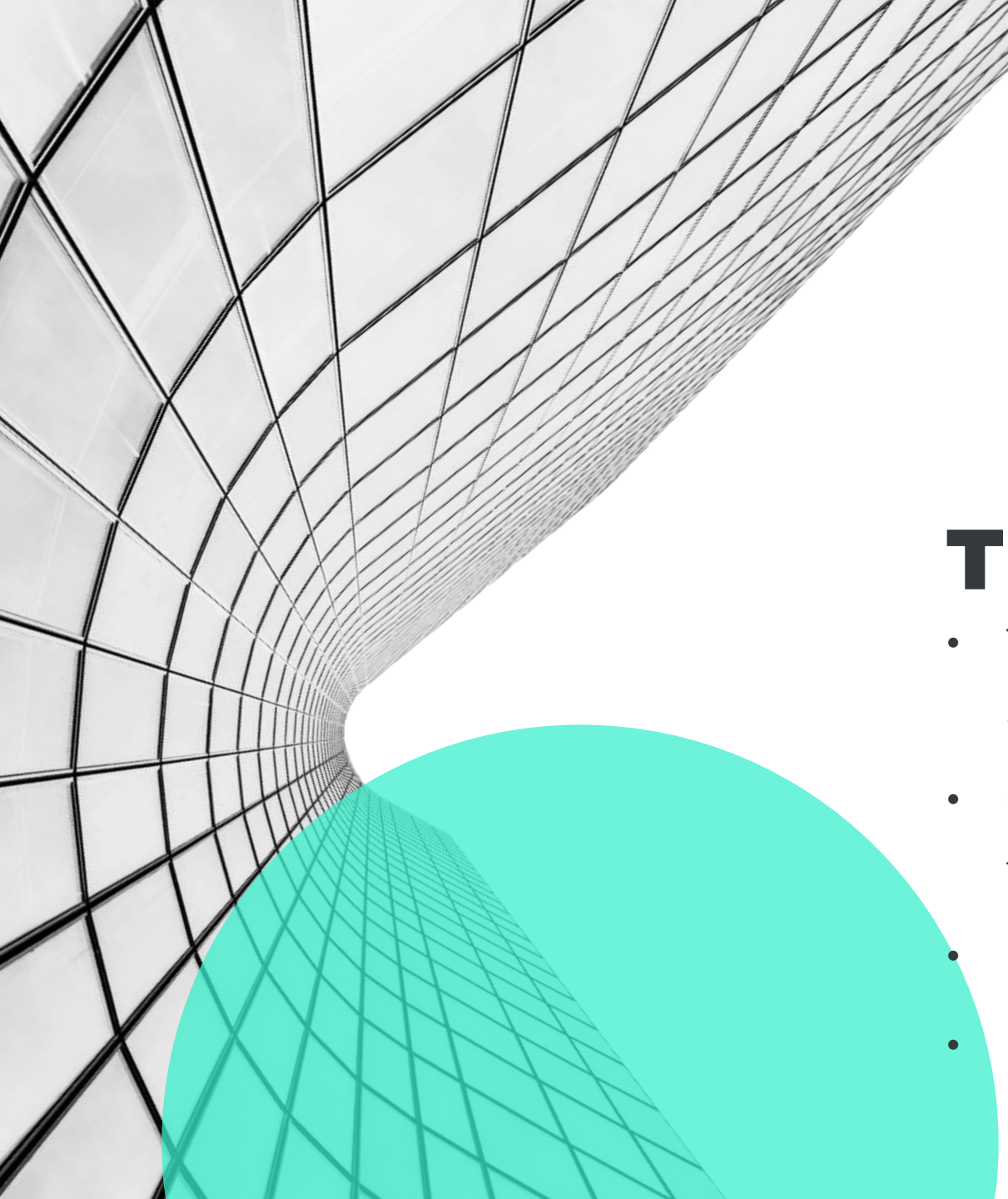
MCNEESE STATE UNIVERSITY

PCI/NPCA STUDIO

INTRO

- January 2021, Dr. Ahmed Abdel-Mohti received a grant from PCI foundation
- January 2022, Dr. Mohti and Dr. Dimitrios Dermisis received a grant from NPCA
- Focused primarily on Civil Engineering
- Partnership with Alfred Miller Contracting, Dunham Price Group and Tindall Corporation



