Duct Design

Lesson Plenum and cavity space are suboptimal pathways for make-up air because it is hard to control air to deliver it where it is needed, and rough space results in inefficiency.

Goal Design and install duct systems that put air where you want it.

What Happened On The Wellstone, plenum and cavity space were designed as return air paths, instead of using ductwork. This strategy for return air is difficult to design and install consistently. It is typically leaky, resulting in inefficient and uncontrolled air movement. At The Wellstone, last-minute attempts to improve the design were not successful; because of the timing, significant improvements were impossible. Even with added awareness to the issues when the system was tested, they performed very poorly due to this design.

Recommendations Often, designers use plenum and cavity space rather than ducts for fresh air returns. This results in inefficient and uncontrolled air movement and the fresh air does not end up where it is needed. This also causes uneven heating and cooling that is less comfortable. Besides inefficiencies, plenum and cavity space may not allow for adequate air intake and wastes energy.

It is far better to use a central ducted return and jump ducts to distribute the air.

Take Away Use ductwork for return air rather than plenum and cavity space.

Relevant Green Communities Criteria:

5.1 a, b	Energy Efficient Building Design
7.5 a, b, c	Exhaust Fans
7.6 a, b	Ventilation

Photo courtesy of Advanced Energy

For more information on green ductwork, see related Lessons Learned fact sheets: Ductwork, Duct Sealing, Kitchen Ventilation, and Pressure Balancing Between Rooms.

Continued on back

LESSONS LEARNED Minnesota Green Communities Demonstration Projects

This publication is part of a series of lessons learned originating from Minnesota Green Communities demonstration projects. The Minnesota Green Communities initiative is currently the largest green building program in Minnesota, with 497 units completed, 908 under construction, and another 1,645 under development. Eight demonstration projects were funded through the Minnesota Green Communities program. The initiative is completing building performance testing on the demonstration projects, and has gathered lessons learned in several areas.

The Lessons Learned series includes the following publications: Integrated Design, Multifamily Green Rehabilitation, Construction Training and Monitoring, Ductwork, Duct Design, Duct Sealing, Kitchen Ventilation, Radon Testing and Mitigation, Pressure Balancing Between Rooms, Water Efficiency, and Cost Increase Triggers in Plans and Specifications. All publications can be found online at www.mngreencommunities.org.

GREATER MINNESOTA HOUSING FUND

FAMILY HOUSING FUND

Enterprise™

Minnesota Green Communities, a collaboration of the Greater Minnesota Housing Fund, the Family Housing Fund, and Enterprise, is an initiative designed to foster the creation of affordable, healthier, and more energy-efficient housing throughout Minnesota. The initiative will support the production of affordable housing with markedly reduced energy costs, use of materials beneficial to the environment, conservation-minded land use planning, and attention to the creation of healthy environments and lifestyles for individuals, children, families, and communities. For more information, please visit www.mngreencommunities.org.

June 2009

Minnesota Green Communities c/o Greater Minnesota Housing Fund
332 Minnesota Street, Suite 1201 East • St. Paul, MN 55101 • Tel: 651-221-1997 or 1-800-277-2258 • Fax: 651-221-1904