ADDENDA

ANSI/ASHRAE/IBPSA Addendum i to
ANSI/ASHRAE Standard 209-2018

Energy Simulation Aided Design for Buildings Except Low-Rise Residential Buildings

Approved by ASHRAE and the American National Standards Institute on September 30, 2024, and by the International Building Performance Simulation Association on September 26, 2024.

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).

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ASHRAE®

International Building Performance Simulation Association

Approved American National Standard ANSI www.ansi.org

SPECIAL NOTE

This American National Standard (ANS) is a national voluntary consensus Standard developed under the auspices of ASHRAE. *Consensus* is defined by the American National Standards Institute (ANSI), of which ASHRAE is a member and which has approved this Standard as an ANS, as "substantial agreement reached by directly and materially affected interest categories. This signifies the concurrence of more than a simple majority, but not necessarily unanimity. Consensus requires that all views and objections be considered, and that an effort be made toward their resolution." Compliance with this Standard is voluntary until and unless a legal jurisdiction makes compliance mandatory through legislation.

ASHRAE obtains consensus through participation of its national and international members, associated societies, and public review.

ASHRAE Standards are prepared by a Project Committee appointed specifically for the purpose of writing the Standard. The Project Committee Chair and Vice-Chair must be members of ASHRAE; while other committee members may or may not be ASHRAE members, all must be technically qualified in the subject area of the Standard. Every effort is made to balance the concerned interests on all Project Committees.

The Senior Manager of Standards of ASHRAE should be contacted for

a. interpretation of the contents of this Standard,
b. participation in the next review of the Standard,
c. offering constructive criticism for improving the Standard, or
d. permission to reprint portions of the Standard.

(This foreword is not part of this standard. It is merely informative and does not contain requirements necessary for conformance to the standard. It has not been processed according to the ANSI requirements for a standard and may contain material that has not been subject to public review or a consensus process. Unresolved objectors on informative material are not offered the right to appeal at ASHRAE or ANSI.)

FOREWORD

Addendum i adds a new Informative Appendix H to the standard.

Informative Note: In this addendum, changes to the current standard are indicated in the text by underlining (for additions) and ~~strikethrough~~ (for deletions) unless the instructions specifically mention some other means of indicating the changes.

