Compliance Forms— Performance Rating Method

The following pages describe information that must be submitted to the rating authority when documenting compliance with energy code or above code performance following the Performance Rating Method of ASHRAE/IES Standard 90.1 (Appendix G). An electronic version is available for download from ASHRAE's website.

The documentation must meet requirements in Section G1.3.2 and make clear to the rating authority or building official what the building characteristics are and how the rating method has been applied.

Contact Information

This section records building address and the contact information of permit applicant, design professionals and energy modeler.

General Project Information

The section includes the following:

a. Title and date for the design document package (drawings and specifications) that the proposed design model is based on.
b. Whether submittal is for documenting minimum code compliance or above-code performance
a. The version of the simulation program and the link to the website that contains the ASHRAE Standard 140 results for the version used in accordance with Section G2.2.4.
b. Weather station used in the simulation and type of the weather file (e.g. TMY2, TMY3, etc.)
c. Project climate zone
d. Description of building areas and systems excluded from energy model, if any, as allowed by Table G3.1 #2.
e. Description of yet to be designed systems and components, if any (Table G3.1 Proposed Building Performance column #1(c).

Table 1 Building Area Summary

This section reports the different building uses included in the building as required in G1.3.2 b. The following must be provided for each building area type:

a. Number of above and below grade floors
b. Floor area broken out by space conditioning category as defined in Section 3 including conditioned, semi-heated, unconditioned and un-enclosed spaces.
c. For each space conditioning category, new construction versus alteration floor area must be reported.

In addition, the Building Performance Factor (BPF) for each building use for the project climate zone from Table 4.2.1.1 is entered. The total area area-weighted BPF is calculated here, and will be used later to determine project compliance.

Table 2 Energy Sources

This section lists all purchased energy sources used in the proposed design such as electricity, gas, district steam and chilled water (G1.3.2 m). For each energy source, the energy consumption units (e.g. kWh, MMBtu), energy demand units (e.g. kW, Btu/hr) are provided and utility rate structure used in the simulation is described, including but not limited to energy and demand charges, time of use charges and block rates. For example, description of electricity rate structure may include off peak $/kWh and $/kW charges, the corresponding peak and off-peak time intervals, and variation in rates by month and day of the week. The source of utility rates must be included for each energy source (G2.4.2).

Table 3 Advisory Messages

This section reports information from the simulation runs that is helpful in identifying modeling problems or special situations (G1.3.2 n). It also includes the number of hours when heating and cooling loads were not met, to allow verifying compliance with requirements in G3.1.2.3

Description of Proposed and Baseline Design Models

This section includes the detailed information about systems and components in the proposed design model, the corresponding mandatory and prescriptive requirements, and the components in the baseline design model.

Sub-sections are required for building envelope, HVAC, service water heating, power, lighting and other equipment. The level of detail provided for each system and component must be aligned with that in the compliance forms for Sections 5 – 10.

In addition, there will be a sub-section describing any process equipment included in the simulation and a sub-section for any other special systems such as combined heat and power.

The details provided in each subsection must include the following:

a. A list of the *energy*-related features that are included in the design and on which the performance rating is based. This list shall document all *energy* features that differ between the models used in the *baseline building performance* and *proposed building performance* calculations. (G1.3.2 c)
b. A list identifying those aspects of the *proposed design* that are less stringent than the requirements of Sections 5.5, 6.5, 7.5, 9.5, and 9.6 (prescriptive provisions) (G1.3.2 e) and a list of those aspects that exceed the prescriptive requirements (G1.3.2 a)
c. A list showing compliance for the *proposed design* with all the requirements of Sections 5.4, 6.4, 7.4, 8.4, 9.4, and 10.4 (mandatory provisions). (G1.3.2 d)

Renewable Energy

The information included in this section describes the renewable energy systems in the proposed design including technology type, system location, system ownership and generation output capacity, to establish applicability of renewable energy requirements in Section G2.4.1.

Exceptional Calculations

The section includes the list of exceptional calculations and a checklist to confirms that required supporting documentation for each exceptional calculation method is submitted (G2.5).

Table 4 Energy Use and Cost Summary by Energy Source and End Use

This table reports the energy consumption and energy cost for the proposed and baseline buildings by end use. Each end use is grouped under either regulated or unregulated energy. Total regulated and unregulated energy cost is calculated and summed to find the total building energy cost. In addition, energy savings calculated using the exceptional calculations are reported. Regulated, unregulated and total energy cost for the baseline and proposed design models and exceptional calculation results will be used in the next section.

Table 5 Energy Use by Energy Source

This section summarizes energy use and cost by fuel type for the proposed and baseline building.

