BY CHRISTY PAXTON | EDITOR-IN-CHIEF

project profile

Transforming

urban sprawl to utopia

Cleveland's EcoVillage seeks to grow a friendly, green world

The EcoVillage town homes on West 58th St. are but one step in the total EcoVillage, a progressive design concept that encompasses a much larger area and includes a soon-to-be-renovated RTA Rapid station at West 65th St. The entire EcoVillage concept covers roughly a quarter-mile area around the Rapid station.

It started as a little green in someone's eye. What it will ultimately become is a suggestion for a better way to build communities by thoughtfully recovering a deteriorated neighborhood through a collaborative effort involving everyone from designers and constructors to community organizations and the residents themselves.

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The first building of the four-building complex was completed in November and ground broken for the second in early December. The structures reflect the commitment to combining green building ideas (energy efficiency, passive solar design, nontoxic building materials, life-cycle cost considerations, wastewater treatment using organisms) with "New Urbanism" concepts such as pedestrian-friendly streets, mixed-use areas/structures, access to public transit and urban green space.

Photos courtesy D-A-S Construction. Graphic images of EcoVillage provided by DSCDO. Construction drawings provided by Building Sciences Corp.

Worldwide movement gets local attention

The movement to go green in building–essentially, to build quality structures–is steadily gaining momentum. Throughout the U.S., many city governments are partnering with environmental organizations to see what can be done to make their communities more people-, plant-, animal- and earth-friendly.

In Cleveland, as the city went through a redevelopment phase in the early 1990s, Case Western Reserve University, Cleveland State University and EcoCity Cleveland wanted to address urban sprawl and abandonment of urban areas. The organizations explored how new construction or rehab in the city could be done with the environment in mind. In 1995, they proposed a partnership between themselves and neighborhood groups to come up with a new type of neighborhood that would be thoughtfully planned for sustainability and lack of environmental consequences but still be workable from time, resource and cost standpoints.

The organizations wanted to see how they could bring together new construction or rehab in the city that would take into account the environment. In 1995, they proposed a partnership between themselves and neighborhood groups to come up with a new type of neighborhood thoughtfully planned for sustainability and lack of environmental consequences but still be workable from time, resource and cost standpoints.

A 1996 CSU study funded by the George Gund Foundation helped further develop the concept. A potential site was selected in the Detroit Shoreway neighborhood, public and government support was solicited, and finally concept drawings were prepared.

"We were chosen because we had a Rapid station right here, we had the green space around [Cleveland Michael] Zone Rec Center, and also opportunities for redevelopment in the area," says David Rowe, project manager for Detroit Shoreway Community Development Organization (DSCDO). Rowe came on board in March 2000.

Two pivotal events served to rally community support for such an adventurous project, says Rowe: One was the public meeting, or charrette, held at St. Stephen's Church on a snowy December day in 1996 where more than 100 people attended to share their thoughts. The other, which occurred shortly there-

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after, was RTA's announced closing of the West 65th Rapid station.

"The residents came out in volume and said 'absolutely not' [to the closing]," says Rowe. "It was, in my opinion, the front door to this project because it really allowed the community to come together to understand how important transit is in a neighborhood." Because of the strong reaction, RTA reversed itself and agreed to meet with residents to determine what needed to be done to the station to make it a safer, more inviting place to use.

EcoCity Cleveland and the DSCDO, which were partnering to further the project, submitted a grant proposal to the U.S. Environmental Protection Agency for funding to hire a project manager. (In addition to these main partners, the project involves the Greater Cleveland RTA, private developers, the City of Cleveland, other neighborhood development organizations and other environmental organizations, such as the Cleveland Green Building Coalition.)

The EPA approved the grant in 1998. In early 2002, construction began on the town homes. The Rapid station project began a little over a month ago.

EcoVillage town homes green building features

- Detailed plans and green specs
- High-density urban infill with rapid transit access
- Extra living space on lower level
- Ducts in conditioned space
- Controlled ventilation
- High-performance envelope, windows and HVAC
- Advanced framing, FSC-certified lumber and finished wood products
- Pervious concrete and salvaged brick pavers
- Extensive construction waste recycling on and off site

Sources: EcoCity Cleveland (www.ecocitycleveland.org), Building America (www.buildingamerica.gov), Building Science Corp. (www.buildingscience.com)

Developing the details

To anyone looking at the EcoVillage town homes, they would appear to be merely a nice example of classic-style housing. The only clue they might be something more are the solar panels on the roofs of the detached garages.

