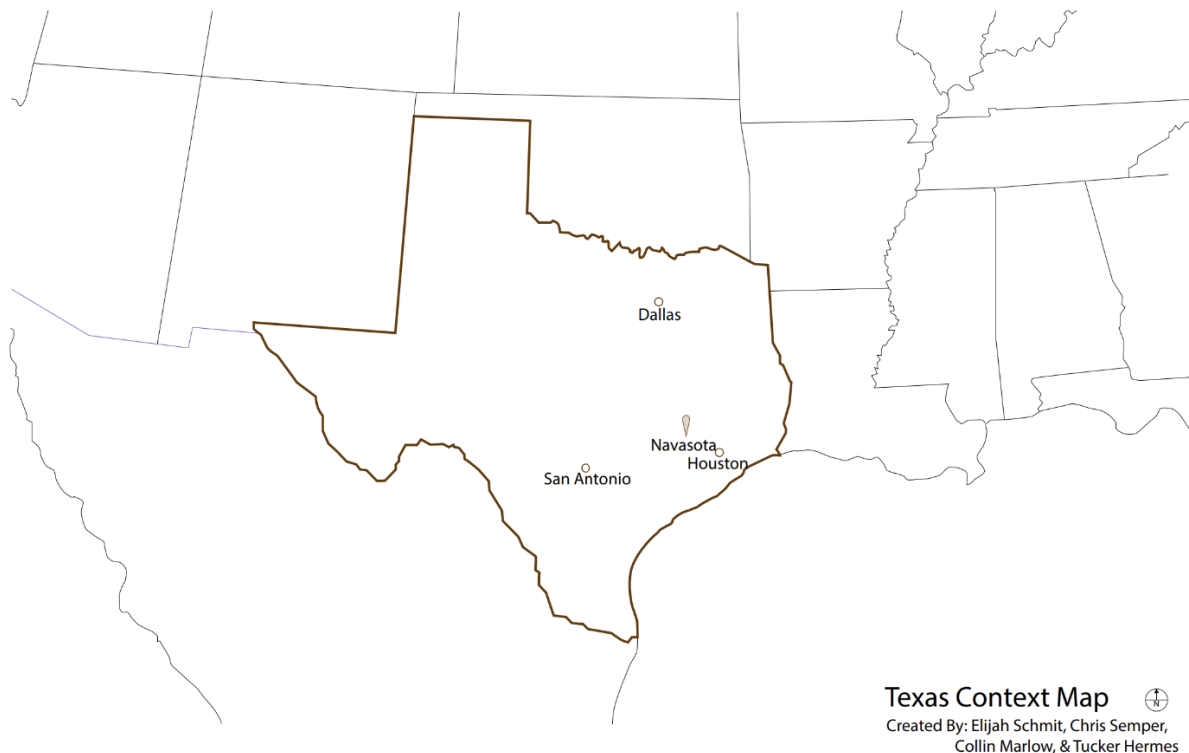


# LDEV 661 - Site Analysis

Chris Semper, Elijah Schmit, Collin Marlow, Tucker Hermes

Site Address: CR306, NAVASOTA, TX 77868

The following Site Analysis was performed on a 440.3196-acre parcel which includes 7.2346 ROW (net area = 433.0850). The subject property is located in Grimes County and the City of Navasota (Tx) ETJ. Along with the attached composite map and conceptual land plan (see appendix), this report takes inventory of physical, societal, environmental, and regulatory aspects and explores the opportunities and constraints to potential development of the site.



## **OVERALL SITE INVENTORY & ANALYSIS**

### *Physical Factors*

#### **Boundary and General Location**

County Road 306 borders the property to the North and Highway 249 (Aggie Expressway) runs directly through the center of the property, dividing the parcel into east and west sections. The

southeastern portion of the property is bordered by County Road 307. The property is located roughly 14 miles east of the Navasota city center, 40 miles west of Conroe, 35 miles northwest Tomball, and 60 miles northeast of the Galleria in downtown Houston.



Navasota Context Map   
Created By: Elijah Schmit, Chris Semper,  
Collin Marlow, & Tucker Hermes

Figure 1: Navasota Context Map

## Subject Property and Surrounding Land Use

The subject property has a current agriculture land use classification along with most surrounding land. However, there is a small planned residential development (see Figures 2 & 3 below for survey/ plat) bordering the northwest section of the property, and a larger residential land use directly south. There are minimal industrial/ commercial land uses in the area given the constraints of the topography, particularly the widely varying elevations (slopes) which would require great amounts of cut and fill to support the large foundations of such structures. (See Figure 4 below for current zoning).

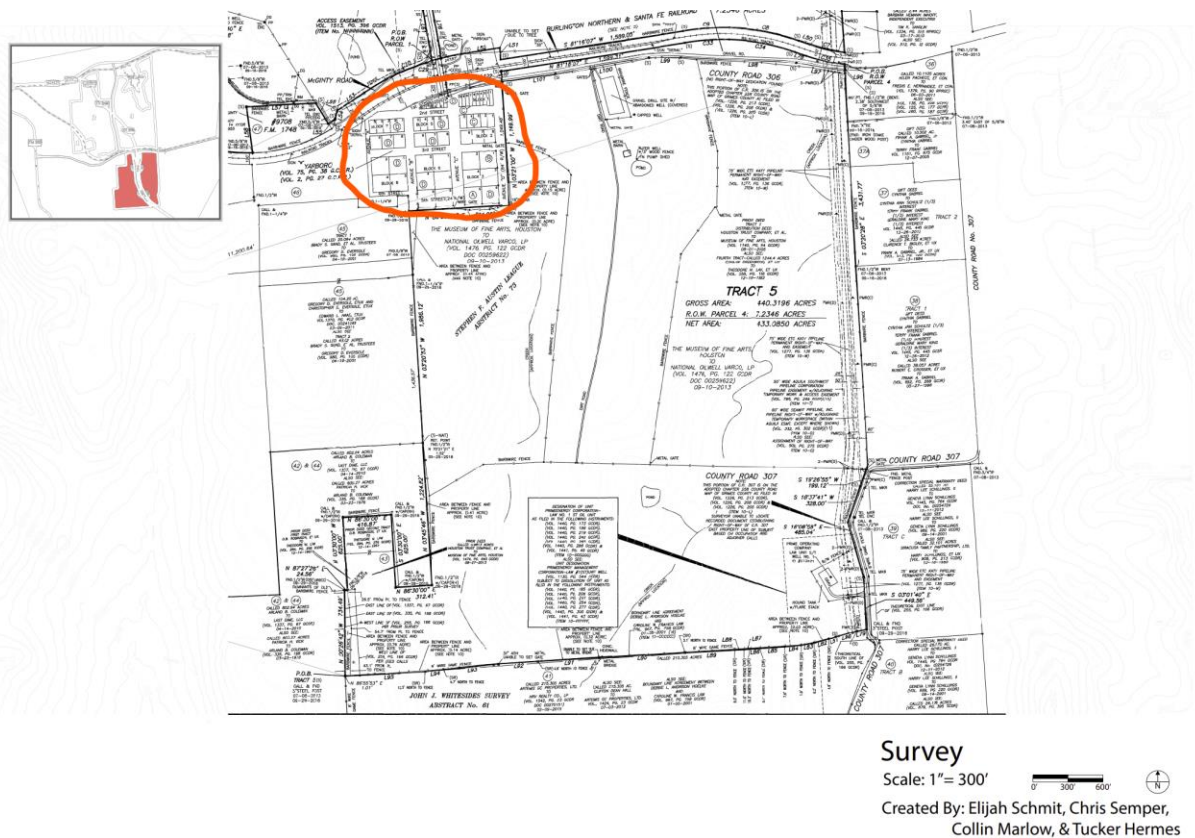


Figure 2: Survey

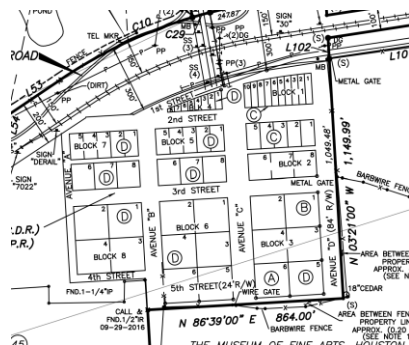


Figure 3: Plat



Figure 4: Zoning Map (Source: id.land)

### **Nearby Schools**

The lot is located within the Navasota Independent School District, which includes 3 elementary schools, 1 junior high, and 1 high school. Navasota High School is currently classified as a 4A school by the UIL, with approximately 800 students enrolled as of 2020. The Texas Tribune gave Navasota ISD an accountability rating of B for the 2020-21 academic year and lists the graduation rate at 94.7%.

