

City of Fort Collins Residential Mechanical Systems Design Submittal

For code references and training reminders/tips, see most current version of "Residential New Construction Mechanical Systems Design Submittal Guide."



Project Information

Builder: _____ Builder model: _____

- Site-specific submittal Address: _____ Direction front of house faces: _____
- Stock plan submittal City of Fort Collins stock plan #: _____

If the plan set shows options, what options affecting the thermal envelope are accounted for in this mechanical design?

- Full basement Full crawl space Basement + crawl Walkout basement Other foundation: _____
- Bonus room Other significant floor area change: _____
- Window area changes > 20 sf: _____
- Other significant options: _____
- Other notes regarding house configuration: _____

Source of information for energy specs (R-values, windows, etc.): _____

Designer

Designer's name: _____ Company: _____

Signature: _____ Date: _____

Local Exhaust -- Bath Fans

Exhaust Pickup Location (1)	Code-required?	Operation (2) + Minimum Airflow Requirement (CFM 5000')	Control and Other Notes (Does any fan also provide whole-house ventilation?) (Specify location of any remote fans)
	__Y __N	__I (50 cfm) __C (20 cfm)	
	__Y __N	__I (50 cfm) __C (20 cfm)	
	__Y __N	__I (50 cfm) __C (20 cfm)	
	__Y __N	__I (50 cfm) __C (20 cfm)	
	__Y __N	__I (50 cfm) __C (20 cfm)	
	__Y __N	__I (50 cfm) __C (20 cfm)	
	__Y __N	__I (50 cfm) __C (20 cfm)	
	__Y __N	__I (50 cfm) __C (20 cfm)	

(1) Match room names on plans (2) I = Intermittent C = Continuous

Whole-House Ventilation

Conditioned floor area, including basement (ft²): _____ # bedrooms: _____

Ventilation system type(s): Exhaust-only Supply-only Balanced *Code minimum airflow rate (CFM): _____ Design airflow rate (CFM): _____
 *(per IRC M1505 and/or equation: $(0.01 \times \text{total ft}^2 \text{ of house}) + [7.5 \times (\# \text{ of bedrooms} + 1)]$)

For simple exhaust-only systems with one fan, provide information here: OEM spec sheet for fan attached

Exhaust-only fan location: _____

Control: _____

For other system types, attach:

- Plan/narrative including component locations, fan design airflow + static pressure, ductwork details, control strategy (including dampering, duty cycling, occupant control, details for fans serving both local exhaust + whole-dwelling unit ventilation functions)
- OEM spec sheet for each fan (or equipment with multiple fans, e.g. HRV units)

Heating + Cooling Design Loads

Building being modeled matches options description in "Project Information" (page 1)

Duct Location	% Supply Ducts	% Return Ducts
Conditioned space		
Floor over garage (1)		
Attic		

Windows	
U-Factor (predominant) _____	SHGC (predominant) _____
Other window types _____	
Shading modeled: <input type="checkbox"/> Exterior overhangs <input type="checkbox"/> Insect screens <input type="checkbox"/> Interior shading	

(1) If construction details approved by City of Fort Collins are shown on plan set, ducts over garage are considered inside conditioned space.

If equipment/lighting gains exceed 3,000 Btuh, describe them: _____

- Before creating reports, orient building in actual orientation (site-specific submittals) or worst-case direction (stock plans).
- ALL submittals -- including site-specific submittals with known orientation -- must include report showing cooling load variation with building rotation.

