Maquoketa Subdivision and Drainage Design

May 1st, 2023

Project Team

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Project Manager

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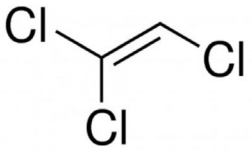
Topics of Discussion

Project Location

Project Scope



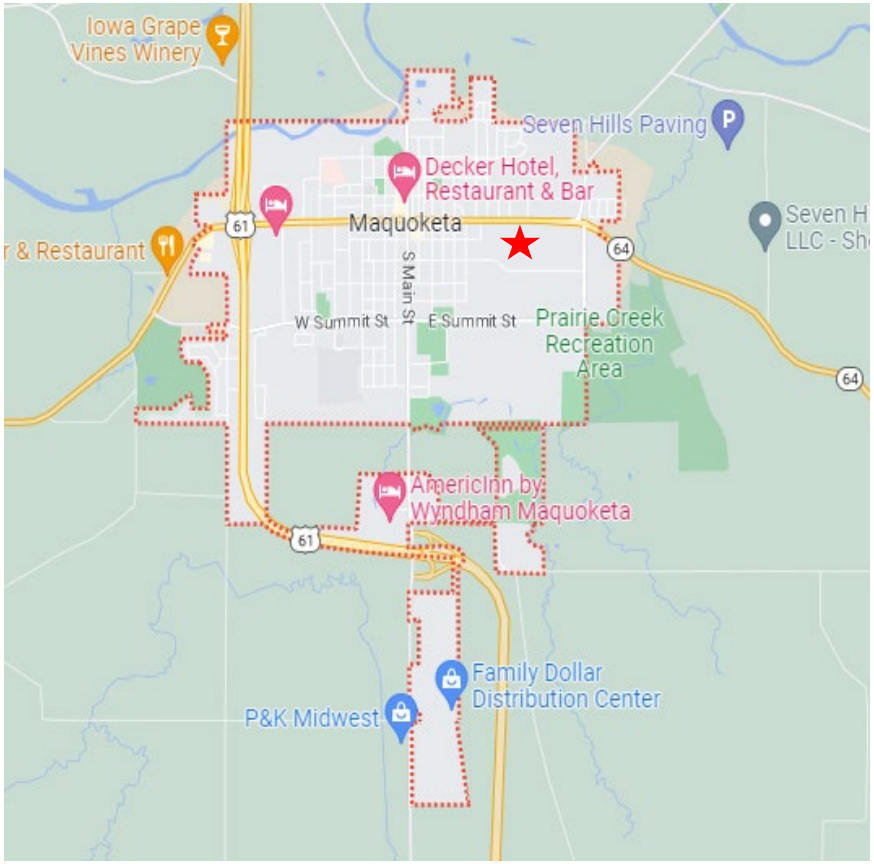
Trichloroethylene (TCE) Challenge

Final Design Elements

Phytoremediation

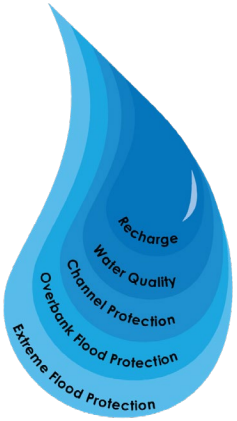
Final Cost Estimates

Site Location



Project Scope

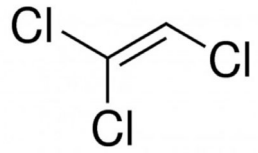
Affordable Housing

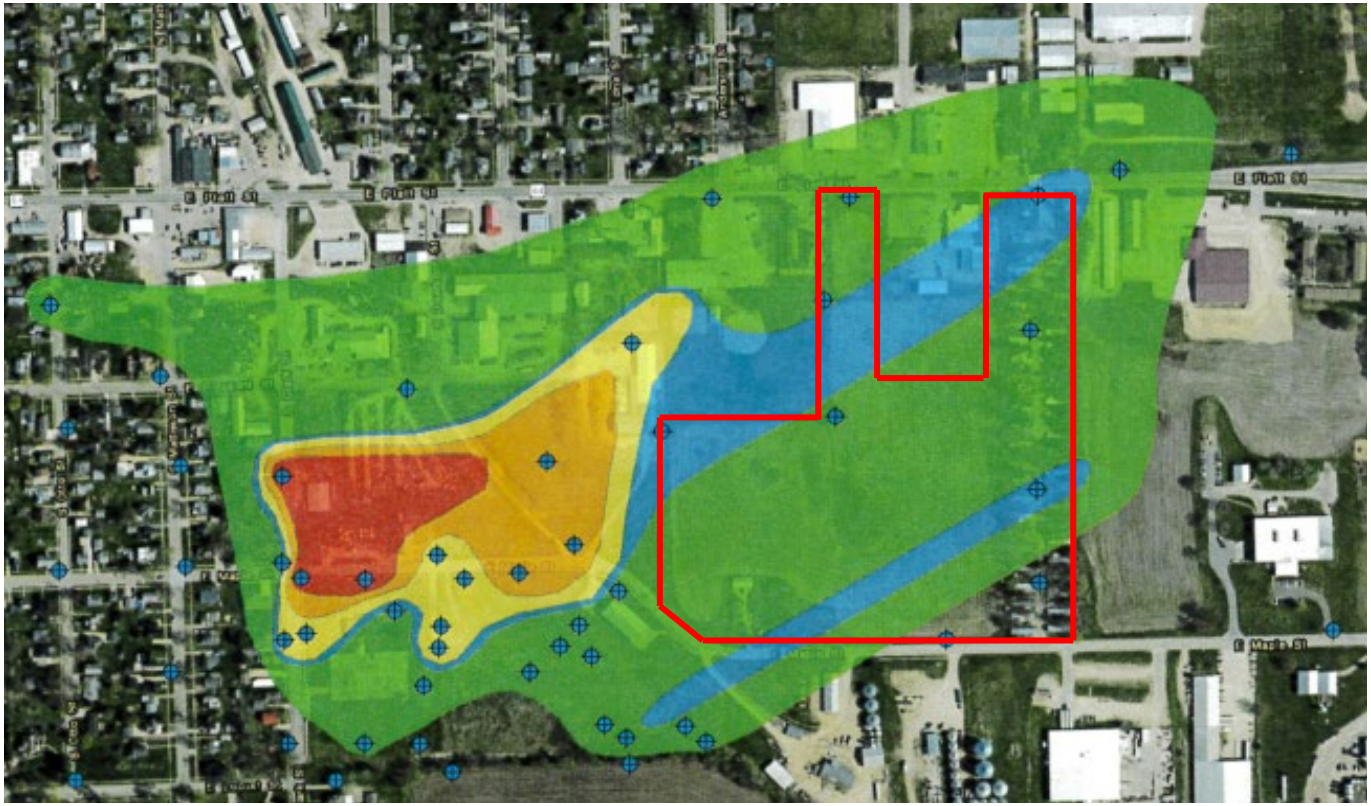


Effective Drainage

Utilities Plan

Trichloroethylene (TCE)





