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# Module 1b: Pre-Design

## Contracting for Energy Modeling Services

### Introduction

Flowing down the requirements of the modified E204 can be accomplished relatively easily using [AIA Document C401-2017, Standard Form of Agreement between Architect and Consultant \(C401\)](#). However, it is recommended that an energy modeling exhibit be added to the C401 to bring greater clarity to the roles and responsibilities of the Energy Modeler.

### Modifications to the C401

In addition to completing the basic information, parties to the C401 may consider the following additional edits:

- **Section 1.2**, the term “This Portion of the Project” should be used to reference Energy Modeling as defined in Exhibit A; which is discussed below.
- **Section 1.3** incorporates the terms of the contract between the Architect and the Owner. However, to emphasize the importance of Energy Modeler’s role in the process described in the modified E204, it is recommended that the modified E204 be listed as an exhibit to the C401 under Section 13.2.4.



## Exhibit A, Energy Modeling Services

Exhibit A, Energy Modeling Services (“Exhibit A”) serves as the link between the processes described in the modified E204 and ASHRAE 209. While it may use similar defined terms as the E204, Exhibit-A provides greater detail as to the scope of the Energy Modeler will provide for successful performance of the E204 requirements. Key features of Exhibit A include:

- **Section A1.1.14** – The term “Energy Modeling” builds on the definition used in the E204 by provided a menu for identifying which ASHRAE 209 Model Cycles are included as Basic Services and which will be paid for as Additional Services.
- **Section A1.1.15** – A new term, “Energy Modeling Workplan,” is introduced. This document will form part of the Sustainability Plan required by the modified E204 and is the primary tool by which the modeling requirements are integrated into the design process. The Energy Modeling Workplan will be developed by the Energy Modeler during the Sustainability Workshop.
- **Section A2.1.1** – Consistent with the requirements of ASHRAE 209, this section ensures that the Energy Modeler considers the General Requirements of that standard in addition to the to the Model Cycles which are included in its scope by this Exhibit A. These include, among other items, using simulation software that meets the minimum requirements of ASHRAE/IES Standard 90.1 1, Section G2.2, supervising the services with a certified Building Energy Modeling Professional, specifies a minimum level of climate and site analysis, conducting and Energy Charette (referred to as the Sustainability Workshop in the modified E204), and developing and documenting the Owners energy performance goals.
- **Section A2.2.1** – Pre-Design services are critical to successful Energy Modeling. This section prescribes a number of Pre-Design services required of the Energy Modeler including:
  - o Facilitating the Sustainability Workshop.
  - o Benchmarking the energy use of buildings in the same building peer group as the Project.
  - o Reviewing applicable building performance standards and facilitating discussions aimed at establishing the Compliance Period, the Building Performance Target, Building Performance Measures and other aspects required for achieving Building Performance Compliance as defined in the modified E204 and this Exhibit A.
  - o Developing Energy Modeling requirements as required by ASHRAE 209.
  - o Preparing the Energy Modeling Workplan and a Pre-Design Energy Model Report.
  - o Completing ASHRAE 209 Model Cycle 1, Simple Box Modeling, and Model Cycle 2, Conceptual Design Model to the extent these are Basic Services.



- **Sections A2.2.2 through A2.2.4** – In Schematic Design, Design Development, and Contract Documents phases, the Energy Modeler is required to:
  - o Review the report of the prior phase and make adjustments to the Energy Modeling Plans as needed to achieve Building Performance Compliance and the Sustainable Design Objective
  - o Perform the ASHRAE 209 Model Cycle 3, Load Reduction Model, Model Cycle 4, HVAC System Selection Model, Model Cycle 5, Design Refinement Model, Model Cycle 6, Design Integration and Optimization Model, Model Cycle 7, Energy Solution-Aided Value Engineering Modeling, and Model Cycle 8, As-Designed Energy Model to the extent these are designated as part of Basic Services in Exhibit A
  - o Prepare a report at the conclusion of each phase
  - o Facilitate a meeting with Project stakeholders to review, understand, and accept the report
- **Section A2.2.4.5** – At the conclusion of the Contract Documents phase, the Energy Modeler prepares a Final Design Energy Modeling Report and adjusts the Energy Modeling Workplan as necessary monitor achievement of Building Performance Compliance and the Sustainable Design Objective during the Construction Phase.
- **Section A2.3.3** – During the Construction Phase, the Energy Modeler will perform the ASHRAE 209 Model Cycle 9, Change Order Model and Model Cycle 10, As-Built Energy Performance Model to the extent these are marked as Basic Services in Exhibit A.
- **Section A2.4.4** – During the Post Occupancy Phase, the Energy Modeler will perform the ASHRAE 209 Model Cycle 11, Post Occupancy Energy Performance Comparison Model to the extent these are marked as Basic Services in Exhibit A. Based on this analysis, the Energy Modeler is required to:
  - o Identify Post Occupancy improvement measures required to achieve Building Performance Compliance and the Sustainable Design Objective
  - o Notify the Owner and Architect of discrepancies between Post Occupancy energy performance and any modeled energy performance that could impact Building Performance Compliance and the Sustainable Design Objective

