

STRUCTURAL ENGINEERING



A NORTH WIND COMPANY

ABOUT US

LBYD was founded in 1973 with the incorporation of E. Glenn Bishop & Associates. In 1978, with the merger of the structural engineering firm Lane & Hodnett Structural Engineers, the firm became Lane/Bishop/Hodnett, Inc. In 1987, with the addition of Dale York and Jim Delahay as Principals, the firm became LaneBishopYorkDelahayInc, known today as LBYD, Inc.

In 2001, LBYD began offering civil engineering services. With the addition of the civil department and the continued commitment of our structural department, LBYD has experienced phenomenal growth. We continue to pursue growth opportunities evidenced by opening the Huntsville office in 2009, the Tampa Bay office in 2011, the Auburn office in 2017, and the Nashville office in 2018.

In November 2020, LBYD merged into North Wind Group as a subsidiary company.

LBYD is part of a family of companies with common ownership under Cook Inlet Region, Inc. (CIRI)—an ANC. The North Wind family, comprised of 17 companies, is managed by North Wind Group, a CIRI government contract holding entity. Under North Wind Group, all 17 companies share the same proven corporate infrastructure (i.e., Health and Safety, Quality Programs, human resources, accounting, contract management, project controls) that has been in place over 25 years successfully completing a combined total of over \$2.4B for 35 offices/districts/ sites within 11 Federal agencies and commercial entities through various contract types including firm fixed price (FFP) indefinite delivery/indefinite quantities (IDIQs). This group of companies provides significant flexibility and diversity, enabling us to effectively meet and exceed customer requirements and expectations through significant reach-back to resources within our own organization.

LBYD is certified by the National Minority Supplier Development Council (NMSDC) as well as the Southern Region Minority Supplier Development Council (SRMSP). LBYD is a minority and economically disadvantaged business (SDB) by statute under 43 U.S.C. § 1602 and 1626(3)(1) & (2) and further codified under 13 C.F.R. § 124.109(a)(2) due to our ANC ownership by CIRI, as determined by the National Congress of American Indians (NACI). In addition, LBYD is a Small Business (SB) per the Small Business Association.





LARGE FIRM EXPERTISE, SMALL FIRM RESPONSIVENESS

Large Firm Expertise, Small Firm Responsiveness has become a staple across our company and is present in the work we do on a daily basis. Starting out as a small one-person firm, and growing to over one hundred engineers, we have provided engineering services for various clients including architects, engineers, contractors, commercial developers, public and private institutions, as well as local, state and federal governments.

OUR PROJECTS

LBYD provides civil and structural engineering services on a wide variety of project types for architects, engineers, contractors, commercial developers, public and private institutions and local, state and federal governments. Our project experience includes libraries, educational facilities, sports fields and complexes, public parks, office complexes, parking garages, hospitals, mixed-use facilities, convention centers, bridges, stadiums, arenas, correctional facilities, manufacturing and industrial facilities, residential buildings, residential subdivisions, municipal consulting and government facilities.



OUR SERVICES

STRUCTURAL ENGINEERING

Our structural engineers are knowledgeable in the development of different framing schemes and foundation designs using a wide variety of construction materials for determining the most economical and constructible structural systems.

CONSTRUCTION ENGINEERING

We understand that connection design must be safe and must be economical for the fabricator and erector to produce. We work closely with fabricators to provide designs that work well with the fabricator's shop practices and can be erected in the field as easily as possible.

HYDROLOGY AND WATER RESOURCES

We offer comprehensive hydraulic and hydrology engineering services to ensure quality corrective and preventative measures for stormwater drainage.

STORM SHELTERS

We design storm shelters within schools and other structures to withstand loading from tornadoes and heavy winds in accordance to ICC 500, and safe rooms according to FEMA P-361.

INDUSTRIAL APPLICATIONS

We work with industrial clients to identify the problem they are facing, understand the processes that are in place in the facility, and create a custom solution around it to make sure the facility meets their exact needs.

CITY ENGINEERING

Our engineers can assist municipalities in all areas of city engineering including development plan reviews, roadway inventories and resurfacing schedules, stormwater management and permitting, public works manuals, parks and recreation design, capital improvement plans, funding assistance, and more.