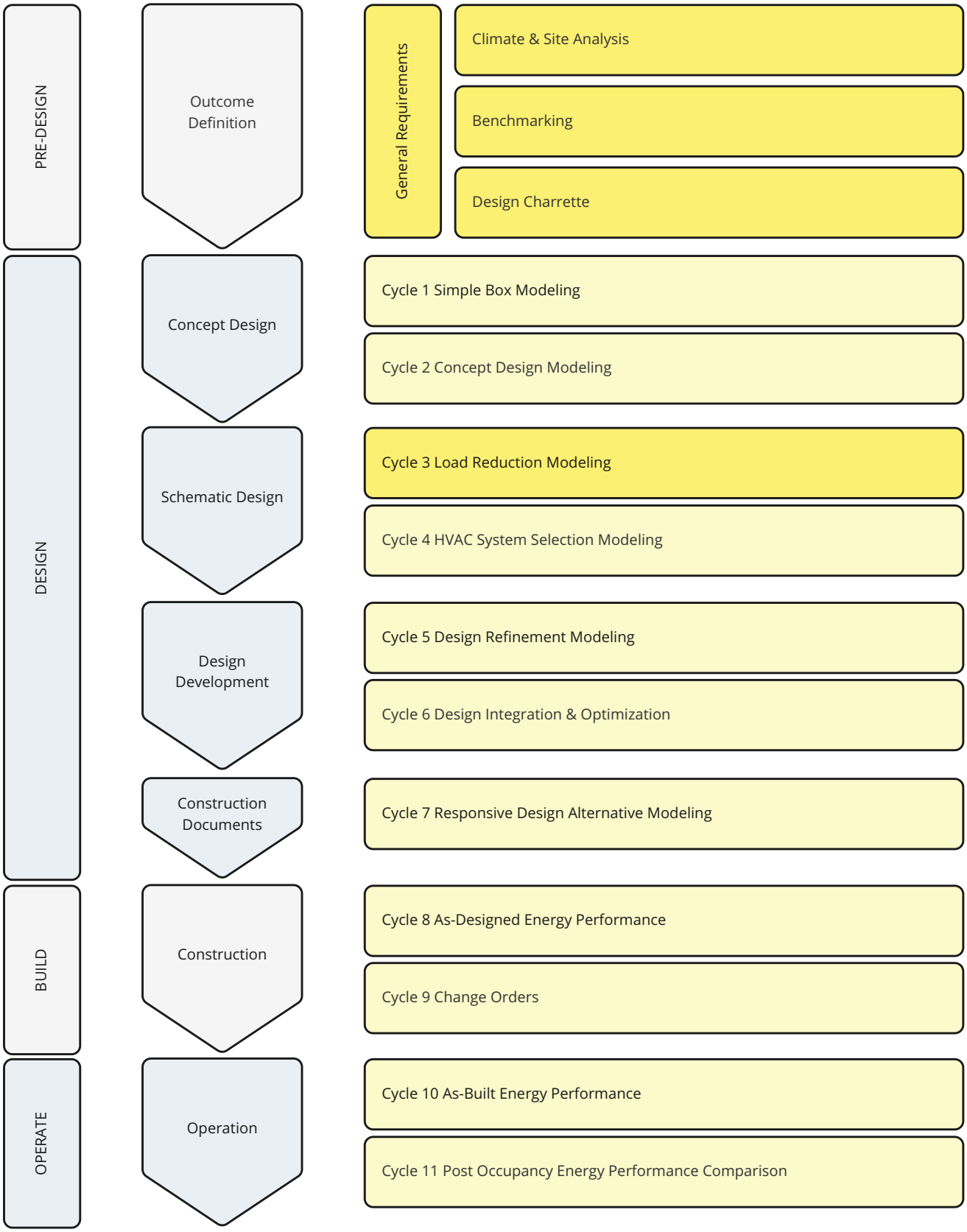
Addendum i to Standard 209-2018

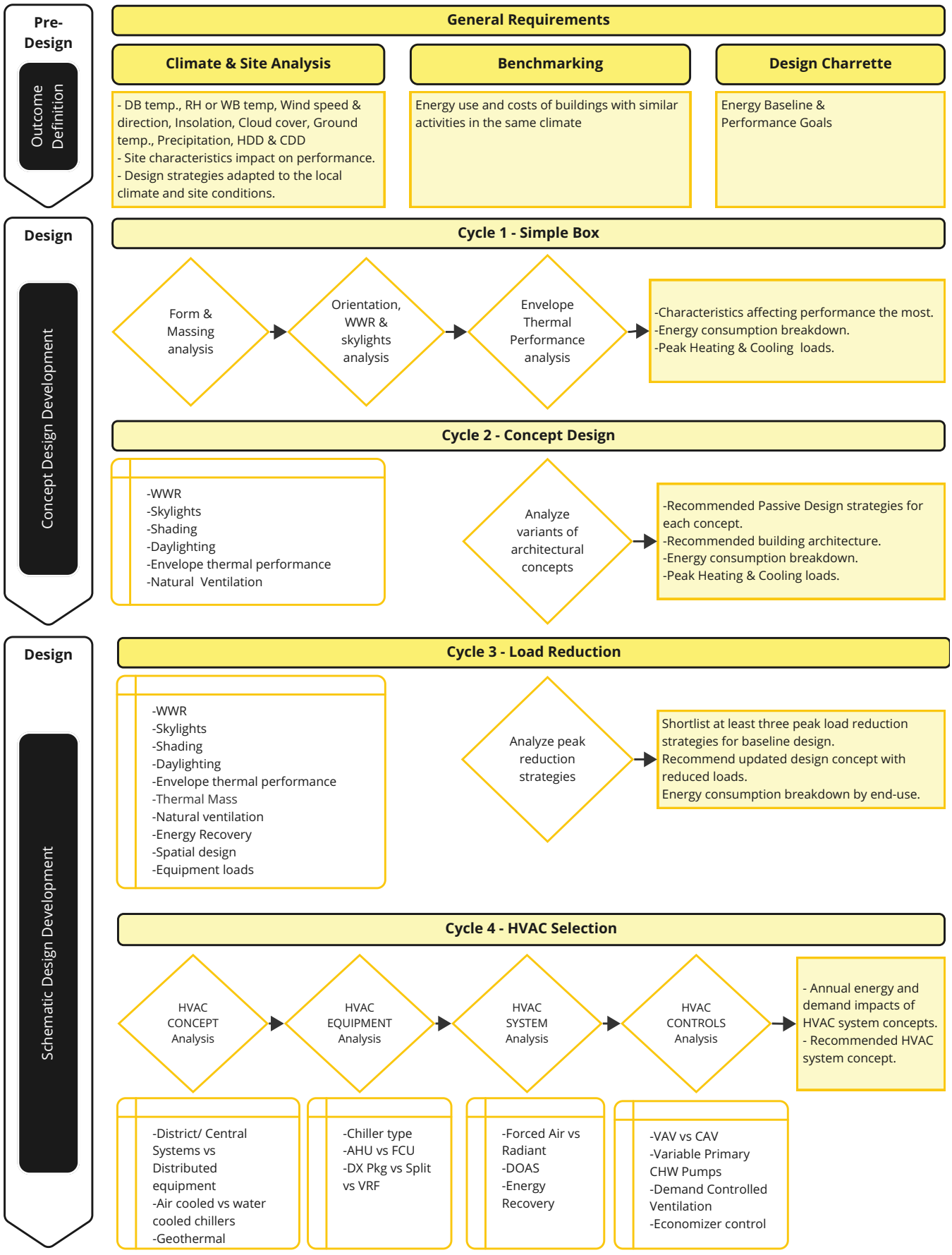
Add new Informative Appendix H as shown.

