

Group C2.02 – Affordable Housing 2

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Project Sponsor: Space Alliance Technology Outreach Program (SATOP)

Project Overview

Affordable Housing Solutions for Hays County

In response to the growing Affordable Housing Crisis in

Central Texas, our team was tasked with developing *affordable, high-quality* housing for 100 families of four in

Hays County. Our goal is to implement a *sustainable foundation design* and *hydrological strategies* to address the complex geotechnical and environmental constraints –

All with the purpose of building a *stronger, more accessible* future for Hays County Residents.

Sustainability Framework

Category	Gained Points	Non-Applicable Points
Location and Transportation	8	13
Sustainable Sites	7	3
Water Efficiency	7	4
Energy and Atmosphere	23	6
Materials and Resources	13	0
Indoor Environmental Quality	14	2
Innovation	5	0
Regional Priority	0	0
Total	77	28

LEED Framework and Rating System

RATING SYSTEMS	
LEED BD+C	Building Design + Construction
LEED ID+C	Interior Design + Construction
LEED O+M	Operations + Maintenance
LEED ND	Neighborhood Development

- CREDIT CATEGORIES
- Location & Transportation
 - Water Efficiency
 - Energy & Atmosphere
 - Innovation

- Sustainable Sites
 - Materials & Resources
 - Indoor Environmental Quality

CERTIFICATION LEVELS

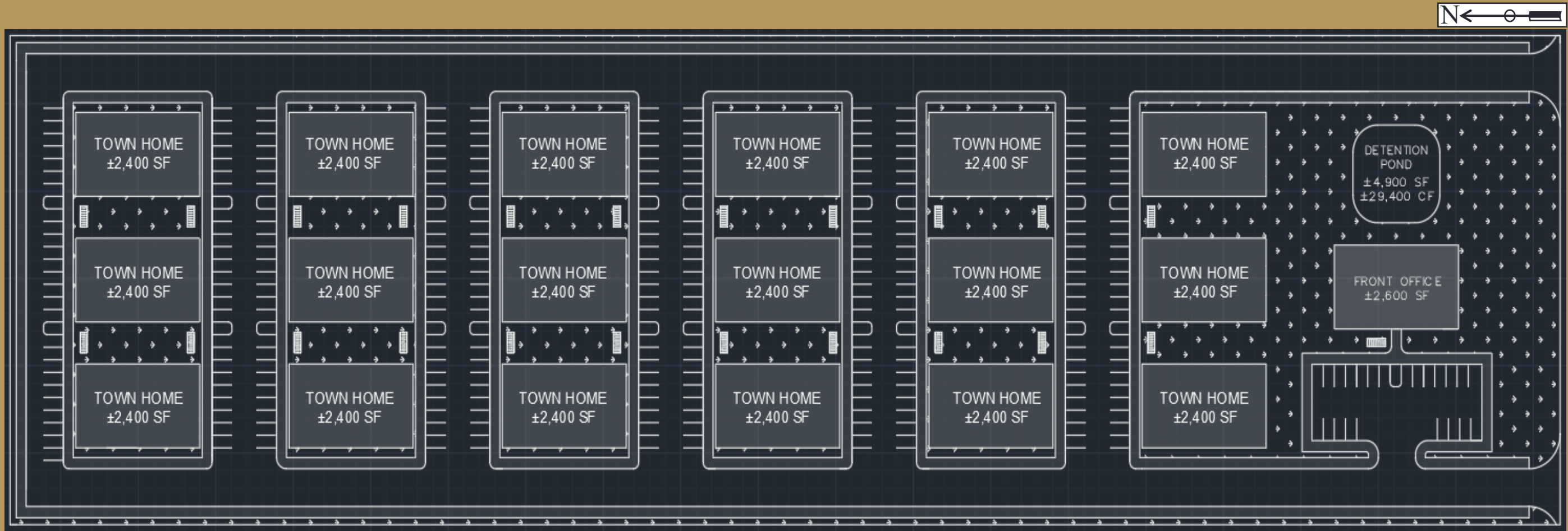
Certified	40–49
Silver	50–59
Gold	60–79
Platinum	80+

