

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 2021 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 (C401.2, item 4)

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 2022 ASHRAE 90.1 Appendix G Performance Rating Method.

The code includes some notable Washington and Seattle specific modifications, including a site energy metric in place of the ASHRAE energy cost metric.

What is a BPF?

The Seattle version of the Appendix G method is a ratio that compares the annual site energy use associated with your proposed design to the site energy that would have been used 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 site energy divided by the baseline design regulated site energy must be less than the BPF in the table. As an example, the BPF for an office building is 0.44, so the proposed design regulated uses can use no more than 44 percent as much energy as would have been consumed by the regulated uses of a 2004 ASHRAE baseline building.

“Regulated uses” include equipment 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.

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

In addition to meeting the building performance factor, the 2021 SEC requires meeting a “site energy performance target,” listed for each occupancy type in Table C407.3(3). This target includes estimated unregulated energy uses, and credits energy production from renewable sources such as rooftop solar.

To maintain the insulating value of the building envelope, the Proposed Total UA, as defined in Equation 4-2, Section C402.1.5, can be no more than 10 percent

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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.

Section C406 – Additional Efficiency Package Options not Required

You are not required to obtain C406 options when using the TPP or TBP in the 2021 Seattle Energy Code.

What is the Target Performance Path (C401.5)?

The Seattle Energy Code includes an outcome-based path for compliance called the Target Performance Path (TPP), that is described in SEC Section C401.5. 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 by code, 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 ASHRAE

90.1, Appendix G). Mandatory in this case means that they must be included in the building design and cannot be traded away through energy modeling. Examples of these measures include air barrier testing, HVAC controls, solar readiness, and many more.

Energy Modeler Qualifications

The energy analyst in responsible charge must have one of the following qualifications:

- ASHRAE Building Energy Modeling Professional (BEMP)
- Association of Energy Engineers Building Energy Simulation Analyst (BESA)
- Completion of at least 5 energy modeling projects within the previous three years that were reviewed and approved by a code official.

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 can only claim savings in the energy model for strategies that are 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 2021 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

- [US Department of Energy \(DOE\) modeling review manual for Appendix G models](#)
- A 2-hour training on [Appendix G basics](#) is available from DOE
- ASHRAE Standard 90.1 – 2022 is available in digital or hard copy formats from the [ASHRAE Store](#)

Resources for City Light Customers

[Seattle City Light](#) has resources for customers who comply with the 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 the following two websites:

- [Energy Efficiency Program Tools and Resources - City Light | seattle.gov](#)
- [Large Commercial and Industrial Business Solutions - City Light | 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.