Legend

- Groundwater sample location

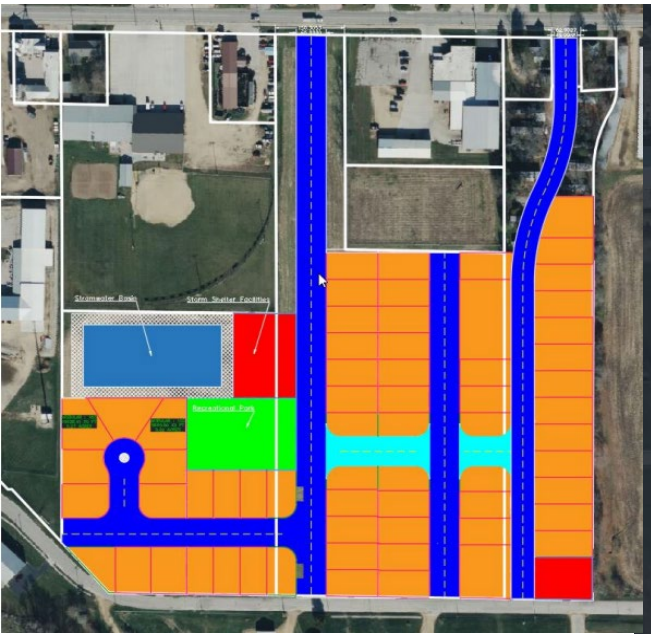
TCE Isoconcentration

- 10 µg/L
- 500 µg/L
- 2,000 µg/L
- 4,000 µg/L
- 8,000 µg/L

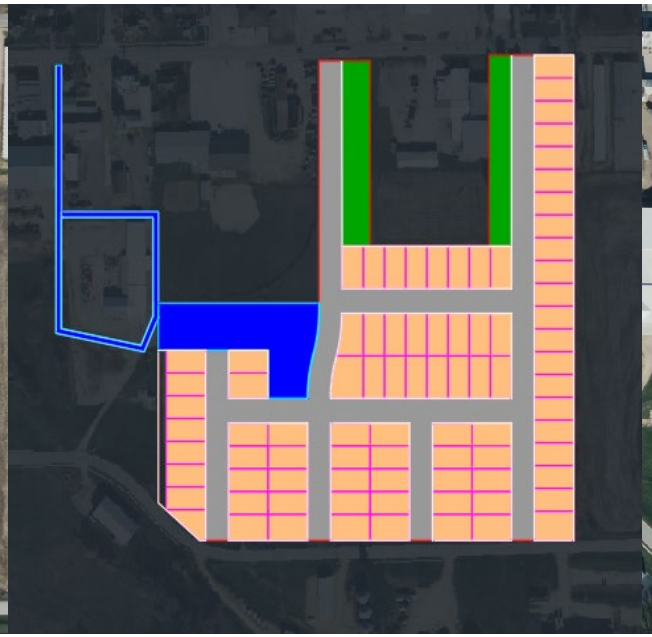
TCE Trichloroethene

µg/L Micrograms per liter

