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## MAKING IT GREEN

A Case Study of LEED®–EB  
Certification Presented by  
Karges-Faulconbridge, Inc.,  
McGough Companies, and  
Pope Associates



## A GREEN JUBILEE IN MINNESOTA'S ROSE CITY

What's in store for a building that has out-lived its usefulness? One that is obsolete – physically, functionally, and economically?

Until recently, the most likely prospect for these buildings is terminal: they're demolished to make way for new, better, more contemporary uses. Their demise is often predictable, because older buildings tend to be located on prime real estate.

A current trend is to 'recycle' these buildings, to find an 'adaptive reuse' for them. The prerequisites, of course, are that the physical plant is in a condition that justifies recycling and the proposed conversion is economically feasible. This development has been successful, especially in transforming obsolete commercial buildings into residential properties, usually lofts. Unfortunately, however, these old structures have too often been allowed to deteriorate to such an extent that rehabilitation is financially unwise.

### *Jubilee Foods as a Target For Reuse.*

Jubilee Foods, an abandoned grocery store in Roseville, Minnesota, was built in 1972. Situated on nearly four acres with an enormous parking lot, the building was a probable candidate for demolition until *Karges-Faulconbridge, Inc.* (KFI), a major Twin Cities engineering firm, spotted it during the

company's search for a new headquarters office site.

Fortunately, KFI principals recognized the building's potential. It was remarkably well built; suitable for use in Minnesota's challenging winter climate; and outfitted with water, sewer, and electricity. Compared with the cost of construction of a new structure, KFI calculated that cost savings for using the existing Jubilee shell would be \$40 per square foot.

*“A current trend is to ‘recycle’ these buildings, to find an ‘adaptive reuse’ for them.”*



*Typical of commercial buildings of its time, the Jubilee Foods site presented a vast expanse of parking with minimal green space.*

*View of northeast corner of building. Windows provide natural daylighting.*



### “Greening” an Existing Building.

As KFI intensified its focus on the Jubilee site, it turned to the *United States Green Building Council* (USGBC) for guidance. The Council, which developed the *LEED Green Building Rating System*,™ provides direction for designing new buildings and rehabilitating existing structures according to environmentally sensitive criteria. Existing Building guidelines include:

- Whole building cleaning and maintenance issues, including chemical use
- Ongoing indoor air quality
- Energy and water efficiency
- Recycling programs and facilities
- Exterior maintenance programs
- Systems upgrades to meet green building energy, water, indoor air quality, and lighting performance standards

KFI applied for and was chosen to participate in the *LEED® for Existing Buildings* (LEED-

EB) pilot program. KFI chose the pilot rating system as a guideline for incorporating sustainable design practices and energy performance tracking systems into the existing structure.

