

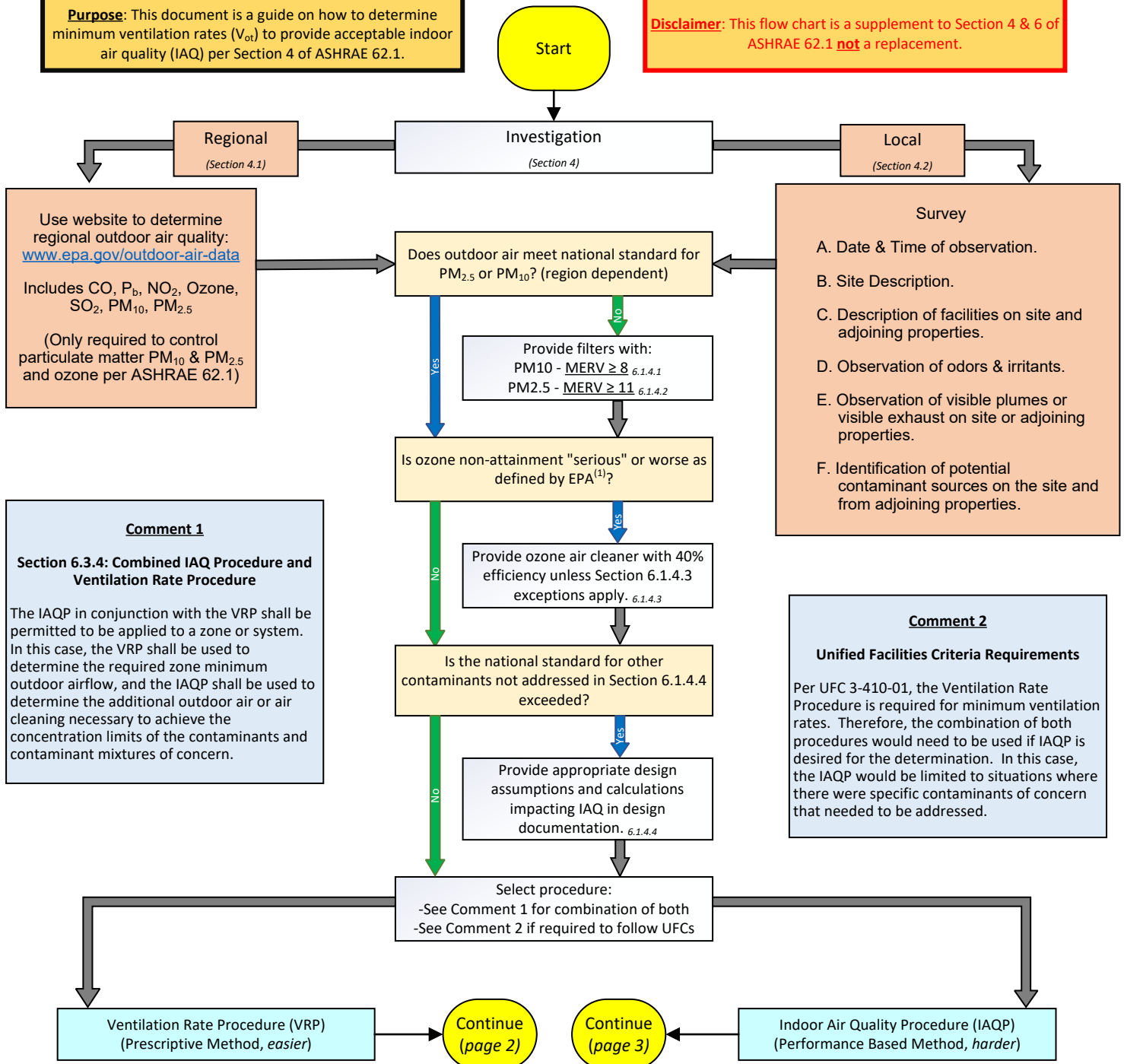
# ASHRAE STANDARD 62.1 INDOOR AIR QUALITY PROCESS FLOW CHART

