



Stewart Family Farm Subdivision

Maquoketa, IA 5/1/2023



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Project Team

Kyle Patterson



Project Manager
Environmental Engineer

Colin Kowalewski



Civil Engineer

Andrew Rohret



Civil Engineer

Jack LaDieu



Civil Engineer

Presentation Outline

Project Overview



Design Elements



Cost Estimate



Site Location

Site is southwest of city limits and would be annexed if the project goes forward

Joshua Boldt – City Manager
Frank Ellenz – Public Works Director
Jenn Schwoob – Water/Wastewater superintendent



94 ac.

Project Scope and Design Objectives

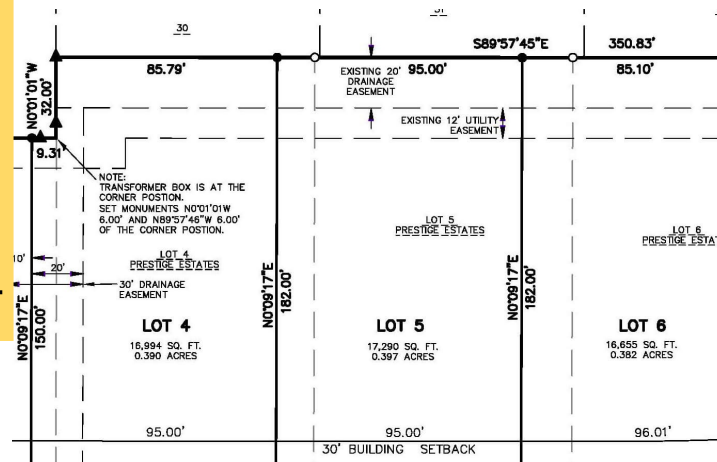
Maximizing the number and size of lots

Stormwater management

Road design along ridge lines

Trail design that encompasses the subdivision and has multiple lot connections

Water main design that offers acceptable water pressure



Site Design

-  COLLECTOR STREET
-  LOCAL STREET
-  DETENTION POND
-  TRAIL

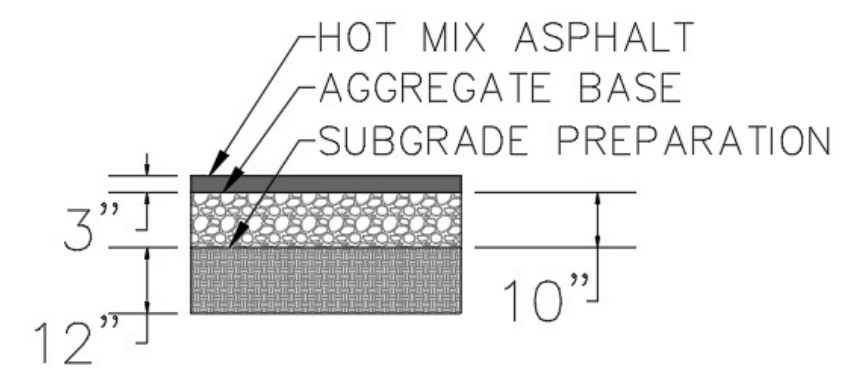
Road Classification	Length (Mile)
Collector	0.77
Local	0.83
Total	1.60

71 Lots

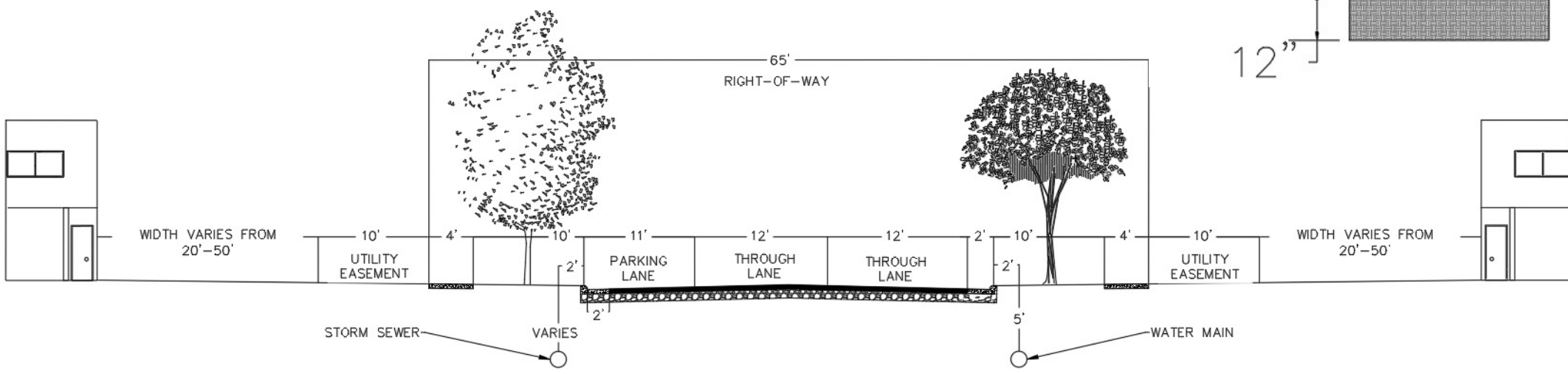


Right-of-Way Cross-Sections

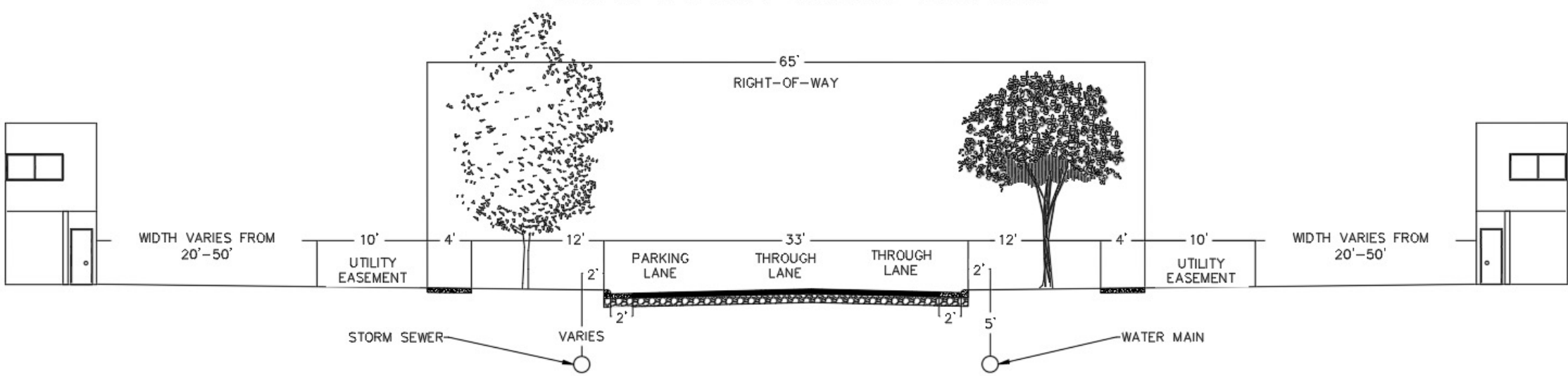
COLLECTOR AND LOCAL STREET PAVEMENT CROSS-SECTION





