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LEEDING THE CHARGE

Four eco-friendly projects seek certification from a national rating system for sustainable buildings.

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A LARGER PURPOSE

Arup Associates and Shelter Architecture set a humanitarian course for 21st-century practice.

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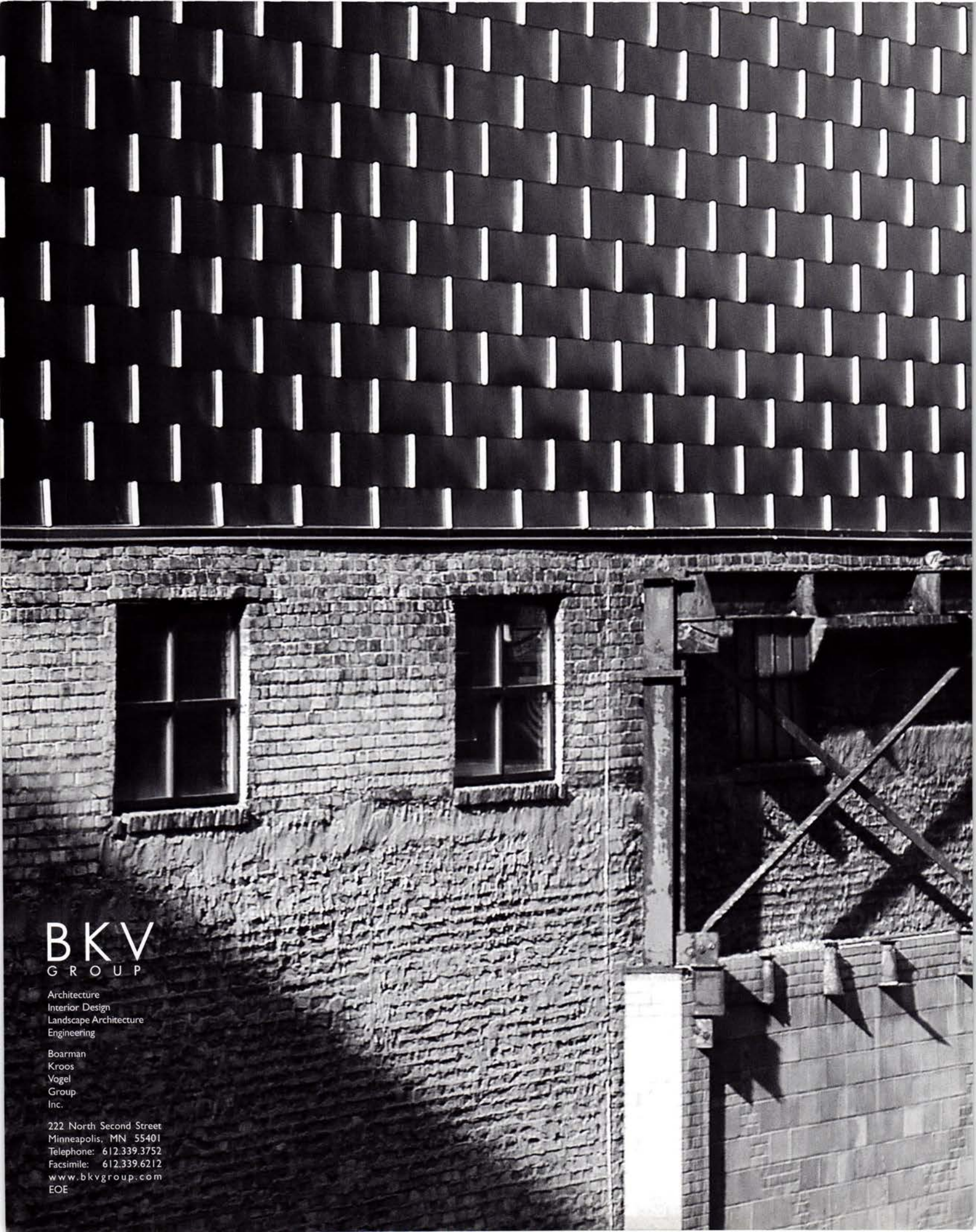
Thinking About Tomorrow

*A healthy, eco-friendly
high-rise reflects the future*

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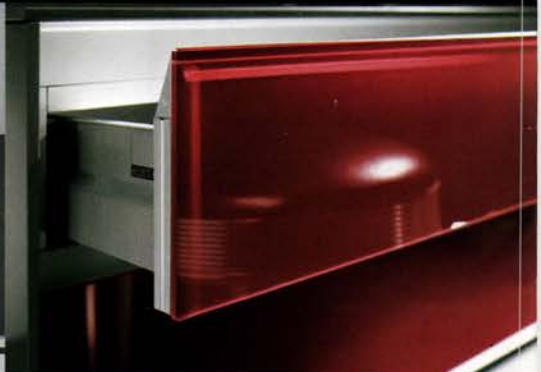
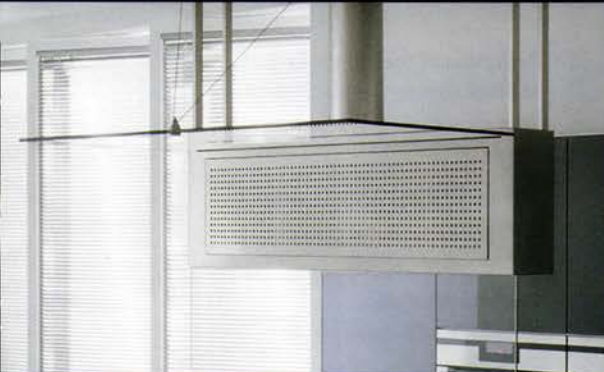


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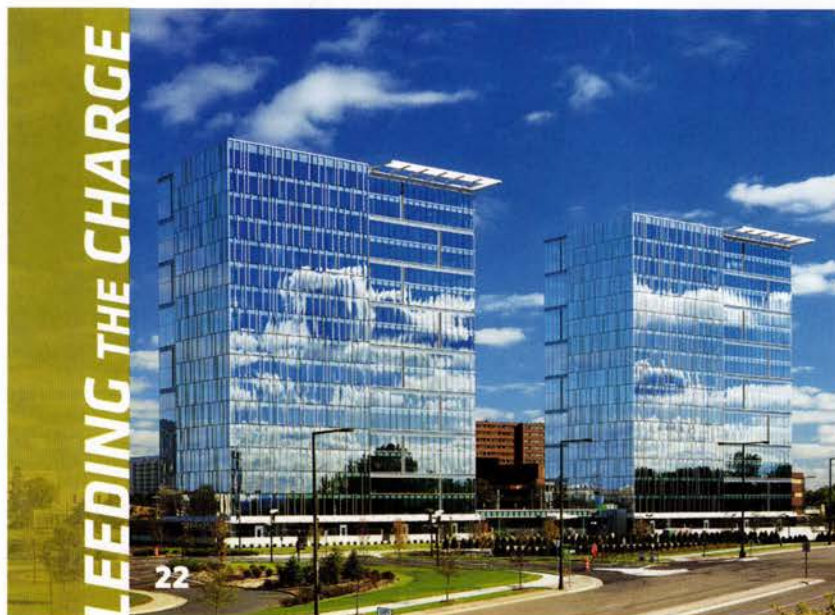
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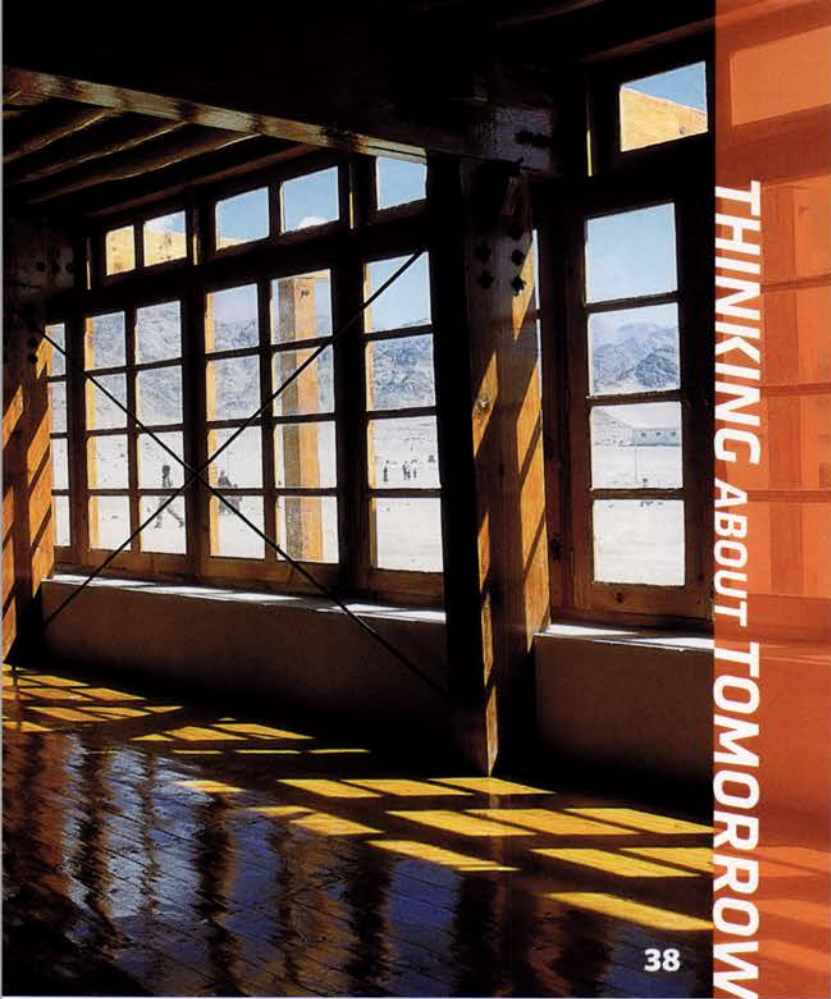
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DON WONG

A few years back, someone — I can't remember who — asked me to name four or five things I couldn't live without. The answers came easily: Diet Coke, air-conditioning, Tylenol PM, and my CD collection. I'm not exactly proud of this list — I would have preferred to say bicycle, library card, and Naked Juice — but there it is. Fast-forward to the present, and my cell phone has been upgraded from convenience to true necessity. Oh, and with my MP3 player always close at hand, I've nearly forgotten what CDs look like.

Gotta Have It

But after assembling this forward-looking issue, I imagine I'll be setting my sights a little higher in the years and decades ahead. For example, I know that if I ever live or work in a space in which a wall serves variously as a wall, a window, a light source, a TV, a communication device, a touch screen, a digital artwork, and a sound system, I'll never go back to just a plain old wall. Who in their right mind would? And the magic wall is just a drop in the bucket. The smart buildings of the future will adjust — even *change shape* — in response to changing conditions outside (wind, temperature, sunlight) and inside (e.g., number of occupants). Once we get a taste of buildings that recognize us and adjust to our preferred settings for visual and acoustic privacy and thermal comfort, we'll wonder how we ever did without.

Likewise, in the not-so-distant future, when the effects of climate change have multiplied, carbon-neutral, zero-emission buildings (page 42) that generate their own renewable energy

will be the only acceptable way to build. In fact, *sustainable design* may become a redundant term, since all design will, by necessity, be centrally concerned with renewable energy and environmental stewardship.

In his feature article on a future course for architectural practice (page 38), Thomas Fisher, Assoc. AIA, highlights two sustainable projects — Druk White Lotus School in India's Himalayan Mountains, by the multinational firm Arup Associates, and Calhoun Photography Studio in New Orleans, by Minneapolis firm Shelter Architecture — that are designed for extreme environmental conditions. "What makes the Arup project noteworthy," Fisher writes, "is how the designers used the school not just to do a lot for people who have very little, but also to demonstrate how we might all have to build in the future, when energy and water resources are as scarce in the rest of the world as they are in the high-altitude desert of Ladakh." Meanwhile, in New Orleans, Shelter is helping

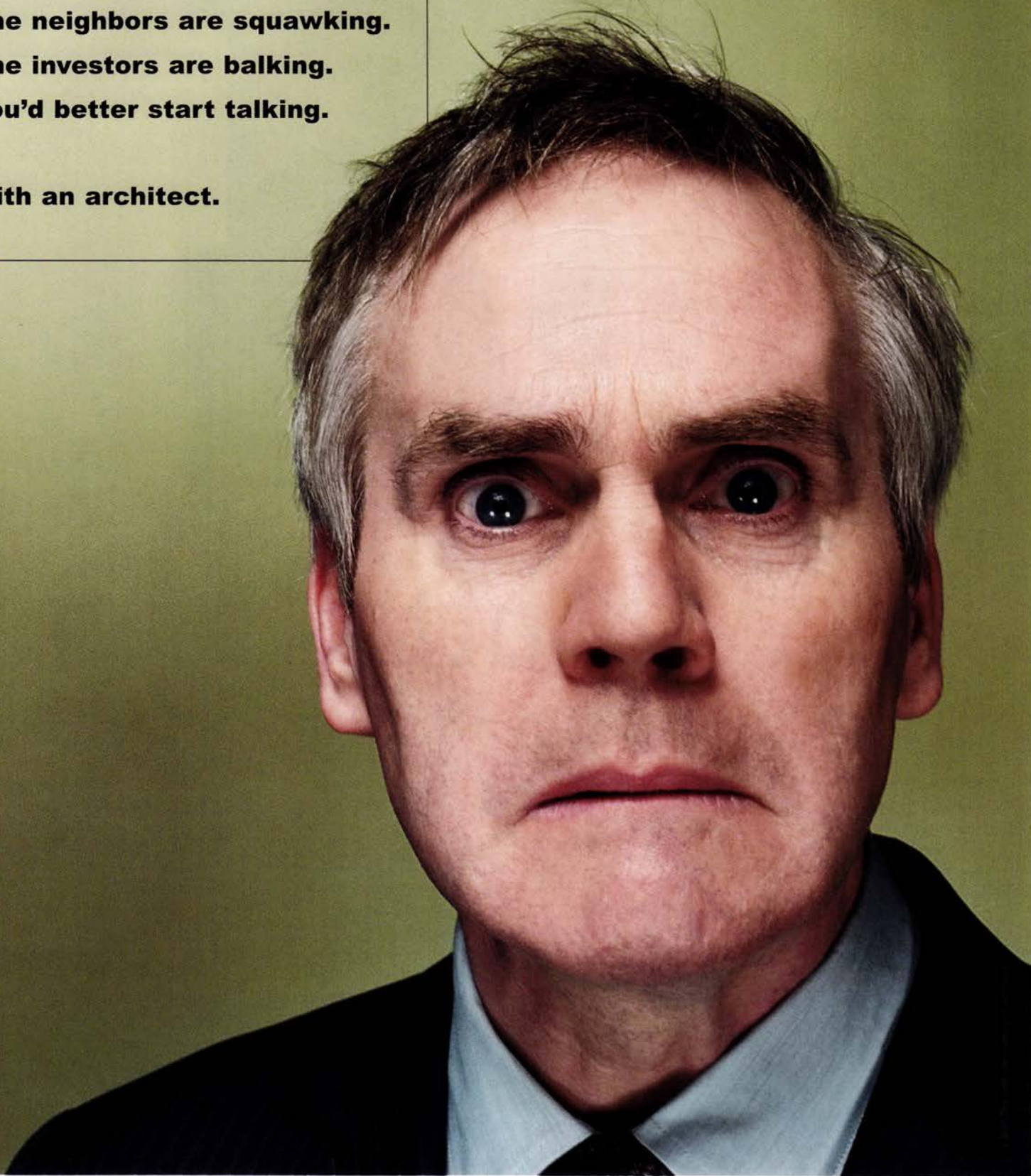
to rebuild a celebrated studio that was destroyed in the flooding that followed Hurricane Katrina. The new studio's first-floor gallery is designed to allow floodwaters to pass through, should disaster strike again.

Photographers Keith Calhoun and Chandra McCormick Calhoun and the teachers and students at the Himalayan school can appreciate how indispensable the right kind of architecture can be. Soon enough, sustainable design will be something none of us can live without. I just hope there's eco-friendly refrigeration in the future. My Diet Coke has got to be ice cold.

Christopher Hudson
hudson@aia-mn.org

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AIA Minnesota is the voice of the architecture profession dedicated to serving its members, advancing their value, and improving the quality of the built environment.

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Get to know our writers and photographers. They're an interesting bunch.

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edinaartcenter.com

Got some free time and an interest in design? Culture Crawl rounds up the latest cultural offerings from around the state.

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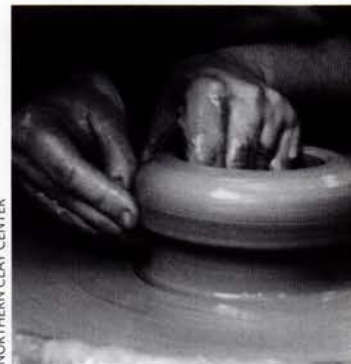


MARILYN GARBER

Minnesota School of Botanical Art

In the dark days of winter, get a taste of spring at the Minnesota School of Botanical Art. Located at the Bakken Museum on the west side of Lake Calhoun in Minneapolis, this school offers an aesthetic and scientific approach to botanical art. Instruction begins with basic drawing and watercolor painting and moves toward more advanced levels and master classes. The Minnesota School of Botanical Art also offers a certificate program for people looking to acquire a professional certificate in the field.

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DULUTH ART INSTITUTE

Duluth Art Institute

This winter, the Duluth Art Institute is featuring a number of drawing classes, including one of their most popular courses, Drawing from Life. Learn just how much detail goes into portraiture and human drawings, and have fun doing it. The institute also offers several ceramics courses, from beginner to advanced. Members receive a discount on all classes. While you're there, don't forget to check out the rest of the museum, including the Lake Superior Watercolor Society Exhibition on display through early February.

duluthartinstitute.org

Northern Clay Center

Like to roll up your sleeves and get your hands dirty? Then the Northern Clay Center in Minneapolis is the place for you. Some of the great classes taught here are in hand-building, wheel-throwing, terra-cotta, and ceramics, and there is instruction for all age levels. In addition to classes, the center is available for special events such as birthday or office parties. A gallery devoted to rare ceramic art is well worth your time, as is the Artists of the Month exhibit in the sales gallery.

northernclaycenter.org

—Compiled by Emily Dowd



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Rochester Art Center

Each year, the Rochester Art Center offers more than 100 educational programs for visitors of all ages. The classes, workshops, film presentations, lectures, and gallery tours are all designed to encourage an understanding of and appreciation for the visual arts. Popular hands-on programs for youth include Teen Studio Sessions and the summertime Total Arts Day Camp. In an effort to make art accessible to more students, the center offers several scholarships for its classes and workshops.

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MORPHOSIS

By Thom Mayne and Val Warke.
Phaidon Press, Paperback, 2006

Paging through the newly released paperback of the eponymous monograph *Morphosis* (first published in hardcover in 2003) is like flying headfirst into a spider's web: Once you get in, it's hard to get out. Spread after spread of large, tightly cropped photographs of angled concrete and plaster planes, exploding metal tracery, and ghostly, perforated veils both seduce and disorient the reader. The less one comprehends the images, the more one aches to know more, to see things from another angle, to find that one full view that explains the entire composition.

But the images, like the work of this renegade architecture firm, offer no such comprehensive understanding. Morphosis hails from the French-

art-film school of architecture; their work shuns anything like a clear narrative, story resolution, or moral purpose—but the scenery is gorgeous. Since Morphosis founder Thom Mayne serves

as both author and subject, it's a safe bet the book's entrancing, fragmentary visual style is entirely by design. "Our strategies are provisional, ad hoc, assimilating the accidental and preserving the fragments of impulses left unfulfilled," Mayne writes, ever the existential tease.

Printed on heavy, sumptuous paper, *Morphosis* is soaking wet with photographs and lightly peppered with line drawings. Save for the rare caption—and the mostly disposable essay by Mayne and Warke tucked in the back—the volume is text free. In other words, it's a perfect architecture book for architects.



Morphosis' Diamond Ranch High School

FUTURE SYSTEMS

By Deyan Sudjic, Phaidon Press, 2006

The first thing everyone says about this catalog of the work of British firm Future Systems is that the cover is very shiny. The volume, which looks like a high school trigonometry textbook wrapped in aluminum foil, suffers from a fragile binding that may not last until the end of this paragraph. Appropriately, this ode to a lifetime of speculative works is itself eye-catching, brash, sexy, and marked by the fleeting beauty of the new. (*Crack, rip.* Well, there it is, then. Honey, where's the tape?)

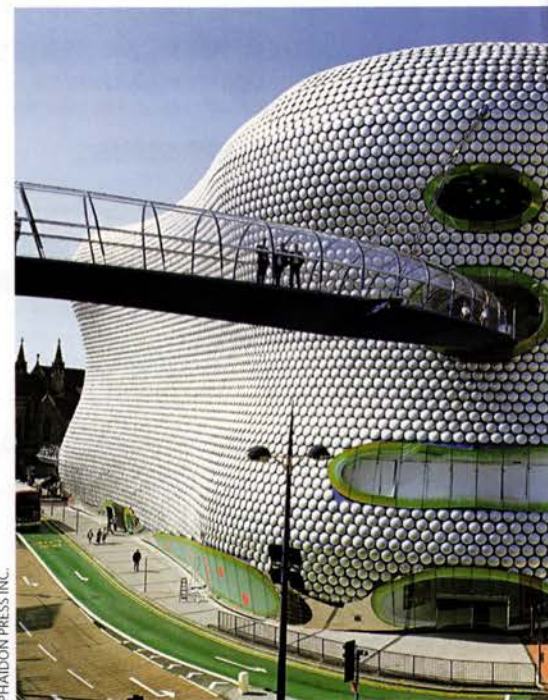
Founded in 1979, the iconoclastic Future Systems studio has produced an hallucinogenic roster of unbuilt futuristic urban villages, light fixtures, champagne buckets, a floating pedestrian bridge, and furniture, most of which get ample coverage in this 240-page portfolio. The firm's six-story



Selfridges department store in Birmingham, England—an awe-inspiring windowless, bulbous blue mass covered in silver pushpins the size of trash-can lids—is by far the most internationally famous of its few realized projects.

Many readers will find it challenging to differentiate the built projects from the theoretical stuff. The photorealism of the conceptual projects merges almost seamlessly with the unreality of the constructed work, and the entire oeuvre is drawn from the firm's signature palette of blob-like shapes, glistening plastic surfaces, bold colors, and overtly sexual forms that are difficult to explain in mixed company without blushing (especially the skyscrapers). But as firm principal Amanda Levete says, summarizing their design philosophy, "It's better to do architecture that is described as 'erotic' than to be labeled as 'high-tech.'" Meeooooow.

—Phillip Glenn Koski, AIA



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FICTION

SAVE THE GUTHRIE! AGAIN.

Story and rendering by Phillip Glenn Koski, AIA

DATELINE: MARCH 15, 2057

Apple Valley, Minnesota

Under the blazing sun of a typical March afternoon, a dozen dignitaries and philanthropists joined the Guthrie Theater's creative director, Shamus O'Malley, on the southern bank of the Minnesota River to break ground on the new home for the world-renowned entertainment-arts and virtual-extreme-sports complex. A large crowd of Guthrie patrons and civic boosters looked on as the esteemed group dug their gold spades into the crumbling asphalt of the long-abandoned Valleyfair amusement park.

Clapping the dust off his translucent white, UV-resistant gloves, Mr. O'Malley mounted the stage to address the crowd with Guthrie president Persephone Cowles-Dayton, the willowy heiress, who sported her trademark deep-rimmed, switch-grass hat. "And thus the curtain is raised," boomed O'Malley in his cultivated Irish brogue, "on the next act in this theater's dramatic evolution. Here we build a new Guthrie on the Minnesota!"

"Bravo! Bravo!" Ms. Cowles-Dayton chimed in. "This is a great day for theater and virtual-sports enthusiasts across the Minnesota Metro and around the globe. From Doha to Calcutta, from Taipei to Mexico City, the eyes of all the world's cultural capitals are watching in anticipation as we usher in a new era of creative-class, popular entertainment."

Plans for the new complex were unveiled the preceding day at a fundraising event in the highly exclusive Crystal Court lobby of the IDS Residences Tower in Minneapolis. Designed by Indian starchitect Theodore "Teddy" Singh, the new facility will include a faithful re-creation of the original building's signature thrust stage for "live-actor" dramatic performances; an expanded

40,000-square-foot black-box Dowling Memorial Theater and Wedding Hall; 18 hologram stages; 4-D NASCAR, bungee-jumping, and whitewater digi-domes; and a 60-room wilderness lifestyle condo-hotel. Architecture critics have recently weighed in, lauding the design for its richly ornamented retro-neoclassical exterior and sprawling site plan, which was inspired by the imperial Roman estate Hadrian's Villa.

The highly engineered ceremonies were marred somewhat by a small contingent of protesters, who set up camp near the event's VIP entry gates. Holding signs reading "Save Nouvel's Guthrie!" the group has drawn increasing media attention over the past few weeks for its opposition to the proposed demolition of the existing Guthrie building on the Mississippi River in downtown Minneapolis. Organized under the name Save Our Guthrie, Goodness, Yes! (SOGGY), the group is led by Lucinda Wu Rubenstein, a noted preservation bulldog and fearless grassroots organizer.

