elements

Setting Their Sights High

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On the Cover:

Industrial Scientific Corporation's new global headquarters, designed by IDC Architects, is now a prominent fixture along a highly traveled business corridor just west of Pittsburgh, Pennsylvania.

Have Your People Call Our People

There is no substitute for great people. What makes CEC a responsive and innovative service provider is our people and the seemingly limitless capabilities they bring to each project. When I look out into a room filled with our employees, both new and not-so-new, I think about the potential contained within that room to make a tremendous impact—on clients such as Industrial Scientific or the Nashville Zoo and also on the world around us. The talented professionals at CEC possess unique skill sets and enjoy working together to solve tough challenges. They are committed to growing professionally, and we are committed to helping them achieve their goals. Making this a focus is just one of the many ways we encourage our employees to choose CEC as the place where they want to spend their entire careers.

Kenneth R. Miller, P.E. President and CEO January 18, 2016

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The fully enclosed site has gated access and a complete walking loop. Other amenities include a patio, balcony and several other outdoor spaces with wireless access, a fitness center with locker rooms, an in-house café, electric car charging stations, and heated promenade sidewalks.

Setting Their Signts Higher Industrial Scientific Puts Employees First in its New Headquarters

In the fall of 2014, Industrial Scientific Corporation was named a "Top Workplace" by the Pittsburgh Post-Gazette based on employee surveys.

Despite the distinction, this leading manufacturer of gas detection and monitoring products and services was not as widely known outside its arena as it could have been. "From a recruiting perspective, we were a pretty well-kept secret," says Garth Miller, Industrial Scientific's vice president of customer operations, "partly because of our physical location."

Industrial Scientific is a global company with more than 700 employees. Its Pittsburgh headquarters and primary manufacturing functions were spread across four buildings and five miles in a western suburb.

"We ended up that way because we grew," said Miller. The separation prompted inventory runs, mail runs, and many redundancies. Employees with responsibilities in more than one building would often split days between locations, but for others, there was never an opportunity to put a face to a name. "It was contrary to our Employees First

"It was worth it from our perspective to make the investment in infrastructure."

philosophy and less than optimal for success." A primary goal was to consolidate and create an environment that would encourage getting to know each other and collaborating more naturally.

The challenge: find a site for a new global headquarters that would meet four specific criteria. The first was to honor the Pittsburgh roots with a Pittsburgh postal address, but to stay on the western side of the city for employees' convenience. The second was the necessary acreage. Third was direct access to Pittsburgh International Airport. And fourth was a prominent location with frontage along a major highway.

After looking at roughly two dozen sites, an option emerged to purchase a 36-acre parcel perched atop a ridge at a major interchange along Interstate 376, which connects downtown Pittsburgh to the airport. "We were able to get the land development plan approved quickly to help Industrial Scientific make a more confident decision about buying the property," said Adele Beaves, CEC senior project manager. Approval was for a full build-out, but the -Garth Miller, Vice President of Customer Operations

initial phase would use 24 acres with the additional 12 acres available for expansion.

The parcel met the four criteria, but came with its share of challenges: it had previously been deep mined, so CEC developed a subsurface grouting program for stabilization and recommended

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A drilling rig excavates through limestone bedrock during construction. Drilling produced a significant amount of lime dust and usable lime, which was incorporated into wet fill to help dry it out before placement.

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supporting the building on a combination of caissons and shallow spread foundations; it had unsightly utility poles, so coordination with nine different carriers was necessary to re-swing lines; and it had no sanitary sewer services, so CEC designed a 600-foot horizontal directional drilling plan that would go down the hill and under the interstate to reach the main connection. "It was worth it from our perspective to make the investment in infrastructure," said Miller. "Immediately after we broke ground and put our name on the site, we began to establish recognition from the high visibility."

