



1433 North Water St Sustainability Case Study

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— 1433 NORTH WATER ST SUSTAINABILITY CASE STUDY

1433 North Water Street is a historic, sustainable icon in the making. Wangard seized the opportunity to transform a historical building into a state of the art, modern office building that revitalizes the Park East Redevelopment area.



The building was initially a wagon works producing: carriages, buggies, sleighs, machinery for mills, tanneries and ship work from 1866 to 1925. Later, the business evolved and a blacksmith shop was added to convert operations to service the automobile industry. In 1926, the Milwaukee Electric Railway and Light Company took over the building for its machine shop. Eventually, Laacke & Joys moved into 1433 North Water Street in 1957.

The former Laacke & Joys main building consisted of two buildings built almost 30 years apart, the familiar 4 story building from 1895 and the smaller 3 story building constructed in the 1930's. Wangard strived to save the existing 1895 building on site but couldn't because of the deteriorating foundation. The foundation was crumbling and there were no pilings. Wangard worked with Graef, Findorff, and Plunkett Raysich Architects to save what we could. We were able to reuse the portion of the building constructed in the 1930's. As an integrated team, we worked together through multiple iterations of design to hit the sweet spot that resulted in the building you see today.

Special attention was given to energy and water efficiency, low emitting materials, occupant control over lighting and thermal comfort, and the systems being purchased for installation. Additionally, with the project's immediate proximity to the Milwaukee River, stringent construction activity pollution prevention plans and construction debris and waste was carefully monitored for proper diversion from landfills.

Concrete from the demolition of the existing building was stockpiled on site and crushed. Then it was used as back fill under slabs and against foundation walls. Existing cream city brick was reused in patching areas of the existing south building and as decorative detail in building finishes. A wooden archway, from the original entrance of the building, was salvaged to be used as decorative details in future work. Windows from the existing south building were salvaged and are being incorporated into a future offsite restaurant design by a local restaurant group.

Wangard and its contractors implemented other sustainable practices and used green materials during construction. One of the most notable is our work with WasteCap prior to demolition of the old building with crumbling foundations. Before demolition began, Waste Cap went through the building and salvaged materials for resale and reuse. Those items included:

- Light Fixture
- Vintage Red Exit Light
- Glass Privacy Doors
- Ladies Room Lettering
- 2 Porcelain Bubblers
- 12 Green Warehouse Overhead Lights
- Laacke & Joys Foam Lettering
- 2 Exterior signs
- Glass Exit Light
- Approximately 4,000 SF Maple

Wangard chose to utilize Property Assessed Clean Energy (PACE) financing. Wangard started researching PACE financing about 9 months prior to closing on permanent financing. We needed to understand how this program could fit into the capital stack for the project. PACE allowed us to close a financial gap, along with installing features that Wangard believes in, such as a geothermal HVAC system and photovoltaic system.

The PACE financing program was adopted into law by the City of Milwaukee in 2014. PACE creates a strong incentive for commercial property owners to incorporate energy and water efficiency upgrades into existing buildings as well as promote efficient systems and renewable energy installations in new construction. The energy or water cost savings from a project will meet or exceed loan repayment costs. Additionally, PACE is tied to the property, so that if the property is sold, any future owner's will receive the benefit of energy efficiency equipment and favorable loan terms.

Since the development sits on 1.71 acres along the Milwaukee River on Water Street, Wangard installed a geothermal system as part of the HVAC system. The system reduces energy by minimizing the temperature differential from the ambient temperature of the surrounding air to the temperature level that is desired from the chiller. In this case, we bring in cool water from the Milwaukee River. This is cooler than the ambient air temperature requiring less energy to bring the cooling fluids to the desired lower temperature.

For instance, if the air temperature is 75 degrees, the river may be at 60 degrees requiring less energy usage to bring the temperature to a desired 52 degrees distributed throughout the building. The river water is circulated through the chiller. Through a heat exchange process, the river water temperature is passed to the internal building loop containing Glycol. The glycol is distributed throughout the building to the heat pumps. The heat pumps temper the forced air from the air handlers to the desired air-conditioned temperature.



We also replaced the existing single paned windows with new windows that are low E insulated with ceramic coated glazing. The windows also protect the historical architectural features but still are energy efficient.

The weighted life cycle average is 20 years for the geothermal system and windows. We amortize payments over the next 20 years. Those costs are passed through to the tenants as part of operating expense tax recovery.

A key factor when pursuing PACE financing is that the energy, water, and maintenance cost savings, and other documentable operational savings over the estimated useful life of the improvements, must be greater than the principal cost of the improvements. For instance, if you spend \$2,000,000 on an HVAC system and windows which have a weighted useful life of 20 years, the energy savings cost over that 20 years, must exceed \$2,000,000

| Energy Conservation Measures | kWh Savings | Total \$ Savings/year | \$ Savings /SF |
|------------------------------------|-------------------|-----------------------|----------------|
| HVAC Upgrades | 974,100 | \$105,008 | \$0.76 |
| Window Upgrades | 144,088 | \$15,533 | \$0.11 |
| TOTAL SAVINGS OVER 20 YEARS | 22,363,760 | \$2,410,820 | |

Ongoing requirements as part of the PACE program include taking the Better Buildings Challenge with the City of Milwaukee and benchmarking energy and water usage in ENERGY STAR Portfolio Manager. ENERGY STAR Portfolio Manager, is the EPA's online tool for measuring and tracking energy and water use. A building can't be green unless it's energy-efficient. And ENERGY STAR is the government-backed program for certifying energy-efficient buildings.

