



Commercial Performance-based Compliance QA/QC Provider and Submittal Reviewer Accreditation Seed Document

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1. Foreword

Whole building energy modeling is increasingly used to document compliance with energy code, qualify projects for utility incentives and in green building certifications. *A Roadmap to Establishing Quality Control and Quality Assurance Infrastructure for Performance-based Compliance*¹ identified creation of a national certifying body that will oversee accreditation of building energy modeling (BEM) tools, energy modelers, submittal reviewers and training providers as the key long-term priority for improving consistency and market acceptance of compliance modeling. *A National BEM Certification Scoping Study*² that reviewed multiple modeling-based programs and certifying body precedents identified establishing a network of third-party quality assurance and quality control providers (QA/QC Providers) as one of the key focus areas for a successful market-based certifying body.

Responsibilities of QA/QC providers include establishing a submittal review process, overseeing submittal reviewers and facilitating submittal reviews, and maintaining files and records for reviewed projects. It is envisioned that the same accreditation process may be used for all Modeling Standards, except the specific technical requirements such as the submittal review steps and training requirements would vary. Below are several examples of a possible engagement between an RA/AHJ, the Certifying Body and the accredited QA/QC Providers.

Example 1: A beyond-code program is based on ASHRAE 90.1 PRM. The RA administering the program chooses to defer to the Certifying Body in respect to energy analyst and submittal reviewer qualification requirements, acceptable BEM software, and reporting requirements. The RA requires participating projects to engage with an accredited QA/QC Provider of their

¹ [Performance-Based Code Compliance: A Roadmap to Establishing Quality Control and Quality Assurance Infrastructure](#), M. Karpman M. Rosenberg, April 2021

² [National BEM Certification Scoping Study - IBPSA-USA](#), M. Karpman, Christina LaPerle, Sep 2023

choice, and directs QA/QC Providers to perform reviews based on Tier 2 scope (as described in Appendix E of this document). The fee for review services are agreed upon between the project submitter and QA/QC Provider. QA/QC Providers report review outcomes for each reviewed project to the RA and to the Certifying Body. The Certifying Body performs QA review of 2-5% of the approved projects.

Example 2: Jurisdiction has the energy code that allows performance-based compliance following 90.1 ECB and PRM. It adopts the Certifying Body QA/QC framework.

- Projects completed by energy analysts that do not have any prior approved projects with the jurisdiction, or projects involving large and complex buildings are required to engage with an accredited QA/QC Provider. The fee for review services are agreed upon between the project submitter and QA/QC Provider. QA/QC Providers are directed to perform Tier 3 reviews as described in Appendix E. The Certifying Body performs QA review of 2-5% of the projects approved by the accredited providers for the program. Optionally, AHJ may perform Tier 1 review of the approved projects.
- All other projects are reviewed in-house by the internal staff following Tier 1+ review scope described in Appendix E.

Example 3: Jurisdiction reviews all submittals in-house, ensuring that reviewers meet reviewer qualifications, modelers meet modeler qualifications, and the submittal review tier is defined.

It is envisioned that the certifying body and the QA/QC providers will operate using a market-based business model. The certifying body activities will be financed by QA/QC Provider accreditation fees and other similar sources. QA/QC Providers may establish a market-based fee structure for the projects

that they review or seek funding from beyond-code program administrators to support their oversight activities.

This document describes QA/QC Provider and submittal reviewer accreditation process that a certifying body may adopt. It also includes a sample submittal review process including three tiers of the review rigor, from Tier 1, that may be appropriate for jurisdictions with limited resources that must perform submittal review in-house to Tier 3, which involves the highest review rigor that may be used by beyond-code programs.

2. Definitions

Authority Having Jurisdiction (AHJ) is an agency or agent responsible for enforcing energy code compliance.

Building Energy Modeling (BEM) Program: a computer program used to simulate the energy performance of building systems.

Certifying Body (CB) is an organization responsible for developing and maintaining the QA/QC Provider accreditation process, overseeing QA/QC Provider accreditation, and performing quality assurance of QA/QC Provider work. The Certifying Body is analogous to RESNET.

Energy Analysts are professionals responsible for performing energy modeling and developing documentation showing compliance with the Modeling Standards. They are analogous to RESNET Raters and Modeling Providers.

