



mecklenburg county
north carolina



air
land
water

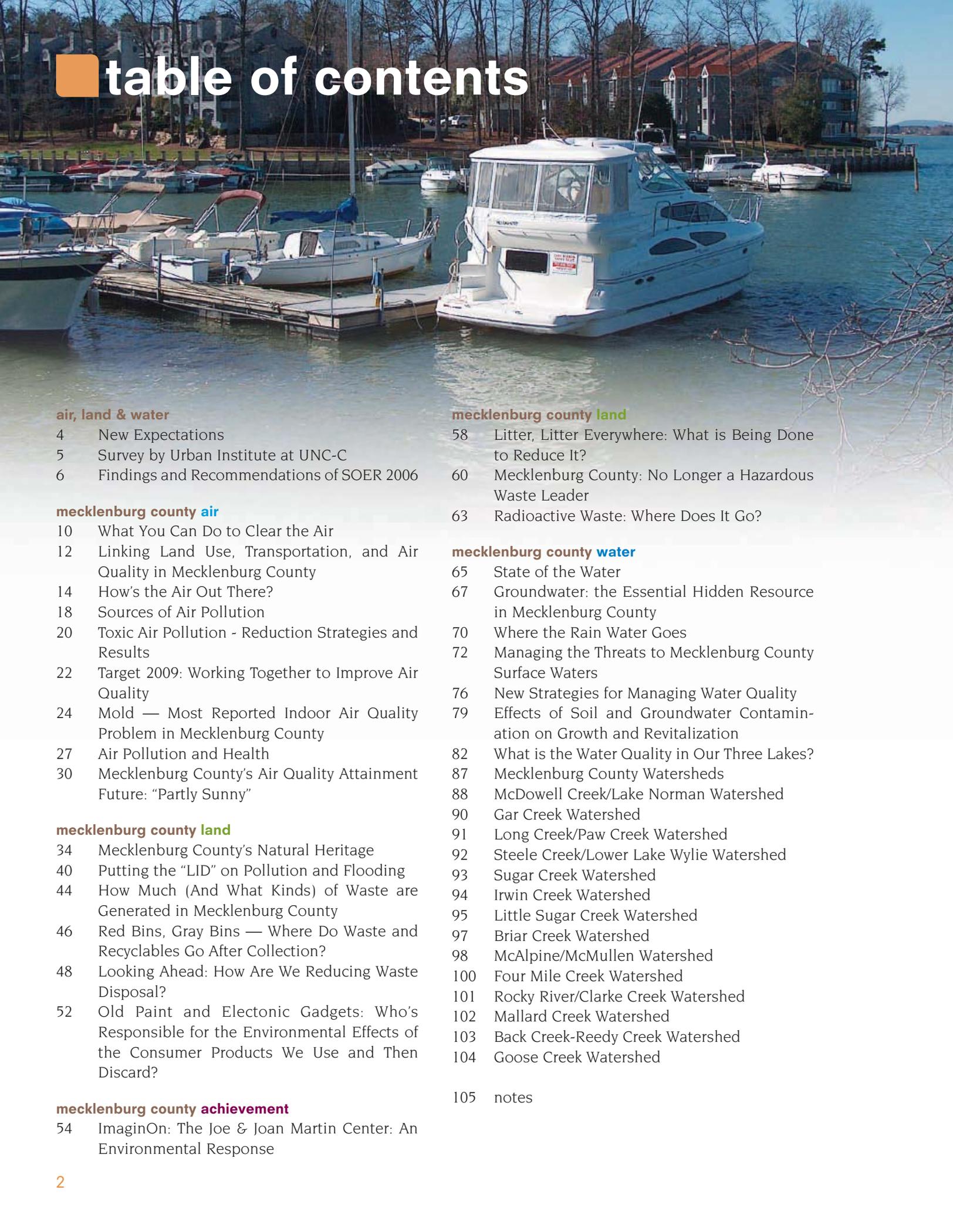
2006



state of the **environment** report



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our purpose

2006 State of the Environment Report for Mecklenburg County, North Carolina
Mecklenburg County Land Use & Environmental Services Agency (LUESA)



The State of the Environment Report was established in 1987 with the purpose of describing Mecklenburg County's current environmental status for the public and the Board of County Commissioners; to give the County objective measures to evaluate progress toward a clean, healthy environment; to highlight the major issues facing the County; and recommend direction concerning those issues.