### **Current Nearby Grocery**

The nearest large grocery store is a Walmart in Navasota at the intersection of Highway 105 and Highway 6, roughly 10 miles from our site. There are also two smaller grocery stores/food marts within 5 miles of the site.

## **Topography (Ridges, Valleys & Swales, High/ Low Points, Drainage and Slope)**

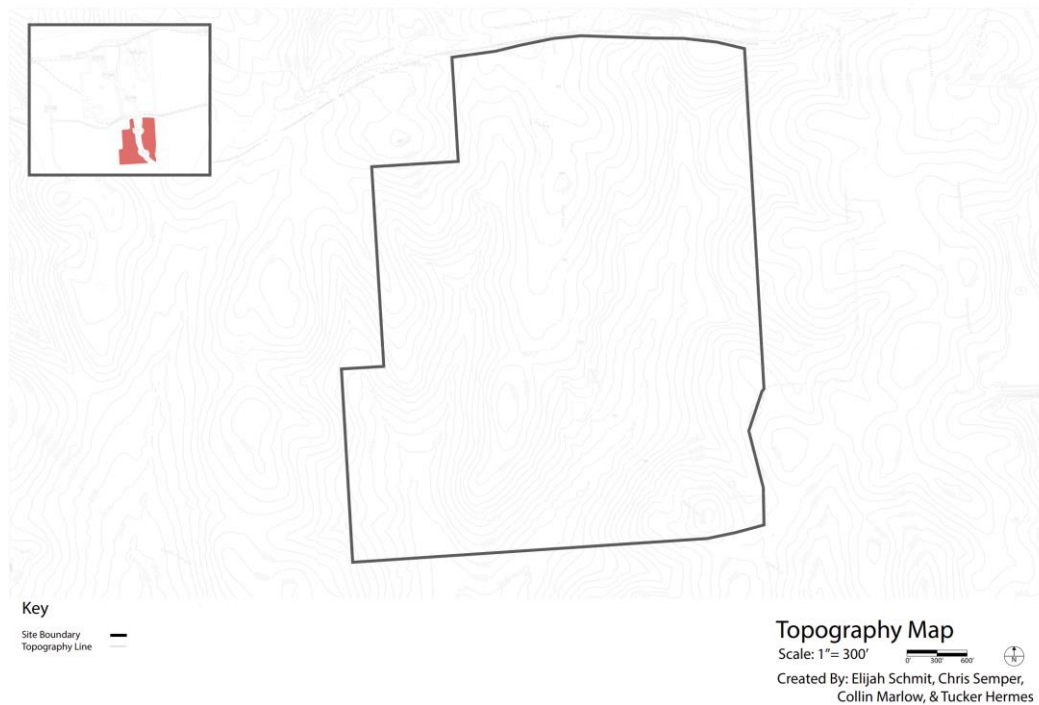


Figure 5: Topography Map

The terrain and topography of the site varies in slopes considerably in different portions of the property. See below for details:

### ***Ridges***

- The primary ridge on the property starts at the intersection of County Road 306 and the Aggie Expressway (Hwy 249) on the north end of the property and runs southwest through the center of the property.
- There are also smaller ridges on the west and east sides of the property.
- See Figure 6 below for details (green lines)





Figure 6: Ridges (Source: id.land)

### *Valleys and Swales*

- There are two large valleys on the site, one on the east section and one on the west section.
- There are also a series of swales that feed into these larger valleys.
- Slopes in these areas can range from 10% - 25% and will be avoided for development and serve as natural retention for the site.
- See Figure 7 below noting these valleys and swales (blue lines)



Figure 7: Valleys and Swales (Source: id.land)

***High and Low Points (see Figure 8 below; high point circled in orange; low point circled in blue)***



Figure 8: Slope Aspect Map

### ***Existing Features and Vegetation***

Dense vegetation exists on the east side of the property and west side of the site, primarily along valleys and swales. There are several potential wetlands that should be investigated during due diligence as well. The figure below also shows natural surface water features that exist on site including Beason Creek that flows south along the east side of the property. See figure below for details:

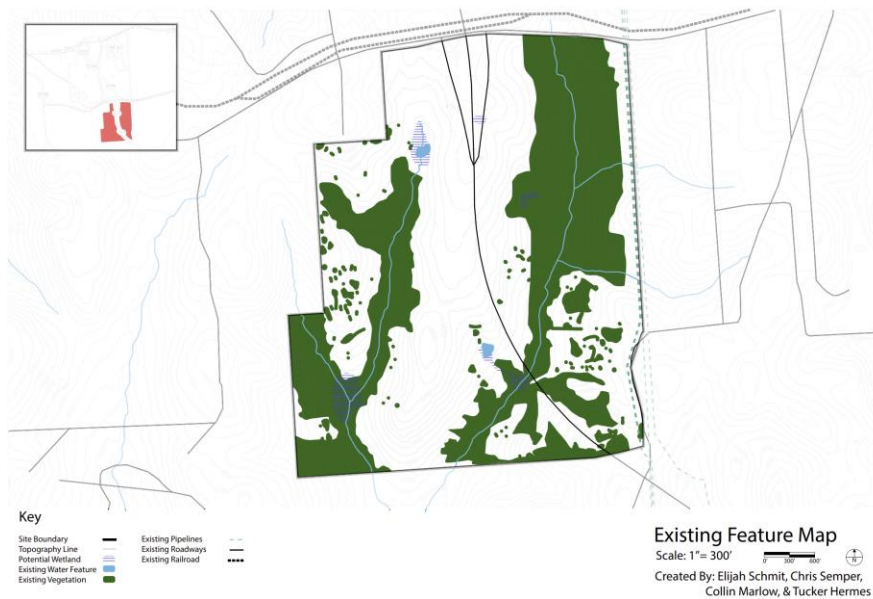


Figure 9: Existing Feature Map



## *Drainage*

Retention and drainage will follow the natural contours, valleys, and swales to flow water from the north end of the property (high point) to the southern end of the property (low point). Water will flow offsite to a larger channel of water denoted by the FEMA floodway in figure below:

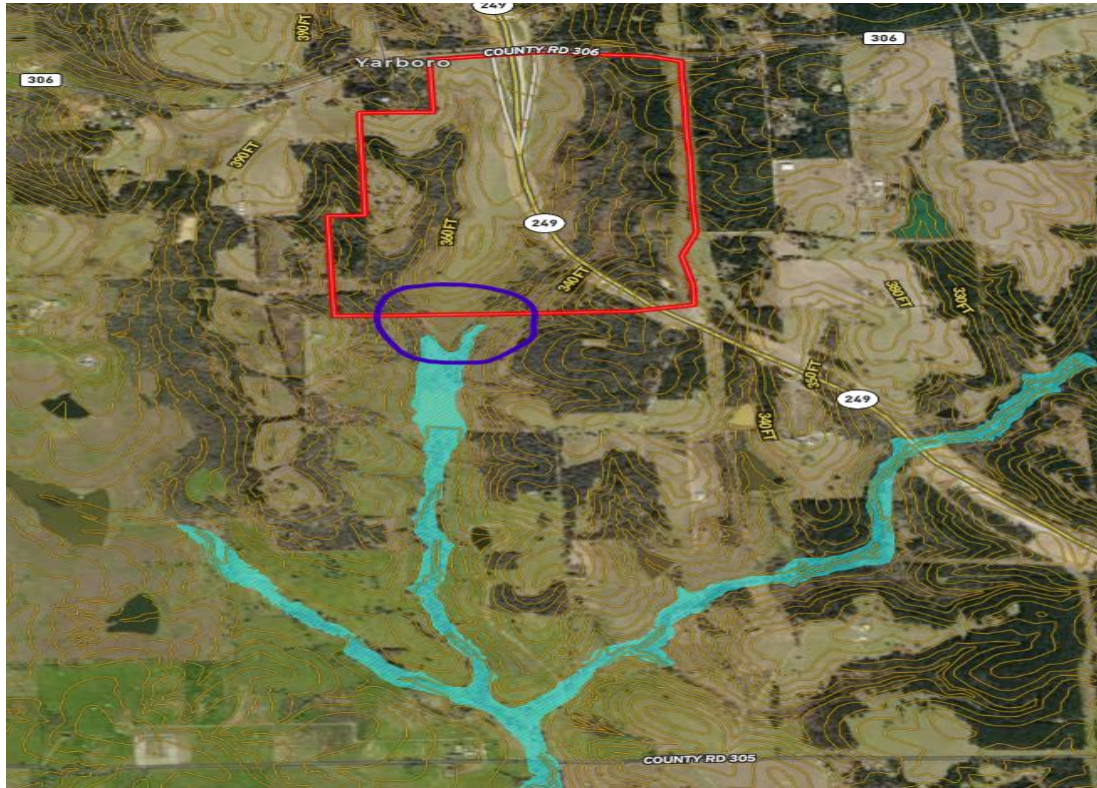


Figure 10: FEMA Map (Source: id.land)

Retention will have to be designed to restrict water flow to the rate at which if it flowed off-site to the south prior to development. It is important to note that the site is not located in the FEMA flood plain.