Speaking to reporters following the groundbreaking, Rubenstein made her case for preservation.

"While the new design unveiled yesterday may be quite lovely, we are adamantly opposed to the Guthrie's plans to demolish Jean Nouvel's masterpiece," Lucinda Wu

Rubenstein explained. "If anything, the building should be historically designated and restored to its previous architectural glory. It is Nouvel's greatest achievement in the Western hemisphere and a dearly loved landmark that would be sorely missed by the quarter million high-rise residents living on either side of St. Anthony Falls."

In response to a reporter's suggestion that the existing structure no longer serves the needs of a contemporary entertainment-arts institution,

Rubenstein shot back, "The current Guthrie is more than a machine for making theater in! We need to save this building so that future generations can enjoy the beauty of its dark, mysterious hallways, the thrilling crush of people funneled up and down its two escalators, and the unrivaled views of the Dasani™ Falls Waterpark from the tip of its Endless Bridge. To say these experiences don't matter is shortsighted."

A key actor in the pending demolition and a long-time Guthrie partner is the enormously endowed McGuire Foundation. Remaining strategically quiet as the preservation debate unfolds, the foundation owns the Minneapolis Guthrie complex as well as the land it was built on—the property acquired during the economic depression of the early 2030s when the theater was on the verge of financial collapse. Since that time, the McGuire Foundation has leased the building back to the Guthrie organization for one dollar a year. The demolition of the Nouvel building will allow the foundation to move ahead with its plans to expand the adjacent Gold Medal Flour Park, a privately operated, gated canine recreation facility. McGuire representatives declined to be interviewed for this story.

Organizers of the new project feel that many concerns of demolition opponents can be addressed through readily available virtual reality technologies. According to the Guthrie's website, the new facility will "re-create inch by inch, and byte by byte, the full experiential environment of Nouvel's original design through the latest advances in holography. Not only will the existing building be preserved in two historic mitigation holographic suites in the new complex, the entire Nouvel design will be available online for home viewing. In many ways the new Virtual Guthrie on the Mississippi will be a superior product because

>> continued on page 54

We've got you covered.

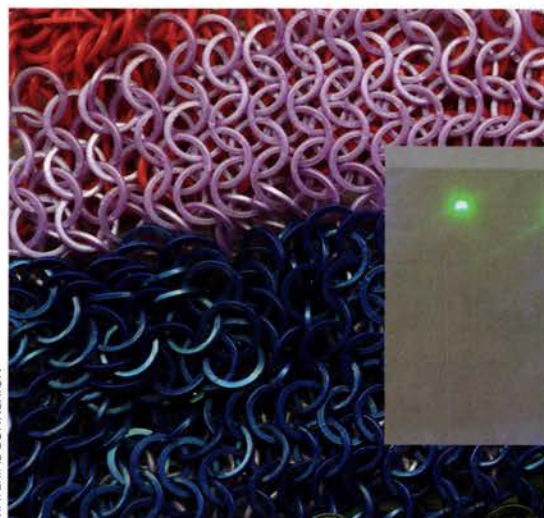


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Materials create the look and feel of a building or designed landscape. Their extraction, manufacturing, and use have an impact on the environment. Material Matters takes a closer look at the architect's palette.

MATERIAL MATTERS

New materials are all the rage, and they have been for the past century



A History of the Future

At the 1939 World's Fair in New York, visitors to the General Motors Futurama exhibit were given a thrill-ride tour around a quarter-scale model of the American landscape, projected into the year 1960 (prediction: suburbs). In the accompanying Previews of Progress exhibit, gawking spectators saw how new materials would transform their future lives. They were told:

[In the year 1960] textile filaments derived from coal, water, and air are stronger and finer and more elastic than any fiber now in use. Threads of rubber and glass are already being woven into cloth. Fabrics will be poured like paper and made into clothes so cheap that it won't pay to launder them. Plastics, clear as glass, strong as steel, inexpensive as clay, will find new uses in homes, airplanes, automobiles. . . . In architecture, new materials, processes, prefabrication will tie up the concept of planning.

On the eve of World War II, the idea that strong and useful materials could be mixed up in the lab, with some scientific ingenuity and "coal, water, and air"—resources so abundant they were rarely

given a second thought—must have been as appealing as the idea today that we might power our cars with used french-fry oil.

The story of architecture in the 20th century is, inevitably, the story of the development and implementation of new materials—manmade substitutes for expensive natural materials and materials created in the lab (or the backyard shed, as was often the case) for their own wondrous promise. Before the 19th century, buildings were constructed of stone and wood, with a little iron thrown in for future archaeologists to discover. But as early as 1906 the means, methods, and materials of construction had expanded sufficiently to warrant the publication of the first printed guide to building materials for architects: the venerable Sweet's Catalog.

A quick scan through any architecture journal, or across the recently built landscape, suggests that material innovation will continue to shape architecture well into the 21st century. But today we see less focus on the creation of entirely new

Modern architecture was characterized by the use of new materials throughout the 20th century. In our 21st-century culture of experimentation and innovation, organizations such as Material Connexion have emerged to guide architects through the often-dizzying array of material choices.

materials than on adapting, combining, and using materials in new ways: Photovoltaics are combined with plastics and other materials, to luminous effect; carbon-based fibers are stretched to create daringly thin and lightweight structural systems; and sustainable construction materials and biomimetic products (see the feature article on biomimicry on page 46) take their cue from nature.

To help the architect and other designers wade through the dizzying array of material innovations, Material Connexion (www.materialconnexion.com)—founded in New York in 1997, with branches in Bangkok, Cologne, and Milan—has become a sort of über Sweet's. More than a catalog, Material Connexion is a full-service physical and online library, available through subscription; its resident experts guide visitors through the wonders of the 21st-century material world. Meanwhile, this writer is still waiting for the throwaway pants she doesn't have to launder.

—Nancy A. Miller

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Citizen Architect profiles architects and designers who have taken on leadership roles in their communities.

Guru of Green

A Minnesota architect leads the charge in creating a more sustainable built environment

Doug Pierce, AIA, is turning up the heat on global warming. The 46-year-old environmentalist, activist, and architect with Perkins+Will is one of the leading proponents of sustainable design in Minnesota. In 2004 Pierce was a principal coauthor of AIA Minnesota's first position statement on climate change (see page 42). The position statement serves two important purposes. It gives architects direction for designing buildings with, among other things, improved energy efficiency, daylighting, and air quality. And with a clearly stated position, AIA Minnesota can appropriately pursue causes and support legislation in favor of energy efficiency in buildings and transportation, and strengthening renewable-energy standards for Minnesota.

While scientists are projecting grim consequences for Earth's habitat should global warming go on unchecked, Pierce is optimistic that, with clear direction and reasonable options, people will make changes to create a more sustainable way of life. And he believes architects are poised to lead the transformation. Buildings, whose construction and habitation consume energy generated mostly from coal and petroleum-burning power plants, are responsible for approximately 47 percent of the greenhouse gases released into the atmosphere (this number combines the CO₂ emitted from energy used for daily building operations—approximately 30 percent of all greenhouse gases—and the emissions generated from manufacturing and transportation used to construct and maintain buildings—approximately 17 percent). By designing more energy-efficient buildings, and eventually those that produce their own renewable energy, architects can play a significant role in reducing global warming. Architects are also well equipped for the task, Pierce argues, because "they're systems thinkers who are in a position to synthesize very broad, challenging topics and create solutions on a societal scale. They do it every day."

For Pierce, the time to act is now, and he's leading by example. In addition to teaching sustainable-design theory and practice at the University of Minnesota's College of Design and chairing AIA Minnesota's Committee on the Environment, he serves on the board of Clean Water Alliance Minnesota and is an active member of the Institute for Market Transformation to Sustainability. He urges people to get involved in their communities, since broad local support eventually trickles up to state and national leaders. As Pierce puts it, promoting sustainable design is a way of gathering momentum on the broader issue: "We have important choices to make about how humans create their presence on the earth."

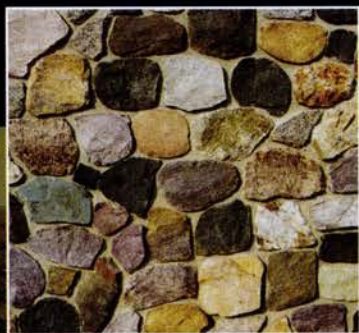
—Paul Neuhaus, AIA

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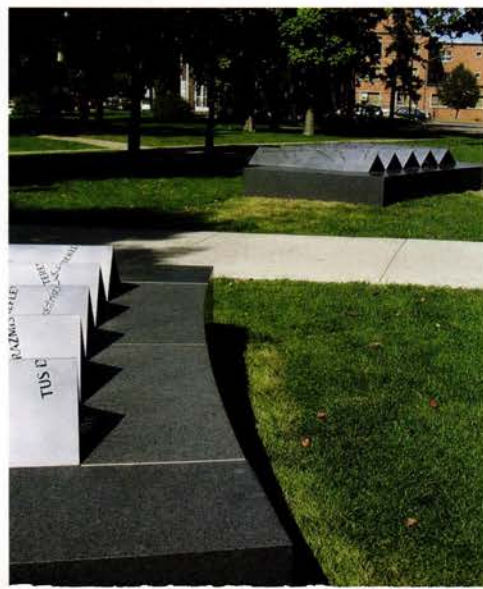
In Platform, we highlight thought-provoking public art in architectural environments.

PLATFORM

PHOTOS BY BKV GROUP

ART IN ANY LANGUAGE

An outdoor art installation
at St. Cloud State University brings
a diverse campus community together



A low-lying gateway to St. Cloud State University's Lawrence Hall, Janet Lofquist's multilingual *Infinite Voices* is a gathering spot where language, representing culture, is a primary point of engagement. The installation consists of two granite bases/benches placed on the radial axis of the site, with each base supporting a crisply folded sheet of stainless steel. Laser cut into the metal are two words—*echoes* and *reflections*—translated into the 51 languages currently spoken by St. Cloud State students and faculty (Lawrence Hall houses the offices of the

Infinite Voices' two granite bases each support an unfolding roadmap of languages.

foreign languages department, the Center for International Studies, and the residence hall for international students).

The installation's resemblance to an unfolding map on a table is accentuated by the angled and intersecting words, which create a roadmap of languages across the pleated surface. Why *echoes* and *reflections*? "*Reflections* represents the contemplation of a thought or idea," Lofquist explains. "*Echoes*, on the other hand, suggests the repetition of a word or idea extending outward and then returning to the sender as something changed, but still recognizable." Fitting concepts for education and cultural dialogue, don't you think?

—Susan Andre, Allied AIA

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LEEDING THE CHARGE

In an issue of Architecture Minnesota that explores the future of architecture and design, we present, on the following pages, four building projects that are designed and built for tomorrow. Which is another way of saying these projects are highly sustainable. How do we know this? One good indicator is that all four have received or are close to achieving LEED® certification.

For those of you unfamiliar with the name, LEED—the acronym for Leadership in Energy and Environmental Design—is a rating system that offers a “nationally accepted benchmark for the design, construction, and operation of high-performance green buildings,” says the U.S. Green Building Council website (www.usgbc.org). Architects, developers, and builders interested in pursuing a LEED stamp first register their projects with the USGBC, then begin the process of building up credits in five categories of human and environmental health: sustainable site development, water savings, energy efficiency, materials selection, and indoor environmental quality. Based on the number of credits they achieve, projects are awarded Certified, Silver, Gold, or Platinum certification.

Currently, there are LEED programs for new commercial construction, existing buildings, commercial interiors, and homes, and programs for schools, retail, and healthcare aren't far off. Like the buildings it certifies, LEED isn't perfect, but it's fast becoming the favored national rating system for green buildings. Many federal agencies and state and local governments, for example, have adopted LEED initiatives and incentives.

Will LEED gain traction in Minnesota? We think so. The more Minnesotans learn about the amount of energy buildings consume (see pages 17 and 42) and the impact buildings have on the environment, the more they will demand homes and workplaces like these four LEED projects. And that can only be a good thing.

—Christopher Hudson

REFLECTIONS AT BLOOMINGTON CENTRAL STATION IS ONE OF THE FIRST-EVER MULTI-UNIT RESIDENTIAL BUILDINGS TO PURSUE LEED CERTIFICATION

By Mason Riddle

With Twin Cities traffic congestion regularly triggering an orange alert, the new condominium project Reflections at Bloomington Central Station (on the Hiawatha light-rail line) looks better every day. The two 17-story glass towers, joined by a linear glass lobby, resemble, what, a Miesian hovercraft about to touch down? The crisply rectilinear towers tread lightly, with a footprint of only 10,000 square feet, and the glass walls reflect the sky and surrounding landscape in high resolution. Whether the interior views north to the Minneapolis and St. Paul skylines are preferable to those south across the expansive Minnesota River valley and adjacent nature preserve is a difficult question to answer.

Even more impressive is the fact that Reflections is every bit as sustainable as it is aesthetically pleasing. In an unorthodox move, the developer and contractor, McGough Companies, is seeking LEED-NC (New Construction) certification for the project, one of the first such requests for a multi-unit residential building. "There aren't many condominium developers going after LEED certification," explains Ken Potts, AIA, director of Bright Green, McGough's Center for Excellence in Sustainability. "As a developer, you don't own the building or units when the sustainable-design payback kicks in." But McGough has created a new model with Reflections. "When we're the developer, and not just the general contractor, we can be a better partner on projects with sustainable-design goals," Potts enthuses.

The curtain wall's two patterns of glass and anodized aluminum—regularized and confetti—create a visual call and response. The nearly transparent glass provides crystal-clear reflections on the exterior and, from the interior, a heightened perception of the surrounding landscape.



What makes Reflections so green? For one, it's the best kind of transit-oriented development (TOD). The first phase in a 54-acre multi-use development built physically and philosophically on light rail, Reflections is only 110 yards from Bloomington Central Station, easily qualifying it for the LEED public transportation credit. When completed, the development will include additional condominiums and townhomes, class-A corporate office space, retail, a hotel, and a central park. Residents are only a short train ride away from the airport, the Mall of America, and downtown Minneapolis, and the retail will meet daily needs such as dry cleaning, groceries, and dining. This holistic approach to sustainable design minimizes dependence on the automobile and thus fossil fuels, reducing traffic congestion as well as numerous environmental problems, including noise and air pollution.

"Sustainable, high-density, mixed-use TOD is the new era of urbanism, and Reflections is an example of how to do it," explains David Graham, AIA, of Elness Swenson Graham Architects, Inc. (ESG), the project's architect of record. "The people choosing to live here are seeking a more efficient lifestyle. We've provided that by building creative density with high-quality public amenities around transit needs." According to Potts, many condo buyers are considering downsizing from two cars to one.

Move past the project's transit component, and the list of sustainable-design features just keeps going. The floor-to-ceiling glass walls bring natural light to 97 percent of the interior spaces, and nearly 99 percent enjoy exterior views, numbers that easily meet LEED's minimum daylight factor. Recycled materials include rebar, anodized metal framing, insulation, drywall, concrete, and steel.



A pocket of 4.25 inches of air in the triple-glazed inoperable windows virtually eliminates exterior noise.

REFLECTIONS AT BLOOMINGTON CENTRAL STATION

Location:
Bloomington, Minnesota

Client:
McGough Development

Architect of record:
ESG Architects
www.esgarch.com

Collaborating design architect:
architects Alliance
www.architectsalliance.com

Principal-in-charge:
David Graham, AIA (ESG)

Project lead designers:
Art Bartels, AIA, and Aaron Roseth, Assoc. AIA (ESG); Peter Clewes and Adrian DiCastrì (architects Alliance)

Energy modeling:
The Weidt Group

Landscape architect:
oslund.and.assoc.
www.oaala.com

Construction manager:
McGough Construction

Size:
282,012 square feet of condominiums, 152,582 square feet of parking

Cost:
\$52.5 million

Completion date:
August 2006

Photographer:
George Heinrich

The under-flooring for sound control is made from 100 percent recycled rubber from car tires, and all of the buildings' paint meets LEED standards for low VOC (volatile organic compounds) content.

The sophisticated, minimalist landscape design, by Minneapolis firm *oslund.and.assoc.*, uses plant material that will weather Minnesota's unforgiving climate while reducing irrigation needs by 50 percent. The grid-like design, an oblique reference to the region's agrarian roots, links the building to the LRT station and the future park beyond. All parking is below grade, reducing heat islands, and the entire mechanical system is embedded in the ground and screened at grade level with an aluminum trellis.

Potts touts two other green achievements. The first is Reflections' highly engineered stormwater

management system. "The quality of stormwater runoff, which ends up in the Minnesota River and nature preserve, is much improved," he says. "When McGough purchased the site, it was a sea of parking lots and rooftops. The water would run off untreated. We now have systems in place that employ a series of Best Management Practices to filter the water before it ever reaches the river, such as the intensive green roof above the parking garage. The park will also filter water." Even the curbless drives are environmentally conscious, designed to further support stormwater management by channeling and containing water within the site.

The second component is the air quality and noise reduction (Reflections is only a stone's throw from the airport) afforded by the building's triple-glazed inoperable windows. A pocket of 4.25 inches of air



between two layers of glass virtually eliminates exterior noise. With the building effectively sealed, the high-performance mechanical system filters air three times before it enters the living units, and there is one complete air exchange per hour. "IEQ [Indoor Environmental Quality] is high and certainly meets LEED criteria," Potts concludes.

For Potts, the beauty is in the details. Graham is more of a big-picture guy. "What really excites me about this project," he says, "is that residents can live in this highly sustainable building overlooking the beautiful Minnesota River valley and, thanks to LRT and intermodal transit, still have easy access to the Twin Cities' best cultural amenities—the Walker, the Guthrie, the new Central Library, the evolving Hennepin Avenue theater district, and eventually North Loop Village and the new Twins ballpark, to name just a few. All this without having to use their cars." **AMN**



The two towers are connected by a single-story Miesian lobby (opposite) featuring two identical glass-and-teak vestibules. Bloomington Central Station (left) on the Hiawatha line is only a few steps away. Trellises on both towers (above) add visual interest.

"Sustainable, high-density, mixed-use transit-oriented development is the new era of urbanism, and Reflections is an example of how to do it."

—David Graham, AIA, ESG Architects



gimme shelter

By Camille LeFevre

A MINNEAPOLIS COUPLE PURSUES A WHOLE NEW LEVEL OF SUSTAINABLE RESIDENTIAL DESIGN: LEED PLATINUM

It all started with the purchase of a Toyota Prius, recalls Salena Gallo, of her and her husband Jeff's conversion to a more sustainable lifestyle. "I needed to buy a new car and decided why not buy one that doesn't burn so much fossil fuel?" Then they saw *An Inconvenient Truth*, Al Gore's treatise on global warming. With more information gathering ("My husband is a very thorough researcher," Gallo says) came a major decision: to build a sustainably designed house that would fulfill the couple's needs for the next 30-plus years.

"Rather than buy an existing house, we want to build an eco-friendly house for the long haul, that will be healthy for our children and for the environment," says Gallo, director of creative accounts at Olive and Company in Minneapolis. Jeff Gallo is a video and commercial director who offices at home. Prefab construction panels, nontoxic materials, a modern aesthetic, and affordability were among the couple's criteria. So they turned to Shelter Architecture. "We're an architecture and interior-design firm for the middle class that puts its vision into practice through sustainable residential design," explains firm principal John Dwyer, AIA.

Dwyer, fellow principal Jackie Millea, Assoc. AIA, and the Gallos began by selecting the new LEED® home standards as a guideline. They decided to aim for the highest LEED rating, Platinum. The two-story, 1,900-square-foot house with four bedrooms, three bathrooms, and no basement will be completed in February 2007.

A small existing house on the site in Minneapolis' Bryn Mawr neighborhood will be torn down and the debris separated and sent to reuse centers whenever possible. In its place will rise a building envelope of precast-concrete panels designed to collect and hold heat "just as a thermal mass like rammed earth or masonry does," Dwyer says, adding that the wall system boasts an R-30 rating.

The concrete will be left exposed on both the exterior and interior. A super-efficient heat pump will provide supplementary heating (and cooling in the summer) to the radiant-floor heat. The house's flat roof will be painted white to reflect heat, and the detached garage will be planted with a green roof. A courtyard in between those structures will provide the couple (and their future family) with a private outdoor living space in the city.

The Gallos deliberately chose to go without a basement, as a way of forcing themselves to consume less over time (i.e., to avoid the temptation of dumping unused stuff out of sight). Instead, they asked Shelter to rigorously plan their interior and incorporate lots of built-in cabinetry to encourage them to keep life simple and tidy.

Other notable green features include cabinetry constructed of durable, sustainably harvested woods; bathroom tiles made from recycled glass, and kitchen pendant lights made from traffic stoplights; translucent resin-based 3form decorative panels and Kirei Board wall panels made of sorghum stalks; mercury-free light switches; and lots of natural light achieved through strategic window placement.

"This house beautifully exemplifies our mission: to focus on the middle-class home as one of the key factors in determining sustainability on a global level," Dwyer enthuses. According to recent statistics, he adds, the property value of a sustainably designed home, especially one with a high LEED rating, is 3 to 10 percent higher than that of a conventional home. "LEED certification is a big priority for us, because it ensures we've done things right," Gallo says. "We want other people to see that they, too, can design and live in a sustainable house." **AMN**

GALLO RESIDENCE

Location:
Minneapolis, Minnesota

Clients:
Jeff and Salena Gallo

Architect:
Shelter Architecture
www.shelterarchitecture.com

Design principals:
John Dwyer, AIA;
Jackie Millea, Assoc. AIA

General contractor:
Aaron Krause

Size:
1,900 square feet

Completion date:
February 2007

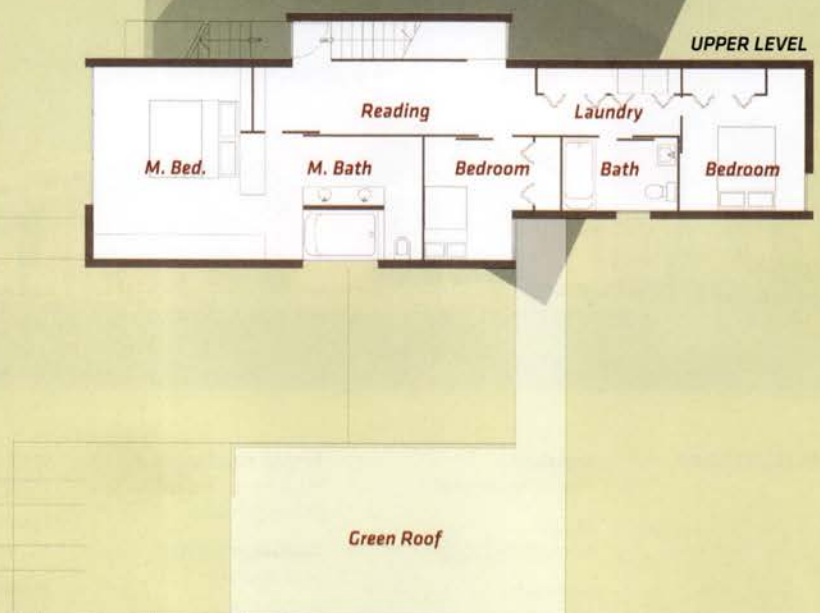
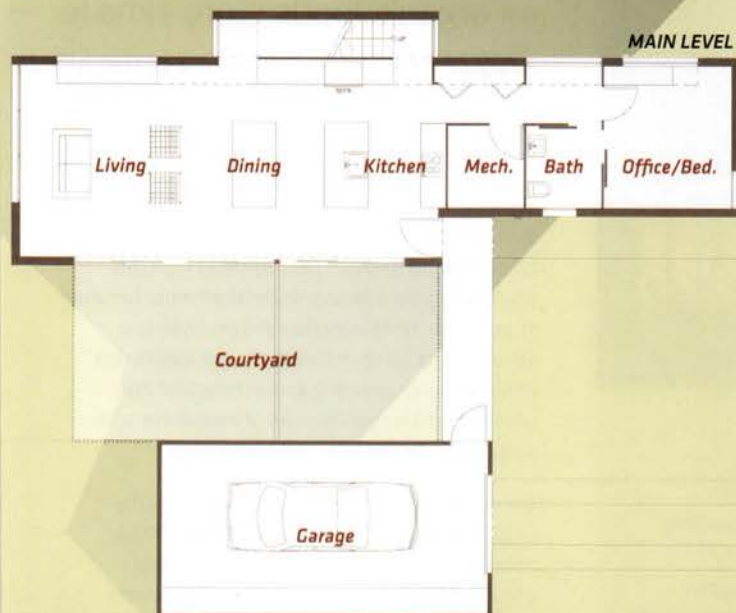
Digital renderings:
Shelter Architecture



"Rather than buy an existing house, we want to build an **ECO-FRIENDLY HOUSE FOR THE LONG HAUL**, that will be healthy for our children and for the environment."

—Homeowner Salena Gallo

The concrete walls in this compact, basement-less house will be left exposed to minimize material use. A courtyard and a rooftop deck will provide the family with private outdoor living spaces on the city lot.



The Gallos asked Shelter to rigorously plan their interior and incorporate lots of built-in cabinetry to encourage them to keep life simple and tidy.