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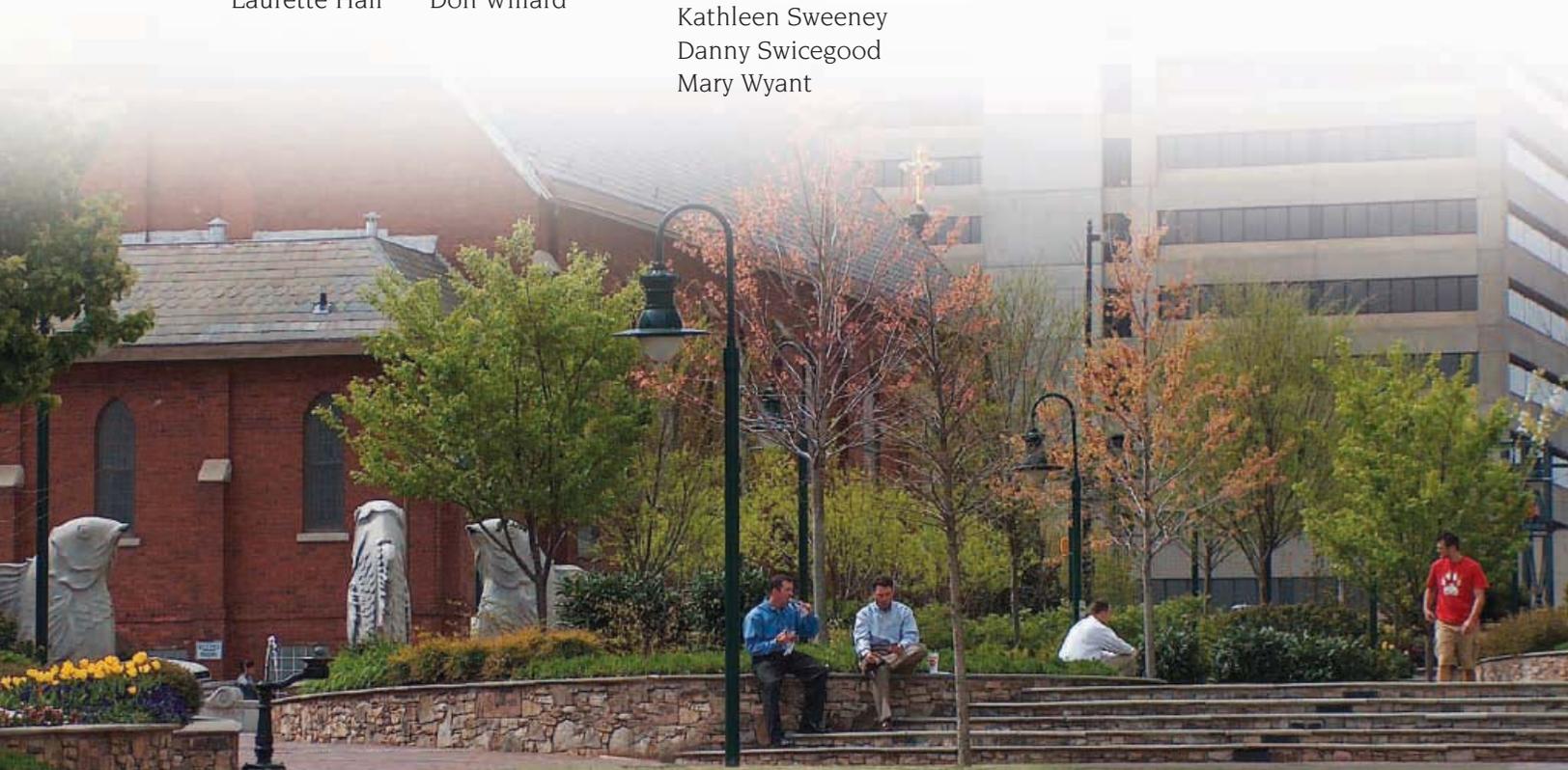
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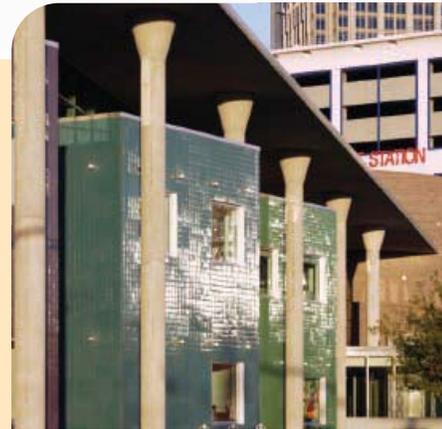
mecklenburg county achievement

