



UNT College of **ENGINEERING**

Senior Design Day 2018



Department of
ENGINEERING
TECHNOLOGY



CONSTRUCTION ENGINEERING TECHNOLOGY

The STARHOUSE

Team Members:

- Chasin Allen
- Lorne Glenn
- Jacob Bimbi
- John Sakwa

External Sponsors/Mentors:

- Rogers-O'Brien

Internal Sponsors/Mentors:

- Dr. Zhenhua Huang

Abstract:

Purpose Construction, LLC is a group composed of the members John Sakwa, Jacob Bimbi, Chasin Allen, and Lorne Glenn. We have been tasked with working under Rogers-O'Brien to tackle different phases of the construction process. Over the course of several months we have come together to use our construction and engineering skills to deliver a quality and efficient project that will serve Frisco for years to come.

Rogers-O'Brien will be building a 17 story multi-family high rise to share the Frisco skyline with the Omni Frisco and the Ford Center. This structure will house over 150 residents and will include parking, a pool, and engaging amenities for all. The building has over 270,000 sqft of floor space to accommodate for a vast array of unit types.

With the help of Dave Parante, Preconstruction Manager of Rogers-O'Brien, we were able to exercise our skills and talents to make a name for ourselves in our future work industry.



Texas Scottish Rite North Campus Playground Addition

Team Members:

- John Barton
- Phillip McDavid
- Kevin Oates
- Christopher Campbell

External Sponsors/Mentors:

- John Raner
- Andrea Miille

Internal Sponsors/Mentors:

- Dr. Zhenhua Huang

Abstract:

The scope of this proposed project includes the construction of a restroom pavilion, a picnic pavilion, and a wood bench/feature. The construction would take place adjacent to an active playground on the grounds of the Texas Scottish Rite North Campus in Frisco, Texas.

In planning the construction of the proposed project, G2C created a report including an overview of the company business plan along with a comprehensive safety plan. G2C also reviewed the site logistics and layout, performed a cost estimate, created a schedule, performed a risk analysis, and wrote a value engineering proposal. Our budget for this project is approximately \$500,000.

G2C collaborated with TDIndustries through email and on-site visits to discuss and review the materials prepared for the proposed project. With the assistance of TDIndustries we believe that if the proposed playground additions were to be made, G2C would be successful at delivering the project on time and on budget.



UNT Health Science Center Interdisciplinary Research Building

Team Members:

- Hunter Rose
- Juan Lopez
- Cole Cowden
- Austin Anderson

External Sponsors/Mentors:

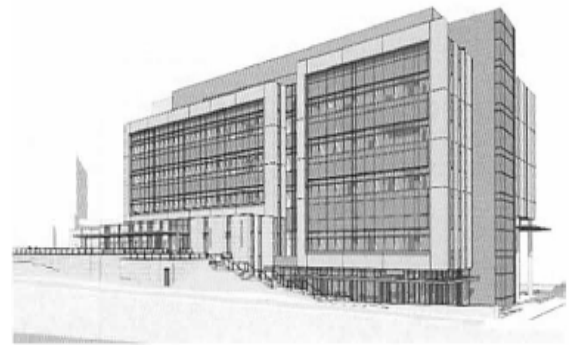
- Vaughn Construction
- Steve Hatcher

Internal Sponsors/Mentors:

- Dr. Cheng Yu

Abstract:

The UNT Health Science Center Interdisciplinary Research Building is located in Fort Worth, Texas at the intersection of Camp Bowie Boulevard and Clifton Street. In the cultural district within walking distance of Kimball Art Museum, Modern Art Museum, and the West 7th shopping and dining center. The project itself is a joint venture between Texas Christian University and The University of North Texas, and will serve as a research and learning center. It will house the North Texas Eye Research Institute, the Institute for Molecular Diagnostic and Therapeutic Development, and the University of North Texas System College of Pharmacy. The project itself is worth \$93 million with a two year time frame for completion, Vaughn Construction broke ground October of 2016 and are scheduled to complete November of 2018. The building will house classrooms, teaching laboratories, seminar rooms, and wet and dry research laboratories. The group will concentrate on the 5th level, which consist of 4 laboratories and with a variety of over 30 offices, break rooms and work space. Emphasizing on the a schedule, budget, take-offs, safety plan, risks analysis and logistics along with other tasks needed to complete a construction project.





US Highway 380 Improvement

Team Members:

- Aniceto Espinoza
- Rodolfo Corral
- Crystal Hernandez
- Cesar Sanchez

External Sponsors/Mentors:

- Coppell Construction Co., Inc

Internal Sponsors/Mentors:

- Dr. Cheng Yu

Abstract:

On July 11, 2017, TXDOT awarded Coppell Construction Company Inc. a contract worth \$3,268,105.61. The name of the project is US Highway 380 improvement. It is located in Wise County. The scope of the project includes replacing East Bound bridge deck, overlaying West Bound bridge deck, bridge repair, pavement reconstruction, and pavement markings. The bridge is 1162 feet long. It passes over BNSF railway and FM 730 through Old Greenwood Road. The project has three different phases as follows. Phase 1 is reconstruction of East Bound bridge deck, Phase 2 is overlaying West Bound bridge deck with polymer, and Phase 3 is final stripping and clean-up. The duration of the project is 235 working days. The estimated completion date is January 15, 2019. ARCC construction will concentrate on the schedule, budget, estimates, safety plan, risks analysis, and logistics along with other tasks needed to complete a construction project.