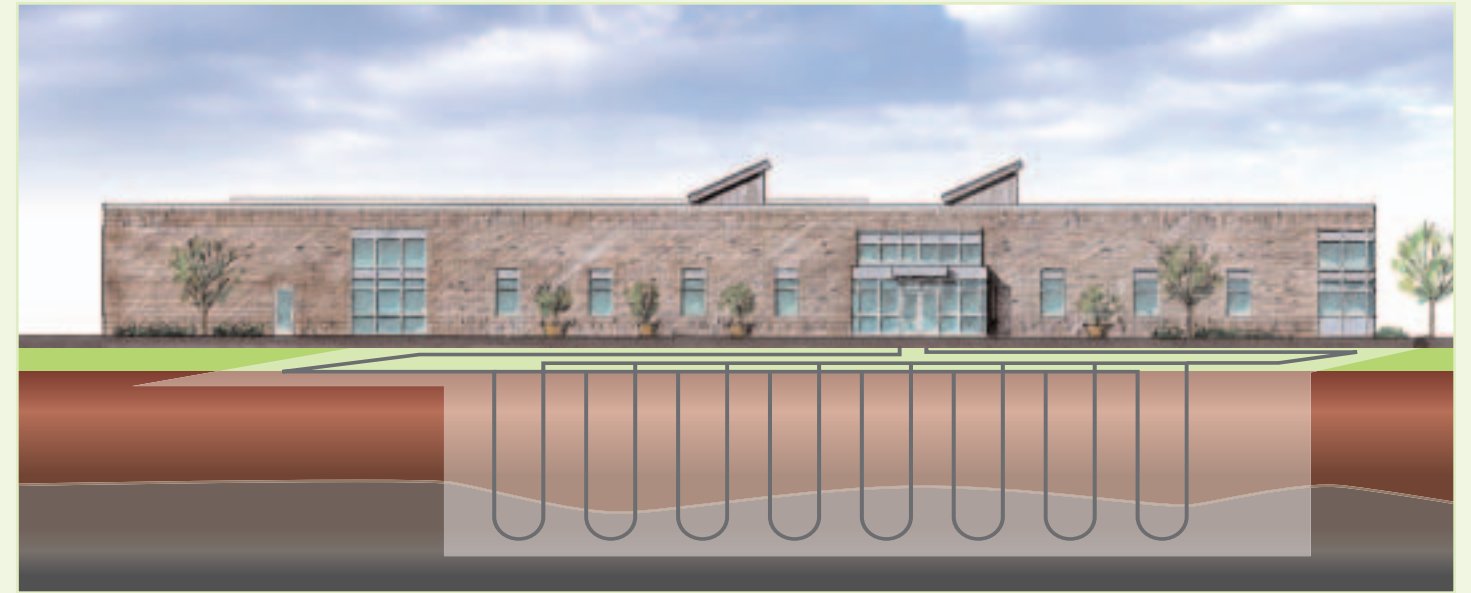
### The “Green” Jubilee.

The transformation process involved the total demolition of the interior spaces. Indeed, nearly 120 tons of waste debris were produced; more significantly, the project recovered approximately 800 tons of recycled materials – more than 90 percent of which was recycled asphalt.

The new construction, which was a partnership between KFI, Pope Associates, a major business-based architectural firm, and McGough, a leading construction company in the Twin Cities, involved substantial use of sustainable materials – including post-industrial waste structural steel, acoustical ceilings, acoustical sound panels, ceramic tile, and carpeting, as well as recycled rubber flooring and natural linoleum.



Natural linoleum flooring is used in various areas of the building. A windowed garage door separates the recreation facility from the rest of the lunchroom. The door can be opened to accommodate more people for special events.



*“The closed-loop geothermal well field consists of 48, 200-foot vertical bores, totalling five miles of underground piping.”*

The mechanical system for the building is perhaps the most striking feature of the “greening” process. KFI designed, and McGough built, a geothermal well field to utilize the earth’s relatively constant temperature to heat and cool the building. The closed-loop geothermal well field consists of 48, 200-foot vertical bores, and five miles of underground piping. The well field is located under the newly designed prairie grass and native wildflower watershed. The system, which can simultaneously heat and cool different areas of the building, is 300 to 400 percent energy efficient. Taken together, the new headquarters building has delivered 65 percent savings in energy usage, as compared to the Minnesota Energy Code.

In October 2004, the LEED-EB Rating System was made available for worldwide use. To date, in addition to the KFI corporate headquarters, 13 projects have been certified under the LEED-EB program, including the National Geographic Society

headquarters complex; the California EPA headquarters building; and three Microsoft buildings.

### THE UNITED STATES GREEN BUILDING COUNCIL (USGBC) AND LEED-EB

In 2002, the USGBC established the LEED-EB pilot program, a rating system that addresses operations, maintenance and system retrofits for existing buildings. For over two years, a number of buildings participated in the pilot program to test and refine the rating system.

In October of 2004, the LEED-EB Rating System was balloted and made available for worldwide use. So far, 14 projects have been certified under the LEED-EB program, some of which include the National Geographic Society Headquarters Complex; the Joe Serna Jr. – California EPA Headquarters Building; Microsoft Buildings 30, 31, and 32; JohnsonDiversity Inc. Global Headquarters; and, of course, the new Karges-Faulconbridge, Inc. Corporate Headquarters located in Roseville, Minnesota.