## *Slopes (see Figure 8 above)*

- Creeks and swales in southern portions of the property
- Southern portions of the property have slope exceeding 8% in some areas.
- Steeper locations, swales, and runoff areas left as greenspace and retention.
- Water accumulates in two primary locations defined by a ridge and with runoff on both sides of the ridge resembling a Y.
- Most suitable areas for building areas for slope is namely along the central ridge and northern end of the property with less slope.



## Geotechnical/Soils

Code	Description	Acres	%	CPI	NCCPI	CAP	?
HuD	Huntsburg loamy fine sand, 5 to 8 percent slopes	182.85	42.26%	-	40	6e	?
DeC	Depcor loamy fine sand, 1 to 5 percent slopes	169.77	39.24%	-	46	3e	?
Slt	Silawa loamy fine sand, 5 to 8 percent slopes	38.66	8.93%	-	43	4e	?
BgD	Boy loamy fine sand, 1 to 5 percent slopes	33.95	7.85%	-	26	3s	?
SIC	Silawa loamy fine sand, 1 to 5 percent slopes	5.51	1.27%	-	42	3e	?
FeC	Fetzer loamy fine sand, 1 to 5 percent slopes	1.46	0.34%	-	44	3e	?




Figure 11: Soils (Source: id.land)

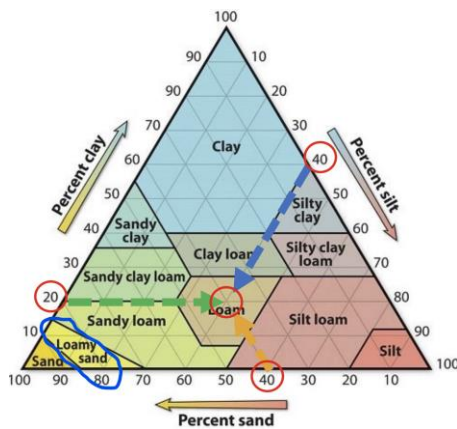


Figure 12: Soil Texture Triangle (Source: <https://streamline.imgix.net/a17bf26e-3dbd-47e6-a928-ad6896262f75/40d9279e-23c9-4fc1-ba17-a7328fbd4322/texture-triangle.jpg?ixlib=rb-1.1.0&w=720&h=720&fit=max&s=c6c6106aae548d395f931ae193b7f443>)

The site consists of varying types of loamy fine sand which is not ideal soil for development. Although it is highly permeable and may offer good drainage characteristics, there are several issues that need to be addressed through a proper geotechnical study:

**Load Bearing Capacity:** Due to lack of cohesion and shear strength, loamy fine sand may have issues with load bearing capacity, especially for larger multistory structures as noted in the conceptual plan (see appendix).

**Settlement and Erosion:** Loamy fine sand can be prone to settlement and erosion overtime which could undermine foundation stability and cause structural issues in the future if not addressed properly.

Due to the above issues, a geotechnical study may provide guidance on the following improvements to the soil:

**Compaction:** Compacting the soil will help increase shear strength, density, and reduce pore space/ void ratio. This can be achieved using heavy machinery like compactors or rollers.

**Soil Stabilizers:** The geotechnical report will likely recommend soil stabilizers like lime, cement, or fly ash. These can be added to improve cohesion, reduce permeability, and increase stability by helping bind the soil particles together.

Additionally, the civil engineer can help advise on the following improvements to the land:

**Geogrids/ Geotextile Installation:** Installing these beneath the foundation can help evenly distribute the load, prevent soil movement, provide additional reinforcement to the soil, and help reduce the risk of settlement.

**Drainage Improvements:** It is crucial to install proper drainage systems to help prevent erosion and excess moisture to ensure soil stability. Improvements such as French drains and surface drainage channels may be recommended along with a comprehensive drainage/ detention plan for storm water runoff.

## **Climate**

- The site is located in Grimes County Texas, where the Summers can be long, hot, and humid, and the Winters are short, cold, and wet.
- Throughout the year the average temperatures range from 43 degrees in the cold season to 95 degrees in the hot season.
- The area is further inland from the coast by about 80 miles but is susceptible to Hurricane influence on rare occasions.

## **Utilities**

- According to the Grimes County website, Grimes County regulates the installation of oil & gas pipelines, as well as water/wastewater, electrical, and communications lines that enter any county road right of way.
- Currently the property is being served by well and septic (existing well is on the east side of the property; see figure below for details)
- Location and width of any utility easements to be determined by the utility companies and should connect with easements established in adjoining properties. All utility easements should be properly located on the plat.

STATE OF TEXAS WELL REPORT for Tracking #411856			
Owner:	HVJ Associates, Inc.	Owner Well #:	B-71
Address:	6120 S Dairy Ashford Road Houston, TX 77072	Grid #:	60-41-2
Well Location:	CR-307 and CR-306 Magnolia, TX	Latitude:	30° 20' 01.6" N
	Intersection of CR-307 and CR-306.	Longitude:	095° 56' 43.4" W
Well County:	Grimes	Elevation:	No Data
Type of Work:	New Well	Proposed Use:	Monitor

Drilling Start Date: 8/21/2015 Drilling End Date: 8/21/2015

	Diameter (in.)	Top Depth (ft.)	Bottom Depth (ft.)
Borehole:	4	30	30
Drilling Method:	Mud (Hydraulic) Rotary		
Borehole Completion:	Screened		

Figure 13: Well Report (Source: id.land)

## Easements

- There are 2 gas pipelines (red dotted lines in Figure below)
- There is 1 oil pipeline inside the property boundary on the eastern border, and 1 oil pipeline just outside the eastern border of the site (green dotted lines in Figure below)
- Additionally, there is a railroad (Burlington Northern and Santa Fe Railroad) directly north of the property (see yellow lines in Figure below). This does not technically affect the property physically but may cause noise issues for the residential development proposed on the northern side of the property.
- There is a gas well circled in the Figure below as well.

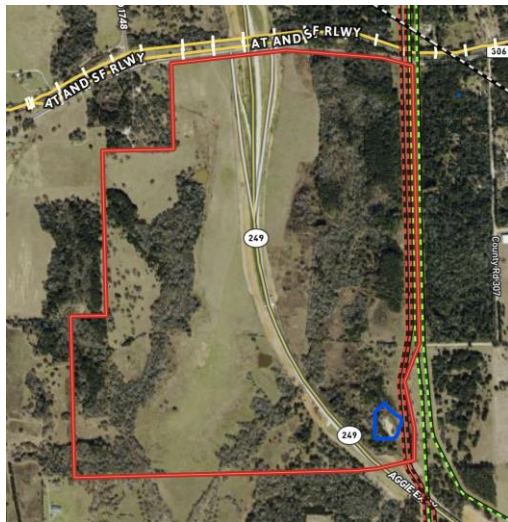


Figure 14: Gas Well (Source: id.land)

- There is a TX DOT Easement for the Aggie Expressway that divides the property (see purple easement in Figure below).



Figure 15: TX-DOT Easement (Source: id.land)

## ***Cultural Factors***

### **Land Use, Ownership, & Control**

#### **SALES HISTORY**

DEED DATE	SELLER	BUYER	INSTR #	VOLUME/PAGE
12/14/2016	NATIONAL OILWELL VARCO, LP	GLOCKZIN RANCH PROPERTIES, LTD	-	1629/81
9/10/2013	MUSEUM OF FINE ARTS/HOUSTON	NATIONAL OILWELL VARCO, LP	-	1476/122
5/4/2005	LAW, T N MRS	MUSEUM OF FINE ARTS/HOUSTON	-	1125/1140/646/94

LAND SEGMENT TYPE	STATE CODE	HOMESITE	MARKET VALUE	AG USE	TIM USE	LAND SIZE
1 - IMPROVED PASTURE #2	Acreage Ranch Land	No	N/A	N/A	N/A	433.085000 acres
<b>TOTALS</b>						<b>18,865,183 Sq. ft / 433.085000 acres</b>

Figure 16: Sales History (Source: grimescad.org)

- Most of the land in the area is for ranching use.
- Previously owned by the Houston Museum of Fine Arts and was subsequently sold to National Oilwell Varco LP in 2016.
- Although there are no current developments in the area, the Aggie Expressway will lead to many new opportunities in the near future.



