College of Engineering

R&D Expo

University of North Texas

SENIOR DESIGN

Spring 2026

COLLEGE OF ENGINEERING
Department of Mechanical Engineering

CONSTRUCTION ENGINEERING TECHNOLOGY
Senior Design Abstracts
Spring 2026

UNT Lovelace Clubhouse

Team Members

Matthew Rosenbalm
Derrick Lee
Collins Chio
Haider Ali

External Sponsors/Mentors

Sponsor - Batson-Cook Texas LLC
Mentor - Finn Gosch

Internal Sponsors/Mentors

Dr. Al Attah
Dr. Kaur Kawalpreet

Abstract

Our senior design project focuses on the planning, design, and construction management of a new softball stadium clubhouse intended to enhance the athletic experience for both players and spectators. The facility is envisioned as a modern, functional space that supports team operations while complementing the aesthetics of the surrounding sports complex. The clubhouse will include locker rooms, showers, offices for coaches, team meeting rooms, restrooms, storage areas, and a small concession or lounge space. Designed with durable, low maintenance materials, the structure will blend architectural appeal with cost efficiency, ensuring long-term sustainability and ease of upkeep.
Grace Design Studio is overseeing an 8,000-square-foot project with a contract value of $5,475,566. Construction is scheduled to run from April 1, 2025, through February 11, 2026. Key milestones include building dry-in on October 9, 2025, OH inspection on November 6, 2025, and permanent power on November 27, 2025. The facility will feature a concrete foundation with steel structural components and a standing metal roof system with insulation and underlayment. This project is being developed in addition to the newly built softball stadium. Overall, the project is moving forward with a clear timeline and defined milestones. Its structure and design elements indicate strong planning for long-term performance.

Denton County I-35/Windsor Dr. Overpass Bridge (Bridges 15 & 16)

Team Members

Kyvonte Perkins
Amir Sharifisousa
Edwin Trejo Sanchez
Edgar Sanchez Castro

External Sponsors/Mentors

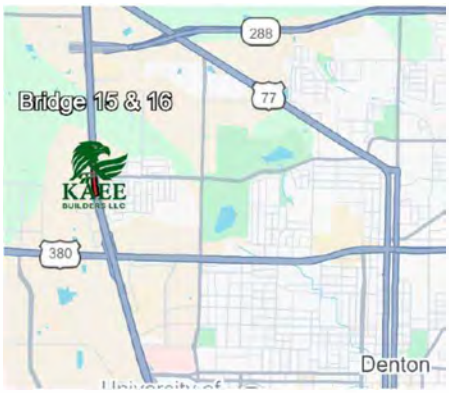
Sponsor: SEMA Construction
Mentor: Cole Hyun, National Scheduler

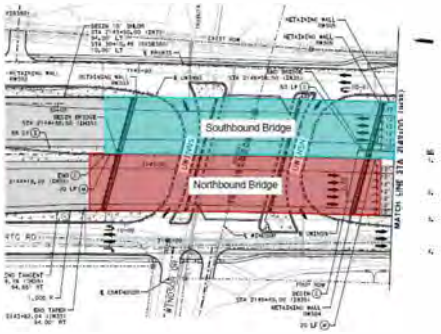
Internal Sponsors/Mentors

Professor: Dr. Aloysius Attah, P.E.
Faculty Advisor: Dr. Saman Rashidyan, P.E.

Abstract

Our senior design project is the I-35 Denton County Project, Bridges 15 & 16. Our senior design project will be creating the cost, schedule, logistics, safety, and sustainability for these 2 bridges out of a mega project in Denton County that plans to modernize and renovate all I-35. These 2 bridges will allow Windsor Rd to cross I-35 without needing to get into the interstate. The bridges will consist of 5 lanes going Northbound, and 4 lanes going Southbound.
The purpose of these bridges is to accommodate the growing population in Denton and the increasing number of travelers going through Interstate 35. The reason I-35 will go over Windsor is to allow future transportation to carry taller, bigger, and heavier vehicles such as Truckers carrying wind turbines. One of our biggest challenges is finding a solution to keep dirt from causing major issues on the highway during construction. Before the 2 bridges are open, they must be joined using robust engineering methods so they can act as 1 bridge and transfer energy between the two.





Irving Fire Station No. 8
Eagle Landing Construction

Team Members

Beterin Cabrera Corrales
Karen Velasquez Duron
Emma Williams
TJ Johnson

External Sponsors/Mentors

CORE Construction

Mentor: Madison Ampoe, APM

Internal Sponsors/Mentors

University of North Texas

Professor: Dr. Aloysius Attah
Faculty Advisor: Dr. Zhenhua Huang

Abstract

Irving Fire Station 8 is currently under construction by Eagle Landing Construction and is being delivered through a LEED-oriented Construction Manager at Risk (CMAR) contract valued at almost $16 million. The project consists of approximately 19,500 square feet and is designed as a two-story, five-bay fire station. In addition to the main facility, the scope includes the construction of a firefighting boathouse at Lake Carolyn. The project duration is 16 months, with substantial completion scheduled for May 13, 2026.

The project has encountered several technical and managerial challenges throughout its life cycle. Significant site-related issues stem from Irving's expansive clay soils, which are susceptible to shrinkage and swelling. To address these conditions, the foundation system incorporates 80-foot-deep concrete piers and a slab-on-void design, increasing both complexity and cost. Additional challenges include financial pressures resulting from unforeseen site conditions, coordination conflicts within mechanical, electrical, and plumbing (MEP) systems, discrepancies in construction documents, and change orders that place strain on project contingencies.

The Ownsby Apartments (Celina I & II) Located in Celina, Texas

Team Members

Drew McDonnell
Oliver Hernandez
Rodolfo Salas
Suleiman Abu-Suleiman

External Sponsors/Mentors

TX Morrow Construction (TXMC)
Breck Landry

Internal Sponsors/Mentors

Dr. Aloysius Attah, P.E.

Abstract

For this senior design project, Celina I & II (alternatively known as The Ownsby Apartments) is being developed under the sponsorship of TX Morrow Construction (TXMC) and the guidance of Breck Landry.

Celina I is the first phase of the development and consists of four buildings. This phase has been completed and includes a primary structure that houses the leasing office, amenities, a pool, and residential units. This is building 1000 and will be reflected in the scale model. Celina II consists of five additional buildings and is currently being constructed. In November 2025, excavation activities, formwork, and initial foundation reinforcement have begun. Upon our second site visit in January 2026 framing on many of the buildings had begun. Phase two has 377 total units and is 448,441 square feet.

A primary focus of this project is the design and construction of a detailed scale model representing the main building from phase one (Building 1000). The model includes architectural and structural elements, such as framing details and floor plans to showcase interior amenity finishes.

In parallel with model construction, the team observed and documented the construction activities on phase two. Construction operations such as staging areas, jobsite logistics, scheduling, and budgeting were evaluated. The observations and findings from both the model development and phase two construction progress were implemented into the report. Including sections on business plan, logistics and jobsite layout, budget analysis, schedule, value engineering, sustainability, safety, risk assessment, and scale model design/construction.

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