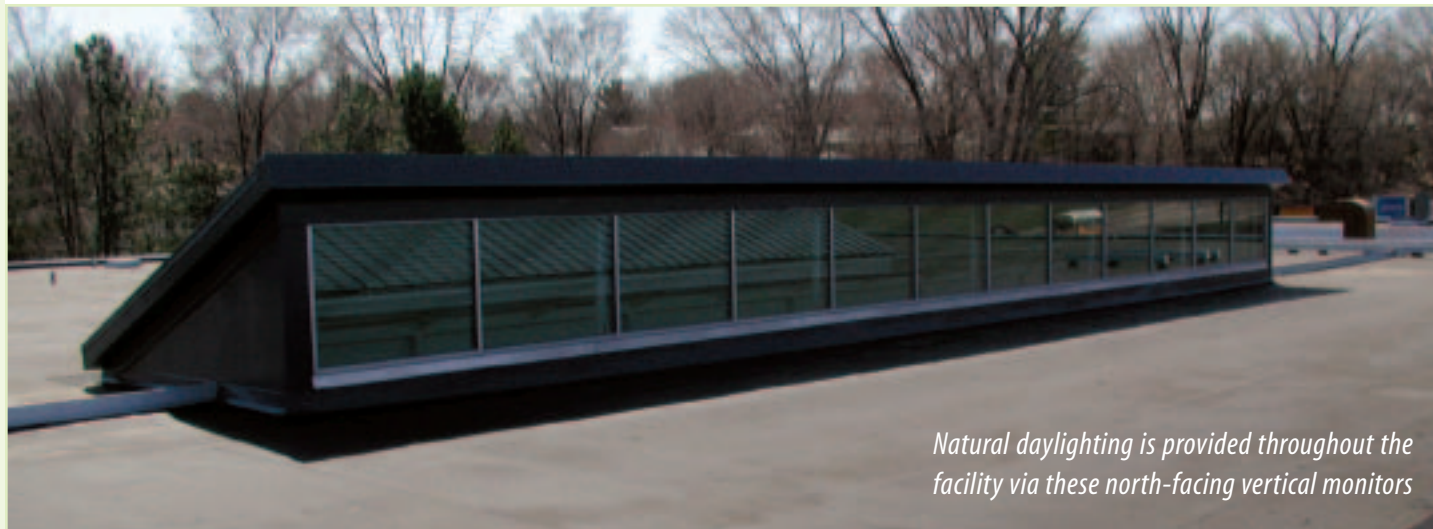
Because the original Jubilee Foods building – as is the case with most grocery stores – had no windows, the KFI building features windows for all exterior offices and north-facing monitors (skylights) to provide natural lighting – called “daylighting” – throughout. In addition to producing energy savings, daylighting creates a bright and vibrant atmosphere for employees and visitors, an environment intended to increase productivity and decrease absenteeism. Finally, the multi-level switching of lighting in the building cuts lighting wattage by one-third.

Another example of sustainable design is the landscaping plan for the KFI headquarters. The

program employs native prairie grasses and wildflowers into a watershed, an “eco-grass” rather than traditionally high-maintenance blue grass. The end result is a 54 percent increase in greenspace on the site.

#### *Goals Achieved and Lessons Learned from the Jubilee Conversion.*

Jim Faulconbridge, a principal of KFI, describes the firm’s goals, “We wanted the lowest operating costs per square foot of any building in the Twin Cities.” More globally, Faulconbridge says that KFI wanted to use the building as a demonstration project overtly intended “to further the progress of sustainable buildings in Minnesota.”



*Natural daylighting is provided throughout the facility via these north-facing vertical monitors*



*The original building had no windows. Now the KFI building features windows for all exterior offices.*

#### **ABOUT KFI**

Karges-Faulconbridge, Inc. provides top quality mechanical and electrical engineering, commissioning, and mechanical and electrical construction management services for industrial, commercial, institutional, healthcare, and national retail organizations. The Karges-Faulconbridge, Inc. team is comprised of design and engineering professionals with practical field experience necessary to expertly guide each project through the design, construction, and commissioning processes.



