

The background image shows a construction site. A yellow excavator is positioned on the right, with its arm and bucket visible. Large concrete pipes are being laid in a trench. The ground is dirt and there are trees in the background.

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# Sanitary Trunk Sewer Project Design

**Mia Smith, Sylvia Tumusiime and Spencer Brown**

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# Introduction

**Project Manager :**

**Mia Smith**

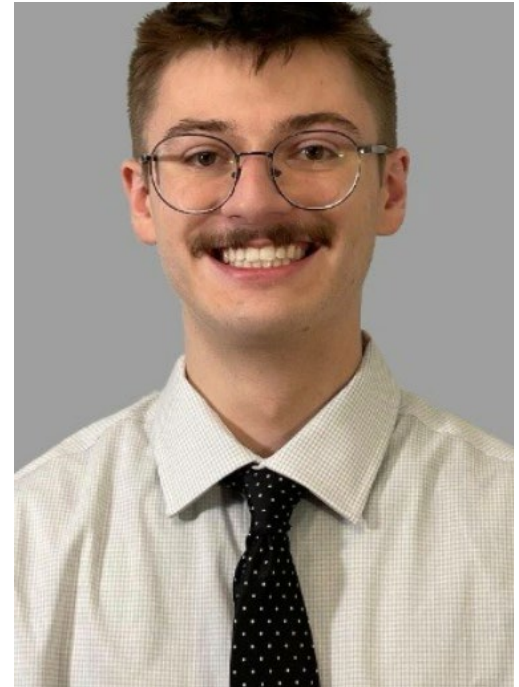
**Environmental Engineering**



**Sylvia Tumusiime**  
**Civil Engineering**



**Spencer Brown**  
**Civil Engineering**



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**Project Location**



**Project scope**



**Site Constraints**



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**Proposed Design**



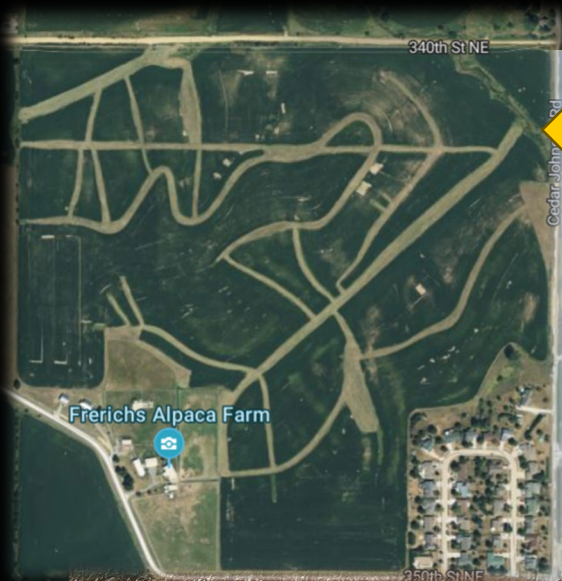
**Cost Estimate**



# West Branch Iowa







**New subdivision  
development**



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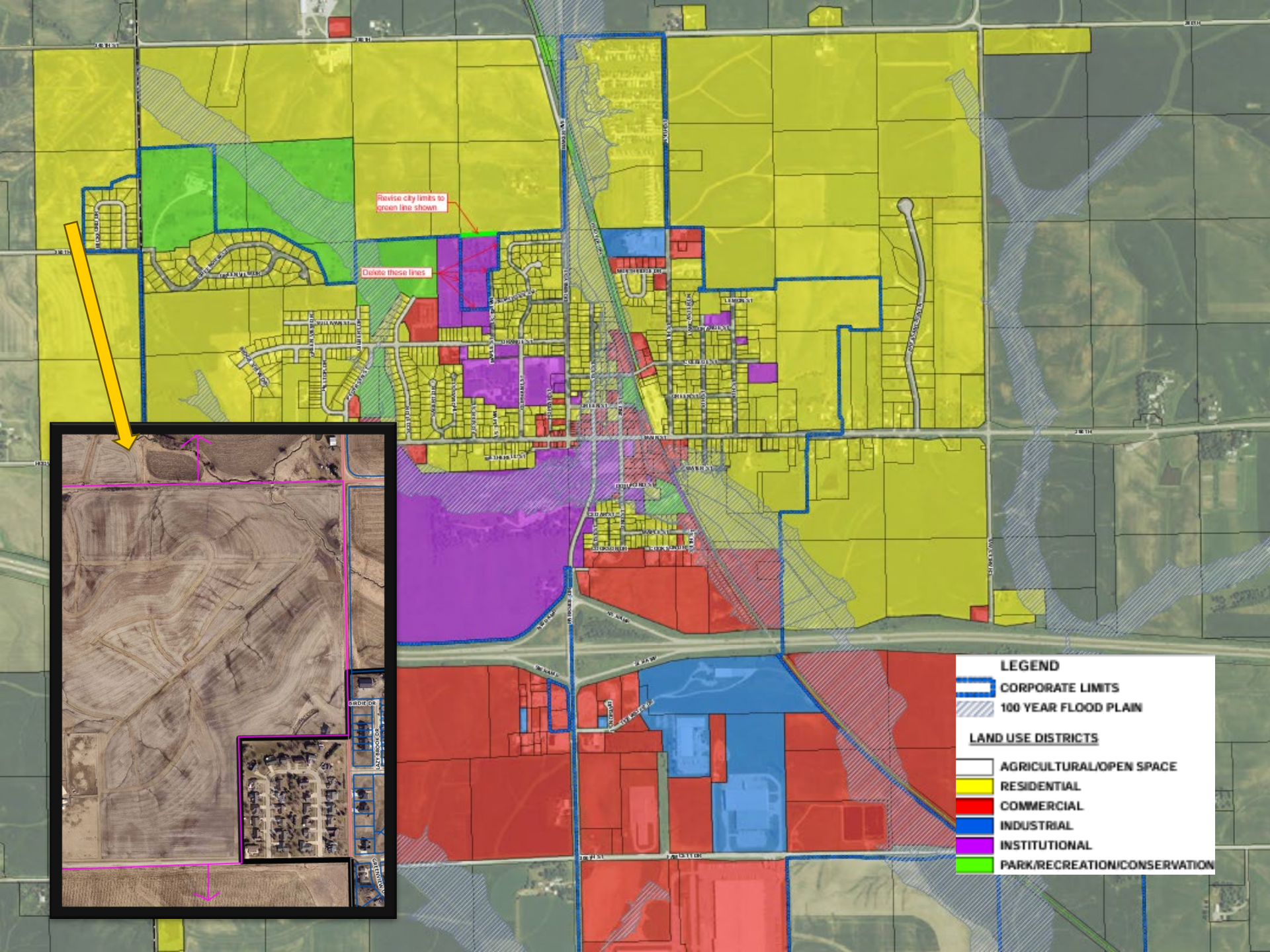
# Project Scope



**Multi-family (medium density  
–4.5 units/acre)**

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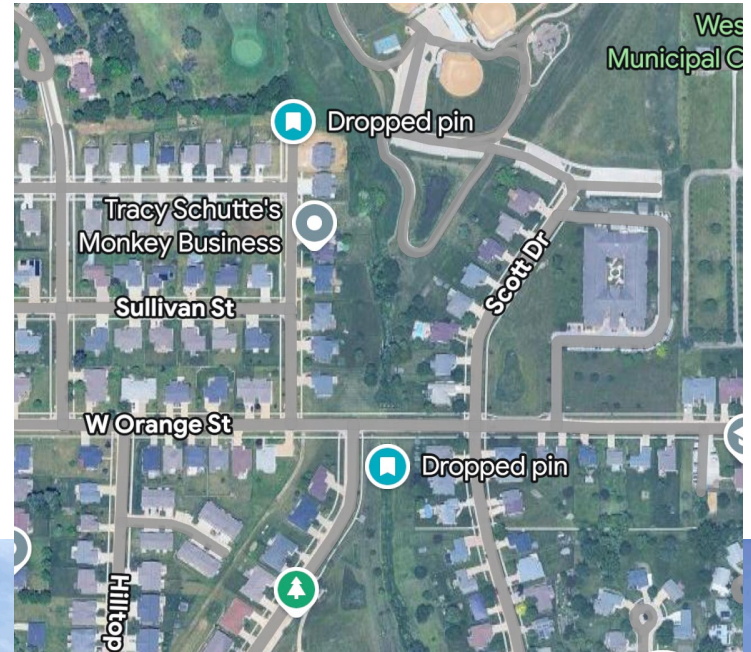






# Project Constraints

- Wetlands





## Site Constraints



# Site Constraint





# Constraints: Easements





# Design Guides and Methods

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**SUDAS**



IOWA DEPARTMENT OF  
NATURAL RESOURCES



**PWSB**

Public Works Service Bureau



# Design Alternatives

- Lift stations







**Design Alternatives:  
Connect to existing**



# Design Alternatives



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# Design Alternatives: Pipe Sizes

## 16" Trunk Sewer

**Q Max = 3.69 MGD**

**Q in = 0.811 MGD**

**Total homes : 2286**  
(after servicing site)

## 18" Trunk Sewer

**Q Max = 4.67 MGD**

**Q in = 0.811 MGD**

**Total homes : 3066**  
(after servicing site)



# Final Pipe Design Flow

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**15" PVC Pipe**

**Q Max = 3.21 MGD**

**Q from site = 0.811 MGD**

**Homes on site: 644**

**Total homes : 1910**

**(after servicing site)**



An aerial photograph overlaid with a topographic map showing contour lines. A blue line, representing a sewer line, runs diagonally from the top left towards the bottom right. The line is marked with small black arrows indicating direction. The terrain is hilly with varying vegetation and some buildings visible.