PROCESS OVERVIEW

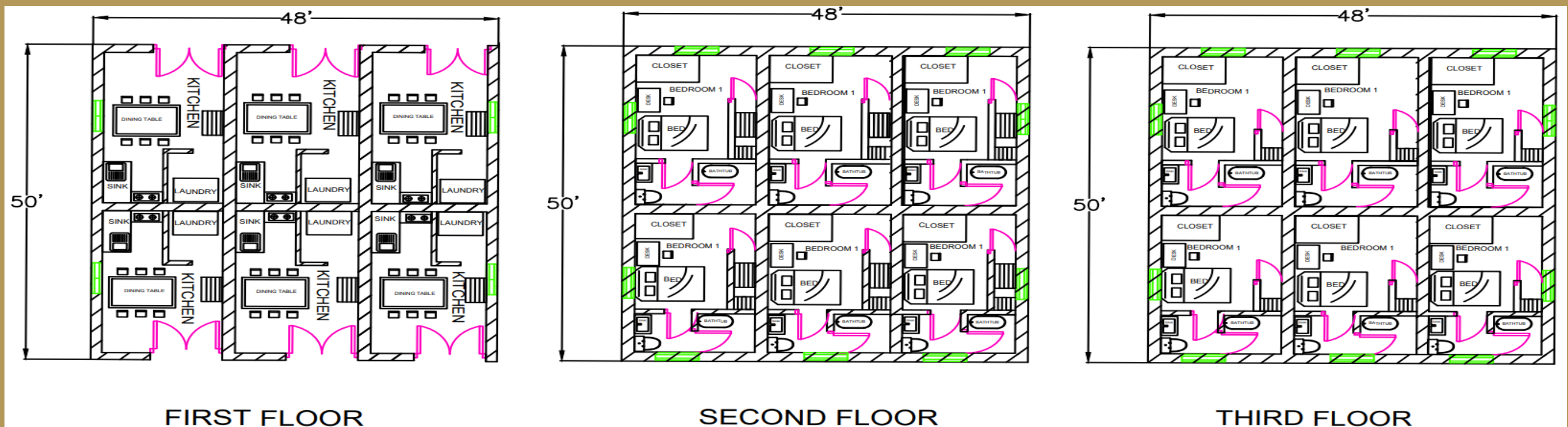
- Project Registration
 - Design & Construction
- Submission to GBCI
 - Review & Certification



