It is a familiar scene—an abandoned gas station, a dilapidated manufacturing facility, an empty or run-down warehouse. The site is possibly known in your community as an “eyesore,” and could even be considered a hazard. Now imagine that site transformed into a bustling public park, a shared community garden, a revitalized commercial space, or a thriving new business. How? The Environmental Protection Agency (EPA) Brownfields Program helps communities of all sizes address environmentally challenged properties while cultivating economic development. The program funding creates opportunities for municipalities, government, and nonprofit organizations to accomplish revitalization within their communities by identifying, assessing, and remediating properties.

**RENEWING A COMMUNITY**

Brownfield grant funding can create positive changes within communities by addressing health concerns, socioeconomic issues, and by jump-starting revitalization efforts. Performing an assessment of a brownfield property often helps remove the environmental stigma which may loom over idle, vacant,
or abandoned properties. An assessment provides property owners or developers with historical and environmental information to determine if the site is contaminated and, if there is an issue, can identify what is necessary for redevelopment and at what cost.

For the program to work, communities must have a desire to make improvements, a need for grant funding, and qualified properties to assess. Each year since 1995, the federal government has allocated millions of dollars to fund the program, which offers various grant options to identify and assess sites throughout a community, clean up specific properties, or assist in the funding of redevelopment planning.

**FOSTERING GROWTH AND RENEWAL**
Assessing and remediating a brownfield site can lead to reduced crime rates and allow for new development, helping residents feel safer. Redeveloped properties may also create more walkable communities, helping residents who might not have access to vehicles have safer access to schools, hospitals, and grocery stores. An additional benefit is the ability for a municipality to generate funds through an increase in local taxes. This growth and renewal can create jobs. Two recent studies* indicated cleaning up brownfield sites can lead to a 5-15 percent increase in value of properties located 1.29 miles from a site, as well as a $29-$97 million tax revenue increase for municipalities one year after clean up.

(*source: epa.gov/brownfields)

Is your community a good fit for the Brownfields Program? Terracon’s team has helped communities of all sizes evaluate possible projects, and when suitable, assisted with development of a successful brownfields program. From grant writing through project implementation and property redevelopment, Terracon can assist you every step of the way.

**MAKING POSITIVE IMPACTS TO COMMUNITIES ACROSS AMERICA**
By August 1, 2019, the Brownfields Program assessed 28,697 properties, leveraged 144,800 jobs, and $27.5 billion, and enabled 80,952 acres of land to be readied for reuse. (source: epa.gov/brownfields)

Belinda Richard
Belinda is Terracon’s national brownfields program manager. She has 22 years of environmental experience, with the last 15 years dedicated to working in the brownfields program.
Severe weather often serves as a disastrous reminder of the need for strong, wind-resistant structures. In an average year, approximately 1,000 tornadoes occur across the country—75 percent of those recorded in the world. Most often, tornadoes occur in the central and southern Plains, spanning up to eight states—an area often referred to as “tornado alley.” But, tornadoes can occur anywhere and have been recorded in nearly all states in every season.

**ANTICIPATING THE POWER OF SEVERE STORMS**

A tornado forms when changes in wind speed and direction create a horizontal spinning effect within a storm cell. This effect is then tipped vertically by air rising through the thunderclouds.

Although tornado-force winds can cause destruction to cars and buildings, most injuries and deaths are caused by flying debris. An average of 101 deaths occur annually due to tornadoes, compared to an average of one death annually from hurricane winds (2007 to 2017). Some insurance companies estimate property damage alone to be billions of dollars per year.

**BUILDING TO RESIST EXTREME WINDS**

Over the years, building codes in areas at risk for earthquakes and hurricanes have been strengthened, while codes for wind events are often outdated or don’t exist. But whether or not building codes address high wind speeds, structures can be built to withstand them within reason. Insurance companies are starting to recommend building to higher wind-resistance standards, because they have discovered that keeping roofs and roof decks in place during wind events is a critical part of protecting buildings and people. Testing of roofs and their edge metal for resistance to high wind events has become top priority for some “at-risk” insurance companies.

