SOUND PROPAGATION AND WIND FLOW AROUND BLOCKAGES AND THEIR CORRELATION

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SEPTEMBER 2010
Sound Propagation and Wind Flow around Blockages and Their Correlation

Submitted to
Department of Building and Construction
in Partial Fulfillment of the Requirements for the Degree of Master of Philosophy

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September 2010
二零一零年九月
ABSTRACT

This study focuses on the behaviors of and the correlation between sound propagation and airflow around blockages and inside group of buildings. The ODEON and CFX software packages are used to simulate sound propagations and airflows in two types of models: a single vertical barrier model and a model of a group of buildings. To verify the airflow model, the simulation results are compared with experimental data obtained from a wind tunnel. In general, the experimental results show a reasonable level of agreement with the simulation results. The effects of different parameters on sound and flow reductions in the simulation models are also studied. Correlations between sound reduction and airflow reduction in different conditions are obtained and investigated. The main contribution of this study is to provide evidence on the correlation between sound reduction and airflow propagation. The results could potentially be used in converting sound reduction data - the onsite measurement of which is more reliable and straightforward - to airflow reduction data - the onsite measurement of which is subject to fluctuations due to uneven prevailing and local winds.
Table of Contents

Abstract............................................................................................................................................ i
Acknowledgement ............................................................................................................................ ii
Table of Contents .............................................................................................................................. iv
List of Figures ........................................................................................................................................ vi
List of Tables ........................................................................................................................................ ix

Chapter 1: Introduction ................................................................................................................... 1
  1.1 Background and Objective ........................................................................................................ 1
  1.2 Study Outline ............................................................................................................................. 2

Chapter 2: Literature Review ......................................................................................................... 4
  2.1 Review on Sound Issues ........................................................................................................... 4
  2.2 Review on Wind Issues – Air Ventilation Assessment (AVA) .............................................. 7
  2.3 Review on the Numerical Simulations ..................................................................................... 9
    2.3.1 Sound Propagation ........................................................................................................... 9
    2.3.2 Air Flow .......................................................................................................................... 11

Chapter 3: Computer Simulation Program for Acoustics (ODEON) ........................................ 13
  3.1 Introduction to ODEON .......................................................................................................... 13
  3.2 Basic Governing Equations .................................................................................................. 15
    3.2.1 Ray Tracing Method ....................................................................................................... 15
    3.2.2 Image Source Method ................................................................................................... 16
    3.2.3 The Hybrid Method ....................................................................................................... 19
  3.3 ODEON Models ....................................................................................................................... 20
    3.3.1 Introduction .................................................................................................................. 20
    3.3.2 Barrier Model ............................................................................................................... 21
    3.3.3 Simulation Model of 4x4 Buildings .............................................................................. 22

Chapter 4: Computer Simulation Program for Wind (CFX) ....................................................... 26
  4.1 Introduction to Computational Fluid Dynamics ...................................................................... 26
  4.2 Basic Governing Equations ................................................................................................... 28
  4.3 CFX Models ........................................................................................................................... 39
    4.3.1 Barrier and a Group of Buildings ............................................................................... 39
    4.3.2 Guidelines for CFD Modeling ...................................................................................... 39
4.3.3 Models of Different Barrier Heights ........................................ 43
4.3.4 Models of Different Building Configurations ............................. 43

4.4 Wind Tunnel .................................................................................. 44
  4.4.1 Introduction ............................................................................ 44
  4.4.2 Experimental Arrangements .................................................... 45

Chapter 5: Simulation Results .............................................................. 48
  5.1 Introduction ............................................................................. 48
  5.2 Sound Reduction Result ............................................................. 49
  5.3 Flow Reduction Result ............................................................... 50
  5.4 Correlations Between Sound and Flow Reduction ...................... 54

Chapter 6: Simulation and Experiment - A Group of Buildings ......... 64
  6.1 Case Studies ............................................................................. 64
  6.2 Sound Reduction Results for the Models of 4 x 4 Buildings .......... 69
  6.3 Flow Reduction Results for the Models of 4 x 4 Buildings .......... 71
  6.4 Correlations Between Sound and Flow Reduction ...................... 75
  6.5 Airflow Results of 2 x 1 Buildings ............................................. 77

Chapter 7: Conclusion ........................................................................ 93
  7.1 Conclusion .............................................................................. 93
  7.2 Future Work ............................................................................ 94

References .......................................................................................... 95