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TRANSPORTATION

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WINDOWS

Windows with recycled aluminum frames and glass



In keeping with its philosophy, an organic foods store aims for—and receives—LEED certification

By Camille LeFevre

One building, 4,000 co-op member clients, and almost as many opinions about the definition of sustainable design. LHB was faced with this challenge in the adaptive reuse of a former furniture store/Italian restaurant/bar and pool hall as a Whole Foods Co-op in Duluth. So the Duluth and Minneapolis engineering and architecture firm, which has more than 15 years of experience with sustainable design, took the logical step.

"We recommended that the co-op embrace the LEED® rating system," says LHB architect Mark Poirier, AIA. "It's a nationally recognized tool and benchmark that gave all of us a framework for our decision making about what parts of green design to embrace."

As a result, the 18,600-square-foot, two-level co-op natural foods store is the first LEED-certified building in Duluth, the third in Minnesota. "We're so excited we achieved this milestone for our

WHOLE FOODS CO-OP

Location:

Duluth, Minnesota

Client:

Whole Foods Co-op

Architect:

LHB, Inc.
www.lhbcorp.com

Principal-in-charge:

Sue Anderson

Project lead designers:

Mark Poirier, AIA;
Jill Isola Johnson

Landscape architect:

Mark Anderson

Construction manager:

Builders Commonwealth

Size:

18,600 square feet

Cost:

\$2.2 million

Completion date:

November 2005

Photographer:

Jeff Frey & Associates
Photography, Inc.



CABINETS

Cabinets made of wheat and sunflower-seed board containing no urea-formaldehyde



PAINT

Low-VOC (volatile organic compound) paints, coatings, and adhesives

FLOORING

Recycled-rubber flooring and linoleum made from rapidly renewable materials

community. It's a reflection of our commitment to sustainability," says Sharon Murphy, the store's general manager. "This was not a project with a sole proprietor. LHB helped us meet all of the visions of our members—our environmental as well as our operational goals."

While the 1953 building was being gutted, the Duluth-based Common Grounds Deconstruction removed all of the wood studs, cabinets, and doors (as well as the nails) to resell in its reuse center. Many of the wood studs, however, ended up back in the building. Some equipment from the co-op's old store was brought over to the new location. LHB moved the building's entrance to maximize parking, and all of the asphalt and concrete that was removed was recycled.

In the vestibule, monitors indicate the amount of energy the photovoltaic panels at the back of the store are producing. The building boasts highly efficient mechanical systems, non-ozone-depleting R410 and R404 refrigerants, and air-to-air energy recovery units. Domestic hot water is preheated

with waste heat from the store's refrigeration system. Recycled-rubber flooring; linoleum made from rapidly renewable materials; windows with recycled aluminum frames and glass; low-VOC (volatile organic compound) paints, coatings, and adhesives; cabinets of wheat and sunflower-seed board containing no urea-formaldehyde; proximity to alternative modes of transportation; bike storage and commuter showers; and natural lighting were some of the choices that earned the project LEED credits.

The building's highly reflective white TPO (thermoplastic polyolefin) roof reduces the interior's refrigeration load. Much of the exterior is clad with a brick-colored, fiber-cement rain-screen system that uses a Home Slicker® drainage plane, neoprene gaskets, and horizontal flashings to keep the building dry while shedding rain back toward

foundation plantings. Inside, LHB largely left the building's existing wood joists and roof decking, steel support structure, and concrete-block walls exposed.

The color palette, Poirier says, "was based on natural elements in our environment, like trees, water, and Lake Superior, but the more lively colors were inspired by the produce." The co-op's new location not only includes wider aisles, five checkouts, and an expanded deli but also dining areas with views of Lake Superior, a service elevator, a kitchen classroom, and offices. When the store opened in November 2005, Poirier recalls, "people lined up down the block to see their co-op." Adds Murphy: "From day one, the building didn't smell like paint or varnish; it smelled like the healthy organic food we sell here." **AMN**

"We're so excited we achieved this milestone for our community.

This was not a project with a sole proprietor. LHB helped us meet all of the visions of our members—our environmental as well as our operational goals." —Sharon Murphy, Duluth Whole Foods general manager

A PROGRESSIVE BICYCLE-PARTS DISTRIBUTOR IN BLOOMINGTON EXPANDS WITH THE GOAL OF LEED GOLD CERTIFICATION

GOING FOR GOLD

BY MASON RIDDLE

Maybe it was all the employee bikes double-racked on a below-freezing October day. Or the bring-your-dog-to-work coordinator. For sure, the three worm-composting tubs full of dirt, coffee grounds, and fruit peels were conspicuous clues that Quality Bike Products (QBP) is no ordinary corporation. Founded by Steve Flagg and wife Mary Henrickson in their Bloomington home in 1981, QBP is now the largest distributor of bike parts and accessories in the United States, selling to independent vendors like Grand Performance in St. Paul and Penn Cycle in Minneapolis. Its Bloomington headquarters, located on an open campus adjacent to Hyland Lake Park Reserve, totals 250,000 square feet of decidedly casual warehouse and administrative space. T-shirts, tattoos, and tennis shoes underscore QBP's youthful culture.

Perhaps it's no surprise, then, that the progressive Flagg would pursue LEED Gold certification for QBP's recently completed 125,000-square-foot addition. What *may* surprise some observers is Flagg's insistence that expanding businesses can keep an eye equally on the environment and the bottom line. "We've shown that you can pursue LEED certification with a return on investment," he enthuses. "The building will have a 15-year return on investment or less, which is proof that you can build an environmentally friendly building and do it for sound economic reasons."

The glassy, rectangular two-story addition, designed by the architecture and engineering firm LHB, forms a wide V with the existing building and showcases sustainable design at every turn. Some 34,000 square feet of open, second-floor office space is daylit via a slightly curving glass curtain wall, and the entire addition employs high-efficiency fluorescent lighting with occupancy sensors. The white ceiling, meanwhile, reflects ambient light, reducing exterior light pollution. To make room for the expansion, QBP demolished

The addition's gently curving glass curtain wall (lower left) guarantees maximum daylighting for both the open-plan office and warehouse spaces.

QBP takes advantage of its expanded digs by hosting Frost Bike, an annual winter open house/trade show (right) for its vendors and employees.

QUALITY BICYCLE PARTS EXPANSION

Location:

Bloomington, Minnesota

Client:

Quality Bicycle Products

Architect:

LHB, Inc.

www.lhbcorp.com

Principal-in-charge:

Rick Carter, AIA

Project architect:

K.C. Lim, AIA

Project manager:

Rachelle Schoessler Lynn

Landscape architect:

LHB, Inc.

Construction manager:

Kraus-Anderson Construction Company

Energy modeling:

The Weidt Group

Size:

90,907 square feet new warehouse,
33,607 square feet new office space

Cost:

\$8 million

Completion date:

February 2006

Photographers:

Peter Bastianelli-Kerze (exterior)
and Marty Wood (interior)





"BY BRINGING THE CONSTRUCTION MANAGER IN AT THE BEGINNING, WE WERE ABLE TO CLEARLY ASSESS THE DESIGN OPTIONS FROM BOTH SUSTAINABILITY AND COST-ANALYSIS POSITIONS. WHAT DIDN'T MAKE FINANCIAL SENSE TO STEVE AND HIS TEAM WAS DROPPED, AND WE PURSUED OTHER AVENUES FOR GOLD CERTIFICATION."

—LHB principal Rick Carter, AIA

QBP PROJECT MANAGER SCOTT CHAMBERS EMPHASIZES THAT THE COMPANY PURSUED SUSTAINABLE DESIGN NOT ONLY FOR "ALTRUISTIC" REASONS BUT ALSO BECAUSE IT MADE GOOD BUSINESS SENSE. "EVERY LEED STRATEGY WE CONSIDERED HAD TO HAVE A PAYBACK," HE SAYS.



The V-shaped QBP headquarters maximizes its natural setting (it borders Hyland Lake Park Reserve) with rain gardens, retention ponds, drought-resistant indigenous plant material, and open gathering spots for visitors, employees, and their pets.

a building from which 83 percent of the materials were recycled or salvaged. The expansion also uses low-VOC (volatile organic compound) materials, and more than 30 percent of all materials were manufactured locally. Rather than install a green roof, QBP invested in the installation, now in progress, of 40 kW photovoltaic roof panels that will provide an onsite, renewable energy source with an eight-to-ten-year return on investment.

QBP project manager Scott Chambers, like Flagg, emphasizes that the company pursued sustainable design not only for "altruistic" reasons but also because it made good business sense. "Every LEED strategy we considered had to have a payback," he says. "We redeveloped and expanded a light-industrial site. If we had moved, we would have lost employees and eaten up more land for a new building. By building vertically and condensing our inventory storage system, we saved on land and maintenance costs." Indeed, QBP increased their storage density by erecting 30-foot-high shelves in the 36-foot-high space, halving the warehouse footprint. Fork trucks run through narrow aisles on an in-floor wire guidance system as the employee moves up and down in the lift with inventory. Overall, the building's energy performance exceeds standard codes by 40 percent.

The client-architect team was equally diligent in pursuing eco-friendly design on the exterior. Ponds and rain gardens reduce stormwater runoff, and porous pavers circling the parking lot filter water before it seeps into the ground or retention ponds; these features also eliminate the need for an irrigation system. As for the landscaping, sod runs a distant second to drought-resistant plants and prairie grasses.

According to LHB principal Rick Carter, AIA, QBP is the first metro-area, large commercial company to aggressively seek LEED Gold certification from the outset. "By bringing the construction manager, Kraus-Anderson, in at the beginning, we were able to clearly assess the design options from both sustainability and cost-analysis positions," Carter explains. "What didn't make financial sense to Steve and his team was dropped, and we pursued other avenues for Gold certification."

In November, QBP submitted documentation to the U.S. Green Building Council for LEED certification. Whether the expansion is awarded Gold or Silver, it serves as proof that green design can be achieved at market-rate cost. "As industry leaders, we wanted to take a leadership role in demonstrating to our employees, vendors, and customers how value is added through sustainable design," says Chambers. "We are a big physical presence in the community and we wanted to set an example. We want to be a good neighbor in spite of our size. But every LEED strategy had to have a payback if we were going to do it. Green design makes an environmental statement but also a strong business statement." **AMN**

THINKING ABOUT TOMORROW

This has been one fun issue to put together. What architecture enthusiast doesn't enjoy thinking about the future—how the world is changing, and what that means for architects and the built environment? We at *Architecture Minnesota* think the future holds some amazing opportunities, as well as some very hefty responsibilities. Actually, those opportunities and responsibilities are already here.

In the following pages, our writers take up topics like: the emerging design economy, and how businesses are seeking out the creative know-how of architects and other design professionals; the blending of humanitarianism and sustainable design both here and halfway around the world, as a way to prepare ourselves for depleted energy and water resources and natural disasters; and the steps architects and builders can take to combat global warming. A workable plan put forward by the nonprofit Architecture 2030, for example, calls for the gradual reduction of building CO₂ emissions to zero over the next quarter-century.

These and other articles will whisk you into the near future. What's true in life is also true for architecture and design: **It's always good to think ahead.**

—Christopher Hudson

In the emerging **design economy**, businesses that understand the value of design are eager to learn the interdisciplinary creative processes of architects and other design professionals

Design in Demand

BY CAMILLE LEFEVRE

David Graham, AIA, has a vision for revitalizing the American city, beginning with downtown Minneapolis: to fill in the existing urban fabric with contemporary, mixed-use residential buildings that will "rebuild neighborhoods in the heart of the city," he says. But Graham's not referring to high-end condos of historicist design, to which there appears to be no end in sight. "Right now there is more than enough higher-priced housing available," he emphasizes.

Instead, his urban-infill vision focuses on sophisticated residential design that a broader spectrum of the population can afford. "The future is design within reach: tasteful, contemporary infill buildings in mid-range prices," he says, echoing the name of the modernist furniture store while emphasizing the cost difference. Graham, a principal with Elness Swenson Graham Architects, has designed two such projects, the Zenith and the Revue, which will also nurture the public realm by maintaining connections to the street with large windows, street-level entry terraces, landscaped sidewalks, and active mixed-use streetscapes.



ESG ARCHITECTS

In other words, Graham continues, "We're delivering ownership condos that are attractive to a more design-savvy middle market yet below the cost of most new construction downtown. We're not only delivering a housing value, but design as value. Using design to differentiate one place to live from the other at a lower price point: That's the challenge now."

Sound familiar? It should. Essentially, Graham is espousing a philosophy that's been part of American culture from at least the Bauhaus era (1920s and 1930s) through Target's current "Design for All" campaign: the importance of bringing good design to the masses. But the Zenith and the Revue also represent a new phase in this ever-evolving philosophy, and its growing influence. The products of ESG's interdisciplinary architectural process, in which urban-design principles, landscape architecture, neighborhood context, midrange price point, and the "design to differentiate" concept are creatively integrated, the Revue and the Zenith are physical manifestations of the new "design economy."

The Designer's Skill Set

A successor to the information or knowledge economy (and the service and manufacturing economies before that), the design economy isn't merely about style or surface appliqué. The design economy has emerged as businesses turn to the innovations, problem-solving methods, and interdisciplinary creative processes of the design professions to overhaul their work practices in order to compete in the world marketplace.

That's right. It's the business world, and not the design professions, that is driving the design economy. In today's global market of inexpensive, mass-produced products and services, businesses need to find the creative edge with which to attract consumer attention and retain consumer loyalty if they are to survive. That competitive edge is design. Design is the differentiator that communicates value.

"The design economy is not just about styling things. It's a deeper-trenched understanding of creative issues that businesses are struggling to understand," explains Stephen Knowles, AIA, a principal with the Minneapolis architecture and design firm Walsh Bishop. "Businesses are trying to figure out how to wrap themselves around and capture that creativity, energy, and marketability that the design professions have always been concerned with."

With new residential urban-infill structures like the Zenith (opposite) and the Revue (below), ESG has entered the design economy by bringing affordable high design to the urban mid-rise.



ESG ARCHITECTS

Local retail giant Target, with its "Design for All" campaign, and industrial-design firm Worrell, Inc. offer products aimed at increasingly design-savvy consumers.



TARGET CORP.



TARGET CORP.

The creative savvy with which firms like ESG and Walsh Bishop process a complex matrix of user needs, client strategies, and social outcomes into one deceptively simple whole is a skill that design-economy proponents like Roger Martin, dean of the University of Toronto's Joseph L. Rotman School of Management, are urging businesses to learn—and quickly. "Corporations still see themselves as product and service factories, and if they think at all about elegant design, it's in that context," Martin writes in a 2005 online article, "Why Decisions Need Design," for *BusinessWeek*.

Large corporations, he added, are essentially "decision factories" with "fundamentally flawed" and "extremely low-quality decision design . . . driven more by producer desires than user needs." To succeed in the design economy, Martin continues, businesses must think more as designers do, deeply and multi-dimensionally. "The designer dives well below the surface to fathom exactly how someone will use the artifact to be designed. . . . Great design is characterized by deep user understanding, visualization of creative resolution of tensions, collaborative prototyping to enhance solutions, and continuous modification and enhancement after launch."

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In a 2006 article for *Fast Company* titled "Tough Love," Martin gets right to the point: "Design, in short, is becoming an ever-more-important engine of corporate profit: It's no longer enough simply to outperform the competition; to thrive in a world of ceaseless and rapid change, business people have to out-imagine the competition as well. They must begin to think—to become—more like designers."

To acquire these new skill sets, businesses are turning to Twin Cities architecture and design firms for insight. Walsh Bishop, for instance, receives a steady stream of calls and visits from business representatives who are "very curious about what we do, as they try to figure out how design can add value to what they're producing by deepening their process and marketability," says Knowles, who leads interdisciplinary project teams that include animators, graphic designers, and prototype fabricators, as well as engineers, architects, and interior designers.

Design: The Tie That Binds

Martin's not the only one urging corporations to embrace the multidisciplinary innovation inherent to creative processes. In his 2005 book *A Whole New Mind: Moving from the Information Age to the Conceptual Age*, Daniel Pink describes an era in which "artists, inventors, designers, storytellers, caregivers, consolers, big-picture thinkers . . . will now reap society's richest rewards and share its greatest joys." Like the design



economy, Pink's post-information-age conceptual age rests on "aptitudes" like "high concept," which "involves the capacity to detect patterns and opportunities, to create artistic and emotional beauty, to craft a satisfying narrative, and to combine seemingly unrelated ideas into something new."

Jane Leonard, president of the nonprofit organization Minnesota Rural Partners, credits Martin and Pink—as well as past experiences with the AIA Minnesota-sponsored Minnesota Design Team (www.minnesotadesignteam.org)—with helping her formulate the focus of the May 2007 Rural Summit, titled "Thriving by Design" (see page 44 for more information). The past five summits, she explains, covered diverse policy directions: "closing the digital divide, energizing entrepreneurs, leveraging new agriculture, boosting human capital, and sustaining the rural landscape." At the 2007 summit, she says, "We'll use the process and context of design to wrap all five elements together."

"We want people to see the importance of design and planning to community building and economic development," she says of the summit's focus. "Design provides a framework, a way to marry these complex, interrelated policies into a manageable, productive whole. We think this is the way to help Minnesota thrive well past our state's 150th anniversary and into the next generation of communities and leaders."

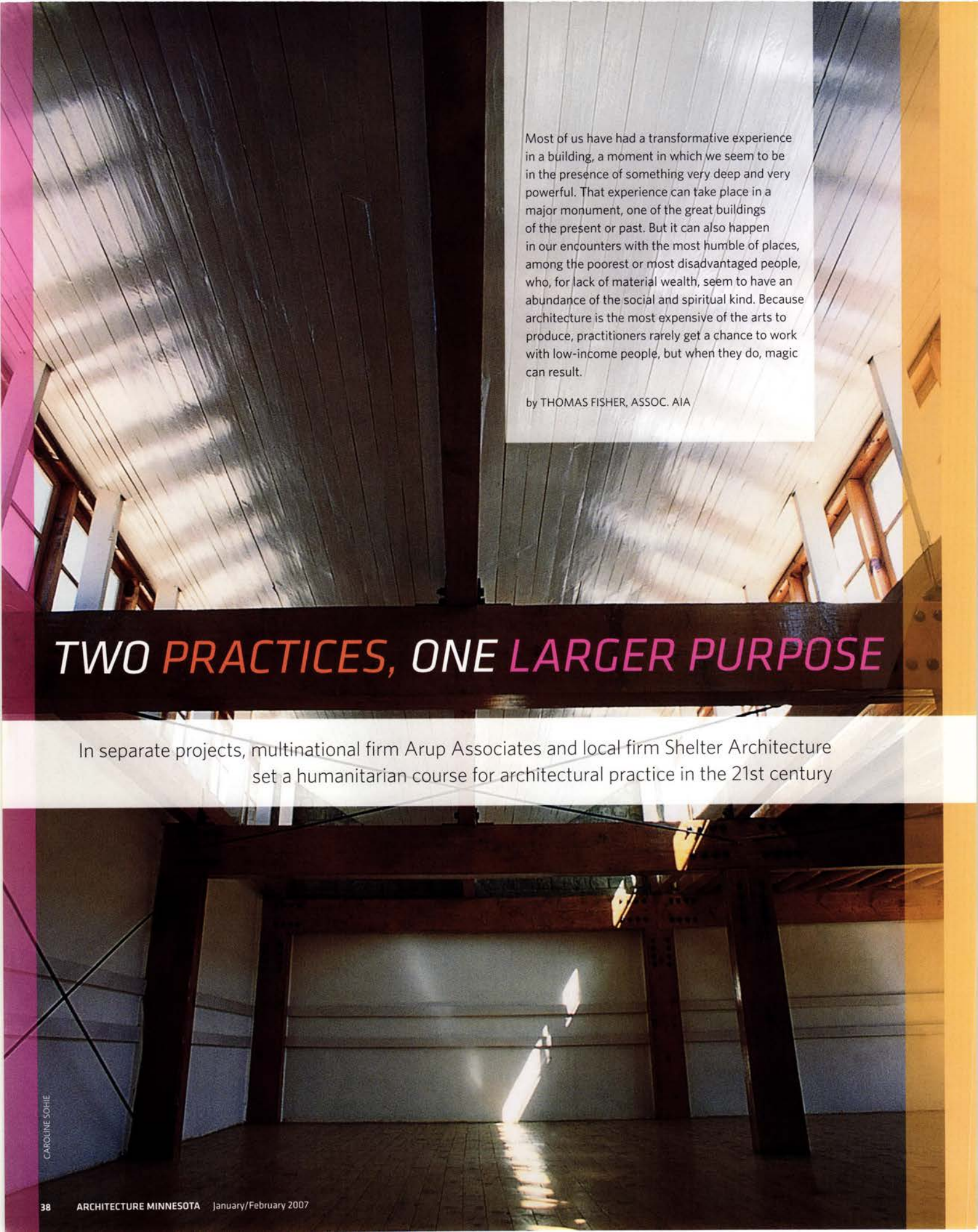
The design economy has emerged as businesses turn to the innovations, problem-solving methods, and interdisciplinary creative processes of design to overhaul their work practices in order to compete in the world marketplace.

The Right Conditions

As design continues to move from the cultural margins of the elite to mainstream American society, increasingly it's viewed "not just as a value-added activity that designers do, but as a creative way of thinking that non-designers need to learn," says Tom Fisher, Assoc. AIA, dean of the University of Minnesota's new College of Design. "In the global economy, if businesses don't invest in design, they won't thrive. I don't think we've ever heard that from the business community before."

So how did we get here? What contributed to the rise of the design economy? After World War II, Fisher explains, the U.S. "found itself the lone industrial giant, without any real competition." By the late 1990s, as Thomas Friedman recounts in his 2006 book *The World Is Flat: A Brief History of the 21st Century*, the Internet and global telecommunications had connected three billion people across the planet—particularly in high-population, high-production, low-wage countries like China and India—with unprecedented access to the free market.

>> continued on page 50



Most of us have had a transformative experience in a building, a moment in which we seem to be in the presence of something very deep and very powerful. That experience can take place in a major monument, one of the great buildings of the present or past. But it can also happen in our encounters with the most humble of places, among the poorest or most disadvantaged people, who, for lack of material wealth, seem to have an abundance of the social and spiritual kind. Because architecture is the most expensive of the arts to produce, practitioners rarely get a chance to work with low-income people, but when they do, magic can result.

by THOMAS FISHER, ASSOC. AIA

TWO PRACTICES, ONE LARGER PURPOSE

In separate projects, multinational firm Arup Associates and local firm Shelter Architecture set a humanitarian course for architectural practice in the 21st century

The interiors of the Druk White Lotus School (right) enjoy ample daylight, use local materials, and deploy a heavy timber, braced-frame structure to resist earthquakes. An outdoor court provides play space for the children (below).



CAROLINE SOHIE



CAROLINE SOHIE

Druk White Lotus School

The Druk White Lotus School, located in the village of Shey, high in India's Himalayan Mountains, offers an example of this magic. Designed by the large multinational firm Arup Associates for the Drukpa Trust, a charity located in the United Kingdom under the patronage of the Dalai Lama, the school seems at once ancient and modern, a stone-and-timber structure with several technically advanced features. Local contractors completed the first phase of the school in December 2001: a nursery school for 86 children. Arup has designed the facility to expand to accommodate 750 to 800 students from the ages of 3 to 18, with a health clinic, open-air Buddhist temple, library, computer and science labs, vocational workshops, a dining hall, and residential units for both students and staff.

What makes the project noteworthy is how Arup's designers used the school not just to do a lot for people who have very little, but also to demonstrate how we might all have to build in the future, when energy and water resources are as scarce in the rest of the world as they are in

the high-altitude desert of Ladakh, on the western border of Tibet. As the jury said of the school, when it won World Architecture Awards in 2002 for Best Asian Building, Best Education Building, and Best Green Building, "The whole project is conceived as a model of appropriate and sustainable design. Building materials are mostly indigenous to Ladakh, with careful auditing of sustainable-resource supplies."

The school's initial phase has two parallel wings, with one containing the nursery and kindergartens and the other housing the first-year classes and administrative spaces. Between the two timber-framed wings stands a walled, open-air courtyard with a row of trees separating the teaching and play spaces on either side. Locally quarried stone walls enclose the school on the north, east, and west sides, with large glass walls facing south. The master plan calls for additional classroom wings that face south, forming a square in the center of which stand common facilities, with a residential district running along a pedestrian path to the north.

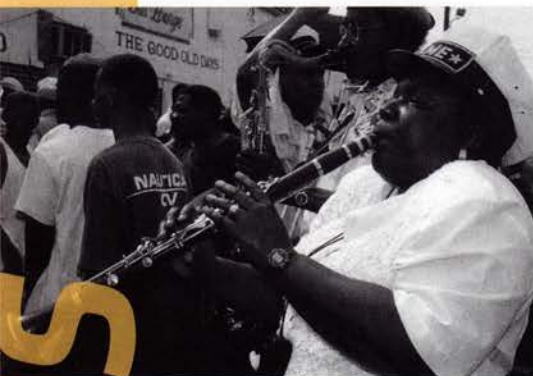
The design evolved out of an unusual process that began in 1997. Every year, Arup gave an engineer or architect a leave of absence to live in Shey and assist the client and contractors. This enabled the Arup designers to understand the severity of the

climate and the isolation and seismic volatility of the location. As a result, they used cross-braced, heavy-timber sway frames to counteract earthquake forces, and granite-clad, mud-brick cavity walls to increase thermal performance and durability. Air-lock entrances, ample south-facing windows, and small stoves in each classroom further enhance the heating of the interior in this cold, arid climate. The lack of water also led the designers to develop solar-assisted waterless pit latrines that use natural ventilation and a solar flue to vent off flies and odors, while allowing liquids to percolate back into the soil. At the same time, photovoltaic-powered water pumps draw water for storage in underground tanks.