## Relevant Section Descriptions

- Section 4:** "Outdoor Air Quality" requires that the site and the quality of outdoor air be evaluated to determine whether special design considerations such as cleaning of the outdoor air are needed.
- Section 5:** "Systems and Equipment" includes specific requirements for the design of ventilation systems in buildings, as well as the building envelope.
- Section 6:** "Procedures" presents methods for determining the volumetric airflow rate of outdoor air that must be brought into the building through the HVAC system(s), as well as requirements for filtration and cleaning of the outdoor air.
- Section 7:** "Construction and System Start-Up" contains requirements that apply during the construction and start-up phase of new construction projects.
- Section 8:** "Operations and Maintenance" outlines requirements for the operation and maintenance of building ventilation systems after they are constructed.

**Purpose:** This document is a guide on how to determine minimum ventilation rates ( $V_{ot}$ ) to provide acceptable indoor air quality (IAQ) per Section 4 of ASHRAE 62.1.

**Disclaimer:** This flow chart is a supplement to Section 4 & 6 of ASHRAE 62.1 **not** a replacement.



### Comment 1

#### Section 6.3.4: Combined IAQ Procedure and Ventilation Rate Procedure

The IAQP in conjunction with the VRP shall be permitted to be applied to a zone or system. In this case, the VRP shall be used to determine the required zone minimum outdoor airflow, and the IAQP shall be used to determine the additional outdoor air or air cleaning necessary to achieve the concentration limits of the contaminants and contaminant mixtures of concern.