Attach software output reports shown below (for multiple zones or systems, submit reports for each)

Wrightsoft Right-Suite Software	
<input type="checkbox"/> Building Analysis	<input type="checkbox"/> Project Summary
<input type="checkbox"/> Component Constructions	<input type="checkbox"/> Right-J Worksheet
<input type="checkbox"/> Loads for Multiple Orientations	<input type="checkbox"/> Load Short Form

Elite RHVAC Software		
<input type="checkbox"/> Project Report	<input type="checkbox"/> Room Load Summary	<input type="checkbox"/> Miscellaneous Report
<input type="checkbox"/> Building Pie Chart	<input type="checkbox"/> Detailed Room Loads	<input type="checkbox"/> Building Rotation Report
<input type="checkbox"/> Total Building Summary Loads	<input type="checkbox"/> Load Preview Report	

House Front Orientation	Design Cooling Load (Btuh) from Manual J			Design Heating Load (Btuh) from Manual J
	Sensible	Latent	Total	

- Design loads include no "adjustment factors"
- For stock plans, total range of cooling load with building rotation is:
 - Less than 6,000 Btuh
 - ≥ 6,000 Btuh (multiple designs required)

Heating + Cooling Equipment Selection

* No ACCA-approved software for equipment selection. Detailed OEM performance data must be used.

* If >1 system, submit each on separate page.

System # _____ Equipment location _____ Areas served _____

Equipment Manufacturer + Model Numbers

Furnace	A/C / Cooling Equipment Outdoor Unit	A/C / Cooling Equipment Indoor Coil
Mfr:	Mfr:	Mfr:
Model #:	Model #:	Model #:

Matched Components

AHRI reference #: _____

Specify data source + attach documentation: AHRI certificate OEM table (highlight selected eqpt combination) Software output

Furnace/Heating Equipment

OEM performance data for furnace + blower are attached Sealed-combustion furnace will be installed in 2-pipe configuration

OEM specifications:

Altitude de-rating factor for 5000': _____ Temperature rise range (F): _____ to _____

Air handler is sealed per IRC N1103.2.2.1

Blower motor type: PSC Brushless-DC or equivalent (eg ECM)

Furnace data are from OEM database rather than performance data table. Output capacity, air flow and temperature rise reflect 5000' altitude.

Design operation (corrected for altitude):

5000' output heating capacity (Btuh): _____ Ext static pressure (IWC): _____ Air flow (CFM 5000'): _____ Temperature rise (F): _____

Furnace size ratio: _____ Size ratio = (5000' output capacity) / (Design heating load)

Size ratio NOT 1.00 to 1.40 - EXPLAIN: _____

Air Conditioner/Cooling Equipment

OEM detailed performance data is attached (excerpt page corresponding to specified equipment, design conditions + chosen airflow).

Sea-level performance data for Fort Collins design conditions is highlighted on OEM detailed performance data table.

Sensible and latent cooling capacities are corrected for dry climate.

Altitude correction method used: Increased airflow De-rated capacity

AC data are from OEM database rather than performance data table. Attached computer report reflects and lists Fort Collins design conditions. Dry climate + altitude adjustments are clearly documented. Airflow is clearly specified as 5000' altitude (CFM 5000').

Design operation (corrected for dry climate and altitude):

Ext static pressure (IWC): _____ Design cooling airflow (CFM 5000'): _____

5000' cooling capacity (Btuh) from equipment manufacturer specs:

Sensible:	Latent:	Total:

Excess total capacity (Btuh): _____ Excess total capacity = (5000' total capacity) minus (Design total cooling load from Man J) Sensible capacity meets/exceeds sensible load

Excess total capacity > 6,000 Btuh - EXPLAIN: _____

Heating + Cooling Ductwork

* If more than one system is being installed, each must be separately documented.

* Duct plan labels must be legible.

Ductwork plans are attached. Minimum contents:

- Duct locations
- Trunk reductions
- All fittings, including turning vanes and balancing dampers
- Duct sizes
- Materials
- Insulation

Ductwork design parameters -- provide data here or attach software reports shown below.

	Total Ext Static Pressure (IWC)	Device Pressure Losses (IWC)	Available Static Pressure (IWC)	Total Equivalent Length (ft)	Friction Rate (IWC/100 ft)
Heating					
Cooling					

- Wrightsoft Right Suite Universal software: Duct System Summary
- Elite RHVAC software: Duct Static Pressure Loss Calculator Report

Heating + Cooling Control

Describe control strategy, including information on multi-stage and/or zoned systems:
