6. Tech Tip: eQUEST Modeling – Ventilation Approaches

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ENERGY STAR MFHR Guidelines

Section 3.14.1 (aligned with 90.1 Section G3.1.2.9):
- Baseline Systems 1 & 2 fan electrical power for supply, return, exhaust, and relief fans shall be 0.3 W/CFM

Section 3.14.2 (aligned with 90.1 Table G3.1 Section 4)
- Baseline System 1 & 2 fans must be modeled as running continuously

MFHR Guidelines Section 3.14 includes 3 examples of typical designs; in all cases, the baseline PTAC fans run continuously.

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Modeling Baseline PTAC Fans in eQUEST

Modeling Baseline PTAC Fans in eQUEST

- Enter OA flow on zone level to have PTACs running continuously instead of cycling with load

- Ventilation rate must be based on Section 3.12.2 of HRMF Guidelines

Example 1: Proposed Design w/Cycling PTACs and Exhaust Ventilation

1: PTACs no longer provide ventilation, and cycle with heating/cooling load

2&3: Exhaust flow equal to baseline OA CFM or as specified, whichever is greater; make-up via infiltration (e.g. trickle vents)

4: Exhaust fan power as specified

Example 2: Proposed Design with HW Baseboards and Exhaust Ventilation

Impact on Fan Energy May be Significant

Annual Energy Consumption by Enduse

Similar outcomes are expected for proposed designs with fan coil units and VRF heat pumps
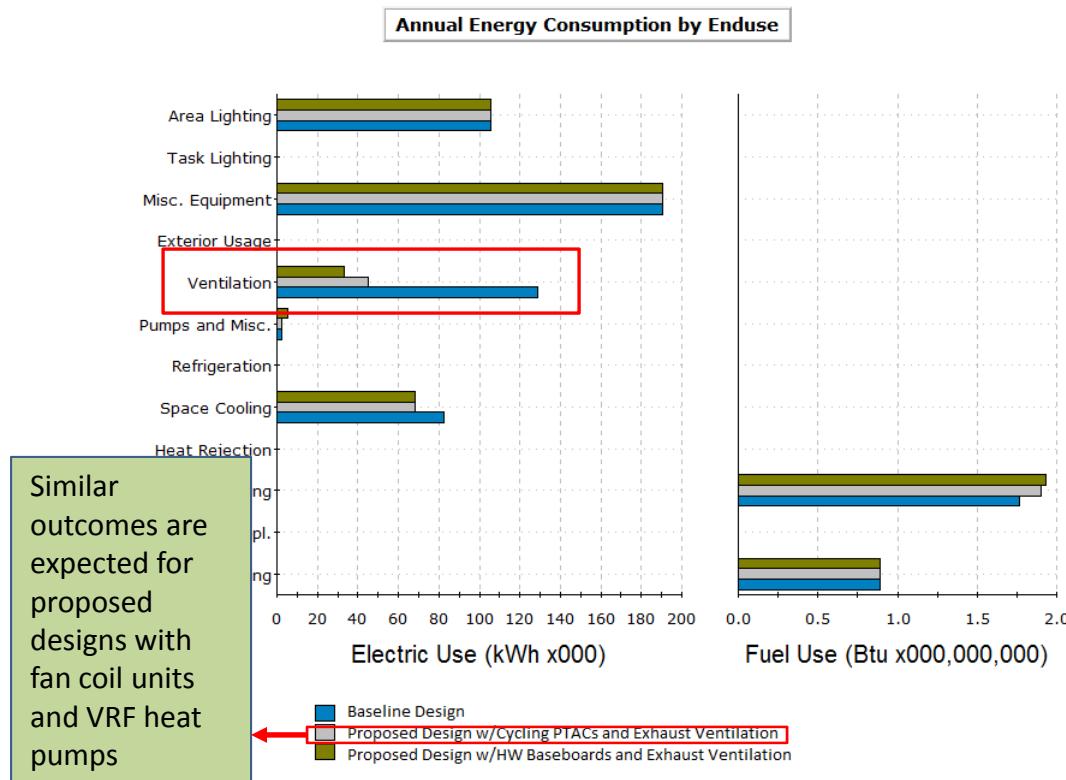
Easy Baseline Fan Energy QC Check

