City of Fort Collins Residential Mechanical Systems Design Submittal

For code references and reminders/tips, see "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-Dwelling-Unit Ventilation

Conditioned floor area, including basement (sf): _____ # bedrooms: _____ Code-minimum airflow (CFM 5000'): _____ 0.01*CondFloorArea + 7.5*(#BR+1)

Ventilation system type(s): ☐ Exhaust-only ☐ Supply-only ☐ Balanced

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

Exhaust pickup location: _____ Fan location: _____ Design flow rate (CFM 5000'): _____

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: ☐ Exterior overhangs ☐ Insect screens ☐ 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	
☐ Building Analysis	☐ Project Summary
☐ Component Constructions	☐ Right-J Worksheet
☐ Loads for Multiple Orientations	☐ Load Short Form

Elite RHVAC Software		
☐ Project Report	☐ Room Load Summary	☐ Miscellaneous Report
☐ Building Pie Chart	☐ Detailed Room Loads	☐ Building Rotation Report
☐ Total Building Summary Loads	☐ Load Preview Report	

House Front Orientation	Design Cooling Load (Btuh)			Design Heating Load (Btuh)
	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 or greater

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	AC Outside Unit	AC Indoor Coil

Matched Components

AHRI reference #: _____

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

Furnace

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

Manifold gas pressure at 5000' (IWC): _____ Temperature rise range (F): _____ to _____

☐ 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

☐ 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): _____ Air flow (CFM 5000'): _____

5000' cooling capacity (Btuh):	Sensible		Latent		Total	

Excess total capacity (Btuh): _____ Excess total capacity = (5000' total capacity) - (Design total cooling load) ☐ 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:

_____

_____

_____

_____