

A photograph of a construction site. In the foreground, a large, light-colored concrete sewer pipe lies on the ground. In the background, a yellow excavator is positioned on a mound of dirt. The sky is overcast. A yellow rectangular box in the top right corner contains the word "IOWA" in large, bold, black capital letters.

**IOWA**

---

# Sanitary Trunk Sewer Project Design

**Mia Smith, Sylvia Tumusiime and Spencer Brown**  
December 12, 2025

# Introduction

---

**Project Manager :**

**Mia Smith**

**Environmental Engineering**



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



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



**IOWA**

# Contents

---



**Project Location**



**Project scope**



**Site Constraints**



**Methods and Design Guides**



**Design Alternatives**



**Calculations**



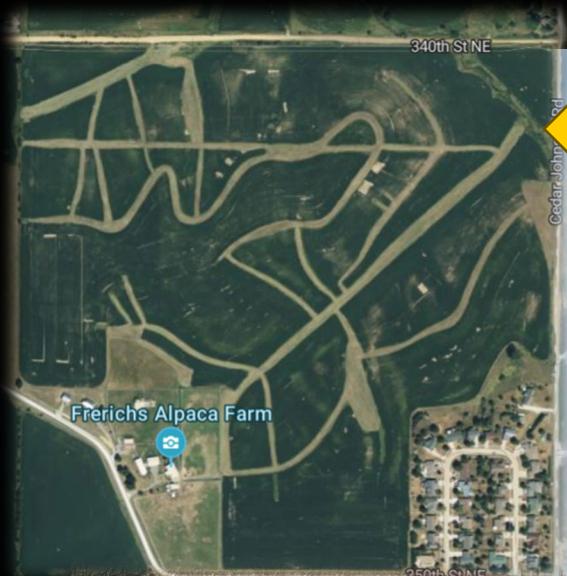
**Proposed Design**



**Cost Estimate**

# West Branch Iowa





**New subdivision  
development**



**IOWA**

# Project Scope

---



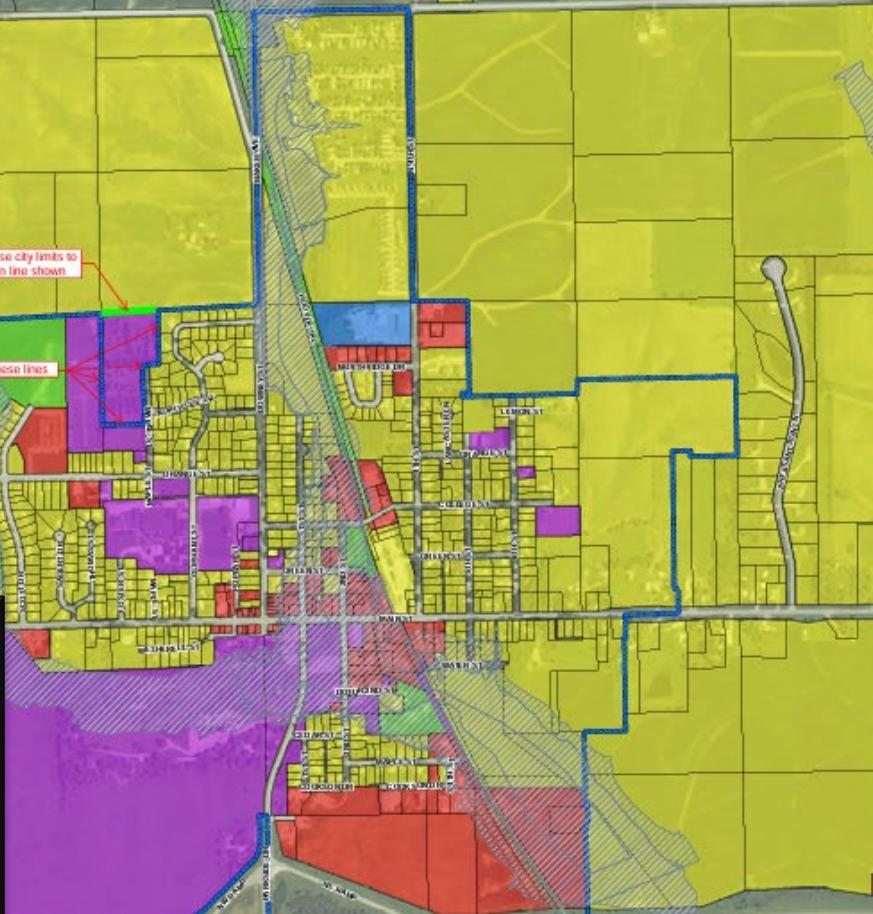
**Multi-family (medium density  
-4.5 units/acre)**

**IOWA**



Revise city limits to  
green line shown

Delete these lines



## LEGEND

 CORPORATE LIMITS  
 100 YEAR FLOOD PLAIN

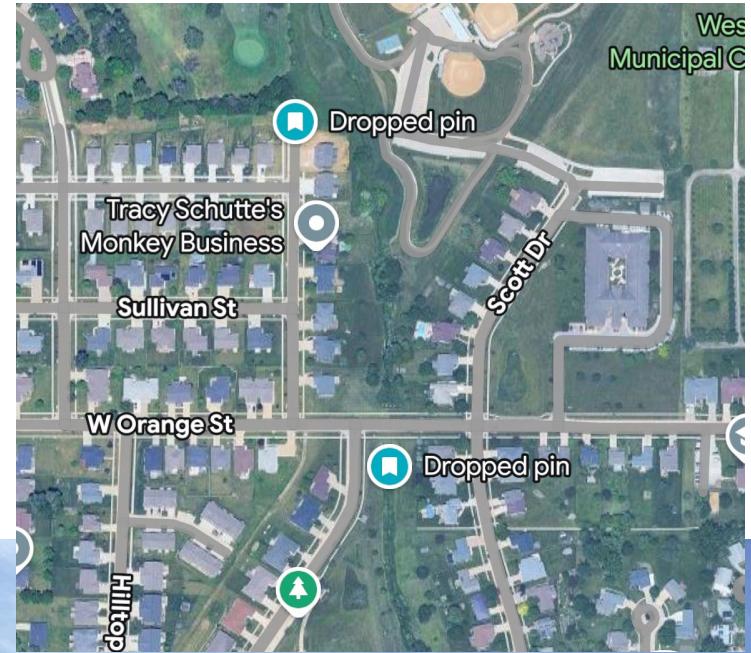
## LAND USE DISTRICTS

- AGRICULTURAL/OPEN SPACE
- RESIDENTIAL
- COMMERCIAL
- INDUSTRIAL
- INSTITUTIONAL
- PARK/RECREATION/CONSERVATION

# Project Constraints

---

- Wetlands



