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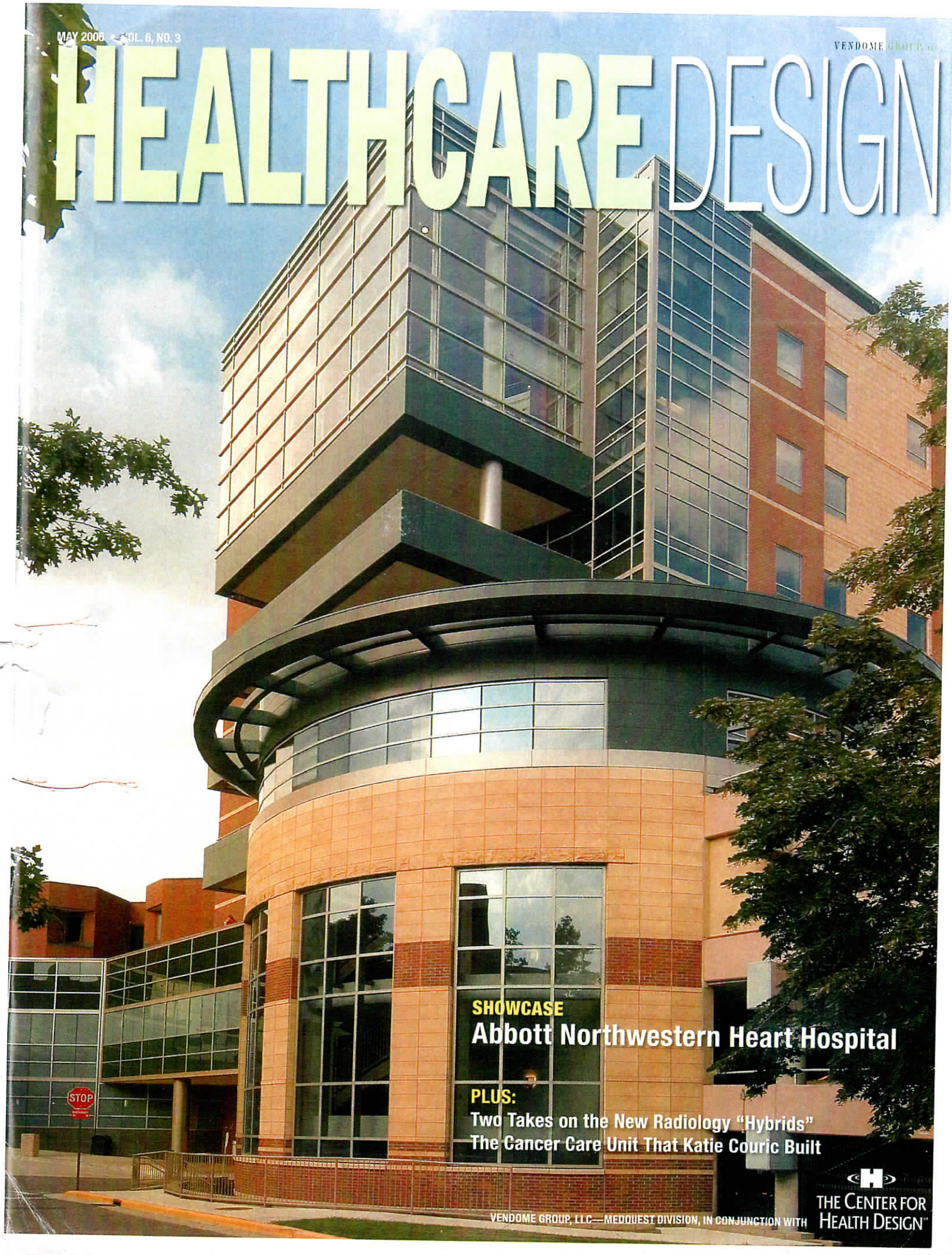
HEALTHCARE DESIGN



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VENDOME GROUP, LLC—MEDQUEST DIVISION, IN CONJUNCTION WITH THE CENTER FOR HEALTH DESIGN™

The Lacks Cancer Center: A steward of health

BY **ROBERT L. MILLER,** AIA, LEED AP; **CAROL JOHNSON KARTJE,** AIA, IIDA; AND **LAURIE ANNE TIKKANEN**

The new Lacks Cancer Center in Grand Rapids, Michigan, is the result of a shared vision of Saint Mary's Health Care and a generous donor community. Guiding the project's path as a steward of health were three main goals: Convey a unique image identity and connect to the community; create a healing environment that provides leading-edge medicine and exceptional care for mind, body, and spirit; and commit to environmentally conscious design with U.S. Green Building Council LEED certification.