50,000 [CFM] X 0.3 [W/CFM] X 8760 [hr/yr] ~ 130,000 kWh

Common Mistakes

Modeling continuously running exhaust fans <u>in addition</u> to
0.3 W/CFM baseline PTAC fan power allowance

Common Mistakes

Exaggerated baseline design flow due to Design Day sizing and ….
…..incorrect Design Day settings
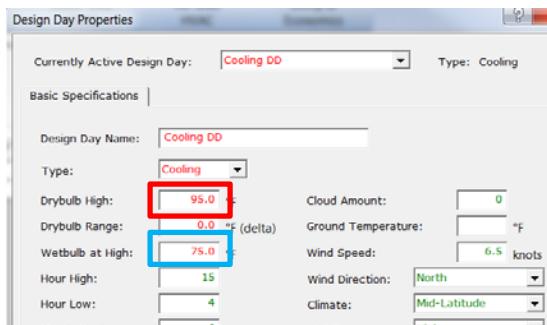
TABLE D-1 U.S. and U.S. Territory Climatic Data *(Continued)*

| State/City	Latitude	Longitude	Elev., ft	HDD65	CDD50	Heating Design Temperature	Cooling Design Temperature	
							Dry-Bulb	Wet-Bulb
						99.6%	1.0%	1.0%
(New York cont.)								
NY Central Pk WSO City	40.78 N	73.97 W	132	4805	3634	NA	NA	NA
NY Kennedy WSO AP	40.65 N	73.78 W	16	5027	3342	11	88	72
NY La Guardia WSO AP	40.77 N	73.90 W	11	4910	3547	13	89	73

Common Mistakes

Exaggerated baseline design flow due to Design Day sizing and ….
…modeling internal loads at 100% during Cooling Design Day
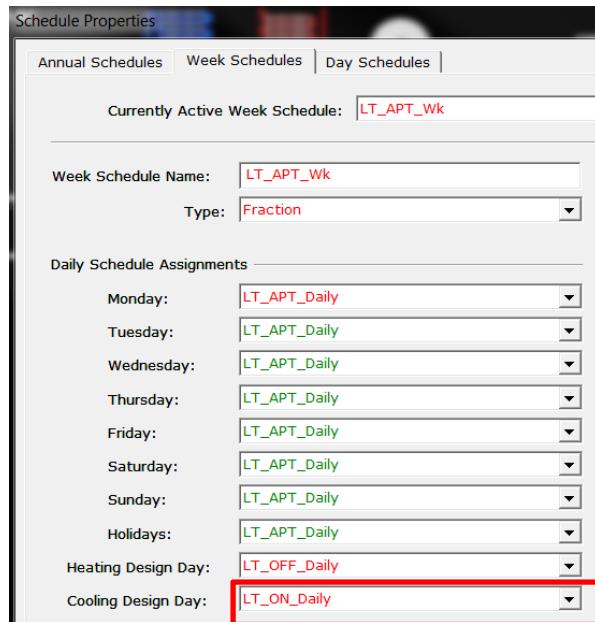
Baseline Fan Flow Sizing Tip 1

- DO NOT enter Cooling DD / Heating DD, to have eQUEST size the flow based on the annual peak load
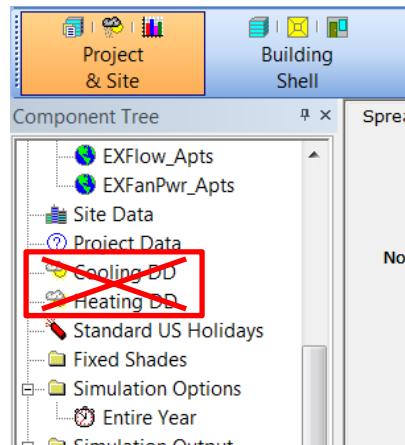
Baseline Fan Flow Sizing Tip 2

Baseline system design supply airflow rates must be based on a supply-air-to-room-air temperature difference of 20°F **(G3.1.2.9.1)**

75F-55F=20F