## **Economic Value**

### VALUE HISTORY

YEAR	IMPROVEMENT	LAND	MARKET	AG MARKET	AG USE	APPRAISED	HS CAP LOSS	ASSESSED
2023	\$3,800	\$0	\$3,800	\$5,956,650	\$42,440	\$46,240	\$0	\$46,240
2022	\$3,800	\$0	\$3,800	\$5,956,650	\$42,010	\$45,810	\$0	\$45,810
2021	\$3,800	\$0	\$3,800	\$3,726,260	\$45,040	\$48,840	\$0	\$48,840
2020	\$3,800	\$0	\$3,800	\$3,726,260	\$45,040	\$48,840	\$0	\$48,840
2019	\$3,800	\$0	\$3,800	\$2,858,360	\$45,470	\$49,270	\$0	\$49,270

Figure 17: Value History (Source: grimescad.org)

- Due to the agriculture use designation, there will be rollback taxes that the developer should negotiate with the seller when acquiring land.

## ***Regulatory Factors***

### **Zoning Codes**

- According to the Grimes County website, Grimes County does not regulate zoning, building code, fire code, or communication facility structures.
- Grimes County also does not issue certificates of compliance or certificates of occupancy.

### **Environmental Regulations**

- To obtain a permit for an onsite sewage facility, a site evaluator must conduct a site and soil evaluation.
- Grimes County Environmental Department lists garbage collection sites for cities within the county.
- The Bluebonnet Groundwater Conservation District, Texas A&M AgriLife Extension Service, and Brazos Valley Health Department partner to help residents with water testing services for private water wells.

### **Subdivision Requirements**

- Lot requirements
  - 60' minimum width at building setback line
  - 40' minimum width at front lot line for pie shaped lots (cul-de-sac or curve)
  - The minimum area of lots that can be serviced with a central sanitary sewer and water system is 7,000 square feet.
  - The design of the lot should ensure that it is spacious, both in width and depth, with a shape that allows for open areas to avoid overcrowding and be suitable for the subdivision's location and the type of development planned.
- Street requirements

- The street design must provide adequate circulation throughout the subdivision and limit excessive traffic.
- Subdivisions may provide a protected right-of-way to within one foot of the adjacent properties by means of dedicated roadway easements.
- The right-of-way width requirements for a local road with a curb and gutter is 55'.
- Names of proposed streets must conform to the names of existing streets that they may become extensions of and shall not conflict with the recognized name of any other street located in Grimes County and be in coordination with local postal service, rural addressing and 911 addressing recommendations.
- Drainage requirements
  - Where conditions require the need for drainage, there must be an adequate storm water drainage easement based on a drainage plan by a registered professional engineer.
  - The easement must be kept clear of fences, buildings, and any other obstructions for the use and maintenance of the drainage system.
  - Adjacent properties are not allowed to drain into this easement.

### **Other Local Requirements**

- Things that Grimes County regulates include:
  - Septic system installations
  - Subdivision plat applications
  - Culvert installation permits for driveways providing access to county roads.
  - Installation of oil and gas pipelines, water or wastewater lines, communications lines, and electric lines that enter the county roads right of way.
  - Surveys conducted within the county road right-of-way that affect the soil/road surface.
  - Proposed developments within a floodplain area
  - High speed rail facilities that cross the county road right-of-way

# ANALYSIS OF EACH LAND USE SECTION

## Concept Plan

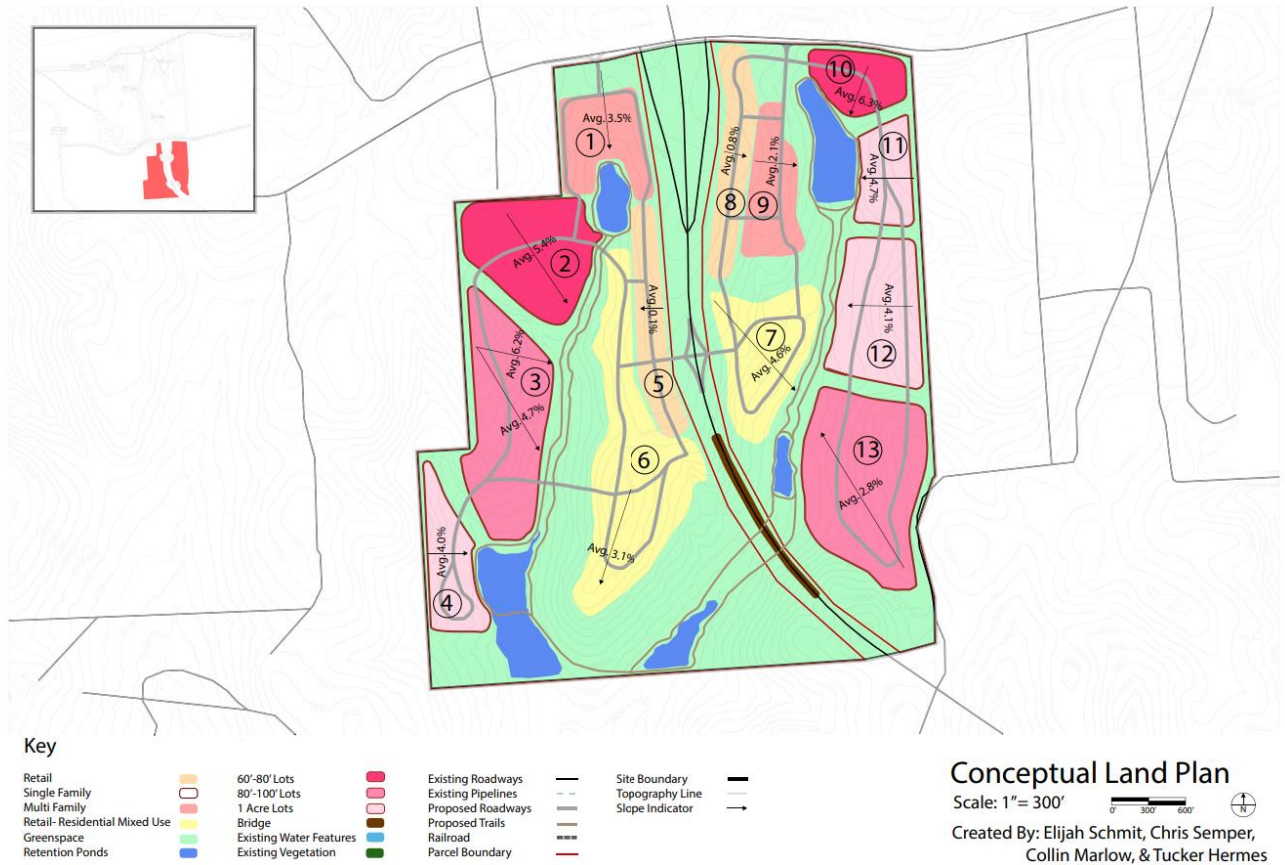


Figure 18: Concept Plan

## SWOT Analysis

### *Strengths*

Natural swales, valleys, and creeks flowing south present ideal drainage without significant use of storm sewer and retention design. Easy access to Houston via the Aggie Expressway.

### *Weaknesses*

Loamy fine sand soils will need stabilization via significant additives (lime/cement) and compaction. Topography limits the developable area to roughly 50% of site.

### *Opportunities*

First significant development in the area with most land zoned agricultural, so capture rate of potential residents should be high as population in the area expands. This mixed-use development could spur additional growth of residential development in surrounding areas.

### ***Threats***

There could be zoning issues and pushback from neighboring properties being the first significant mixed-use development in the area.

### **Overall Improvements to the Site**

- A MUD (Municipal Utility District) must be created for public utility infrastructure improvements to service the site.
- The 1 acre lots will be served by well and septic (county minimum lot size requirement).
- The loamy fine sand soils will have to be stabilized with lime or cement and compacted prior to construction.
- Retention Ponds and drainage system as shown in the concept plan.
- The developer will have to coordinate with TX DOT on access in middle of property off the Aggie Expressway.
- There will be no development on the pipeline easements (eastern border of property).
- Site design was meant to leverage all existing features and save natural trees/ vegetation.
- Trees removed will be sold for reuse to offset clearing & grubbing costs.