CEC's civil engineering services included site layout plans, grading plans and earthwork computations, utility design services, and comprehensive stormwater management design and water quality calculations. "Because the site was tributary to an impaired watershed along the I-376 right-of-way owned and maintained by PennDOT, we used a higher level of water quality best management practices to demonstrate that we wouldn't impact the watershed," said Beaves. CEC also provided geotechnical, ecological and environmental services for the project. "We could count on Adele to give us realistic answers. Her approach and willingness to look at items objectively helped us to maintain compliance in a way that was possible for us," Miller explains.

From groundbreaking to move-in during the summer of 2015 took 20 months, four less than scheduled. Today, the roughly 204,000-square-foot building houses nearly 425 employees, administrative functions, customer support, training space, lab space, product design and engineering, manufacturing operations with flexible lines to meet peak demand, supply chain management, and efficient warehouse and shipping capabilities.

Unique meeting spaces and "neighborhoods" on each floor help create efficiencies and opportunities to interact with people in different capacities. Being in one building



Staff and guests enjoy a spectacular six-story open atrium with manufacturing operations fully visible on each floor across the width of the bright, airy building designed by IDC Architects.

has also allowed for cross-training or "flexing" of manufacturing service teams. "We flex people from one group into another when we have peak demand in one area. This has given us economies of scale for more cost-effective utilization of people based on demand," said Miller.

One-third of the staff had input on the project, resulting in a wish list of almost 500 items. "This was a very tangible way for us to demonstrate that we put employees first," said Miller. "We were able to accommodate about 70-plus percent of the wish list items. Our employees see that their requests came to life and can say, 'that's what I asked for.'"

In the fall of 2015, Industrial Scientific's employees helped the company to be named a Top Workplace in Pittsburgh for the second year in a row.



Manufacturing operations comprise roughly forty percent of the space in the new facility and are strategically situated along the front-facing side of the building with windows from floor to ceiling.



These stately saddle-billed storks live in a habitat supplied by the natural stream that feeds from the stormwater retention basin at the Nashville Zoo.

With the focus shifted from simply displaying animals to educating the public about protecting them

(and the environments in which they live), today's zoos must emulate the characteristics of native habitats: environments that most likely do not occur naturally within hundreds or even thousands of miles. Yet, many major zoos are planted smack-dab in the middle of an urban or metropolitan area. This has created a unique set of challenges, particularly for managing stormwater, at zoos across the nation.

When stormwater runoff from a business park was negatively impacting property at the Nashville Zoo, including a small headwater stream that flows through its grounds, Zoo officials joined forces with local experts to correct the issue. Working with the Cumberland River Compact, a regional nonprofit whose primary focus is improving and maintaining the quality of water in the Cumberland River Basin, the Zoo secured partial funding for the project via a Clean Water Act 319 grant administered by the Tennessee Department of Agriculture. CEC's Nashville office was engaged as a key partner on the project team, having previously helped the Zoo obtain an individual National Pollutant Discharge Elimination System (NPDES) permit-the only zoo in Tennessee to have one.

The goal was to enhance the water quality of the small headwater stream by retrofitting an existing stormwater detention basin at the Zoo. Both basin inlets were modified to capture debris. CEC also implemented water quality control berms to spread, slow and filter outlet flow and maintain usability of the land between the basin and stream. This six-acre brushy area underwent extensive removal of invasive, exotic plants followed by seeding and planting of native vegetation. The transformation restored the area to historic regional conditions as a native grass prairie, creating a habitat for a future native elk and bison exhibit—and numerous educational opportunities for visitors.

Through the grant, the project also created a unique opportunity for the Zoo and Cumberland River Compact to educate a different audience, specifically design-build and stormwater professionals, on the use of stormwater best management practices to meet their own development goals and improve water quality, as well as to promote collaborative approaches to stormwater retrofit projects.

CEC provided in-kind support to help develop a one-day professional training workshop and behind-the-scenes field event at the Zoo, including creation of the syllabus, presentation materials and literature. "The Magic of Stormwater Retrofits" event was held in November 2015, during which all of the project partners presented on the design, engineering, construction and results of the retrofit.