THE PCI/NPCA LAB

- The lab has wide range of instruments to help students with their projects
- Computers available with the latest design softwares for students to use
- Resources are obtainable to make mixes
- Different instruments to test materials

CURRENT PROJECTS

- Effect of Recycle Aggregate on SCC Precast concrete
- Effect of Vibration on Precast and Cast-In-Place Machine Footings
- Project related to underground precast structures

EFFECT OF RECYCLE AGGREGATE ON SCC PRECAST CONCRETE

- Focuses on the effects of recycled concrete aggregate on the early compressive and tensile strength
- Replacing up to 50% of natural aggregate (NCA) with recycled concrete aggregate would improve the early strength of concrete
- This was the first big project conducted at the PCI/NPCA studio

EFFECT OF VIBRATION ON PRECAST FOOTING

- Project is a collaboration between Civil and Mechanical Engineering
- Focuses on vibration absorbed by the machine footing
- ACI 351 and ACI 318 guidelines were followed
- Students from Prestressed Concrete class joined during the casting of the first footing

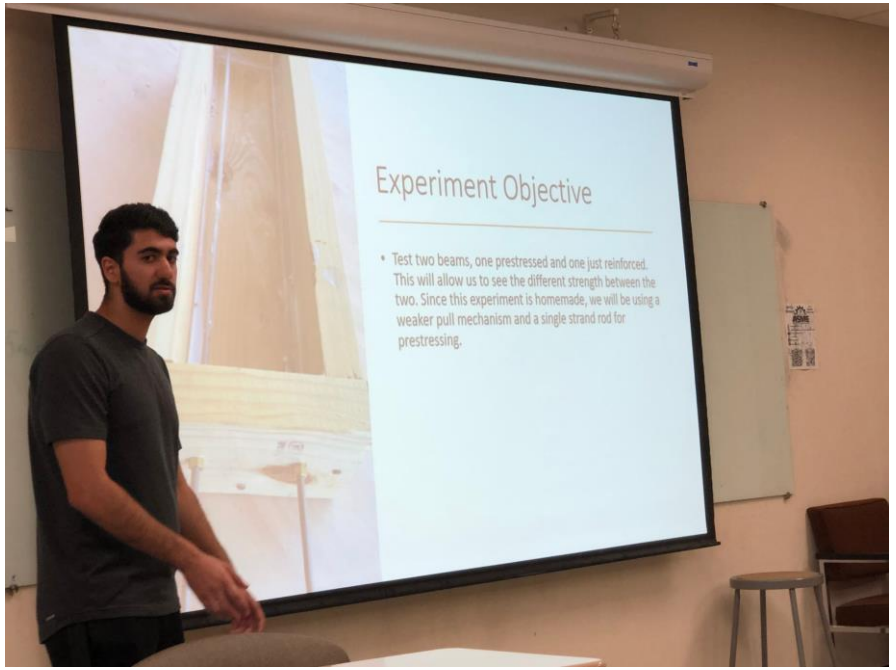
UNDERGROUND PRECAST STRUCTURES

- Focuses on underground precast structures
- Students investigated underground structures in the area