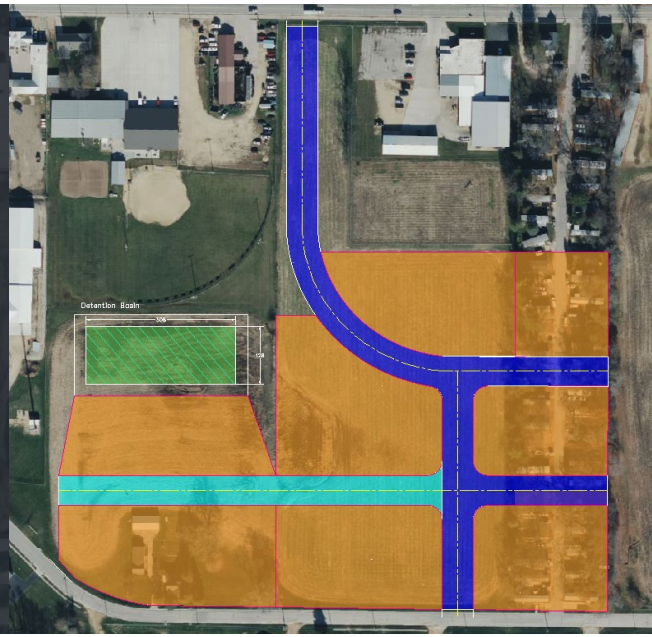
Road Alternatives



Residential One



Residential Two



Industrial/Commercial

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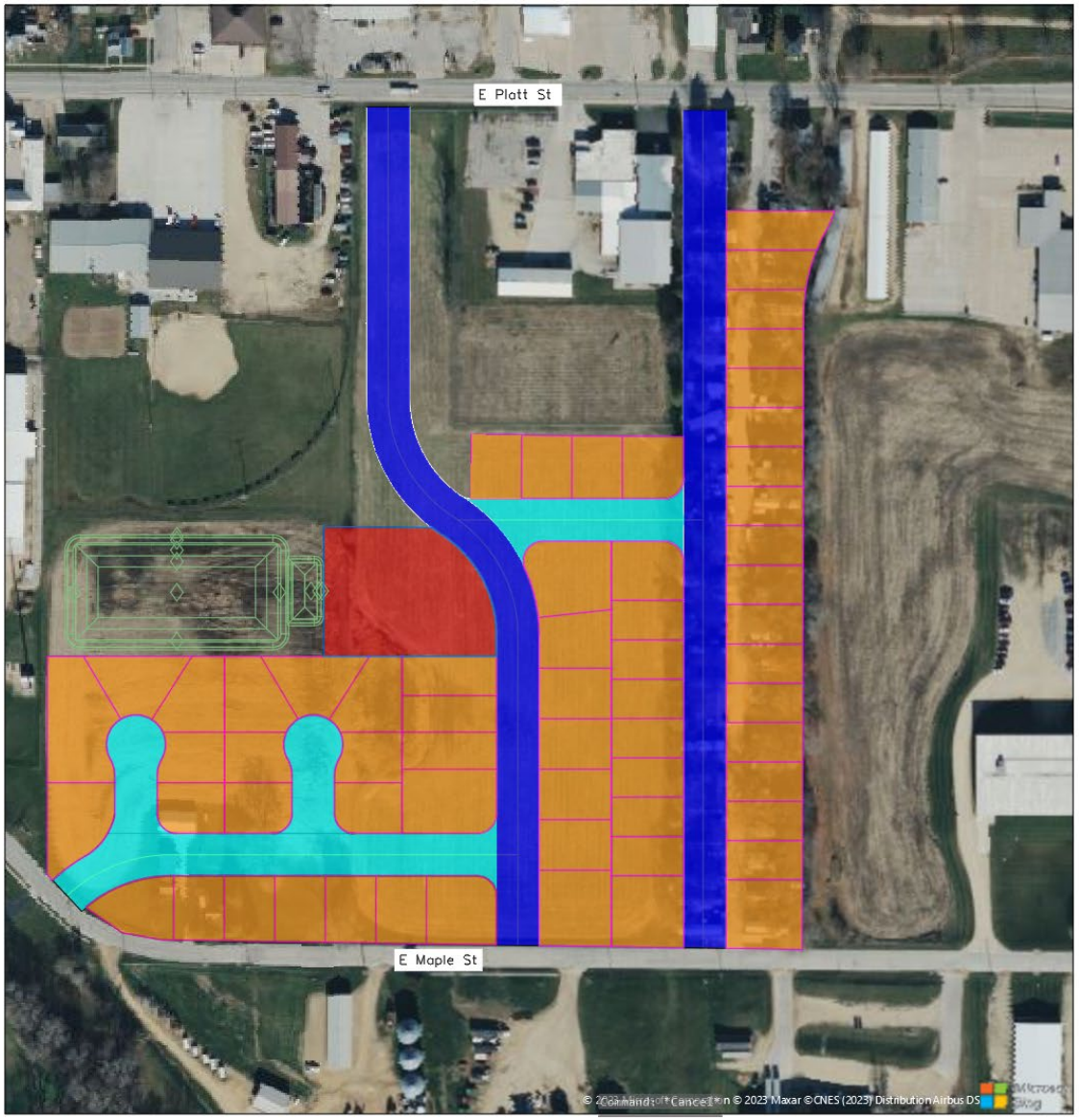
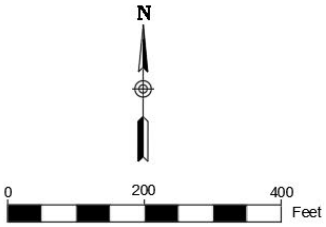
Recommended Alternative