ImaginOn: The Joe & Joan Martin Center An Environmental Response

by Cheryl Walker, AIA, LEED™ AP Gantt Huberman Architects, PLLC

Project Information

Owner:	The Public Library of Charlotte and Mecklenburg County
Architect:	Gantt Huberman Architects in association with Holzman Moss Architecture
Construction Manager:	RodgersHardin
Date of Occupancy:	2005
Construction Cost:	\$28 million
Size:	114,000 square feet
Owner contact:	Rich Rosenthal, chief of operations Public Library of Charlotte and Mecklenburg County Phone: 704.336.4146



COO's Statement "From the conceptual stage of project planning, the Library wanted to make ImaginOn a LEED™ project. Our rationale was that this is a project dedicated to enriching the lives of children. As such, we thought that sustainable design was an expression of faith and hope in the future in the same way that a facility designed for the children of our community expresses hope and commitment to the future." (Rich Rosenthal, chief of operations, The Public Library of Charlotte and Mecklenburg County)

ImaginOn: The Joe & Joan Martin Center was conceived as a one-of-a kind facility that reinvents children's educational and entertainment spaces. The brainchild of Bob Cannon, former executive director of the Public Library of Charlotte and Mecklenburg County, and Bruce LaRowe, executive director of the Children's Theatre of Charlotte, ImaginOn integrates two entities with shared missions into a new facility type with an original approach to education, learning, and the arts. The resultant facility is an integrated learning environment combining the staff, collections and performances of both organizations. ImaginOn is an exciting and interactive space for children of all ages to experience the art of storytelling — written, spoken, and electronic. The building houses 550- and 250-seat theaters on the cutting edge of theatrical technology, a storytelling room, a blue screen animation studio, and

numerous interactive exhibits. ImaginOn's innovative design creates an exciting learning environment for its visitors.

Early in the design process, ImaginOn's planning team established a goal of designing and building a state-of-the-art learning center that was both environmentally responsible and provided a healthy environment for the building's occupants. In the design of this project, the team has addressed environmental issues in the five areas recognized by the **LEED™ Rating System**: site development, water efficiency, energy and atmosphere, indoor environmental quality, and materials and resources. The building provided an opportunity to demonstrate environmental stewardship in a practical way.

The U.S. Green Building Council's nationally accepted benchmarking system afforded the

opportunity for validating the building's level of "greenness" through a third-party certification process. The goal was to pursue a "silver" LEED™ level certification, since it is widely documented by the USGBC that buildings seeking this level of certification can be constructed at no or very low additional first construction costs and by utilizing conventional building practices. Green strategies were identified and applied to the project in a "budget neutral" manner, meaning that only those strategies that resulted in no net increase to the established construction budget were incorporated.

ImaginOn is seeking to be the first LEED™ certified building in Mecklenburg County. In pursuing this goal, the owner hopes to lead by example, both in forging community partnerships and in demonstrating how the community might approach sustainable design on future projects.

ImaginOn's careful siting of the building, use of green materials, and energy-efficient building systems are designed and constructed to create long term benefits for the community.

Sustainable Project Highlights

[See also the Sidebar-Green Strategies]

Urban Redevelopment

The owner selected a previously developed urban site for ImaginOn, anchoring the growing cultural hub of Charlotte, NC. The site, a former parking lot, was converted to a higher density urban facility with structured underground parking. The owner took advantage of existing infrastructure and reduced the need for private automobile use. The site is located adjacent to a light rail and trolley stop and is within 1/4 mile of the city's Transportation Center, with many visitors/school groups arriving by bus. Public parking is available in nearby city-owned decks as well as below the building.

