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BUILDING ENERGY MODELING STEP-BY-STEP PROCEDURES FOR LEED CERTIFICATION

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ONLINE TRAINING BY KRISHNAJI PAWAR

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BUILDING ENERGY MODELING : STEP-BY-STEP PROCEDURES FOR LEED CERTIFICATION

ANSI/ASHRAE Standard 140-2020 is a crucial document in the field of building energy analysis, developed by the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE). It provides a framework for testing and validating the performance of computer software used in energy modeling of buildings.

Learning Objectives

- **Introduction and Course Outline**

- **Building Energy Modeling Checklists**

- **Scaling an imported drawing from AutoCAD**

- **ANSI/ASHRAE Standard 140-2020**

- **BEM software inputs for the project section, facade, systems, and zones**

- **Setup and Running the Building Energy Modeling Simulation**

- **Review BEM Software Output Reports.**

- **Sample Energy Modeling Report**

- **Summary and Resources**

- **BEMP Practice Test V.4.1**

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INTRODUCTION

- Developed by ASHRAE, it provides a framework for testing and validating computer software in energy modeling.

- Aims to ensure reliable tools for energy use predictions, fostering confidence among engineers, architects, and policymakers.

- Outlines test procedures for assessing energy simulation programs' accuracy and reliability.

- Specifies benchmark models for testing various building types and conditions.

- Importance of validating building energy analysis programs: inaccurate predictions can lead to poor design decisions, increased operational costs, and missed energy savings opportunities.

- Promotes a culture of accountability and rigor in the energy modeling community.

ANSI/ASHRAE STANDARD 140-2020 OVERVIEW

- Developed by the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE).
- Provides a framework for testing and validating the performance of computer software used in energy modeling of buildings.
- Aims to ensure reliable tools for energy use predictions, fostering confidence among engineers, architects, and policymakers.

PURPOSE AND SCOPE

- Establishes a methodical approach for the validation of energy analysis programs.
- Outlines procedures for conducting tests that evaluate how well these programs can replicate known benchmarks or real-world performance.
- Specifies conditions under which simulations should be conducted, types of building configurations that should be tested, and metrics that should be reported.

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KEY COMPONENTS OF THE STANDARD

- Test Procedures: Comparative Testing, Sensitivity Testing, and Robustness Testing.

- Benchmark Models: Designed to represent a variety of building types and conditions.

- Reporting Guidelines: Ensures transparency and reproducibility by detailing input parameters used, methodologies followed, and output results.

KEY COMPONENTS OF ASHRAE 189.1

ASHRAE

ADDENDA

ANSI/ASHRAE Addendum b to
ANSI/ASHRAE Standard 140-2020

Method of Test for Evaluating Building Performance Simulation Software

Approved by ASHRAE and the American National Standards Institute on January 31, 2023.

This addendum was approved by a Standing Standard Project Committee (SSPC) for which the Standards Committee has established a documented program for regular publication of addenda or revisions, including procedures for timely, documented, consensus action on requests for change to any part of the standard. Instructions for how to submit a change can be found on the ASHRAE® website (www.ashrae.org/continuous-maintenance).

The latest edition of an ASHRAE Standard may be purchased on the ASHRAE website (www.ashrae.org) or from ASHRAE Customer Service, 180 Technology Parkway, Peachtree Corners, GA 30092. E-mail: orders@ashrae.org. Fax: 678-539-2129. Telephone: 404-636-8400 (worldwide), or toll free 1-800-527-4723 (for orders in US and Canada). For reprint permission, go to www.ashrae.org/permissions.

IMPORTANCE OF VALIDATION

- Inaccurate energy predictions can lead to poor design decisions, increased operational costs, and missed opportunities for energy savings.
- Adherence to protocols established in ANSI/ASHRAE Standard 140-2020 provides stakeholders with greater assurance that the energy analysis tools they rely on will yield trustworthy results.
- ANSI/ASHRAE Standard 140-2020 plays a pivotal role in ensuring the reliability and accuracy of building energy analysis programs.

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