Legend

- Collector Road
- Local Road
- Single Family Lot
- Open Space / Storm
- Shelter Site
- Detention Basin

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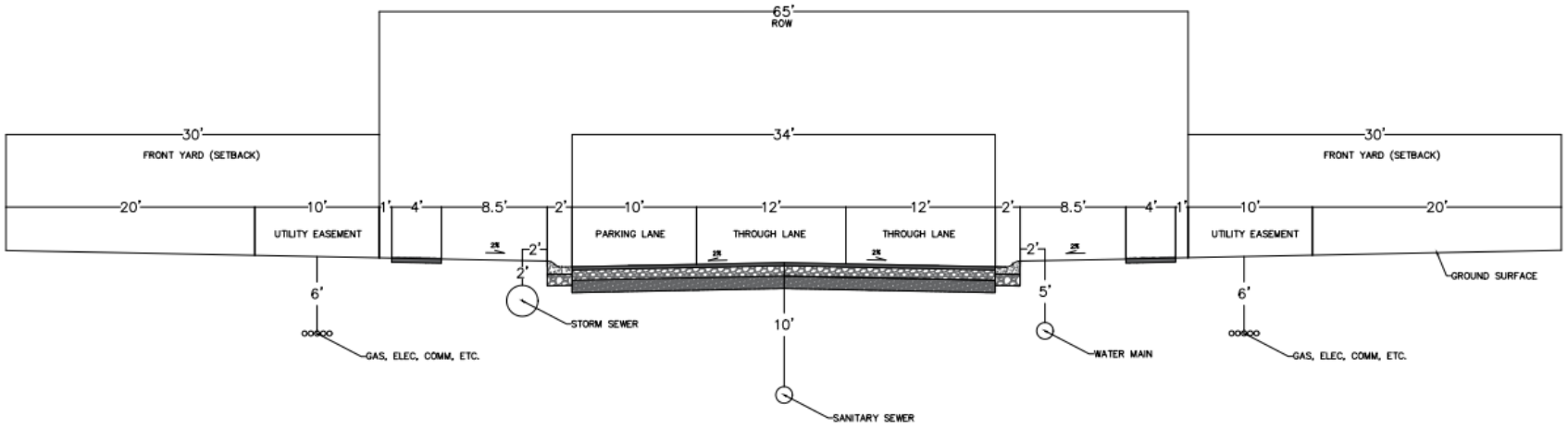
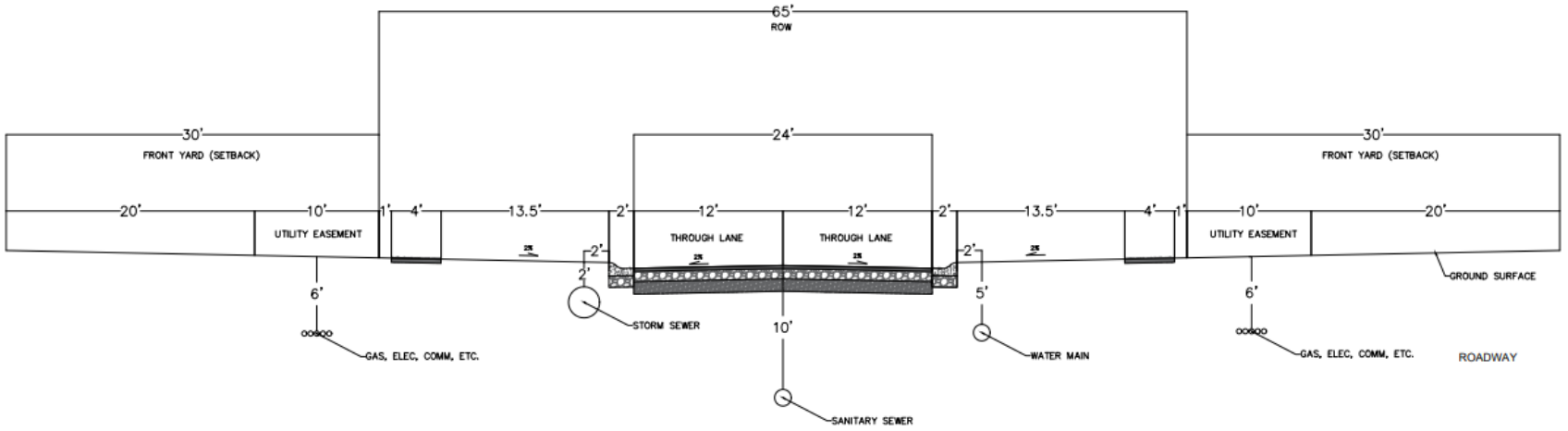
Roadway Cross-Sections

