(This is a normative appendix and is part of the standard.)

NORMATIVE APPENDIX A
MULTIPLE-ZONE SYSTEMS

This appendix presents an alternative procedure for calculating the system ventilation efficiency (E_v) that must be used when Table 6.2.5.2 values are not used. In this alternative procedure, E_v is equal to the lowest calculated value of the zone ventilation efficiency (E_{vz}) (see Equation A1.2.1 below).

Informative Note: Figure A-1 contains a ventilation system schematic depicting most of the quantities used in this appendix.

A1. SYSTEM VENTILATION EFFICIENCY

For any multiple-zone recirculating system, the system ventilation efficiency (E_v) shall be calculated in accordance with Sections A1.1 through A1.3.

A1.1 Average Outdoor Air Fraction. The average outdoor air fraction (X_s) for the ventilation system shall be determined in accordance with Equation A1.1.

$$X_s = V_{ou}/V_{ps} \qquad \text{(A1.1)}$$

where the uncorrected outdoor air intake (V_{ou}) is found in accordance with Section 6.2.5.3, and the system primary airflow (V_{ps}) is found at the condition analyzed.

Informative Note: For VAV-system design purposes, V_{ps} is the highest expected system primary airflow at the design condition analyzed. System primary airflow at design is usually less than the sum of design zone primary airflow values because primary airflow seldom peaks simultaneously in all VAV zones.

A1.2 Zone Ventilation Efficiency. The zone ventilation efficiency (E_{vz}) shall be determined in accordance with Section A1.2.1 or A1.2.2.

A1.2.1 Single Supply Systems. For single supply systems, wherein all of the air supplied to each ventilation zone is a mixture of outdoor air and system-level recirculated air, zone ventilation efficiency (E_{vz}) shall be determined in accordance with Equation A1.2.1. Examples of single supply systems include constant-volume reheat, single-duct VAV, single-fan dual-duct, and multizone systems.

$$E_{vz} = 1 + X_s - Z_{pz} \qquad \text{(A1.2.1)}$$

where the average outdoor air fraction for the system (X_s) is determined in accordance with Equation A1.1, and the primary

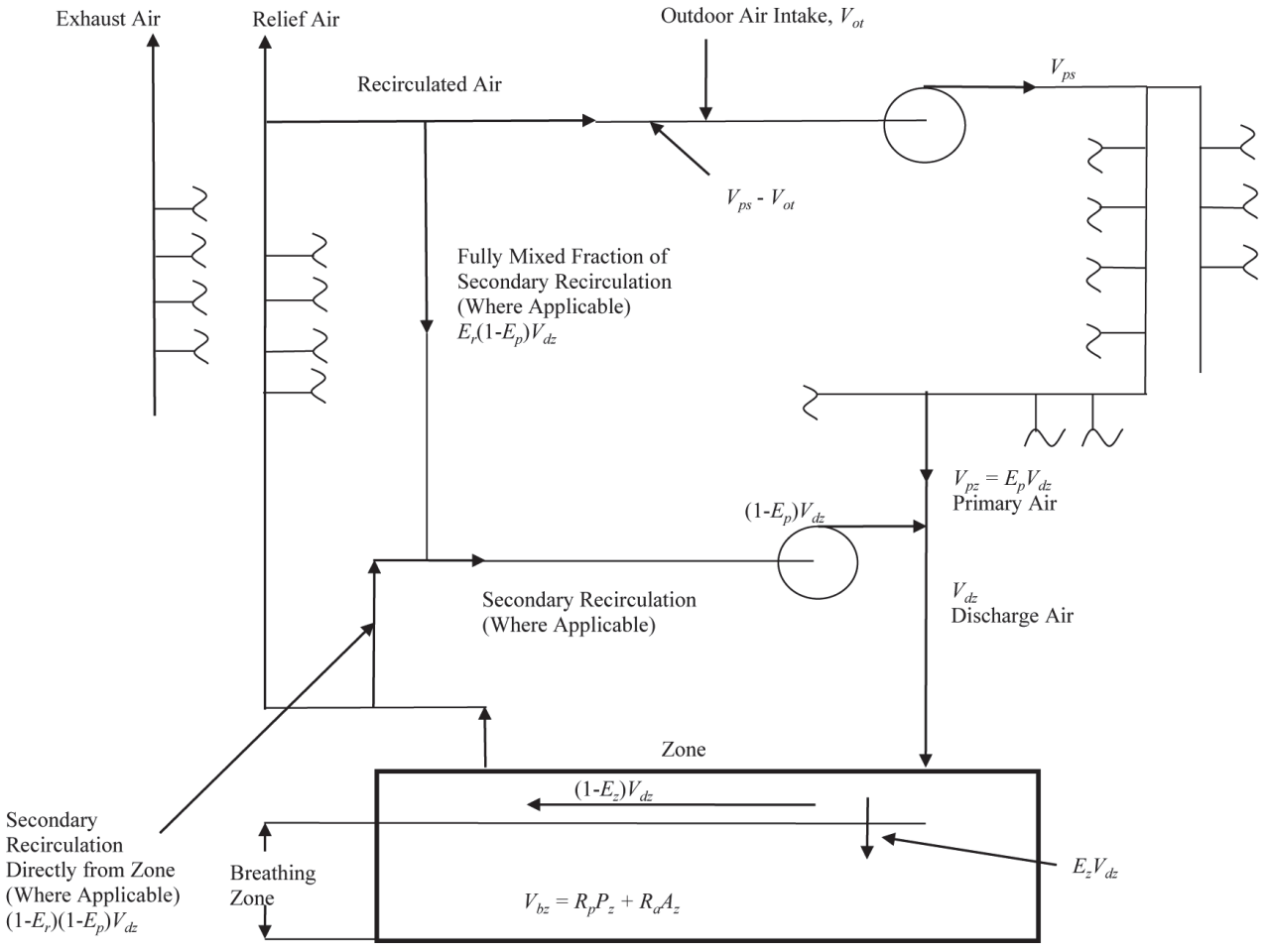

FIGURE A-1 Ventilation system schematic.