COLLECTOR STREET CROSS-SECTION



LOCAL STREET CROSS-SECTION

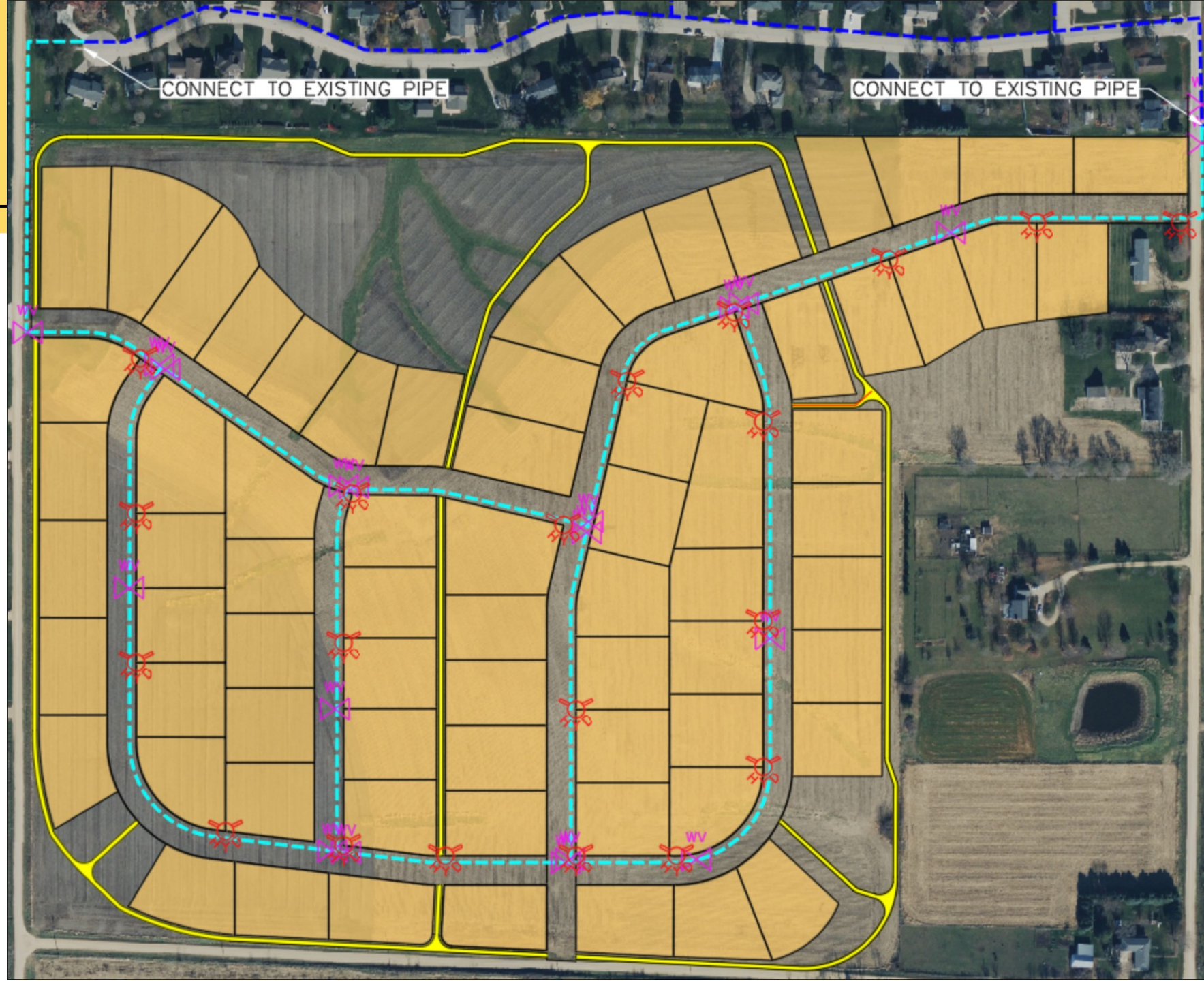


Water Main Design


- 10" EXISTING WATER MAIN
- - - 10" PROPOSED WATER MAIN
-  FIRE HYDRANT
-  WATER VALVE

WATER MAIN QUANTITIES

LENGTH OF 10" PIPE (LF)	9267
NUMBER OF VALVES	20
NUMBER OF HYDRANTS	20



Water Pressure Challenge

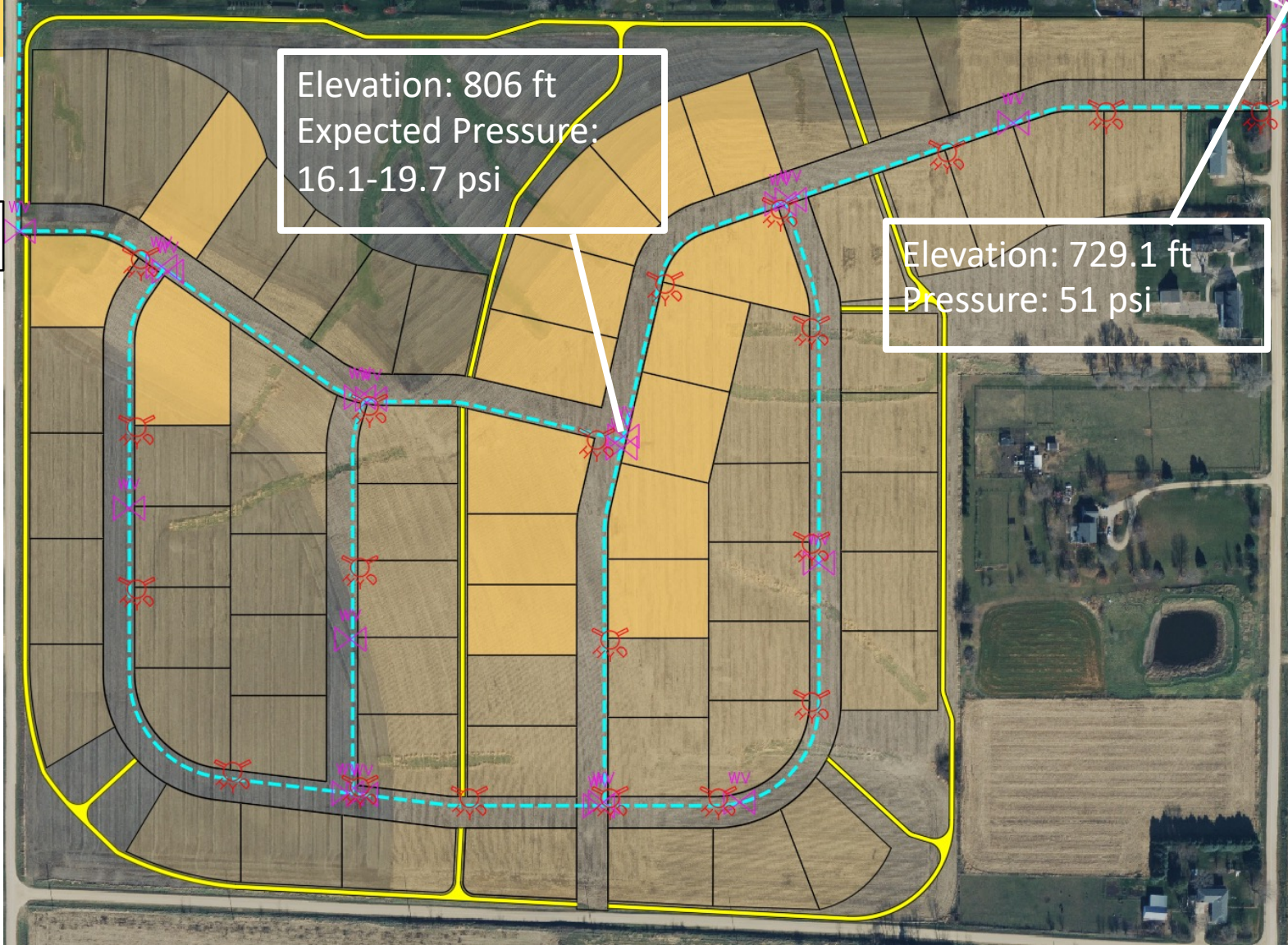
 Lots with water pressure under 25 psi

80-ft elevation change from the connection point

Would be new highest elevation in town

Minimum household water pressure set at 25 psi

16 lots are under this pressure level