The resulting $46,000,000 facility, designed by Trinity Design, is a dynamic center for healing that provides integrated state-of-the-art, holistic care for cancer patients, their families, and the community while protecting the health of the environment. The only comprehensive cancer center in Western Michigan, it contains the most precise radiation therapy technology available today, 42 private patient rooms, expansion space for 42 additional rooms, family hospitality spaces, treatment spaces, surgical suites, outpatient services, and a healing garden, chapel, and resource library.

Responding to the challenge by major donor Peter Wege, a Grand Rapids philanthropist and environmentalist, to create a green building, The Lacks Cancer Center received LEED certification in January 2006. It is the second hospital and only the third healthcare facility in the nation to receive this distinction. This article outlines some of the project's major design considerations.

Conveying a Unique Identity and Connecting to the Community

Before the construction of The Lacks Cancer Center, Western Michigan residents did not have easy access to comprehensive cancer treatment in one location. Cancer care often meant referrals to unfamiliar doctors, long waits between appointments, and extensive travel for treatments not available in the community. A generous $10,000,000 donation by the family of Richard S. Lacks, Sr., kicked off the program to meet this community need. The new center provides a model of care that combines primary and ancillary services, advanced technologies, and treatment resources under one roof to serve Grand Rapids area residents.

Physically, the center conveys a warm and welcoming identity that strengthens the connection between Saint Mary's and the community. The prominent beacon tower is a memorable icon, a symbol that shares a promise of advanced technology, spiritual connection, and welcome. Long-lasting, low-energy LED lighting in the tower creates continuously changing, dramatically colorful light displays.

Environmentally, the building exceeds all local and governmental environmental regulations. Because it was a redevelopment project, damage to the environment was limited and sensitive land areas were preserved. The urban site has a developmental density of more than 60,000 square feet per acre. It is served by multiple public transportation lines, with ready access to large pools of urban workers, reducing urban sprawl and the need for private automobiles.

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Care for the environment and the surrounding neighborhood was evident throughout the construction process. Construction manager Triangle Associates took great care to contain noise, storm-water runoff, erosion, and sedimentation from construction grading, and to prevent nighttime light pollution.

With several large historic residential districts and other Saint Mary's Health Care facilities surrounding the center, Trinity Design's solution seamlessly blends the new with the old. The design responds to Grand Rapids Historic Preservation Commission challenges: to share a sense of place with the surrounding communities, remain sensitive to existing campus building architecture,

and recall the architecture of the demolished building it was replacing.

As part of Saint Mary's Health Care's community outreach, many of the center's spaces are open to the public. Expansive windows create a strong connection to the vitality of the urban surroundings and bring the healing energy of daylight inside.

Brian Kelly Photography

Creating a Healing Environment

The Lacks Cancer Center's caregivers believe that every aspect of a patient's health is important. While they treat cancer with every technologic advantage available, they also integrate alternatives to support patients emotionally and spiritually.

Focusing on a contemporary hospitality aesthetic, Trinity Design created an interior design vocabulary that conveys the promise of advanced medical treatment, spiritual connection, and gracious welcome. The simple, sophisticated forms, materials, colors, and appointments create an inviting ambience and inspire confidence in care. From point of entry to each destination, the interior experience is memorable, meaningful, and easy to navigate, and it has an inspiring sense of place as part of a larger whole. Key concepts incorporated into the design include:

- Private patient rooms
- Patient choice and control
- Family support
- Uplifting character
- Connections to nature
- Profusion of light
- Life-affirming elements
- Textures of stone and wood
- Sounds of water
- Privacy, dignity, and independence

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The center's design enables patients to maintain control with options for alternative settings for treatment. For example, patients receiving infusion therapy may choose a private room, a small group setting, or an outdoor garden, or they may wander within the building. Family spaces are interspersed throughout, reflecting a commitment to supporting families as an integral part of patient care.

Saint Mary's Health Care's commitment to bringing care to the patient is illustrated by its menu-driven food-on-demand program. Typically, hospital meals are prepared in advance and delivered to patients at set times during the day. Selections are limited and food may go to waste, particularly with cancer patients who often are unable to tolerate food. In The Lacks Cancer Center, the kitchen is located on the patient floor, and patients and families may order food they find appealing any time of the night or day. Patients are satisfied, less food is wasted, and energy consumption is reduced.