## **Final Design**

**Pipe: 15"**  
**Depth: ~ 8.5'**  
**Length: 6706'**

**Plan View of Trunk Sewer**



# Final Design

Pipe: 15"  
Depth: ~ 8.5'  
Length: 6706'

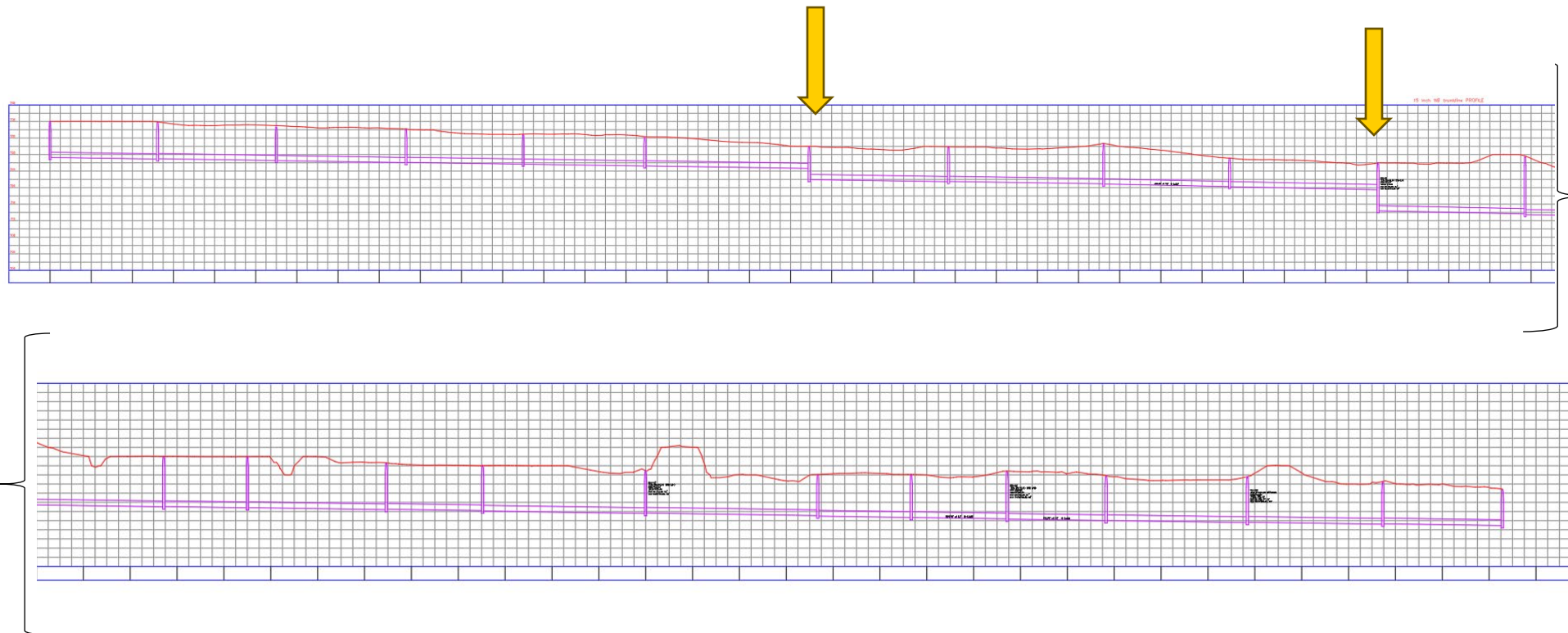
Plan View of Trunk Sewer



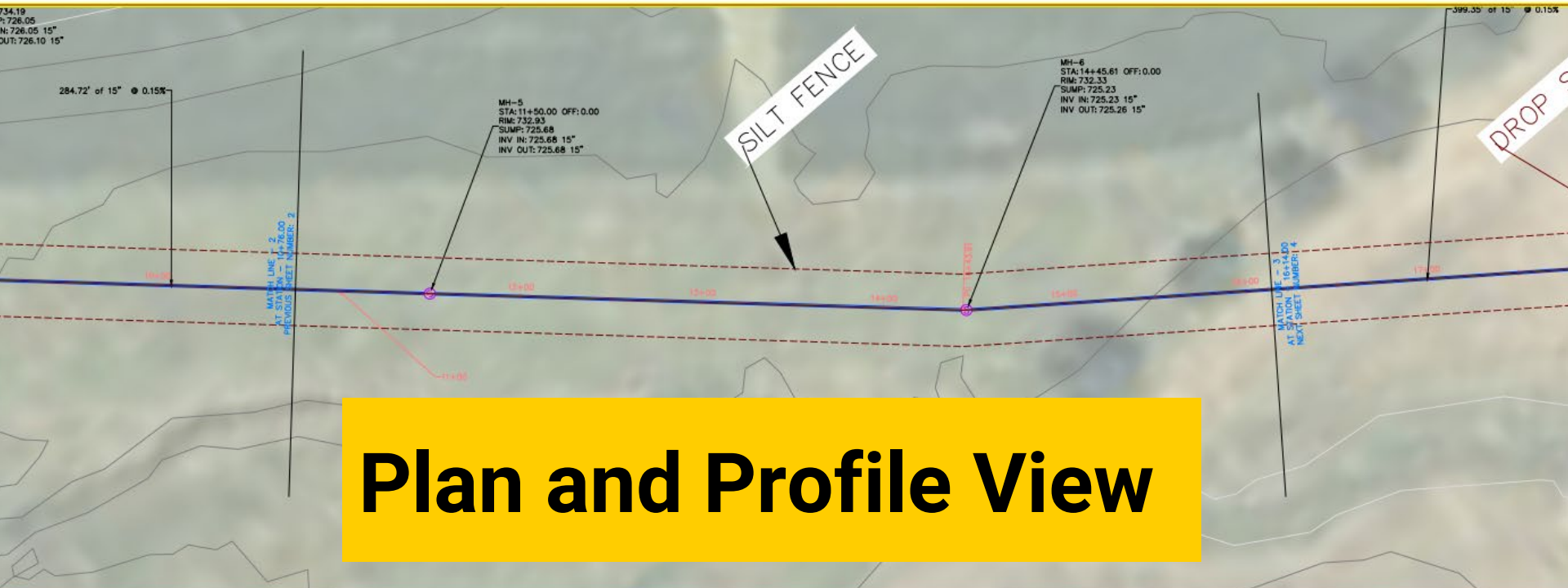
Crosses into  
private property