Building owners can gather relevant data for existing roofs based on the calculation of resistance to high winds for roofs and their edge metal. Two commonly used tests are roof system uplift testing, a non-destructive test standard for most new and older roof systems, and the roof edge metal test, which is conducted to ensure roof and edge metal are secured to a standard based on a design wind pressure.

Terracon recently assisted a client along the Gulf Coast with improving an existing building shell to withstand a Category 5 hurricane wind force. Another client seeking to build a new headquarters building in tornado-prone North Texas chose to build beyond existing codes for a more wind-resistant structure.

Preserving the structural integrity of a building—including edge metal, windows, and roofing—can help it to resist the destructive forces of high winds. The right time to plan for an extreme wind event is before it happens. New and existing buildings can benefit from this expertise. Terracon can assist clients who wish to protect their buildings, assets, and users or occupants by providing recommendations for structural engineering, building enclosures, and cladding materials.

By providing recommendations for building foundations and materials used for edge metal, windows, and roofs, our experts help building owners make choices that provide long-term wind protection to existing structures and to new structures while in the planning phase.
It was a big dream—to transform nearly 100 acres at the margins of Tulsa’s Arkansas River floodplain into a dynamic, interactive, and inviting environment with a pond, hills, unique playground equipment, and several iconic structures. Terracon’s Tulsa office is proud to have been a part of making this dream of a world-class park a reality. Gathering Place was first imagined by George Kaiser and his family foundation as a welcoming, natural space where members of diverse communities could come together to explore, learn, and play. The park opened in September 2018 and had 300,000 visitors the first month.

The Gathering Place is a public park privately funded through collaboration with more than 80 corporate and philanthropic organizations. It was designed by renowned landscape architectural firm Michael Van Valkenburgh Associates, Inc. with input from many Tulsa citizens. As with all creative designs involving the built environment, the engineering details behind the landscaping, bridges, and buildings of Gathering Place are what make it special. Terracon’s engineers partnered with the park architects to turn creative ideas into reality.

Terracon was involved early in the park’s construction during the design phase in 2013. Our team was responsible for all the geotechnical borings required for the original concept of the park, including bridges, city roadways, a lodge, boathouse, pond, and parking lots. A large amount of fill dirt was required to add topographic relief to the park, including geogrid-reinforced steep hills that were constructed from river sediments.

Understanding the scope of Gathering Place and being able to make adjustments to changing design requirements during construction were the key to success on this one-of-a-kind project.

“Gathering Place is a project that required as much, if not more, communication as a tall building project,” said Mike Homan, P.E., Tulsa office manager. Unique design elements such as the construction of tall geogrid-reinforced interconnected hills with slopes as steep as 1H:1V necessitated iterative design changes to facilitate revisions to pathways and buildings as the park design evolved. Homan noted that being responsive to design changes kept the project moving forward on schedule.

The park project required resources from the local Tulsa team as well as Terracon’s geotechnical engineers in Phoenix, who led the design of the geogrid-reinforced hills, and field exploration teams from three states. In addition to the design of the steep hills, Terracon collaborated in the design and construction of four land bridges that are unique in the U.S. To accommodate construction of the three-story tall boathouse and to eliminate loads on the structure, Terracon designed wire basket-faced load relief walls that were constructed next to the below-grade boathouse walls. Utilizing this approach to retain fill away from the structure resulted in a more economical design of the foundation walls of the boathouse. The team also tested unique rock anchors used to attach large slabs of cut sandstone to buildings, walls, and bridges.

Terracon’s creative solutions to the park’s design challenges, as well as its national resources, enabled us to contribute to a world-class riverfront park that welcomes Tulsans and people from everywhere.
Using an accredited laboratory (lab) adds confidence that the work being performed is completed in accordance with nationally and internationally recognized standards and procedures, and with proper equipment. The accreditation process involves an on-site lab assessment including detailed inspections of records and equipment. Firms must have management and technical staff that meet accreditation body requirements. When a company chooses a lab to become accredited, it is not an easy path to take. The firm must make quality a top priority.