### **Section 1: Garden-Style Multifamily (11.56 acres)**



Figure 19: Garden-Style Multifamily Rendering (Source: <https://www.pnnewswire.com/news-releases/new-active-senior-residences-open-in-myrtle-beach-301241885.html>)



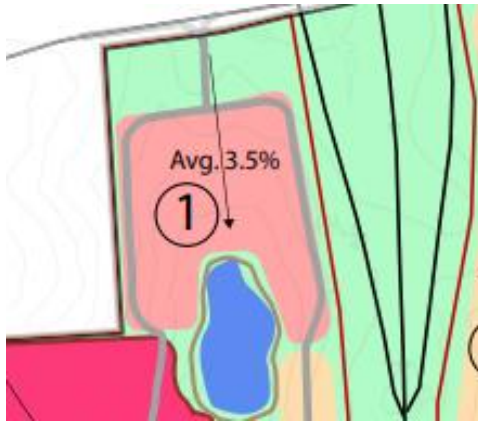


Figure 20: Section 1 in Concept Plan

The concept plan is designating the northwest section of the property to garden-style apartments with surface parking. This will be a gated community and serve as the entrance to the site off County Road 306. We have set this community back roughly 300 ft from the boundary of the site to the north along County Road 306 to help offset the noise from this road and the railroad. This portion of the property is ideal for multifamily as the average slope is roughly 3.5% with a maximum slope of 8%. The limited slope differential will help mitigate the need for cut/fill, whereas other portions of the property have much greater slope ranges. Roughly 2,500 sq ft of cut may be necessary (see Figure 21 below) to stabilize the site for construction and allow greater density of 13 units/ acre (150 units total). Garden-style will allow for multiple 2-3 story buildings and reduce grading needs; however, the surface parking (impervious) will create additional drainage needs for storm runoff. A large retention pond will be located directly behind the community for drainage as well as an amenity for residents (includes access to walking trail system). Large entry monuments will be placed in the greenspace directly north of the community with visibility off County Road 306.

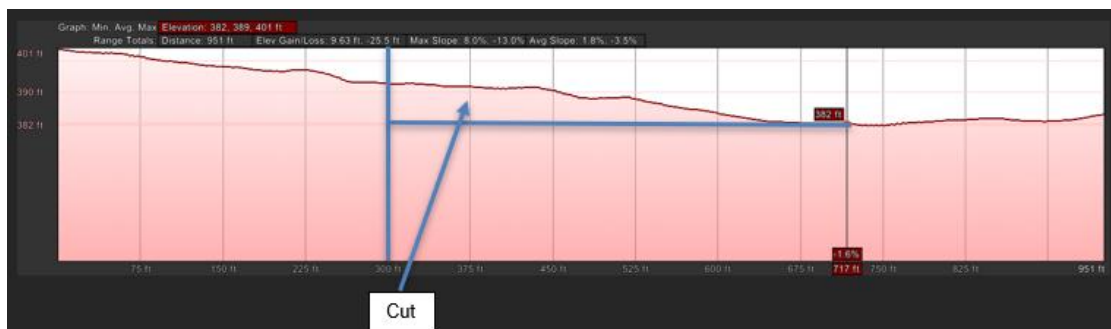


Figure 21: Section 1 Slope Elevation Profile (Source: earth.google.com)

## **Section 2: High-Density Single-Family Residential (18.62 acres)**



Figure 22: High Density Single Family Residential Photo Example (Source: <https://oldurbanist.blogspot.com/2015/03/single-family-zoning-its-all-about-lot.html>)



Figure 23: Section 2 in Concept Plan

This section will consist of 60-80 ft wide lots for higher density single family residential homes. The subdivision ordinance adopted requires a minimum of 60' width at the building line setback and a 115' minimum length (7,000 sq ft lot) to be serviced with a central sanitary sewer and water system. The average slope from the high point to the low point of this section is 5.4%, with a maximum slope of 13.3%. Although there is a large range of slopes in this section, the right-of-way running parallel to the existing contours and the gently sloping terrain (see Figure 24 below) will help mitigate cut/fill, the size of retaining walls and foundations for the homes. This section is close to access to County Rd 306 and the railroad directly north of the property which will have increased noise and less seclusion than other sites. Due to these factors, lower price points will be reflected in this section, hence the need for higher density. The goal will be to increase lot yield to offset construction cost with the relatively lower price point of this section. Large commercial developments would not be suitable here as extreme amounts of excavation and

earth work would be required making it infeasible from a cost perspective. Additionally, this section has very little vegetation which will save costs for single family construction.

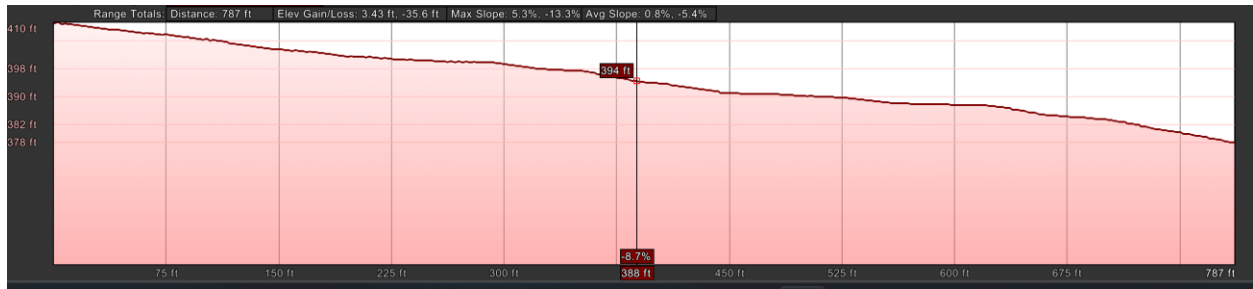


Figure 24: Section 2 Slope Elevation Profile (Source: earth.google.com)

### **Section 3: Medium-Density Single-Family Residential (23.60 acres)**



Figure 25: Section 3 Single Family Home Photo Example (Source: <https://www.pinterest.com/pin/269934571395529547/>)



Figure 26: Section 3 in Concept Plan

This section will consist of 80-100 ft wide lots for medium density single family residential homes. The average slope from the high point to the low point of this section is 5.9% from the north end to the east and 4.7% towards the southeastern end, with a maximum slope of 23% (see Figure 27 below). This area is sparsely vegetated which will reduce clearing costs but has dense vegetation surrounds this section created privacy for these homes. Residents will also have access to the walking trail system and the largest retention pond which will serve as an amenity. The development of this section will require intense grading and significant use of retaining walls to properly drain water away from properties and into the storm water system. Some areas with greater than 15% slope may have to be avoided altogether for construction. However, the hope is to create less density in this section to limit the cost of grading and retaining walls but allow enough density to offset the costs with higher price point homes. Large commercial developments would not be suitable here as extreme amounts of excavation and earth work would be required making it infeasible from a cost perspective.