CIVIL ENGINEERING

Our work includes site grading, storm water management, best management practices, erosion and sediment control, utility design which includes gravity sanitary sewer designs, wetland mitigation, flood plan modifications, stream impacts, on-site sewage disposal, and earthwork calculations.

TEMPORARY STRUCTURES

We design and verify the structural capacity of temporary structures such as tents, temporary grandstand seating, stage platforms, etc.

PEER REVIEWS

Peer reviews can include interviews, review of documents obtained during the review process and technical reviews.

FORENSICS

We offer innovative and economical investigative and corrective design services in areas such as site placement, foundation failures, roofing and envelope investigations, storm damage, earthquake and vibration damage, truss failures, concrete failures, expert testimony and litigation support, and more.

PARKING

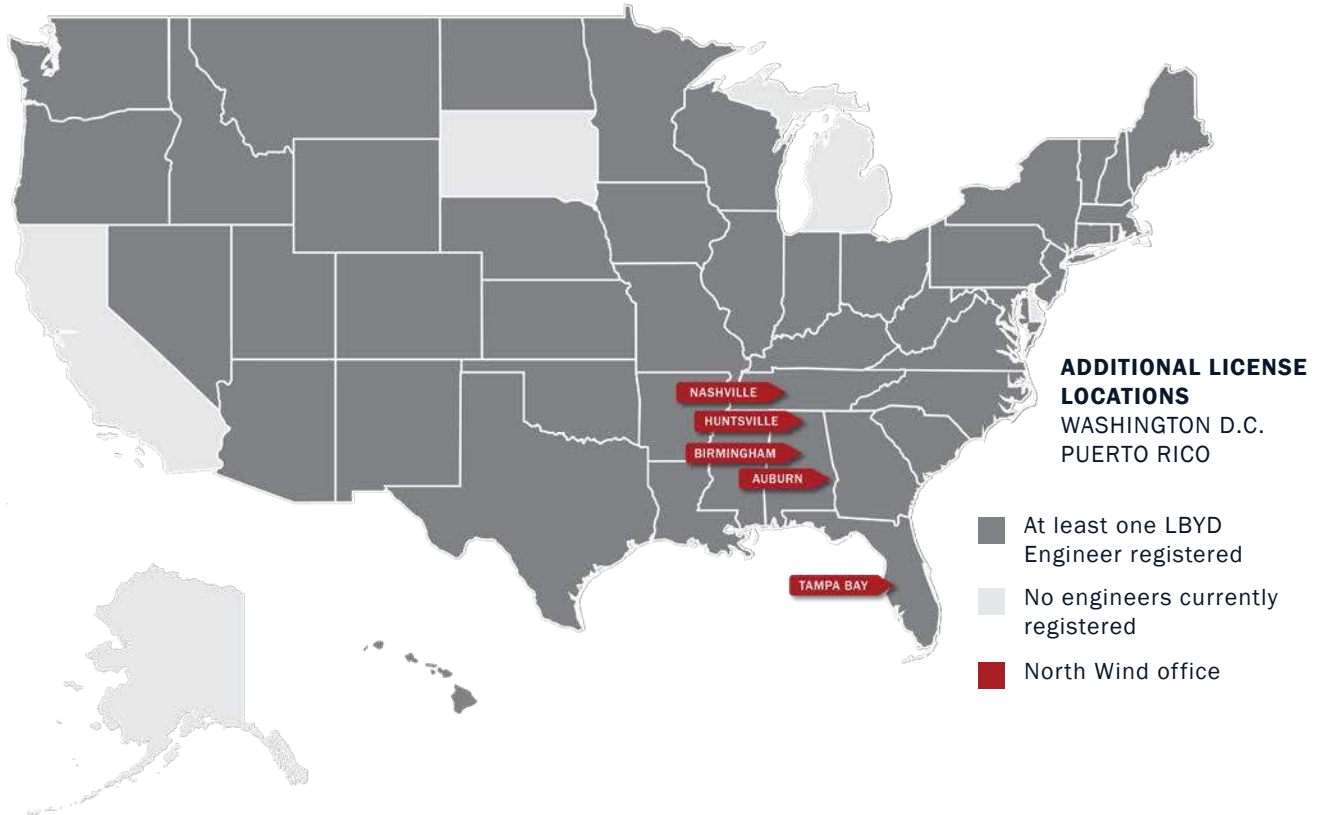
LBYP is a leader in the design of parking facilities in the Southeast. We have designed parking facilities for federal facilities, government facilities, institutional facilities, office buildings, churches, hospitals, mixed-use facilities, commercial buildings, and residential buildings.

