



**History Project 2014-15**

## **KJWW Des Moines 25<sup>th</sup> Anniversary**



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**The Beginning.** On July 15, 1989, KJWW Engineering Consultants officially announced the opening of their new Des Moines Office. They had been involved with several projects located throughout Central Iowa over the years so they felt it was time to open a brick and mortar location to better serve their customers and expand their client base.

Scott Bowman was hired specifically to manage and grow the Des Moines office. He was a graduate of Iowa State University's mechanical engineering program and a licensed engineer in both Iowa and Nebraska. Prior to coming to KJWW, Scott worked for Frank Pulley Associates as a mechanical engineer, then went to Woodburn & O'Neil Architects doing both mechanical and electrical design. Scott was with Frank Pulley when KJWW opened discussions to purchase Frank Pulley Associates, but that never went any farther than just talks. However, KJWW and Scott connected directly later to start a new office as a grassroots effort. It was just him at first working to get the business off the ground in Des Moines. He spent most of his first few months attending meetings with owners and architects to secure work while utilizing the engineering resources available in their Rock Island, IL headquarters to execute it. He also did a lot of construction administration at Iowa State University, saving several Rock Island engineers from the long drive.

The first office was located at 700 Second Avenue, Des Moines, IA in the lower level of the old Iowa Association of School Boards Building. Scott knew that the first office needed to be located near the heart of the city to solidify their presence in the community. This location was also attractive due to the proximity of the local Master Builders of Iowa plan room and RDG Planning & Design, their most significant client at the time. The beginning was very humbling with Scott using an old kitchen table for his desk and a hand-me-down chair from the Rock Island office that no one else wanted. One memory that he recalls from the first office was the combustion turbine plant located across the street. He said they always knew when it was getting warm out in the spring because they could hear and feel the vibration of these units when they kicked on to help support the additional electrical load that downtown required.

Within 10 years, the company had already expanded twice and had outgrown their current space. Management made the decision to purchase and move to their current location at 2882 106<sup>th</sup> Street in Urbandale, IA. The new office was more than 17,000 square feet with plenty of room for additional employees. Scott Bowman became principal of the company in 2002. Andy Thielen joined the company in 1997 and served as supervisor of the electrical department prior to his promotion to branch manager in 2009. He is a 1995 graduate of Iowa State University and earned his professional engineering degree in Iowa in 2001.

The Des Moines office still resides at the Urbandale location and currently employs 39 design professionals. Scott Bowman retired earlier this year after 25 years of service with KJWW and now owns Integrated Design + Energy Advisors, LLC.

KJWW Des Moines has witnessed and participated in several large HVAC technology shifts throughout its 25-year history. The following are some examples of projects in which they were on the leading edge of these new, innovative designs over the years:

**Integrated Design.** One the very first projects that Scott Bowman was tasked with designing early in his career at KJWW was Drake University's Knapp Center. This facility is a 7,152-seat multi-purpose arena on the campus of Drake University in Des Moines, IA. It was built in 1992, and is the home of the Drake Bulldogs. This was a very large project for the young KJWW Des Moines office that stretched his local

resources very thin. Scott said that it was a very stressful project but he knew that it had to be designed and executed out of Des Moines in order to give them the credibility they needed to grow in the market.

This project was one of the first integrated design projects in Des Moines. The conventional definition of integrated design is that the project team members from all disciplines work together early and often throughout the project design process to minimize coordination issues and ensure the project moves forward as smoothly as possible. Paul Morris was Drake's Director of Facilities at the time. The project team consisted of RDG as the architect, Taylor Ball as the general contractor, Waldinger as the mechanical and sheet metal contractor, and Baker Electric as the electrical contractor.



