



UNT College of ENGINEERING

Senior Design Day 2021



Department of
MECHANICAL
ENGINEERING

Senior Design Day 2021



CONSTRUCTION ENGINEERING TECHNOLOGY

Senior Design Day 2021



Kimball Office – Ground-up Office Building

A-To-Z Construction

Team Members:

- Connor Wisner
- Jasmine Linton
- Edgar Sierra
- Juan Lara Mejia
- Robert Allen

External Sponsors/Mentors:

- Ridgemont Commercial Construction
- Greg Graham – Senior Project Manager
- Sam Heath - Project Engineer

Internal Sponsors/Mentors:

- Cheng Yu, Ph.D., P.E.

Abstract:

A-To-Z Construction is a medium sized roofing company that has been operating in the DFW area for roughly 5 years. Though they began their business doing residential roofs, they now only do commercial roofing. Medici Development Partners has partnered with Ridgemont Construction to build the Kimball Office project. The site is located at 2102 E. State Highway 114 in Southlake Texas. A-To-Z Construction is currently assigned a \$600,000 contract from Ridgemont to construct the roofing scope of the Kimball Office project that is currently underway. This building will contain several office spaces along with a lounge and a restaurant. There will also be outdoor and indoor seating throughout the building for the enjoyment of its occupants. The parking for the building will be inside a parking garage that will be adjacent to the property. They will be compiling a series of documents for this project including cost estimates, schedules, logistics and layout plans, a business plan, a safety plan, and will also be performing important project management tasks such as a sustainability assessment, a risk assessment and a value analysis. The projected completion date is set for June 2021. The roofing scope will be completed in phases to accommodate the size and location of the jobsite.



Lake Arlington Raw Water Pump Station

Team Members:

- Edward Medina
- Mathew North
- Alfredo Soto
- Adam Mariam
- Xavier Tapia

External Sponsors/Mentors:

- Jeffrey Kendal – Archer Western
- Asa Kinder – Archer Western

Internal Sponsors/Mentors:

- Rashidyan Saman, Ph.D., PMP

Abstract:

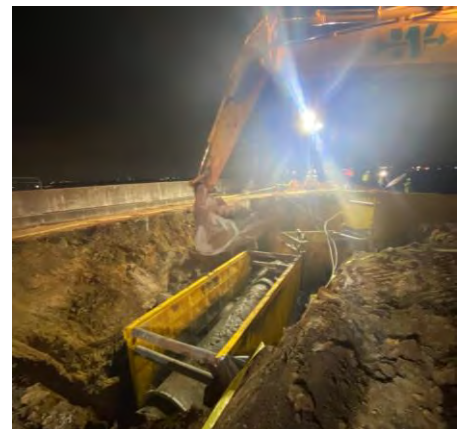
The Lake Arlington Raw Water Pump Station Improvements project includes the installment of about 400 LF of 60" steel pipe & 40LF of 30" steel pipe for TRA. It also includes the construction of a Meter Vault for Pierce Burch Water Treatment Plant to analyze the flow of water through 20 LF of new 54" pipe along with a magnetic flow meter for the City of Arlington.

EMAAX Construction Co. is to develop a site-specific safety & logistics plan to prepare and plan for the crowd of workers that will be present during specific shutdown periods. EMAAX is to build and track an accurate estimate & schedule to communicate between the two owners of the project which include TRA – Trinity River Authority & CoA – City of ARLINGTON.

EMAAX will also ensure QA/QC is to standards with the help of BIM to further analyze the pipeline project and dissect joint to joint to foresee any issues with existing utilities or duct banks or any natural barriers that will pose a difficulty when laying the 60" pipe.

EMAAX hopes to accomplish the mentioned by utilizing the most that BIM can offer to ensure successful project results.

EMAAX appreciates the help that our sponsors from Archer Western made during these difficult times as well as our UNT faculty sponsors for guiding us through our college experience.





Summit Climbing Gym – SDG3

Team Members:

- Hayden Whatley
- Rachel Olson
- Dillon Pruitt
- Preston Rush
- Breanna Van Den Heuvel

External Sponsors/Mentors:

- Matt Teagarden – Ridgemont Commercial
- Connor Hurd – Ridgemont Commercial

Internal Sponsors/Mentors:

- Aloysius A. Attah, Ph.D., P.E.

Abstract:

Ridgemont Commercial Construction has partnered with Summit Climbing Gym to help with the construction of a new facility located in Grapevine Texas. This 20,000 square foot prefabricated metal building located just west of the DFW Airport will be the site where many patrons can learn how to climb, bolder, and participate in yoga along with other physical activities. This Design-Build contract between Ridgemont Commercial and Summit Climbing Gym is a fast-moving construction project, expecting to take only a short 10 months to complete and with an overall budget of only \$7 million. Ridgemont Commercial and SDG3 Construction from the University of North Texas have paired up to assist in the planning and coordination of the 28 various subcontractors selected for this project. SDG3 will be tasked with scheduling subcontractors, budgeting, quality control, developing a sight logistic plan, and a safety plan. SDG3 will also assist in a value engineering and sustainability assessment to find and establish recommended alternatives to materials and equipment for this project. Building Information Modeling (BIM) benefits will be outlined along with potential LEED benefits.



Special thanks to the Construction Engineering Technology faculty for continued guidance, and Ridgemont Commercial for the opportunity to work with them on this project.