The school contrasts, says Arup designer Francesca Galeazzi, with "the trend among some local architects and engineers to design new buildings in steel and concrete, an approach wrongly perceived as 'better' because it's identified with Western modernity." Perhaps it took a Western firm like Arup to see the limitations of such modernity, and to see the potential of what Ladakh's Buddhist culture has to offer as we look to a future environment that resembles that region. In a series of charts titled "Drivers of Change 2006," Arup documents the expected rise of the global population to nine billion by 2050, the accepted fact that we have now exceeded the biosphere's ecological capacity by 20 percent, and the likely prospect that two out of three people worldwide will be affected by water shortages by 2025. With such crises looming, we in the West may have as much to learn from the Ladakh people in how to live joyfully with few resources as they have from us in how to create such remarkable structures.

Arup's designers used the school not just to do a lot for people who have very little, but also to demonstrate how we might all have to build in the future, when energy and water resources are as scarce in the rest of the world as they are in the high-altitude desert of Ladakh.

The Calhoun Photography Studio and Residence (lower left, right) has a floodable first-floor gallery; the residence and photographic archives are located on the second floor. The rear building (right) uses the same strategy of elevating the living spaces.



KEITH CALHOUN

DIGITAL RENDERING BY SHELTER ARCHITECTURE



Calhoun Photography Studio

Americans do not have to go halfway around the world, however, to see the future. New Orleans has given us a much closer glimpse of what the dramatic climate changes of the coming century may mean for coastal cities, and what architects have to offer communities seeking to rebuild in the wake of both natural and manmade disasters. An example of this is the reconstruction of the Calhoun Photography Studio and Residence by the Minneapolis firm Shelter Architecture. Assisted by the nonprofit organization Architecture for Humanity and the Preservation Resource Center of New Orleans, John Dwyer, AIA, of Shelter has worked with photographers Keith Calhoun and Chandra McCormick Calhoun to rebuild their home and studio, located, fittingly, on Flood Street in the Ninth Ward.

Famous for their documentary photography of daily life in New Orleans (see examples on this page and the next), the Calhouns lost more than two-thirds of their nearly 10,000 negatives in the flooding that followed Hurricane Katrina. Dwyer heard about the destroyed studio from a colleague at Tulane University and met with the Calhouns. "The loss of much of their collection was tragic," says Dwyer. "It was not just about the black community but about life itself." Shelter has developed a schematic design for the studio, reusing cypress, brick, and slate salvaged from the original building. A first-floor gallery, constructed of concrete and glass, will have removable frames to allow future floodwaters to move through the space, while the second floor will contain the residence and the photography storage area, above flood level. A small building out back, erected first, will enable the Calhouns to live on the property during the construction of the main building. "We will be doing a design charrette for the studio and gallery in November," says Dwyer, along with "the official groundbreaking of the back house."

NEW ORLEANS



New Orleans has given us a much closer glimpse of what the dramatic climate changes of the coming century may mean for coastal cities, and what architects have to offer communities seeking to rebuild in the wake of both natural and manmade disasters.

As Arup did with the Druk White Lotus School, Shelter has participated in fundraising for the Calhoun project, working with Architecture for Humanity in pursuit of grant money. And in line with Arup's decision to allow staff to spend large blocks of time on the Himalayan site, Shelter has worked pro bono, on location, to bring the project to a point where fundraising becomes possible. Such donation of time may not seem like a sustainable practice over the long term, but working on projects like the Indian school and the New Orleans studio can have other, more remunerative rewards. Consider the amount of press both projects have received, be it major architectural awards in the case of the Ladakh school or articles about the Calhoun studio in newspapers like the *New York Times* and *Houston Chronicle*. Or consider the knowledge gained from developing new building strategies—water-conserving measures in the school, flood-resistant design in the studio—for environmental conditions we may all face in the future.

Architects need to be not only more proactive in helping the most disadvantaged people but also more aware of the prototypical nature of what they design. What arises out of pro bono work can meet the needs of literally millions of people, with the potential profits that follow from that. So while projects like these may not pay the rent over the short term, they offer extraordinary long-term benefits as well as transformative experiences for all involved. And no one can ever take those riches away. **AMN**

A cane worker pauses for photographer Chandra McCormick.

Making a Statement

On October 7, 2004, AIA Minnesota's board of directors unanimously and enthusiastically adopted a position statement on climate change, propelling the organization into a new role—that of advocating for state renewable electricity standards, public transit funding, and energy-efficient building incentives—with the intent to protect the health, safety, and welfare of the public by reducing greenhouse gas emissions attributable to the built environment. The American Institute of Architects' recent endorsement of the 2030 "Challenge (carbon-neutral buildings) is now focusing the profession's attention on global warming at the national level.

AIA Minnesota's climate change statement was inspired in part by Edward Mazria's October 2003 *Metropolis* article "Turning Down the Global Temperature" and by the AIA Minnesota Committee on the Environment's (COTE) strong desire to support state energy legislation. It set precedent as the first position statement to originate from a local AIA committee and established protocol for formal advocacy within AIA. Look for AIA Minnesota and COTE to continue taking a leadership position on global warming through collaborative ventures with the University of Minnesota's College of Design, the Minnesota Pollution Control Agency, Fresh Energy, and others. You can download a copy of the AIA Minnesota 2004 Climate Change Position Statement at www.aia-mn.org/committees/pdf/cote/climate_position_aia_mn.pdf

—Doug Pierce, AIA, COTE chair

Buildings are major contributors to greenhouse gas emissions; therefore, taking action to reduce the impact of buildings on climate change is part of the architecture profession's commitment to protecting the health, safety and welfare of the public.

Climate change results primarily from activities that release heat-trapping greenhouse gases such as carbon dioxide (CO₂) and methane (CH₄) into the atmosphere. CO₂ is the primary greenhouse gas. Atmospheric concentrations of CO₂ and CH₄ have been increasing for about two centuries as a result of human activities and are now higher than they have been for over 400,000 years.¹ Since 1750, CO₂ concentrations in the atmosphere have increased by 30 percent and CH₄ concentrations in the atmosphere have increased by 150 percent.¹ The main sources of CO₂ include burning fossil fuels such as coal, gas, and oil, and deforestation. Seventy-five percent of Minnesota's electricity is produced by coal-fired power plants,² and buildings consume 65% of that electricity.³

Based on current scientific information about the causes and impacts of climate change, the Members, Officers and Board of Directors of the American Institute of Architects Minnesota herein affirm that AIA Minnesota will advocate for design practices and government policies that reduce greenhouse gas emissions. We are committed to the challenging goal of reducing climate change impacts in the state of Minnesota.

Historically, the American Institute of Architects (AIA) has been a leader in supporting changes that improve our built environment. For example, in the early 1930s when engineers developed insulation and a means to manufacture it, the AIA studied the issue and endorsed the concept. This endorsement contributed to launching new industries and re-thinking the way building envelopes are designed, resulting in improved human comfort, increased productivity and greater energy efficiency.

Today the AIA has an opportunity to support important changes in the way we build, influencing our quality of life now and in the future. By designing to reduce climate change, we can take a leadership position on one of the most critical issues currently facing our state, our nation and our world.

If we do not act to slow global warming, the United Nations Intergovernmental Panel on Climate Change

predicts that by the year 2100 the earth's average temperature is expected to increase three to ten degrees Fahrenheit.⁴ Climate change in Minnesota over the next 100 years is projected to occur more than 100 times faster than the change in climate since the last Ice Age.⁵ In recent decades, the Minnesota fall freeze has been moving later by 1.5 days per decade and spring lake ice-out earlier by 2 days per decade.⁵

If we act now, we can provide for the health, safety and welfare of the public while having a positive impact on the economy. For example, British Petroleum recently developed an internal strategy for curbing carbon emissions, resulting in a ten percent company-wide reduction in those emissions and a \$650 million net boost to the company over a three-year period.⁶ Germany has created 40,000 jobs manufacturing wind machines⁷ while cutting its use of coal in half since 1990.⁸ Minnesota wind power could produce 10 times the electricity our state consumed in 2000 when fully developed.¹⁰ Homebuyers could save \$81 million a year in energy if their homes were built to be energy-efficient.⁹ When passed, the U.S. Climate Stewardship Act of 2003 is projected to provide a net GDP increase of \$100 billion to the American Economy by 2015.¹⁰

The United States has over five million commercial structures¹¹ and 76 million residential structures. These buildings account for 65 percent of U.S. electricity consumption, 36 percent of U.S. primary energy use, and 30 percent of U.S. greenhouse gas emissions.³

Over 10 billion square feet of new construction and renovation take place in the U.S. each year.¹² The magnitude of the building sector means that decisions about the future design of new and remodeled structures will be a major determinant of total greenhouse gas emissions. The architectural community must be actively engaged in supporting reduced emissions in order to reduce climate change.

AIA Minnesota represents the interests of architects before local, state and national policy-making bodies. AIA Minnesota's active involvement in the political process enables the organization to advocate effectively on legislative, regulatory, and related issues of importance to AIA members.

>> continued on page 56

By

The 2030 °Challenge calls for an immediate 50-percent decrease in building emissions, followed by an additional 10-percent cut every five years until the goal of carbon-neutral, zero-emission buildings is reached in 2030.



the Numbers

Architecture 2030 and its 2030 °Challenge offer a bold plan to reduce building CO₂ emissions to zero over the next quarter-century

BY WILLIAM WEBER

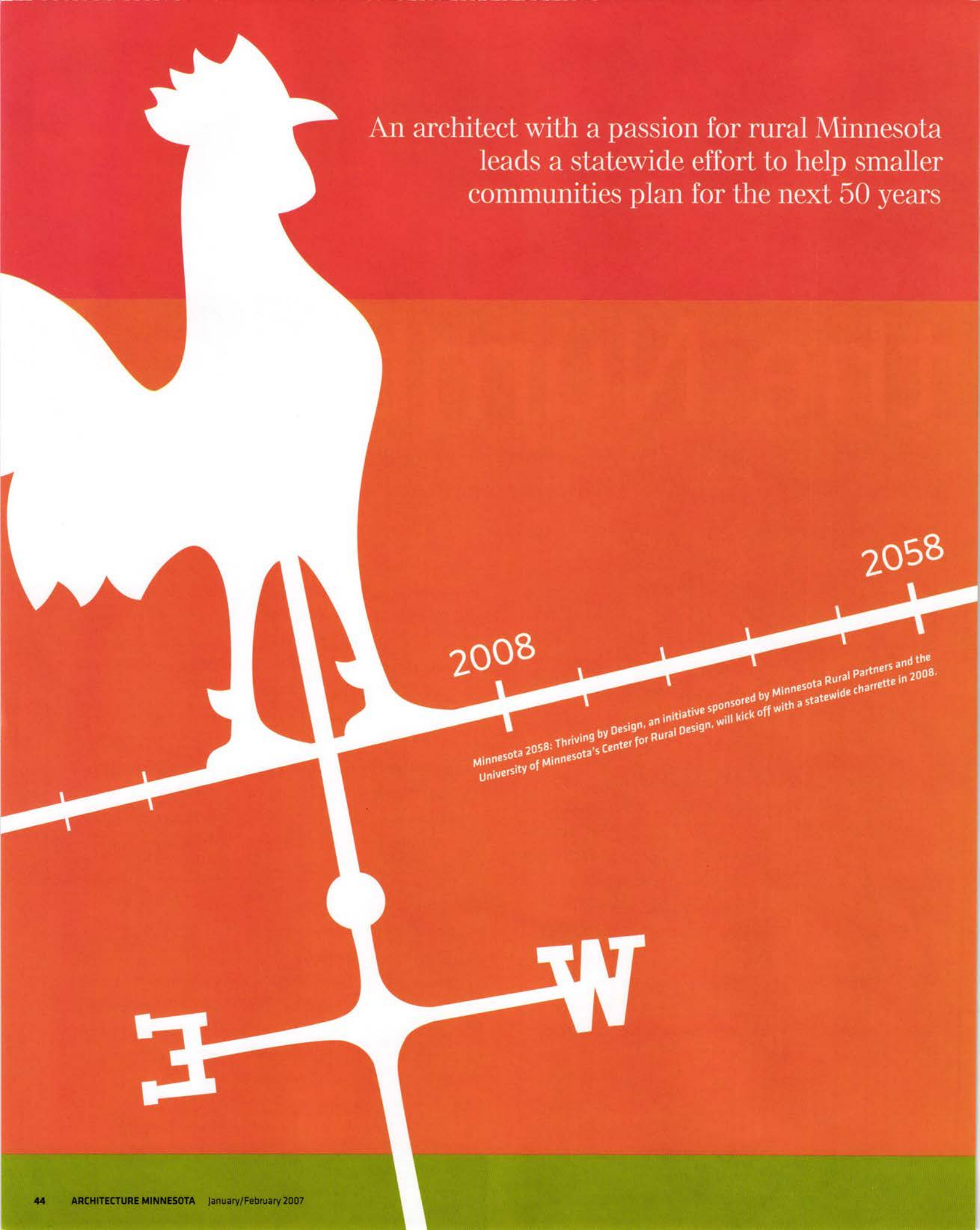
Edward Mazria, AIA, is on a coast-to-coast barnstorming tour of the U.S. explaining the facts of global warming and laying out a partial solution to any and all comers. One recent stop was the West Coast Green Conference, where he delivered the opening keynote on Architecture 2030 (www.architecture2030.org)—a nonprofit organization he founded to address global climate change—and its 2030 °Challenge.

Mazria began his presentation by asserting that the earth is at a tipping point; if anthropogenic global warming continues unchecked, we will not be able to avert massive climate change. A projected increase in average earth temperature of 2°C (3.6°F) by 2050 above pre-industrial levels will melt polar ice caps, causing rising sea levels, killing reefs and fisheries, shifting climate zones, and flooding heavily populated coastal regions. Mazria's 2003 white paper on the topic—"It's the Architecture, Stupid!"—identifies one major cause. Roughly half of U.S. energy consumption and an equal percentage of global-warming-causing CO₂ emissions is attributable to buildings and the building industry.

The grim facts explained, Mazria outlined his vision for a workable solution. The 2030 °Challenge calls for an immediate 50-percent decrease in building emissions, followed by an additional 10-percent cut every five years until the goal of carbon-neutral, zero-emission buildings is reached in 2030. Each year in the U.S. we tear down 1.75 billion square feet of obsolete buildings, build 5 billion square feet new, and renovate an additional 5 billion square feet. This staggering rate of construction means that by 2035 three-quarters of all buildings in the U.S. will be new or renovated. These numbers reveal an opportunity to construct an ecologically compatible built environment in a little over a quarter-century.

In closing, Mazria issued a challenge to the room, the same challenge he posed in an open letter to architects, planners, and builders (available on the Architecture 2030 website) in January 2006: Join the 2030 °Challenge and act to avert irreversible damage to the environment. The good news is, people are heeding the call. The 2030 °Challenge has been formally adopted by the American Institute of Architects and the U.S. Conference of Mayors. **AMN**

Edward Mazria will discuss the 2030 °Challenge and zero-emission design in Minnesota at the 2007 Earth Day Forum at the University of Minnesota's College of Design in April. For more information, visit www.cdes.umn.edu



An architect with a passion for rural Minnesota
leads a statewide effort to help smaller
communities plan for the next 50 years

2008

2058

Minnesota 2058: Thriving by Design, an initiative sponsored by Minnesota Rural Partners and the University of Minnesota's Center for Rural Design, will kick off with a statewide charrette in 2008.

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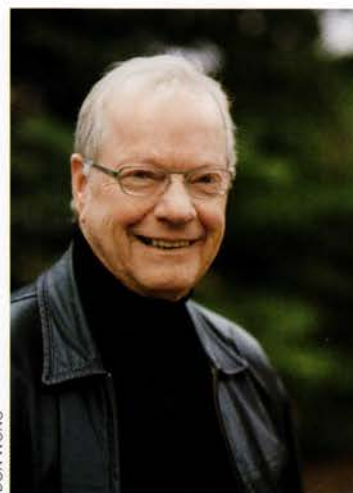
Love of Country

By Nancy A. Miller

To illustrate his discussion of the future of Minnesota, Dewey Thorbeck, FAIA, director of the University of Minnesota's Center for Rural Design (ruraldesign.coafes.umn.edu), looks

to the past. He unfurls a map, dated 1895, and argues that our image of and vision for the state, especially the rural landscape, has not evolved significantly since the year that map was first printed.

Thorbeck aims to change that.



DON WONG

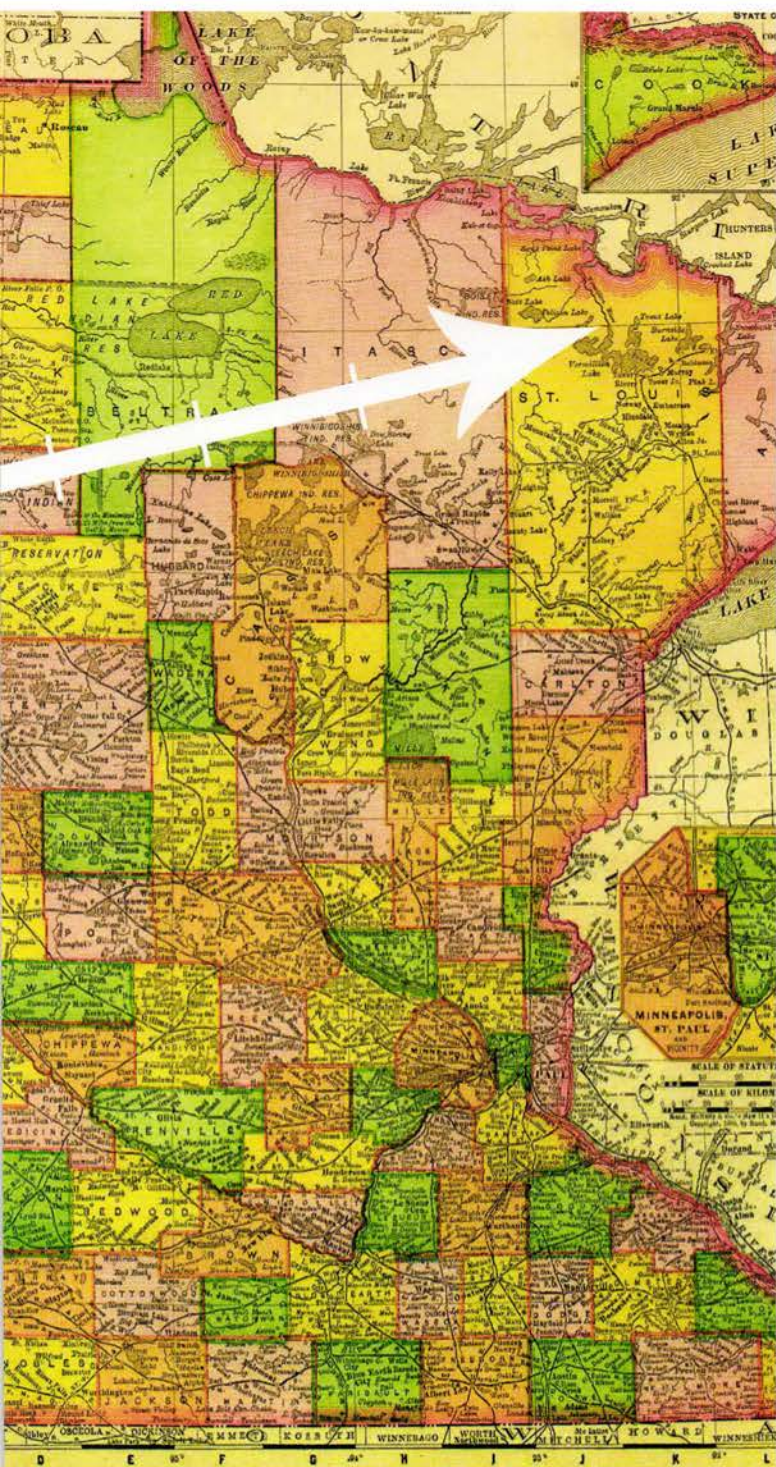
Dewey Thorbeck, FAIA

He founded the Center for Rural Design in 1997 to bring the innovative thinking of research-based design to rural communities across Minnesota. The small but thriving center, which is unique in the nation, works to understand rural issues and opportunities regionally, attacking the outdated paradigm of a monolithic "outstate" Minnesota.

"We know from working in various regions of the state that the issues are hugely different depending on where you are," says Thorbeck. He and his staff have worked in communities in every corner of Minnesota, and while many issues they examine are unique to the rural landscape, other issues, such as affordable housing, public health, education, transportation, the environment, and even conflicts arising from overdevelopment, are not so different from those faced in urban areas.

However, because most rural cities and townships do not have the resources to undertake comprehensive visioning and planning projects on their own, the Center for Rural Design emphasizes building working partnerships. Research fellow Steve Roos describes the center's working process as "looking at inter-jurisdictional relationships and trying to identify opportunities for people to work together." That approach has spurred Thorbeck and his team to reexamine traditional working methods; for example, they have suggested using landscape features such as watersheds, rather than political boundaries, to construct a planning framework.

Back to the future. With the state's upcoming sesquicentennial in mind, the Center for Rural Design has collaborated with Minnesota Rural Partners to establish a three-year, future-oriented planning effort called "Minnesota 2058: Thriving by Design." Recognizing that rural Minnesota comprises a dynamic, evolving landscape, the initiative aims to be proactive in anticipating issues and opportunities. At the heart of the effort is a multi-regional, statewide charrette planned for 2008 in which the Center for Rural Design and University of Minnesota faculty from a variety of disciplines, along with architects, planners, and community partners, will work together to create a new vision for the future of Minnesota. "In my mind," says Thorbeck, "I see this as a huge celebration throughout the state, in which each region comes together as in an old New England town meeting, to speculate on the next 50 years." Sounds like we'll need a new map. **AMN**



Not much has changed: an 1895 map of Minnesota.

Graduate architecture students at the University of Minnesota
explore the emerging field of biomimicry

Innovative by

By William Weber

"The underlying ideas of sustainability and biomimicry are the same. Nature already knows how to do what we are trying to figure out—that is, how to live sustainably on the planet."

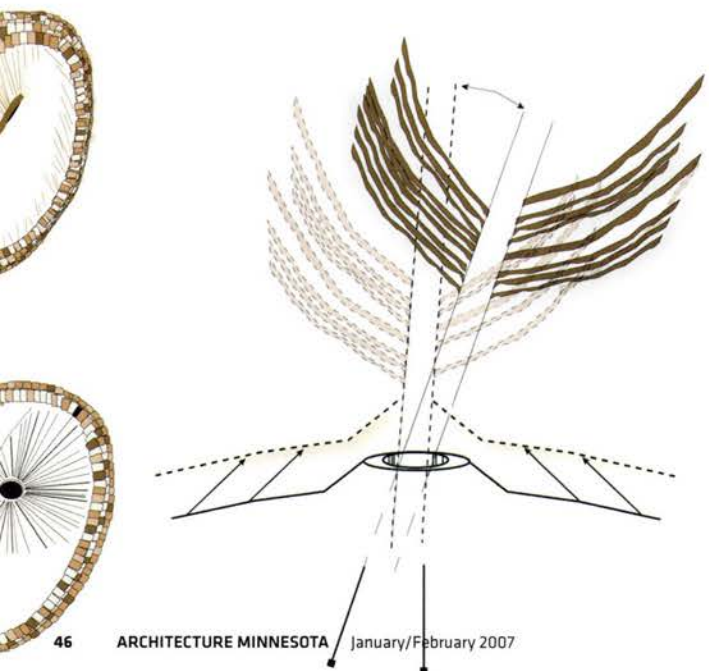
—John Carmody,
director of the University of Minnesota's
Center for Sustainable Building Research

In fall 2005, students and faculty at the University of Minnesota's School of Architecture came together for a kickoff workshop for a new graduate studio exploring the application of biomimicry in design. The participants gathered around a table strewn with what appeared to be the contents of a natural history museum diorama—shells, bones, snake skins, bird nests, and every size and shape of seed pod. These items would serve the group as "nature's champions," workshop leader Dayna Ayers Baumeister from the Biomimicry Guild explained, asking the students to "quiet their cleverness" and spend the weekend exploring nature through a new lens. But this was no touchy-feely, ain't-nature-great classroom experience. Rather, it posed profound questions about the ways in which nature can inspire innovative design.

It has been 10 years since Janine Benyus' *Biomimicry: Innovation Inspired by Nature* introduced readers to a new way of thinking about the relationship of nature to design. Her book is a glimpse into the world of cutting-edge scientist-designers who learn from nature to create the technology of tomorrow. Benyus refers to this quest as "the conscious emulation of life's genius" and outlines three ways that we can draw knowledge and inspiration from nature:

NATURE AS MODEL. Biomimicry is a new science that studies nature's models and then imitates or takes inspiration from these designs and processes to solve human problems.