SUSTAINABLE DESIGN

LBYP is a Founding Member of the Alabama Chapter of U.S. Green Building Council. We have designed many facilities that have earned LEED certifications.

LICENSED LOCATIONS

LBYD has engineers currently registered in multiple states across the country, but we are continually expanding our licensure as needed.



LEADERSHIP



BRAD CHRISTOPHER, PE PRESIDENT / SENIOR PRINCIPAL ENGINEER

Brad Christopher is the President & General Manager of LBYD, Inc. and Engineering Group President. He graduated from Auburn University where he received his Bachelor's and Master of Science degrees in Civil Engineering. Brad has over 30 years of design experience covering new construction, renovation, and additions to existing structures for institutional, athletic, commercial, municipal, and industrial uses. He is registered as a professional engineer in 10 states.

Brad is an active member of the Auburn University Engineering Alumni Council, the American Concrete Institute, the International Code Council, Inc., and the Structural Engineers Association of Alabama. He has also served on the Board of Directors for the Structural Engineers Association of Alabama, and Auburn University Civil Engineering Advisory Board, and annually assists with the senior civil engineering design class at Auburn University. Brad has authored three articles for Structure Magazine on economical concrete construction.





STRUCTURAL ENGINEERING

LBYD Engineers has provided structural engineering design services for projects with various functions, users, and owners, generating a diversified portfolio of experience. Our structural engineers are knowledgeable in the development of different framing schemes and foundation designs using a wide variety of construction materials for determining the most economical and constructible structural systems.

Our engineers also conduct studies and provide reports including, but not limited to, consultation on code requirements and earthquake risks. This experience is utilized in all aspects of design and construction including new construction, renovations, additions to existing structures, and the preservation of national historic landmarks. LBYD Engineers has provided structural design services for an array of types including single- and multi-family residences, churches, office buildings, hospitals, financial institutions, industrial facilities, educational facilities, theaters, parking garages, special structures, sports stadiums, retail centers, and government/military facilities.

BUILDING DESIGN

Building Design is one of the most common tasks that LBYD is involved with. Providing an economical structural building design to support gravity and lateral loads while fitting in with the architecture of the building is the goal. LBYD has experience in designing all sizes of buildings out of many types of materials, including concrete, steel, wood, masonry, precast and light gauge steel.

CHANNELSIDE DISTRICT

TAMPA, FLORIDA

This project will consist of a new residential development in downtown Tampa, Florida. The development will consist of a new 21-story residential tower, 12 stacked townhomes, and a 7-story parking deck with 474 parking spaces. The 21-story tower will consist of concrete post-tensioned flat plate slabs supported by concrete columns. The townhomes will be framed out of wood. The parking deck will be made up of precast concrete.



AUBURN UNIVERSITY ADVANCED STRUCTURAL ENGINEERING LABORATORY

AUBURN, ALABAMA

At 41,500 SF, the Advanced Structural Testing Lab provides state-of-the-art engineering testing capabilities using the most modern structural testing equipment in the world. The facility includes a high bay test lab, a concrete test lab, and an administrative area.



PLASTICAL

SYLACAUGA, ALABAMA

This facility consists of a new state-of-the-art 60,000 SF mineral/polyolefin compounding plant. LBYD designed platforms for machinery, the foundation for the rail scale and the finished good structures, as well as the installation of the railway from a civil aspect. Many of the moment connections were also designed in-house. All structures were designed with expandability in mind.