The Bell Tower - UNT Campus Frisco JAMS Construction

Team Members:

- Abdalla Samir Aldhurais
- Abdallah Barbakh
- Jonathan Scruggs
- Juan Ayulo
- Mansoor Alsharif

External Sponsors/Mentors:

Mr. Mark Allen - Project Manager - Vaughn
Construction

Internal Sponsors/Mentors:

Zenhua Huang, Ph.D., P.E.

Abstract:

Vaughn Construction has been awarded the project to manage at-risk - with guaranteed maximum price - the infrastructure, first building, paving, and the construction of the bell tower for the University of North Texas in their Campus in Frisco. The project will be performed by about 80 subcontractors by the substantial completion date on November 29, 2022.

JAMS Construction has partnered with Vaughn Construction to perform project management duties that includes site logistics development plan, a business plan, risk assessment and value analysis, a schedule of project activities, and a comprehensive safety and health plan of the Bell Tower at UNT Campus in Frisco located on 12995 Preston Street. The construction of the Bell Tower will include activities such as concrete foundation, steel structure, masonry, sheathing, waterproofing, and electrical work. The limestone-decorated Bell Tower extends in height to 122'-6" and includes a 13'-4" wide UNT sign, a 12' wide sign of the Bell Tower, and UNT logo fitted on a framed channel glass system.



Special thanks to the College of Engineering alongside the Department of Mechanical Engineering and Vaughn Construction Company.



Gaylord III Lone Star Construction

Team Members:

Jacob Flores, Jesus Delgado,
Tyler Cox, Gilberto Arvizu,
and Christopher Escobar.

External Sponsors/Mentors:

TX-Morrow Construction, INC.
Breck Landry (APM)

Internal Sponsors/Mentors:

Aloysius A. Attah, Ph.D., P.E.

Abstract:

Lone Star Construction is in a partnership with Breck Landry, the Assistant Project Manager for TX-Morrow Construction. The tasks for our company included specifying, planning, and performing management analysis for the precast parking garage on the Gaylord III project. The location of this project is in Frisco, Texas off of State HW 121 and Ohio Dr. Gaylord III will be right next to Gaylord I and II, creating a community feeling. The parking garage will be composed of five floor levels including a pool and fitness center on the amenity deck. The size of the garage is a total of 34,596 sqft and will include 470 parking spaces. The expected completion date for Gaylord III is November 2021.



Special thanks to the College of Engineering, the professors within Construction Engineering Technology program, TX-Morrow Construction, and Breck Landry.

UNT Discovery Park MEP Upgrade

Goodfellas Construction Company

Team Members:

- Esteban Almeida
- Jimmy Castro
- Byron Choate
- Jonathan Rich

External Sponsors/Mentors:

Logan Harper - Project Manager at
TDIndustries
Obi Nweke - Assistant Project Manager at
TDIndustries

Internal Sponsors/Mentors:

Aloysius A. Attah, Ph.D., P.E.

Abstract:

Our team, Goodfellas Construction Company, partnered with TDIndustries to work on our beloved Discovery Park. This project is located at 3940 N Elm St Denton, Tx 76207. With the continued growth of the College of Engineering but an outdated building, it was time for some MEP upgrades to handle the capacity for now and the future. The work consists of replacing the existing MEP systems. The estimated project completion date is in 2022.

For such a complex project, TDIndustries was chosen as the subcontractor to SpawGlass and is responsible for the Mechanical and Plumbing. Due to its size, the project has been segmented by wings. Our focus was on Wing F. Logan Harper, our sponsor, tasked us with the scope of mechanical demolition and replacement, and the installation of the new Air Handling Units. This project will help provide a more energy-efficient and sustainable environment for the next 25 years.

Due to the uniqueness of this being an active job site, students/staff are always present.

Goodfellas Construction was tasked to develop a site logistics plan, schedule, budget, quality control plan, and a safety plan for this project. Our company will also develop a construction and management plan that will entail budget, value analysis, and the integration of BIM.



Special thanks to the College of Engineering, Department of Mechanical Engineering, TDIndustries, and all the professors involved with the Construction Engineering Technology program.
Go Mean Green!



UNT Discovery Park MEP Upgrades Scrappy Construction

Team Members:

- Ernesto Torres Jr
- Jordan Nevil
- Robert Reynolds
- Anu Kafle

Scrappy Construction

External Sponsors/Mentors:

- Austin Christensen – Project Manager – SpawGlass Contractors Inc

Internal Sponsors/Mentors:

- Aloysius A. Attah, Ph.D., P.E.

Abstract:

Scrappy Construction is working closely with our mentor Austin Christensen, the Project Manager for SpawGlass Contractors Inc, with SpawGlass' project UNT Discovery Park MEP Upgrades located at the UNT Discovery Park campus. SpawGlass won the project with a Guaranteed Maximum Price (GMP) bid of \$15,080,000 and a 24-month substantial completion timeline. SpawGlass Notice to Proceed (NTP) construction date was 10/16/20. The project work consists of adding upgrades to the mechanical systems in Wing E, Wing F, and the Central Utility Plant. Along with this, SpawGlass is tasked with redesigning the Central Utility Plant to improve both its operation and better control of airflow within Wing E and Wing F. Lastly, this project is tasked with adding a new direct digital controls (DDC) system for all the new equipment. This project is seeking to improve and add upgrades to Discovery Park that will result in energy savings.

Throughout our time with SpawGlass, Scrappy Construction has visited the site and held several meetings with our mentor to show us the ins and outs of the project. Through visits and conversations, we will see the fundamentals of a construction project come together outside of the classroom.





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