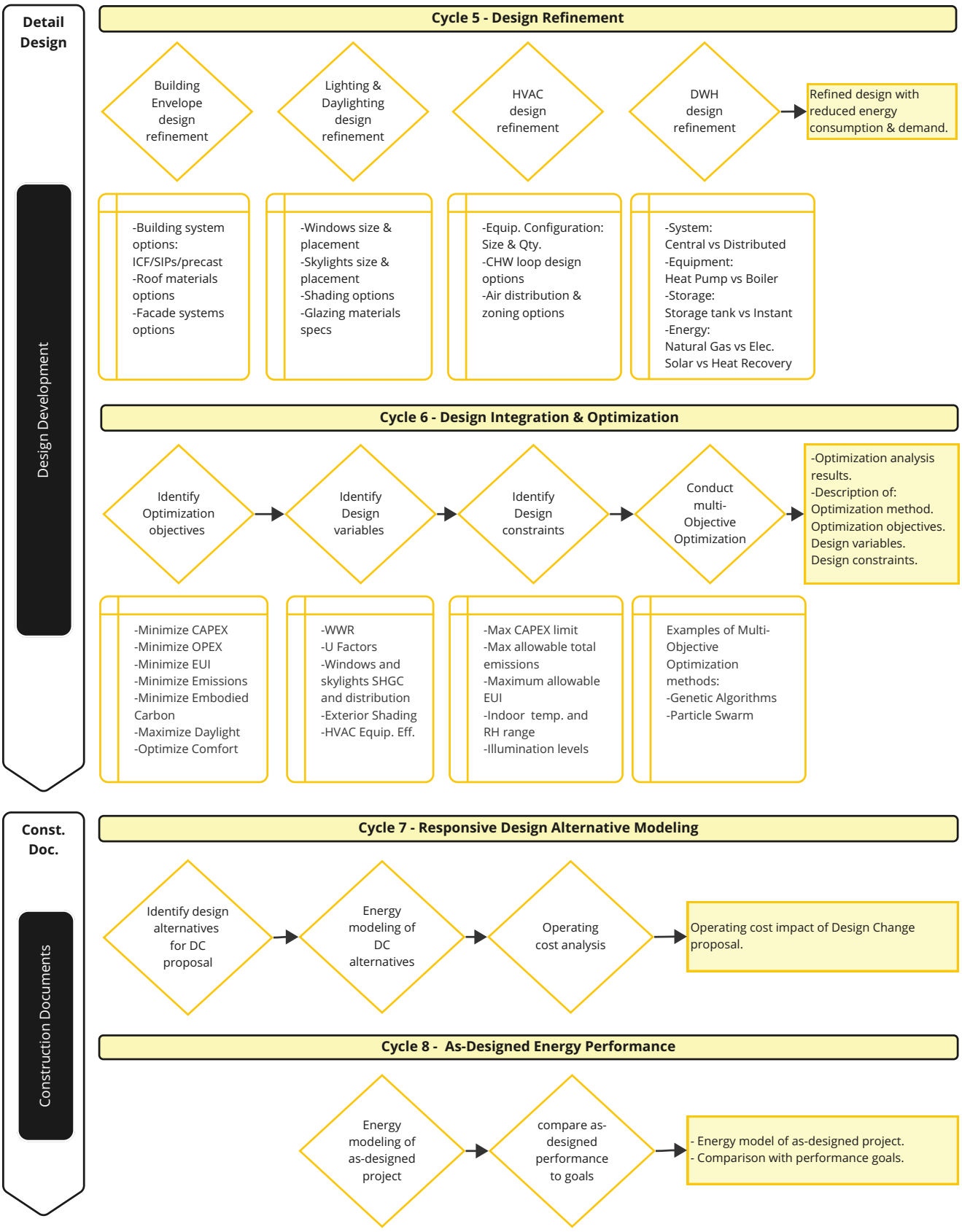
(This appendix is not part of this standard. It is merely informative and does not contain requirements necessary for conformance to the standard. It has not been processed according to the ANSI requirements for a standard and may contain material that has not been subject to public review or a consensus process. Unresolved objectors on informative material are not offered the right to appeal at ASHRAE or ANSI.)