STRUCTURAL SYSTEM STUDY

Determining the most economical structural system is a very important part of a project. The structural system can determine whether or not a project is within budget or not. LBYD engineers have a wide range of experience of studying many types of structural systems at the beginning of the project, factoring in items such as column free spaces, head room, structural depth, constructability, deflection, vibration resistance, and cost per square foot. Designing a typical bay of structure out of several different types of materials for contract pricing early in a project is common.

AUBURN UNIVERSITY AT MONTGOMERY P-40 PLACE RESIDENCE HALL

MONTGOMERY, ALABAMA

The New Residence Hall is a dormitory that will provide student housing at Auburn University at Montgomery. Design of the new facility began in early 2015 with construction scheduled for completion in mid-July 2016 in order to accept students for the 2016 fall semester. LBYD, Inc. provided both civil and structural engineering services on the job. The facility is a four-story building with flat slab, post-tensioned floor system, concrete columns, and concrete shear walls. The building geometry is very distinctive, incorporating design aspects including large overhangs, diverging column lines, and shifting slab edges from level to level making each floor unique. Given the grade relief, a basement mechanical room was included as part of the project. As part of new requirements in the state of Alabama, a storm shelter was also incorporated into the design to protect the residents in the event of severe storms, particularly tornadoes. LBYD, Inc. was the structural engineer of record on the job and designed all aspects of the structural system.



As structural engineers, we were tasked in designing a structural system that was efficient and cost effective. The owner expressed early in the design process the desire to complete the project in a time frame that would allow it to be move-in ready for the fall semester of 2016, which allotted a very short window for design in order to allow for the required construction time.

The first challenge encountered was the unique geometry of the building. No two floors were alike and the skewed angles and diverging column lines were such that traditional analysis would have been difficult and time consuming. RAM Concept allowed us to design the post-tensioned slab efficiently and in such a manner as to ensure that all portions of the slab were accounted for based on the unique geometry, as well as determining the most efficient tendon placement for each level. Once the building was modeled, it also made the construction administration phase of the project faster as designed situations were able to be modified to reflect actual infield conditions. This made reanalysis of specific aspects time efficient and provided the contractor answers in so that construction could continue.

BRIDGE DESIGN

Vehicular Bridges

LBYD has experience in both steel and concrete vehicular bridge design. Precast concrete, such as double tees or AASHTO girders, are common. Concrete slab on steel beams are used as well. LBYD has experience with department of transportation standards and with AASHTO design standards. Designing abutments and foundations for vehicular bridges is part of LBYD's experience as well.

Pedestrian Bridges

LBYD also has experience with pedestrian bridges, both pre-fabricated/pre-engineered bridges and conventional ones. Wood, steel, and concrete are some of the materials LBYD has designed with. Shallow and deep foundation design for support of the bridges can be performed as well.

BARBER MOTORSPORTS PEDESTRIAN BRIDGE

BIRMINGHAM, ALABAMA

This pedestrian bridge, totaling 450 feet long and 12 feet wide, begins at the back of the existing Barber Museum and extends into the race track infield. The structural design for the bridge consisted of reinforced concrete foundations, substructure supports, and reinforced concrete patios at both ends of the bridge.



HUSKY PARKWAY BRIDGE

TRUSSVILLE, ALABAMA

This project consisted of adding a new $\pm 300'$ long bridge to allow for a connection between two major roadways in Trussville (Trussville-Clay Road and Deerfoot Parkway) to provide a secondary means of access to the high school and to reduce traffic on I-59. This bridge will also allow pedestrian/bicycle/golf cart traffic along the roadway from the high school to the field house and new football stadium. Additional turn lanes and traffic signals will be added to Trussville-Clay Road to improve traffic flow in the area.

STRUCTURAL EVALUATION

LBYD has ample experience evaluating existing structures. Structural evaluations may involve checking an existing structure for vertical or horizontal expansion or analyzing a specific area for new loading. New loading could include changing the use of a building (using a different, heavier live load) or installing new mechanical equipment. Determining where to cut new floor or door openings is commonplace, too. LBYD engineers are trained to take field measurements of existing structures, make reasonable assumptions based on the history of the structure, and calculate capacities of even the oldest structures.

