Seattle Department of Construction and Inspections

sdci

Tip 423

Seattle Permits

— part of a multi-departmental City of Seattle series on getting a permit

Energy Compliance Though the Target Performance or Total Building Performance Paths

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This Tip answers frequently asked questions on how you can meet the Seattle Energy Code requirements though the Total Building Performance (TBP) and Target Performance Path (TPP) compliance pathways. This Tip is not a comprehensive compliance guide.

Background

New commercial construction projects in Seattle can comply with the 2018 Seattle Energy Code (SEC) through one of three pathways listed in C401.2:

- Prescriptive Path (includes C402.1.5 Component Performance Alternative)
- Total Building Performance Path (C407)
- Target Performance Path (C401.3)

The Total Building Performance and the Target Performance paths each require whole building energy modeling. The Total Building Performance Path uses only modeled performance to show code compliance. The Target Performance Path also uses energy modeling to demonstrate that the proposed design is capable of hitting the operational performance target, but in addition, this path requires that the actual measured building energy consumption meets the target.

General FAQs

What is Total Building Performance?

Total Building Performance, SEC Section C407, describes the procedure used to compare a proposed design to the standard reference design, using the 2019 ASHRAE 90.1 Appendix G Performance Rating Method. The code includes some notable Washington and Seattle specific modifications, including a carbon emissions metric.

What is a BPF?

The Seattle version of the Appendix G method is a ratio that compares the annual carbon emissions associated with your proposed design to the carbon emissions that would have occurred had the building been constructed to the requirements of the 2004 ASHRAE 90.1. That ratio is the BPF – Building Performance Factor.

A maximum allowable BPF for each occupancy type is shown in Table C407.3(2). The proposed design regulated carbon emissions divided by the baseline design regulated carbon emissions must be less than the BPF in the table. As an example, the BPF for an office building is 0.51, so the proposed design regulated uses can generate no more than 51 percent as much carbon emissions as would have been generated by the regulated uses of a 2004 ASHRAE baseline building.

“Regulated uses” include items such as lighting, heating, cooling, fans, and commercial refrigeration. Unregulated uses include items such as computers, printers, servers, and break room appliances. You can find complete definitions and explanations of these terms in ASHRAE 90.1 Appendix G.

Carbon emissions factors for each fuel source (electricity, gas, etc.) are shown in Table C407.3(1).

Section C407.3 lists a number of additional modifications to Appendix G that adapt the method to Seattle standards. These include item such as changing “energy cost” to carbon emissions as the metric, clarifications to the requirements for documentation, and the treatment of tenant spaces that are not yet designed.

There are certain constraints on construction of the Proposed Design model.

- Renewable energy, beyond that required by Section C412, is only permitted to reduce carbon emissions in the proposed design model by 3 percent. Additional renewable energy can be provided, but cannot be counted in the model. See item 2 in C407.3.

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- The Proposed Total UA, as defined in C402.1.5, can be no more than 10 percent higher than that allowed for prescriptive compliance. For all Total Building Performance projects, you will need to complete a component performance (Target UA) calculation as described in Section C402.1.5. See C407.3.1.

How do I apply Section C406 – Additional Efficiency Package Options?

You are not required to obtain C406 options when using the TPP or TBP in the 2018 Seattle Energy Code.

What is the Target Performance Path (C401.3)?

The Seattle Energy Code includes a novel outcome-based path for compliance called the Target Performance Path (TPP), that is described in SEC Section C401.3. Under the TPP, you have to provide utility bills to prove that your building's actual energy use meets a specific Energy Use Intensity target. The TPP gives you increased design freedom, in exchange for your commitment to demonstrate actual energy efficiency. You have to post some form of financial security, and the owner will have to pay a financial penalty if the building does not meet its target. You must submit your building's energy use via Portfolio Manager as required by the Seattle Energy Benchmarking Law, and if the building's energy use is below its target for a period of twelve consecutive months, you can contact SDCI to release the financial security.

The TPP also uses the ASHRAE Appendix G method, but permits the Building Performance Factor to be as much as 12 percent higher than the BPF shown in Table C407.3(2).

Why choose the Total Building Performance Path or Target Performance Path?

