

Ventilation requirements can affect far more than HVAC. They can influence space, structure, electrical capacity, energy performance, cost and construction. The Indoor Air Quality Procedure (IAQP) gives mechanical engineers another design path when outdoor air alone creates conflicts elsewhere in the project. Use this quick reference to identify common constraints that may make IAQP worth evaluating.

PHYSICAL AND STRUCTURAL CONSTRAINTS

Project Constraint	Potential Design Impact	What to Evaluate with IAQP
Limited plenum, shaft or equipment space <i>Affects:</i> <i>Architecture and design</i>	Outdoor-air requirements may increase intake ductwork, louvers, shaft area or equipment footprints.	Compare outdoor-air requirements, associated infrastructure and equipment footprints under VRP and IAQP scenarios.
Existing roof-load limitations <i>Affects:</i> <i>Structural engineering</i>	Larger or additional HVAC equipment may exceed available roof capacity or require reinforcement.	Compare equipment capacity, size, weight and structural support requirements under each scenario.

CAPACITY AND PERFORMANCE CONSTRAINTS

Project Constraint	Potential Design Impact	What to Evaluate with IAQP
Limited electrical capacity <i>Affects:</i> <i>Electrical engineering</i>	Outdoor-air conditioning and fan loads may contribute to electrical upgrades or compete with other building priorities.	Compare peak demand, including heating, cooling, dehumidification, fans, air cleaning and controls.
Energy or decarbonization targets <i>Affects:</i> <i>Energy and sustainability</i>	Conditioning outdoor air may make modeled energy targets more difficult to achieve.	Compare annual energy use and peak loads for each strategy, including the energy required for air cleaning.

COST AND CONSTRUCTION CONSTRAINTS

Project Constraint	Potential Design Impact	What to Evaluate with IAQP
Growing project cost or scope <i>Affects:</i> <i>Ownership and development</i>	Larger equipment can create additional ductwork, structural, electrical, material, labor and coordination requirements.	Compare total installed scope, first cost and long-term operating implications.
Construction or phasing limitations <i>Affects:</i> <i>Construction management and contractors</i>	New ductwork, penetrations, shutdowns and equipment replacement may complicate occupied renovations or phased work.	Compare mechanical scope, shutdowns, disruption, trade coordination and installation schedules.

EXISTING CONDITIONS AND ONGOING PERFORMANCE

Project Constraint	Potential Design Impact	What to Evaluate with IAQP
Existing-building limitations <i>Affects:</i> <i>Architecture, construction and ownership</i>	Current HVAC capacity, outdoor-air pathways or electrical service may not support substantial ventilation changes.	Assess integration with the existing HVAC system, zoning, controls and available infrastructure.
Performance verification and operation <i>Affects:</i> <i>Commissioning and facilities</i>	Design assumptions may be lost during equipment selection, startup, maintenance or changes in occupancy.	Define contaminant targets, air-cleaning performance, controls, commissioning and maintenance requirements.

Another Scenario May Be Worth Evaluating

When one or more of these constraints are present, IAQP may be worth modeling before the mechanical design and supporting project scope are finalized.

Even projects already progressing through a VRP design may still have options. The potential impact will depend on the building, climate, occupancy, contaminants of concern, system design and applicable code requirements.

Evaluate IAQP for Your Project

Facing one of these constraints on a current project? Fellowes Air Quality Management can help explore what may be possible through a complimentary, project-specific IAQP analysis.