Conceptual Site Plan

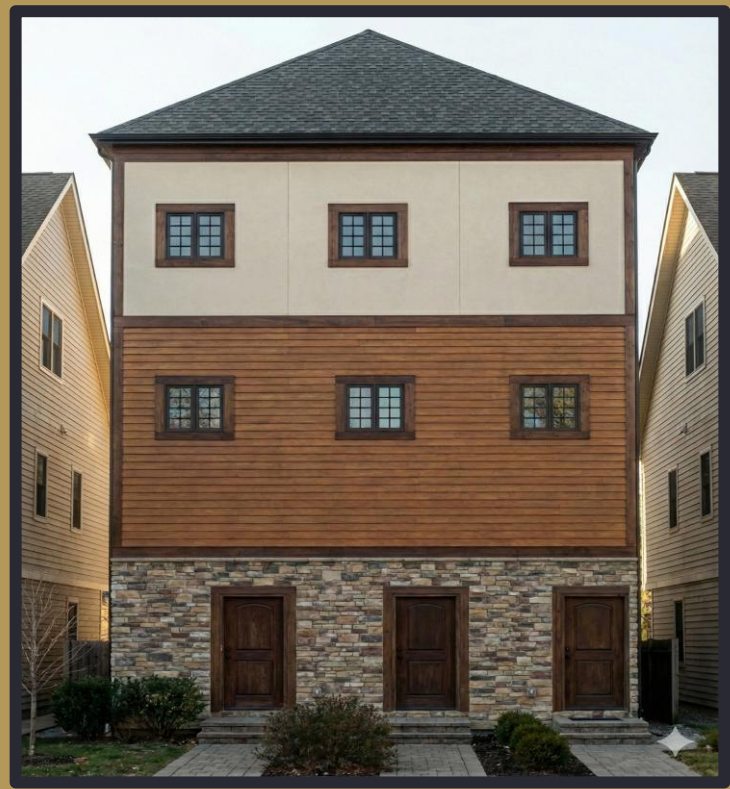


Conceptual Drawing of the Affordable Housing Development



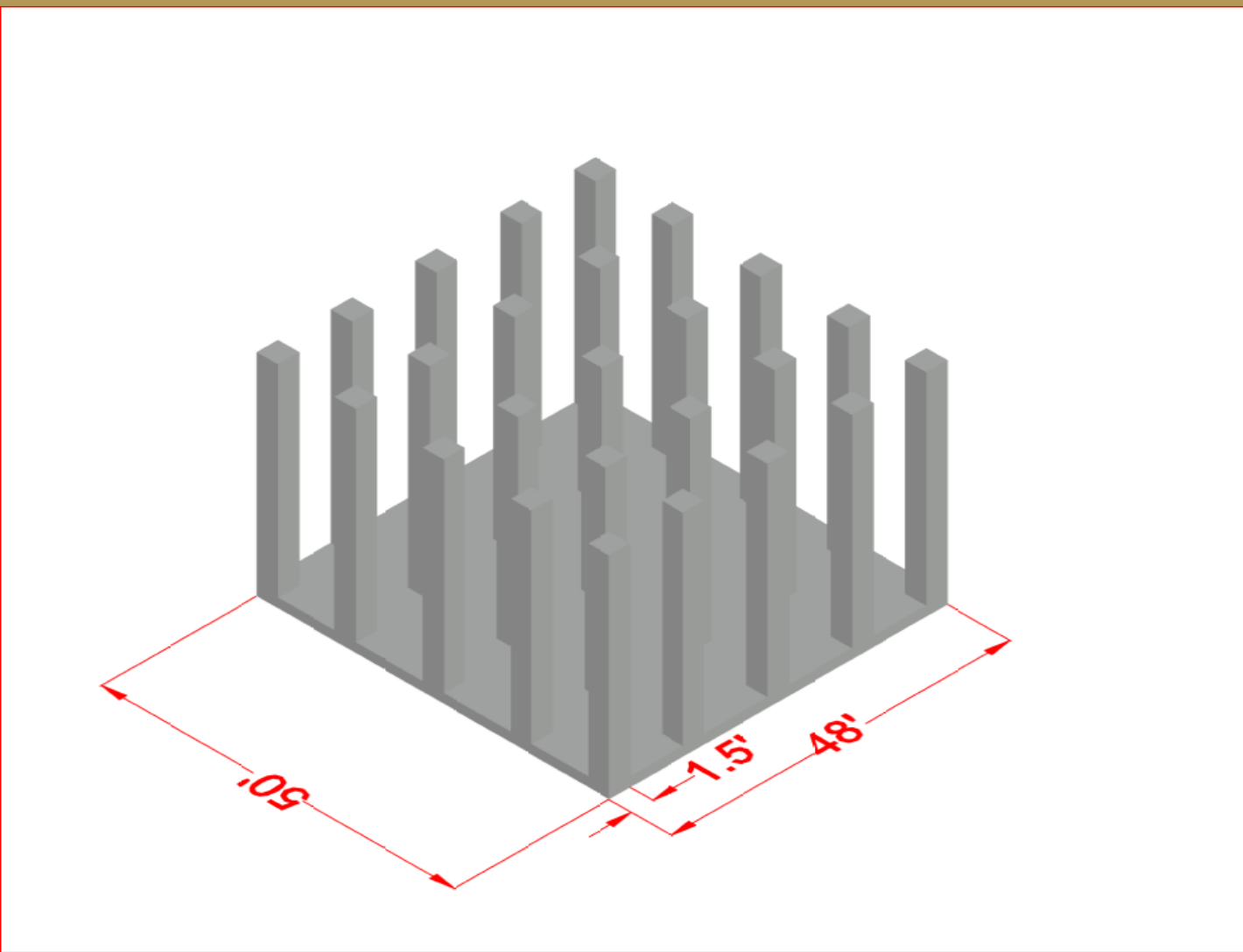
Conceptual Floor Plan for One Unit

Site Overview		
Residential Units	18	43,200 SF
Parking Spaces	297	42,800 SF
Detention Pond	1	29,400 CF