Modeling Standards are a set of rules and requirements including but not limited to performing whole building energy simulation that apply to new construction and/or retrofit projects. Examples of the modeling standards include but are not limited to ASHRAE 90.1 Energy Cost Budget Method (ECB), ASHRAE 90.1 Performance Rating Method (PRM) and IECC Total Building Performance (TBP).

Performance-based Compliance QA/QC Providers (QA/QC Providers) are the organizations that are accredited to perform submittal reviews of projects that follow the Modeling Standards. These organizations are analogous to RESNET Rating Providers. The QA/QC Providers may be engaged as third-party reviewers by Authorities Having Jurisdiction (AHJs) and Rating Authorities (RAs). Alternatively, AHJs and RAs may use the proposed framework to perform QA/QC in-house, effectively fulfilling responsibilities of QA/QC Providers for their code compliance or beyond code programs.

Rating Authority (RA) is an organization or agency that adopts the Modeling Standards for quantifying beyond-code performance. Examples of RAs include administrators of utility incentive programs and green building certifications.

Submittal Reviewers are professionals affiliated with QA/QC Providers (are either QA/QC provider employees or subcontractors) who are responsible for reviewing projects that use the Modeling Standards to document compliance with energy code or beyond code performance, or AHJ/RA staff performing review in-house. Submittal Reviewers are analogous to the RESNET Rating Provider staff.

3. QA/QC Provider Roles and Responsibilities

Entities seeking QA/QC Provider recognition must submit an application to the certifying body demonstrating the ability to fulfill the following roles and responsibilities:

- Establish submittal reviewer qualification requirements and engage with professionals meeting these qualifications;
- Facilitate review of the submittals following an agreed upon scope of work. A sample third party reviewer scope of work is published at [DOE EnergyCodes website](#).
- Develop and implement submittal review quality assurance process;
- Develop and implement submittal review dispute resolution process;

- Develop and implement a process for communicating with the energy analysts and the certifying body;
- Maintain project files and records; and
- Participate in meetings and communications with the Certifying Body.

4. QA/QC Provider Accreditation Process

4.1 Initial Accreditation

The candidate organizations (Applicants) must complete the application found in Appendix A and submit it to the certifying body (CB) for review.

- The CB will accept and review the applications on a rolling basis.
- CB will confirm receipt of applications within 5 business days and notify the Applicant regarding CB's determination on the application within 20 business days.
- CB application approval is contingent upon the Applicant demonstrating that it meets the eligibility criteria and can satisfactorily fulfill all required roles and responsibilities.
- CB will inform the candidate organizations whose applications are not approved of the specific deficiencies identified. Applicants that are rejected are invited to contact the CB to further discuss their applications and to re-apply based on feedback.
- Once recognized, the Provider must abide by all the CB requirements to maintain their recognition.

4.2 Termination

If, after recognition, the CB determines that a Provider is not adequately meeting its required roles and responsibilities or is not acting in good faith, the CB will notify the Provider in writing notification and allow a period of 30

days to resolve identified issues and provide CB with a written response summarizing the changes made. If the organization fails to meet this requirement, CB will suspend or rescind recognition.

4.3 Renewal

- A. Accredited Providers must submit an "application for renewal" (renewal application) to the CB once every two years, no later than October 1st of the calendar year when certification is due. By September 1st, CB shall send to each Provider a renewal application and reminder of the deadline for submission.
- B. At the time of submitting a renewal application, it is the accredited Provider's responsibility to inform CB staff of any substantive changes in the Provider's operating policies and procedures or other information that may affect the provider fulfilling the required roles and responsibilities.

Appendix A: Application to Become an Accredited QA/QC Provider

DEFINITIONS

Applicant: the organization submitting the application to become an accredited QA/QC Provider.

Energy Analyst, Submitter: the person responsible for performing the energy modeling and developing documentation for the applicant to show compliance with the Modeling Standards.

Submittal Reviewer, Reviewer: the professional responsible for reviewing the submissions

PART ONE: General Applicant Information

Organization Name: _____

Mailing Address: _____

Primary Contact: _____

Primary Contact Telephone #: _____

Primary Contact E-mail Address: _____

Organization Web Site Address: _____

PART TWO: Ability to Operate Impartially

QA/QC Provider must preserve objectivity and maintain a system or process to safeguard impartiality. The applicant must attach documentation demonstrating that the organization meets the following criteria:

- Maintains policies to ensure that potential conflict of interest issues are identified and avoided;

- Maintains an open participation policy related to Submitter qualifications;
- Maintains impartiality and confidentiality in the project approval process;
- Maintains impartiality in the internal oversight of Reviewers;
- Establishes an impartial conflict resolution process;

The *applicant* acknowledges that the *QA/QC Provider* shall not review documentation for projects for which its staff member or consultant served as an Energy Analyst [].