Committing to Environmentally Conscious Design

The need to strike a balance between the center's three main goals in a facility that operates 24/7/365 weighed heavily during design. Many of the design features integrated by Trinity Design not only contribute to a green building, but they are also important for improving patient health.

The five-story, 172,000-square-foot facility has a 32,703-square-foot footprint and has reduced floor-to-floor heights to minimize mass. The rectangular form of the building is oriented along a north-south axis for optimal sun exposure. The long east-west elevations and expansive exterior windows maximize winter heat gain from the sun.

Recycling Demolition Debris

Construction of the center began with the demolition of the nine-story, 100,000-square-foot

McAuley Building, built in 1909 as the area's first hospital. Trinity Design worked with local and state historical preservationists before demolition. Key to their approval was a plan to recycle 98% of the building's masonry, concrete, and steel (11,000 tons) and reuse unique architectural details from the original hospital. Most of the recycled concrete was crushed and reused as roadbed fill to repair Michigan highways.

Building Materials

Trinity Design used durable, attractive, and environmentally responsible materials that met LEED-specific criteria. The building materials contain no irritating, odorous, hazardous, or toxic components that adversely affect human health through out-gassing of VOCs or with direct contact, supporting the healing purpose of the facility.

Preference was given to locally manufactured products, to reduce transportation and energy costs; more than 20% of the materials specified were manufactured within a 500-mile radius of Grand Rapids. Western Michigan–based manufacturer Steelcase provided most of the interior furnishings, graciously donated by the Wege Foundation.

Major materials included wood certified by the Forest Stewardship Council; ceiling tiles with 72% recycled content; carpeting that complies with the Carpet and Rug Institute's IAQ program; low-VOC–emitting sealants, adhesives, and paints; and PVC substitutes including linoleum and nonvinyl wallcoverings.

Trinity Design also considered potential effects of the building's envelope on the surrounding community and the overall life-cycle impact of the materials involved. The center uses self-cleaning glass in the tower and operable windows to eliminate the need for additional structure for cleaning lifts and to reduce detergent runoff. Exterior brick and precast concrete skin have a long life expectancy and a timeless connection to the historic neighborhood.

Light and Air

The Lacks Cancer Center's design takes advantage of daylighting with continuously operating light sensors and dimming ballasts that respond to varying daylight levels throughout the day. Windows have high-performance glazing, letting in the visible light spectrum while filtering out the hotter, infrared rays. Electrical and mechanical engineering firm Wolf Wineman tailored the lighting system to the needs of individual departments and rooms to minimize heat waste and reduce cooling loads. Exterior lighting was designed according to IESNA (Illuminating Engineering Society of North America) recommendations for light pollution reduction, including light shielding to prevent spill beyond the property.

To improve indoor air quality and promote wellness, the center is a nonsmoking building. A Trane mechanical system provides effective ventilation throughout the building without CFCs (chlorofluorocarbons) and HCFCs (hydrochlorofluorocarbons). Fresh air is brought in at higher than usual amounts, while carbon dioxide levels are monitored. Natural ventilation offers a seasonal opportunity for air-conditioning savings.

During all construction phases, maintaining indoor air quality was critical, with scheduled housekeeping and protective measures incorporated. After construction, the interior was flushed with air for two weeks to remove contaminants.

Water Usage

Determining the water usage per day for the center was complicated by occupancy variables in both type and volume. The population of the lower, first, and second floors is mainly staff and outpatients; the fourth floor is mainly inpatients and staff, while the fifth floor is a transient group of occupants from all floors and the general public.

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The center reduced potable water irrigation consumption by 50% by using high-efficiency irrigation technology and eliminating sodded lawn. The irrigation includes bubblers in lieu of spray heads, rain sensors, and a digital time clock. Drought-tolerant xeriscaping includes bed plantings that require minimal irrigation.

A 20% reduction in water usage was achieved by using waterless urinals; sensor-operated faucets; low-consumption, device-sensing toilets; and low-flow showerheads. Waste steam condensate from Kent County municipal incinerators heats domestic water and snow-melting systems in the driveway.

Energy

Comfort for patients and staff was Saint Mary's Health Care's primary concern and influenced Wolf Wineman's design and commissioning of the HVAC system. Under LEED guidelines, the thermal comfort level complies with ASHRAE 15-1992, which is higher than code requirements. There are no CFC-based refrigerants in the building's systems. The center received LEED credit for developing a measurement-and-verification energy consumption plan for its mechanical and electrical systems.

