



PROJECT SCOPE

- Design a sustainable and cost-efficient Affordable Housing Complex for 100 families in the Central Texas Region
- Ensure sustainability of the proposed design utilizing the Leadership in Energy and Environment Design (LEED) Rating System
- Develop a Construction, Material, and anticipated Life-Cycle Cost Analysis to determine a final Net Present Value in current dollars.
- Configure both a system and component design for our housing complex

DESIGN CONSIDERATIONS

- Sustainability
- Environmental Impacts
- Code Considerations
- Land Usage
- Cost (Construction and Lifetime)
- Time Frame of Construction

SUSTAINABILITY EVALUATION

LEED Rating Results

LEED Assessment	Score	Rating
1	47	Certified
2	62	Gold

TEAM PHOTO



Team Members from left to right:
Carlos Sanchez, Cortland Hughes, Trevor Meyer, Aaron Gonzales

SYSTEM DESIGN

- The layout of our complex including building placement, parking spots, sidewalks, landscape, fire lanes, ADA requirements and more.
- Local, State and Federal Building Codes were considered

Parking Lot Regulations	
502.2) Vehicle Spaces: Car parking spaces shall be at least 8 feet wide and van parking spaces must be 11 feet wide, with an exception where van parking spaces can be 4 feet wide if the access aisles are 4 feet wide as well.	502.3.1) Access aisles serving parking spaces need to be at minimum 5 feet wide.
502.3.2) Access aisles need to be extended to the full length of the parking space they serve.	502.3.3) Access aisles need to be clearly marked so prevent parking in that space.

- Proposed Site Design Calculations for Required Parking & Impervious Cover

Required Parking	1.05 spots/unit	113 required (108 units)	243 provided
Impervious Cover	Total Site Area 716,040 ft ²	Impervious Area 297,402 ft ²	39% Impervious cover

COMPONENT DESIGN

- Geotechnical Foundation included analysis of soil properties, determining mitigation mechanisms for settlement, potential vertical rise (PVR), and develop a shallow foundation for each building.
- In order to remediate the in-situ soil which contained mostly fat and lean clays, the team opted to utilize a Lime-based chemical treatment.

