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Nota di contenuto	Wind Flow and Vapor Cloud Dispersion at Industrial and Urban Sites; Contents; Preface; Acknowledgments; List of Symbols; 1 Introduction; 1.1. Background; 1.2. Objectives of This Book; 1.3. Overview; 1.4. Definition of Scenarios and Modeling Scales; 2 Overview of Meteorology and Atmospheric Dispersion; 2.1. Definitions of Concepts and Terms; 2.2. Engineering Background; 2.3. Survey of Currently Available Methods for Classifying Dispersion Coefficients for a Variety of Surface Types; 2.3.1. Introduction to Discussion of Efects of Surface Features 2.3.2. Use of a Simple Gaussian Dispersion Model to Undetstand the Efects of Roughness2.3.3. Situations Where Winds, Stability and Underlying Terrain Vary in Time and/or Space; 2.3.4. Methods for Accounting for Surface Roughness Length and Displacement Length in Dispersion Models; 2.4. Survey of Experiments Showing Effects of Surface Roughness Obstacles on Dispersion; 2.4.1. Dispersion of

Clouds with Mass- Weighted Mean Heights Greater Than the Roughness Obstacle Height, Hr; 2.4.2. Dispersion of Clouds with Mass- Weighted Mean Heights Less Than the Roughness Obstacle Heights, Hr
3 Methods for Characterizing the Effects of Surface Roughness Obstacles on Flow3.1. Required Flow Characteristics for Input to Transport and Dispersion Models; 3.2. Consideration of Flow Above and Below the Tops of the Obstacles; 3.3. Flow above the Surface Roughness Obstacles; 3.3.1. Definition of Surface Roughness Length, zo, and Displacement Length, d, as They Relate to Flow Characteristics Such as Wind Speed; 3.3.2. Methods for Estimating zo, and d from Wind Observations; 3.3.3. Size of Surface Area that Influences Flow at a Given Height
3.3.4. Estimation of zo and d Based on Knowledge of Surface Roughness Obstacles' Dimensions and Geometric Relations (the Morphological Method)3.3.5. Overview of Land Use Category Methods for Estimating zo and d; 3.3.6. Estimation of zo for Surface Conditions Varying in Space; 3.4. Flow Through an Obstacle Array; 3.4.1. Extent of the Roughness Sublayer; 3.4.2. Wind Velocity Fields within and Near Obstacle Arrays; 3.4.3. Model Comparison with Experimental Data; 3.4.4. The Turbulence Field within the Obstacle Array; 3.4.5. Extensions to Other Effects within the Obstacle Array
3.4.6. Summary of Recommendations for Wind Speed and Turbulence within Obstacle Arrays3.5. Summary of Recommended Methods for Estimating zo, d, and Flow Characteristics Such as Wind Profiles. Friction Velocity (u*), and Turbulence Velocities in Urban and Industrial Areas; 3.5.1. Definition of Region of Interest (from Source to Receptor); 3.5.2. Determination of zo and d; 3.5.3. General Simple Formulas for u*, u(z), and Turbulent Velocities; 3.5.4. Selection of an Appropriate Mean Wind Speed and Stability
3.5.5. Estimates of Urban and Industrial Geometric Parameters Hr, f, and p Using the ROUGH Code

Sommario/riassunto

A key component of risk reduction is reducing the potential consequences that could result from toxic or flammable releases. The science of vapor cloud dispersion has advanced significantly in recent years, but one of the long-standing challenges has been in accounting for dispersion around buildings, equipment, and similarly sized geologic and man-made features. With current concerns about terrorism in industrial and urban sites, improving consequence modeling within industrial and urban sites is more important than ever This new definitive book advances the science of vapor cloud dispersion