16TH STREET BAPTIST CHURCH RENOVATION

BIRMINGHAM, ALABAMA

LBYD provided structural engineering services for the renovation and restoration of the historic 16th Street Baptist Church. The two phase project involved the renovation and restoration of the Sanctuary, administration building and parsonage. These renovations were completed without compromising the integrity of the existing building.

Phase I of the project included the evaluation of the existing building and recommendations to ensure water tightness of the structure and its integrity. Items addressed included water seepage through the basement walls, cracks in the masonry walls and cracked and decayed parapets.

Phase II consisted of the consulting services related to the above grade condition of the building including masonry walls and lintel cracks, elevator guide rail anchorage, roof joist bearing conditions and bell tower roof framing decay.



AUBURN UNIVERSITY JORDAN-HARE STADIUM ANNUAL STRUCTURAL REVIEW

AUBURN, ALABAMA

LBYD has conducted annual structural reviews of Jordan-Hare Stadium for over 15 years. The purpose of these reviews is to observe the condition of the stadium from a structural integrity standpoint. These reviews often lead to structural repairs to the stadium. The repairs often included concrete repairs, reinforcing existing steel beams, painting, etc.

SEISMIC DESIGN

LBYD has completed projects across the United States resulting in vast experience designing for high seismic forces. The design of a building to resist seismic loads is substantially different from designing for wind loads. The resulting forces from an earthquake often require the building to resist large deformations and strains to dissipate the energy associated with an earthquake. Special framing and foundation considerations are often required to dissipate this energy.

Many parameters have to be considered when designing a building to resist seismic forces. These include not only the building's geographic location, but other parameters such as:

- Applicable building code
- Proximity of site to nearby faults
- Soil conditions on which the building is sited
- Cladding of the building
- Occupancy and use of the building
- Building framing

LBYD evaluates buildings per the standard ASCE/SEI 41 "Seismic Evaluation and Retrofit of Existing Buildings" to identify any deficient items in the seismic force resisting system. Any deficient items identified are upgraded to a minimum threshold per ASCE 41 and based on occupancy requirements, while additional voluntary seismic improvements may be undertaken at the discretion of the building owner based on information and guidance provided by LBYD.



UAB HEALTH SERVICES FOUNDATION - KIRKLIN CLINIC

BIRMINGHAM, ALABAMA

This facility is a three-story, 82,000 SF structure that includes Radiation Oncology, Infusion, Pharmacy, Diagnostic Imaging, education/meeting rooms, café and office space. The Kirklin Cancer Center is located in a high seismic area, requiring specially detailed seismic moment resisting frames. Foundations were designed using Geopier rammed aggregate piers.



ENCOMPASS HEALTH (FORMERLY HEALTHSOUTH) REHABILITATION HOSPITAL

YUMA, ARIZONA

Projects located in the western United States are more likely to be near faults. The proximity of a building to a known fault greatly affects the structural design of the project. This 40-bed, 40,000 SF rehabilitation hospital in Yuma, Arizona is only 34 miles from the California Imperial Fault that extends from Southern California into Mexico. The seismic loads for this project required additional bracing of the steel frame and drag struts to dissipate the seismic forces. Column baseplates had to be configured with shear tabs to transmit forces. Column baseplates had to be configured with shear tabs to transmit forces in the steel frame into the foundations. This project was designed using the Uniform Building Code and is located in the Seismic Zone 4, the most intense seismic zone found in the Uniform Building Code.

HISTORICAL RESTORATION

LBYP has over 47 years of design experience related to the renovations of existing buildings and has become familiar with and understands the need for innovation and creativity in the design of renovation projects. Property values and space limitations often present unique challenges to structural engineers. Many times, LBYP has been presented with these challenges and has found innovative options and designed creative solutions to overcome obstacles seen by many. Historic structures often need to be preserved for posterity.

At the same time, it is not uncommon for new space to be generated for new uses at the expense of historic structures. LBYP is well attuned to such conflicts of preserving the past and meeting the needs of the future. LBYP has worked to preserve buildings and structures such as the ADAL Air University Library, Sixteenth Street Baptist Church, the McWane Center, and Sloss Furnaces. Other examples of past meeting future include the preservation and additions to the Independent Presbyterian Church, John Hand Building, Pizitz Building, and other similar structures destined for new or expanded uses.