COLLECTOR ROADWAY CROSS–SECTION



LOCAL ROADWAY CROSS–SECTION



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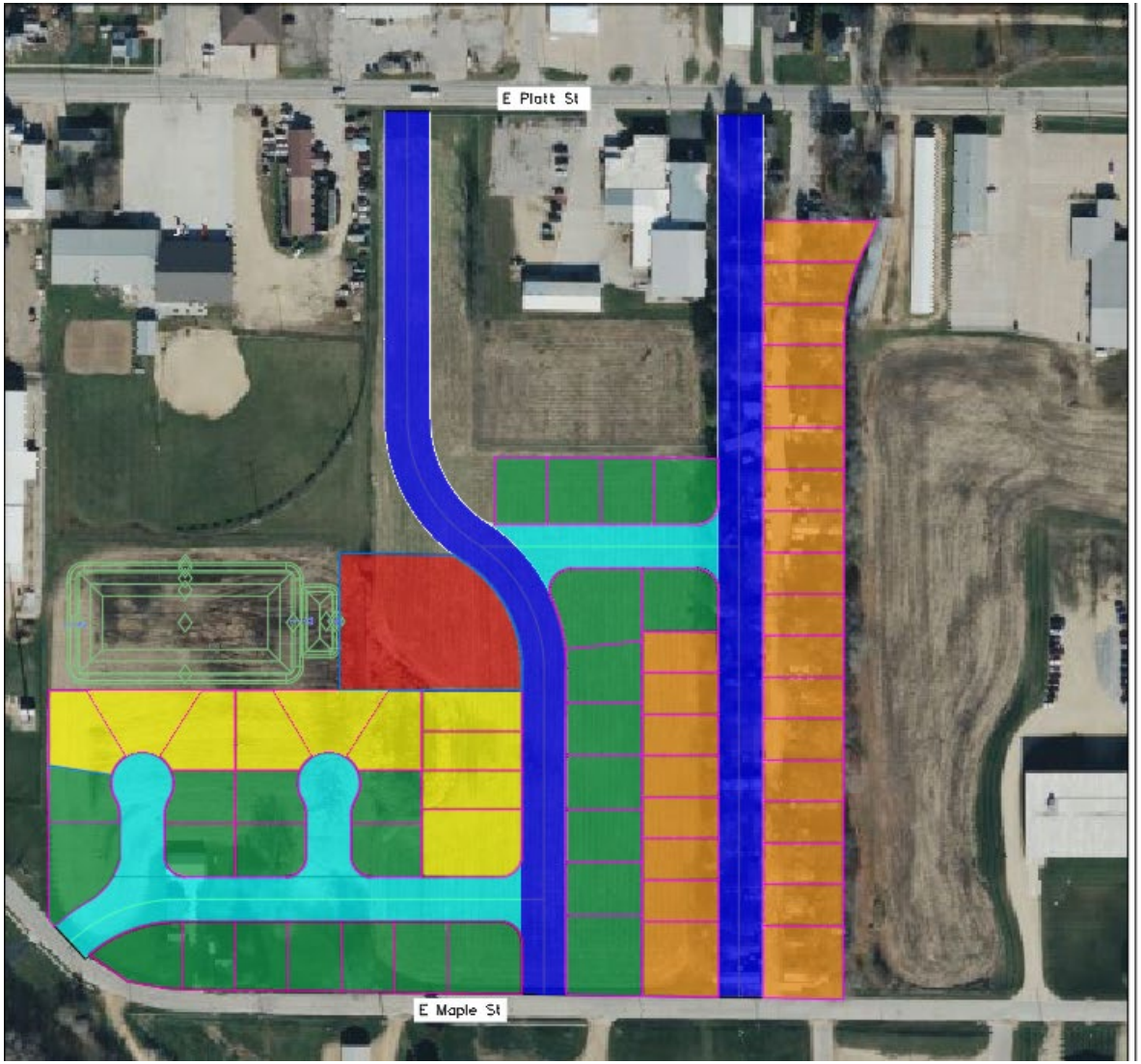
Housing Alternatives

Town Houses/duplexes

Stick-built houses

Pre-manufactured Houses

Housing Design



N

0 200 400 Feet

Legend

- Collector Road
- Local Road
- Manufactured Home Lot
- Modular Home Lot
- Stick-Built Home Lot
- Open Space / Storm Shelter Site