Table 6 Performance Cost Index and Performance Cost Index Target

This section is used to calculate the Performance Cost Index Target (PCI_t) that the proposed building must meet. The total area weighted BPF and the regulated, unregulated and total energy cost for the baseline building are transferred from previous tables and used in the calculation. The Performance Cost Index (PCI) is also calculated. The PCI including solar is then compared to the PCI_t, and the building complies if the PCI does not exceed PCI_t.

Supporting Documentation Checklist

This section lists supporting documentation that must be included along with the filled out compliance form (G1.3.2).

Performance Rating Report

Project Name:		
Project Address:		Date:
Designer of Record:	Email:	Telephone:
Contact Person:	Email:	Telephone:
City:		

General Project Information

Design Documents Used as Basis for Energy Models Name:		Date
Simulation Program Name:	Version:	Link to Standard 140 Results:
Weather Station Location:	Data Type:	File Name
Minimum Code Compliance? ☐ Above Code Performance? ☐		
Climate Zone:		

Building areas and systems excluded from energy model, if any.

Yet to be designed systems and components, if any

Table 1 Building Area Summary

Building Use	Conditioned Area (ft² or m²)		Semi-heated and Uncond. Area (ft² or m²)		Total Area (ft² or m²)		Unenclosed Space Area (ft² or m²)	Above Grade Floors	Below Grade Floors	BPF (Table 4.2.1.1)
	New Const.	Alteration	New Const.	Alteration	New Const.	Alteration				
Total Area										
Area Weighted BPF (4.2.1.1)										

Table 2 Energy Sources

Energy Source Type	Energy Consumption Units	Demand Units	Rate Type	Fee Structure Description

Table 3 Advisory Messages

	Proposed Design Model	Baseline Building Model	Difference: Proposed – Baseline
Number of hours heating loads not met (system/plant)			
Number of hours cooling loads not met (system/plant)			
Number of warnings			
Number of errors			
Number of defaults overridden			

Description of Proposed and Baseline Design Models

For each of the following subsections, provide the following:

a. A list of the *energy*-related features that are included in the design and on which the performance rating is based. This list shall document all *energy* features that differ between the models used in the *baseline building performance* and *proposed building performance* calculations. (G1.3.2 c)

b. A list identifying those aspects of the *proposed design* that are less stringent than the requirements of Sections 5.5, 6.5, 7.5, 9.5, and 9.6 (prescriptive provisions) (G1.3.2 e) and a list of those aspects that exceed the prescriptive requirements (G1.3.2 a)

c. A list showing compliance for the *proposed design* with all the requirements of Sections 5.4, 6.4, 7.4, 8.4, 9.4, and 10.4 (mandatory provisions). (G1.3.2 d)

   1. Building Envelope
Complete Building Envelope Compliance Form 2019 in this User's Manual to describe proposed design. Use the same tables to document applicable prescriptive requirements and baseline model components as required by G1.3.2 (c) and G1.3.2 (e), and that the mandatory provisions are met as required by G1.3.2 (d).

   2. HVAC
Complete HVAC Compliance Form 2019 in this User's Manual to describe proposed design. Use the same tables to document applicable prescriptive requirements and baseline model components as required by G1.3.2 (c) and G1.3.2 (e), and that the mandatory provisions are met as required by G1.3.2 (d).

   3. Service Water Heating
Complete Service Water Heater Compliance Form 2019 in this User's Manual to describe proposed design. Use the same tables to document applicable prescriptive requirements and baseline model components as required by G1.3.2 (c) and G1.3.2 (e), and that the mandatory provisions are met as required by G1.3.2 (d).

   4. Lighting
Complete Lighting Compliance Form 2019 in this User's Manual to describe proposed design. Use the same tables to document applicable prescriptive requirements and baseline model components as required by G1.3.2 (c) and G1.3.2 (e), and that the mandatory provisions are met as required by G1.3.2 (d).

   5. Other Equipment

System Name	System Description	Prescriptive Requirements	Proposed Design Model Inputs	Baseline Model Inputs

6. **Process loads and special systems.**

Provide additional sub-sections for any major process equipment or special systems (such as combined heat and power) that are included in the simulation.

Renewable Energy

System Name:	Technology Type:	Located On-Site? ☐ Yes ☐ No

☐ Building owner owns the *on-site renewable energy system*.

☐ Building owner has signed a lease agreement for *the on-site renewable energy system* for at least 15 years.

☐ Building owner has signed a contractual agreement to purchase *energy* generated by the *on-site renewable energy system* for at least 15 years.

☐ Other.