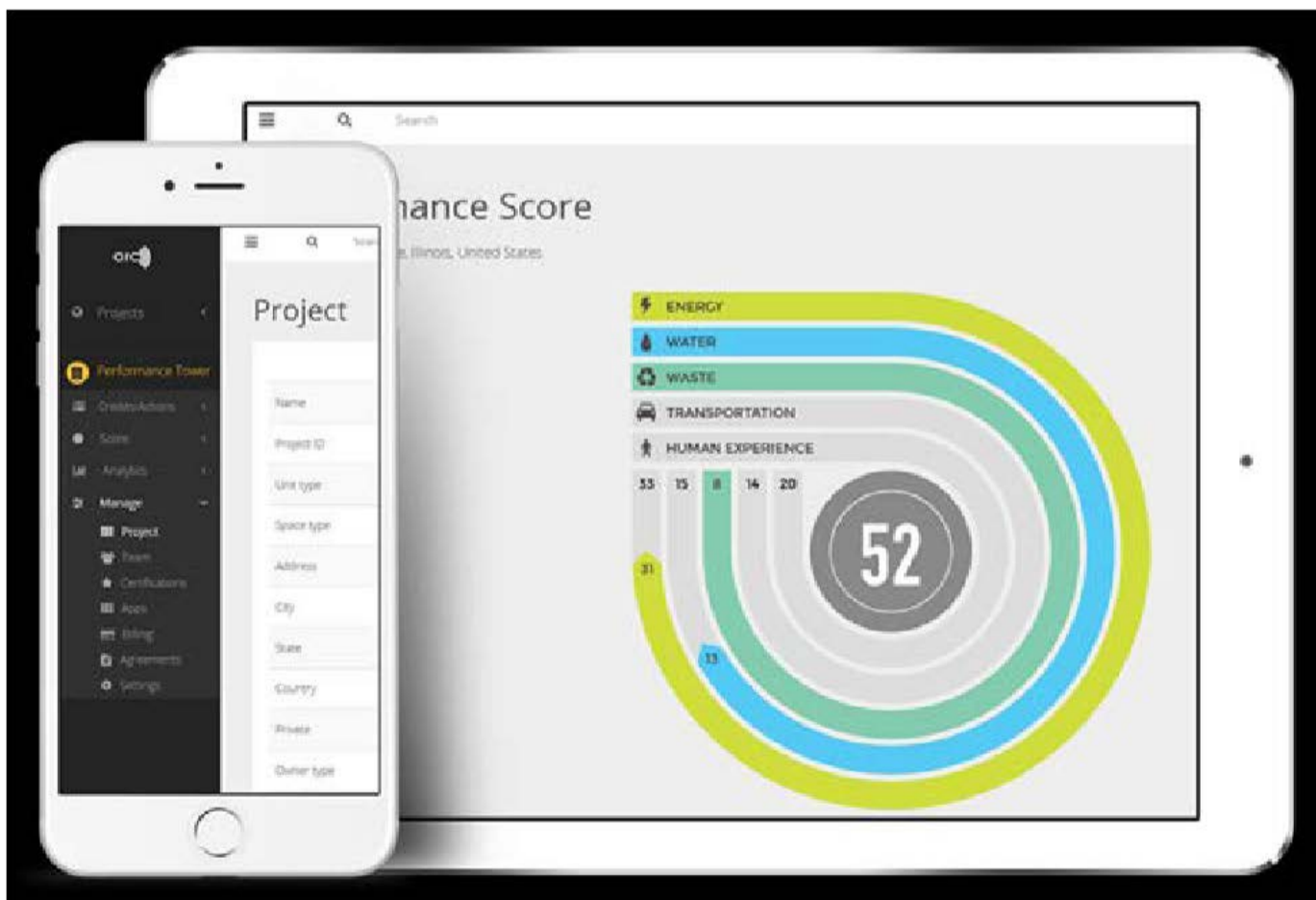
Outside of PACE financing, Wangard chose to install a 44.16kWDC photovoltaic system on the roof. The 128 SolarWorld modules face south at a 10° tilt with a minimal 0.8% of shading. The panels are designed to withstand heavy snow loads, a typical issue in wintery Wisconsin. The panel's proprietary surface coatings and granular texture of the Sunmodule's front glass create two effects: the reduction of the light reflected from the outside (air-glass interface) and the internal trapping of the light reflected from the solar cells in the module (light-trapping). These two effects combine to make an extremely efficient and high-performance PV module.



Future plans for 1433 North Water Street include providing bicycles and kayaks to employees in the building for use for free and a rooftop patio.

A new technology called Arc Skoru, launched by Green Business Certification, Inc. in December 2016. Arc Skoru uses its Arc platform to allow users to measure performance, make improvements and benchmark against other projects. Arc is a complement to LEED and other green building rating systems, standards, protocols and guidelines and allows buildings and spaces to compare performance metrics and connect those metrics to green building strategies. Arc enables incremental improvements and can put a project on track for LEED or other rating system certification. Arc is the first-of-its kind platform to track a building's incremental improvements through a performance score.

Arc tracks energy, water, waste, transportation and human experience and generates a performance score from 0 to 100. Arc scores create a holistic picture of the results of sustainability efforts at the building, portfolios, and community levels. Through the initial step of tracking data, Arc gives any project an immediate entry point to the world of performance measurement and certification, no matter where they are on their sustainability journey.



Contact us today.

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