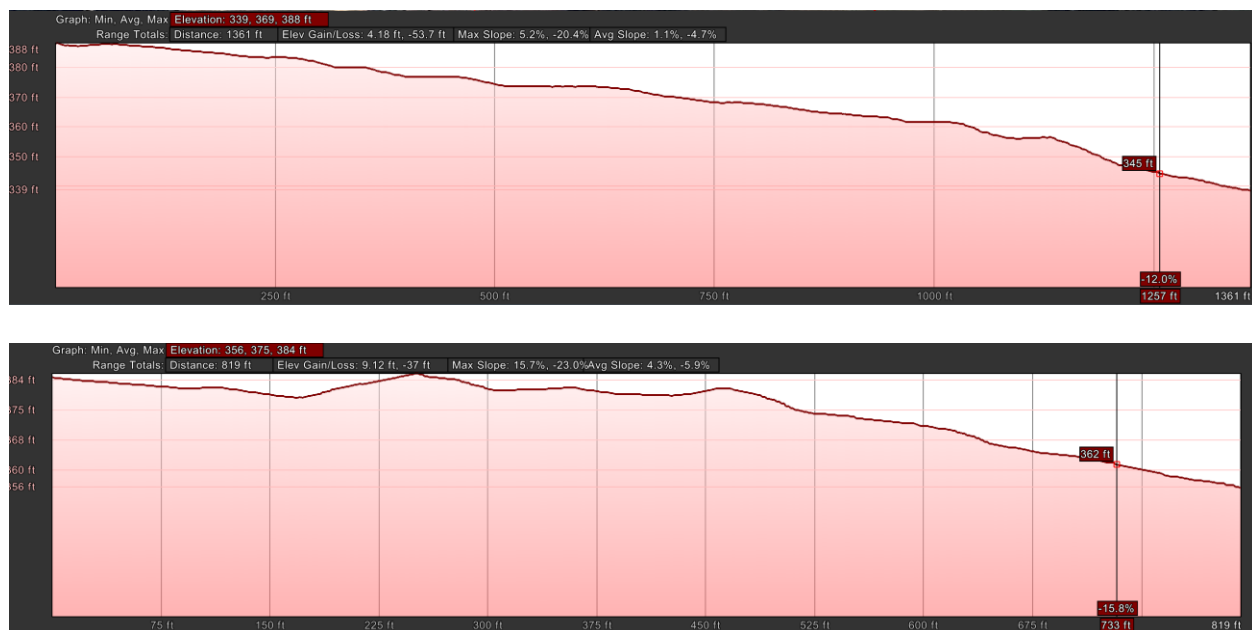


Figure 27: Section 3 Slope Elevation Profile (Source: earth.google.com)



#### **Section 4: Low-Density Single-Family Residential (9.61 acres)**



Figure 28: Section 4 Single Family Residential Photo Example (Source: <https://www.riverchaseestates.com/storage/app/uploads/public/5e6/309/9a7/5e63099a72214620669261.jpg>)



Figure 29: Section 3 in Concept Plan

This section will consist of 1 acre lots that will be served by well and septic. This is area has extremely dense vegetation and the trees should be saved to mitigate the environmental impact to the site. The larger lots will allow the developer to save the trees to improve site drainage and serve as increased privacy for residents in this section. These lots will be at a much higher price point due to the privacy and frontage of the retention pond/ lake amenity. As shown in the Figure 30 below, the slope ranges dramatically throughout this section (2.4% - 18.7%) which would create challenges for denser single family residential or larger commercial due to higher grading

costs, increased detention needs (as surface would be less permeable), and the use of extensive retaining walls.

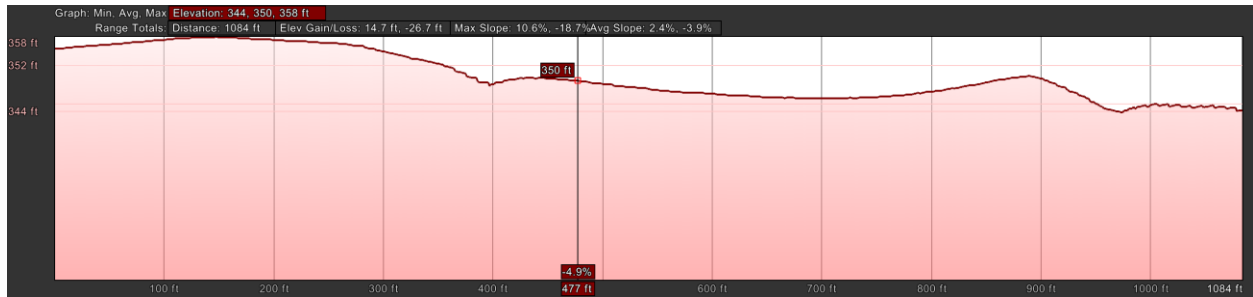


Figure 30: Section 4 Slope Elevation Profile (Source: earth.google.com)

### **Section 5: Retail (10.06 acres)**



Figure 31: Section 5 Retail Center Photo Example (Source: <https://www.douglaswilson.com/project-details/serra-mesa-shopping-center/>)



Figure 32: Section 5 in Concept Plan

This section will be dedicated to retail strip centers, primarily featuring food establishments catering to residents and travelers along the Aggie Expressway (with views traveling both north

and south). This section is accessible via the Aggie Expressway to the west and is strategically located to attract commuters traveling between College Station and Houston. Planned access roads will ensure easy public access, enticing drivers to visit the numerous retail spaces for dining, shopping, and travel breaks. With an average slope of only 2.1% and a maximum slope of 6.5% (see Figure 33 below), this section boasts minimal slope differentials, reducing the need for extensive cutting and filling during the construction period. characteristic will significantly speed up the development of retail spaces and paved parking areas compared to other sections. Roughly 8 ft of cut will be required over portions of the north end of this section (997 ft) to stabilize the site for construction of the buildings and parking (see elevation profile below). As mentioned previously (section 1), the northern part of this section features a large retention pond. Residents of sections 1 and 2 will benefit from a dedicated walking trail around this retention pond that provides convenient access to the retail area, enhancing the overall appeal and accessibility of the development.



Figure 33: Section 5 Slope Elevation Profile (Source: earth.google.com)

## **Section 6: Retail-Residential Mixed-Use (31.43 acres)**



Figure 34: Retail-Residential Mixed-Use Photo Example (Source: <https://www.loopnet.com/Listing/14468-72nd-Ave-Surrey-BC/17224092/>)



Figure 35: Section 5 in Concept Plan

This section is designated for a mixed-use development, combining retail and residential spaces. As illustrated in the example above, the development will feature ground-floor retail spaces, with condominiums available for sale on the upper floors. With an average slope of 2.4% and a maximum slope of 10.1% (see Figure 36 below), our approach will avoid development in areas of severe elevation change such as the saddle shown on the elevation profile (circled in Figure 36). The placement of fill in the location indicated on the elevation profile will level the ground and establish a stable foundation for the mixed-use development. The development will seamlessly integrate with the retail spaces in section 5, connected by a planned road network. Surrounding the development on the east, west, and south sides will be expansive green spaces, offering tenants and customers picturesque views of the natural surroundings.

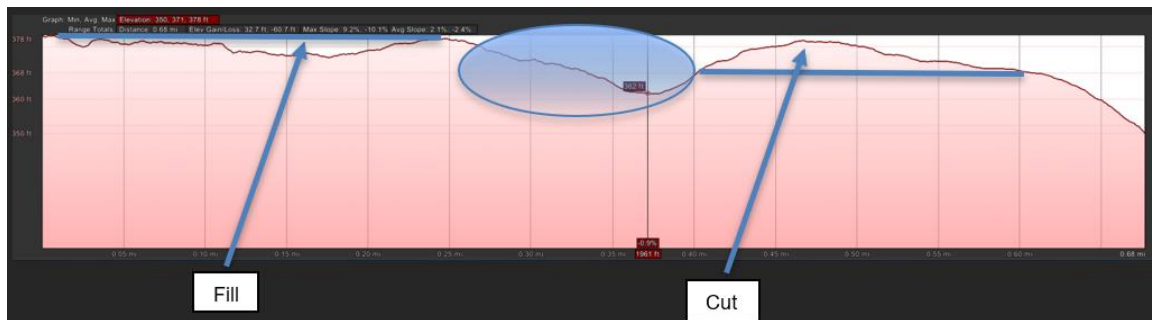


Figure 36: Section 6 Slope Elevation Profile (Source: earth.google.com)



## **Section 7: Retail-Residential Mixed-Use (16.33 acres)**



Figure 37: Retail-Residential Mixed-Use Photo Example (Source: buildinglosangeles.blogspot.com)



Figure 38: Section 7 in Concept Plan

Like section 6, section 7 will feature a mixed-use development combining retail and residential spaces. Located on the east side of the Aggie Expressway, this section will comprise retail establishments on the ground floor, with condominiums situated on the upper levels. The area slopes gradually from the northwest to the southeast, with an average slope of 4.6% (see Figure 39 below). To accommodate this topography, we will implement cut and fill methods along the blue line indicated on the elevation profile to ensure a level foundation for the development. Unlike the other mixed-use section, section 7 is not widely surrounded by green space. However, it is bordered by retail and multifamily sections to the north, as well as single-family residences to the east. Additionally, a walking trail to the east connects all sections within the area, enhancing accessibility and connectivity. To the south of section 7 lies a retention pond, which serves the dual purpose of managing drainage for the development and providing an attractive view for both tenants and customers.