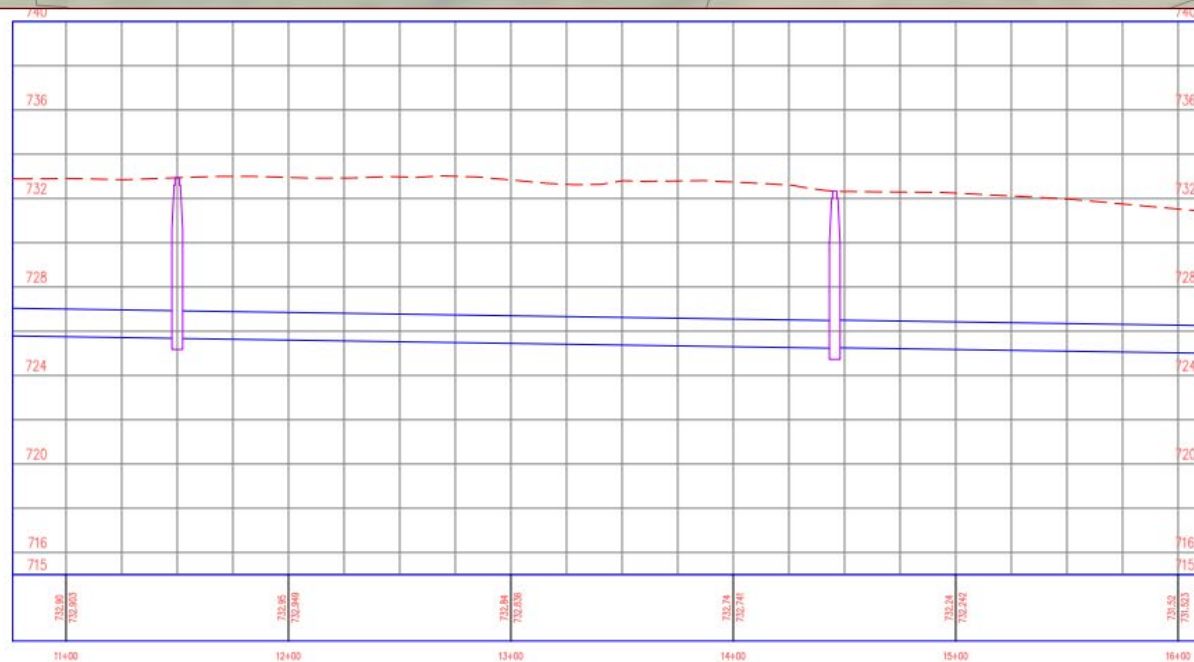
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# Plan and Profile View





# Cost Estimate

Subtotal	\$	808,189.28	
Contingencies	\$	929,417.67	15%
Administrative & Engineering	\$	975,888.56	5%
Total	\$	975,888.56	



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**Questions?**