Water Pressure Alternatives

Grading the Highpoints



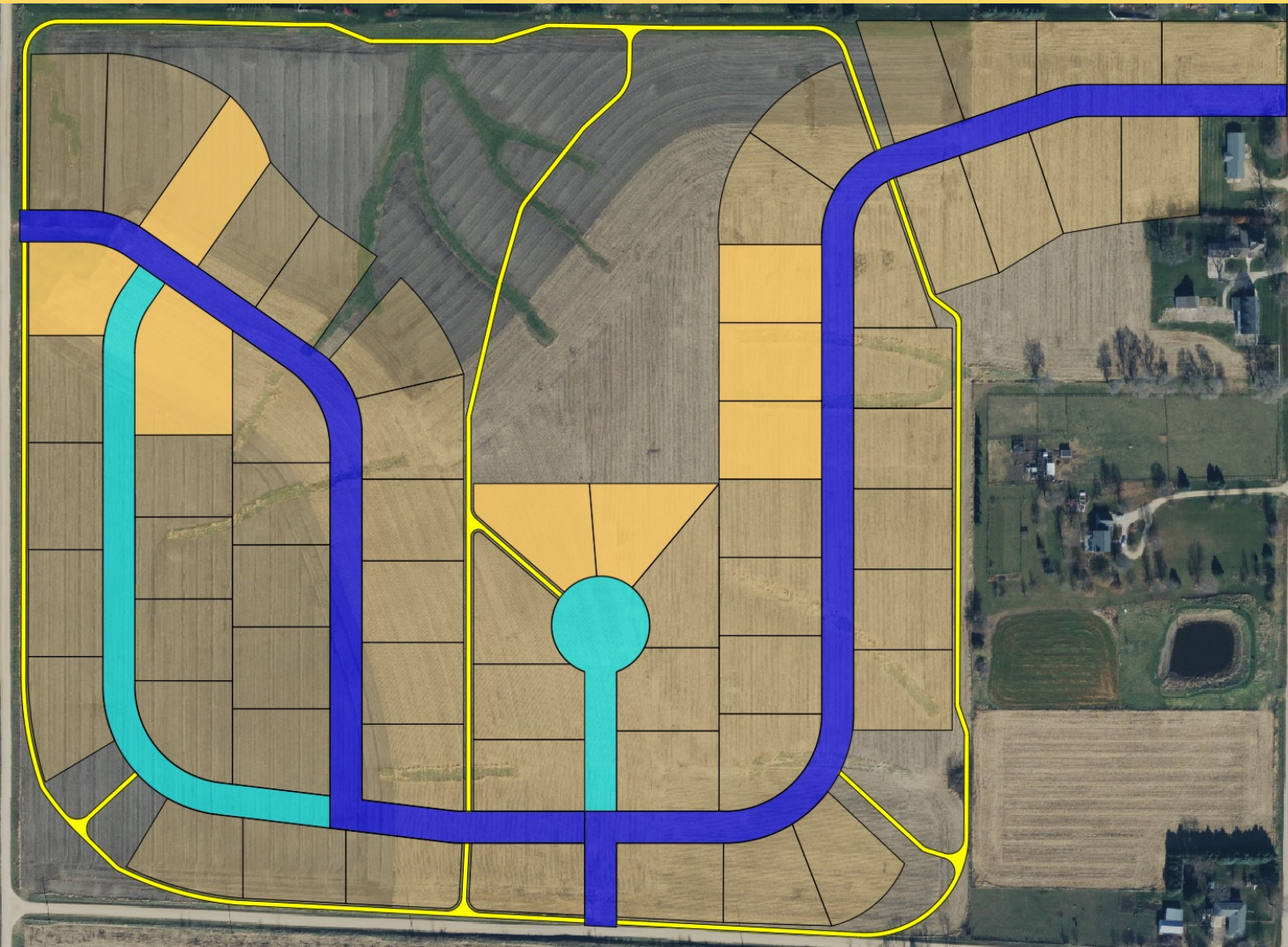
Individual Household Boosters



Private Wells



Water Pressure Alternatives



 Lots with water pressure under 25 psi

64 lots

8 lots remain under the 25
psi water pressure threshold

Water Pressure Alternatives Analysis

Features	Booster Solution (Alt 1A)	Grading Solution (Alt 1B)	Well Solution (Alt 1C)	Modified Plat Solution (Alt 2)
Water Main Cost (\$)	\$819,000	\$819,000	\$130,000	\$620,000
Number of Lots	71	71	71	64
Booster Cost (\$)	\$28,800	\$10,800	\$0	\$14,400
Well Drilling and Distribution Cost (\$)	\$0	\$0	\$600,000	\$0