PART THREE: Ability to Meet Required Roles and Responsibilities

The *applicant* must attach documentation that describes the organization’s policies and approach to conducting each of the following:

1) Establish Submittal Documentation Requirements

QA/QC Provider must require that submitters use a reporting format that meets requirements of the Modeling Standards

- The Applicant will [] will not [] require submitters to provide a filled out DOE/PNNL 90.1 Energy Cost Budget Method or Performance Rating Method Compliance Form (CF) for projects following these protocols.
- The Applicant will [] will not [] accept alternate submittal documentation. If the Applicant is proposing to accept alternate documentation, the alternative reporting template is [] included with the application, and documentation is provided [] to demonstrate that it meets the reporting requirements of the applicable standards³.

³ Projects following ASHRAE 90.1 Energy Cost Budget Method or Performance Rating Method must use [DOE/PNNL ASHRAE Standard 90.1 Performance Based Compliance Form](#) or an equivalently detailed format.

- The Applicant will [] will not [] require submitters to provide the construction documents
- The Applicant will [] will not [] require submitters to provide the modeling files

3) Establish Submittal Review Process

QA/QC Provider must establish a formal and defined submittal review process.

- The Applicant will [] will not [] utilize the submittal review process included in Appendix C.
- If an alternative submittal review process will be utilized, detailed description of an alternative submittal review process is [] included in an attachment, and justification is [] provided to demonstrate that it is not less rigorous than the process included in Appendix C.

In an attachment, please specify:

- How projects are assigned to submittal reviewers;
- What policies are in place to ensure a consistent review across different submittal reviewers;
- What policies are in place to regarding multiple review iterations;
- The estimated turn-around time for submittal reviews; (The target turnaround time should not exceed 20 business days.)
- How comments related to the review (e.g., why a submission was not accepted) will be communicated to the Submitter

4) Establish Submittal Reviewer Qualification Requirements and Engage Qualified Reviewers

QA/QC Provider must ensure that all Submittal Reviewers possess the knowledge, skills, and abilities to effectively review the project submission.

- The *applicant* will [] will not [] require all submittal reviewers to meet qualification requirements in Appendix B.

- The *applicant* will [] will not [] require submittal reviewers signing off on the review to meet qualification requirements included in Appendix B.
- If alternative qualification requirements are used, these alternative requirements are included in the attachment and a narrative is [] provided to demonstrate that these requirements are equally rigorous.

5) Establish Quality Assurance Process

QA/QC Provider must develop and employ an internal quality assurance process to ensure proper oversight of the submittal reviews.

- In an attachment, please describe the organization’s internal quality assurance process, including how quality assurance is performed and on what elements of the review process, who is responsible for performing quality assurance, and policies and procedures for addressing deficiencies when they are identified.

6) Establish Dispute Resolution Process

QA/QC Provider must develop and maintain a Dispute Resolution Process that includes a formal framework for addressing issues or disagreements that may arise between the Submitter’s project team (Modeler, Submitter, Developer, etc.) and the Provider’s Reviewer(s).

- In an attachment, please describe the organization’s Dispute Resolution Process.

7) Communications with Submitters and the Certifying Body

QA/QC Provider must develop and maintain communication process with the submitter and the Certifying Body, including but not limited to submittal review comments and review outcome such as submittal acceptance or rejection. The Applicant acknowledges this requirement. []

8) Data Management

QA/QC Providers must maintain all submitted project files reviewed by their organization for at least 7 years after final certification.

The Applicant [] agrees to furnish to the CB any and all project files upon request.

QA/QC Providers must report the following information to the CB on a quarterly basis for each submitted project:

- Project name; address; developer and/or builder name; submitter name; modeler name; buildings occupancy type; path used (90.1 ECB, 90.1 PRM, IECC TBP) and code edition (e.g., 90.1 2016); and status of the project.
- If available, also include: % improvement over code; project website; participation in other green building programs.
- Review turnaround times.

The Applicant acknowledges this requirement. []

9) Coordination with the Certifying Body

QA/QC Provider must participate in periodic conference calls or webinars with the Certifying Body to be informed of program updates, provide information on successes and challenges, and to help ensure consistency of review and certification activities across the program.

