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CONTENTS

ASHRAE Guideline 33-2021
Guideline for Documenting Indoor Airflow and Contaminant Transport Modeling

SECTION	PAGE
Foreword	2
1 Purpose	2
2 Scope	2
3 Definitions	2
4 Project Documentation	3
5 Building Description	3
6 Multizone Modeling Documentation	3
7 CFD Modeling Documentation	5
8 Results	7
9 References	7

NOTE

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FOREWORD

Airflow and contaminant transport modeling studies are performed for a number of reasons using a wide variety of analysis tools and techniques. This poses a challenge to the practitioners as well as those who might depend on the work of said practitioners to develop, execute, present, and interpret such studies. This guideline is meant to provide those who carry out and those who commission such studies with a common ground pertaining to the documentation of these types of studies. This guideline is not meant to provide an all-encompassing and restrictive set of rules but to establish a foundation upon which documentation of such studies can be formed.

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1. PURPOSE

This guideline establishes a method and format for documenting inputs, assumptions, methods, and outputs utilized when conducting indoor-airflow and contaminant-transport modeling studies.

2. SCOPE

This guideline applies to the application of airflow and contaminant modeling for analyses of indoor air quality, thermal comfort, energy, and events related to chemical, biological, and radiological agents. This guideline only applies to modeling efforts using multizone network models, computational fluid dynamics (CFD), or combinations of the two.

3. DEFINITIONS

airflow path: a connection between two nodes of a multizone model through which air and contaminants can be transported.

analysis tool: a computer program that implements a multizone and/or computational fluid dynamics model and utilizes numerical techniques to solve the equations imposed by the underlying multizone or CFD model.

building envelope: the elements of a building that separate conditioned spaces from the exterior.

building model: a representation of a building or portion of a building for purposes of analysis with a multizone or CFD analysis tool.

computational fluid dynamics (CFD): quantitative prediction of thermal/fluid physical phenomena in an indoor space by numerically solving coupled, partial differential conservation equations.

contaminant: an airborne gas, particle, or liquid droplet of interest that is represented within an analysis tool.

leakage: airflow through cracks/openings in a building component or assembly.

multizone model: an analysis method whereby a building and its ventilation systems are idealized as a discrete set of air volumes or nodes that are interconnected by a set of airflow paths or links.

sink model: a representation within a building model of a contaminant removal mechanism.

source model: a representation within a building model of a contaminant emission or generation mechanism.

zone: a portion of a multizone building representation that is characterized by a well-defined volume of air.