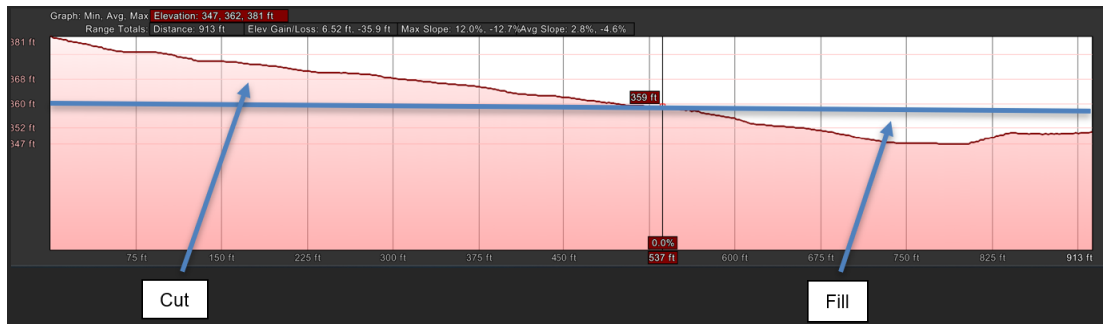


Figure 39: Section 7 Slope Elevation Profile (earth.google.com)

## **Section 8: Retail (10.25 acres)**



Figure 40: Section 8 Retail Center Photo Example (Source: <https://www.atproperties.com/8629347/200-w-north-avenue-west-chicago-illinois-60185-nei>)

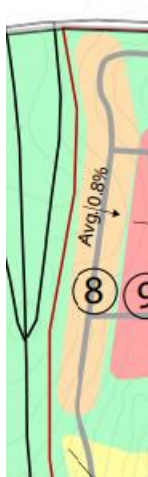


Figure 41: Section 8 in Concept Plan

Like the model of section 5, section 8 will be dedicated to a retail strip center. Situated adjacent to County Road 306 (north) and the Aggie Expressway access road (east), this section offers excellent accessibility, especially with the planned roads. Access to the site can be from the north off County Rd 306 or east of the Aggie Expressway just south of the section (see conceptual map). Primarily featuring food establishments, section 8 provides tenants and customers with a strategic vantage point overlooking the Aggie Expressway. The central area of the section, stretching from west to east, has only a 0.8% average slope, with a maximum slope of 9% (see Figure 42 below). Although the elevation profile indicates mostly flat terrain in parts, significant cutting will be necessary where the slope increases to ensure a stable foundation for the development and parking lot paving. Minimal clearing and grubbing will be required due to lack of vegetation, which will help offset the excavation costs. Section 8 will back up to section 9, which comprises multifamily units interconnected by a proposed road, enhancing the overall connectivity and appeal of the development.



Figure 42: Section 8 Slope Elevation Profile (Source: earth.google.com)

## **Section 9: Contemporary Urban-Style Multifamily (10.30 acres)**



Figure 43: Multifamily with Structured Parking Photo Example (Source: <https://www.structurecareus.com/markets/residential-and-commercial-parking-garage-maintenance/>)



Figure 44: Section 9 in Concept Plan

This section, situated in the northeast area of the property, is designated for contemporary urban-style apartments featuring both surface and structured garage parking for residents. Accessible via an entrance off County Road 306, this area is ideal for a multifamily development due to its favorable topography, with an average slope of approximately 2.1% and a maximum slope of 10.2%. Cut of up to 10 ft will be required (see Figure 45 below) and construction will be avoided towards the south of this section as slope increases significantly towards a swale. Minimal clearing will be required due to lack of vegetation which will help offset excavation costs. To manage drainage and enhance the resident experience, a sizable retention pond will be positioned



behind the community, also serving as an amenity with access to a walking trail system. Enhancing visibility and identity, large entry monuments will be strategically placed in the greenspace to the north of the community, visible from County Road 306.

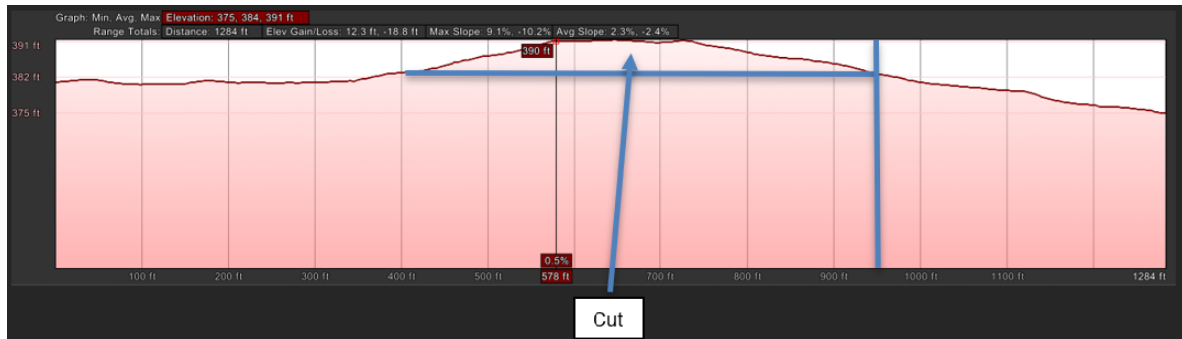


Figure 45: Section 9 Slope Elevation Profile (Source: earth.google.com)

## **Section 10: High-Density Single-Family Residential (7.54 acres)**



Figure 46: Section 10 High Density SFR Photo Example (Source: <https://timandjulieharris.com/2022/02/07/best-suburban-market-for-first-time-buyers-in-2022.html>)



Figure 47: Section 10 in Concept Plan

Section 10 of the concept plan is located in the northeast corner of the property, and alongside county road 306, and a railroad. We have chosen to do high density development here that are 60-80 ft wide lots for higher density single family residential homes. The slope of the property varies considerably, with our maximum slope sitting at 15.9% and our average slope sitting at 6.3% (see Figure 48 below). This site will require heavy clearing and grubbing for lots, with potentially some preserved trees. Our right of way will follow along the slope until turning for access to other sites. This will help limit the amount of cut and fill required for portions of the site. Due to the proximity to the intersection of highway 249 and county road 306 alongside a railroad, high density was chosen due to noise and less privacy. The creation of more lots will be our approach to the higher construction costs in lot 10. The soils here will require compaction, stabilization, and lime for building sites.

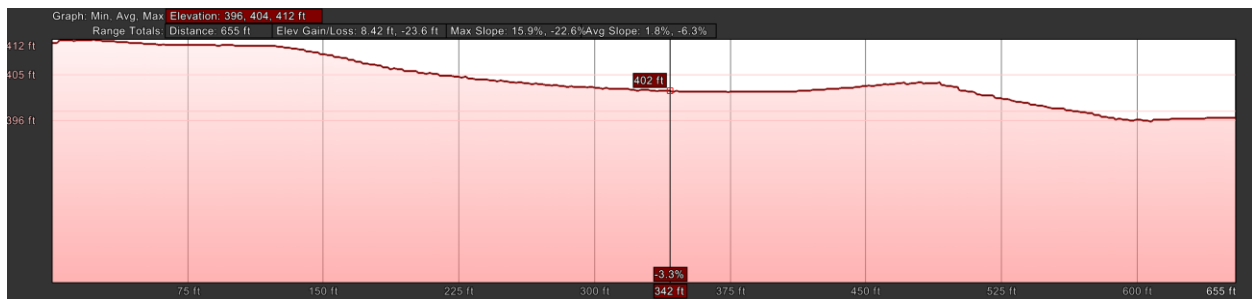


Figure 48: Section 10 Slope Elevation Profile (Source: earth.google.com)

## **Section 11: Low-Density Single-Family Residential (7.88 acres)**



Figure 49: Section 11 Single Family Residential Photo Example (Source: [https://www.engelvoelkers.com/en-us/property/single-family-in-college-station-texas-3201446.30000\\_exp/](https://www.engelvoelkers.com/en-us/property/single-family-in-college-station-texas-3201446.30000_exp/))



Figure 50: Section 11 in Concept Plan

This section in our concept plan will consist of our larger 1 acre lots for low-density single-family homes. Our slopes for this section will range from 16.9% with our average around 2.3% (see Figure 51 below). This area does have dense vegetation but will not be fully cleared with larger trees being preserved with areas around homes being primarily cut and cleared enabling better privacy and reducing clearing costs. Lots near the waterfront will be the most challenging as the slope increases and must be built on select areas. Retention walls, proper drainage, and grading will have to be emphasized in this section. Residents here will have direct access to amenities such as walking trails around our retention pond area. Thoroughfare through other sections will be utilized to ensure our roads are parallel to our contour lines on the site. The larger lot sizes will add to flexibility in home design and allow for the construction of larger homes on the lots to be sold at premiums. Cut and fill will likely have to be used for homes closer to the retention pond, however lots on our east side are more level. Soils in this section will consist of areas of loamy fine sand requiring compaction and stabilization with lime on build sites. Lots here will be served by septic tanks for waste and served by wells for water to further offset costs. Furthermore, through building more upscale homes on our larger lots this will minimize the amount of heavy earthwork, and clearing done, and utility requirements while allowing us to sell lots for premiums and enable this section to be feasible and profitable while minimizing the costs of developing the land.