NATURE AS MEASURE. Biomimicry uses an ecological standard to judge the "rightness" of our innovations. After 3.8 billion years of evolution, nature has learned: What works. What is appropriate. What lasts.



RENDERINGS AND PHOTOS BY COURTNEY KRUNTORAD

Nature

NATURE AS MENTOR. Biomimicry is a new way of viewing and valuing nature. It introduces an era based not on what we can extract from the natural world, but what we can learn from it.

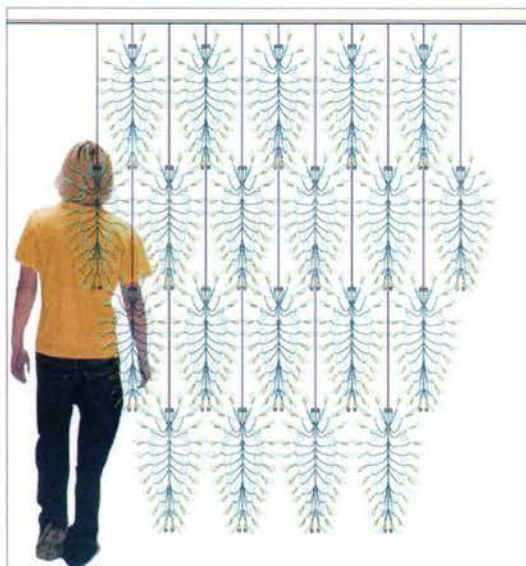
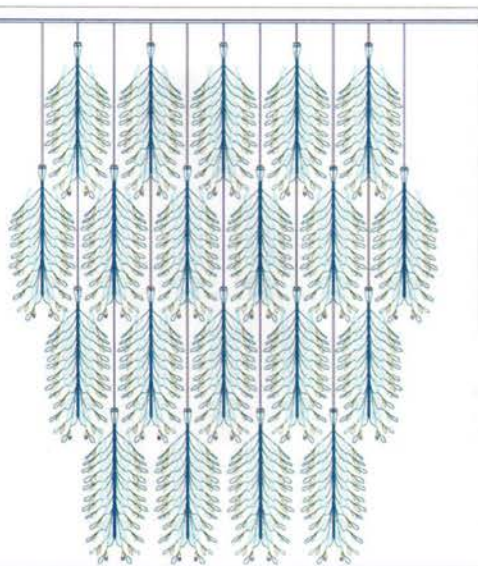
Not surprisingly, architecture schools across the country have been early explorers of the ideas contained in Benyus' book. The University of Minnesota studio, led by assistant professor Marc Swackhamer, used *model*, *measure*, and *mentor* as a guide for research and a yardstick for success. Swackhamer devised the course to alternate between periods of research and speculation and periods of synthesis and design, and he often returned to one particular notion espoused by Benyus and Baumeister: quieting human cleverness. "It's important early in the design process to observe, listen, and analyze rather than problem solve," he explains. Students often jump to conclusions, but here they

were encouraged to be curious and to allow for trial and error, which led to richer projects.

As the studio progressed, the students pursued an array of architectural problems, including fire resistance, portable structures, heat retention, acoustic attenuation, and on-site water treatment. For each they sought out a natural champion to both inspire and educate them. Swackhamer, meanwhile, invited biologists from the University of Minnesota's Bell Museum as well as mechanical engineers to aid the students in their investigations. Biomimetic design can emulate nature in form (physical shape, which follows function), process (the way nature makes and maintains itself, and harvests and stores energy), or ecosystem (the dynamic relationships and dependencies between organisms, both physical and social). Accustomed to the study of form and function, most of Swackhamer's students took the first—and simplest—approach.

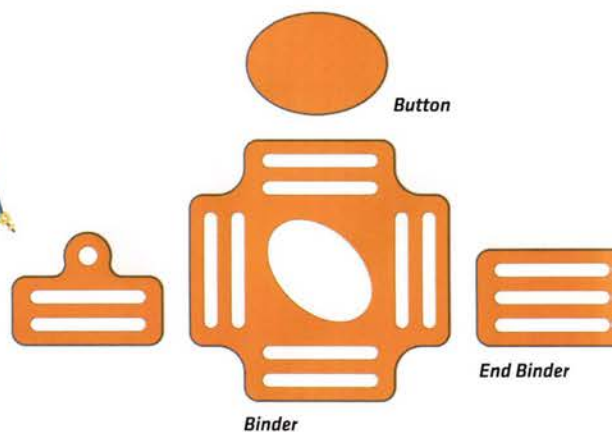
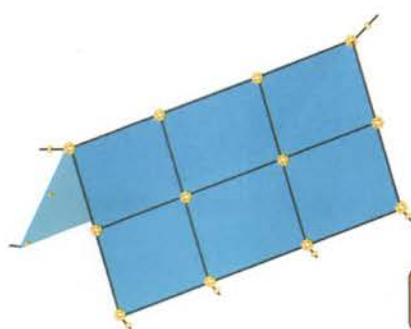
Cream of the Crop

One such student was Ben Pauly. Pauly, Swackhamer recalls, became curious about how nature deals with fire, particularly fast-burning forest fires. In his study of several tree species, Pauly found that the Giant Sequoia is protected from fire by the movement of water through its bark by capillary action. He then proceeded to design a clay-tile skin that could be pre-saturated with water in the event of a fire. "Ben developed a thorough understanding of capillary action, ultimately designing tiles sized and shaped accordingly," Swackhamer explains. "The size and spacing of the openings were all determined by capillary flow." The tiles are ovoid-shaped and interlock end to end to create a cladding system; the pattern of openings resembles simplified Louis Sullivan filigree. The organic shape of the tiles was not intentional; form simply followed function as Pauly studied water movement through the material.



Courtney Krontorad learned that the barn owl adjusts the feathers on its parabola-shaped face to focus sound into its ears, and relaxes the feathers to dampen sound when it sleeps. Krontorad eventually designed a beautiful, dynamic wall system of gathered and pleated fabric that can be turned "on" to allow sound to pass through or "off" to dampen sound in response to conditions.

Barn swallow nests combine a base of common materials—mud and saliva—with location-specific materials—twigs, leaves, paper, plastic. These observations led Michael Kisch to design a metal clip—analogueous to the mud and saliva—to be used in combination with plastic strapping to form a tensile net that can be filled in with found materials to create a shelter in disaster situations.



Two students' feathered champions led them in different directions. Michael Kisch used the idea of the barn swallow's nest-making process to design a system for constructing temporary shelters in disaster situations. Swallow nests combine a base of common materials with location-specific materials. "All swallow nests are made of mud and saliva," Swackhamer explains. "But in a natural or rural setting a swallow's nest will also contain twigs, leaves, and other found materials. Likewise a nest in an urban setting will incorporate paper, fabric, and plastic." These observations led Kisch to design a metal clip—analogueous to the mud and saliva—to be used in combination with plastic strapping to form a tensile net that can be filled in with found materials to create a shelter.

Courtney Krontorad took a more direct form-and-function approach to the problem of sound attenuation. She learned that the barn owl adjusts the feathers on its parabola-shaped face

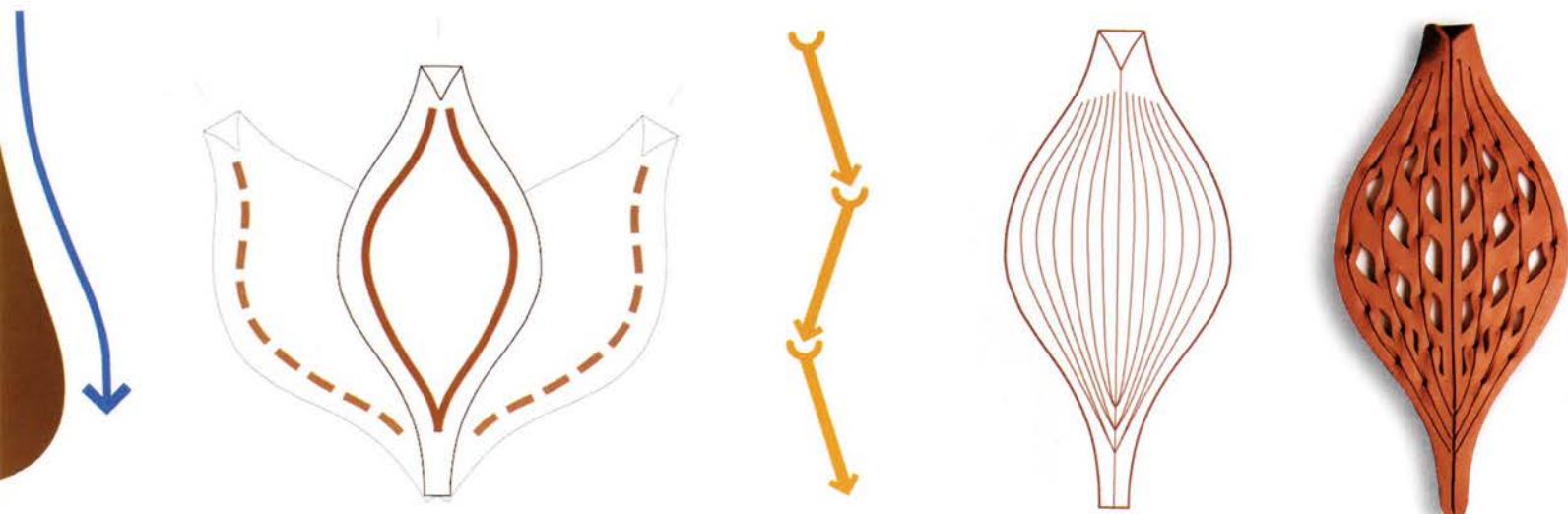
to focus sound into its ears, and relaxes the feathers to dampen sound when it sleeps. Krontorad eventually designed a beautiful, dynamic wall system of gathered and pleated fabric that can be turned "on" to allow sound to pass through or "off" to dampen sound in response to conditions.

From the outset, Corri Kluba was determined to take a different approach. "Part of what I was trying to do was to explore biomimicry at a large scale," she says. Ironically, it was a small mouse in her kitchen that started her thinking about architecture as a barrier to the natural world. "All around us is tamed nature," Kluba says. "I began to wonder if we could live more mutually with nature." Her curiosity led her to examine mutualisms in nature such as the relationship between fungus and algae, which together form lichen. Ultimately, for Kluba, the relationship between *Iridomyrmex* ants and the *Myrmecodia* plant resonated the most.

The ants and the plants have a true mutual relationship," she explains. "Each gains from the relationship: The plant grows a special chamber in which the ants deposit their waste, which in turn provides nutrients for the plant to grow nectar for the ants." The closed-loop patterns expressed in the relationship spurred Kluba to think about wastewater patterns on a community scale, and how they might be closed. Specifically, she looked at how a food-producing greenhouse and a Living Machine®—a living wastewater-treatment system pioneered by Canadian biologist John Todd—might be integrated into the fabric of a neighborhood.

It's Out There

Of course, universities aren't the only explorers and practitioners of biomimicry. In fact, biomimetic products have already entered the public consciousness, if not the average household. Anyone who watched Aussie Ian





RENDERINGS AND PHOTOS BY MICHAEL KISCH

"Thorpedo" Thorpe swim to gold at the 2000 Sydney Olympics will recall his controversial apparel. Signaling the death of the traditional Speedo, he wore a revolutionary full bodysuit made from Fastskin™. The fabric, inspired by the hydrodynamic skin of a shark, has ridges mimicking the V-shaped dermal denticles on sharks; the ridges decrease drag and turbulence, thus increasing a swimmer's speed through the water.

Also on the market is self-cleaning paint that employs the Lotus-Effect®, so termed because it mimics the surface structural characteristics of the self-cleaning lotus leaf. It's fairly simple: The paint surface, like the lotus leaf, is super-hydrophobic, which means that it causes water to bead and roll off. And because of the strong adhesion between water and dirt, the water carries the dirt away with it. The same idea may someday lead to self-cleaning windows.

Looking ahead, biomimicry may make its biggest splash in the area of industrial design and manufacturing. Consider, for example, what the abalone has to teach us (Benyus trumpets this example in her book). An abalone produces a mother-of-pearl-lined shell by secreting proteins or polysaccharides into the water that self-assemble on the inner surface of the shell into a three-dimensional matrix of open compartments; calcium and carbonate ions in the seawater crystallize and fill in the matrix. The result is mother-of-pearl that is twice as strong as our strongest ceramics. Benyus is quick to point out that the mollusk accomplishes all this at ambient temperatures without toxic byproduct or expenditure of large amounts of energy. By contrast, the manufacture of manmade products typically requires a "heat, beat, and treat" approach, referring to the energy use, complexity, and toxicity of most

>> continued on page 58

Instructor Marc Swackhamer devised the course to alternate between periods of research and speculation and periods of synthesis and design, and he often returned to one particular notion espoused by Benyus and Baumeister: quieting human cleverness. "It's important early in the design process to observe, listen, and analyze rather than problem solve," he explains.

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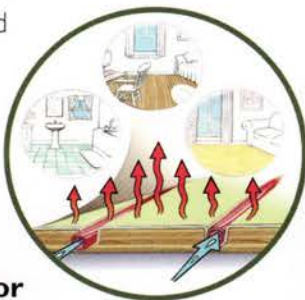
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Design in Demand

<< continued from page 37

As the global economy flattened, U.S. business found itself competing for manufacturing, research, and design work, on which it had long held a monopoly. Then came the dot-com bust, followed by the terrorist attacks of September 11, 2001. The trifecta "pushed the country over the edge. It was more than the economy could take," says Bob Worrell, founder of the Minneapolis industrial-design firm Worrell, Inc.

"In 2002, we saw the biggest industry shakeout in the design professions we'd ever seen," Worrell continues. "There was only one place to go: upmarket, with smarter, better-quality, more-sophisticated products that created value through differentiation." For decades, Worrell says, he had encouraged his clients to embrace "the interdisciplinary design process we offer," which drew from the firm's staff of graphic and industrial designers, industrial engineers, an anthropologist, ethnographic researchers, and a prototyping engineer. But the clients balked.

"Today," Worrell says, "our process hasn't changed, but businesses are having to." Whether they want to or not, Fisher emphasizes. "3M apparently has to create a successful product every week to stay in business. And they can't just be doing yellow Post-it Notes in pink. They need to take existing technology and invent something totally new. In this global marketplace, the pressure on companies to keep constantly creative is tremendous."

Hotbeds of Creativity

The creative talent that businesses seek will increasingly be found in the nation's cities, according to Richard Florida's recent research. Florida's article "Where the Brains Are," in the October 2006 issue of *The Atlantic*, charts the "mass relocation of highly skilled, highly educated, and highly paid Americans to a relatively small number of metropolitan regions." While Florida doesn't cite Minneapolis/St. Paul as one of his "superstar cities," color-coded maps of Minnesota's 1970 and 2000 populations in the article show significant migration to the metro area.

"The physical proximity of talented, highly educated people has a powerful effect on innovation and economic growth," writes Florida,

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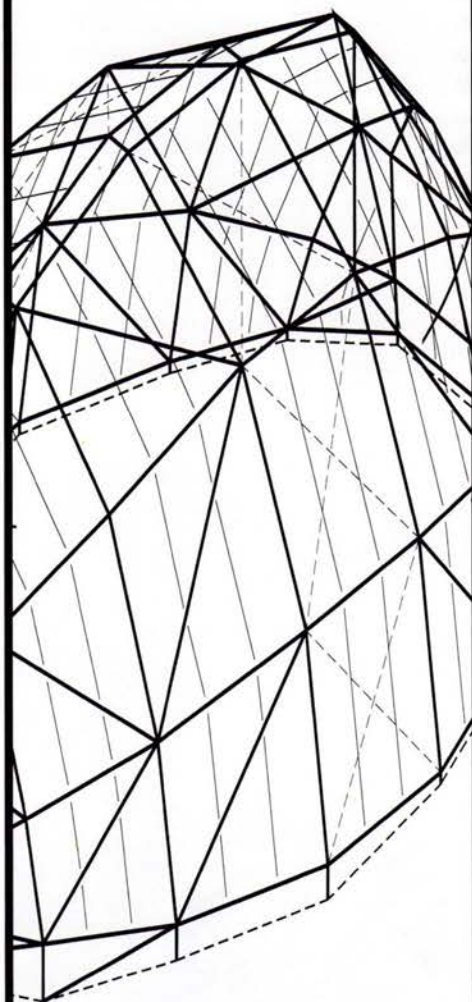
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Design in Demand

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Hirst Professor of Public Policy at George Mason University and author of *The Rise of the Creative Class* (2002). "That's all the more true in a postindustrial economy dependent on creativity, intellectual property, and high-tech innovation."

Worrell confirms that, in today's economy, "Our creativity is becoming an extremely valuable commodity. Our currency is our creativity—the ability to visualize, to think broadly about concepts and possibilities, but also to go deep into the manufacturing segment to provide real products, real value, real revenue opportunity. Our firm has become far more assertive and proactive at promoting our creativity, and our revenues have tripled since 2002."

The University of Minnesota's new College of Design, another reflection of this interest in the design economy, will also contribute to the consolidation of creative talent in the Twin Cities, Fisher says. The college, which merged the former College of Architecture and Landscape Architecture with such allied professions as interior, graphic, and apparel design, hopes to "graduate students with broad and deep interdisciplinary knowledge, who can design teapots and buildings but also re-conceive whole businesses, industries, and product lines," Fisher says. "In today's design economy, you can't separate the innovative product from the innovative process and innovative facilities."

In answer to Florida's concerns that America's brainiest cities will also see a drain of "the traditional lower and middle classes," leaving the urban areas "inhabited by a core of wealthy workers leading highly privileged lives" in high-priced real estate, residences like the Zenith and the Revue by ESG will provide creative professionals of all ages and incomes with the design value they seek—in Minneapolis, at least. "To create contemporary residences at affordable prices that build on traditional, higher-density urban fabric—that's a key design principle for me," Graham says. "It's all about good design for more people. The beauty is, people can get something aesthetically great for less, if we work at it."

As Worrell says of the design economy, with all of its challenges, opportunities, and possibilities, "Now is the time for designers." **AMN**

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Save the Guthrie! Again.

<< continued from page 13

it captures Nouvel's original design, erasing many of the unfortunate and disfiguring alterations the actual building has endured over the decades."

Ms. Cowles-Dayton has stated publicly that, while she regrets that the move will result in the original theater's demolition, many of the historically significant elements of Nouvel's design were irreparably altered by previous renovations and additions. "The building that was designed is not the building we see today," she explains. "Nouvel's innovative metal-panel cladding with its midnight blue color and ghostly images was removed in the 2012 renovation because of severe UV degradation. Unfortunately, it simply wasn't designed to resist the severe changes in our climate."

According to the records of the Northwest Architectural Archives at the University of Minnesota, the building has endured a number of architectural modifications over its 50-year history—so many, in fact, that only a few of the area's older residents clearly remember the gleaming luster of Nouvel's original vision. The familiar beige-brick exterior with square punched windows, the mirrored-glass observation silo on the top of the building, and the bulky, concrete virtual-

activities wing with its Endless Tunnel all represent drastic modifications to the original design. With so little of the original intact, Cowles-Dayton argued successfully before the State Historic Preservation Office (SHPO) last May that it should deny historic designation, a decision that is now facing multiple appeals within the state's court system. It was during the SHPO hearing that Cowles-Dayton famously said, "Frankly, tearing the whole thing down is the only humane thing to do."

It was this callous statement, says SOGGY's Rubenstein, that energized the ad-hoc preservation cause she now leads. "Tearing down the Guthrie and replacing it with sanitized hologram fakes does not qualify as preservation. No matter how many optical-nerve stimulators you strap to my head, nothing beats bricks and mortar for a quality architectural experience." Rubenstein, who says she's spoken frequently with Nouvel in recent days (now the oldest living man in France), remains inspired by the optimism of early-21st-century culture and architecture—a time when architects were chiefly concerned with making interesting forms and keeping the water out, and not with the number of terabytes per square foot. "We're real people fighting for real buildings with real history," says Rubenstein. "That's the message we'll be taking to the Minnesota Supreme Court."

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Making a Statement

<< continued from page 42

Therefore, AIA Minnesota will join with other Minnesota organizations to support reductions in greenhouse gas emissions by endorsing the Climate Stewardship Act. AIA Minnesota will advocate for greenhouse-gas-reducing design practices and government policies that:

- Require and encourage energy-efficient private residential and commercial buildings while providing for good indoor air and environmental quality;
- Require and encourage state-bonded buildings to perform 30% better than the Energy Code and meet the B3 Sustainable Guidelines;
- Require and encourage clean, renewable power sources such as wind, solar and bio-mass and/or discourage the continued use and/or construction of fossil-fuel-burning power plants;
- Encourage and support full implementation of the Minnesota Renewable Energy Objectives (REO) and passage of the federal Renewable Electricity Standard (RES);
- Require and encourage low-impact community design by encouraging municipal and regional planning that embraces the energy-efficient transportation of humans, materials and products and provides for carbon fixing through planted open space;
- Require and encourage material selections that improve energy efficiency and support ecologically sound forest stewardship practices;
- Require and encourage the immediate reduction of greenhouse gas emissions to levels 60% to 80% below 1990 levels as recommended by the U.N. Intergovernmental Panel on Climate Change (IPCC).

AIA Minnesota Committee on the Environment **AMN**

¹ "Our Changing Planet: The U.S. Climate Change Science Project," United States Climate Change Science Program and the Subcommittee on Global Change Research, A Supplement to President George W. Bush's Federal Budget for Fiscal Years 2004 and 2005, August 2004, page 79.

² "Energy Policy and Conservation Report," Minnesota Department of Commerce, July 2004.

³ U.S. Green Building Council, <http://www.usgbc.org/>

⁴ "Climate Change 2001: Synthesis Report – Summary for Policymakers," U.N. Intergovernmental Panel on Climate Change, September 2001.

⁵ "Confronting Climate Change in the Great Lakes Region: Impacts on Our Communities and Ecosystems," Union of Concerned Scientists, April 2003.

⁶ Braithwaite, Roger J., "Special Report: Global Warming," BusinessWeek, August 16, 2004.

⁷ Noble, Michael, "Designing an Energy Future: We Choose the Climate Our Children Will Inherit," AIA-MN Convention, November 21, 2003.

⁸ Larsen, Janet, "Coal Takes Heavy Human Toll," Earth Policy Institute, August 24, 2004.

⁹ "New Alliance to Save Energy Report Links High Energy Bills, Waste, Pollution to Poor Housing Codes," <http://www.ase.org/content/news/detail/548>, accessed August 13, 2004. According to a 1998 report from the Alliance to Save Energy, homeowners could save at least \$81 million per year if the 36 states in which they live upgraded their energy codes for new home construction to the 1993 Model Energy Code.

¹⁰ "Redefining Progress: Effects of Global Warming on the State of Minnesota," Environmental Entrepreneurs, May 2004.

¹¹ U.S. Department of Energy: Energy Information Administration, www.eia.doe.gov.

¹² 2003 Buildings Energy Databook, U.S. Department of Energy: Energy Efficiency and Renewable Energy, August 2003.



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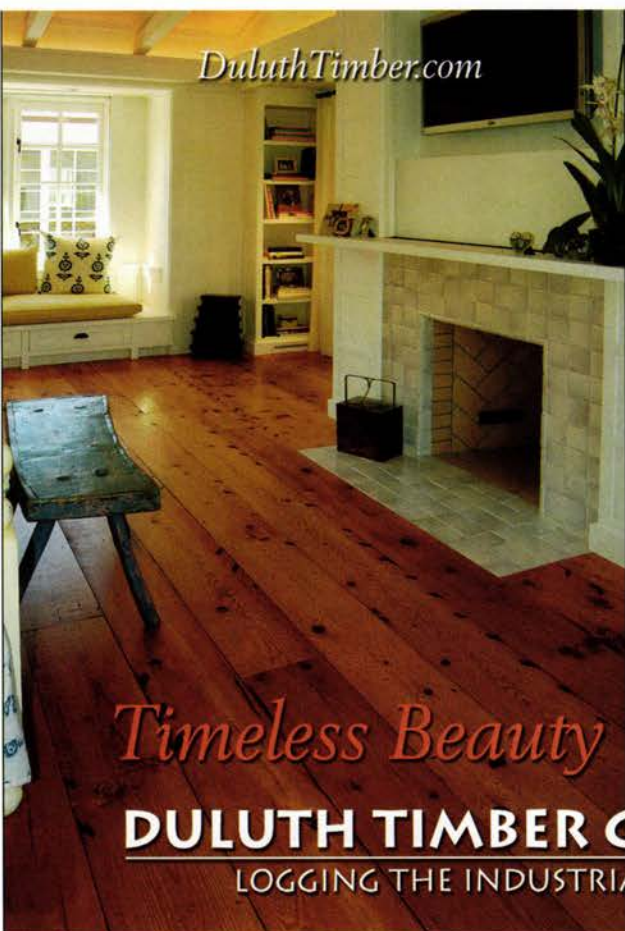
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<< continued from page 49

manufacturing processes. So will the abalone inspire new processes? It's already happening: Using rapid prototyping and three-dimensional printers, researcher Paul Calvert of the University of Arizona Materials Laboratory is mimicking the process to make actual objects.