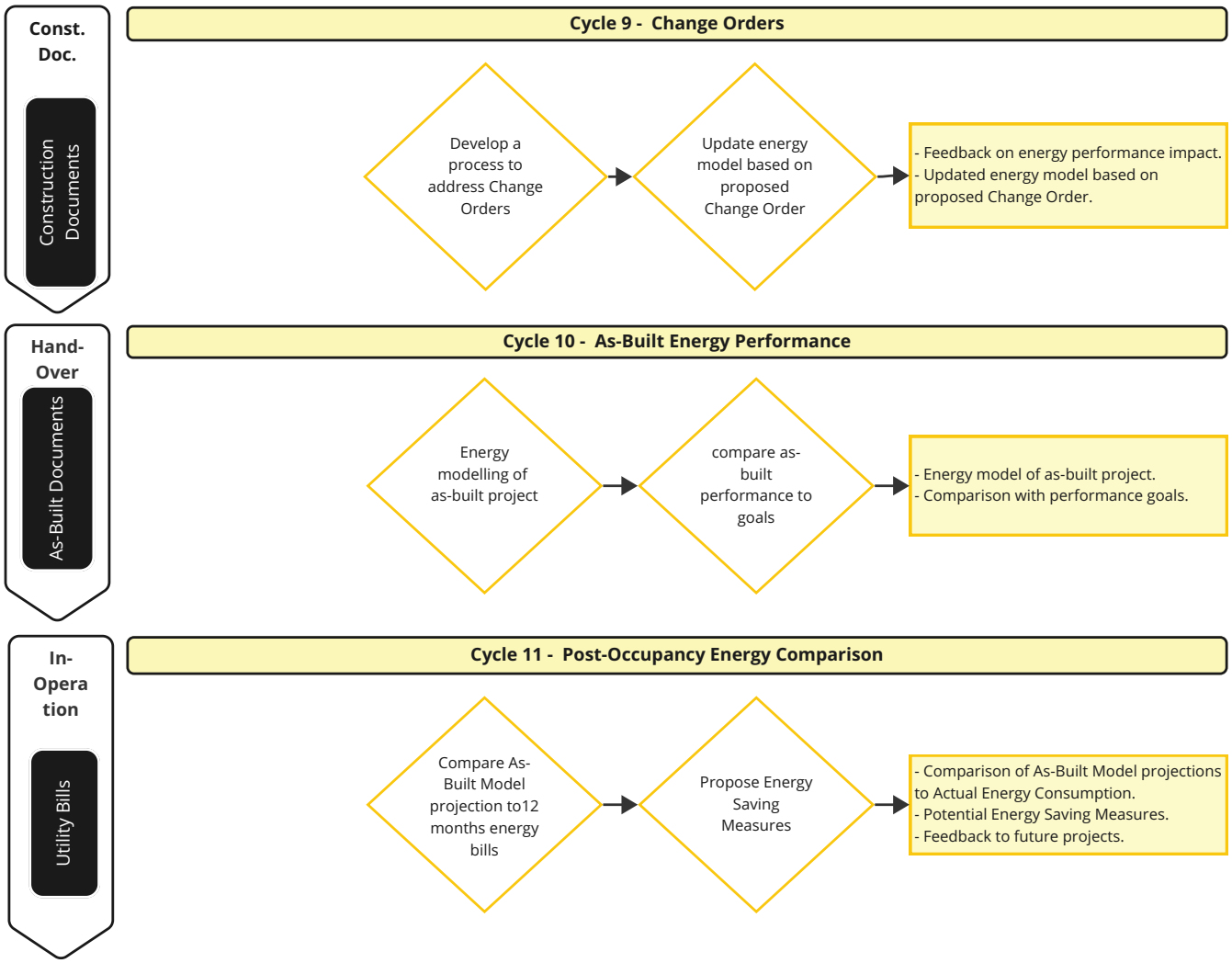
INFORMATIVE APPENDIX H
GUIDANCE IN DESIGN