- *Applicant* acknowledges this requirement. []

Appendix B: Submittal Reviewer Qualification Requirements

Submittal Reviewer is a professional who performs submittal review or signs off on the submittal review performed by others and is responsible for the review quality. Submittal Reviewer shall have a combination of professional certifications, training and professional experience adding up to the minimum of 30 points based on Table 1.

Examples of Acceptable Qualifications:

1. Mandatory trainings + ASHRAE Building Energy Modeling Professional (BEMP) certification (20 points) + 5 successful project reviews (5x2=10 points)=30 points
2. Mandatory trainings + 10 hours of trainings of submittal reviews (10*0.5=5) + 10 project reviews (10x2=20 points) + 3 energy models (3x2=6) = 31 points
3. Mandatory trainings + (5 points)+13 submittal reviews (2x13)=31 points

Table 1: Submittal Reviewer Minimum Qualification Requirements

REQUIREMENT	NUMBER OF POINTS
A (Mandatory). Training on the applicable Modeling Standard (e.g., ASHRAE Standard 90.1 Section 11 or Appendix G)	8 hours required 0.5 points for each additional training-hour up to 5 points
B (Mandatory). Training on compliance documentation	2 hours required 0.5 points for each additional training-hour up to 5 points
C. ASHRAE Building Energy Modeling Professional (BEMP) certification	20 points
D. Association of Energy Engineers Building Energy Simulation Analyst (BESA) certification	10 points

E. Submittal review training	0.5 points per training-hour, up to 5 points
F. Successful completion of projects modeled following the applicable modeling standards (e.g., 90.1 Section 11 or Appendix G) within the last three years that were reviewed and approved by AHJ/RA.	2 points per project
G. Successful completion of submittal review on a project modeled following the applicable modeling standards (e.g., 90.1 Section 11 or Appendix G) within the last three years that were approved by AHJ/RA, while acting independently or under the supervision of a senior reviewer meeting these Submittal Reviewer qualification requirements.	2 points per project

The following supporting documentation shall be submitted to demonstrate compliance with the minimum qualification requirements:

- a. BEMP or BESA accreditation certificate
- b. Training completion certificates with the name of the training provider, course name, date, and number of hours; see Appendix C for the material that must be covered by each type of training.
- c. List of projects used to meet criteria F. The following information must be included for each project:
 - Applicant role
 - Lead energy modeler
 - Supporting energy modeler
 - Lead reviewer, independent review
 - Lead reviewer, under supervision of qualified reviewer
 - Other (please describe)
 - Compliance path followed by the project
 - Edition of 90.1 (e.g. 2007, 2010, 2013, etc.)
 - Modeling protocol (90.1 Section 11, 90.1 Appendix G)
 - Project context

- Above-code program (indicate which one, e.g. LEED NC v4.0)
- Minimum code compliance (indicate jurisdiction)
- Project overview
 - Include building type (e.g., multifamily, office, hospital), floor area, location, summary of HVAC design, summary of features that are improvements over minimum code requirements.
- Simulation Program (e.g. EnergyPlus, eQUEST, IES-VE, TRACE 3D)
- For completed models, when demonstrate compliance with criterion 3a:
 - Name of RA/AHJ to which the model was submitted (e.g. USGBC, NYC DOB)
 - Number of review iterations before the final approval
 - RA/AHJ contact information
- For completed reviews, when demonstrating compliance with criterion 3b:
 - Name of RA/AHJ on behalf of which the review was completed (e.g. USGBC, NYC DOB)
 - Contact information for the supervising senior reviewer (if applicable)
 - RA/AHJ contact information

Appendix C: Training Courses

ASHRAE Standard 90.1 Section 11 or Appendix G

The training must be the minimum of 8 hours and meet the following learning objectives:

- Articulate the energy modeling requirements of the ASHRAE 90.1 Appendix G Performance Rating Method and Section 11 Energy Cost Budget Method for building envelopes, lighting, HVAC, service water heating, and miscellaneous other systems.
- Name similarities and differences between the two compliance options.
- Differentiate between design elements and systems that do and do not qualify for performance trade-offs.
- Describe 90.1 mandatory requirements that projects must meet
- Describe how to establish the configuration of the baseline and proposed design models for renovation, core and shell and tenant fit-out projects when following Section 11 and Appendix G.
- Understand how to use energy modeling results to establish compliance.