So what makes them green? Use of recycled materials, low-VOC (volatile organic compounds) materials, photovoltaic (PV) panels, yes. But so much more. "The usual suspects, we've got them all," says Betsy Pettit of Building Sciences Corp. (BSC), the architect for the town homes and a leader in the green building concept movement. "[But] this building is integrally green, and it's because it was

"These town homes needed to perform, to give legitimacy to green building...They also needed to fit into the neighborhood, respect the street, and respect the architecture that already existed, and finally they needed to be sustainable." — David Rowe, DSCDO

put together as a system. The building details that were chosen are durable, and they're going to last a long time."

That thinking is nothing new. "Let's not forget that this is actually an old practice," says Manda Gillespie, program manager for EcoCity Cleveland. "Some of the most beautiful buildings in the world from Fallingwater to the Taj Mahal pay special attention to both nature in their design and to their impact on nature–don't forget that nature includes humans and our health."

Perhaps this old practice is simply receiving new attention as individuals and communities around the globe become more and more aware of the need to better manage finite resources.

"We have a contract with the Department of Energy to reengineer the American home," says Pettit. "It's a systems approach: The idea is that, with the same kit of parts we are currently building with, by putting the pieces together in a smart way, we can get better performance.

"These town homes needed to perform," says Rowe. "They needed to give legitimacy to green building. In Cleveland, we didn't have anything on the market that would show the whole package of high-efficiency, good solid indoor air quality. They also needed to fit into the neighborhood, respect the street, and respect the architecture that already existed. Finally, they needed to be sustainable."

"We end up taking redundancy out of the design. By doing that, we can take the cost of one thing and use that money to achieve better performance," says Pettit. "For instance, if we can take lumber out of the building frame that is literally not doing anything and replace it with insulation, we get a better thermal value on the envelope."

DSCDO's David Rowe and EcoCity's Manda Gillespie celebrate at the grand opening.

Building green does often involve rethinking and changing ingrained habits. One challenge for the EcoVillage design team was to add new specs related to environmental performance but still include the standard language contractors needed to do the job right. The team ended up writing its own green spec language by drawing on resources such as BuildingGreen.com's GreenSpec (www.build inggreen.com/).

"We wrote a special spec where we literally went through every trade and tried to pick products that were the same cost but a better response to environmental issues," says Pettit. Where they felt contractors or subs might be hard put to find certain materials such as Forest Stewardship Council (FSC)-certified lumber or high-content slag/flyash concrete, designers included complete distributor/manufacturer information.

Drawings and construction details for the EcoVillage project run more than 60 pages and include complete framing layouts and detailed cross-sections for every wall assembly since there were many different types (see Figure 1 on page 24). The drawings were complemented by the project specifications. Throughout the specs were specific references to building principles and detailed graphics from the "Builder's Guide - Cold Climates" from BSC. The general contractor and all subcontractors received a copy of the guide.

For a sample of the spec language used, go to the web site www.buildingscience.com/buildingamerica/casestudies/ecovillage

Vendor list

The following subcontractors were involved in the EcoVillage town home project:

Trade	Subcontractor
Cabinets	Alside
Concrete	New Age Cement
Drywall	Carroll Drywall
E I F S	Midpark Interiors
Electric	First Energy
Electrical	Pro-lectric
Exterior Doors	D. W. Ross
Gas	Dominion East Ohio
H V A C	Brennan & Assoc.
Insulation	4-Seasons
Lumber	Dougherty Lumber
Masonry	Dave Philips Masonry
Painting	Tri-County Painting
Pavers/ Retaining	Interlock Paving Co.
Phone	Ameritech
Plumbing	K & H Plumbing
Roofing / Gutters	Clinton Roofing (labor)
Roofing	Allied Bldg. Supply (material)
Rough Carpentry	Springhill Construction
Sewer	Cleveland Water Pollution
Siding	Patrick's Home Improvement
Site	Yochman Excavating
Structural Steel	Eagle Fabricators
Survey	Reitz Engineering
Water	Cleveland Water
Windows	Alside

What is an ecovillage?

The background or motivation for ecovillages is the need to reverse the gradual disintegration of supportive social/cultural structures and the upsurge of destructive environmental practices on our planet.

Ecovillages are urban or rural communities of people who strive to integrate a supportive social environment with a low-impact way of life. To achieve this, they integrate various aspects of ecological design, permaculture, ecological building, green production, alternative energy, community building practices, and much more.

Ecovillages typically build on various combinations of three dimensions:

Source: Global Ecovillage Network (GEN) www.gaia.org/

Social/Community: Ecovillages are communities in which people feel supported by and responsible to those around them.

Ecological: Ecovillages allow people to experience their spiritual connection to the living earth.

Cultural/Spiritual: Most ecovillages do not place an emphasis on spiritual practices as such, but there often is a recognition that caring for one's environment does make people a part of something greater than their own selves.

