cubical building cases: inflow wind perpendicular to front face and at 45 degree anglee

The naming convention is generally as follows: The first three characters represent the project name (EP3 in all cases here), the next two or three characters represent the case number (e.g., C12 represents case 12), and the last characters represent the type of measurements, usually C for center-plane measurements and G for ground-plane measurements – they contain both U and W components (for center-plane measurements) or U and V (for ground-plane measurements). These are sometimes supplemented with a letter such as F for “full” data set or “zeroes added” or T for “turbulence components”.

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All dimensions listed in the table are in units of 200mm, i.e., the cubical building (Case 1) is 200mm on each side, and the wind angle is given in degrees; in the data files, the case number is usually followed by a set of 4 numbers in parentheses, i.e., “Case 14 (1,1,4,15)” is a building with height of 200mm, length of 200mm, width of 800mm, and oriented at 15o to the mean wind vector.

The first row of the files contain the case number and the (H,L,W,Q) designation. The column headings are generally self-explanatory, with u’ indicating the rms value of the turbulence component (m/s), u-skew and u-kurt indicating the nondimensional skewness and kurtosis of the velocity fluctuations, sometimes TKE representing the turbulent kinetic energy, etc. The origin of coordinates is at the front center of the building at ground level. In many files, zeroes have been added at the ground or building surfaces to facilitate the streamline-construction program (i.e., to assure that streamlines did not cross into solid surfaces). TecPlot (version 5 from Amtec) was used to construct the streamlines.

On some occasions the column headings are “zeroes”, “negs”, “outlo” and “outhi”. These come from the original data files, where the output pulses indicated zero or negative velocities, outlo and outhi represent the number of output pulses indicated as above or below an acceptable range of speeds. We used these data as indicators of acceptable PWA operation and hence as data quality indicators.

Most of the streamline plots are in the ground-plane (x-y plane at z=20mm), and if the flow was symmetrical, we assumed symmetry and measured only on one side of the centerline – most of these plots show only half the field and may be mirror-imaged to indicate the full flow field.

reference:

Snyder, W.H. & Lawson, R.E. Jr. 1994 Wind-Tunnel Measurements of Flow Fields in the Vicinity of Buildings. *Eighth Jt. Conf. on Appl. of Air Pollution Meteorology* with AWMA, Jan. 23-28, Nashville, TN, Amer. Meteorol. Soc., Boston, MA.