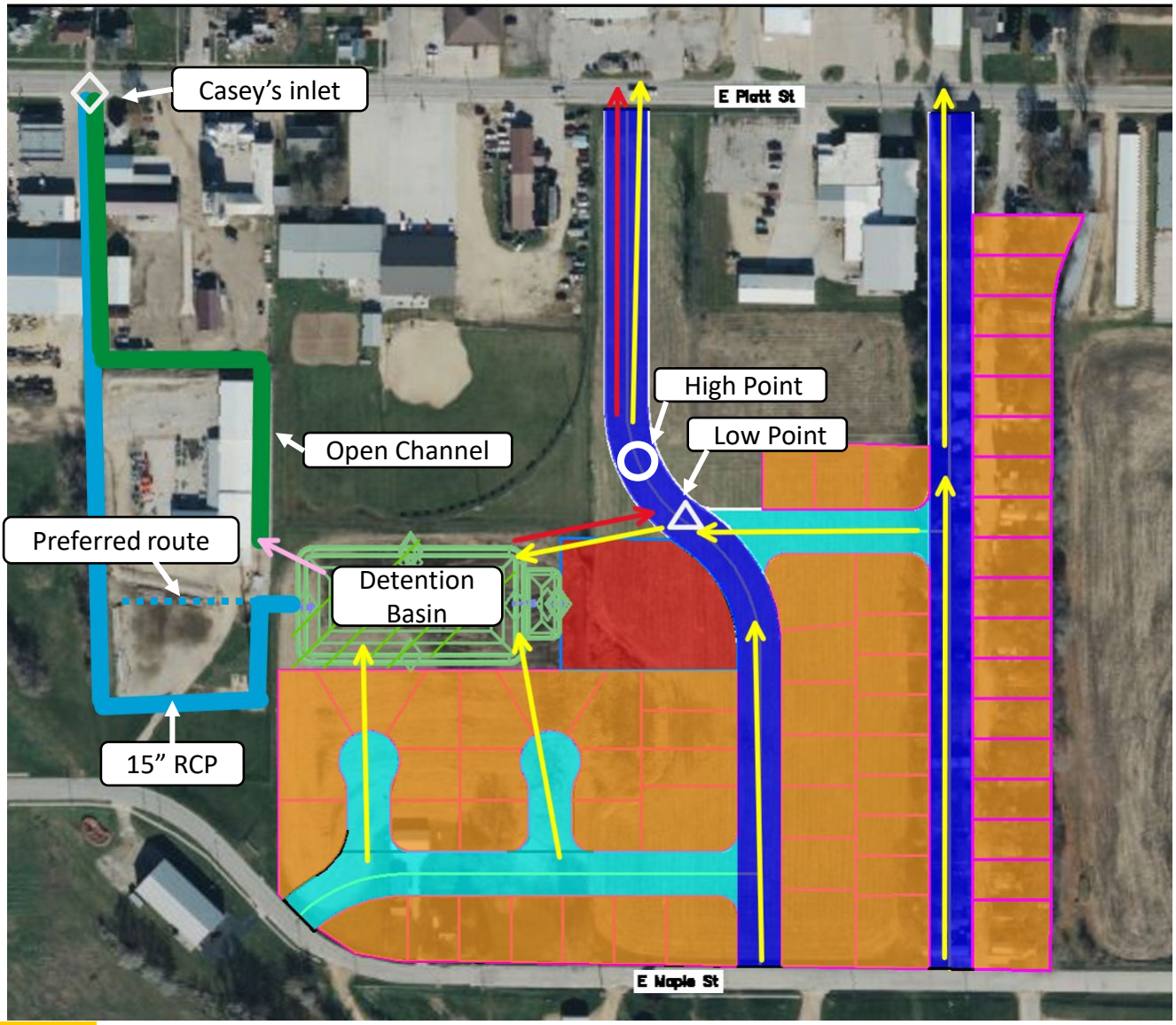
Drainage Alternatives

Alternative #1: Wet Bottom Pond

Alternative #2: Fill Low Points

Alternative #3: Dry Bottom Detention Basin

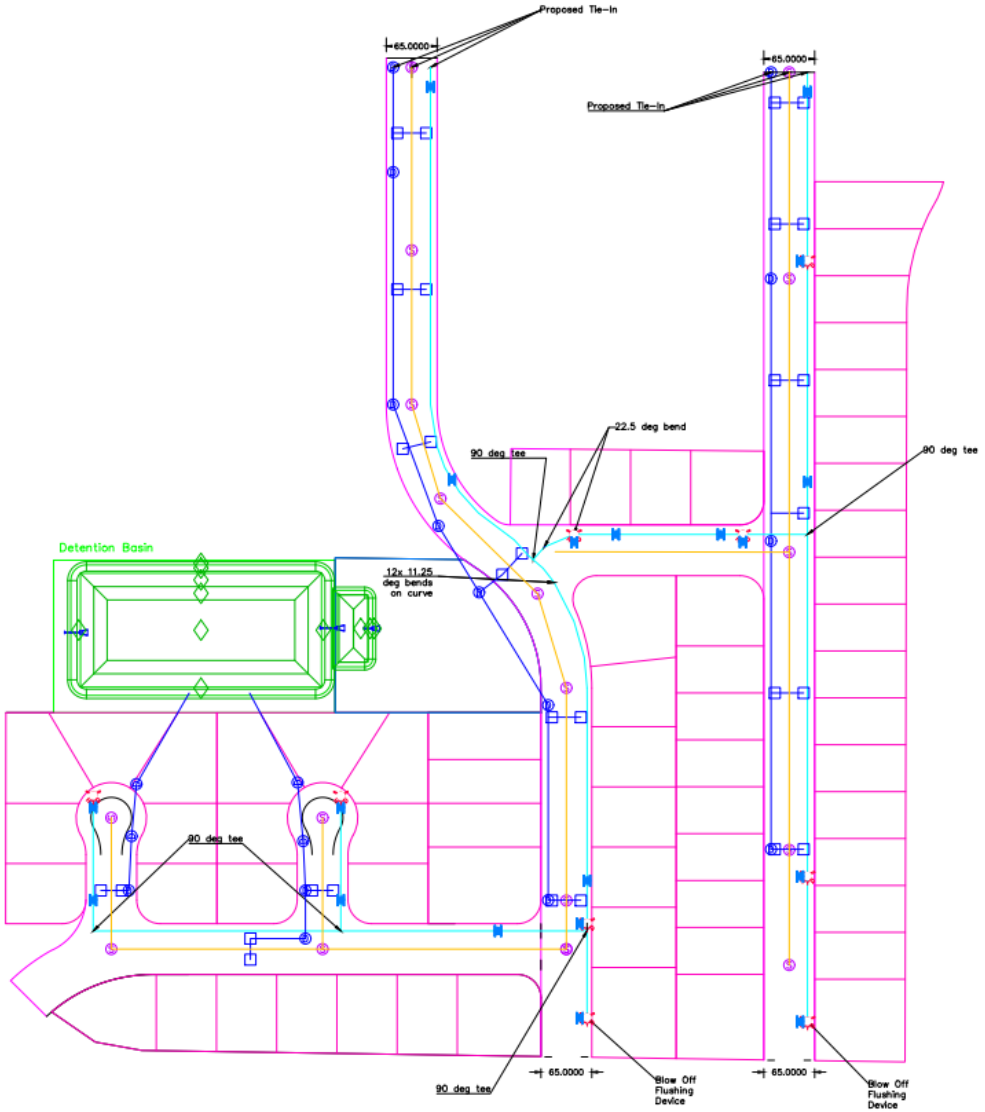
Drainage Design

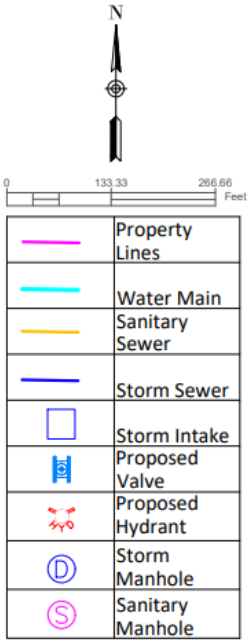


Drainage Plan Benefits

	Flow Entering the Existing Open Channel		
