SW Maquoketa Land Use Plan

City of Maquoketa, IA

The University of Iowa
College of Engineering

May 5th, 2022

CITY OF MAQUOKETA
ONE OF A KIND

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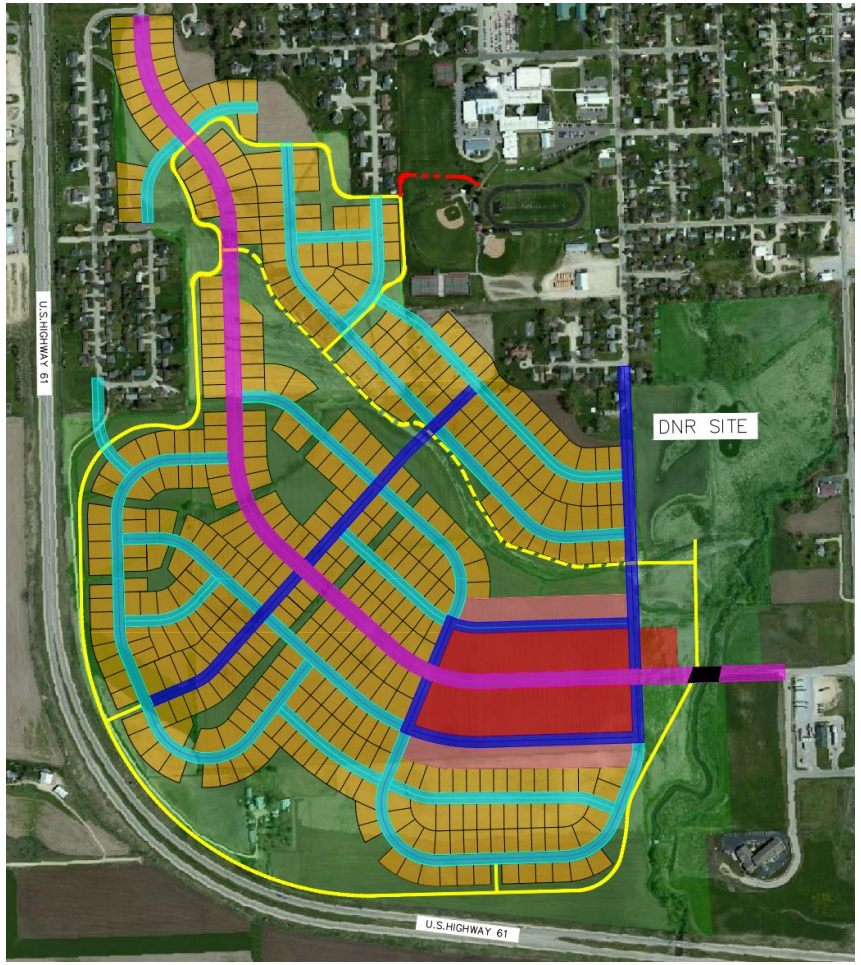
Project Team