Money Lost From Undeveloped Lots (\$)	\$0	\$0	\$0	\$560,000
Additional Grading Cost (\$)	\$0	\$800,000	\$0	\$0
Approximate Total Cost (\$)	\$847,800	\$1,629,800	\$730,000	\$1,194,400

Water Pressure Solution - Boosters

Allows for fire-fighting flow

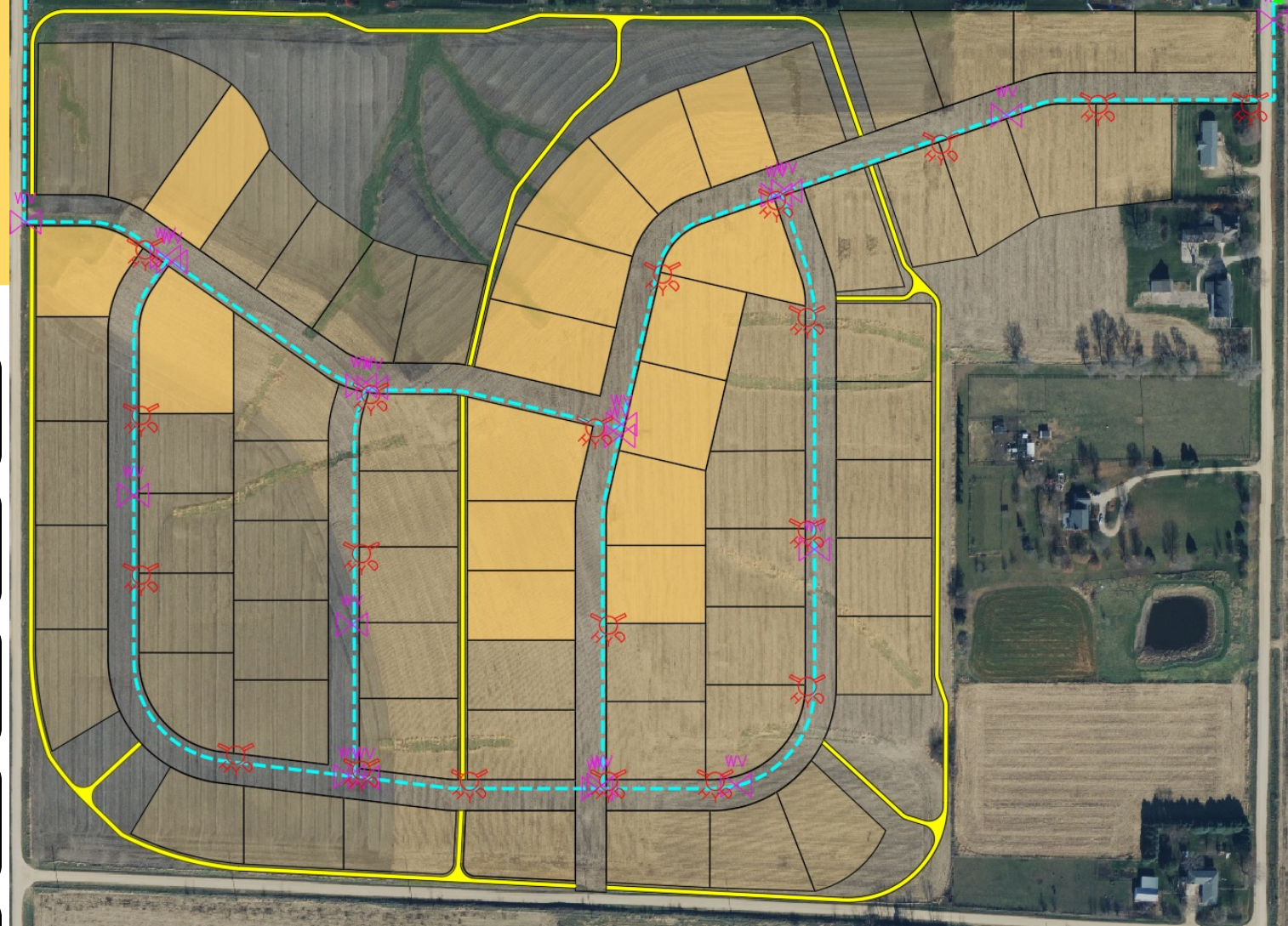
Reduces cost burden on residents

Connected to drinking water treatment plant

Lends itself to further development southwest





Each booster can raise the water pressure by up to 67 psi

Non-highlighted homes may need a booster for higher pressure or second-story water usage