**IOWA**



# Site Constraints

# Site Constraint



# Constraints: Easements



# Design Guides and Methods

---



**SUDAS**



**PWSB**  
Public Works Service Bureau

**IOWA**



IOWA DEPARTMENT OF  
NATURAL RESOURCES

# Design Alternatives

---

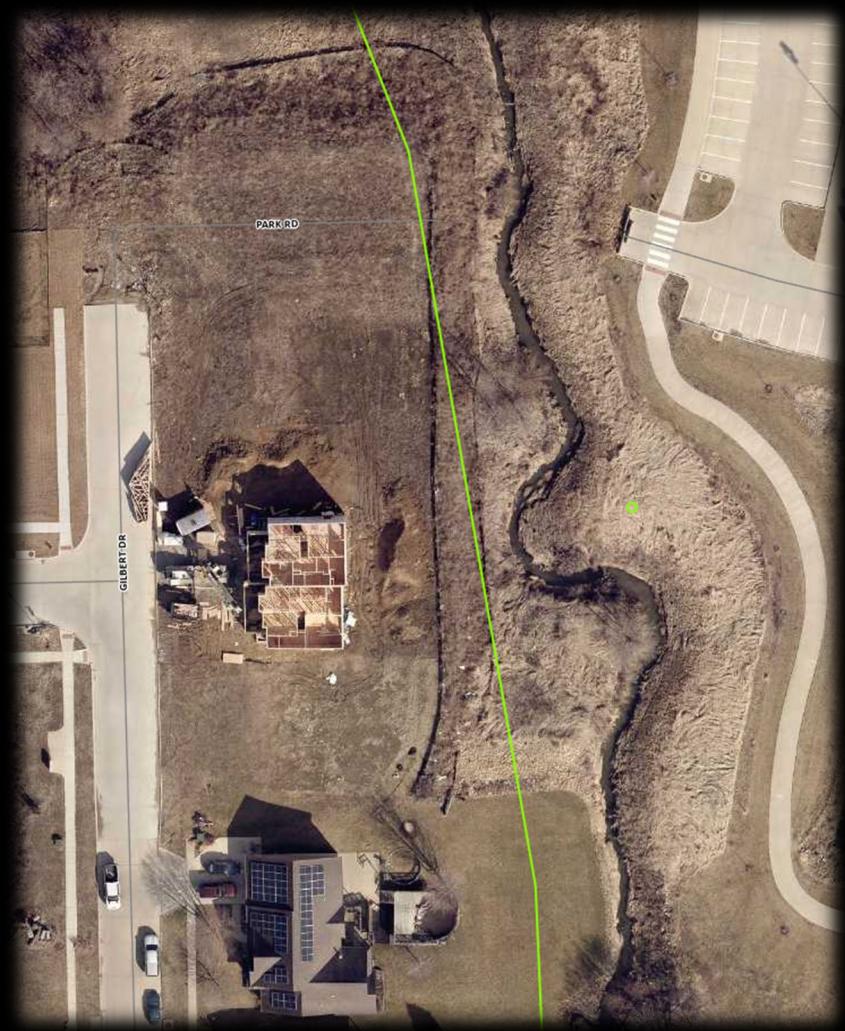
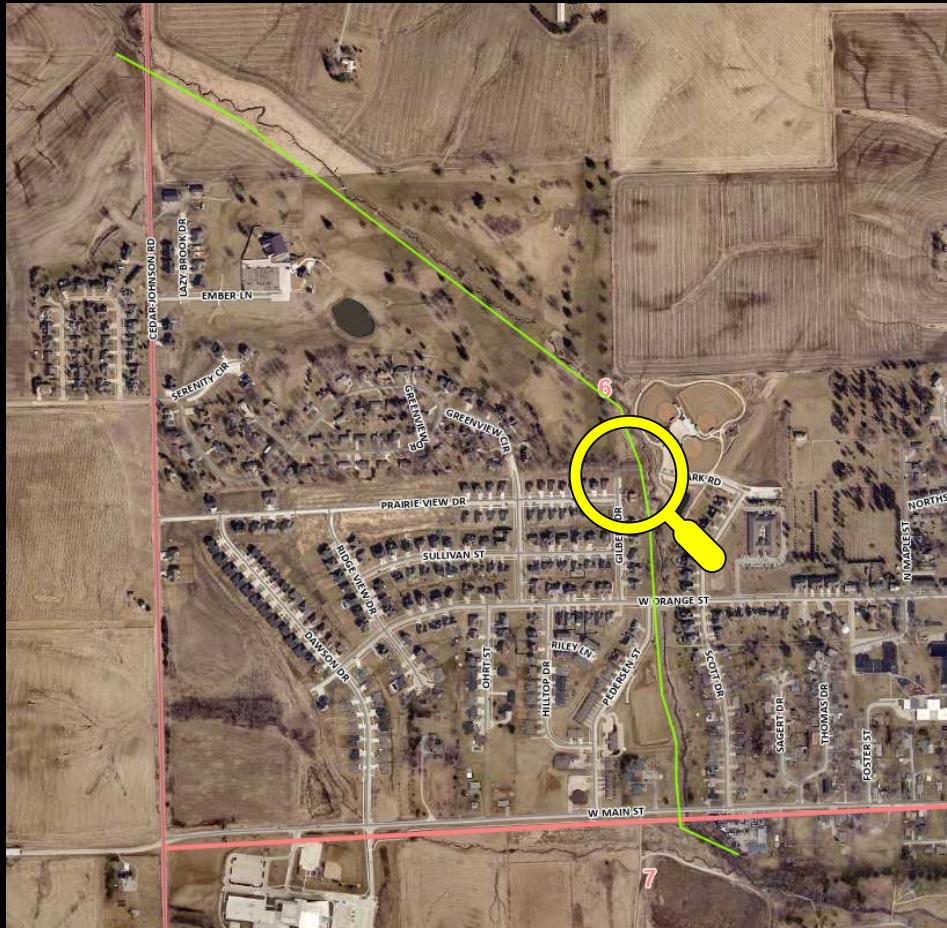
- Lift stations