Green Through and Through

It goes without saying that biomimicry is a decidedly green endeavor. John Carmody, director of the University of Minnesota's Center for Sustainable Building Research, notes the synchronous relationship between sustainability and biomimicry: "The underlying ideas of sustainability and biomimicry are the same. Nature already knows how to do what we are trying to figure out—that is, how to live sustainably on the planet." The inherent connection between the two is further underscored by Benyus' "canon of nature's laws":

Nature runs on sunlight; Nature uses only the energy it needs; Nature fits form to function; Nature recycles everything; Nature rewards cooperation; Nature banks on diversity; Nature demands local expertise; Nature curbs excesses from within; and Nature taps the power of limits.

Outlined in this manner, nature is indeed a model, measure, and mentor for sustainable design.

Carmody sums up the excitement surrounding biomimicry. "Biomimicry has a psychological resonance," he observes. "It shifts your mindset from an anthropocentric worldview—the view that the world is ours for the taking, that we can solve all problems with technology alone—to a wider view in which we are surrounded by nature's encyclopedic library of solutions on how to survive on the planet." He then adds: "We just need to 'quiet our cleverness' and let the ideas flow in." **AMN**

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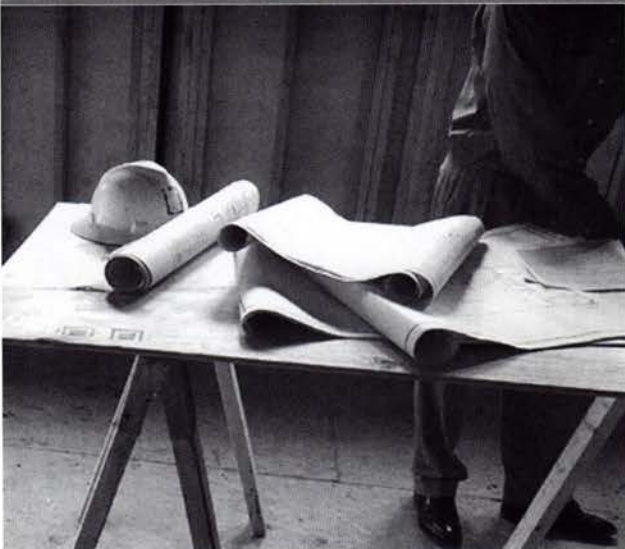
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DIRECTORY OF CONSULTING ENGINEERING FIRMS

With this issue, *Architecture Minnesota* presents the 15th directory of Minnesota firms providing consultative engineering services. Principals of these firms are members of the American Council of Engineering Companies of Minnesota, AIA Minnesota or firms not aligned with either organization.

Engineers provide those critical design skills that enable our entire built environment to be structurally safe, comfortably warm and well lit and environmentally friendly. They also design our highways and bridges, water treatment facilities and power generation plants.

In Minnesota, you will find there is a wealth of engineering talent available for your next project. Study this directory and call either the American Council of Engineering Companies of Minnesota (ACEC) at (952) 593-5533 or the American Institute of Architects Minnesota (AIA Minnesota) at (612) 338-6763 for additional information and assistance.

Legend

PE	Professional Engineer
PG	Professional Geologist
AIA	American Institute of Architects (registered)
AICP	American Institute of Certified Planners
CCM	Certified Construction Manager
CID	Certified Interior Designer
CIH	Certified Industrial Hygienist
ASLA	American Society of Landscape Architects
PLS	Professional Land Surveyor (registered)
RA	Registered Architect
RCDD	Registered Communications Distribution Designer
RLS	Registered Land Surveyor
LS	Land Surveyor (registered)
SE	Structural Engineer (Certified)
LEED AP	Leadership in Energy and Environmental Design Accredited Professional

ALBERTSON ENGINEERING INC.

2198 Goodrich Avenue
St. Paul, MN 55105
Tel: (651) 699-5083
Fax: (651) 699-5084
Email: shane@albertson-engineering.com
www.albertson-engineering.com
Established 1998

Firm Principal

J. Shane Albertson, PE, LEED

Firm Personnel by Discipline

Mechanical Engineers	1
Technical	1
Total in Firm	2

Mechanical consulting engineering for HVAC, plumbing, fire protection, process piping, refrigeration piping, temperature controls, energy management and HVAC system commissioning for commercial, industrial, medical, educational and municipal projects.

Shakopee Public Works, Shakopee, MN; Shakopee Aquatics Center, Shakopee, MN; Enterprise Rent-A-Car Offices, Eagan, MN; St. Cloud State University Public Safety Center and Ramp, St. Cloud, MN; Metro Transit Park and Ride Ramps, Minnetonka and Bloomington, MN; West Oak Condominiums, St. Louis Park, MN

AMERICAN ENGINEERING TESTING, INC.

550 Cleveland Avenue North
St. Paul, MN 55114-1804
Tel: (651) 659-9001
Fax: (651) 659-1379
Email: info@amengtest.com
www.amengtest.com
Established 1971
Other MN Offices: Chanhassen, Crosby, Duluth, International Falls, Mankato, Marshall, Rochester
Other Offices: La Crosse, Wausau and Menomonie, WI; Rapid City, Beresford and Pierre, SD; Fort Meyers and Palatka, FL
Contact: Bob Struve, PE, Dir. of Bus. Dev.

Firm Principals

Terry E. Swor, PG
Richard Stehly, PE
Daniel Larson, PE
Mike Schmidt, PE
Jeff Voyer, PE
Robert Kaiser
Tom Venema, PE

continued next column

Firm Personnel by Discipline

Civil Engineers	55
Structural Engineers	1
Mechanical Engineers	1
Other Engineers	18
Other Professional	14
Technical	148
Administrative	43
Total in Firm	280

AET is a multi-disciplinary forensic, geotechnical, environmental, and materials firm providing engineering, testing, and specialized services: building/structure condition assessments, brownfields, environmental assessments, construction testing, special inspections, geotechnical exploration, and engineering review. New: roofing/waterproofing inspection, piezocene testing, seismic testing, pavement/infrastructure management, source emissions monitoring, wetland services.

Ivy Tower, Minneapolis, MN; The Carlyle High-rise Condominiums, Minneapolis, MN; Integrated Practices Building, Mayo Clinic, Rochester, MN; Minnesota Library Access Center Underground Archive, Minneapolis, MN; St. Mary's Duluth Clinic Expansion, Duluth, MN; The Great Northern Business Center, South St. Paul, MN; General Mills World Headquarters, Golden Valley, MN

ARMSTRONG, TORSETH, SKOLD & RYDEEN, INC.

8501 Golden Valley Road, Suite 300
Minneapolis, MN 55427
Tel: (763) 545-3731
Fax: (763) 525-3289
Email: information@atsr.com
www.atsr.com
Established 1944
Contact: Paul W. Erickson, AIA
(763) 545-3731

Firm Principals

Paul W. Erickson, AIA
Jim T. Lange, PE
Gaylen D. Melby, PE
Terry L. Stofferahn, PE
Bob J. Gunderson, ASLA

Firm Personnel by Discipline

Civil Engineers	1
Mechanical Engineers	4
Electrical Engineers	1
Architects	15
Other Professionals	10
Technical	33
Administrative	11
Total in Firm	75

continued next column

ATS&R is a multi-disciplined architectural/engineering firm providing mechanical and electrical engineering for educational facilities, churches and public buildings. Other services include civil engineering for site design and storm water management as well as technical design for video, voice, data and security systems. Specialized designs for energy conservation measures including passive solar, heat recovery systems, thermal storage (ice), variable air volume, displacement ventilation and energy management systems.

Anoka-Hennepin School District, ventilation upgrade projects using positive displacement induction units; Osseo Area Schools, Osseo Junior High School and North View Junior High School, upgrade pool ventilation systems; Farmington School District, Farmington High School, re-commissioning HVAC systems; North Branch School District, North Branch Primary, commissioning HVAC systems; Prior Lake-Savage Area Schools, facility study; Metro Transit, fire alarm upgrades consisting of a distributed AutoCad-based monitoring at 11 metropolitan locations.

BKBM ENGINEERS, INC.

5930 Brooklyn Boulevard
Minneapolis, MN 55429-2518
Tel: (763) 843-0420
Fax: (763) 843-0421
Email: rlamere@bkbm.com
www.bkbm.com
Established 1967
Contact: Ronald J. LaMere, PE
(763) 843-0438

Firm Principals

Thomas J. Downs, PE
Ronald J. LaMere, PE
Andrew M. Rauch, PE
John B. Thiesse, PE
Thomas J. Cesare, PE

Firm Personnel by Discipline

Civil Engineers	10
Structural Engineers	19
Other Professional	1
Technical	8
Administrative	4
Total in Firm	42

Our nationally-recognized and award-winning firm provides innovative civil, structural and restoration engineering design solutions.

Mill City Museum, Minneapolis, MN; Bet Shalom Synagogue, Minnetonka, MN; Lakeville High School South, Lakeville, MN; Ivy Tower Condominiums, Minneapolis, MN; Landscape Arboretum, Chanhassen, MN; Shakopee High School, Shakopee, MN

BKV GROUP

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Minneapolis, MN 55401
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Fax: (612) 339-6212
Email: ddahlman@bkgvgroup.com
www.bkgvgroup.com
Contact: Dan Dahlman, PE, LEED AP
(612) 339-3752

Firm Principals

J. Owen Boorman, AIA
David Kroos, AIA
Gary Vogel, AIA
Daniel Dahlman, PE, LEED AP
Jeff Piehl, PE
Stephen Hearn, PE

Firm Personnel by Discipline

Structural Engineers	5
Mechanical Engineers	4
Electrical Engineers	5
Architects	39
Other Professional	14
Technical	6
Administration	11
Total in Firm	84

BKV Group offers mechanical, electrical, structural engineering utilizing technology integral with environmental issues to bring clients into a productive and efficient environment they can control and enjoy. With over 25 years of governmental, corporate, academic and mixed-use residential experience, BKV Group has engineered new construction, additions and renovations.

Plymouth Public Safety Building and City Hall, Plymouth, MN; Rondo Community Outreach Library/University Dale Apartments, St. Paul, MN; ATS Headquarters, St. Cloud, MN; Air National Guard Composite Maintenance Complex, Minneapolis, MN; Silver Lake Village Redevelopment, St. Anthony, MN; Mainstreet Bank, Minneapolis, MN

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www.bonestroo.com
Established 1956
Other MN Offices: St. Cloud and Rochester
Other Offices: Milwaukee, WI; Libertyville, IL
Contact: Amy Stresheim, Mktg. Mgr.
(651) 604-4862

Firm Principals

Gunnar F. Unger, Jr., AIA
Bruce P. Paulson, AIA
Mark Forbes, AIA
Richard Fischer, AIA

Firm Personnel by Discipline

Civil Engineers	79
Structural Engineers	3
Electrical Engineers	3
Other Engineers	63
Architects	18
Other Professional	138
Technical	41
Administrative	83
Total in Firm	428

Bonestroo provides architectural, planning and engineering services for the commercial, industrial, and institutional markets. With offices in St. Paul, St. Cloud, and Rochester, our team can provide these services throughout Minnesota. Our services focus on the client's needs and budget by assembling a team that produces the most innovative and cost-effective design solutions.

Albertville City Hall, Albertville, MN; Perpich Center for the Arts, Golden Valley, MN; Chaska Water Treatment Plant, Chaska, MN; Eastman Park Community Building, Willmar, MN; Mitchell Aquatic Center, Mitchell, SD; Willmar Airport Terminal, Willmar, MN

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11001 Hampshire Avenue South
Minneapolis, MN 55438
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www.braunintertec.com
Established 1957
Other Offices: St. Paul, St. Cloud, Lakeville, Rochester, Hibbing and Albertville, MN; Fargo and Bismarck, ND; La Crosse, WI
Contact: Kay Bergstrom (952) 995-2076

continued next column

Firm Principals

George D. Klumpke, PE
Robert J. Janssen, PE
Charles R. Brenner, PE
Jon A. Carlson, PG
Michael M. Heuer, PE
Steven J. Flaten, AIA

Firm Personnel by Discipline

Civil Engineers	96
Environmental, Geological, Soils,	
Hazardous Waste, Engineering Technology	89
Architect	1
Other Professional	201
Administrative	61
Total in Firm	448

Serving as an engineering, consulting and testing firm providing solutions for property development, redevelopment, facilities management and infrastructure-related issues. Provides services during each stage of development from the pre-project geo-technical and environmental evaluations through materials evaluation during construction and property management issues. Provides services nationally and internationally.

Van White Memorial Bridge, Minneapolis, MN; West Side Flats, St. Paul, MN; Central Library, Minneapolis, MN; Department of Human Services, St. Paul, MN; McPhail Center for the Arts, Minneapolis, MN; Ridgeview Medical Center Enclosure Expansion, Waconia; Guthrie Theater Expansion, Minneapolis, MN

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www.cainouse.com
Established 1983
Contact: Jay J. Cain, PE (651) 426-9549

Firm Principals

Jay J. Cain, PE
Wallace M. Ouse, PE
Scott D. Thomas, PE

Firm Personnel by Discipline

Mechanical Engineers	4
Electrical Engineers	2
Technical	4
Administrative	2
Total in Firm	12

Mechanical and electrical engineering for nearly all types of facilities and infrastructure. Common project types include churches, schools, public works, health care, entertainment, retail, and all levels of housing. Technical specialties include interior and exterior lighting, ground source heat pumps and public works specialties.

continued next column

Sholom Home East, St. Paul, MN; City Public Works Facility, Bloomington, MN; New High School, River Falls, WI; St. Anthony Mills Apartments, Minneapolis, MN; Ethan Allen Home Interiors, Woodbury, MN; St. John's Lutheran Church, Lakeville, MN

CLARK ENGINEERING CORP.

621 Lilac Drive North
Minneapolis, MN 55422
Tel: (763) 545-9196
Fax: (763) 541-0056
Email: kmcelmury@clark-eng.com
www.clark-eng.com
Established 1938
Other Offices: Aberdeen and Sioux Falls, SD

Firm Principals

Larry McMurtry, PE
Hadi Sajadi, PE
Cory Casperon, PE
Tim La Bissoniere, PE
Abi Assadi, PE
Don Weigel, PE

Firm Personnel by Discipline

Civil Engineers	10
Structural Engineers	13
Other Professionals	4
Technical	22
Administrative	9
Total in Firm	58

Clark Engineering Corporation provides structural engineering, civil engineering and land surveying services for educational, commercial, industrial, and public sector facilities. Clark specializes in blast resistant structures, overhead material handling systems, and restoration. Clark offers civil engineering and surveying services for site development, wastewater treatment and disposal, and storm water management.

East Lake Community Library Renovation and Expansion, Minneapolis, MN; Belvidere High School, Belvidere, IL; Stinson Building Remodeling and Restoration, Minneapolis, MN; M & I Bank Site Development, Oakdale, MN; North Branch Senior Housing, North Branch, MN; Black Bear Casino, Hotel, and Parking Ramp, Cloquet, MN

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7575 Golden Valley Road, Suite 210
Golden Valley, MN 55427
Tel: (763) 544-8456
Fax: (763) 544-8914
Email: harry@dbm-inc.com
www.dbm-inc.com
Established 1966
Contact: Harry D. Menk, PE
(763) 544-8456 Ext. 16

Firm Principals

Gene Bolgrean, PE
Harry D. Menk, PE

Firm Personnel by Discipline

Structural Engineers	4
Technical	2
Administrative	1
Total in Firm	7

Provides structural engineering services on commercial/retail, office/warehouse, academic, industrial, governmental, medical/health, housing, religious, parking and specialty structures. With expertise in steel, concrete, masonry and wood, DBM has engineered new construction, additions and renovations on over 5,000 projects in 23 states.

Faribault Public Works Facility, Faribault, MN; ReMax/Results Office Building, Plymouth, MN; Riverside Golf Clubhouse, Bozeman, MT; Zumbro Valley Office and Treatment Campus, Rochester, MN; Waconia Fire Station, Waconia, MN; St. Therese Senior Housing, Brooklyn Park, MN

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700 Rosedale Towers
Roseville, MN 55113
Tel: (651) 604-3200
Fax: (651) 639-9618
Email: info@dcedesign.com
www.datacoreeng.com
Established 1991

Firm Principals

James W. Giefer, PE
D. Lane Hersey, PE

Firm Personnel by Discipline

Electrical Engineers	3
Technical	9
Total in Firm	12

Data Core is a technology consulting firm. We provide technology planning and design services to architects and engineers for the integration of computer, audio/visual, telephone and other communication and security camera systems for both new construction and renovation projects. Data Core also provides technology support services.

Allan Hancock College, New Library Lobby Revisions, Santa Maria, CA; University of Minnesota Duluth Labovitz School of Business and Economics, Duluth, MN; U.S. Army Reserve Training Centers and Maintenance Facilities, Nationwide; Network and Internet Support, Cretin Derham Hall, St. Paul, MN; Prior Lake High School, Prior Lake, MN; Technology Design, Douglas County Metro Center, Superior, WI

DLR GROUP

9521 West 78th Street
Minneapolis, MN 55344
Tel: (952) 941-8950
Fax: (952) 941-7965
Email: mjohnson@dlrgroup.com
www.dlrgroup.com
Established 1966
Other Offices: Phoenix, AZ; Seattle, WA; Kansas City, KS; Omaha, NE; Orlando, FL; Philadelphia, PA; Chicago, IL; Honolulu, HI; Portland, OR; Colorado Springs, CO; Des Moines, IA
Contact: Don Horkey, PE (952) 941-8950

Firm Principals

Griff Davenport, AIA
Matt Johnson, AIA, LEED AP
Troy Miller, AIA
Jon Crump, AIA, LEED AP
Don Horkey, PE, LEED AP
Kelly Artz, PE, LEED AP

Firm Personnel by Discipline

Civil Engineers	12
Structural Engineers	22
Mechanical Engineers	34
Electrical Engineers	32
Architects	125
Other Professional	39
Technical	125
Administrative	130
Total in Firm	519

As a national, full-service architecture, engineering, planning and interior design firm, DLR Group's engineering services—mechanical, electrical, structural, civil, commissioning and technology/communications—are integrated into each project team. DLR Group engineers are client-focused and support the overall design goals by addressing sustainability, cost-effectiveness, indoor air quality, end-user needs, life-cycle costs, and long-term maintenance.

Century College Library and Science Center, White Bear Lake, MN; Farmington High School, Farmington, MN; Scott County Jail and Law Enforcement Center, Shakopee, MN; Prior Lake School District Commissioning, Prior Lake, MN; Richfield School District Mechanical and Electrical upgrades, Richfield, MN; Moundsview Public Schools Mechanical and Electrical Upgrades, Moundsview, MN

DOLEJS ASSOCIATES INC.

1624 North Riverfront Drive
Mankato, MN 56001
Tel: (952) 435-6790
Fax: (507) 388-9225
Email: mdolejs@dolejsinc.com
Established 1977

Firm Principals

Joseph Dolejs, PE
Christopher J. Dolejs, PE
Michael Dolejs, PE

Firm Personnel by Discipline

Mechanical Engineers	3
Electrical Engineer	1
Technical	10
Administrative	2
Total in Firm	15

Dolejs Associates provides mechanical and electrical design services for the building industry. Building types include educational, recreational, churches, engineered housing, hotels, restaurants and public works. An experienced and stable staff provides expertise in HVAC, plumbing, fire protection, temperature control, lighting, power, communication and life safety systems.

Hosanna! Lutheran Church, Lakeville, MN; Public Works Facility, Faribault, MN; Howard Lake High School, Howard Lake, MN; St. Augusta Fire Hall, St. Augusta, MN; Willowbrook Cooperative Housing, Mankato, MN; Southeast Technical College Addition and Remodel, Winona, MN; Heraeus Company Corporate Office Building, White Bear Lake, MN

DUNHAM ASSOCIATES, INC.

50 South Sixth Street, Suite 1100
Minneapolis, MN 55402-1540
Tel: (612) 465-7550
Fax: (612) 465-7551
Email: info@dunhameng.com
www.dunhameng.com
Established 1960

Firm Principals

Kathleen Kolbeck, PE, LEED AP
Dale Holland, PE, LEED AP
Jay Rohkohl, PE, LEED AP
Steve Gentilini, PE, LEED AP
Ron Feldhaus, PE, LEED AP

Firm Personnel by Discipline

Mechanical Engineers	36
Electrical Engineers	26
Registered Communications Distribution Designer (RCDD)	2
Administrative	12
Total in Firm	76

Dunham is committed to delivering the best mechanical and electrical engineering service for each of our clients. We serve clients in the aviation, commercial, education, healthcare, hospitality and retail industries. Dunham also offers specialized expertise in commissioning, telecommunications and CFD modeling for HVAC analysis. Demonstrating our commitment to sustainable engineering design, over half of our technical staff is LEED accredited.

Great River Energy Headquarters, Maple Grove, MN; Oceanaire Seafood Room, Multiple Locations; Fairview Ridges Hospital Millennium Phase II, Burnsville, MN; Hinckley Hotel and Casino, Hinckley, MN; University Center Rochester Health Sciences Renovation, Rochester, MN; Warren E. Burger Federal Building and Courthouse Commissioning, St. Paul, MN

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 www.ellerbebecket.com
 Established 1909
 Other Offices: Dallas, TX; Kansas City, MO;
 San Francisco, CA; Washington, D.C.;
 Dubai, United Arab Emirates; Doha, Qatar
 Contact: Steve Wernersbach, PE
 (612) 376-2271

Firm Principals

Jon Buggy, AIA
 Steve Wernersbach, PE
 David Landsverk, PE
 Greg Cardinal, PE
 Dan Dickenson, PE, LEED AP
 Jon Iverson, PE

Firm Personnel by Discipline

Structural Engineers	11
Mechanical Engineers	45
Electrical Engineers	24
Architects	145
Other Professional	55
Technical	28
Administrative	70
Total in Firm	378

Ellerbe Becket's engineering team has a proven history of success in the execution of technically complex projects, including new construction, renovation and building systems retrofits. The team offers experience in a wide range of facility types, including hospitals and clinics, mission critical facilities, laboratories, corporate workplace, learning environments and heating/cooling plants.

Department of Veterans Affairs Orlando, New Bed Tower, Orlando, FL; NRG Energy Inc., Multiple Projects, Minneapolis, MN; Regions Hospital Expansion 2009, St. Paul, MN; Dow Chemical Company, Building 1790 Renovation, Midland, MI; Immanuel St. Joseph Hospital, Multiple Projects, Mankato, MN; Sioux Valley Hospital, Central Plant Expansion, Sioux Falls, SD

ENGINEERING DESIGN INITIATIVE

420 North 5th Street, Suite 565
 Minneapolis, MN 55401
 Tel: (612) 343-5965
 Fax: (612) 343-5982
 Email: jhruby@edilimited.com
 www.edilimited.com
 Established 2002
 Contact: Jay Hruby, PE (612) 343-5965

Firm Principals

Jay Hruby, PE
 Larry Svitak, PE

Firm Personnel by Discipline

Mechanical Engineers	4
Electrical Engineers	3
Technical	6
Administrative	1
Total in Firm	14

EDI provides innovative M/E engineering solutions for a variety of building types. Our services include M/E engineering, building commissioning, energy modeling and daylight modeling services. EDI is committed to delivering designs that are energy efficient, maintainable and sustainable. We are passionate in our creative design, attention to detail and commitment to teamwork—from defining initial performance goals through validation by commissioning.

St. John's Abbey Guesthouse and Chapter House, Collegeville, MN; Roberts County Corrections/Facility, MN; St. Cloud Public Library, St. Cloud, MN; SPPS Central High School Technology Upgrade, St. Paul, MN; City of Minneapolis Water Works Maintenance Facility, Fridley, MN; Blue Earth County Law Enforcement Center, Mankato, MN

ERICKSEN ELLISON AND ASSOCIATES

2635 University Avenue West, Suite 200
 St. Paul, MN 55114
 Tel: (651) 632-2300
 Fax: (651) 632-2397
 Email: jart@eeaengineers.com
 www.eeaengineers.com
 Established 1954

Firm Principals

William Thiesse, PE
 Jim Art, PE
 Todd Peterson, PE
 Dave Losier, PE

Firm Personnel by Discipline

Mechanical Engineers	
Electrical Engineers	
Fire Protection	

continued next column

A mechanical/electrical engineering firm designing building systems for higher education, K-12, libraries, churches, judicial/corrections, municipal, recreational, residential, retail, medical, corporate and industrial clients. Systems include: HVAC, plumbing, ground source heat pumps, fire protection, specialty lighting, critical power, voice/data communications, sound reinforcement, security/surveillance, and facility infrastructure planning.

Minneapolis Central Library, Minneapolis, MN; Macalester College Athletic and Recreation Facility, St. Paul, MN; Grinnell College Campus Center, Grinnell, IA; MCF Faribault M & E Infrastructure Renovation, Faribault, MN; Ramsey County Correctional Facility Renovation and Expansion, Maplewood, MN; Eli Lilly Corporate Data Center, Indianapolis, IN

ERICKSEN ROED & ASSOCIATES, INC.