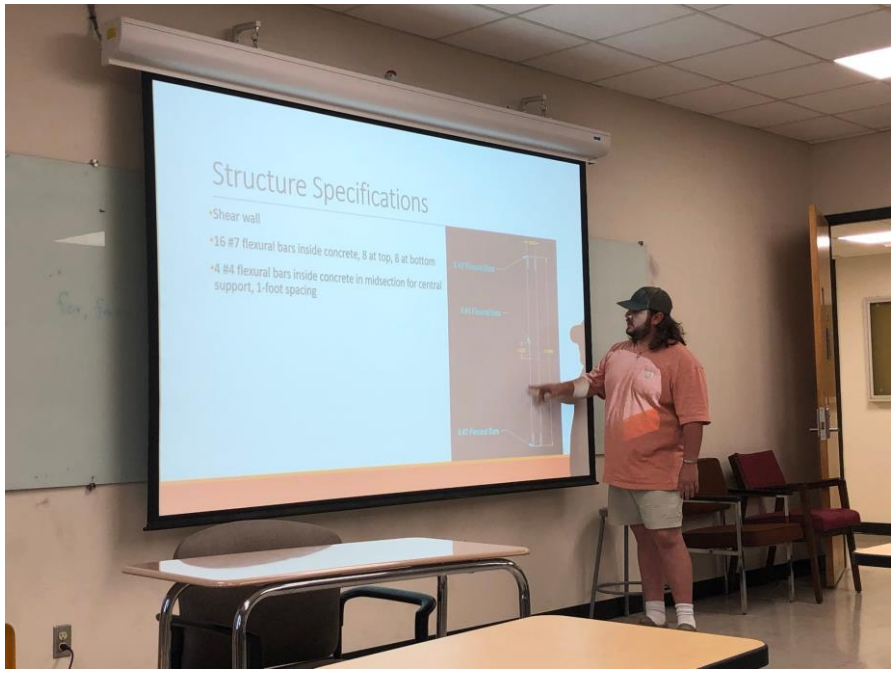
NEW COURSES
PRESTRESSED CONCRETE & REINFORCED CONCRETE

- Prestressed Concrete class introduces the basic concept of prestressing
- Consists of guest speakers and plant tours
- Students present projects that can utilize studio
- Reinforced Concrete class also features plant tours and guest speakers


Design Alternatives


Experiment Objective
• Test two beams, one prestressed and one just reinforced. This will allow us to see the different strength between the two. Since this experiment is homemade, we will be using a weaker pull mechanism and a single strand rod for prestressing.


DESIGN
• Wooden ceiling
• 3-foot attic space
• Rain filled water tank
• 840 gallons of water; 30 gallons per person for 7 days


Structure Specifications
•Shear wall
•16 #7 flexural bars inside concrete, 8 at top, 8 at bottom
•4 #4 flexural bars inside concrete in midsection for central support, 1-foot spacing

