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## Project Overview

- Warehouse Solutions was tasked with developing a design for an industrial warehousing complex with a minimum gross floor area of 300,000 SF, on a designated 25-acre property to fulfill the needs of businesses seeking space in fast growing Hays county

## Project Summary

- Design 1**
- We focused on narrowing down our four site layout design alternatives which included cross dock, rear load, shared dock, and no constraints
    - Safety
    - Revenue
    - Cost (Capital Cost & Life-Cycle Cost)
    - Sustainability

Criteria	Weighted	Alternatives							
		No Constraints		Shared Dock		Cross Dock		Rear Dock	
		Score	Total	Score	Total	Score	Total	Score	Total
GFA	10	7	70	5	50	9	90	4	40
GFA-Impervious Cover Ratio	6	7	42	7	42	7	42	6	36
Safety	4	6	24	10	40	7	28	6	24
Revenue	10	8	80	6	60	10	100	4	40
<b>Total</b>			<b>216</b>		<b>192</b>		<b>260</b>		<b>140</b>

### Final Decision

- Cross Dock scored the best on our weighted matrix table allowing us to move forward with this site layout

## System Design

### Utilities:

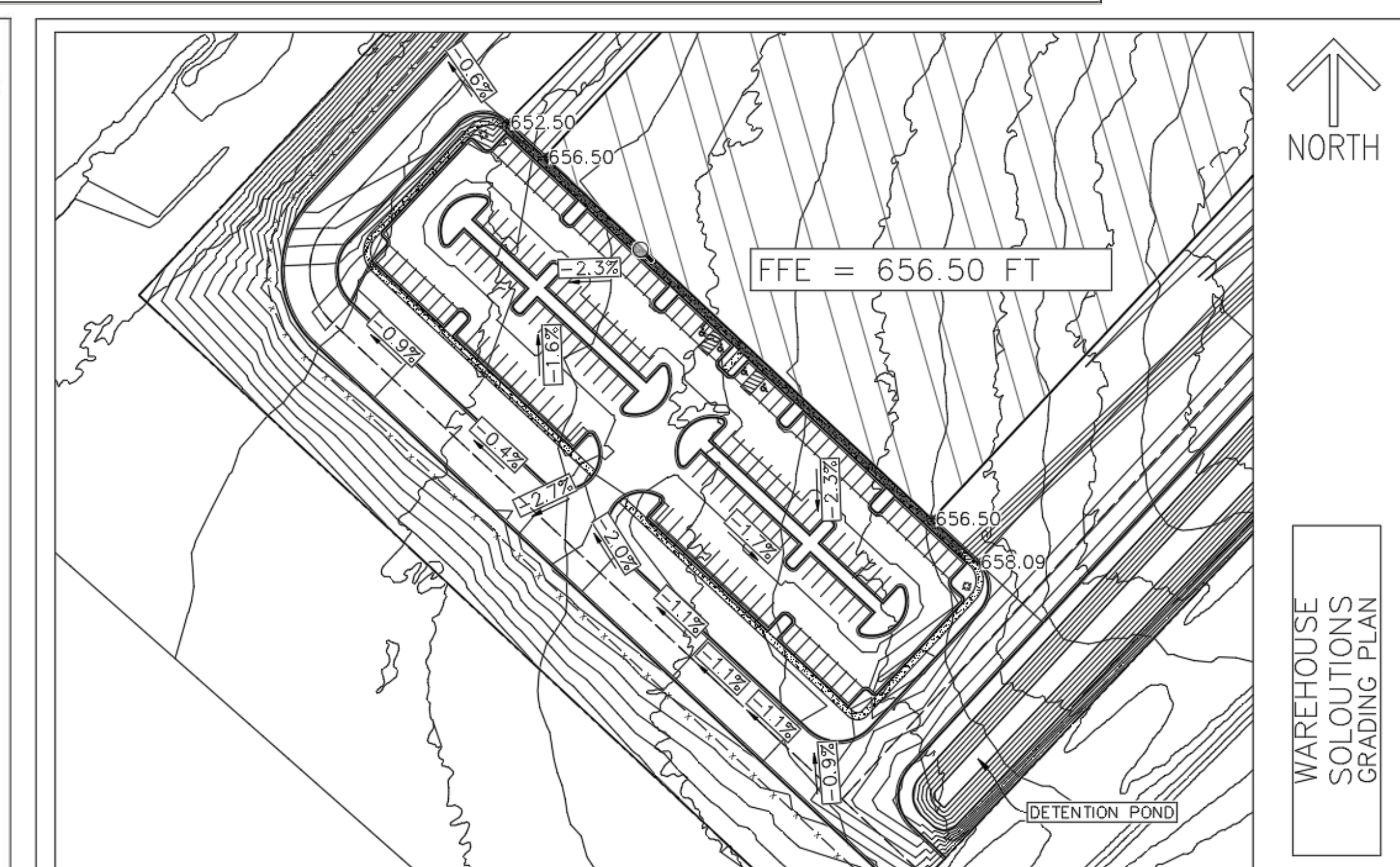
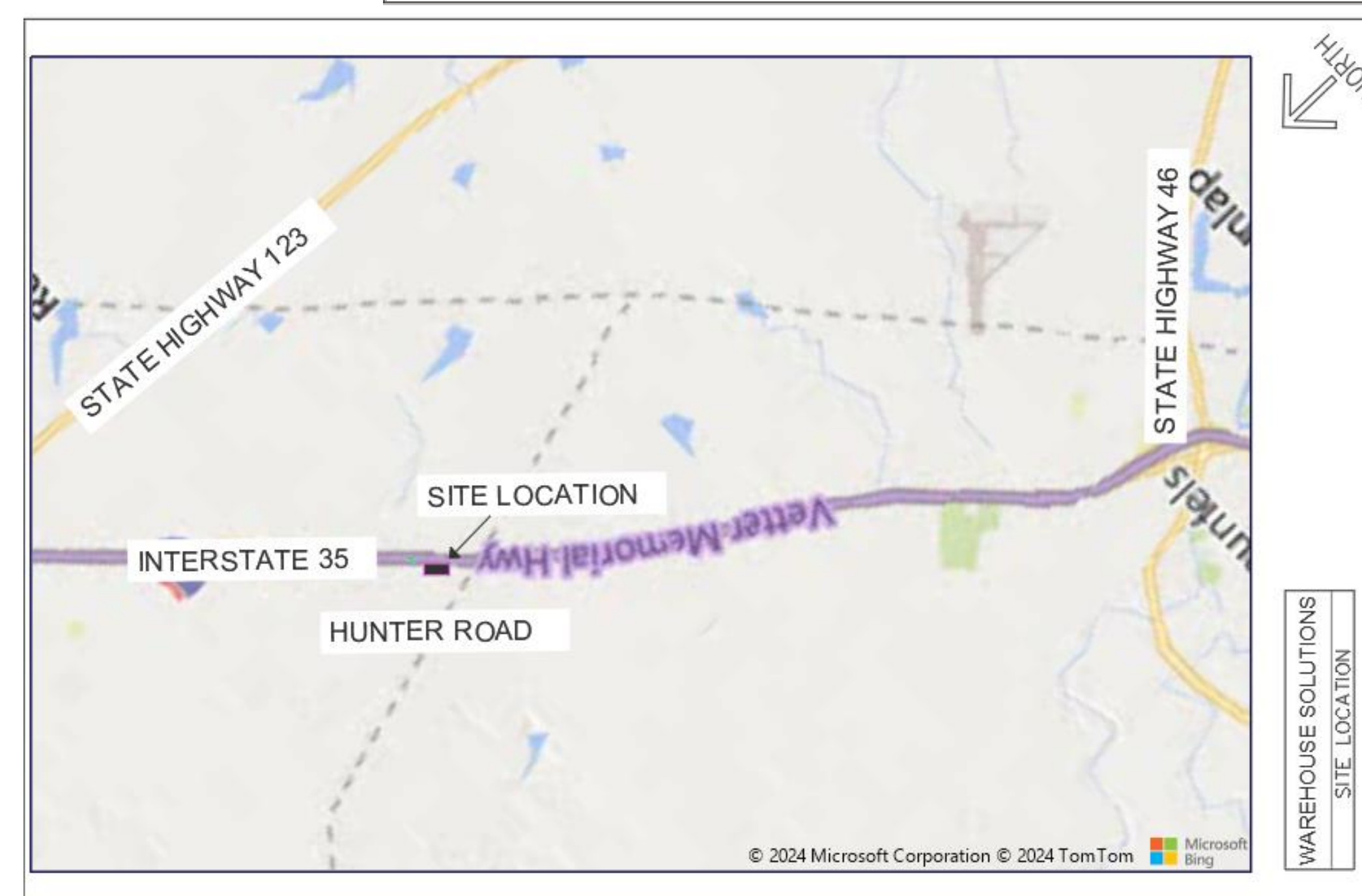
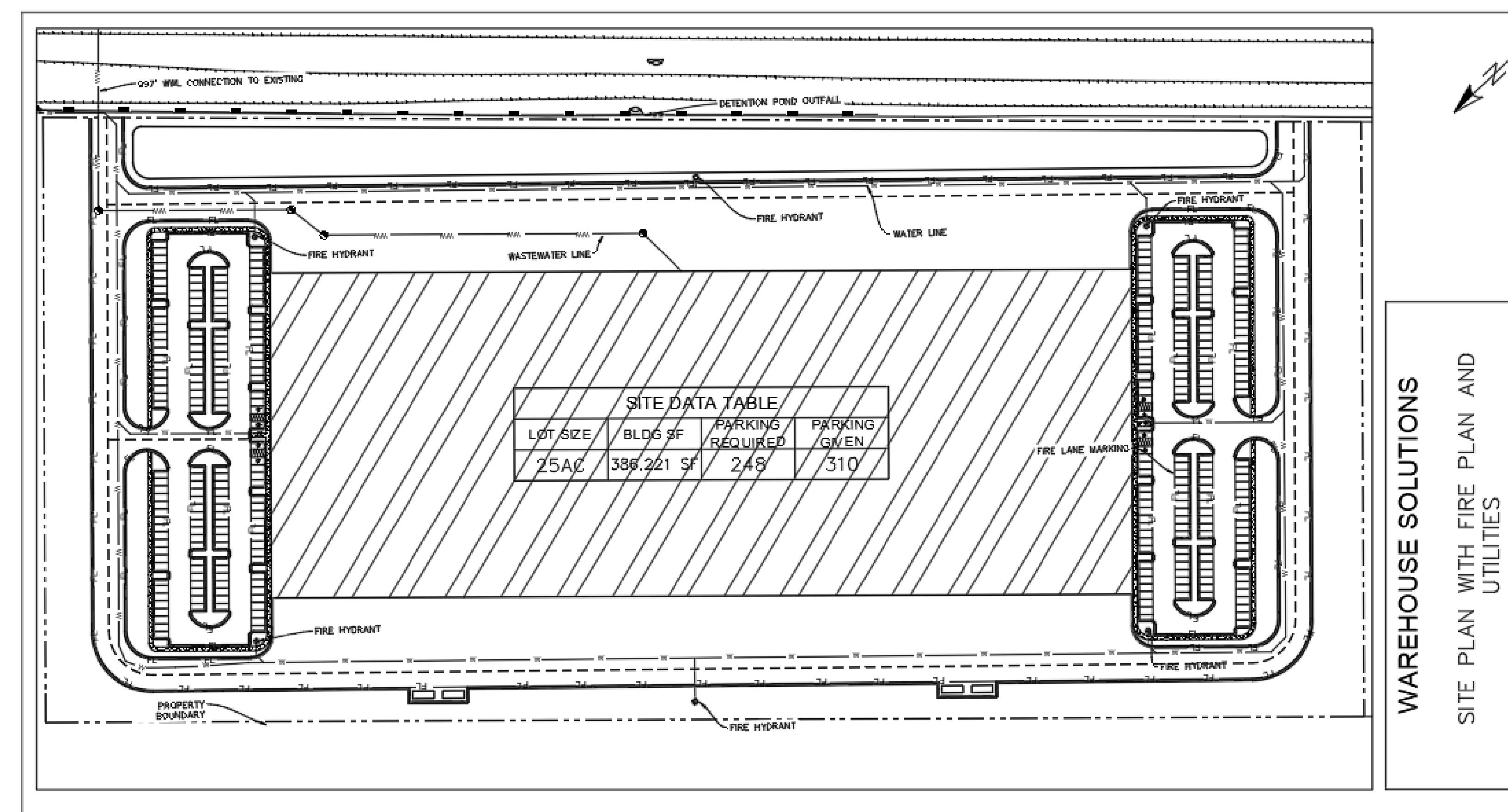
- When laying utilities, we had to consider
  - Connection to existing
  - Bends in system (water - 45°)
  - Access to Fire Hydrants