Design Storm	Peak Flow: Existing Conditions (CFS)	Peak Discharge: Post-Development (CFS)	Peak Reduction %
2-yr	56.7	12.7	77.6
10-yr	105	23.4	77.7
50-yr	152.3	48.5	68.2
100-yr	184.5	76.4	58.6
500-yr	217.8	98.9	54.6

Utility Design





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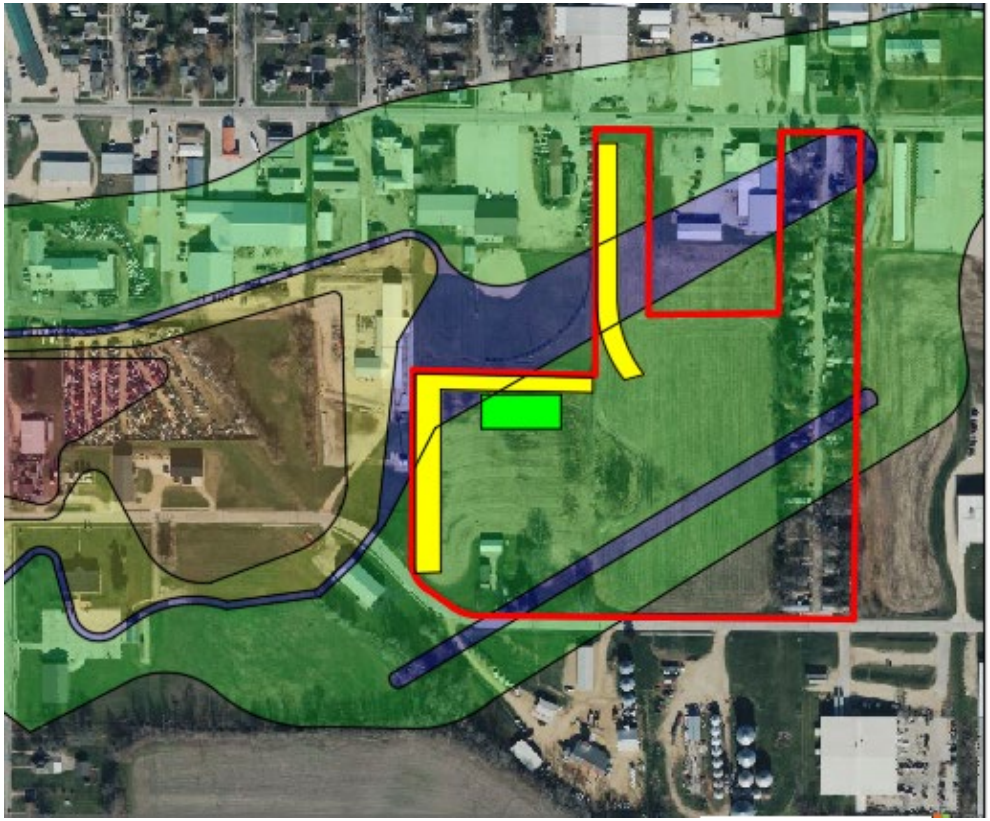
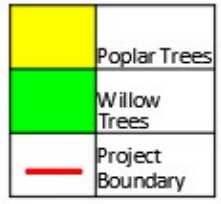
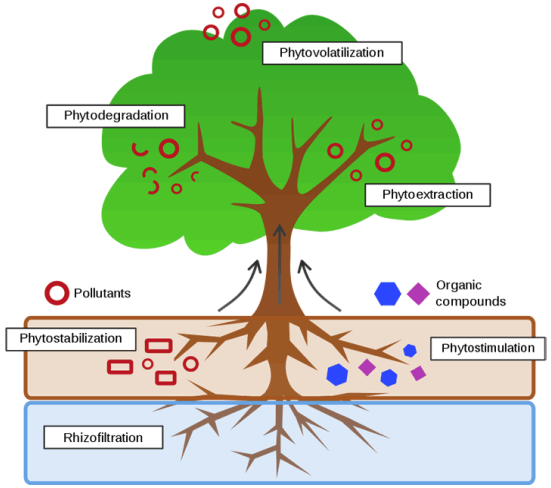
Phytoremediation