 Lots that will require a household pressure booster



Storm Sewer Design

-  STORM MANHOLE
-  PROPOSED 15" STORM SEWER
-  STORM INTAKE
-  DETENTION POND

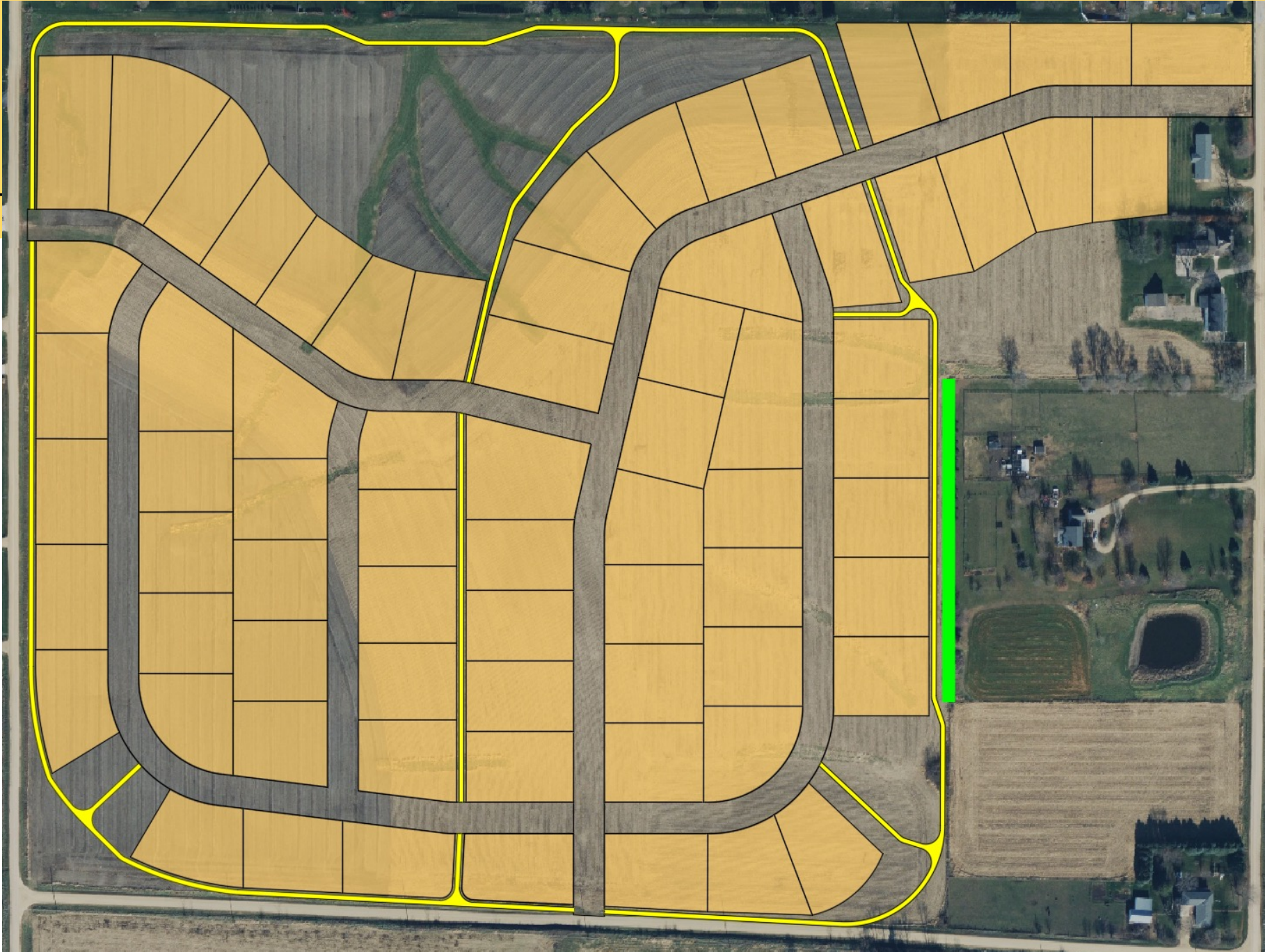
STORM SEWER QUANTITIES	
LENGTH OF 12" PIPE (LF)	7401
STORM MANHOLES	34
STORM INTAKES	34
STORM OUTLET STRUCTURES	3



Trail Network

-  PCC TRAIL
-  TREE LINE BUFFER

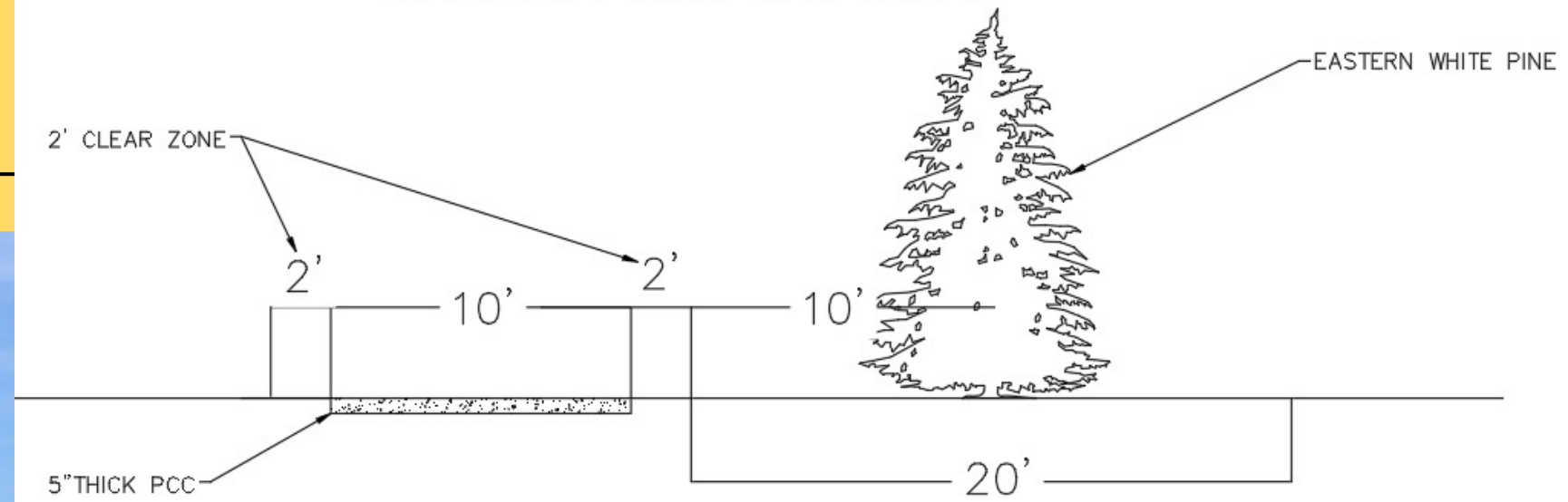
Route	Distance (Miles)
East Loop	0.97
West Loop	1.06
Outside Loop	1.32



