

To: Rocky Hill Cohousing
From: Bruce Coldham
Date: March 19th 2003
Project Name: Rocky Hill Cohousing
Subject: Heating System Choices

Project No.: 02-03

Heating System Choices all use natural gas			
	Space Heater	Furnace and Ducted Air	Boiler and Baseboard Radiator
space required	space in living area	space in basement for equipment, space for duct risers, wall and/or ceiling vents in individual rooms	space in basement for equipment, baseboard units along bottom edge of walls
distribution and control	single heater located in the first floor living space controlled at the unit (See note 1)	ducts controlled as a single zone	pipes multi-zone control for a small additional cost for each added zone
cooling	separate device required	can add cooling option to the system	separate device required
water heating (See note 2)	separate device required	separate device required	storage tank with "loop" off boiler
air filtration	separate device required	can add air filtration option to system	separate device required
air humidification	unit has a place to add water but it cannot be hooked directly into plumbing	can add air humidification option to system	separate device required
how to heat basement and cost	another space heater or electric unit or loop off water heater (additional cost \$700-1500)	extra duct work at nominal extra cost	extra loop at nominal extra cost
system cost	\$2,000 —plus basement	\$6,000-\$7,000	\$7,000-\$8,000

Notes

1. Distribution is via the interior spaces of the house. The acceptability of the space heating option depends upon individual expectations of temperature differences between upper and lower floor within the house, and upon lifestyle (living patterns) particularly regarding propensities to leave bedroom doors open or closed. We have established in testing on a similar small house with a space heater on the lower floor that, on the coldest nights, a 5 degree temperature difference is to be expected between bedrooms on living space with bedroom doors open, and a 10 degree difference if the bedroom doors are closed.
2. All the figures we have been working with include the cost of the domestic hot water heater and the cost of the heating system. The upcharge for the hydronic assumes the domestic hot water is heated off the same unit and circulated to a storage tank.

Ventilation: Why build tight and then ventilate mechanically?

Comfort

- leaky buildings provide **uncontrolled** ventilation such as when the wind blows, or when it is very cold outside
- leaky buildings do not provide fresh air when and where it is most needed

Durable Structure and Finish

- leaky buildings allow moist air into structural cavities...where condensation occurs, followed by wetting, rotting, decay and mold

Controlled Ventilation = Healthier Spaces and Durable Buildings

Ventilation System Options

System options	features	Cost
SIMPLEST OPTION: through the wall exhaust fans usually located in bathrooms	<ul style="list-style-type: none"> quiet remotely controlled by a range of possible switches and timers rated for continuous operation exhaust only ... fresh air is drawn in through envelope (either through design “inlets”, or just through know leakage areas). 	\$100-\$200 per unit
ducted central exhaust system which removes air from two or three locations	<ul style="list-style-type: none"> more powerful than wall exhaust fan. remotely controlled by a range of possible switches and timers exhaust only ... fresh air is drawn in through envelope (either through design “inlets”, or just through know leakage areas). 	\$1,000 plus/minus
MOST EFFECTIVE OPTION: powered supply and exhaust systems taking and directing air to/from multiple locations. Involves duct work and heat recovery technology	<ul style="list-style-type: none"> pulls fresh air into house, first warming it with outgoing air fresh incoming air is ducted to specific (preferred) locations, such as bedrooms, where it is most beneficial. saves \$ on heating — 10% to 25% depending on the amount of time the ventilation system is run 	\$1,500 - \$2,000

Note: the “simplest option” above will provide a good in-door air quality in the sort of houses that we are contemplating — providing that these bathroom through-the-wall- units are operated sufficiently.