TEXAS STATE UNIVERSITY
Ingram School of Engineering

C1.03 - FOUNDATION FORGE
Affordable Housing in Hays County, Texas

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FOUNDATION FORGE — STRENGTH IN EVERY STRUCTURE

Project Summary

This project evaluates four affordable housing alternatives in San Marcos, TX-multifamily, townhomes, tiny homes, and 3D-printed-to determine the most feasible development option. Each alternative was analyzed using LCCA, OPCC, and LEED-based sustainability criteria to compare cost, performance, and environmental impact.

Constraints & Standards Used

- Affordable Budget
- One Lot for all alternatives
- Located in San Marcos, Texas and used SM Subdivision Regulations

Parcel Information

Parcel ID:	**R16597**
Address:	**IH 35, SAN MARCOS TEXAS 78666**
Legal Description:	**A0321 A0321 – Joel Miner Survey, Acres 35.672, (SO OF OPPORTUNITY @ IH35)**
Acreage:	**35.67 AC**
Zoning:	**HC – Heavy Commercial District**

Alternatives Considered

Alternative 1: High-Density Multifamily

A high-density apartment style development designed to maximize housing capacity within a limited footprint. This alternative emphasizes efficient land use, centralized infrastructure, and reduced per-unit utility demand.

Alternative 2: Townhome Development

A townhome development comprised of one-story townhomes, built as 4-unit buildings. The development is expected to have 25 buildings for a total of 100 townhomes. This alternative emphasizes living space while remaining space efficient by placing homes close to each other.

Alternative 3: Tiny Homes

A compact residential development of small, single-family units designed to maximize land efficiency and minimize construction and operational costs. This option provides approximately 100 units with a reduced footprint, emphasizing affordability, lower material usage, and efficient infrastructure while maintaining functional living spaces.

Alternative 4: 3D-Printed Homes

A 3D-printed duplex development designed to provide 100 units through the construction of 50 duplex buildings. This alternative emphasizes reduced construction time and labor costs by using emerging 3D printing technology, while still maintaining a moderate footprint and efficient use of infrastructure.

Location Map

Summary of Sustainability

- Alternative Sustainability evaluated using the **Leadership In Energy & Environmental Design (LEED) Criteria.**

LEED Score Chart

Point Range	LEED Score
40 - 49	Certified
50 - 59	Silver
60 - 79	Gold
80 - 110	Platinum

Alternative	LEED Score
Alternative 1 High Density Multi-Family	61 | GOLD
Alternative 2 Townhome Development	57 | SILVER
Alternative 3 Tiny Homes	53 | SILVER
Alternative 4 3D Printed Duplexes	52 | SILVER

Summary Cost

Opinion of Probable Capital Cost

Cost per Material	Alternatives			
	1	2	3	4
Land Acquisition	$1,700,000	$1,700,000	$1,700,000	$1,700,000
Preparations	$1,226,433	$1,226,433	$1,226,433	$1,226,433
Dwelling Units	$17,200,000	$15,750,000	$18,000,000	$15,000,000
Concrete Pavement	$820,000	$1,312,000	$1,640,000	$1,435,000
Roadways	$559,440	$621,600	$777,000	$673,400
Water	$484,279	$923,795	$1,326,491	$1,096,379
Wastewater	$172,055	$302,610	$432,110	$358,110
Storm	$742,500	$742,500	$742,500	$742,500
Electrical	$250,000	$1,147,200	$250,000	$250,000
Contingency (50%)	$11,577,354	$11,863,069	$13,047,267	$11,240,911
Total	**$34,732,061**	**$35,589,208**	**$39,141,802**	**$33,722,734**

Notes:
*Items that were assumed to be the same for all alternatives are shown in RED.