**Design Alternatives:  
Connect to existing**

# Design Alternatives



IOWA

# 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

---

**15" PVC Pipe**

**Q Max = 3.21 MGD**

**Q from site = 0.811 MGD**

**Homes on site: 644**

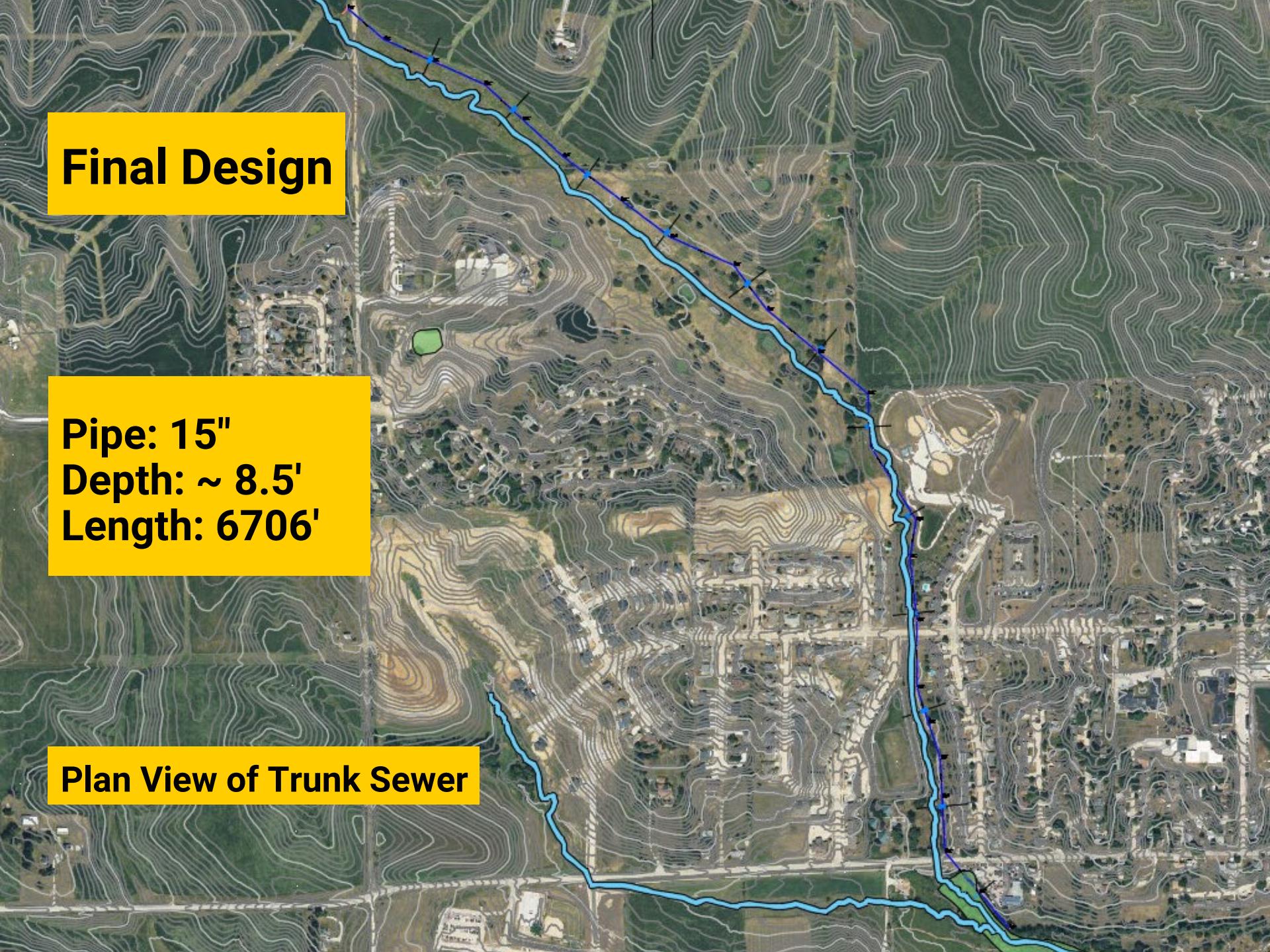
**Total homes : 1910**

**(after servicing site)**

**Final Design**

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