This appendix provides visual guidance regarding the structure and requirements of ASHRAE Standard 209. It is provided for informative purposes only and does not supersede any requirements in the body of the standard.

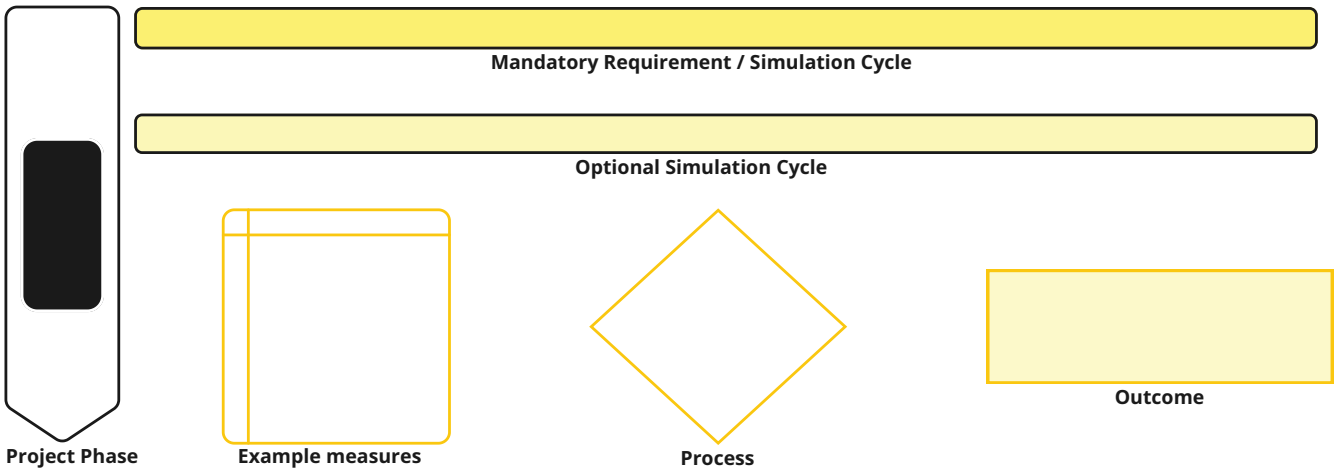








LEGEND



Cycle 1: Simple Box Modeling

PURPOSE	PROCESS	OUTCOME
Identify energy use breakdown Evaluate energy use and demand characteristics that affect building conceptual design.	Create a Simple Box model based on building location and type (Use identical HVAC systems) Conduct sensitivity analysis to changes in design variables: a. Building geometry. b. Window-to-wall ratio. c. Orientation. d. Building envelope and structure.	Determine which characteristics affect performance the most. Energy consumption breakdown by end-use Peak heating and Cooling loads.