Though the innovative project is nearing the final stages, there already has been marked improvement in the health of the water and habitats. "It is absolutely amazing how quickly a stream can recuperate thanks to a good erosion control and infiltration project," said Dale McGinnity, the Nashville Zoo's ectotherm curator. "This stream segment had always been composed of a strictly brown silt substrate. Now there are rocks and gravel evident, and it has the appearance of a healthy streambed that can support macroinvertebrates and biodiversity. I really did not expect the character of the stream to change so dramatically, so quickly."



CEC Principal Steve Casey, design engineer for the project, explains the stormwater best management practices implemented at the Nashville Zoo during a professional training workshop.

IN THE NEWS:

Cleared for Takeoff

CEC was granted an exemption by the Federal Aviation Administration (FAA) to conduct commercial operations utilizing small Unmanned Aircraft Systems (sUAS) in the United States.

The sUAS program at CEC includes certificated and registered quad-copter and fixed-winged Unmanned Aerial Vehicles (UAVs), also known as drones, as well as a full-time, in-house licensed commercial pilot to perform commercial sUAS operations.

"We are among the first civil and environmental engineering firms to receive an exemption from the FAA," said Rick Celender, CEC vice president and head of sUAS operations. "The exemption enables CEC to run a safe and responsible sUAS program that provides a reliable method to capture large amounts of data often faster than traditional aerial mapping technologies."

During flight, UAVs gather information and capture a series of high-resolution images in situations that might otherwise be dangerous, dirty, dull or difficult for humans—the "Four Ds" as they are referred to at CEC. Real Time Kinematic (RTK) satellite navigation can be synced with either a ground-based or virtual station to provide horizontal and vertical control for data capture while aerial photogrammetry software is used to generate 2D and 3D deliverables such as orthomosaic images, point clouds, and topographic maps and models.

Applications include stockpile or airspace volumetric calculations and pipeline and power line right-of-way monitoring, among others, for the agriculture, construction, environmental, mining, oil and gas, and solid waste industries. ■



CEC's In-house pilot, Bryan Hazelwood, has more than 1,430 flight hours and a current FAA airman medical certificate.

Spotlight

On The Air with Corporate Air Practice Leader Tony Babb

What has been your goal since joining CEC?

My goal has been to build CEC's reputation as a world-class provider of Air Quality services. I've been connecting with all of CEC's Industry Consulting Groups (ICGs) and offices, and I've also been attending conferences and meeting our clients, letting them know that we are able to provide a number of air services they may need, but which they may not have known we offered. Many of our clients know us for our stack sampling capabilities-we do that kind of work and do it quite well—but CEC provides all air quality services, including permitting, air dispersion modeling, compliance assessment, and the many activities that go along with them. CEC is able to evaluate air pollution control equipment, and we also have ambient air and meteorological monitoring capabilities.

What are some of the current challenges industries face with regard to air quality?

There are so many air regulations coming out right now. A lot of what our clients need is assistance with interpreting these regulations. CEC works with a variety of industries to develop the best strategies to obtain permits for operating their facilities. For instance, the Mercury and Air Toxics Standards (MATS) is a primary concern for the power industry at the moment. Another area that is impacting almost everyone is greenhouse gas emissions. Also, when a National Ambient Air Quality Standard (NAAQS) is lowered, as was the case this past fall for ground-level ozone, areas that were in attainment may become classified non-attainment. All non-attainment New Source Review (NSR) permits will require Lowest Achievable Emission Rate (LAER) limits, emission offsets, and opportunity for public involvement. We can help companies develop the right strategy for obtaining and complying with new permits.

How does CEC set itself apart from other firms that provide air services?

This fall, CEC received official accreditation as an Air Emission Testing Body (AETB) from the Stack Testing Accreditation Council, Inc. (STAC) and the American Association for Laboratory Accreditation (A2LA). CEC is one of only six organizations in the nation to currently be an accredited AETB. With this accreditation in place, CEC's clients can be confident in our ability to provide reliable, accurate data as we perform a full scope of air testing services, including wet test methods, instrumental/ continuous emission monitoring and Fourier Transform Infrared Spectroscopy (FTIR).