An accredited lab is one that has taken the steps by an independent accreditation agency to gain formal recognition of technical competence in certain types of testing, calibration, and measurements. After any necessary corrective action response, submission, and resolution, the lab is added to the agency’s list of accredited labs, and may mention its accreditation in marketing materials. Most construction projects require third-party testing labs to be accredited.

**HOW DOES A LAB BECOME ACCREDITED?**
The accreditations a lab chooses to obtain can depend on several factors. The scope of tests the laboratory performs may dictate what accreditations are best suited. The scope can include various subfields of Construction Materials Testing (CMT) to include cement, concrete, masonry, soil, rock, aggregate, asphalt mixtures, and steel. The accreditation required by a local jurisdiction or project specifications may drive the selection of the agency as well. Some of the accreditation agencies include AASHTO re:source (formerly AMRL), CCRL (Cement and Concrete Reference Laboratory), A2LA (American Association for Laboratory Accreditation), NVLAP (National Voluntary Laboratory Accreditation Program), ISO 17025, CMEC (Construction Materials Engineering Council) and USACE (United States Army Corps of Engineers). These agencies are typically used by labs performing testing for geotechnical and materials engineering services.

Terracon operates more than 140 labs, serving all 50 states. Each lab follows strict quality assurance guidelines for equipment usage and calibration.

Terracon owns, operates, and maintains one of the largest networks of accredited and validated labs of any geotechnical engineering firm in the U.S. Terracon’s national laboratory resources allow us to process large volumes of test specimens quickly, accurately, and reliably, reducing risk of delays to your critical project schedule. And, with a local presence, we have in-depth familiarity with materials and specifications of numerous local, state, and federal agencies.

**Terracon labs meet your needs with more than 140 materials and geotechnical laboratory locations throughout the U.S., including these national accreditations:**

- **USACE validation** – 48 locations
- **AASHTO accreditation** – 95 locations
- **AASHTO accredited and USACE validated** – 42 locations
- **ISO 17025** – 7 locations
- **CMEC** – 8 locations
- **NVLAP** – 2 locations
- **A2LA** – 5 locations

Local accreditations also available at many locations. Visit terracon.com/services/field-and-laboratory-testing

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**LINDA DOBKINS, P.E., P.G.**

Linda is a senior engineer in Terracon’s Cheyenne, Wyo. office. She has more than 17 years of experience in construction materials testing services in the western region of the U.S. Linda also performs internal quality audits for Terracon’s laboratories throughout the Western Operating Group.

Terracon has named **JASON SANDER, P.E.,** as senior vice president and national director for materials engineering services. Previously, Sander served as regional manager for Terracon’s offices in Cincinnati and Portsmouth, Ohio, and Lexington, Ky. He has been with the company since 1995 performing materials testing and inspection, and special inspections, as well as geotechnical and materials engineering, supervision, and management.

“Throughout my career, I have always appreciated the opportunity to collaborate with all the hardworking people in the construction industry, and am thankful to have worked on so many great teams building challenging, unique, and one of a kind projects, or solving difficult problems,” Sander said.
TERRACON FOUNDATION AWARDS $98,538 IN GRANTS

The Terracon Foundation is pleased to announce the award of $98,538 in community and university grants this spring. The goal of the Terracon Foundation is to reach out and become a real part of our employees’ lives and the communities where they live and work.

As part of an ongoing effort to support higher education, the Terracon Foundation presented university grants for scholarships, fellowships, and programs in the areas of science, technology, engineering, and mathematics.

“The recent grants awarded by the Terracon Foundation represent a variety of local needs from a diverse group of nonprofit organizations where our employees are actively involved. These range from helping to build affordable housing, to educating students about careers in STEM,” said Laura Campa, P.E., chair of the Terracon Foundation and manager of Terracon’s Baton Rouge, La., office.

To date, the Foundation has granted more than $2 million to community organizations, universities, dependents of employees, and for disaster relief efforts. For more information about the Terracon Foundation, visit: terracon.com/foundation

Representatives of the University of Texas Rio Grande Valley College of Engineering accepted a Terracon Foundation grant from grant co-champions of Terracon’s Pharr office.

CONTACT US:
Call us at (800) 593 7777
To provide feedback, change your address, or remove a name from the mailing list, email the editor at clientnews@terracon.com.