TIMING & APPLICABILITY

Early in Concept Design. Before deciding on geometry and orientation. Before or During Design Charrette.

Cycle 2: Conceptual Design Modeling

PURPOSE	PROCESS	OUTCOME
Evaluate energy improvements relevant to building form and architecture.	Model variants of building form and architectural concepts.(Use identical HVAC) Compare and evaluate improvement measures.	Recommended passive design strategies for modeled concepts. Recommend building architecture. Energy consumption breakdown by end-use. Peak heating and Cooling loads.

TIMING & APPLICABILITY

After completing Load Reduction Modeling. Before the end of the construction documents phase. After defining the design direction for: Building form, orientation, HVAC, water heating system and space program

Cycle 3: Load Reduction Modeling

PURPOSE	PROCESS	OUTCOME
Evaluate performance considering load reduction strategies relative to the current proposed design.	Model and compare strategies that reduce heating and cooling loads based on current architectural concept (Orientation, form and geometry) (Use identical HVAC) Applies for loads comprising at least 60% of the total annual energy use.	Shortlist at least three peak load reduction strategies with the biggest impact on energy consumption and HVAC system sizing. Energy consumption breakdown by end-use. Peak heating and Cooling loads

TIMING & APPLICABILITY

Prior to end of Schematic Design. Prior to final selection of HVAC system type. Required for all projects..

Cycle 4: HVAC System Selection Modeling

PURPOSE	PROCESS	OUTCOME
Estimate the annual energy and demand impacts of HVAC system options.	Building energy simulation to evaluate a minimum of two HVAC system concepts.	Comparative analysis of potential HVAC design concepts. Annual energy and demand impacts of HVAC system concepts Recommended HVAC system concept

TIMING & APPLICABILITY

After Load Reduction modeling. Before HVAC system selection.

Cycle 5: Design Refinement

PURPOSE	PROCESS	OUTCOME
Use energy models to evaluate building systems, confirm current design directions, and support further development of the building design.	Use energy modeling to develop and refine the design of at least one building system: 1. HVAC systems. 2. Lighting systems. 3. Building Envelope. 4. Service water heating system. 5. Process and plug loads.	Energy modeling results supporting design development and refinement

TIMING & APPLICABILITY

During Concept Design. Before finalizing building form and architecture.
Applies to buildings with process loads ≤ 75% of overall energy

Cycle 6: Design Integration and Optimization

PURPOSE	PROCESS	OUTCOME
Apply building performance simulation to identify the point that optimally meets multiple design objectives (Global Optimum) or a range of points that meet one objective over a range where other objectives are also met.	-Identify two or more optimization objectives related to the identified performance goals -Identify two or more design variables of interest to a multivariate optimization process -Identify the design constraints or test range for each design variable. -Identify the multi - objective design optimization method that will be used -Conduct multi-objective optimization analysis	-Optimization analysis results -Description of: Optimization method Optimization objectives Design variables Design constraints

TIMING & APPLICABILITY

Before the end of the Construction Documents phase.

Cycle 7: Responsive Design Alternative Modeling

PURPOSE	PROCESS	OUTCOME
Use energy modeling to evaluate impact of Design Change proposal on performance goals	Identify design alternatives arising form at least one Design Change proposal Use energy modeling to evaluate impact on performance goals	Operating cost impact of Design Change proposal.

TIMING & APPLICABILITY

Before the end of the Construction Documents phase. First cost estimates must be available.

Cycle 8: As-Designed Energy Performance

PURPOSE	PROCESS	OUTCOME
Evaluate as-designed energy performance relative to project performance goals.	Develop a building energy model to represent the As-Designed project.	Comparison of As-Designed performance to project performance goals.

TIMING & APPLICABILITY

After completion of Construction Documents.