Nick Radcliffe, Thomas Dau, Matthew Huinker, & Shane Hochstetler

Presentation Outline

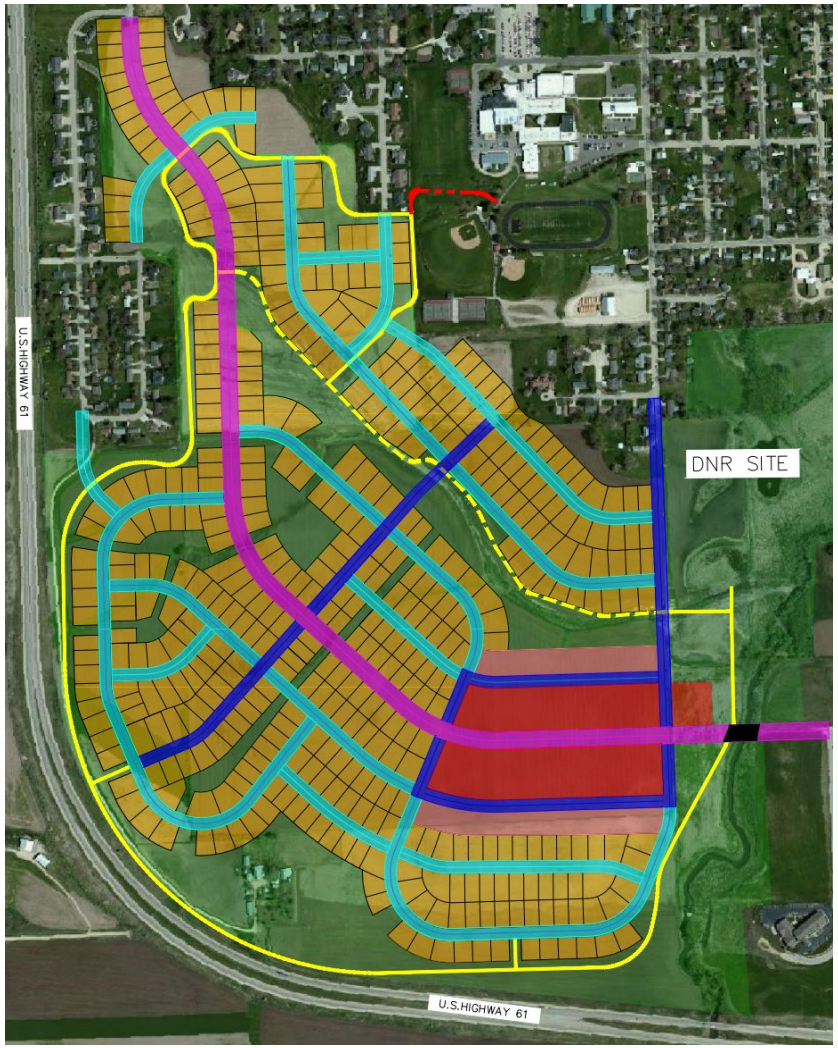
Project Overview

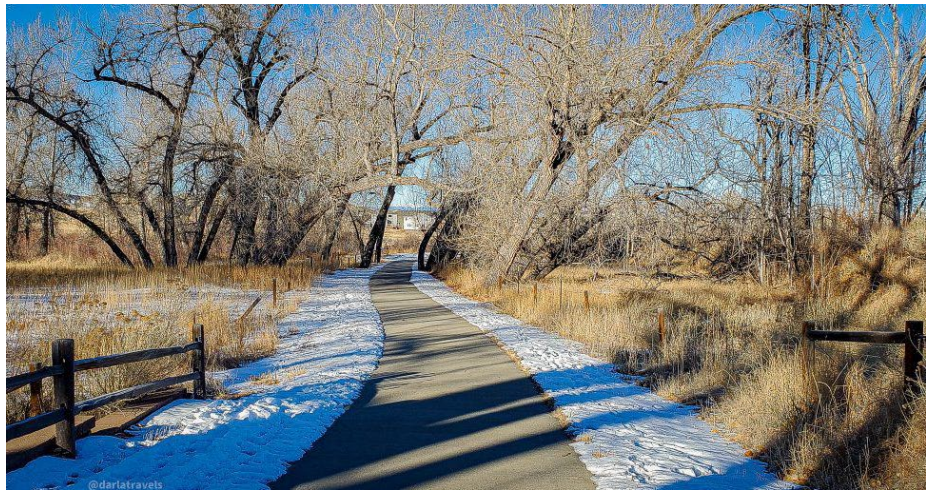


Design Elements

Increased Tax Base and Infrastructure Value

ESTIMATED TAX BASE INCREASE		
SINGLE-FAMILY TAX BASE INCREASE	$	122,500,000.00
MULTIFAMILY TAX BASE INCREASE	$	6,976,000.00
COMMERCIAL TAX BASE INCREASE	$	4,817,000.00
TOTAL TAX BASE INCREASE	$	134,293,000.00





Project Objectives and Goals

Proposed Zoning

ZONING AREA		
SINGLE-FAMILY RESIDENTIAL	128	ACRES
MULTIFAMILY RESIDENTIAL	8	ACRES
COMMERCIAL SPACE	15	ACRES
GREEN AND OPEN SPACE	133	ACRES