You would typically use one of these pathways when the design of a project makes prescriptive compliance impractical. Common examples include:

- Buildings with a glazing area greater than otherwise allowed by code
- Buildings without air economizer
- Where a Dedicated Outdoor Air System (DOAS) is required, but not provided in the building

Don't Forget about Mandatory Requirements!

Projects using the Total Building Performance Path or Target Performance Path must also comply with a number of mandatory requirements, listed in Table C407.2 (but not the mandatory requirements in Appendix G). Mandatory in this case means that they must be included in the building design. Examples of these measures include air barrier testing, HVAC controls, solar readiness, and many more.

Required Documentation

For the Total Building Performance Path or Target Performance Path modeling, you must submit an energy model report as required per ASHRAE 90.1 G1.3.2 in addition to a completed compliance form, available here ASHRAE Standard 90.1 Performance Based Compliance Form. For Seattle projects, select "Seattle" from the pulldown menu on the "Code/Beyond Code Program" line at the top of the "General Information" tab. Note that the form can import much of the data from popular energy modeling software into the Compliance Form to avoid retyping. Submit a printout of the input and output files. Include your completed form with the permit drawing sets (architectural, electrical, mechanical, etc.) that document key savings items. You cannot claim savings in the energy model for strategies that aren't included in the permit drawings, so if you take credit for lighting in the energy model, the electrical permit must be approved before the permit can be issued.

Tenant Versus Core & Shell Spaces

SDCI often issues "core & shell" building permits before the tenant space designs are complete. In such cases, the core & shell project must meet the Total Building Performance or Target Performance Path requirements without depending on energy efficiency savings from undefined tenant systems. You need to indicate the proposed terminal systems for the mechanical systems in both common areas and future tenant spaces, and include these terminal systems modeled as minimally compliant with prescriptive 2018 SEC requirements in the proposed design in the energy model. You must substantiate any other savings for tenant space measures (e.g. lighting) on your permit drawings that accompany the energy model report. You can't use tenant lease agreements to substantiate tenant energy savings.

Pre-submittal meetings

Pre-submittal meetings are an opportunity for the design team to ask the SDCI energy/mechanical reviewer specific questions. You should document the questions and issue resolutions in your meeting notes and ask the SDCI energy/mechanical reviewer to review and approve your meeting notes. Common topics for discussion include the selection of baseline model HVAC systems , non-standard use of a space type, and any unique situations or code clarifications. Include the approved notes with your permit application and in your Total Building Performance or Target Performance Path report. For more detailed information about pre-submittal conferences, see Seattle SDCI Form - Pre-submittal Conference Construction Information.

NFRC fenestration documentation

Projects that include curtain wall, storefront, ribbon windows, or other site-assembled fenestration must typically provide an NFRC Component Modeling Approach (CMA) bid report with the permit application. An NFRC simulation report is another option. Refer to Tip 403, "NFRC Labeling Requirements," for more detail.

Appendix G Modeling Resources

A US Department of Energy (DOE) modeling review manual for Appendix G models is available at: https://www.energycodes.gov/sites/default/files/2021-07/90.1_Secton_11_and_Appendix_G_Review_Manual_V02.pdf

A 2-hour training on Appendix G basics is available from DOE at: Performance Based Compliance Documentation for ASHRAE 90.1 Section 11 and Appendix G | Building Energy Codes Program

ASHRAE Standard 90.1 – 2019 is available in digital or hard copy formats from: ASHRAE Store (techstreet.com)

Resources for City Light Customers

The Seattle City Light website includes resources for customers who comply with code using the "Total Building Performance" energy modeling compliance path. These programs continue to evolve – see the current offerings on the SCL website under the "Whole Building" heading at CommercialNewConstructionIncentives.pdf (seattle.gov)

For information and assistance on City Light renewable energy and energy efficiency programs for commercial and multifamily buildings, contact a City Light Energy Advisor at (206) 684-3800

For assistance with energy strategy development, daylighting or healthcare facilities, contact the City Light design partners at the UW Center for Integrated Design at (206) 616-6566.

Access to Information

Links to electronic versions of SDCI **Tips, codes**, and **forms** are available on the "Tools & Resources" page of our website at **www.seattle.gov/sdci**. Paper copies of these documents are available from our Public Resource Center, located on the 20th floor of Seattle Municipal Tower at 700 Fifth Ave. in downtown Seattle, (206) 684-8467.