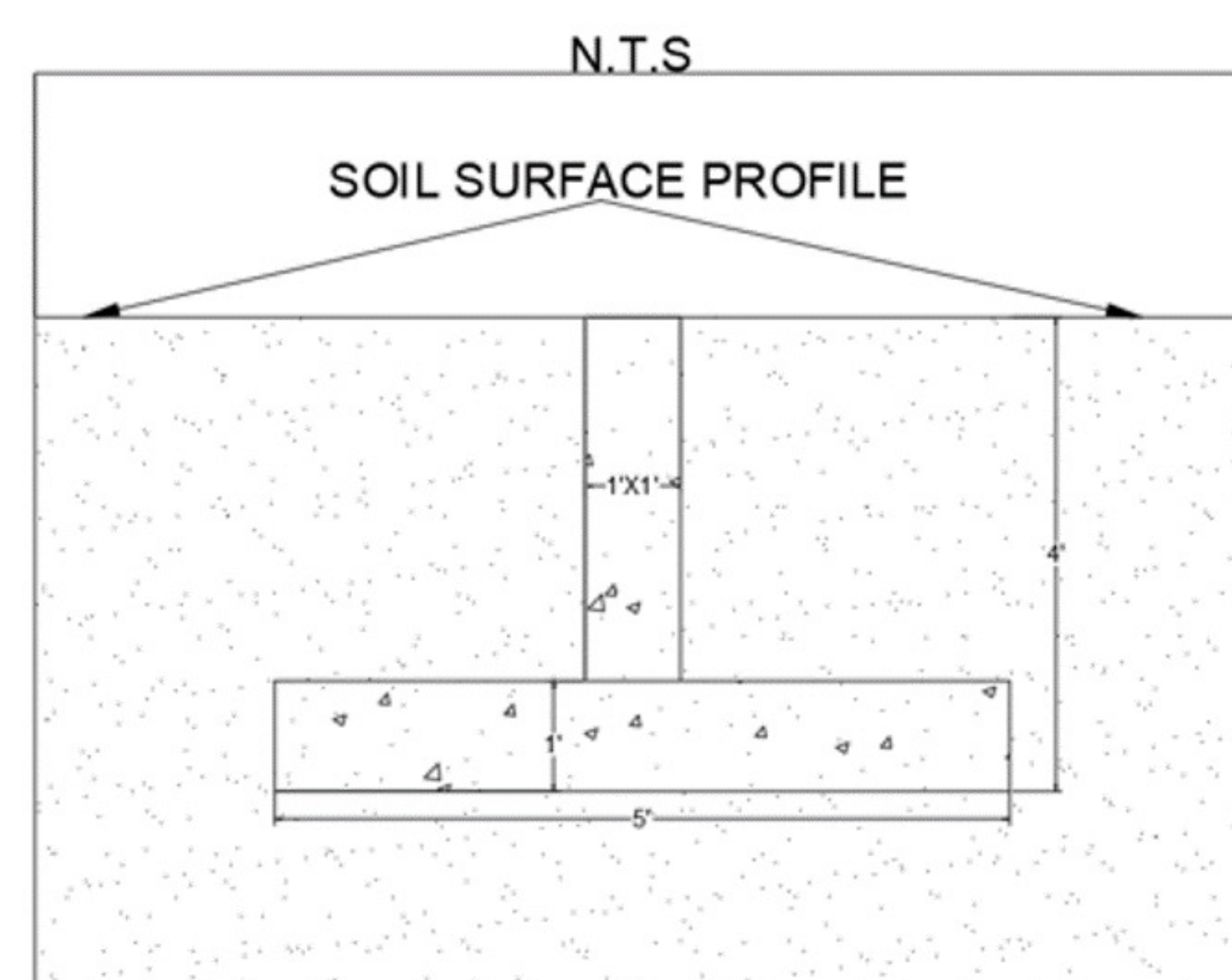


Figure 1: Foundation 2 Dimension

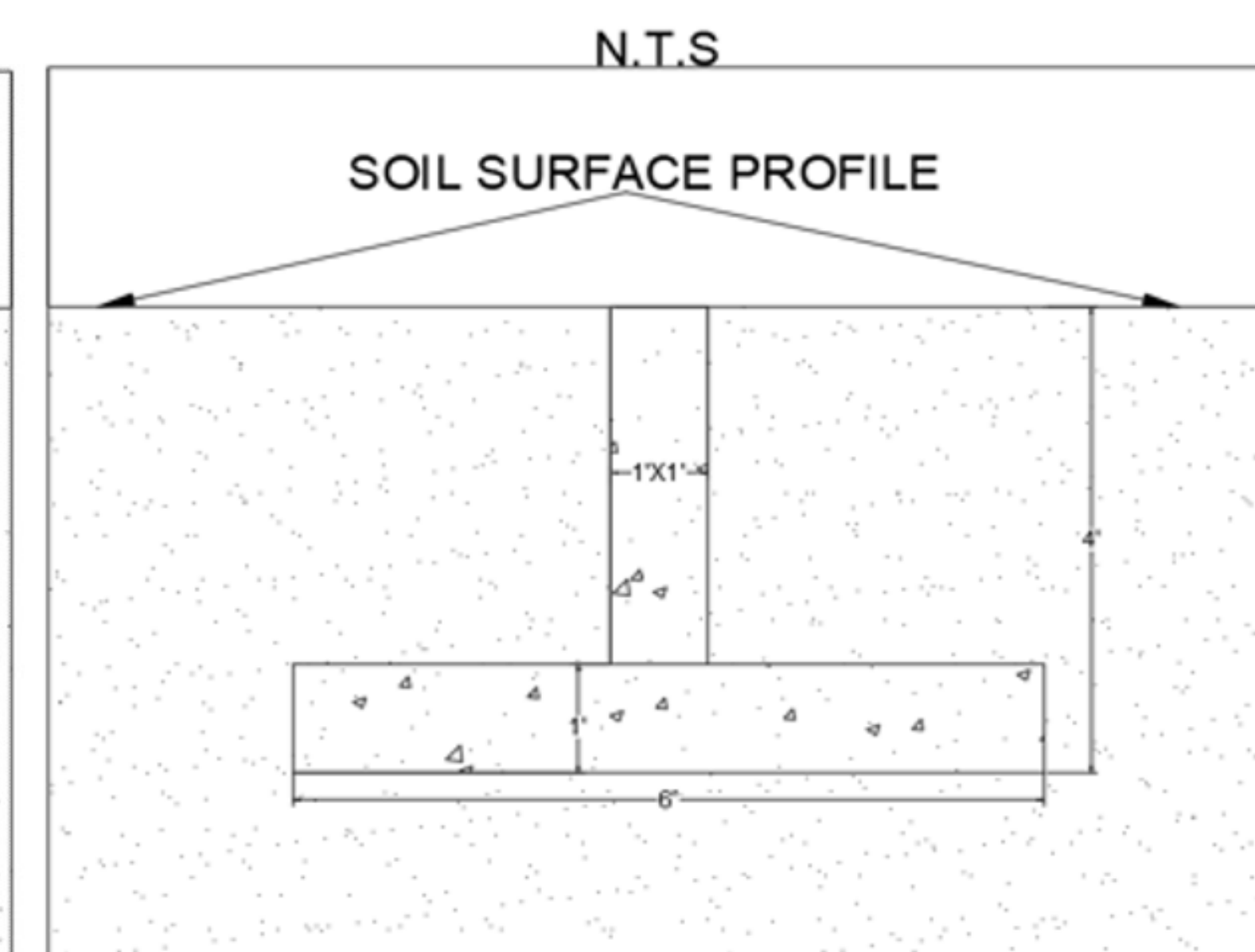


Figure 2: Foundation 2 Dimensions

CONSTRUCTION SCHEDULE

- A proposed timeline of our construction schedule of the geotechnical foundation is shown in Figure 3
- An estimated 4 months for the foundation construction including grading, conventional lime treatment and the pouring of the foundation

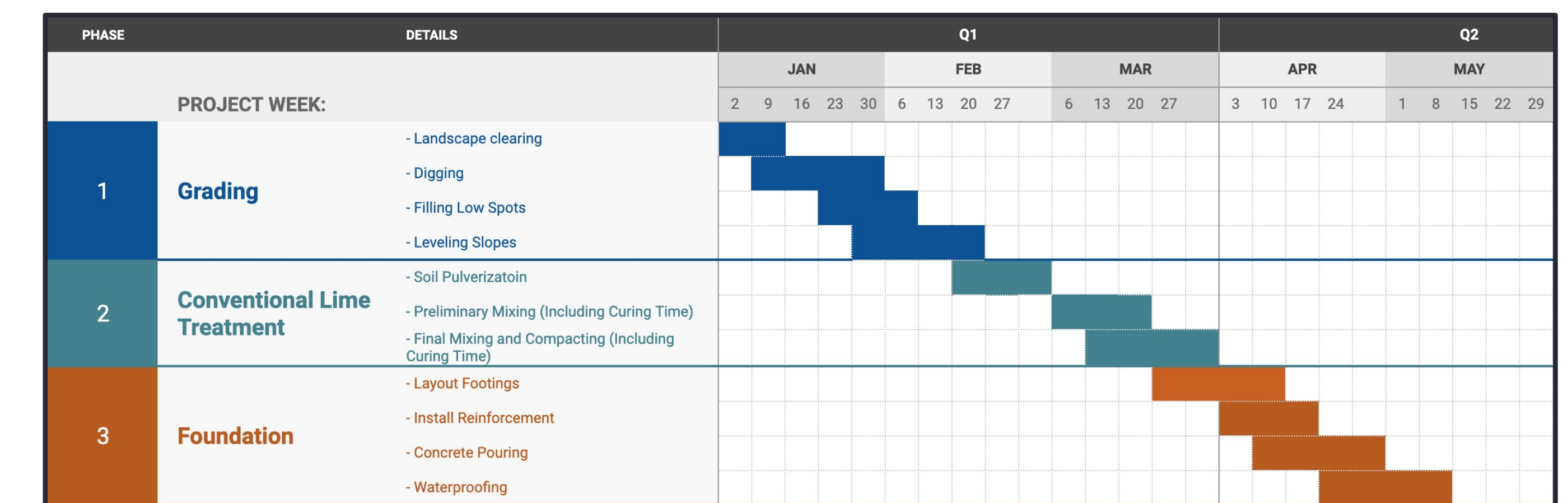


Figure 3: Foundation Construction Timeframe

CAPITAL AND LIFE CYCLE COSTS

Construction Costs	\$38,500,000.00
Life Cycle Costs	\$95,100,000.00
NPV	\$49,300,000.00
NPV (Adjusted)	\$59,200,000.00

REFERENCES/ACKNOWLEDGMENTS

- 1) <https://www.rent.com/research/average-rent-price-report/>
- 2) <https://www.census.gov/library/publications/2021/demo/p60-273.html>
- 3) RSMMeans <https://www.rsmeansonline.com/>
- 4) Arias Geoprosessionals, December 2020, Geotechnical Engineering Services, Project No. 2020-907
- 5) Dr. Stacey Kulesza – CE Associate Professor – Ingram School of Engineering