ACCOLADES





The Ralston Creek Restoration project for the City of Franklin received the Honor Award in the Natural Resource Conservation Landscape Restoration category from the Tennessee Chapter of the American Society of Landscape Architects during its 2015 Professional Design Awards.





Our stack samplers have key clients they do work for routinely—annually, semi-annually, etc. Of course that's often considered a commodity in the industry, but CEC breaks away from the commodity mentality by providing highquality service and extensive knowledge, and by being extremely responsive to client needs; communicating with them thoroughly and frequently. And though the client is hiring CEC, they really are hiring the person or the team of people doing the work. It's a personal business relationship.

What is CEC doing to stay on the cutting edge?

We recently added new technology to our in-house arsenal to analyze dozens of analytes in a complex gas matrix simultaneously and in real time. We can measure hundreds of hazardous air pollutants (HAP) like benzene and naphthalene, and also criteria pollutants like NO_x and SO₂.

Fourier Transform Infrared Spectroscopy (FTIR) is a technique that has been around for years, but the technology used to perform it has become faster and more sensitive. The instruments we have are specifically for gas applications. The technology can identify individual organic and inorganic compounds in complex mixtures and the quantity of each compound—from PPB to several percent levels. The FTIR can be used to measure room air, exhaust emissions, material offgassing and process operations to help our clients optimize processes and control equipment in real time. FTIR is fast becoming the preferred method for monitoring stack emission sources in the cement, chemical manufacturing, ethanol production, wood products, electronics and automobile industries.

Having worked in a number of places, what's so great about CEC?

The culture we have is so attractive. I'm having fun again. We also have a really special group of people; innovative thinkers and problem solvers. Paul Jenkins, for instance. Last year, Paul won CEC's Award for Innovation for a gas analysis "time-sharing" technique he developed and applied for continuous emission monitoring systems (CEMS). I did my first stack sampling in 1974, as did Paul. He claims he's going to continue performing stack sampling until he has done it for 50 years. Paul may be the first stack sampler in the U.S. who will achieve that goal, but we have others like Mike Mowery who are just a few years behind him and will be striving to achieve that goal as well. There is such a high level of commitment to the work that we do.



Chatham University's Eden Hall Campus project received the first-ever Engineering + Science Award of Excellence during AIA Pittsburgh's Design Pittsburgh 2015 awards. The Engineering + Science category was introduced to the awards program in 2015.



The Axis at Block 400 project received the top award for Real Estate Development, and

the Ironworks at Keystone project received both the top award for Neighborhood Revitalization and an honor award for Real Estate Development at the Indy Chamber Monumental Awards in Indianapolis.



During the West Virginia Brownfields Conference in Morgantown, CEC received the Environmental Impact Award for its role on the Brooke-Hancock

Brownfields Task Force. The goal of the task force is to identify and redevelop brownfields sites in the northern panhandle of West Virginia.

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GEFF BOTTOMLEY	Publisher
EMILY CHIODO	Editor/Writer
TARA KIRKMAN	Art Director

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PHOTO CREDITS

Massery Photography, Inc. Christian Sperka Yates Bateman for TNASLA Gwen Griffith Rick Celender Emily Chiodo Michael Ciccone Tara Kirkman

For information, address changes, corrections or additions to the mailing list, contact 1.800.365.2324 or email elements@cecinc.com.

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Back Cover:

PHOTO CONTEST WINNER JOHN SIENERTH / PITTSBURGH

CEC sponsors a Photo-of-the-Month contest encouraging employees to submit photos from their work sites. The winning photo is published on CEC's internal website and social media pages.







Corporate Office 333 Baldwin Road Pittsburgh, PA 15205–9702

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CEC was on site performing construction quality assurance (CQA) testing and inspections for structural foundations when this 186,000-pound, six-foot-diameter, 99.5-foot-tall demethanizer tower was placed into its final position at a cryogenic plant. Operators performed what is known as a "two-crane pick," which is considered a critical lift and comes with significant safety precautions and pre-planning.