The proposed utilities are shown in the site layout. The connection to existing amounted to 962' which is included in the cost analysis table.

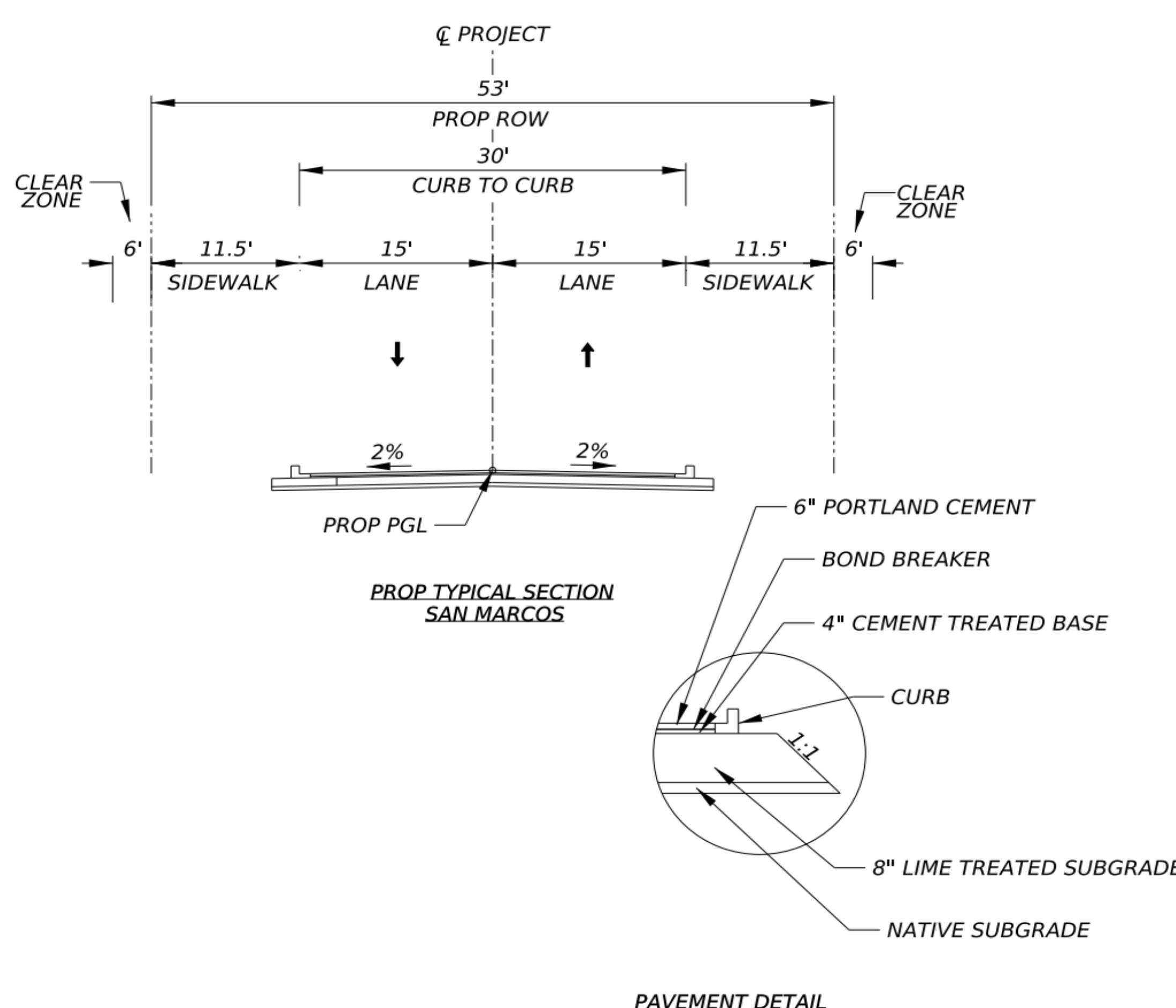
### Fire Plan:

- Fire plan is designed according to The City of San Marcos Fire standards with
  - Minimum 25' turning radius
  - 5 hydrants within 600' radius
  - Fire Lanes added

## Site Layout, Site Location & Grading Plan



## Pavement Design



To ensure proper pavement design, the following factors need to be accounted for:

### Soil conditions:

- Fat clays
- Weak soils

### Traffic analysis:

- Tracked the average daily traffic growth of 18-wheeler trucks over a 20-year period

### Design:

- Rigid Pavement Design due to its durability, low maintenance, strength, and ability to distribute loads effectively.

## Team



## Cost

Category	Amount
Capital Cost	\$12,300,000
Sustainability	\$2,500,000
Pavement	\$2,400,000
20% Contingency	\$17,200,000
<b>Total</b>	<b>\$17,200,000</b>
<b>NPV (30 years)</b>	<b>\$4,000,000</b>

## Conclusion

This senior design project produced a Cross Dock warehouse design, that includes utilities, fire protection, site grading and pavement design. Furthermore, we included a proposal for a Gold LEED certification while considering the following:

### Impactful Categories:

- Transportation
- Source water quality/ Efficiency in use
- Energy

### Additional Considerations:

- Quality Transit, Water, Solar Panels, EV Charging Stations

### Building Standards Followed:

- LEED rating system
- TxDOT
- City of San Marcos
- AASHTO
- Hays County fire department code
- 2021 International Fire Code (IFC)