2550 University Avenue West, Suite 201-S
 St. Paul, MN 55114
 Tel: (651) 251-7570
 Fax: (651) 251-7578
 Email: info@ericksenroed.com
 www.ericksenroed.com
 Established February, 1985
 Other Office: Eau Claire, WI

Firm Principals

Alfred "Bud" Ericksen, PE
 James D. Roed, PE
 William T. Buller, PE, SE
 Michael A. DeSutter, PE
 Robert A. Curtis, PE
 Robert J. Quinn, PE

Firm Personnel by Discipline

Structural Engineers	32
Technical	25
Administrative	3
Total in Firm	60

Full service structural engineering for retail, medical, commercial, educational, computer centers, high-rise offices, housing, parking facilities, sports and recreational facilities, as well as conduct investigations of existing structures for remodeling and renovation. We are registered as Professional Engineers in Minnesota and throughout the United States as well as the owner of the ER-POST—Precast Building (ER Patented) System.

Department of Human Services Building and Parking Ramp, St. Paul, MN; Guthrie Theater and Parking Ramp, Minneapolis, MN; Cobalt Residential Towers, Lund's Foods and Retail, Minneapolis, MN; University of Minnesota Molecular Cellular Biology, Minneapolis, MN; Target North Campus, Brooklyn Park, MN and Target Stores, Nationwide

FOSTER, JACOBS & JOHNSON, INC.

345 Canal Park Drive, Ste. 200
 Duluth, MN 55802
 Tel: (218)722-3060
 Fax: (218) 722-1931
 Email: mail@fjj.com
 Established 1922

Firm Principals

James R. Johnson, PE
 Charles F. Jacobs, PE

Firm Personnel by Discipline

Mechanical Engineers	4
Electrical Engineers	2
Technical	7
Administrative	2
Total in Firm	15

Full Service Mechanical and Electrical consulting services, including design and preparation of contract documents for fire protection, plumbing, HVAC, controls, lighting, power distribution, communications and life-safety systems and construction administration. We offer computer-aided selection of M/E equipment and generate drawings using Auto Cad with "soft desk" building services.

Cirrus Design Expansion, Duluth, MN; Fortune Bay Resort and Casino Renovation, Tower, MN; Grand Rapids Middle School, Grand Rapids, MN; Minnesota Air National Guard Composite Aircraft Maintenance Complex, Duluth, MN; University of Minnesota, Duluth Sports and Health Center, Duluth, MN; Virginia Regional Medical Center/SMDC Medical Office Building, Virginia, MN

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Email: scottf@ffcdi.com
www.ffcdi.com
Established 1989

Firm Principals

Scott A. Futrell, PE (WI)
Rich Pehrson, PhD, PE (MN, SD, AR, OK)

Firm Personnel by Discipline

Professional Engineers	2
Technical	3
Administrative	2
Total in Firm	7

Fire Protection Engineering, fire alarm and suppression system design, risk analysis, plan and engineering report reviews, special instructions, commissioning, expert witness, third-party review and project management.

3M, Nationwide; SPHA, Various Projects.
St. Paul, MN: University of Minnesota,
Various Projects, Minneapolis Campus, MN;
MnANG (Minnesota Air National Guard),
Duluth, MN; MnSCU Trafton Science Center,
Mankato, MN; Blue Earth County Jail,
Mankato, MN

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Roseville, MN 55113
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Email: gmmail@gausman.com
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Established 1935
Other Offices: Duluth, MN; Portland, OR;
Los Angeles, CA

Firm Principals

James W. Giefer, PE
James A. Keller, PE, LEED AP
D. Lane Hersey, PE
Robert B. Full, PE
James D. Manning, PE
Edward L. Studniski, PE
Dave T. Blume, PE

Firm Personnel by Discipline

Mechanical Engineers	11
Electrical Engineers	10
Fire Protection Engineer	1
Other Professional	1
Technical	41
Administrative	12
Total in Firm	76

Gausman & Moore provides mechanical, electrical, fire protection, and technology support services. Areas of special expertise include sustainable design (LEED® AP), mission critical power systems, forensic investigations, lighting design, and health care.

University of Minnesota Duluth Labovitz
School of Business and Economics, Duluth,
MN; El Capitan Theatre, Hollywood, CA;
Business Center, Santa Barbara College,
Santa Barbara, CA; Cloquet Community
Memorial Hospital Remodeling and
Addition, Cloquet, MN; U.S. Army Reserve
Training Centers and Maintenance Facilities,
Nationwide; Retail, Nationwide

HALLBERG ENGINEERING, INC.

1750 Commerce Court
White Bear Lake, MN 55110
Tel: (651) 748-1100
Fax: (651) 748-9370
Email: hei@hallbergengineering.com
www.hallbergengineering.com
Established 1984
Contact: Tania Gorka (651) 748-4367

Firm Principals

Joseph W. Hallberg, PE
James R. Penkivech, PE

Firm Personnel by Discipline

Mechanical Engineers	9
Electrical Engineers	5
Other Professional	4
Technical	19
Administrative	6
Total in Firm	43

A mechanical and electrical consulting engineering firm, we specialize in mechanical, electrical, and technology systems design, along with building analysis and commissioning. Our Commissioning services ensure that building systems work as and provide for reduced operation and maintenance costs, energy savings, and improved indoor air quality. Our Schools for Energy Efficiency, or SEE program was created in response to our school district needs. We provide schools with the tools they need to save energy and money through promoting, communicating, and executing low and no cost energy-efficient strategies.

In MN: Andover YMCA; Chaska New High School; Moose Lake Correctional Facility; Rainforest Cafes; University of Minnesota Duluth School LEED Commissioning, St. Paul Schools SEE Program

HAMMEL, GREEN AND ABRAHAMSON, INC.

701 Washington Avenue North
Minneapolis, MN 55401
Tel: (612) 758-4000
Fax: (612) 758-4199
Email: info@hga.com
www.hga.com
Established 1953
Other Offices: Rochester, MN;
Milwaukee, WI; Sacramento,
Los Angeles and San Francisco, CA
Contact: Julie Luers, Dir. of Mktg.
(612) 758-4613

Firm Principals

Chuck Cappellin, PE, LEED AP
Jeff Harris, PE, LEED AP
Leigh Harrison, PE, LEED AP
Kenny Horns, PE, LEED AP
Doug Maust, PE, LEED AP
Yan Shagalov, PE

Firm Personnel by Discipline

Civil Engineering	5
Structural Engineering	33
Mechanical Engineering	46
Electrical Engineering	22
Other Licensed Engineers	8
Architects	214
Other Professional	31
Technical	41
Administrative	87
Total in Firm	487

HGA has engineering expertise in the design of a broad range of facility types. In addition to traditional HVAC, structural and electrical systems, HGA has specialists in clean environments, industrial processes, central plants, utility infrastructure, existing condition surveys, facility assessments, telecommunications systems design, healthcare technology applications design, structural special inspections, and specialty lighting. HGA engineers serve both prime consultants and sub-consultants.

Fairview Health System, Maple Grove, MN;
General Mills, Golden Valley, MN; Honeywell,
Minneapolis, MN; Motorola, Schaumburg,
IL; 3M, St. Paul, MN; University of
Minnesota, Minneapolis/St. Paul, MN

INSPC, INC.

5801 Duluth Street
Minneapolis, MN 55422
Tel: (763) 546-3434
Fax: (763) 546-8669
E-mail: fking@inspec.com
www.inspec.com
Established 1973
Other Offices: Milwaukee, WI; Chicago, IL
Contact: Fred King (763) 546-3434

Firm Principals

Dwight Benoy, PE
Gary Patrick, AIA
Mike Remington, PE
David W. Campbell, AIA

Firm Personnel by Discipline

Civil Engineers	7
Structural Engineers	2
Architects	3
Technical	48
Administrative	23
Total in Firm	83

Inspec offers our clients smart engineering for roofs, walls, pavements and waterproofing. Our services include survey and evaluation, failure investigation, design and consultation, expert witness testimony, construction administration and observation, on-site and lab testing, and customized facility management programs. We also specialize in historic building renovation and outdoor athletic facilities.

Glensheen, Duluth, MN; Minnesota State Capitol, St. Paul, MN; American Swedish Institute, Minneapolis, MN; Minnesota State Colleges and Universities (54 campuses), Statewide; Anoka County, MN; University of Chicago, Chicago, IL

KARGES-FAULCONBRIDGE, INC.

670 West County Road B
St. Paul, MN 55113
Tel: (651) 771-0880
Fax: (651) 771-0878
Email: kfi@kfiengineers.com
Established 1996

Firm Principals

William J. Karges, Jr., PE
James A. Faulconbridge, PE

Firm Personnel by Discipline

Mechanical Engineers	24
Electrical Engineers	6
Chemical Engineers	2
Commissioning	10
Administrative	12
Designers	50
Total in Firm	104

Karges-Faulconbridge, Inc. (KFI) is a unique engineering firm of engineers, designers, professional estimators, and commissioning specialists registered in 50 states, the District of Columbia and Puerto Rico. Located in St. Paul, KFI's office building was the first building in Minnesota to obtain the LEED-EB Gold certification. KFI provides engineering and construction management services for industrial, institutional, healthcare, and commercial organizations.

50 million gallon per year - Greenfield Ethanol Plant, Heartland Corn Products, Winthrop, MN; Forest Elementary, Robbinsdale Schools, Robbinsdale, MN; Best Buy Stores, Nationwide; Nasseff Specialty Clinic, United Hospital, St. Paul, MN; Commissioning 29 Buildings, Osseo Schools, Osseo, MN

KRECH, O'BRIEN, MUELLER & ASSOCIATES, INC.

6115 Cahill Avenue
Inver Grove Heights, MN 55076
Tel: (651) 451-4605
Fax: (651) 451-0917
Email: jkrech@komainc.com
www.komainc.com
Established 1987

Firm Principals

James H. Krech, PE
Michael J. Lisowski, PE
Daniel J. O'Brien, AIA
Brady R. Mueller, AIA
Cindy Douthett Nagel, CID

continued next column

Firm Personnel by Discipline

Structural Engineers	3
Architects	4
Architectural Interns	4
Other Professional	2
Technical	1
Administrative	2
Total in Firm	16

KOMA offers structural engineering, architecture, interior design and construction management services. Registered structurally in 24 states, typical structural projects include industrial, commercial, institutional, ecclesiastical, forensic, agricultural, blast resistance, and hazardous waste containment. Specialties include granular material storage, hazardous liquid containment, corrosive environments, blast resistance, and aluminum greenhouse design.

International Union of Operating Engineers Local 49, Training Facility, Pine City, MN; Woodbury High School, HVAC Upgrade, Woodbury, MN; Allina Clinic, St. Michael, MN; Citizens State Bank, Hudson, WI; Chain of Lakes YMCA, Lino Lakes, MN; The Gateway Mixed-use Development, Edina, MN

KRECH OJARD & ASSOCIATES, P.A.

227 West First Street, Suite 200
Duluth, MN 55802
Tel: (218) 727-3282
Fax: (218) 727-1216
Email: mail@krechojard.com
www.krechojard.com
Other Offices: Eau Claire, WI; Bellingham, WA
Contact: David Krech, PE (218) 727-3282

Firm Principals

David Krech, PE
Rich Ojard, PE
Marvin Anderson, PE
Jeff Heller, PE
Russell Betts, AIA

Firm Personnel by Discipline

Civil Engineers	4
Structural Engineers	15
Mechanical Engineers	4
Registered Land Surveyors	2
Architects	4
Technical	32
Administrative	9
Total in Firm	70

The firm provides civil, structural and industrial mechanical engineering services, as well as surveying. Specialty areas include bulk material handling, railway and marine design as well as general consulting services for commercial and industrial facilities.

continued next column

Consumers Energy Coal Handling Facility, Holland, MI; Midwest Energy Resources Corporation Expansion, Superior, WI; Charter Films Manufacturing Facility, Superior, WI; CLM Lime Plant Expansion, Superior, WI; Kirby Plaza Expansion, University of Minnesota, Duluth, Staples Distribution Center, Beloit, WI

LANDFORM ENGINEERING COMPANY

800C Butler Square
100 North Sixth Street
Minneapolis, MN 55403
Tel: (612) 252-9070
Fax: (612) 252-9077
Email: info@landform.net
www.landform.net
Established 1994
Other Office: Phoenix, AZ
Contact: Darren B. Lazan, RLA
(612) 252-9070

Firm Principals

Darren B. Lazan, RLA
Stephen M. Johnsten, PE
Carolyn Krall, AIA
Kendra Lindahl, AICP

Firm Personnel by Discipline

Civil Engineers	22
Architects	2
Other Professional	21
Technical	6
Administrative	11
Total in Firm	62

Landform provides civil engineering, planning and urban design, landscape architecture and land surveying services. Our broad range of local and national clients includes developers, architects, corporate/commercial groups, builders, cities, and other governmental entities. Specialties include mixed-use, retail, office, hospitality, residential, medical campuses and public/institutional.

Mound Harbor Renaissance, Mound, MN; Methodist Hospital Heart and Vascular Center, St. Louis Park, MN; ADC World Headquarters, Eden Prairie, MN; Heritage Square at Legacy Village, Maplewood, MN; Providence, Empire Township, MN; Hardwood Creek, Lino Lakes, MN

LARSON ENGINEERING, INC.

3524 Labore Road
White Bear Lake, MN 55110
Tel: (651) 481-9120
Fax: (651) 481-9201
Email: info@larsonengr.com
www.larsonengr.com
Established 1979
Other Offices: Chicago and Naperville, IL; Appleton and Milwaukee, WI; St. Louis, MO; Scottsdale, AZ; Norcross, GA
Contact: Kesh Ramdular, PE (651) 481-9120

Firm Principals

Lee Granquist, PE
Jack Pastore, SE, AZA
Kesh Ramdular, PE

Firm Personnel by Discipline

Civil Engineers	14
Structural Engineers	87
Mechanical Engineers	8
Electrical Engineers	5
Other Professional	11
Technical	32
Administrative	15
Total in Firm	172

Headquartered in White Bear Lake, Minnesota, our multi-disciplinary firm specializes in structural, civil, mechanical and industrial engineering. We are registered structurally in all 50 states, five Canadian provinces and Puerto Rico. Whether your project is big or small, our engineers will design and develop options that ensure success.

Guthrie Theater, Minneapolis, MN; Minneapolis Central Library, Minneapolis, MN; Sauk Rapids Fire Station, Sauk Rapids, MN; Central Minnesota Federal Credit Union, Melrose, MN; 2006 Athletic Facilities Construction, Lakeview K-12 School, Cottonwood, MN; Howard Lake-Waverly-Winsted New High School, Howard Lake, MN

LHB, INC.

21 West Superior Street, Ste. 500
Duluth, MN 55802
Tel: (218) 727-8446
Fax: (218) 727-8456
Email: info@lhbcorp.com
www.lhbcorp.com
Established 1966
Other Office: Minneapolis, MN
Contact: Richard A. Carter, AIA
(612) 338-2029

Firm Principals

William Bennett, PE
David Sheedy, PE
Richard Carter, AIA
Michael Fischer, AIA
Steven McNeill, AIA
Joseph Litman, PE

Firm Personnel by Discipline

Civil Engineers	13
Structural Engineers	14
Mechanical Engineers	8
Electrical Engineers	8
Professional Land Surveyors	3
Architects	35
Other Professional	13
Technical	38
Administrative	28
Total in Firm	160

LHB provides survey, civil, electrical, mechanical, and structural engineering for buildings, sites and infrastructure. We serve government, public works, pipeline, industrial, education, healthcare, commercial, and housing. Specialties include roads, structures, water/sewer/waste water systems, and building performance which helps manage ownership costs. LHB values sustainability, design excellence and quality documents.

Superior Rooftop Rain Garden, Superior, WI; Lake Superior College (LSC) Academic Student Services Addition, Duluth, MN; St. Louis County Joint Sheriff's and 911 Facility, Duluth, MN; Wells Fargo Hennepin Business Center, Minneapolis, MN; Ripley Gardens Mixed-use Housing Development, Minneapolis, MN; St. Paul Port Authority Jackson, Arlington and Westminster Business Park Site Design, St. Paul, MN

LKPB ENGINEERS, INC.

1935 West County Road B2, Suite 300
St. Paul, MN 55113
Tel: (651) 633-1223
Fax: (651) 633-1355
Email: karla.sampson@lkpb.com
www.lkpb.com
Established 1969
Contact: Karla Sampson (651) 633-1223

Firm Principals

Peter A. Potvin, PE
Leonard A. Lundquist, PE
Gayland Bender, PE
John M. Killeen, PE
Jon D. Haack, PE

Firm Personnel by Discipline

Mechanical Engineers	16
Electrical Engineers	3
Technical	23
Administrative	7
Total in Firm	49

LKPB Engineers, Inc. (LKPB) is a mechanical and electrical consulting engineering firm that was founded in 1969. The firm provides services to clients in settings such as education, health care, corporate, commercial, historical, recreational and government environments. Services include master planning, design phases, construction documentation, construction administration and commissioning.

University of Minnesota TCF Bank Stadium, Minneapolis, MN; Shubert Theatre Renovation, Minneapolis, MN; Fairview Southdale Peri-natal, Children and Family Services Remodel, Minneapolis, MN; Middlebury College Starr Axinn Center, Middlebury, VT; Federal Reserve Cleveland Commissioning, Cleveland, OH; Inver Hills Community College, Fine Arts Addition, St. Paul, MN

LOUCKS ASSOCIATES

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Minneapolis, MN 55369
Tel: (763) 424-5505
Fax: (763) 424-5822
E-mail: home@loucksassociates.com
www.loucksassociates.com
Established 1976

Firm Principals

Thomas G. Loucks
Jeffrey A. Shopek, PE
Paul J. McGinley, PLS
Michael J. St. Martin, PE
Paul A. Kangas, ASLA

Firm Personnel by Discipline

Civil Engineers	9
Other Professionals	8
Technical	35
Administrative	4
Total in Firm	56

Services include site layout, grading, storm water conveyance systems, water quality retention ponds, wetland mitigation, EAW/EIS documents, Phase I and II ESAs, groundwater contamination, ALTA title surveys, site feasibility studies, comprehensive plan amendments, rezoning, permitting and approvals for industrial, commercial, retail, corporate campus, assisted living community, senior co-op, townhome and education facilities.

Highland Catholic Church, St. Paul, MN; Allianz Corp. Facility, Golden Valley, MN; Protein Design Lab (PDL), Brooklyn Park, MN; Boston Scientific, Maple Grove, MN; CVS Pharmacy, North Quadrant/Sibley Mixed Use, St. Paul, MN; Minnesota State Fair, St. Paul, MN; Staples Hospital, Staples, MN; Maple Grove Hospital, Maple Grove, MN

MATTSON MACDONALD YOUNG, INC.

901 North 3rd Street, Suite 100
Minneapolis, MN 55401
Tel: (612) 827-7825
Fax: (612) 827-0805
Email: davem@mattsonmacdonald.com
www.mattsonmacdonald.com
Established 1983

Firm Principals

David H. Macdonald, PE
Stephanie J. Young, PE

Firm Personnel by Discipline

Structural Engineers	8
Technical	3
Administrative	2
Total in Firm	13

continued next column

Structural engineering services for commercial, educational, industrial, institutional and residential buildings. Design of new buildings, renovation and restoration of existing buildings. Experienced in the restoration and adaptive re-use of historic buildings.

Chambers Hotel, Minneapolis, MN; Stone Arch Lofts, Minneapolis, MN; Milwaukee Road Depot Restoration, Minneapolis, MN; Central Baptist Church, Sioux Falls, SD; Ritz Theatre Restoration, Minneapolis, MN; James J. Hill House Restoration, St. Paul, MN

MBJ, INC.

12 South Sixth Street, Suite 810
Minneapolis, MN 55402
Tel: (612) 338-0713
Fax: (612) 337-5325
Email: info@mbjeng.com
www.mbjeng.com
Established 1955
Other Offices: Duluth, MN; Phoenix, AZ
Contact: Joan Gasper (612) 604-3603

Firm Principals

Daniel E. Murphy, PE
Michael J. Ramerth, PE
Jerod Hoffman, PE
Anthony J. Polusny, PE

Firm Personnel by Discipline

Structural Engineers	37
Technical	12
Administrative	5
Total in Firm	54

50 years of thorough, responsive, and creative structural design for all building types. Committed to provide design solutions that fulfill the architectural vision while maintaining constructability and value to the owner. Services include design, analysis, feasibility studies, construction documents, field observation, special inspections, forensics, and ramp condition surveys.

McNamara Alumni Center, University of Minnesota, Minneapolis, MN; Abbott Northwestern Heart Hospital, Minneapolis, MN; Minneapolis Institute of Arts West Gallery Addition, Minneapolis, MN; Children's Theater Addition, Minneapolis, MN; Reflections Condominium Towers at Bloomington Central Station, Bloomington, MN; Grand Lodge Hotel/Water Park of America, Bloomington, MN

**MCCONKEY JOHNSON
SOLTERMANN, INC.**

241 Cleveland Avenue South, Suite B2
St. Paul, MN 55105
Tel: (651) 698-5626
Fax: (651) 698-5628
Email: mjseng@qwest.net
www.mconkeyjohnsonsoltermann.com
Established 1978
Contact: Richard W. Johnson, PE
(651) 698-5626

Firm Principals

Richard W. Johnson, PE
Christian Soltermann, PE

Firm Personnel by Discipline

Structural Engineers	3
Technical	2
Administrative	1
Total in Firm	6

Structural engineering consulting services for commercial, industrial, institutional and residential projects. Structural assessments of existing structures. Design office that stresses cooperation, communication and a knowledgeable exchange of ideas. Licensed in 14 states.

Beltrami County Government Center and Judicial Court, Bemidji, MN; Lone Oak Center, Eden Prairie, MN; Triple Play Sports Complex, Prior Lake, MN; Choice Financial Group, Fargo, ND; Eden Prairie Fire Station No. 4, Eden Prairie, MN; Carlson Real Estate, Plymouth, MN

MICHAUD COOLEY ERICKSON

333 South Seventh Street, Suite 1200
Minneapolis, MN 55402
Tel: (612) 339-4941
Fax: (612) 339-8354
Email: wdollahan@michaudcooley.com
www.michaudcooley.com
Established 1946
Contact: Wanda Dortinger-Dollahan
(612) 673-6964

Firm Principals

Dean A. Rafferty, PE
Douglas C. Cooley, PE
Monty L. Talber, Jr.
Joseph A. Tennyson

Firm Personnel by Discipline

Mechanical Engineers	57
Electrical Engineers	45
Fire Protection Engineer	1
Administrative	12
Total in Firm	115

MCE designs HVAC, plumbing, fire protection, electrical, illumination, security, life safety, audio visual, building automation, voice data and other special systems. Feasibility and deficiency studies, reports and master planning. Tenant representation and fit-up services, commissioning, facilities management and IAQ analysis.

The New Guthrie Theater, Minneapolis, MN; Allianz Life II, Golden Valley, MN; Boston Scientific, Maple Grove, MN; Target, Locations Nationwide; Wells Fargo SOC, Shoreview, MN; W.E. Burger Federal Building, St. Paul, MN

MJP ASSOCIATES, LTD.

4362 Oakmede Lane
White Bear Lake, MN 55110
Tel: (651) 426-7037
Fax: (651) 426-6643
Email: mike@mjp-associates.com
www.mjp-associates.com
Established 1993

Firm Principal

Michael J. Preston, PE

Firm Personnel by Discipline

Structural Engineers	1
Administrative	5
Total in Firm	1.5

Specialized structural engineering services tailored to high-end residential projects, specialized component evaluation, and miscellaneous structures including investigative studies, feasibility studies, structural analysis and design, preparation of contract documents, and construction observation.

continued next column

Historic Building Renovation, St. Paul, MN; Exterior Metal Studs, Various Locations; Crutchfield Residence (proposed construction 2007), Mendota Heights, MN; Major Private Residence (proposed construction Spring 2007), Lake Calhoun, MN; Field Stone Retaining Walls, Various Locations

OLSSON ASSOCIATES

6600 France Avenue South, Ste. 230
Edina, MN 55435
Tel: (952) 941-0477
Fax: (952) 941-0644
Email: communications@oaconsulting.com
www.oaconsulting.com
Established 1956
Other Offices: Lincoln, Omaha, Grand Island, South Sioux City, Holdrege, Hastings and Scottsbluff, NE; Phoenix and Tucson, AZ; Denver, CO; Kansas City and Springfield, MO; Overland Park, KS; Sioux City, IA
Contact: Brandon Anderson, PE
(952) 927-3805

Firm Principals

Roger Severin, PE
Patty McManus, MS
Jack Lynch, RLA
Brandon Anderson, PE
Tim Gross, PE
James G. Sokolowski, PE

Firm Personnel by Discipline

Civil Engineers	137
Structural Engineers	6
Mechanical Engineers	10
Electrical Engineers	13
Other Engineers	8
Landscape Architects	9
Other Professional	45
Technical	168
Administrative	45
Total in Firm	608

Since 1956, Olsson Associates has been providing our clients with complete and comprehensive design and consulting engineering services. With expertise in such disciplines as transportation, structural, water/wastewater, land development, landscape architecture, mechanical/electrical, power electrical, surveying, environmental sciences, and water resources, Olsson offers clients a full complement of technical resources.