Compliance Documentation for ASHRAE Section 11 and Appendix G

The training must be the minimum of 2 hours and meet the following learning objectives:

- Understand the reporting requirements of ASHRAE Standard 90.1 Section 11 and Appendix G.
- Understand the documentation that must be submitted to RA/AHJ for performance-based projects.
- Understand how to fill out the Compliance Form to limit the number of review iterations.

Review of ASHRAE 90.1 Section 11 and Appendix G Modeling-based Submittals

The training must be the minimum of 8 hours and cover the following learning objectives:

- Understand how to check submittals for completeness;
- Confirm that building systems and components shown in the Compliance Form reflect design documents;
- Verify that the configuration of the baseline (budget) design model is established correctly based on the applicable rules of ASHRAE 90.1 Section 11 or Appendix G;
- Use simulation reports to verify that the baseline (budget) and proposed designs were modeled as described in the Compliance Form;
- Verify that the compliance outcome was established correctly based on the simulation results.

Instructor Credentials

1. One of the following professional certifications:
 - a. ASHRAE Building Energy Modeling Professional (BEMP)
 - b. Association of Energy Engineers Building Energy Simulation Analyst (BESA)
2. Successfully completed at least 5 projects modeled following ASHRAE Standard 90.1 Section 11 or Appendix G that were reviewed and approved by AHJ/RA.
3. Successful completion of submittal review on at least 10 projects modeled following ASHRAE Standard 90.1 Section 11 or Appendix G that were approved by AHJ/RA, while acting independently or under the supervision of a senior reviewer meeting qualifications 1, 2 and 3a.

4. Demonstrated experience for delivering the following trainings
 - a. ASHRAE Standard 90.1
 - b. Energy modeling or submittal review following ASHRAE 90.1 Section 11 and Appendix G

Supporting documentation for criteria 1-3 is the same as for reviewer qualifications,

Supporting documentation for criteria 4 must include the following:

- a. Name of the course
- b. Number of hours
- c. Applicant role (curriculum developer, presenter, co-presenter)
- d. Number of sessions delivered
- e. Course accreditation for continuing education credits (e.g. AIA, USGBC, etc.)

Appendix D: Submittal Review Process

AHJs/RAs may choose different submission review scopes depending on their enforcement philosophy and available resources. This appendix provides three sample scopes of varying rigor, starting from Tier 1 (least rigorous) to Tier 3 (most rigorous). Additional details on the specific review steps for projects following ASHRAE 90.1 Energy Cost Budget Method or Performance Rating Method are found in the [Submittal Review Manual](#) (the Manual) that includes the following:

- The review checks to verify that the proposed design reported in the Compliance Form reflects design documents; that the configuration of the baseline/budget model is established correctly, that the baseline/budget and proposed design is modeled as reported, that the simulation is error-free, and that the compliance outcome is established correctly;
- Checks to verify compliance with the mandatory requirements of 90.1 relevant to the simulation inputs;
- Examples and common mistakes;
- The methodology for prioritizing the review;
- Simulation reports for common BEM tools annotated with tips on performing specific checks.

In addition to detailed description of several hundred of the model review checks, the Manual provides recommendations to jurisdictions and rating authorities for establishing effective and efficient submittal review process and methodology for identifying impactful systems and components in a particular project to help prioritize review. Recorded training courses are available on the DOE Energy Code website on using the [Submittal Review Manual](#) and the [Compliance Form](#).

The scopes described below assume that projects use ASHRAE 90.1 Performance Based Compliance Form, but may be adapted to projects that use other reporting formats. Review prioritization strategies

Tier 1

Tier 1 review scope includes verifying that submittal is complete and that there are no unresolved flags in the Quality Control Checks tab of the Compliance Form. This scope covers Steps 1 and 5 and a subset of Step 3 tasks described in the Review Process section of the [Submittal Review Manual](#).

- A. Use the Submittal Checklist tab of the Compliance Form to verify that all required materials are provided. Request additional information if the submission is incomplete.
- B. Review the Dashboard tab of the Compliance Form to verify compliance outcome and confirm that modeler and design professional signed off on the submittal
- C. Open Quality Control Checks tab of the Compliance Form (Figure 1). The tab includes all review checks listed in the Review Manual. For some of the checks, the review outcome is automatically set to “Pass” or “Fail” based on the information provided on other tabs of the Compliance Form. There should be either no “Fail” flags, or an acceptable explanation is provided by the submitter for each such flag.

