



# Integrated Design

**Lesson** Integrated design works. Minnesota Green Communities demonstration project New San Marco invested significant time in a strong integrated design process and reaped huge benefits.

**Goal** Develop a cost-effective plan that will be implemented as designed.

**What Happened** The New San Marco integrated design process began when architect LHB facilitated a charrette in 2004. The team met twice monthly for two years, covering green building and other issues. It included the developer organization and development consultants, service providers, architects, staff from Corporation for Supportive Housing, building management, and maintenance staff. The contractor was added to this team as soon as it was selected. Not all members attended all meetings, but participated when possible.

There were four major green building outcomes from this process. First, the team decided to design what they needed and no more to build the smallest project that could meet the needs of the building program and to plan it thoughtfully. This included building one building rather than two. The original concept was to build two buildings in phases in order to house two different populations of residents. Instead, they decided to build two buildings inside one shell, saving significant materials, land, and costs. Inside the project, one “building” cannot be accessed from the other—it is necessary to go outside and reenter through a different entrance. Second, they decided to build a “100-year building,” and to focus on durability and energy efficiency. Third, a broad set of development team members participated in Enterprise-sponsored online green building trainings. This resulted in deeper commitment to the goals of the project. For example, the maintenance staff member became really excited about the health and sustainability effects of his work, and did extra research on how to change his team’s practices to support the sustainability of the building once it was occupied.

Finally, when bids were received on the project, they were millions of dollars over budget. The strong team built over two years of meetings came up with solutions that allowed the New San Marco to maintain the durability and energy efficiency they had set as goals. They could achieve their goal of a 100-year building and still save substantially by changing the top three floors from concrete to wood, and part of the brick exterior to Hardi board. They also made the building a little shorter, using less material, and reduced the square footage by 5,000 square feet by eliminating part of the basement. They never even considered setting aside the energy efficiency measures, in part because they had a three-year payback.

**Relevant Green Communities Criteria:**

**1.1 Green Development Plan**



New San Marco, Duluth

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**What Happened**  
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On another project, The Wellstone, there was a strong integrated design process regarding the solar thermal hot water system, but it didn't extend to the overall project. After the building was complete, the developer noted that the process made the innovative solar thermal system implementation painless, but other less ambitious aspects of the design and construction were more difficult and they wished they'd used the integrated design process more broadly.

**Recommendations**

Begin at the earliest point possible with a green charrette—a full-day meeting with all development team members and stakeholders. With a facilitator, set project goals and work through all the Green Communities criteria items to communicate who is responsible for what and how the team will work together. Carefully document decisions and reasons for decisions made at the charrette, as there will be changes in the team during the process and this will help transfer information through transitions. Meet with the entire team on a regular basis throughout the development process to review goals.

**Take Away**

Integrated design is essential for cost-effective sustainable development.

*For more information on integrated design, see related Lessons Learned fact sheet: Construction Training and Monitoring.*

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**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](http://www.mngreencommunities.org).



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](http://www.mngreencommunities.org).

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