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Wind Action on Natural Smoke Exhaust in Atria

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Abstract

Performance of natural vents installed at height would be affected under strong wind. Smoke might even be pulled downward or inward by wind action if the building is located near to a tall building or on the hillside. The importance of studying aerodynamics around a building located adjacent to a vertical wall while designing static smoke exhaust system will be illustrated in this paper. Air flow pattern around the buildings depends on many factors including wind speed, fire size, height of the vertical wall and distance away from the building, theoretical study is difficult. Numerical simulations with Computational Fluid Dynamics is appropriate to design smoke exhaust system design under these conditions. Key equations of calculating the smoke exhaust rates and the required vent area will be reviewed. Modified equations on smoke exhaust rates with wind effects discussed earlier will be applied.

Keywords: Wind action, Natural vent, Smoke exhaust, Nearby wall

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