CheckID	QC Check	Include in Review?	Review Outcome	Rev 0 Review Comments
Ref SG01	The same approved weather file was used in the baseline and proposed design simulations	Yes		
Ref SG02	At least 8760 hours per year were explicitly modeled.	No	n/a	
Ref SG03	The number of unmet load hours (UMLH) for baseline and proposed design is below 300.	Yes	Pass	
Ref SG04	Confirm that the modeled floor area of the proposed design reflects design documents.	Yes		

Figure 1: Quality Control Checks tab of the Compliance Form

- D. Provide written comments to the applicant if corrective actions are required or approve the submission. The comments may be communicated by returning the Compliance Form with the filled-out Quality Control Checks tab to the applicant

Tiers 2 and 3

Tier 2 review scope includes verifying submission for completeness and performing the highest priority review checks. Tier 3 includes additional checks highlighted below that target systems and components that are impactful for the particular project.

Step 1: Check submittal for completeness

- A. Use the Submittal Checklist tab of the Compliance Form to verify that all required materials are provided. Request additional information if the submission is incomplete.
- B. Review the Dashboard tab of the Compliance Form to verify compliance outcome and confirm that modeler and design professional signed off on the submittal as required

Step 2: Get general understanding of the project

- A. Review the General Information tab of the Compliance Form to understand building type, size, location, whether it's a new construction or renovation and the compliance path followed
- B. Review the Energy Performance Summary tab of the Compliance Form to understand which end uses have significant impact on the modeled energy use. (See Identifying Impactful Aspects of the Submittal section of the Review Manual.)

Step 3: Establish Review Scope

- A. Open Quality Control Checks tab of the Compliance Form. The tab includes all review checks listed in the manual. Complete review for the checks with the "Include in Review" box set to "Yes". (These settings follow the logic described in the Establishing Review Scope section of the Review Manual.)

- B. For some of the pre-selected checks, the review outcome is automatically set to “Pass” or “Fail” based on the information provided on other tabs of the Compliance Form. For checks with “Fail” outcome, a default review comment is displayed and may be edited by the reviewer.
- C. Follow recommendations in the Identifying Impactful Aspects of the Submittal and Establishing Review Scope sections of the Manual to identify additional checks to be performed on the project. For these checks, set “Include in Review” box to “Yes” in the Quality Control Checks tab of the Compliance Form (Figure 4).

Step 4: Perform the Review

- A. Perform the selected review checks in the order listed in the QC Checks tab of the Compliance Form. Record “Pass” or “Fail” outcome for each check and provide actionable review comments for each check with the “Fail” outcome.
- A “Pass” outcome means that no changes are required in the given area and any provided comments can be treated as informative.
 - A “Fail” outcome means that changes must be made to the submittal before it is approved. In this case, the issues and required changes should be described in the review comment.
- B. Confirm the outcome on the checks that are automatically set to “Pass” and update the outcome if necessary.
- C. Use CheckID provided in the QC Checks Tab to locate the 90.1 references and tips for performing the check in the Review Checks section of the Manual as necessary.
- D. For checks that involve verifying simulation reports, use the names of the reports listed for each check to locate the annotated reports in the Simulation Reports section of the Manual.

Step 5: Communicate review outcome to the Permit Applicant

Provide written comments to the applicant if corrective actions are required or approve the submittal. The comments may be communicated by returning the Compliance Form with the filled-out Quality Control Checks tab to the applicant

References

1. [DOE/PNNL ASHRAE Standard 90.1 Performance Based Compliance Form](#) (the Compliance Form) is spreadsheet-based and meets the documentation requirements of Standards 90.1-2016 and 2019 Section 11 Energy Cost Budget Method and Appendix G Performance Rating Method. It helps the modeler establish simulation inputs for the baseline/budget and proposed design models and includes a submittal checklist to ensure that all necessary supporting documentation is included in the submittal. It standardizes compliance documentations and simplifies submittal reviews by code officials and administrators of above code program implementers.
2. DOE/PNNL [ASHRAE 90.1 Section 11 and Appendix G Submittal Review Manual](#) (the Review Manual) is a comprehensive reference for reviewing modeling-based submittals. The Manual is a companion to the Compliance Form. It supports 2016 and 2019 editions of ANSI/ASHRAE Standard 90.1. All of the review checks described in the Manual are incorporated into the Quality Control Checks tab of the Compliance Form, and some of the checks are automatically completed and flagged as either Pass or Fail.