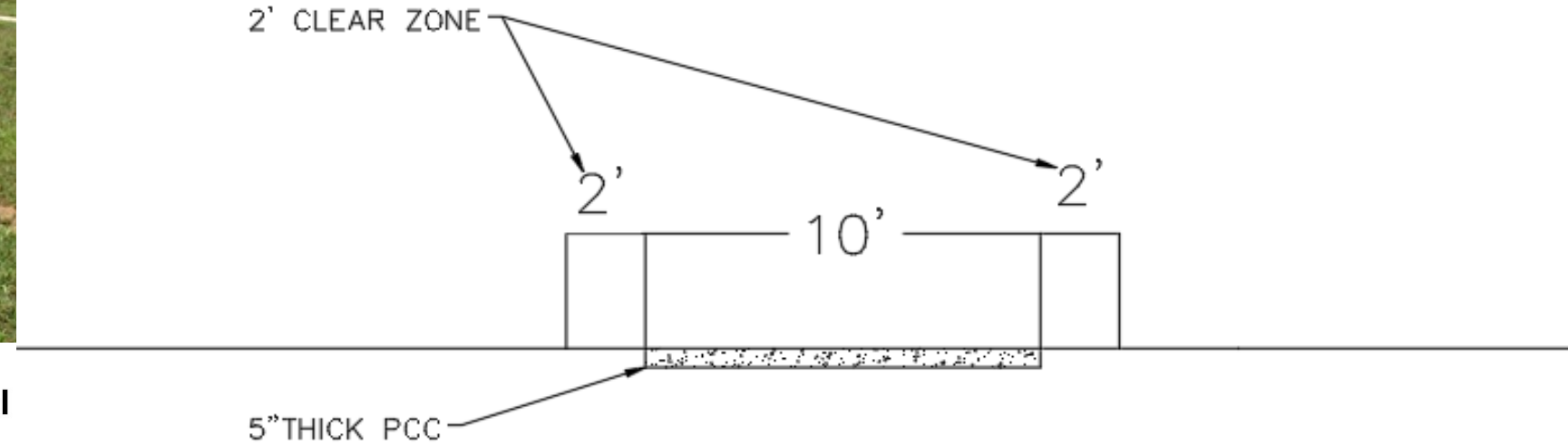
Trail Design



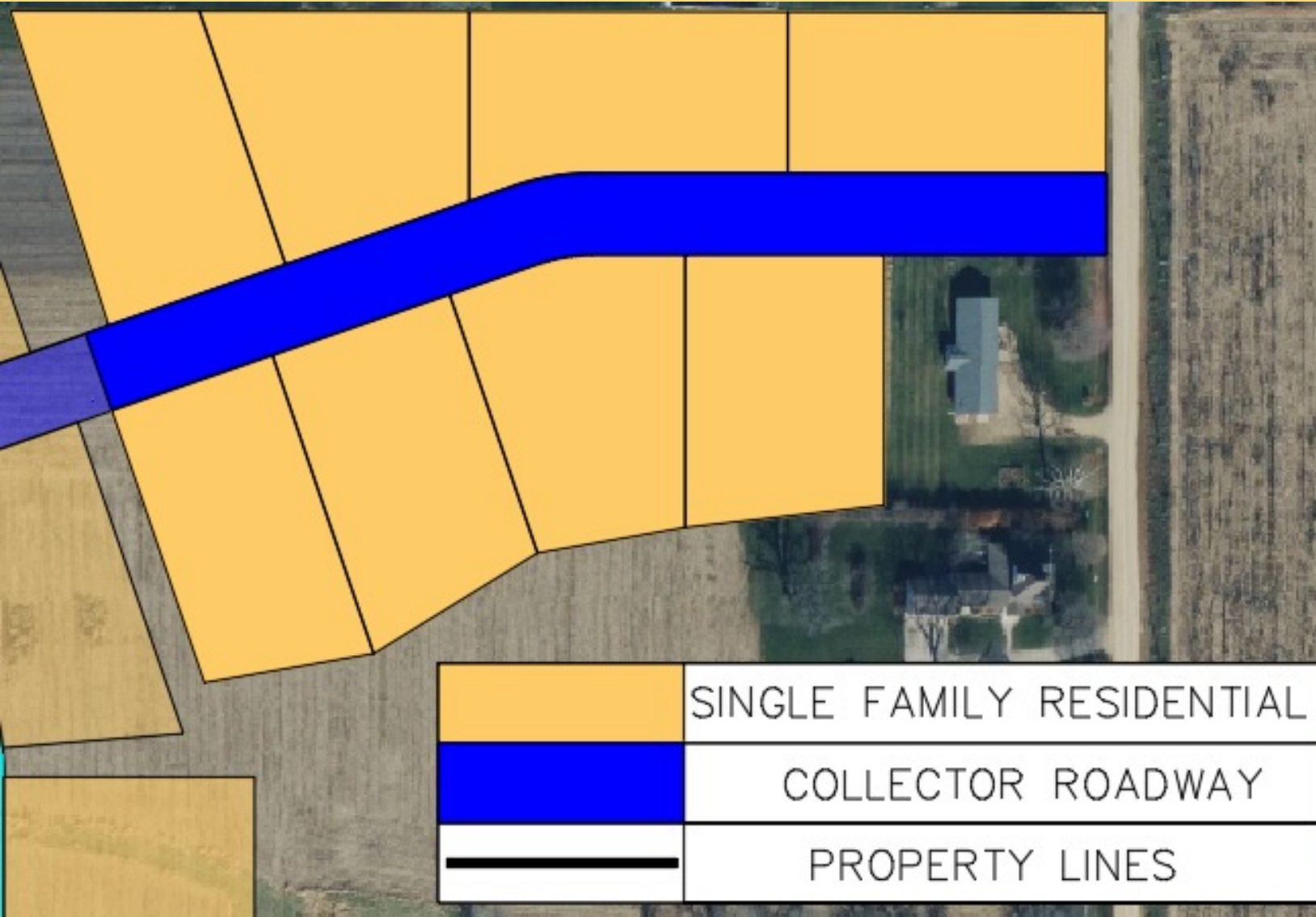
TRAIL WITH TREE LINE BUFFER



TYPICAL TRAIL CROSS-SECTION

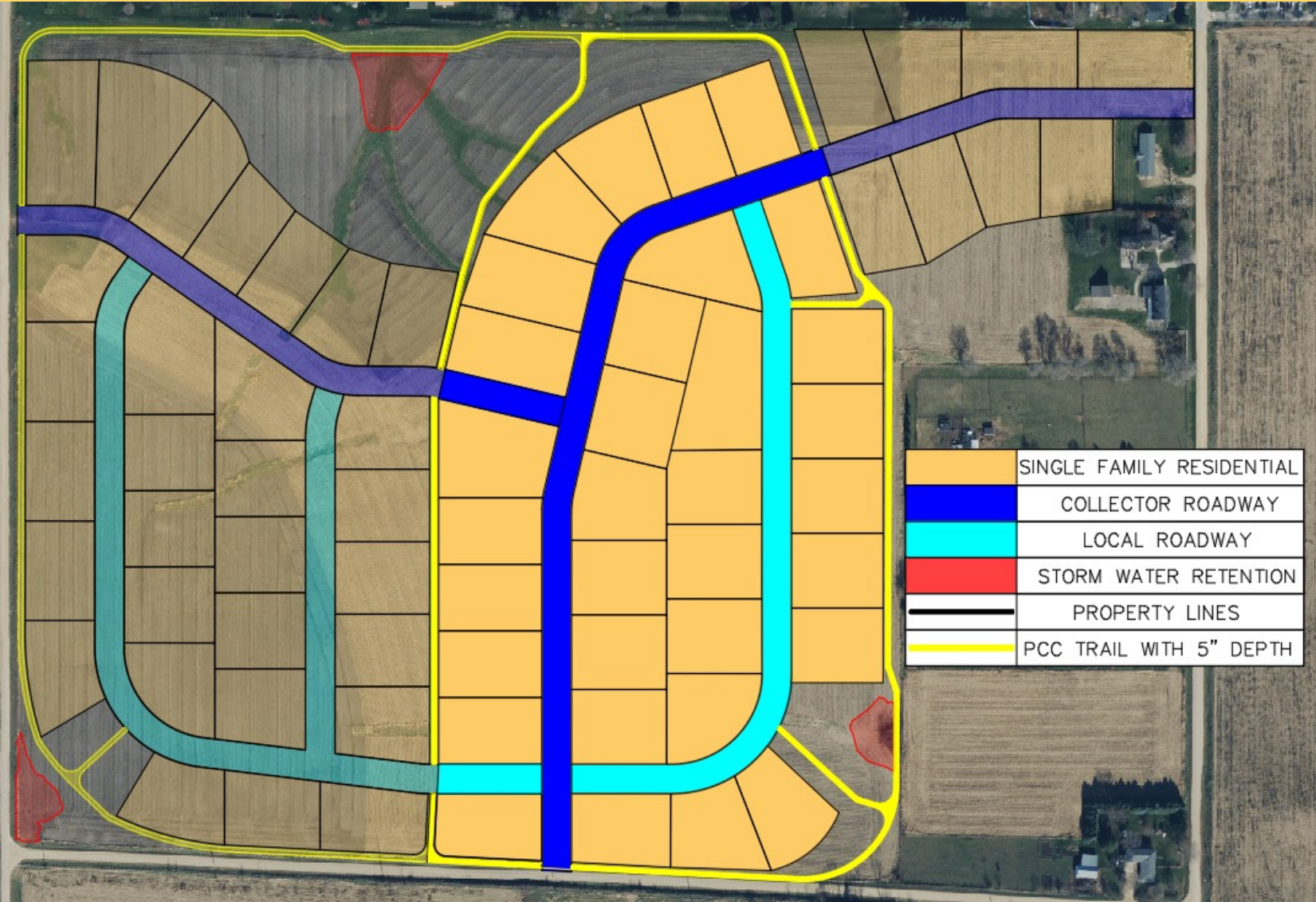