Lee's Summit West High School, Lee's Summit, MO; Mystic Meadows, Farmington, MN; Antelope Valley, Lincoln, NE; Tempe Sports Complex, Tempe, AZ; Wal-Mart Super Centers, Various Locations throughout MN, NE, CO and ND; El Paso County GIS Stormwater Master Plan, El Paso County, CO

REIGSTAD & ASSOCIATES, INC.

192 West 9th Street, Suite 200
St. Paul, MN 55102
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Fax: (651) 292-8015
Email: greigstad@reigstad.com
www.reigstad.com
Established 1979
Other Office: Gulfport, MS

Firm Principals

Gordon H. Reigstad, PhD, PE SE
Charles R. Ashton, PE
David A. Senter, PE (CA, CO, ND, SD, WI)

Firm Personnel by Discipline

Structural Engineers	12
Technical	18
Administrative	3
Total in Firm	33

Provides structural design for all types of projects utilizing steel, concrete, masonry, and timber systems, along with pre-cast and post-tensioned concrete and space frame systems. Specialty structural designs include multi-story floating buildings, along with marine design, barge modifications, and mooring dolphins and, since 2001, providing anti-terrorist designed structures for military.

Hoigaards, St. Louis Park, MN; Mankato Skyway, Mankato, MN; Grammercy Club of Edina, Edina, MN; Holy Cross Village, South Bend, IN; Grand Biloxi Casino Hotel and Spa, Biloxi, MS; Island View Casino Resort, Gulfport, MS

RLK INCORPORATED

6110 Blue Circle Drive, Suite 100
 Minnetonka, MN 55343
 Tel: (952) 933-0972
 Fax: (952) 933-1153
 Email: jdietrich@rlkinc.com
 www.rlkinc.com
 Established 1959
 Other MN Offices: Ham Lake, Duluth,
 Hibbing, Oakdale
 Contact: John Dietrich (952) 933-0972

Firm Principals

Vern Swing, PE
 Joseph Samuel, PE
 Mark Scholle, PE
 Charlie Melcher, PE
 John Dietrich, ASLA
 John Jamnick, PE

Firm Personnel by Discipline

Civil Engineers	36
Landscape Architects	7
Planner	2
Other Professionals	69
Total in Firm	114

RLK, Inc. is a professional consulting firm which partners with architects, property owners and developers to provide land development services. RLK's core services are civil and transportation engineering, master planning, landscape architecture, municipal engineering and land survey services. RLK has experience in managing the plan approval process, obtaining site entitlements, and in producing site documents from concept through completion.

Dean Lake Mixed-use Development, Shakopee, MN; Cedar Point Commons, Richfield, MN; Great River Centre, Otsego, MN; Cabela's, Rogers, MN; Village Creek, Andover Station, Andover, MN; Brooklyn Park, MN; Knollwood Super Target, St. Louis Park, MN

SCHOELL & MADSON, INC.

15050 23rd Avenue North
 Plymouth, MN 55447
 Tel: (763) 746-1600
 Fax: (763) 746-1699
 Email: mail@schoellmadson.com
 www.schoellmadson.com
 Established 1956
 Other MN Office: Elk River
 Contact: Dana Swindler, CEO
 (763) 746-1606

Firm Principals

Dana Swindler
 Scott Harri, PE
 Dan Nickols, PLS
 Tom Goodrum, Planner
 Jay Hill, PE, PLS
 Paul Schroeder, RLA

Firm Personnel by Discipline

Civil Engineers	15
Landscape Architects	5
Registered Land Surveyors	3
Other Professional	15
Technical	10
Administrative	5
Total in Firm	53

Schoell Madson offers planning, landscape architecture, civil engineering, land surveying, wetlands and environmental services to the land development market. We serve both private and government and specialize in entitlements and site design.

Target Medina, Medina, MN; Mid-Town Exchange, Minneapolis, MN; Gander Mountain, Lakeville, MN; Stone's Throw, Hassen Township, MN; Shakopee Public Utilities Service Center, Shakopee, MN; River Point, Elk River, MN

SEBESTA BLOMBERG

2381 Rosegate
 Roseville, MN 55113
 Tel: (651) 634-0775
 Fax: (651) 634-7400
 www.sebesta.com
 Established 1994
 Other Offices: Boston, MA; Chicago, IL;
 Ames, IA; Rochester, MN; Rosslyn, VA;
 Dallas, TX; Detroit, MI; Shanghai, PR China
 Contact: Rick Sievertsen

Firm Principals

James J. Sebesta, PE
 Paul J. Blomberg, PE
 John A. Carlson, PE
 Dean R. Sharpe, PE
 Oleksa P. Breslawec, PE
 Tony R. Litton, PE

Sebesta Blomberg is a specialty engineering and management consulting firm providing services to institutional, industrial, health care, energy and government markets nationwide. Services include: utility infrastructure modernization and optimization, building systems design and analysis, commissioning, LEED® facilitation, sustainable process engineering, power generation, transmission and distribution, facilities management support, and construction services.

University of Minnesota Nicholson Hall, Minneapolis, MN; Department of Defense Commissioning - Pentagon, Arlington, VA; Partners Health Care 70 Francis Street Building, Boston, MA; Mayo Foundation, Stabile and Eisenberg, Rochester, MN; Dallas-Fort Worth International Airport, Dallas, TX; Ball State University, Central Plant Engineering, Muncie, IN

**SHORT ELLIOTT
HENDRICKSON INC. (SEH)**

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 Fax: (612) 758-6701
 www.sehinc.com
 Established 1927
 Other MN Offices: St. Paul, Minnetonka,
 St. Cloud, Brainerd, Cannon Falls, Duluth,
 Virginia, Grand Rapids, Gaylord, Glencoe,
 Rochester and Worthington
 Other Offices: Chippewa Falls, Rice Lake,
 New Richmond, Wausau, Madison,
 Appleton, Sheboygan and Milwaukee, WI;
 Chicago, IL; Lake County and Gary, IN; Sioux
 Falls, SD; Cheyenne, WY; Boulder, Denver,
 Grand Junction, Fort Collins and Pueblo, CO;
 Cedar Rapids, IA; Houghton and Novi, MI;
 Omaha, NE
 Contact: Michael Kraemer, CEO/Pres.
 (651) 490-2101

Firm Principals

Michael Kraemer, PE
 Nancy Schultz, AIA
 Dan Boxrud, PE
 Glenn Schreiner, PE
 Steve Gausman, AIA
 Dave Pillatzke, PE

Firm Personnel by Discipline

Civil Engineers	207
Structural Engineers	9
Mechanical Engineer	1
Electrical Engineers	8
Other Engineers	58
Architects	23
Other Professional	85
Technical	246
Administrative	128
Total in Firm	765

Full-service professional consulting firm specializing in civil, structural, electrical, mechanical, traffic, transportation, environmental and waste resources engineering, architecture and landscape architecture; GIS; community planning and construction administration. Projects include municipal building, water, wastewater, highway, airport, flood control and industrial/educational/institutional sector projects.

U.S. Fish and Wildlife Interpretive Center, Oak Harbor, OH; Mound Public Safety Facility, Mound, MN; Airport Control Tower, St. Cloud, MN; Fortune Bay Golf Resort Club House, Vermilion, MN; Arrival/Departure Building, Redwood Falls, MN; Government, Forestry and Maintenance Facility for Washburn County, Shell Lake, WI

STEEN ENGINEERING, INC.

5430 Douglas Drive North
Crystal, MN 55427
Tel: (763) 585-6742
Fax: (763) 585-6757
Email: steen@steeneng.com
Established 1993

Firm Principals

Mark R. Brengman, PE
Steven M. Youngs, PE
Eugene A. Striefel

Firm Personnel by Discipline

Mechanical Engineers	16
Electrical Engineers	9
Administrative	3
Total in Firm	28

Steen Engineering provides Mechanical and Electrical Engineering design from feasibility studies to preparing construction documents. Design experience includes corporate, municipal, medical, hospitality, institutional and retail. Providing HVAC, plumbing, fire protection, lighting, power distribution, life safety, automatic temperature control, energy and analysis and deficiency studies.

Westin Edina Gallery, Edina, MN;
Minnehaha Academy, South Campus,
Minneapolis, MN; Grand Lodge Hotel and
Water Park of America, Bloomington, MN;
Rochester Toyota, Rochester, MN; North
Branch Senior Housing, North Branch, MN;
State Administration Office Building,
St. Paul, MN

**STRUCTURAL DESIGN
ASSOCIATES, INC.**

10900 Noble Avenue North
Champlin, MN 55316
Tel: (763) 560-5300
Fax: (763) 560-5400
Email: sda@sdaeng.com
www.sdaeng.com
Established 1989
Other MN Office: Brainerd

Firm Principal

Gregory J. Duerr, PE

Firm Personnel by Discipline

Structural Engineers	6
Technical	3
Administrative	1
Total in Firm	10

continued next column

Structural Engineers providing design, construction documents, reports, and construction administration services for projects in the educational, industrial (manufacturing, warehousing, equipment supports, and repairs), commercial, municipal, medical, and renovation fields. Services provided to Architects, Owners, Contractors, Developers and others.

Buffalo High School, Buffalo, MN;
Green Bay Packaging Addition, Wausau, WI;
Conference Center for Andersen Windows,
Bayport, MN; Redwood Falls Hospital
Addition, Redwood Falls, MN; Brentwood
Hills Apartment, Inver Grove Heights, MN;
Rosedale Retail and Theater Addition,
Roseville, MN

TKDA

444 Cedar Street, Suite 1500
St. Paul, MN 55101-2140
Tel: (651) 292-4400
Fax: (651) 292-0083
Email: facilities@tkda.com
www.tkda.com
Established 1910
Other Offices: Grand Rapids, MN;
Chicago, IL; Kansas City, KS
Contact: Becky Nazario (651) 292-4412

Firm Principals

William Deitner, PE
Thomas Stoneburner, PE
John (Jack) Griffin, PE
Kevin Cullen, PE
Christopher Rand, PE
John Ahern, PE

Firm Personnel by Discipline

Civil Engineers	80
Structural Engineers	7
Mechanical Engineers	10
Electrical Engineers	8
Architects	9
Other Professional	20
Technical	66
Administrative	15
Total in Firm	215

TKDA's Facilities Division specializes in the sports and recreation, industrial, government and education markets. Services include: electrical, mechanical, structural and civil/site engineering, and architecture and landscape architecture. TKDA also provides engineering, architecture, and planning services to the municipal, aviation, rail, and surface transportation sectors.

continued next column

Flint Hills Resources, Administration
Building, Inver Grove Heights, MN; Gustavus
Adolphus College, Football Stadium,
St. Peter, MN; City of Victoria Fire Station
No. 1 and Water Treatment Plant, Victoria,
MN; City of North St. Paul, City Hall, Police
and Fire Station, North St. Paul, MN;
Andersen Corporation, Steam/Energy
Facility, Bayport, MN; Pacific Ethanol,
Facilities, Western U.S.

ULTEIG ENGINEERS

5201 East River Road, Suite 308
Minneapolis, MN 55421-1027
Tel: (763) 571-2500
Fax: (763) 571-1168
Email: info@ulteig.com
www.ulteig.com
Established 1944
Other Offices: Detroit Lakes, MN;
Fargo and Bismarck, ND; Sioux Falls, SD

Firm Principals

Dan Sargeant, PE
Mike Magelky, PE
Walt Gregory, RLS
Loren Winters, PE
Mike Berger, PE

Firm Personnel by Discipline

Civil Engineers	52
Structural Engineers	26
Mechanical Engineers	7
Electrical Engineers	34
Fire Protection Engineer	1
Sanitary	5
Hydraulic	1
Architects	1
Other Professional	100
Technical	65
Administrative	41
Total in Firm	333

Commercial electrical engineering for electric, data, emergency power, lighting and security systems; mechanical engineering for HVAC, automation/temperature control and plumbing; fire protection engineering; structural engineering; site design for commercial and private developments; water resources; municipal engineering; survey services including legal; topographic, ROW acquisition; ALTA; and underground utilities

New Horizon Day Care Centers, Minneapolis
Metro Area, MN; MacLean Hall Renovation,
Minnesota State University at Moorhead,
MN; St. Joseph's Hospital, Brainerd, MN;
VA Medical Center Renovation, Fargo, ND;
Concordia College Heating Plant Expansion,
Moorhead, MN; Senior Housing Buildings,
Minneapolis Metro Area, MN

**VAN SICKLE, ALLEN
& ASSOCIATES**

2955 Xenium Lane North, Suite 10
Plymouth, MN 55441
Tel: (763) 559-9100
Fax: (763) 559-6023
Email: sstangeland@vansickleallen.com
www.vansickleallen.com
Established 1978
Other Offices: Roseville, MN; Hutchinson, KS
Contact: Scott Stangeland, PE
(763) 577-9132

Firm Principals

Scott Stangeland, PE
Keith Jacobson, PE
Kelsey Brown, PE
Mark Mielke, PE
Jeff Schrock, PE
Gary Nagel, PE

Firm Personnel by Discipline

Civil Engineers	4
Structural Engineers	26
Architect	1
Technical	34
Administrative	4
Total in Firm	69

We are committed to exceeding the expectations of our clients, providing collaborative thinking, proactive communication, innovative solutions, and unparalleled service and support. Engineering consultants providing structural and civil engineering services for commercial, corporate, retail, hospitality, educational, government, healthcare, industrial, senior housing and parking facilities. Designing A Bright Future Together.

American Medical Systems, Minnetonka,
MN; Red Pine Crossing Mixed-use
Development, Eagan, MN; Minnesota
Dental, Minneapolis, MN; Target,
Nationwide; Pueblo of Isleta Hotel,
Albuquerque, NM; Shaller Family Shalom
East Campus, St. Paul, MN; Argonne
Commons, Lakeville, MN

WENZEL ENGINEERING INC.

10100 Morgan Avenue South
Bloomington, MN 55431
Tel: (952) 888-6516
Fax: (952) 888-2587
Email: info@wenzelengineering.com
www.wenzelengineering.com
Established 1990
Contact: Lowell Wenzel (952) 888-6516

Firm Principals

Lowell E. Wenzel, PE
Patricia A. Cole, PE
Jeff A. Segar, PE

Firm Personnel by Discipline

Structural Engineers	4
Technical	1
Administrative	1
Total in Firm	6

Wenzel Engineering, Inc. is a Structural Engineering Firm dedicated to understanding and meeting our clients' goals. Our experience includes new facilities, renovations, additions, and investigations for commercial, industrial, public, retail, educational, religious and healthcare clients.

Leech Lake Tribal College, Cass Lake, MN; Unweave the Weave, St. Paul, MN; Dayton Cemetery Plant, Dayton, MN; Phoenix on the River, Minneapolis, MN; The Penfield, St. Paul, MN; 5000 France, Edina, MN

WESTWOOD PROFESSIONAL SERVICES, INC.

7699 Anagram Drive
Eden Prairie, MN 55344
Tel: (952) 937-5150
Fax: (952) 937-5822
Email: wps@westwoodps.com
Established 1972
Other Offices: St. Cloud and Brainerd, MN

Firm Principals

Dennis Marhula, PE
Dwight Jelle, PE
Ron Peterson
Paul Greenhagen, LS
Richard Wiebe
Bruce Grivna, LS

Firm Personnel by Discipline

Civil Engineers	36
Other Professional	47
Technical	20
Administrative	10
Total in Firm	167

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Westwood is a Minnesota-based, full-service engineering consulting firm, specializing in land development, and providing planning, landscape architecture, surveying, civil engineering and traffic services to private and public agencies. Westwood was established in 1972, and now operates four Minnesota offices, with the headquarters in Eden Prairie and branch offices in

Arden Hills, St. Cloud and Brainerd, MN; Riverdale, Coon Rapids, MN; Super Targets, Lakeville and Blaine, MN; Evermoor, Rosemount, MN; Liberty on the Lake, Stillwater, MN; Cobblestone Lake, Apple Valley, MN; Minneapolis Traffic Operations Project, Minneapolis, MN

WIDSETH SMITH NOLTING

7804 Industrial Park Road
Baxter, MN 56425
Tel: (218) 829-5117
Fax: (218) 829-2517
www.wsn-mn.com
Established 1975
Other Offices: Alexandria, Bemidji and Crookston, MN; Grand Forks, ND
Contact: Timothy Moe, PE (320) 762-8149

Firm Principals

Timothy Moe, PE
Don Anderson, PE
Tim Bayerl, PE
Dave Kildahl, PE
Paul Richards, AIA
Roger Helland, AIA
Kevin Donnay, AIA

Firm Personnel by Discipline

Civil Engineers	23
Structural Engineers	3
Mechanical Engineers	4
Electrical Engineers	1
Environmental Scientists, Geologists,	
Land Surveyors, Transportation Engineers	15
Architects	14
Construction Manager	1
Technical	61
Administrative	18
Total in Firm	140

WSN is a fully-integrated engineering, architecture, land surveying and environmental services firm. Our engineering group includes: Civil—primarily municipal and water resources; Structural—project specific, industrial and bridges; Mechanical/Electrical—HVAC, plumbing and lighting. Our complete team solves a variety of design and construction issues from planning to completion.

continued next column

ISD 181 Forestview Middle School, Baxter, MN; Red Lake River Restoration and Habitat Improvement Project, Crookston, MN; 3rd Avenue Reconstruction, Alexandria, MN; Bagley Stabilization Ponds, Bagley, MN; Gordon's Bridge (No. 05533), Benton County, MN; Crow Wing County CSAH 20, Brainerd, MN

WOLD ARCHITECTS AND ENGINEERS

305 St. Peter Street
St. Paul, MN 55102
Tel: (651) 227-7773
Fax: (651) 223-5646
Email: mail@woldae.com
www.woldae.com
Established 1968
Other Offices: Palatine, IL; Troy, MI
Contact: Kevin Marshall, PE (651) 227-7773

Firm Principals

Michael S. Cox, AIA
R. Scott McQueen, AIA
Vaughn Dierks, AIA
Kevin Marshall, PE
Matt Mooney, PE
Lucia Anderson, PE

Firm Personnel by Discipline

Mechanical Engineers	18
Electrical Engineers	11
Architects	80
Administrative	15
Total in Firm	124

Wold Architects and Engineers provides a full range of services to meet the facility needs of our public sector clients. Services include systems analysis, troubleshooting, options analysis, budgeting, project design, construction administration, project closeout and commissioning.

Lakeville South High School, ISD 194, Lakeville, MN; Rosemount High School Chiller Plant and Ventilation Upgrade, ISD 196, Rosemount, MN; Dakota 9-1-1 Communications Center, Empire, MN; Dakota County Northern Service Center, West St. Paul, MN; Ramsey County Law Enforcement Center, St. Paul, MN; Crow Wing County Jail, Brainerd, MN

YAGGY COLBY ASSOCIATES

717 Third Avenue SE
Rochester, MN 55904
Tel: (507) 288-6464
Fax: (507) 288-5058
Email: twestby@yaggy.com
www.yaggy.com
Established 1970
Other Offices: Mendota Heights, MN; Mason City, IA; Delafield, WI
Contact: Tammy S. Westby (507) 288-6464

Firm Principals

Donald Borcharding, PE, RLS
Chris Colby, AIA, CID
Scott Samuelson, PE
Bob Ellis
Jose Rivas, AIA

Firm Personnel by Discipline

Civil Engineers	45
Structural Engineers	2
Transportation Engineers	9
Geo-technical Engineers	2
Architects	5
Other Professional	40
Technical	51
Administrative	26
Total in Firm	180

Municipal, transportation, land development and building and site services including grading and utility plans, storm water management, water and wastewater treatment and permitting, parking lots, traffic studies, geotechnical and structural design, boundary and topographical surveys, construction staking, sub-division plats, ALTA's agency permitting, landscape plans wetland delineation and environmental studies.

Target, Rochester, MN; Lowes, Rochester, MN; Home Depot, Rochester, MN; MinnEnergy Ethanol Plant, Eyota, MN; Diamond Jo Casino, IA Hawthorn Hills, Rochester, MN

It takes a village to design, engineer, and construct a great building. So let's give credit where credit is due.

Reflections at Bloomington Central Station

page 22

Location: Bloomington, Minnesota

Client: McGough Development

Architect of record: Elness Swenson Graham Architects, Inc. (ESG)

Collaborating design architect: architects Alliance

ESG principal-in-charge: David Graham, AIA

ESG project architects: David Graham, AIA; Art Bartels, AIA; Aaron Roseth, Assoc. AIA; John Tadewald

Project lead designers: Art Bartels, AIA, and Aaron Roseth, Assoc. AIA (ESG); Peter Clewes and Adrian DiCastri (architects Alliance)

ESG project managers: Art Bartels, AIA; Aaron Roseth, Assoc. AIA

Developer: McGough Development

Structural engineer: Meyer, Borgman, Johnson Inc.

Mechanical engineer: Michaud, Cooley, Erickson

Electrical engineer: Michaud, Cooley, Erickson

Civil engineer: URS Inc.

Energy modeling: The Weidt Group

Lighting designer: ESG

Interior design: ESG

Construction manager: McGough Construction

Landscape architect: oslund.and.assoc.

Stone: Architectural Cast Stone

Cabinetwork: O'Keefe

Flooring systems/materials: STS Flooring & Twin City Tile and Marble

Window systems: Harmon Glass (curtain wall); W.J. Higgins (glass consultants)

Architectural metal panels: Harmon

Concrete work: McGough Construction

Millwork: O'Keefe

Photographer: George Heinrich

Gallo Residence

page 26

Location: Minneapolis, Minnesota

Clients: Jeff and Salena Gallo

Architect: Shelter Architecture

Design principals: John Dwyer, AIA; Jackie Millea, Assoc. AIA

Project team:

Jackie Millea, Assoc. AIA; Kurt Gough, Assoc. AIA; Colin Oglesbay, Assoc. AIA; Tom Westbrook, Assoc. AIA; Jessica Barnd; Sarah Caruthers; John Dwyer, AIA

General contractor: Aaron Krause

Structural engineer: Ulteig Engineers

Interior design: Shelter Architecture

Window systems: Brin Northwestern

Concrete work: Forecast Concrete

Digital renderings: Shelter Architecture

Whole Foods Co-op

page 28

Location: Duluth, Minnesota

Client: Whole Foods Co-op

Architect and engineer: LHB, Inc.

Principal-in-charge: Sue Anderson

Project architect: Mark Poirier, AIA

Project lead designers:

Mark Poirier, AIA; Jill Isola Johnson

Project manager: Mark Poirier, AIA

Project team: David Williams; James Brew, AIA; Cheryl Rouse

Structural engineer:

Alan Vorderbruggen

Mechanical engineer: Stewart Cran

Electrical engineer: Linnea Weyandt

Lighting designer: Emphasis Lighting Group, Inc.

Interior design: Jill Isola Johnson

Construction manager: Arno Kahn of Builders Commonwealth

Landscape architect: Mark Anderson (LHB)

Landscape project team:

Philip Barden; Heidi Bringman

Recycled wood: Duluth Timber

Flooring materials:

Johnson Carpet and Tile

Millwork: Builders Commonwealth

Photographer: Jeff Frey & Associates Photography, Inc.

Quality Bicycle Products Expansion and Remodel

page 30

Location: Bloomington, Minnesota

Client: Quality Bicycle Products

Architect and engineer: LHB, Inc.

Principal-in-charge: Rick Carter, AIA

Project architect: K.C. Lim, AIA

Project lead designer: Doug Friend

Project manager:

Rachelle Schoessler Lynn

Structural engineer: Joel Rector

Mechanical engineer: David Williams

Electrical engineer: Linnea Weyandt

Civil engineer: Jim Tiggelaar

Lighting designer:

Emphasis Lighting Group, Inc.

Interior design:

Michelle McKinney (LHB)

Construction manager:

Kraus-Anderson Construction

Landscape architect:

Bruce Chalupsky (LHB)

Building Demolition:

Veit & Company, Inc.

Earthwork: Belair Excavating

Utilities: Nova Frost

Paving: Bituminous Roadways

Site concrete: C.R. Fischer and Sons

Porous Pavers: Glacial Ridge

Landscaping: Arteka

Concrete/masonry:

Northland Concrete

Precast concrete: Fabcon

Structural steel fabricator:

Central Minnesota Fabricating

Structural steel erector: KMH Erectors

Miscellaneous metals:

National Steel Fabricators

Rough carpentry:

Northside Construction

Insulated metal panel:

Innovative Building Concepts

Roofing: Dalbec Roofing

Joint sealants: Right-Way Caulking

Doors, frames, hardware:

Contract Hardware

Glazing, curtain wall, aluminum

storefronts and windows, sunscreen: Empire House, Inc.

Drywall and framing: Mulcahy, Inc.

Ceramic tile: Grazzini Brothers

Acoustical ceiling: Sonus Interiors

Paint and wall coverings:

Swanson and Youngdale

Access floor: Sound Ceilings, Inc.

Toilet accessories: Bartley Sales

Interior signage: Bartley Sales

Loading dock equipment:

Star Equipment

Fire protection:

National Automatic Sprinkler Co.

Passenger elevators:

Minnesota Elevator

Mechanical: Doody Mechanical

Electrical: Bloomington Electric

Renewable energy:

Innovation Power Systems Solar

Energy modeling: The Weidt Group

Photographers:

Peter Bastianelli-Kerze (exterior);

Marty Wood (interior)

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—Adapted from photographer Maxwell MacKenzie's introduction to *Abandonings*