**Plan View of Trunk Sewer**



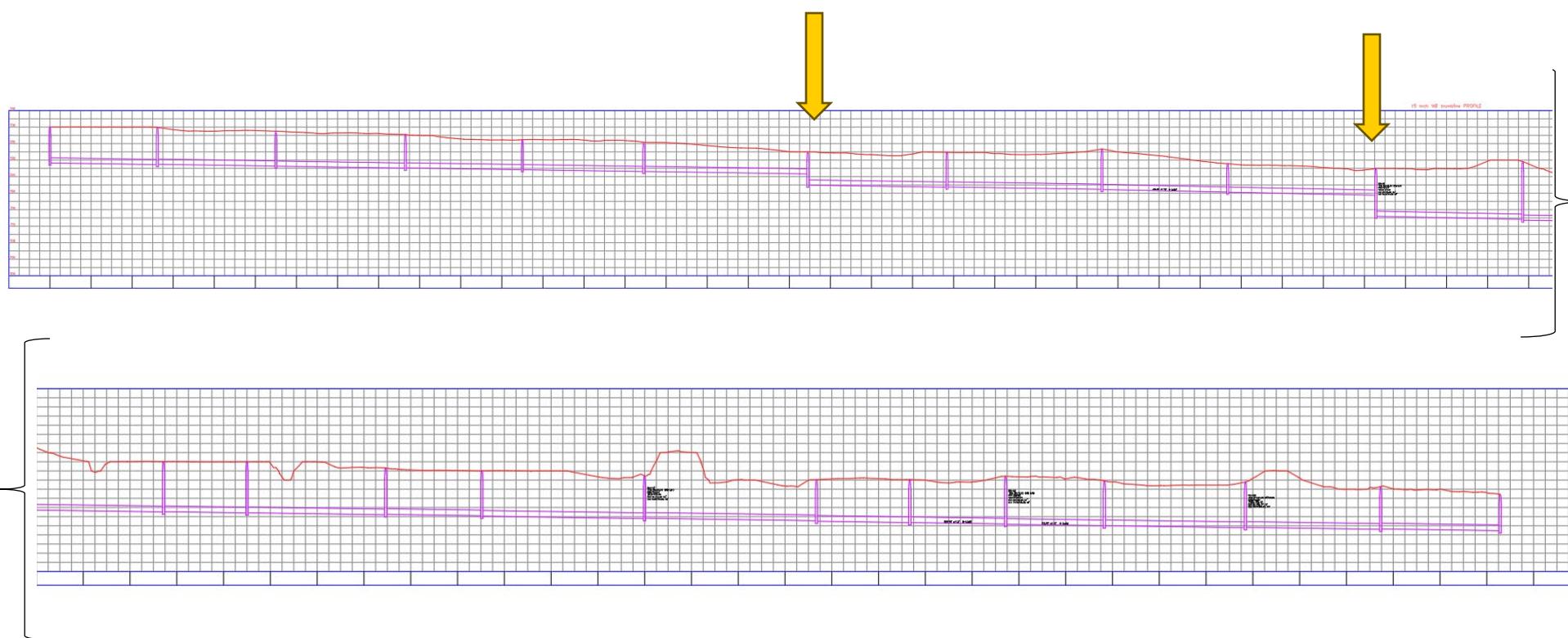
# Final Design

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

Plan View of Trunk Sewer

**Crosses into  
private property**

# Profile View



IOWA

734.19  
P: 726.05  
N: 726.05 15"  
OUT: 726.10 15"

284.72' of 15" • 0.15%