Phase 1



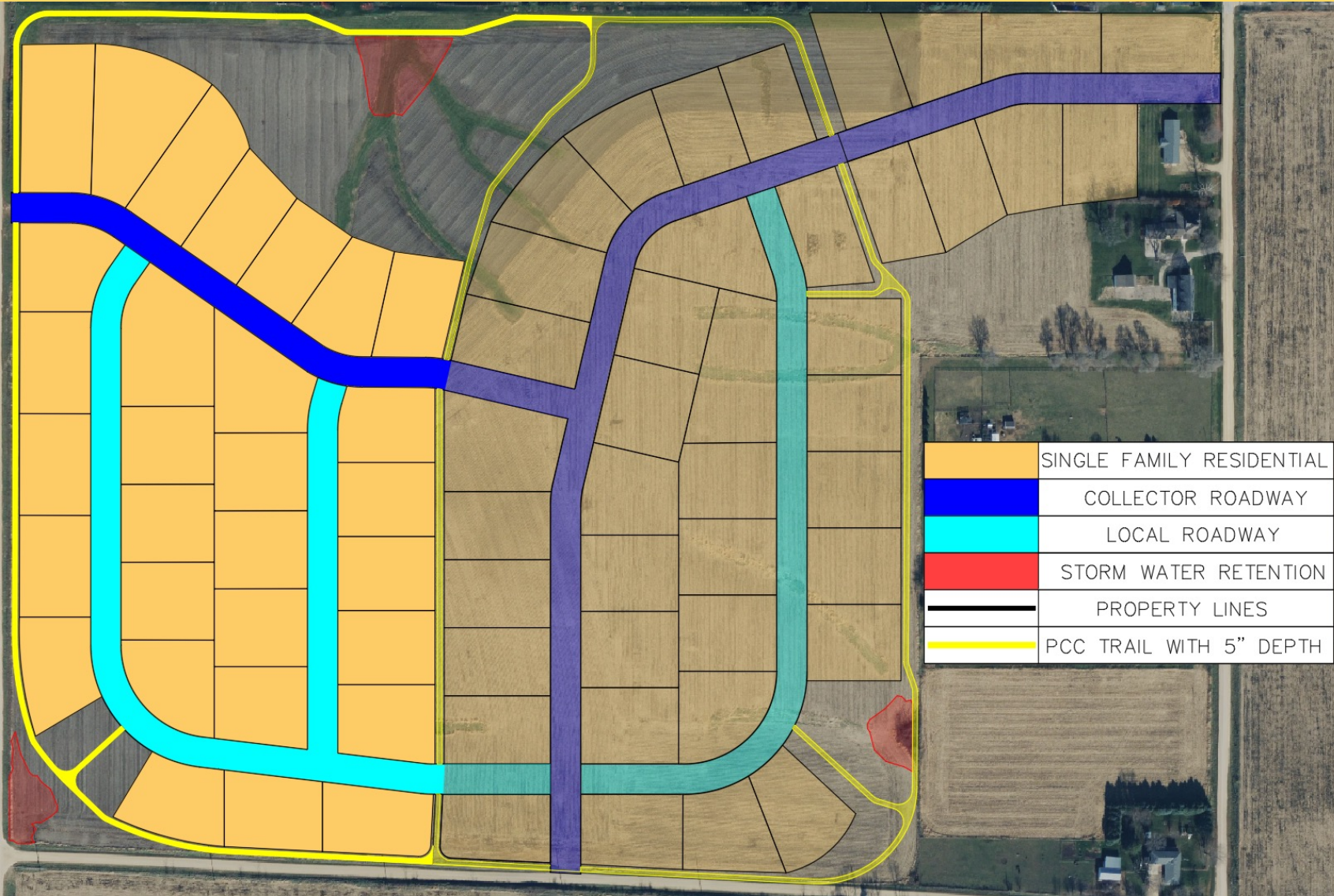
INFRASTRUCTURE COST ESTIMATE		
ROAD NETWORK	\$	177,000
WATER MAIN	\$	97,000
STORM SEWER	\$	83,000
SITE GRADING	\$	79,000
TOTAL COST	\$	436,000