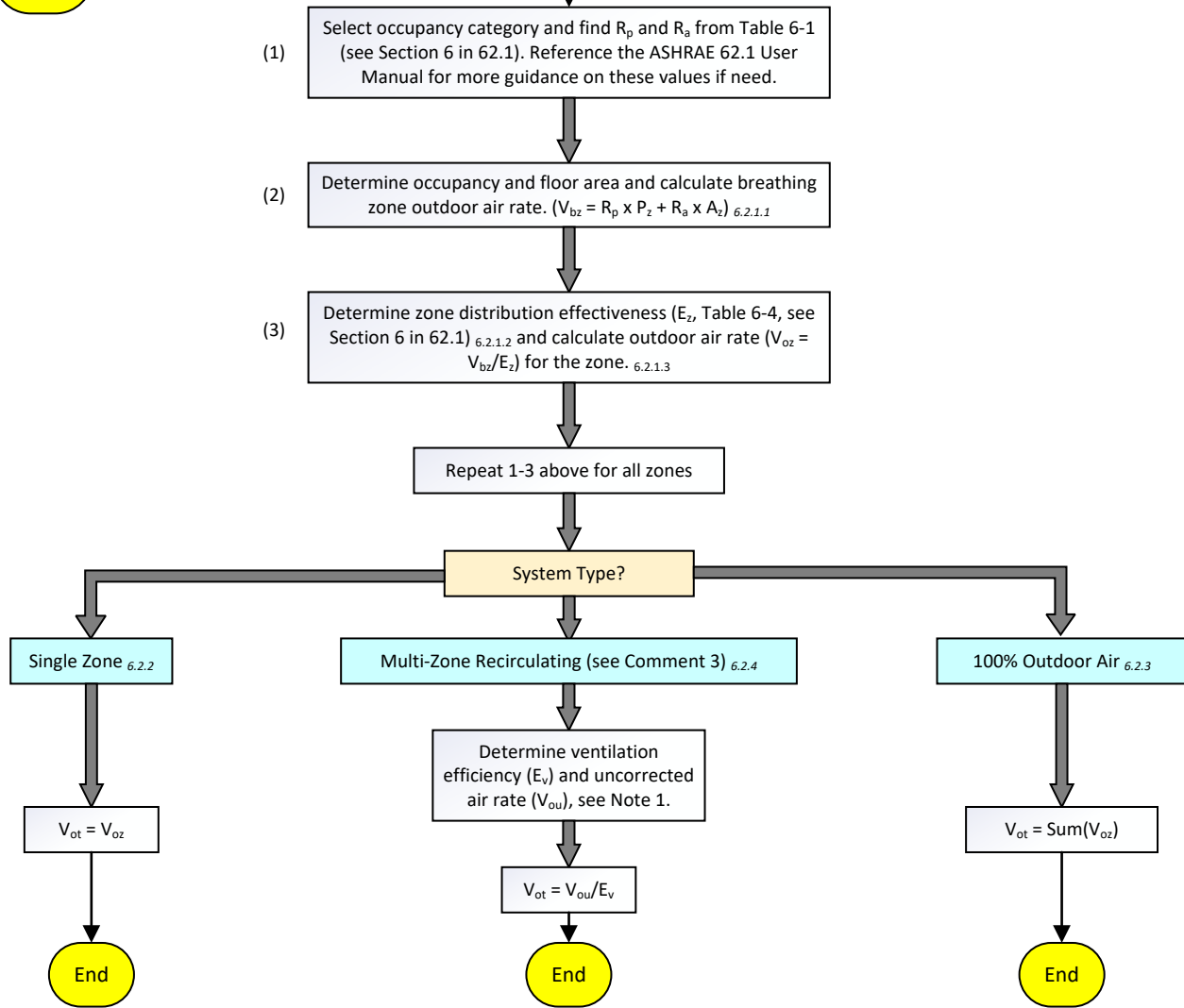
### Comment 2

#### Unified Facilities Criteria Requirements

Per UFC 3-410-01, the Ventilation Rate Procedure is required for minimum ventilation rates. Therefore, the combination of both procedures would need to be used if IAQP is desired for the determination. In this case, the IAQP would be limited to situations where there were specific contaminants of concern that needed to be addressed.

# VENTILATION RATE PROCEDURE

Continue



### Definitions

- $A_z$ : zone floor area, the net occupiable floor area
- $P_z$ : zone population, the number of people in zone during use
- $P_s$ : system population, the total number of people in the area served by the system
- $R_p$ : outdoor airflow rate required per person as determined from Table 6-1
- $R_a$ : outdoor airflow rate required per unit area as determined from Table 6-1
- $V_{bz}$ : breathing zone outdoor air rate
- $V_{oz}$ : calculate zone outdoor air rate
- $E_z$ : zone distribution effectiveness
- $V_{ou}$ : uncorrected outdoor air rate
- $D$ : occupant diversity
- $E_v$ : ventilation efficiency
- $V_{ot}$ : design outdoor air intake flow

### Comment 3

#### Multi-Zone Recirculating

Multiple-Zone Recirculating system applies when a single system or unit (such as a single constant or variable volume AHU) supplies multiple different breathing zones.

#### Note 1:

$E_v$  can be determined by using the simplified procedure or using Normative Appendix A for Alternate procedure. See Appendix A for more information.

#### Calculations

Determine occupant diversity:

$$D = P_s / \sum_{\text{all zones}} P_z$$

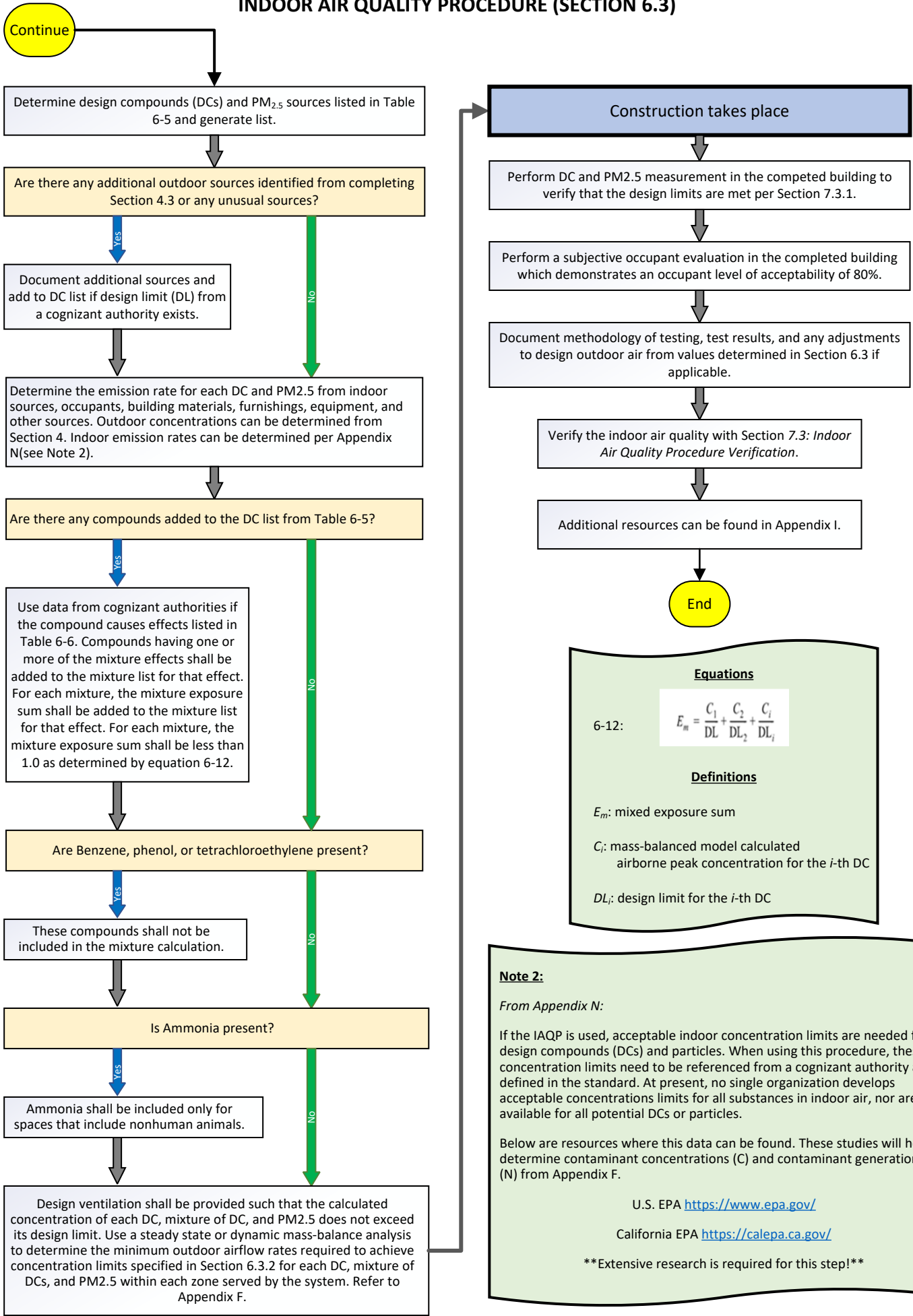
Determine uncorrected outdoor air rate:  $V_{ou} = D \cdot \sum_{\text{all zones}} ((R_p P_z) + (R_a A_z))$

$E_v$  Simplified Procedure:

If  $D < 0.6$ :  $E_v = 0.88D + 0.22$

If  $D \geq 0.6$ :  $E_v = 0.75$

# INDOOR AIR QUALITY PROCEDURE (SECTION 6.3)



### Equations

6-12: 
$$E_m = \frac{C_1}{DL} + \frac{C_2}{DL_2} + \frac{C_i}{DL_i}$$

### Definitions

- $E_m$ : mixed exposure sum
- $C_i$ : mass-balanced model calculated airborne peak concentration for the  $i$ -th DC
- $DL_i$ : design limit for the  $i$ -th DC

### Note 2:

*From Appendix N:*  
 If the IAQP is used, acceptable indoor concentration limits are needed for design compounds (DCs) and particles. When using this procedure, these concentration limits need to be referenced from a cognizant authority as defined in the standard. At present, no single organization develops acceptable concentrations limits for all substances in indoor air, nor are limits available for all potential DCs or particles.

Below are resources where this data can be found. These studies will help determine contaminant concentrations (C) and contaminant generation rate (N) from Appendix F.

- U.S. EPA <https://www.epa.gov/>
- California EPA <https://calepa.ca.gov/>

\*\*Extensive research is required for this step!\*\*

## REFERENCES

### ASHRAE

1791 Tullie Circle NE

Atlanta, GA 30329, United States

1-404-636-8400; [www.ashrae.org](http://www.ashrae.org)

ANSI/ASHRAE Standard 62.1 (2019)

Ventilation for Acceptable Indoor Air Quality