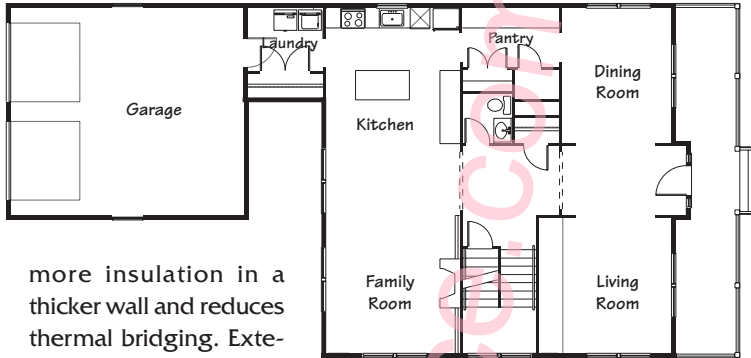


Every home built by Prairie Holdings Corporation has a controlled ventilation system that enhances indoor air quality and comfort by bringing in outside air when needed by the occupants. Typical homes have no way of providing outdoor air in a controlled manner aside from relying on the construction of leaky homes and the whims of the weather (wind and temperature differences). Leaky homes consume energy and tend to be uncomfortable from drafts. Tight homes without controlled ventilation can also have problems due to a build up of odors and other pollutants. The optimum approach for healthy, safe, comfortable, energy efficient homes is to construct a tight building envelope and provide controlled mechanical ventilation.

**Building Envelope** An advanced framing system using 2x6s on 24-inch centers, single top plates and stacked framing allow for



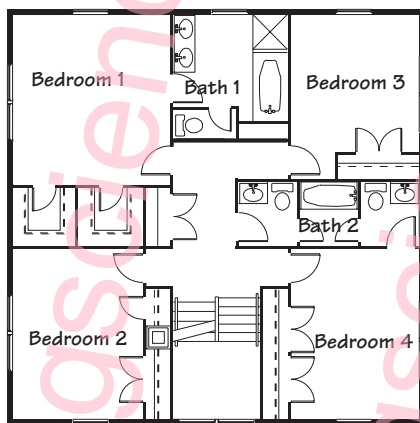
more insulation in a thicker wall and reduces thermal bridging. Exterior rigid foam sheathing with taped joints acts as an exterior air barrier as well as a drainage plane eliminating the need for building paper or housewrap.

**Windows** Low-emissivity, argon-filled windows increase the insulating value over standard windows.

**Mechanical Systems** A sealed combustion condensing gas furnace is completely isolated from the inside air. Combustion air is drawn from the outside with a minimal chance of combustion products spilling into the conditioned space. The water heater is a power vented model. A programmable setback thermostat with a timer is installed which reduces the energy demand.

The tighter building envelope, the high-performance windows and the increased levels of thermal insulation allow a considerable simplification and reduction in size of the duct distribution system for heating and cooling. Moving the ducts within the conditioned space eliminates duct leakage to the exterior as well as limits the temperature difference at the ducts. These improvements result in reduced heating and cooling loads which allow the air conditioning unit to be downsized as well.

Controlled mechanical ventilation is provided by a fresh air supply-only system with an AirCycler for mixing.



## Prairie Crossing Four Square

Prairie Holdings Corporation  
Grayslake, Illinois  
1999

2,650 sq. ft. four bedroom, 2 1/2 bath house with an optional fireplace and fully insulated basement and attic living space with optional bath and dormers

### Specifications

The mechanical system improvements include:

- Single, sealed combustion furnace located in the building envelope (basement)
- All ductwork located within the building envelope
- Independent supply ventilation system
- Power vented gas water heater

Building envelope improvements include:

- Basement has R-10 full height fiberglass batt insulation
- Walls use the advanced framing system with R-19 batts, R-7 insulating sheathing and an interior air flow retarder
- Roof truss with R-38 blown and batt attic insulation with vented assembly
- Windows are low-E, argon filled units
  - Total envelope leakage is less than 2.5 square inches per 100 square feet of building envelope area at 10 Pascals

Overall system improvements include:

- Controlled supply ventilation system
- Exterior air flow retarder system (sheathing taped)
- Interior air flow retarder system (glued gypsum board)
- High performance glazing
- All ductwork placed in the conditioned space