_specs.pdf for more.

Because so much of this is new to so many, on-site educational workshops prepared by BSC in conjunction with the Cleveland Green Building Coalition have been conducted throughout the project. "The biggest challenge was getting up the 'learning curve' of green construction techniques as quickly as possible so as to stay on schedule, while making sure all subcontractors likewise followed and paid the necessary attention to detail," says Joe Knab, project manager for D-A-S Construction.

"We've been there about a half-dozen times giving seminars," says Pettit. "It started out with the charrettes finding out [from the public] what was important. Then as we decided what we wanted to do, we had more seminars, with many local designers by the way, to explain why we made design decisions. Then we had several seminars with the builders association about the same subject, then during construction we had several where we showed people how certain details are working that are unique, like how you wrap a window to make sure it never leaks."

"In the town home development, we found that we had to think about community design as well as green building features and the beauty of the individual units," says Gillespie. "For instance, the architect's initial instinct was to have the town homes all face…each other with courtyards to maximize the southern exposure of each unit on the site. The architect felt it would both create lovely semi-private front yards and provide beneficial solar gain.

"However, the neighbors in the EcoVillage wanted the homes to better match the urban fabric of the area and to be inviting to the surrounding community. So they asked to have the town homes face the street. So, the town homes do face the street, and the end result is quite beautiful and much more architecturally appropriate for the traditional neighborhood feel," she says.

"We try to turn everything we do into a learning tool," says Rowe. "Really open it up, have a workshop around it, get other people, other architects, other developers out there, so they can see how we to do this."

Efficiency and durability

The EcoVillage town homes replace 10 single-family houses which stood in disrepair and are a five-minute walk from the Rapid station. "Like almost every site in Cleveland, the area where the town homes were built used to have homes on it," says Gillespie. "Many of these homes had been bull-

"The design was meant to be timeless," says Pettit. "We have an elegant design that is exceeding the performance of the rest of the things that are being built around it by leaps and bounds. And that, just by virtue of the excitement it generates as it's being built, will ultimately having an effect on everybody who sees it."

dozed and buried within the basement. All of this must be dealt with before construction and is part of the cost associated with development on land that isn't greenfield."

Site preparation on this project was different from others in that the original intent was to stockpile both site clearing materials (i.e. topsoil and chipped trees/branches) and construction debris (masonry scrap/drywall/lumber/shingles), says Knab. The topsoil was used in lawn and planter beds; the wood chips for temporary parking and walkways. Stockpiled construction materials were to be ground and left on site, but not enough material was collected to warrant bringing a grinder to the site.

"We are working with the Green Building Coalition to recycle or reuse any leftover waste," says Gillespie. "For instance, we're making SEE studs with the local trade school out of left-over stud pieces."

The two most-used materials at EcoVillage, as with most building, are wood and concrete. FSC-certified lumber or salvaged wood was used for everything from framing lumber to trim and cabinets. Concrete and concrete block are specced for high-content blast furnace slag or flyash, both waste materials that can replace up to 50% of the very energy-intensive Portland cement used in concrete.

"Bottom line is, we didn't get all the additives in the concrete that we wanted, but we're hoping next time around, we will," says Pettit. "On the wood, they did a fabulous job of doing our advanced framing, and we have an excellent building envelope. There was virtually no wood waste, so we didn't have to worry about grinding it and recycling it."

Creating the envelope

To build a durable structure, guidelines developed for constructing homes in cold climates were used. The result was foundation, wall and roof assemblies that safeguard building components from degrading forces such as water vapor, extreme temperatures and ultraviolet light.

"An important element is the absolute attention to moisture issues. The building is insulated on all six sides–yes, including under the basement," says Gillespie. Supply and exhaust fans remove moisture from the air by literally causing air change, and moisture and undesirable air sources are identified and dealt with. The end result is building assemblies are kept dry.

Using the systems approach, says Pettit, "is basically being able to provide a good leak-free building envelope that has the best thermal performance that we can provide for the dollars, that keeps the rainwater out, and that then provides outside air distributed to the air space where people need it for good indoor air quality.

"These houses use less than 50% of the energy for heating, cooling and hot water that a standard house that meets the current Cleveland building code uses. So for basically the same money, $80 per square foot of construction cost, we have performance that's twice as good."