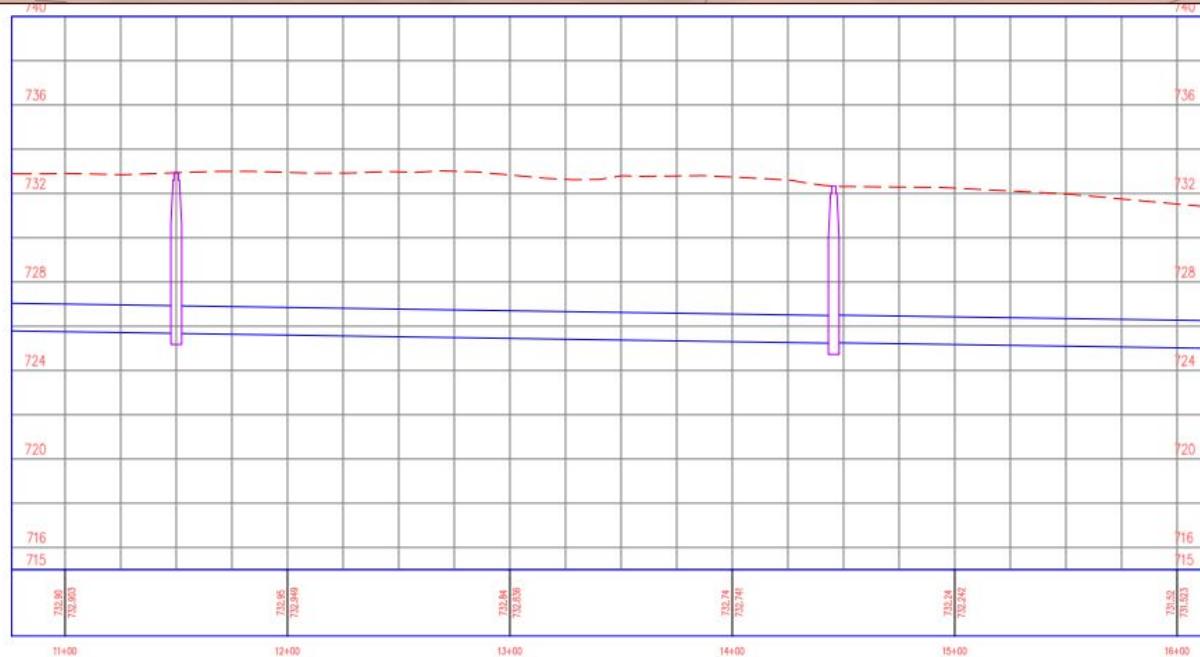
MH-5  
STA: 11+50.00 OFF: 0.00  
RIM: 732.93  
SUMP: 725.68  
INV IN: 725.68 15"  
INV OUT: 725.68 15"

SILT FENCE

MH-6  
STA:14+45.61 OFF:0.00  
RIM: 732.33  
SUMP: 725.23  
INV IN: 725.23 15"  
INV OUT: 725.26 15"

PROP

# 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	

\$

**IOWA**

**Questions?**