Cycle 9: Change Orders

PURPOSE	PROCESS	OUTCOME
Analyze the impact of Change Orders on energy performance.	Develop a process to address Change Orders: Roles and responsibilities and Timeframes. Update energy model based on at least one proposed Change Order.	Updated energy model based on a proposed Change Order. Feedback on energy performance impact.

TIMING & APPLICABILITY

Prior to Constuction. Applies to Change Orders that negatively impact performance goals

Cycle 10: As-Built Energy Performance

PURPOSE	PROCESS	OUTCOME
Evaluate as-built energy performance relative to project performance goals.	Develop an energy model to represent the as-built physical building asset. Compare as-built performance to project goals. Use "As-Designed" schedules unless new information is available.	Energy model of As-Built project. Comparison with performance goals

TIMING & APPLICABILITY

After Construction Completion. After final As-Built Drawings submittals.

Cycle 11: Post-Occupancy Energy Comparison

PURPOSE	PROCESS	OUTCOME
Inform future energy model assumptions and potentially identify operational energy savings opportunities.	Compare modeled energy performance from the last design- or construction-phase energy model to the actual measured energy use from utility bills If available, use actual rather than "typical" weather data. Optional: Regression analysis to calculate error metrics (The predictions relative to actual)	Evaluation of Post-Occupancy energy performance relative to performance predicted by the last design or construction phase energy model Potential energy savings measures Feedback to future projects

TIMING & APPLICABILITY

Post- Occupancy. 12 months at least.

POLICY STATEMENT DEFINING ASHRAE'S CONCERN FOR THE ENVIRONMENTAL IMPACT OF ITS ACTIVITIES

ASHRAE is concerned with the impact of its members' activities on both the indoor and outdoor environment. ASHRAE's members will strive to minimize any possible deleterious effect on the indoor and outdoor environment of the systems and components in their responsibility while maximizing the beneficial effects these systems provide, consistent with accepted Standards and the practical state of the art.

ASHRAE's short-range goal is to ensure that the systems and components within its scope do not impact the indoor and outdoor environment to a greater extent than specified by the Standards and Guidelines as established by itself and other responsible bodies.

As an ongoing goal, ASHRAE will, through its Standards Committee and extensive Technical Committee structure, continue to generate up-to-date Standards and Guidelines where appropriate and adopt, recommend, and promote those new and revised Standards developed by other responsible organizations.

Through its *Handbook*, appropriate chapters will contain up-to-date Standards and design considerations as the material is systematically revised.

ASHRAE will take the lead with respect to dissemination of environmental information of its primary interest and will seek out and disseminate information from other responsible organizations that is pertinent, as guides to updating Standards and Guidelines.

The effects of the design and selection of equipment and systems will be considered within the scope of the system's intended use and expected misuse. The disposal of hazardous materials, if any, will also be considered.

ASHRAE's primary concern for environmental impact will be at the site where equipment within ASHRAE's scope operates. However, energy source selection and the possible environmental impact due to the energy source and energy transportation will be considered where possible. Recommendations concerning energy source selection should be made by its members.

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About ASHRAE

Founded in 1894, ASHRAE is a global professional society committed to serve humanity by advancing the arts and sciences of heating, ventilation, air conditioning, refrigeration, and their allied fields.

As an industry leader in research, standards writing, publishing, certification, and continuing education, ASHRAE and its members are dedicated to promoting a healthy and sustainable built environment for all, through strategic partnerships with organizations in the HVAC&R community and across related industries.

To stay current with this and other ASHRAE Standards and Guidelines, visit www.ashrae.org/standards, and connect on LinkedIn, Facebook, Twitter, and YouTube.

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ASHRAE offers its Standards and Guidelines in print, as immediately downloadable PDFs, and via ASHRAE Digital Collections, which provides online access with automatic updates as well as historical versions of publications. Selected Standards and Guidelines are also offered in redline versions that indicate the changes made between the active Standard or Guideline and its previous version. For more information, visit the Standards and Guidelines section of the ASHRAE Bookstore at www.ashrae.org/bookstore.

IMPORTANT NOTICES ABOUT THIS STANDARD

To ensure that you have all of the approved addenda, errata, and interpretations for this Standard, visit www.ashrae.org/standards to download them free of charge.

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