.
4. Cooking (as applicable):
   a. where multiple units are to be installed for cooking, provide listing of capacity for each and total for the system,
   b. if program does not list energy consumption for cooking separately in the output, then provide calculation of annual energy consumption for this end-use.
5. Other (as applicable):
   a. provide supporting data for other end-uses (e.g. commercial washers and dryers, etc.),
   b. if program does not list energy consumption for other end-uses separately in the output, then provide calculation of annual energy consumption for these end-uses.

K. Computer Printout of Inputs and Outputs

Provide inputs and outputs with pages numbered so cross-references can be made to the Energy Analysis Summary Form.

INSTRUCTIONS:

Electronic Version:

A spreadsheet version is available on the Seattle Energy Code website @ www.seattle.gov/dpd/codesrules/codes/energy/forms

Project Information:

Enter SDCI address, project number, and date of this Energy End-use Summary Form.

Enter the space uses in the building and the gross square footage of each.

(Add/revise headings as necessary.) Spreadsheet automatically calculates subtotals and total.

Energy Consumption by End-Use:

Enter fuel source for each end-use (e.g., electric, gas, oil, steam, etc.).

Enter total site energy consumption in **BTU** for each end-use for both the Standard Reference Design and Proposed Design.

(Spreadsheet calculates the BTU/conditioned-square-foot-year, percentages, and differences.)

ENERGY ANALYSIS SUMMARY FORM

PROJECT INFORMATION

SDCI Project Address:					SDCI Project Number:					
Project Name:					Date of this submittal:					
	Conditioned Space						Unconditioned Space			
Bldg Use	Office	Retail	Group R			Subtotal	Parking		Subtotal	
Area (SF)										

ENERGY CONSUMPTION BY END-USE

		STANDARD REFERENCE DESIGN			PROPOSED DESIGN			DIFFERENCES		
END-USE	FUEL	Total Energy Use Estimate	BTU/Cond. Sq.Ft.-Year	% of Standard Design Total	Total Energy Use Estimate	BTU/ Cond. Sq.Ft.-Year	% of Standard Design Total	Total Energy Use Estimate	BTU/ Cond. Sq.Ft.-Year	% of Standard Design Total
Lighting - interior			_____%			_____%				_____%
Lighting - parking			_____%			_____%				_____%
Lighting - façade			_____%			_____%				_____%
Space Heating (1)			_____%			_____%				_____%
Space Heating (2)			_____%			_____%				_____%
Space Cooling			_____%			_____%				_____%
Fans – interior ventilation			_____%			_____%				_____%
Fans – interior exhaust			_____%			_____%				_____%
Fans – parking garage			_____%			_____%				_____%
Service water heating			_____%			_____%				_____%
Office equipment			_____%			_____%				_____%
Elevators & escalators			_____%			_____%				_____%

ENERGY CONSUMPTION BY END-USE—continued

Refrigeration (food, etc.)			_____%			_____%				_____%
Cooking (commercial)			_____%			_____%				_____%
_____			_____%			_____%				_____%
_____			_____%			_____%				_____%
Total			100%			100%				100%
Percent of Standard Reference Design: 100% = _____ % + _____ % = _____ %										

((~~**INSTRUCTIONS:**~~

~~**Electronic Version:**~~

~~A spreadsheet version is available on the Seattle Energy Code website @ www.seattle.gov/dpd/energy~~

~~**Project Information:**~~

~~Enter DPD address, project number, and date of this Energy End-use Summary Form.~~

~~Enter the space uses in the building and the gross square footage of each.~~

~~(Add/revise headings as necessary.) Spreadsheet automatically calculates subtotals and total.~~

~~**Energy Consumption by End-use:**~~

~~Enter fuel source for each end-use (e.g. electric, gas, oil, steam, etc.).~~

~~Enter total energy consumption in **BTU** for each end-use for both the Standard Reference Design and Proposed Design.~~

~~(Spreadsheet calculates the BTU/conditioned-square-foot-year, percentages, and differences.)~~))

DESIGN PARAMETER COMPARISON

Element	Standard Design Value	(Page)	Proposed Design Value	(Page)
Building Envelope				
((~~**Space heat type** (electric resistance vs. other):~~))				
Glazing: total vertical + overhead area (sq. feet):				
((~~Glazing~~)) Vertical glazing area as a percentage of gross above-grade wall (%):				
Overhead: total area (square feet):				
Overhead U-factor (weighted-average):				
Overhead SHGC (weighted-average):				
Vertical: total area (square feet):				
Vertical U-factor (weighted-average):				
Vertical SHGC (weighted-average):				
Roof: total area (square feet):				
Opaque roof: net area (square feet):				
Opaque roof U-factor (weighted-average):				
Wall: total above-grade area (square feet):				
Opaque above-grade wall: net area (square feet):				
Above-grade wall U-factor (weighted-average):				
Below-grade wall: net area (square feet):				
Below-grade wall U-factor (weighted-average):				
Opaque door: area (sq. feet):				
Opaque door U-factor (weighted-average):				
Floor over unconditioned space: area (sq. feet):				
Floor U-factor (weighted-average):				
Slab-on-grade floor: perimeter (lineal feet):				
Slab-on-grade F-factor (weighted-average):				
Below-grade slab floor: net area (square feet):				
Below-grade floor U-factor (weighted-average):				
Infiltration rate:				

DESIGN PARAMETER COMPARISON—continued

Element	Standard Design Value	(Page)	Proposed Design Value	(Page)
Design heating load:				
Design cooling load:				
Lighting				
Interior				
Watts/sq.ft.: Office				
Watts/sq.ft.: Retail				
Watts/sq.ft.:				
Watts/sq.ft.:				
Parking/outdoor: total area (square feet)				
Watts/square foot				
Façade: total area (square feet)				
Watts/square foot				
Space Heating and Space Cooling System				
Space Heating: system type:				
Peak equipment efficiency:				
Output capacity:				
Percent of design heating load:				
Other features:				
Space Cooling: system type:				
Peak equipment efficiency:				
Output capacity:				
Percent of design cooling load:				
Other features:				
Ventilation				
Interior ventilation fans				
Economizer type (air or water):				
Economizer percentage:				
Supply fan: total CFM:				
Fan KW:				
Return fan: total CFM:				
Fan KW:				
Exhaust fan: total CFM:				
Fan KW:				
System Watts/CFM:				
Other features:				
Other features				
Service Water Heating				
Capacity:				

DESIGN PARAMETER COMPARISON—continued

Element	Standard Design Value	(Page)	Proposed Design Value	(Page)
Other End-uses				
Fans – toilet and other exhaust: capacity (KW)				
Fans – parking garage: capacity (KW)				
Elevator and escalator: capacity				
Refrigeration: capacity				
Cooking: capacity				
_____: capacity				
_____: capacity				
_____: capacity				