UNT Residence Hall 2018

Team Members:

- Zachary Canales
- Dawson Guerrettaz
- Abdul Olisa
- Jose Sandoval

External Sponsors/Mentors:

- Vaughn Construction
- Andrew Thompson

Internal Sponsors/Mentors:

- Dr. Aloysius Attah

Abstract:

Vaughn Construction is not an ordinary -construction company. It focuses on the whole construction process on any project that the company focuses on. They take control of construction projects from start to finish. Vaughn Construction has taken on the project of the 2019 residence hall and tour center. It was started during fall 2017 and is expected to be completed by spring of 2019. This project will include a 120,000 SF residence hall with 500 beds. Along with a separate 22,000 SF tour center building which will host prospective students and parents as they visit and tour the campus as they decide if UNT is the right college for them to pursue a successful career. New Campus Solutions will focus on the schedule, budget, estimates, safety plan, risks analysis, value analysis, sustainability, and logistics.



I-30 Bridge Replacement & Road Improvements

Team Members:

- Antonio Guajardo
- Brooke Reed
- Patrick Black
- William Burgess

External Sponsors/Mentors:

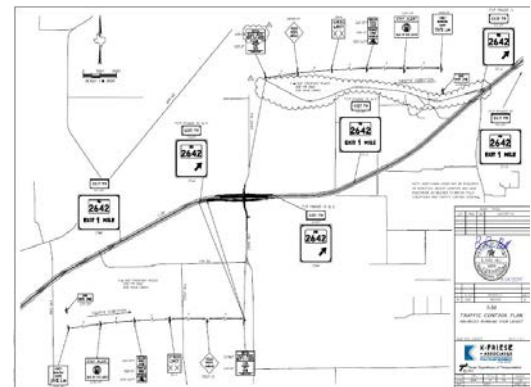
- Austin Bridge & Road
- Lee Pelton

Internal Sponsors/Mentors:

- Dr. Aloysius Attah

Abstract:

The project specifications and contract plans call for the replacement of a bridge and surrounding roads on State Highway 30 at the intersection of FM 2642 in Hunt County. The details supplied by TxDOT require us to install new on-ramps and exit-ramps, and to tear out the existing bridge assembly, frontage roads, main lanes of I-30, and the FM 2642. We are then instructed to install new concrete pavement and asphalt pavement over these road sections. Our team will be working with Austin Bridge and Road, and Lee Pelton with Austin will be our sponsor. Our project team has created the company, "Texas Roadworks", for this project, and Texas Roadworks will be our team name for the project. Texas Roadworks will be creating a project plan that implements all of the lessons and content that we have learned while attending the Construction Engineering Technology (CNET) program. In this project plan, we will be discussing the logistics, schedule, budget, risks, business plan, safety, market analysis, sustainability analysis and value analysis.



Plano East Senior High School Addition

Team Members:

- Michael Garza
- Moses Midence
- Esther Valero
- Shayn Kaysing

External Sponsors/Mentors:

- Cadence McShane Construction

Internal Sponsors/Mentors:

- Dr. Aloysius Attah

Abstract:

Our senior design project is the Plano East Senior High School Classroom Addition located in Plano, TX. Our project includes the new construction of 24 classrooms, 14 of which will be enclosed by concrete masonry units (CMU's) and serve as a Tornado/Severe weather shelter for that addition of the school. The first level will have 11 classrooms and will be able to hold a total of 291 occupants. The second level will have 12 classrooms holding 268 occupants. It will feature an assembly area complete with presentation area that is capable of holding an additional 127 occupants for a grand total of 686 occupants between the two levels.



The Tornado/Severe weather shelter area is part of the 2015 International Building Code Group E, Section 423.4. Normally, the International Code Council's 500 gives construction requirements and designs for a "safe room" during severe weather. The IBC's latest version now specifically mandates that areas where wind speeds can reach up to 250 MPH are required to have this shelter. This is a huge step in keeping the students and faculty safe during events that can frequent the North Texas area. The campus will also be able to enjoy a new walking path that will run between an existing pond on the South side of the campus and join at the steps of an existing building as well.

Our project team is tasked with creating a project report that aligns with the design project. The sections covered will include: Logistics and Layout, Budget, Schedule, Sustainability, Value Analysis, Risk Assessment, Safety Plan, Business Plan, and Computer Modeling program such as BIM.