Phase 2



INFRASTRUCTURE COST ESTIMATE		
ROAD NETWORK	\$	707,000
TRAIL NETWORK	\$	261,000
WATER MAIN	\$	289,000
STORM SEWER	\$	315,000
SITE GRADING	\$	73,000
TOTAL COST	\$	1,645,000

Phase 3



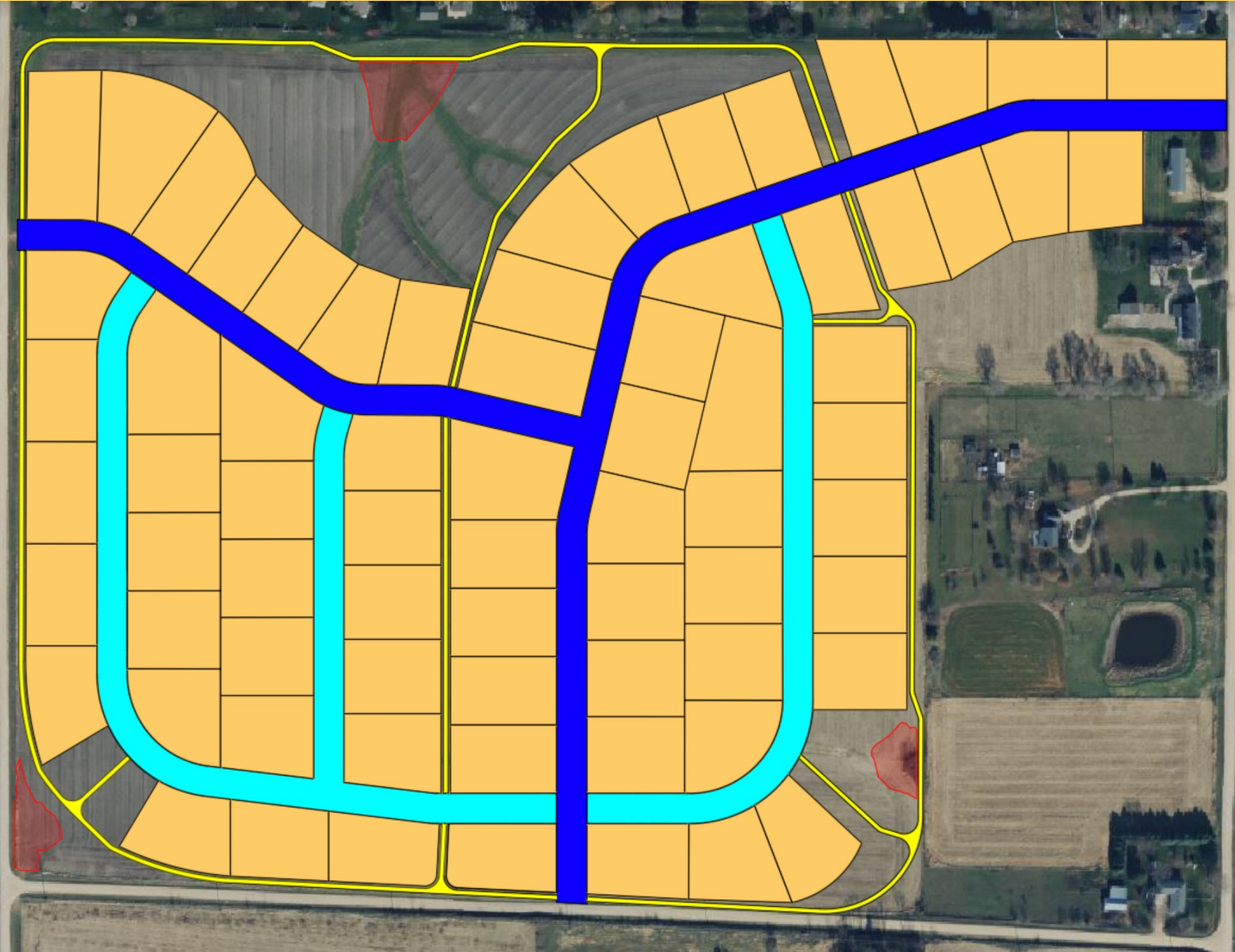
INFRASTRUCTURE COST ESTIMATE	
ROAD NETWORK	\$ 809,000
TRAIL NETWORK	\$ 176,000
WATER MAIN	\$ 414,000
STORM SEWER	\$ 422,000
SITE GRADING	\$ 146,000
TOTAL COST	\$ 1,967,000

Increase Tax Base for the City of Maquoketa



ESTIMATED TAX BASE INCREASE

SIGNLE-FAMILY TAX BASE INCREASE	\$	28,400,000
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Cost Estimate



Cost per Lot: \$69,900

INFRASTRUCTURE COST ESTIMATE	
ROAD NETWORK	\$ 1,695,000
TRAIL NETWORK	\$ 437,000
WATER MAIN	\$ 807,000
STORM SEWER	\$ 857,000
SITE GRADING	\$ 298,000

INFRASTRUCTURE AND DESIGN COST ESTIMATE	
CONSTRUCTION SUBTOTAL	\$ 4,094,000
20% CONSTRUCTION CONTINGENCIES	\$ 818,800
DESIGN COST	\$ 51,000
TOTAL COST	\$ 4,964,000

Stewart Family Farm Subdivision



71 lots

250 residents

\$28.4 Million Tax Base

Privacy and Flood Protection