*The building incorporates daylight harvesting, multi-level switching of direct and indirect light, and a Transient Voltage Surge Suppression System (TVSS).*



*The plotting and catalog area is centrally located and easily accessible from all locales within the building. The building core also features daylighting and infrared heating.*



*This conference room features daylighting, a custom-built table, and an antique boiler door.*

*“We wanted the lowest operating costs per square foot of any building in the Twin Cities.” More globally, Faulconbridge says that KFI wanted to use the building as a demonstration project overtly intended to further the progress of sustainable buildings in Minnesota.”*

KFI has tested the economic benefits derived from the Jubilee renovation, a LEED® requirement leading to accreditation. For Jim Faulconbridge, the results are in, and they’re conclusive: he reports that “all systems are functioning as designed. Energy savings have been independently verified at an incredible 96 percent of anticipated savings.”

Another objective of pursuing LEED® Certification, according to Faulconbridge, was to make design decisions based upon “sound engineering judgment.” KFI discovered that some of the LEED components were financially or logistically impractical; Faulconbridge cited as an example the installation of a “graywater” system, intended

to collect rainwater for reuse in water closets, urinals and irrigation systems. Similarly, mounting a sodded “green” roof on the building was found to be too expensive in light of the payback period required to justify its use.

Faulconbridge notes that there has been a subtle, somewhat unexpected benefit from pursuing LEED certification: employee satisfaction and retention. The “users” of the building – owners, employees, and clients – experience the unique comforts of a sustainable building. As Faulconbridge explains, “We don’t turn more lights on because we don’t need to. We don’t turn the thermostat to a more aggressive heat or cool position

#### ABOUT MCGOUGH

Through four separate entities, McGough provides a broad range of services to meet the real estate and facility needs of its clients. A focus on partnering and understanding the unique needs of each client has been the cornerstone of success for the company.

For nearly half a century, successive generations of McGough’s have enjoyed an unparalleled reputation for delivering complex projects, on budget and on time, while maintaining a tradition of quality and craftsmanship.

#### ABOUT POPE ASSOCIATES

Pope Associates is a high-energy client and customer service-focused architecture and interior design firm that creates value through collaborative partnerships. Pope is about Building Together. They welcome client input, shape a process to fit the client’s style, and make the client’s goals their own. They have long been advocates of negotiated-team and design-build delivery methods and welcome the input of the builder and specialty subcontractors from the outset of nearly every project. This open, flexible, and enjoyable approach helps Pope form productive, long term relationships with their clients and the construction and development community.

because we're comfortable. We eat lunch in the lunchroom because we like it there. Our clients visit us because they enjoy being in a place that inspires them to make the right decisions. Our building isn't a theme park: it's a living, breathing example of what can be achieved with sustainable infrastructure. It's everywhere if you want to find it, but it's entirely absent if you don't."

Tim Dunnwald served as the McGough senior project manager for the project. Dunnwald observed that LEED certification means that the construction manager sometimes needs to become acquainted with new technologies, and particularly the durability of sustainable materials. Similarly, although some of these materials may be more expensive initially, they may be cheaper to maintain over time, which means that the payback period must be calculated for each item. This "lifecycle" costing, another element of the LEED program, may require the builder to acquire new skills. Finally, because applicants for LEED certification may choose to avoid the use of some customary tools, such as adhesives and certain cleaning compounds, the construction manager needs to become acquainted with

permissible products – while maintaining a laser-like focus on the owner's return on investment.

Jim Faulconbridge highlights the interplay between sustainability and return on investment. "Our intent was to help to develop the standard on our own structure initially," he says. "Now we know what other designers can't know: how the owner feels as they make decisions about sustainability in a return-on-investment situation."

Faulconbridge summarizes the KFI experience: "Success stories don't come much better than this. Jubilee Foods, a well-built structure whose time had come and gone, has been transformed into a stunning workplace. With KFI's vision, Pope's design, and McGough's craftsmanship, our building will serve as the gold standard for practical, sustainable projects for years to come."

*On November 2, 2004, the KFI building received LEED-EB Gold Certification, the first Gold Certified building in the state of Minnesota.*



*The lobby features recycled rubber flooring, natural daylighting, and an antique air compressor.*



*The main open area features displacement ventilation.*



*The bathroom features sensed faucets and water closets.*



*KFI has incorporated a low-impact environmental cleaning policy using Green Seal 37 Products.*



*The dedicated outdoor air path system incorporates an energy recovery wheel to pretreat outside air.*