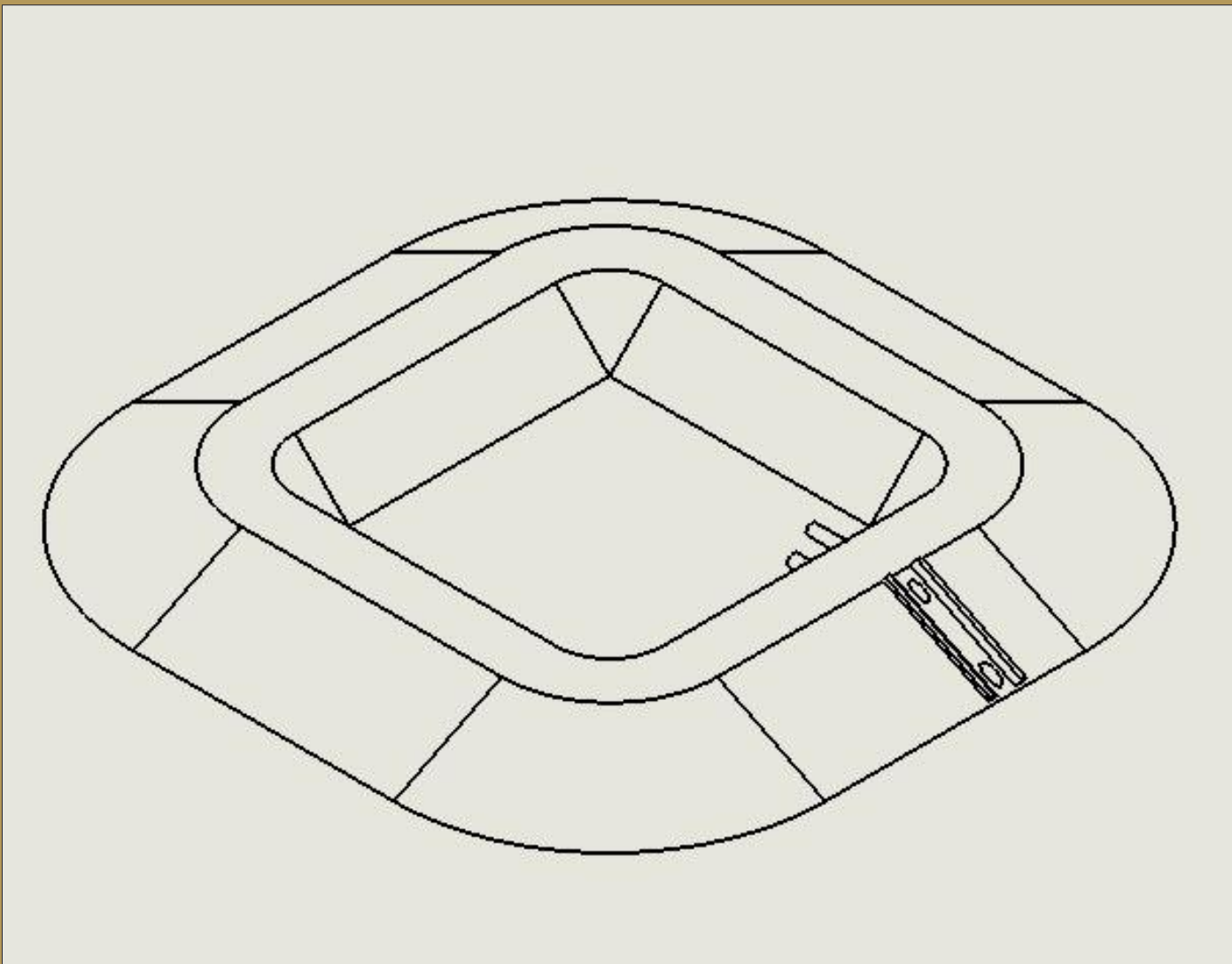


Conceptual Model of Front View

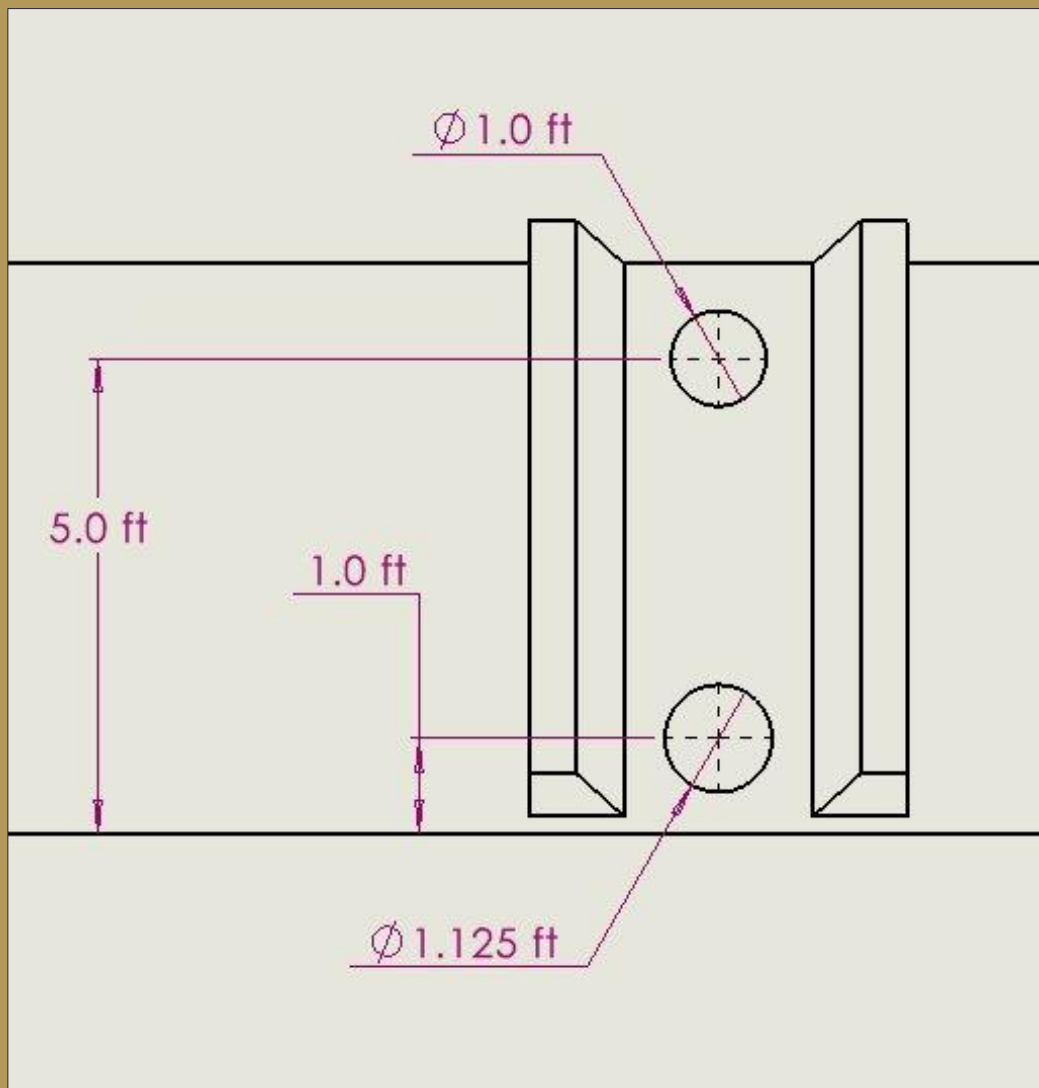
Element Design



Conceptual View of Foundation Design



Conceptual View of Detention Pond



Detailed View of Detention Pond

Capital Cost Analysis

Item	Units	Unit Price	Quantity	Price
Initial Purchase	Lot	\$565,000	1	\$565,000
Sidewalk	SY	\$225	7,000	\$1,575,000
Asphalt (Milling)	SY	\$10	125,000	\$1,250,000
Regrading	CY	\$55	650	\$36,000
Foundation (Including Columns)	CY	\$200	3,240	\$650,000
Modular Construction	Dwellings	\$60,000	110	\$6,600,000
Excavation	CY	\$30	25,500	\$765,000
Pavement Marking	LF	\$10	1,700	\$17,000
Landscaping	SY	\$8	37,000	\$296,000
Total				\$11,754,000

Team Members



(Left to Right):
William Youngdale, Gerardo Ortiz,
Jessie Nguyen, Maximus Valles

Design Considerations

- Structural Optimization
(Foundation Design vs. Material Costs)
- Geotechnical Resilience
(Mitigate Long-Term Settlement)
- Long-Term Sustainability
(Low-Cost and Long-Lasting Design)
- Regulatory Compliance
(Adhere to Codes & Ordinances)

Standards & Constraints

- 2021 International Building Code
(Chapter 18: Soils & Foundations)
- ACI 318-19 Building Requirements
(Structural Concrete & Reinforcements)
- TCEQ Environmental Regulations
(WPAP & SWPPP)
- San Marcos Development Code
(Zoning & Environmental)