Daylighting and Energy

UNCC's College of Architecture's Lighting and Energy Building Technology Laboratory was employed to study ImaginOn with respect to daylighting, quality of light, and energy considerations. Analysis was done for building orientation, significant building elevations, and solar impact. Results of the analysis were incorporated into the design of the building.

Green Strategies Employed at ImaginOn

Salient green features of ImaginOn include:

Sustainable site development:

- Redeveloped an existing urban site, thus minimizing disturbance of new land
- Accessible by bus lines, trolley, and future light rail
- Reduced "heat islands" by placing parking underground, use of light colored paving, landscaped surfaces, and an "Energy Star" reflective roof

Water Efficiency:

- Use of indigenous, low maintenance landscaping coupled with a highly efficient irrigation system
- 30% reduction in potable water consumption through use of water-efficient plumbing fixtures

Energy Efficiency:

- Incorporated natural daylighting to reduce dependence on artificial lighting, reduce heat loads, reduce glare, and to improve the quality of interior spaces
- Used sun shading devices on critical elevations to control sunlight penetration into the building
- Reduced energy consumption by 30% by using energy efficient mechanical and lighting systems coupled with integrated building controls and exterior shading devices
- Used ozone-friendly mechanical equipment (CFC-free and HCFC-free)

Indoor Air Quality (IAQ):

- Used low-emitting (low VOC) materials, carpet, adhesives, paints, and wood products for better occupant health and comfort
- Implemented an IAQ management plan during construction to protect the ventilation system components from introduction of moisture, dust, particulates, and volatile organic compounds
- Conducted IAQ tests prior to occupancy to confirm that air quality standards were maintained
- A monitoring system informs the ventilation system to adjust air flow various spaces in response to carbon dioxide levels

Materials and Resource Conservation:

- Used materials containing high quantities of recycled-content such as the exterior quarry tile, recycled plastic toilet partitions, recycled content aluminum curtain wall and steel, and concrete with fly ash
- Used rapidly renewable materials such as wool carpet, natural linoleum flooring, and wheat board cabinets to conserve natural resources
- Used salvaged materials, such as the granite face stone made from rejected tombstone material
- Obtained 50% of wood products from sustainably managed forests (FSC certified wood)
- 55% of materials were manufactured regionally (within a 500-mile radius)
- Diverted 78% of construction waste from landfill through construction recycling

The lab worked with the mechanical engineer to calculate energy savings due to the integration of daylighting, exterior shading devices, selection of reflective interior colors, and energy efficient electrical lighting. The initial project goal of optimizing energy performance by 20% over a standard code-compliant building was exceeded. Projected energy savings is 30%, with the integrated daylighting strategies contributing to the savings.

Resource Conservation and Materials

Durable and regionally produced materials, recycled content materials, and rapidly renewable materials were used extensively on the project. Certain “signature” materials used frequently by the design team, such as stone and glazed quarry tile, posed unusual challenges and opportunities.

A. Stone



photo by Tom Kessler

Stone is a signature material the design team employs on many buildings. Midway through design, the regional stone quarry discontinued offering the polished stone planned for use on the project. The design team was faced with shipping unpolished stone from the quarry long distances to a new location to be polished, then shipping the finished stone back for installation. The other alternative was to find another material. Research netted another possibility. The design team was able to purchase remnants (waste material) from a tombstone/monuments carving operation. The granite cutoffs from Dakota Granite Co. were polished and shipped to ImaginOn to face the story telling tower.

B. Glazed Colored Quarry Tile



Another signature material was the brightly colored, glazed quarry tile used to face the tile “boxes.” However, the quarry tile contained no recycled content. With construction under way, the team learned that the tile company was experimenting with recycled content quarry tile. Because recycled content materials

were so important to the project, and because the glazed tiles were such an important feature of the building, the manufacturer agreed to develop a specific formula that met the project requirements.