The HVAC system calls for a 75°F operating temperature with 30% relative humidity. The Trane building management system keeps these values steady with permanent monitoring stations operating in all seasons, variable-volume terminal units, reheat coils, and humidifiers. Typically, rooms with regular occupancy have their own thermostats to allow occupants to control temperature and airflow. Primary humidification occurs in the air-handling units with some secondary humidifiers maintaining higher levels for certain areas as required by code.

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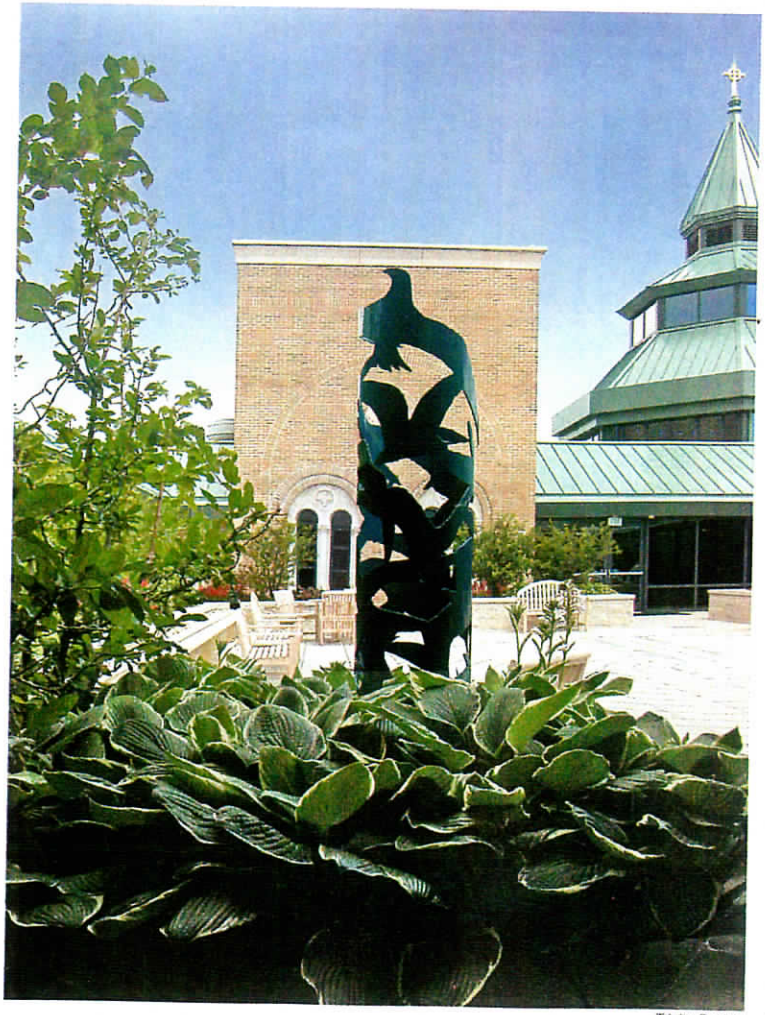

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Occupant-based sensing and time-of-day dimming are provided by the Lutron lighting control system to conserve energy and extend lamp life by reducing burning hours.

Rooftop Garden

While the lower levels of The Lacks Cancer Center house the latest technology to help heal the body, the rooftop is an oasis for the mind and spirit. Combining lush plantings, art, music, a labyrinth, and the soothing sound of water, the garden provides an escape from the hospital routine. A glass-enclosed conservatory and sheltered promenades provide indoor alternatives for connections to nature.

Covering two-thirds of the roof, the garden offers panoramic views of the city. A variety of trees, plants, and ground cover and a high-albedo surface provide the garden with the water-retention benefits of a green roof and help reduce noise pollution. By absorbing rainwater and reducing runoff, the green roof allows for improved storm-water management, reducing the amount of water treated by the municipal system.

Shading, sunlight reflection, and evapotranspiration of the plants help reduce both the building's temperature and rooftop heat gain. The plants and high-albedo surface also protect the roof membrane from the elements, ensuring a much longer life than those of traditional tar-and-gravel roofs. The garden is also a habitat for birds and insects.

The Lacks Cancer Center is changing the way we treat cancer and the way cancer patients are treated. The new building strengthens the mission of Saint Mary's Health Care to steward the health of its patients, the communities it serves, and the environment. **HD**

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