One example of how the integrated design approach was successful on the Knapp Center project was with regards to the AHU supply fan motor. Since this was prior to pre-fabricated custom air handling units, all of the cabinet panels had to be constructed by a third party company and sent to the jobsite. Through the upfront coordination process, the team identified that the supply fan motor was too large to fit into the normal access doors. Waldinger was able to get some of the panels changed prior to arriving at the jobsite preventing any issues in the field. The standard project format that had been more commonly utilized at the time probably wouldn't have caught this issue until the supply fan assembly arrived at the jobsite and caused a great deal of pain for the project team.

**Pond-Coupled Geothermal.** Another good example of innovative design is the Des Moines Area Community College (DMACC) West Campus pond-coupled geothermal project. Dave Inghram from the Des Moines office led the design of this project. He designed and executed a full geothermal heat pump system utilizing a 4-acre pond near the campus to serve the 56,000 square foot facility. The pond provides 168 tons of cooling and is capable of providing up to 420 tons for future expansion. This system captures and dissipates heat from the pond which provides an energy efficient and cost-effective means of heating and cooling the facility. Since the pond is used for the heat source and heat rejection of the heat pump system, there are no boilers or cooling towers required. This greatly reduces the maintenance requirements and eliminates the need for chemical treatment associated with boilers and cooling towers.

This project also utilized an underfloor air distribution system, demand control ventilation, daylight harvesting, and energy modeling to increase the overall performance of the building. This project was so innovative for its time that it earned First Place 2004 International Technology Award and was a featured article in the May 2004 ASHRAE Journal.

**Commissioning.** The next shift in technology was seen in the mid-90's. The Des Moines office began providing commissioning services before this concept started picking up steam to where it is today. One of the first commissioning projects took place at the Principal Financial Group "Z" Building. This was the first project where the KJWW Des Moines office performed commissioning services. They were not involved in the design of the project but subcontracted by Waldinger to perform the commissioning

portion of their bid package per the plans and specifications. It was a complex project with many complex systems.

One issue that this process worked though was with regards to the design of the smoke control system. Waldinger followed the specifications word for word but when the Fire Marshal did their inspection for occupancy, they would not give accept it. The Fire Marshal felt that the code required a smoke exhaust system which is very different and more costly than the smoke control system designed by the engineers. The commissioning that KJWW did on the project actually helped mitigate the situation and remove Waldinger's liability since KJWW was able to prove that it was indeed installed correctly and met what was set forth in the plans and specifications. This example shows why commissioning can be such an important part of a project today. KJWW now has 8 individuals on staff that are part of the commissioning group that work on various projects throughout the country.



**LEED.** Sustainability has always been at the forefront of KJWW's work over the years. Therefore, it only made sense for them to embrace LEED's third-party verification rating system when it first came out in the late-90's. Performance on these projects focus on human and environmental health in five key areas including sustainable site development, water savings, energy efficiency, materials selection, and indoor environmental quality.

One of KJWW's most prominent LEED projects was the Wellmark headquarters located in Downtown Des Moines. The owner wanted to reach the highest of LEED achievements, Platinum. In order to do so, KJWW had to come up with innovative ways to earn the points necessary to reach this lofty achievement.

One groundbreaking design element that the project team used to achieve water efficiency points was the rainwater capture system. The design consists of collecting rainwater from the roof and other sources where it then accumulates into two large custom designed underground cisterns. From there, the water is pumped through a water treatment process (strainers, filters, UV, ozone, etc.) where it is eventually used for brown water applications like flushing toilets and irrigation. This system ended up earning the project seven total points including one Innovation in Design credit. It was estimated that

the owner will save 9,400 gallons of water per working day (250 working days per year). This project won many awards for its design including ENR's 2011 Best Project for the Midwest.

**Conclusion.** As you can see, KJWW Des Moines has been on the front end of many of the major shifts in technology over the past 25 years. Others not listed above include replacement of inlet guide vanes with variable frequency drives, pneumatic controls with DDC controls, and field erected air handling units with packaged custom air handling units. It is their intent to continue this trend as they work towards their next 25 years of service in the Des Moines market.

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