The first four town homes get an added energy bonus. "Because Detroit Shoreway got the grant to demonstrate photovoltaics, there will also be another 25% reduction on top of that on the electric bill. So we're expecting those homeowners in the first four units to

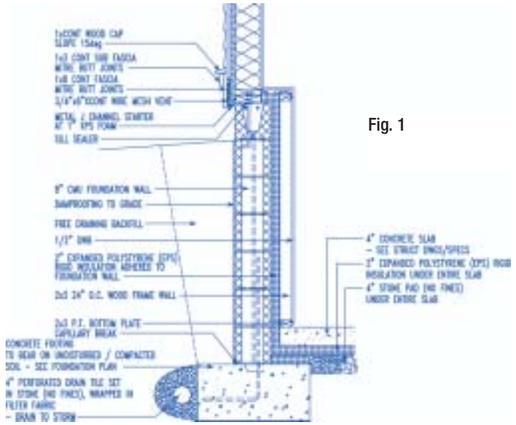

Fig. 1

basically be anywhere from zero utility costs to 25% of the total utility cost that a like home would have," says Pettit. Utility costs include heating, cooling and hot water, she says, but not plug load, which can't be predicted in this situation.

As these completed units sell out, the next units will be built. According to Rowe, the town homes are scheduled to be completed by spring 2004.

These and the Rapid station are but two pieces in the puzzle that, when fully assembled, will be the EcoVillage.

Continuing to grow green

RTA has purchased several parcels of land around the West 65th station to develop as mixed-use areas. A community garden, started three years ago, covers three public lots and one private lot. Green Built, a local developer, wanted to do some prototype single-family homes, says Rowe. Space was acquired, one home was completed and sold, and another one is being started on West 54th.

Rowe says DSCDO has acquired another parcel of land on West 58th Street near Pear and plans to build four town homes there. Green space development and bike paths to the lake are other thoughts. And there's so much more.

The challenge, Rowe says, is "pulling it all together and keeping all of those things as important. It can be argued, the garden isn't that important or the town homes are more important because there are a lot of dollars invested. But the social aspect of the community garden–you can't put a price tag on that."

Other things you can't put a price tag are evident when the building partners share their thoughts about the project.

"I cannot emphasize enough, the community support for this project has been incredible. Everybody connected with the city has been wonderful," says Rowe. "Mayor Campbell's office, and Mayor White's before, they've all just been great. Same for our architect and D-A-S Construction."

"We are very happy to be a part of a revolutionary process and direction of green building in a residential application," says Lori Alba, marketing manager for D-A-S Construction. "Our team has been very receptive to learning the new process of this type of construction and has done a great job of not falling back to the typical construction applications. We look forward to using this experience and knowledge on future green buildings."

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"For the community and the city, it really does start to put Cleveland on the map as a 'green city.' It says we care about the community, and we care that we should not be spending all these dollars and not getting good indoor air quality in a home or that we should not be throwing away energy we don't need to use," says Rowe.

"I am proud of the vision," says Gillespie. "We are trying to redevelop a little bit of the world by taking the land and the people that are there and bringing new ideas and better resources to the table. And, though the area still isn't much to look at and might not be for another 10 years, it is a radical, radical notion that few have had the vision or spirit to try before. How exciting that it is happening here, in the heart of Cleveland." **BXM**

Want more information on green building? Watch for our special section in February on "going green."

The Building America Program

The U.S. Department of Energy (DOE) Building America program is a research, development and technology implementation process, cost-shared, in cooperation with the home construction industry. This process develops systems engineered, sustainable, innovative building methods and integrated, cost-effective, advanced technologies. These innovations can save builders and homeowners millions of dollars in construction and energy costs.

The program aims to:

- Reduce energy use by 30% to 70%
- Improve comfort and indoor air quality
- Encourage a systems engineering approach for design and construction of new houses
- Reduce construction time and waste
- Accelerate the development and adoption of high performance in production housing

For more information, visit www.buildingamerica.gov.

New Urbanism

New Urbanism promotes the creation and restoration of diverse, walkable, compact, vibrant, mixed-use communities composed of the same components as conventional development, but assembled in a more integrated fashion, in the form of complete communities. These contain housing, work places, shops, entertainment, schools, parks, and civic facilities essential to the daily lives of the residents, all within easy walking distance of each other.

New Urbanism promotes the increased use of trains and light rail, instead of more highways and roads. Currently, there are more than 500 New Urbanist projects planned or under construction in the United States alone, half of which are in historic urban centers.

Source: www.newurbanism.org

Project specs: EcoVillage town homes

Size:
20 town homes, four separate buildings: two four-unit, two six-unit

Two- and three- story units

1,600 sq. ft. average; total 32,320 sq. ft.

Owner:
Detroit Shoreway Community Development Organization

Project partner:
EcoCity Cleveland

Architect:
Building Science Corp.

General contractor:
D-A-S Construction Co.

Engineering:
Renovation Planners

Developer:
Evergreen 58

Landscape architecture:
Kerr + Boron Associates, LLC