Willow Trees:
Thrive in a wet environment and will help take up water in the basin while also assisting with phytoremediation for the groundwater plume

Poplar Trees:
Traditionally used in this approach and are planted in rows as an effective barrier to assist with phytoremediation of the groundwater that moves through the area. Will act as a barrier between industrial land to the west and residential development.







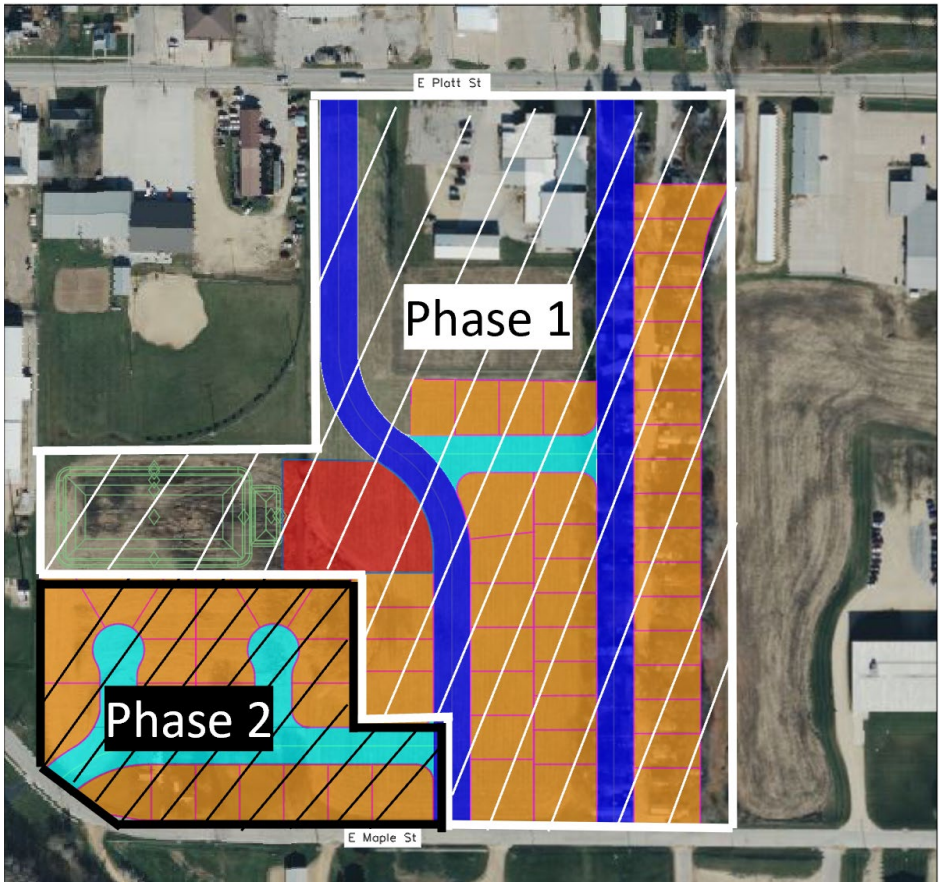
Total Cost

Phase 1

Site Work and Paving	$1,579,500
Storm Sewer	$514,000
Sanitary Sewer	$285,000
Water Main	$409,000
Contingencies	20%
Number of Lots	42
Total Construction Cost Estimate	**$3,268,000**
Cost of Infrastructure per lot	$78,000

Phase 2

Site Work and Paving	$622,000
Storm Sewer	$185,500
Sanitary Sewer	$92,500
Water Main	$149,000
Contingencies	20%
Number of Lots	21
Total Construction Cost Estimate	**$1,203,000**
Cost of Infrastructure per lot	$57,000



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Questions?

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ONE OF A KIND

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