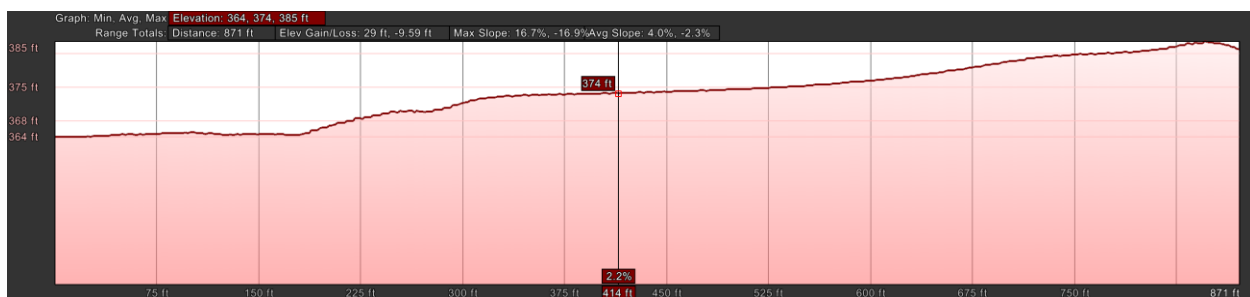


Figure 51: Section 11 Slope Elevation Profile (Source: earth.google.com)



## **Section 12: Low-Density Single-Family Residential (17.82 acres)**



Figure 52: Section 12 SFR Photo Example (Source: <https://onekindesign.com/2022/12/23/hilltop-contemporary-farmhouse-texas/>)



Figure 53: Section 12 in Concept Plan

This section, like section 11, will consist of larger 1 acre lots due to varying terrain and dense vegetation. Our maximum slope for section 12 is around 15.1% while our average is around 2.8% (see Figure 54 below). Some areas will have to be avoided for construction. This section will have amenities such as our walking trails and close access to our residential and retail area that are quite walkable. This area is also densely vegetated and will require clearing in housing sections, while larger trees and other vegetation on the lots can be preserved to save costs. Cut and fill along with retaining walls will have to be used on the steeper spots inside of this section. However, section 12 will be larger lots with larger homes to be sold at premiums to help offset the land costs. Section 12 will also be served through our well site on the property with lots also containing a septic tank for waste treatment to help offset some utility costs. This section will



also have a reasonable view of the property. Soils in this section also consist of loamy fine sand and will require lime and compaction on the build sites of the lots.

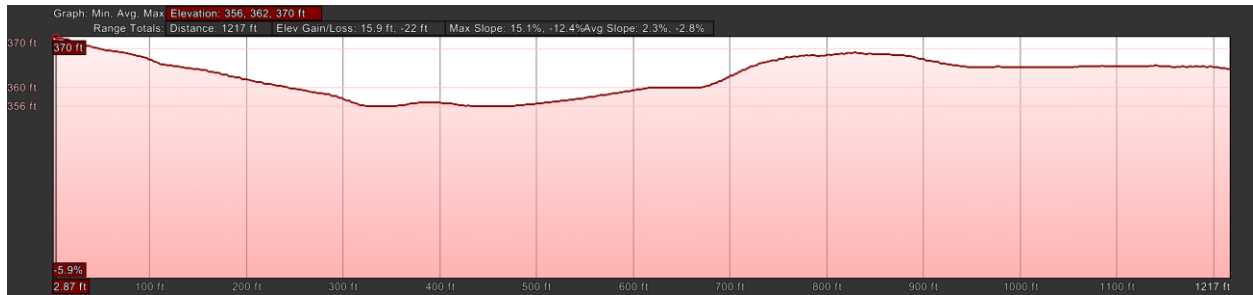


Figure 54: Section 12 Slope Elevation Profile (Source: earth.google.com)

### **Section 13: Medium-Density Single-Family Residential (29.21 acres)**



Figure 55: Section 13 SFR Photo Example (Source: <https://thearchitectsdiary.com/looking-to-build-a-custom-home-here-are-some-useful-insights/>)



Figure 56: Section 13 in Concept Plan

Section 13 will be a medium density site located on the southeast corner of the property. with slopes maxing at 18.6% with our average slope around 2.8% (see Figure 57 below). Construction on this site will be easier with the terrain flattening out a bit more. Clearing and grubbing will be required in section 13 but is of a medium density and includes the preservation of larger trees. We have some separation from Aggie Expressway to allow for more privacy and less noise. This site will also be next to county road 307 and a loop inside the development following contour lines for travel in and out of the community. This site will be tied into water and sanitary that will be servicing the development. With some of the build sites on the steeper side of the site, especially the northeast and east side, the use of retaining walls will be extensive. The amenities around site 13 will include a retail mixed use development alongside several walking trails. The use of medium density is the most logical for a better return with lot premiums to be profitable without having to do the land work high density would require. The soil requirements of loamy fine sand on this site will require compaction, stabilization, and lime.

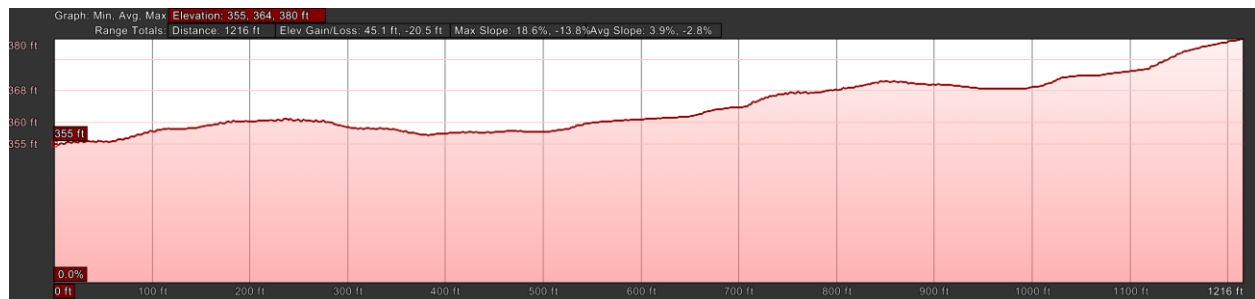


Figure 57: Section 13 Slope Elevation Profile (Source: earth.google.com)

#### Works Cited

Soil descriptions

[https://www.nrcs.usda.gov/sites/default/files/2022-11/MultiPointTriangle\\_v1.xlsm](https://www.nrcs.usda.gov/sites/default/files/2022-11/MultiPointTriangle_v1.xlsm)

Grimes county environmental permits

<https://grimescountytexas.gov/permits>

Subdivision rules and regulations

[https://grimescountytexas.gov/vertical/sites/%7B958238D0-27E6-4F6C-919E-F1D98542C5FD%7D/uploads/Subdivision\\_Rules\\_and\\_Regs\\_2011\\_rev\\_2022.pdf](https://grimescountytexas.gov/vertical/sites/%7B958238D0-27E6-4F6C-919E-F1D98542C5FD%7D/uploads/Subdivision_Rules_and_Regs_2011_rev_2022.pdf)

Subdivision development application

[https://grimescountytexas.gov/vertical/sites/%7B958238D0-27E6-4F6C-919E-F1D98542C5FD%7D/uploads/Subdivision\\_Development\\_Application.pdf](https://grimescountytexas.gov/vertical/sites/%7B958238D0-27E6-4F6C-919E-F1D98542C5FD%7D/uploads/Subdivision_Development_Application.pdf)

Grimes county regulations

<https://grimescountytexas.gov/vertical/sites/%7B958238D0-27E6-4F6C-919E-F1D98542C5FD%7D/uploads/Grimes-Cty-Regulations.pdf>

Texas ISD locator

<https://tea.texas.maps.arcgis.com/apps/Solutions/s2.html?appid=8b1d6f13310a49f48aa7052fe13f505a>

Navasota ISD

<https://www.navasotaisd.org/>

<https://schools.texastribune.org/districts/navasota-isd/>