The glazed tiles were made with 34% recycled solid waste as defined by the EPA’s Comprehensive Procurement Guideline (CPG) program, a formula that Tom Sawyer with the Quarry Tile Co. created specifically for ImaginOn. The Eco-Body tile recycled material is a combination of 17% post-consumer recycled glass and 17% post-industrial grinding paste from the computer industry. All of the recycled waste products used in the tile are from within a 350 mile radius of the manufacturing plant and replace materials that previously were brought in from as far away as 2,300 miles. As part of Quarry Tile’s total environmental program, as much as 10% of the Eco-Body is reprocessed glaze over-spray, body scrap and waste water from other Quarry Tile Co. tile manufacturing processes. As a result the company has introduced the recycled-content tile formula to market.

C. Recycled Plastic Toilet Partitions

One of the more popular materials used in the building was the recycled plastic toilet partitions from Yemm and Hart. To make the partitions, recycled plastic detergent bottles of all colors are melted together, but the remaining “brew” maintains the individual yellow, blue, red and orange colors in a confetti-like pattern. Upon closer inspection, the observant visitor may read some of the actual detergent labels on the partitions.



photo by Gordon Seifert

Construction and Demolition Waste Recycling

In keeping with Mecklenburg County Solid Waste Department’s effort to encourage reduction of construction waste going into the landfill, the construction manager, RodgersHardin developed and implemented an extensive recycling program with a goal of recycling 75% of construction waste. With the County’s help, RodgersHardin, developed a network of local recycling facilities that were able to accept a substantial quantity of waste materials, including asphalt and concrete from demolition operations, and drywall, steel, cardboard, and wood from construction operations.



Recycling waste involved detailed logistics planning, continuous education and communication to subcontractors and suppliers, and a reliable tracking system. The contractor was faced with staging the recycling efforts on a tight, urban site. A phased recycling plan called for relocating the recycling staging area three times during construction. Site separation dumpsters were based on the projected waste stream at each distinct phase of the project. The final project recycling rate was 78%.

As a result of the pilot project, Mecklenburg County Solid Waste Services has implemented a policy requiring construction and demolition waste recycling on all County projects. RodgersHardin noted that the well-planned recycling program resulted in a more organized, efficient, and safer construction site. “It has worked so well, I plan to implement a recycling program on all future projects that I am involved in, whether it is a green building or not,” said Matt Connolly, project manager, RodgersHardin.

Sustainable Education

The environmental focus of the building is but one of several “stories” told by the facility, but the green elements are a prominent feature that attracts



photo by Tom Kessler

many additional visitors beyond the target audience. The building’s green aspects have been seamlessly incorporated into the educational program through “green scavenger hunts,” online articles and “green facts” posted on the Web site, and comprehensive building signage that explains green strategies to the visitor.

Recognition

The Public Library of Charlotte and Mecklenburg County made the commitment to environmental stewardship in the realization of *ImaginOn*. As the first project in Mecklenburg County seeking LEED™ certification, *ImaginOn*’s environmental efforts have been recognized through several regional awards, including Mecklenburg County Solid Waste’s 2005 Green Building of the Year Award and Carolinas Clean Air Coalition’s 2005 Airkeeper Award.

Environmentally Responsible and Sustainable Building Practices

Gantt Huberman Architects believe that integrating “sustainable” or “green” building practices into the design and construction of buildings is a solid financial investment that lowers energy, waste disposal, and water costs; lowers environmental and emissions costs; lowers operations and maintenance costs; and increases the productivity and health of the building’s occupants.

As a member of the U.S. Green Building Council (USGBC), Gantt Huberman employs environmental strategies on all projects, including use of the US Green Building Council’s LEED™ Rating System as a framework for the green design and construction process. Using an integrated design approach, Gantt Huberman begins each project with “green goal setting” sessions that encourage all team members — owner, architect, and engineers — to focus on the sustainable aspects of the building. This process demands collaboration about the project goals, design possibilities, budget issues, and the integration of sustainable technologies.

RodgersHardin, the construction manager for *ImaginOn*, is at the forefront of sustainable construction both regionally and nationally. RodgersHardin has made sustainable construction a priority by training the entire operations staff on the principles and policies of the U.S. Green Building Council’s LEED™ process. An early adopter of such company-wide training, RodgersHardin is committed to providing clients with the highest level of expertise in the green-building arena. The alliance partners of RodgersHardin, members of the U.S. Green Building Council, have ensured that every construction team has access to a LEED accredited professional within the firm. Currently, RodgersHardin has more than five LEED accredited professionals available to be part of the sustainable construction process.