PIZITZ BUILDING

BIRMINGHAM, ALABAMA

This project consists of approximately 235,000 SF of renovated retail, office and residential space of the historic Pizitz Building, originally constructed in 1923. Also included are 11,000 SF of new construction including the refurbishing of a 600-space parking deck. The building includes a Food Hall on the bottom floor. The renovation was performed in accordance with National Park Service guidelines to secure Historic Preservation Certification.



OLD FEDERAL RESERVE BANK OF AMERICA RENOVATION

BIRMINGHAM, ALABAMA

The building is the existing Federal Reserve Bank of Atlanta – Birmingham Branch. It was built in the 1920s, and an annex was built in the 1950s. Both structures were renovated to become office space with a restaurant on the ground floor of the annex building. It included analysis of the existing structure for new occupancy loading, infill of existing openings, framing for new openings in the floors and walls, removal of ramps and walls, new stairs, new mechanical equipment on the annex roof, replacement of the existing bank roof, and support for new stonework at the bank entrance.



STORM SHELTER DESIGN

LBYD Engineers has experience designing community “safe rooms” within schools and other structures to withstand loading from tornadoes. These safe rooms are designed according to ICC 500-2008, ICC / NSSA Standard for the Design and Construction of Storm Shelters, which was adopted in 2010 by the State of Alabama to require safe rooms for all new K-12 school construction. LBYD Engineers has also performed numerous peer reviews of the community safe room designs of other engineers, which is required by the ICC 500-2008 Code for typical school safe rooms. LBYD is a member of NSSA, the National Storm Shelter Association, which collaborated with the International Code Council to issue standard safe room shelter requirements to resist hurricane and tornado loadings.

In accordance with the International Building Code (IBC), 2018 Edition, most K-12 educational and emergency operation facilities will require a storm shelter if they are located in a 250-mph tornado wind speed zone. With this most recent code change, many more projects will require design teams that are capable of designing and administering the construction associated with storm shelters. Owners will need to be educated as to the cost increases associated with storm shelter construction, as well as their responsibilities associated with operating and maintaining the shelter during the building’s lifespan. Contractors need to become familiar with the requirements for constructing storm shelters.

The process for designing storm shelters is complex and requires all parties to be involved. Architects and engineers need to determine where the storm shelter is best suited to be located inside a building. This requires understanding the size and loading associated with the shelter. Engineers need to determine the best structure type to resist the extreme loads associated with the storm. Architects and engineers also need to determine the operational requirements for the shelter, including ingress/egress, bathrooms, ventilation, and emergency power. Owners must provide input on how they plan on operating the shelter during a storm event. They must also be involved in maintaining the shelter during the building’s lifespan. The design ultimately is peer reviewed by third-party architects/engineers to determine if it meets the code requirements. Similarly, there are additional contractor responsibilities and inspections during construction to ensure the shelter is built in accordance with the design.

In designing storm shelters for 10+ years in the State of Alabama, LBYD has developed invaluable experience. LBYD has designed storm shelters of all different types utilizing multiple structural systems. LBYD has partnered with many trade partners on both the design and construction of storm shelters. LBYD wants to continue to develop relationships and educate others on the importance of storm shelters in local communities. We look forward to working with new clients as the IBC requirements will apply to the development of additional storm shelters in other parts of the country.



AUBURN HIGH SCHOOL

AUBURN, ALABAMA

This project consists of a new 340,000 SF high school with associated parking, three storm shelters, two football practice fields, a 60-yard football practice field, a 400-meter track for track & field events, a baseball field, a softball field, a band practice field, and six tennis courts. The associated parking consists of a several new parking lots with a total of 1,040 parking spaces. The total site is 101 acres.



SPARKMAN HIGH SCHOOL

HARVEST, ALABAMA

This project consisted of an 80,000 SF performing arts addition to the existing Sparkman High School. The performing arts building consists of a 14,300 SF auditorium with an 800-seat audience capacity. It houses a 3,200 SF storm shelter, 6,100 SF band room, art classes, and five classrooms. The addition also includes a glass-enclosed, air-conditioned 3,300 SF pedestrian bridge, connecting the junior high school to the high school.

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