Exceptional Calculations

Name	Description	Reduction in Energy Cost by Fuel Type
Total		

The following supporting documentation is provided for each exceptional calculation (G1.3.2o):

☐ Step-by-step documentation of the exceptional calculation method performed, detailed enough to reproduce the results.

☐ Copies of all spreadsheets used to perform the calculations.

☐ A sensitivity analysis of *energy* consumption in which each of the input parameters is varied from half to double the value assumed.

☐ Theoretical or empirical information supporting the accuracy of the method.

Table 4 Energy Use and Cost Summary by Energy Source and End Use*

Regulated Energy	Energy Type	Proposed Building		Baseline Building	
		Energy (10⁶ Btu/yr or MJ/yr)	Energy Cost ($/yr)	Energy (10⁶ Btu/yr or MJ/yr)	Energy Cost ($/yr)
Lighting					
Space heating					
Space cooling					
Fans					
Pumps					
Heat rejection					
Service water heating					
Refrigeration					
Elevators and escalators					
Motors					
Transformers					
Other regulated loads					
Total Regulated Electric Energy					
Total Regulated Gas Energy					
Total Regulated Energy					
Unregulated Energy					
Office equipment					
Other computers/servers					
Cooking (commercial)					
Other unregulated loads					
Total Unregulated Electric Energy					
Total Unregulated Gas Energy					
Total Unregulated Energy					
Exceptional Calculations Energy Savings					
Total Energy Including Regulated, Unregulated and Exceptional Calculations					

* These results use assumptions for showing compliance during a typical year; actual energy costs may be substantially different.

☐   The total reduction in the energy cost of the proposed design for all exceptional calculations constitute no more than half of the difference between the baseline building performance and the proposed building performance.

Table 5 Energy Use by Energy Source*

	Proposed Building		Baseline Building	
	Energy Use (10⁶ Btu/yr or MJ/yr)	Energy Cost ($/yr)	Energy Use (10⁶ Btu/yr or MJ/yr)	Energy Cost ($/yr)
Electricity				
Natural gas				
Other fossil fuel				
District steam/hot water				
District chilled water				
Total without renewable energy				
Renewable energy				
Total including renewable energy				

* These results use assumptions for showing compliance during a typical year; actual energy costs may be substantially different.

Table 6 Performance Cost Index Target

Variable	Description	Value	Source
BBUEC	Baseline Building Unregulated Energy Cost ($)		Table 4
BBREC	Baseline Building Regulated Energy Cost ($)		Table 4
BBP	Baseline Building Performance Energy Cost ($)		BBREC+BBUEC
BPF	Total Area Weighted Building Performance Factor		Table 4
PCI_t	Performance Cost Index Target		$[BBUEC + (BBREC \times BPF)]/BBP$
PBP	Total proposed building energy cost including renewable energy ($)		Table 5
PBPpre	Total proposed building energy cost excluding renewable energy ($)		Table 5
PCI	Performance Cost Index		PBP/BBP
Renewable Pct	Percent renewable energy savings		(PBPnre – PBP)/BBP

'

Is (PBPnre – PBP)/BBP > 0.05?

□   Yes

        Is PCI + [(PBP$_{nre}$ – PBP) / BBP] – 0.05 < PCI$_t$?

        □   Yes, project Complies

        □   No, project does not comply

□   No

        Is PCI < PCI$_t$?

        □   Yes, project Complies

        □   No, project does not comply

Supporting Documentation Checklist

☐ A site plan showing all adjacent *buildings* and topography that may shade the proposed *building* (with estimated height or number of stories). (G1.3.2g)

☐ *Building* elevations and *floor plans (G1.3.2h)*

☐ A diagram showing the *thermal blocks* used in the computer simulation *(G1.3.2i)*.

☐ An explanation of any significant modeling assumptions *(G1.3.2j)*.

☐ Backup calculations and material to support data inputs (e.g., *U-factors* for *building envelope* assemblies, NFRC ratings for *fenestration*, end-uses identified in Table G3.1, "1. Design Model," paragraph [a]) *(G1.3.2k)*.

☐ Input and output reports from the *simulation program* or compliance software, including a breakdown of *energy* use by at least the following components: lighting, internal *equipment* loads, *service water-heating equipment*, *space*-heating *equipment*, *space*-cooling and heat rejection *equipment*, fans, and other HVAC *equipment* (such as pumps). The output reports must also show the amount of *unmet load hours* for both the *proposed design* and *baseline building design (G1.3.2l)*.

Performance Rating Result

☐ The proposed and baseline buildings comply with all applicable mandatory requirements and the requirements of the Performance Rating Method of ANSI/ASHRAE/IES Standard 90.1–2019.

Individual certifying authenticity of the data provided in this analysis:

Signature	Title