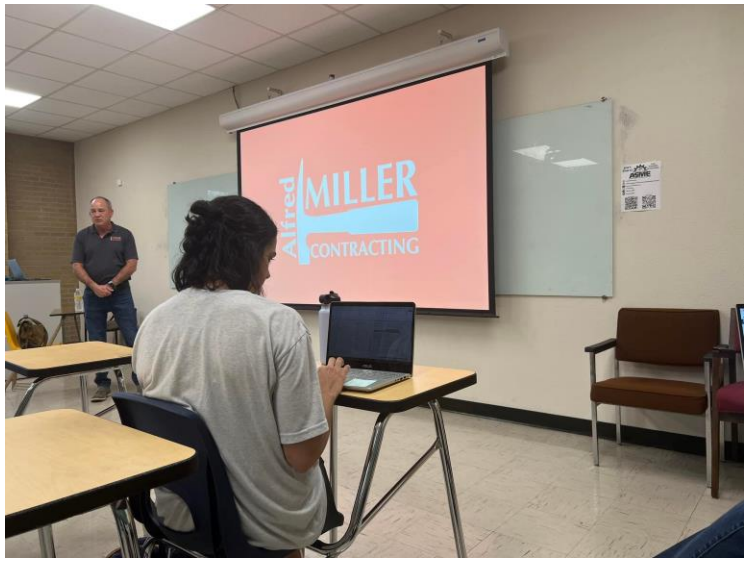
PLANT TOURS 2021-2022

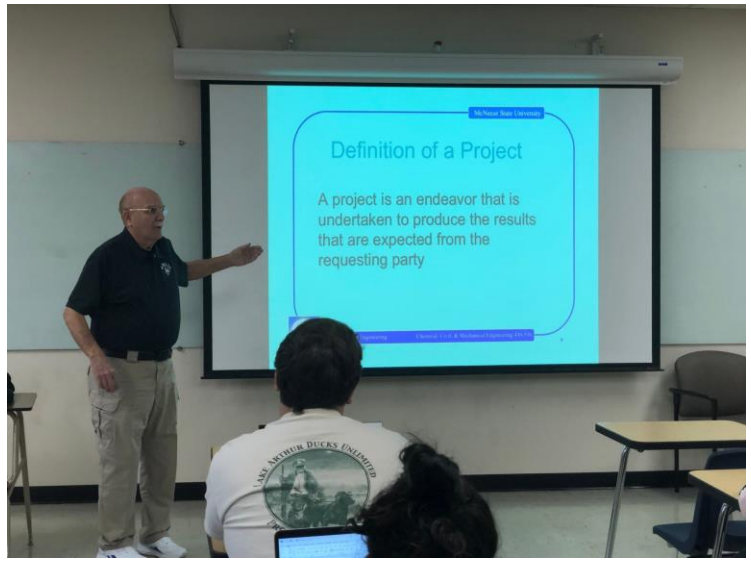

Alfred
MILLER
COMPANIES
B.E.T.ER
MIX

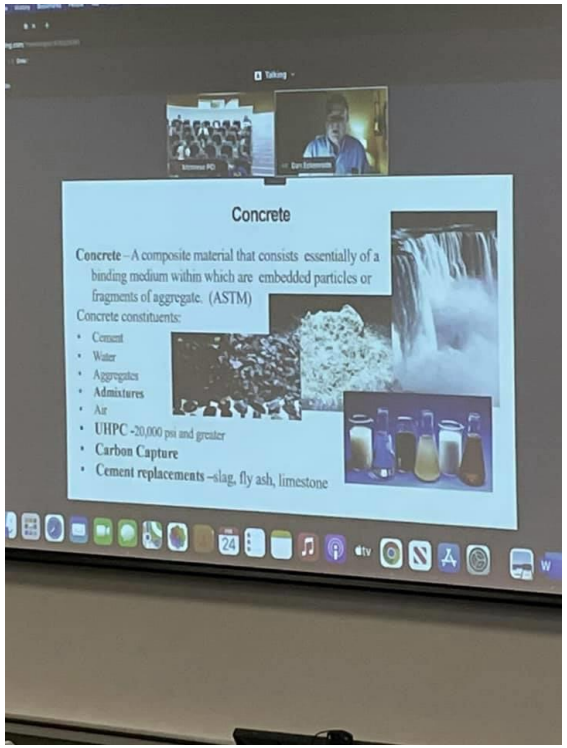

McNEESE


McNEESE

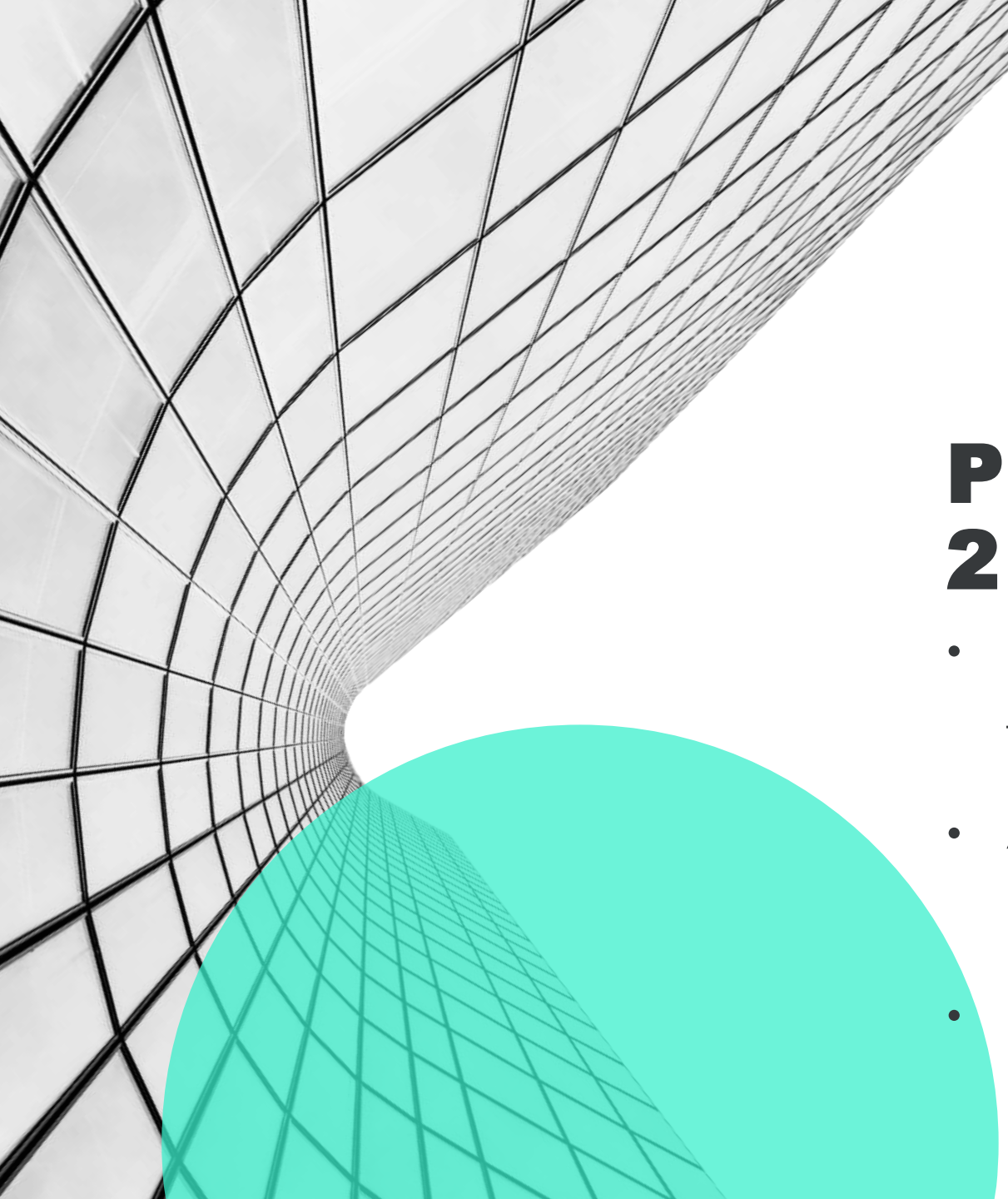
GUEST SPEAKERS






Concrete
Concrete – A composite material that consists essentially of a binding medium within which are embedded particles or fragments of aggregate. (ASTM)
Concrete constituents:
• Cement
• Water
• Aggregates
• Admixtures
• Air
• UHPC - 20,000 psi and greater
• Carbon Capture
• Cement replacements – slag, fly ash, limestone


SIT HERE



PCI CONVENTION 2021-2022

- Selected students get the opportunity to attend the annual PCI Convention
- Attendees engage in technical sessions and attend “The Precast Show”
- During 2022 convention, McNeese had their own display poster


PRECAST SHOW
PCI
Precast/Prestressed Concrete Institute
ALP SUPPLY
VERSATILE
EFFICIENT
PCI STUDIO NATION
McNEESE STATE UNIVERSITY


THE NATIONAL WWII MUSEUM


McNEESE STATE UNIVERSITY
LAKE CHARLES, LOUISIANA
COLORADO STATE UNIVERSITY
UNIVERSITY OF MINNESOTA
UNIVERSITY OF KENTUCKY
UNIVERSITY OF COLORADO
DENVER, COLORADO
SINCE 2021
SINCE 2018
ALP SUPPLY

CONCLUSION

- The journey thus far has been great
- More students are getting interested in the precast industry
- Potential growth for more projects in the future

THANK YOU

Quazi Rumi