	Public Open Space
	Commercial Development
	Single–Family Residential
	Multi–Family Residential

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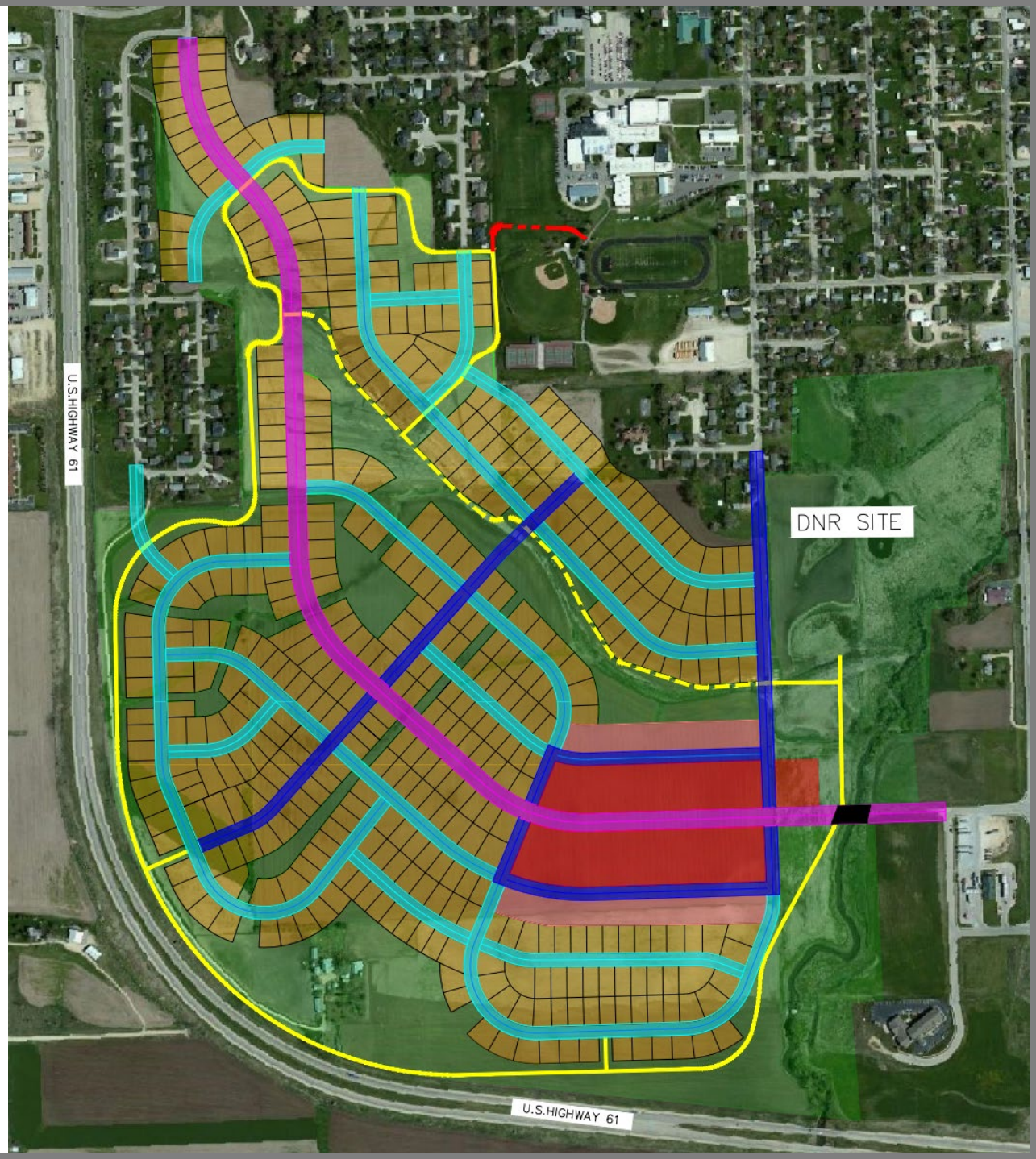


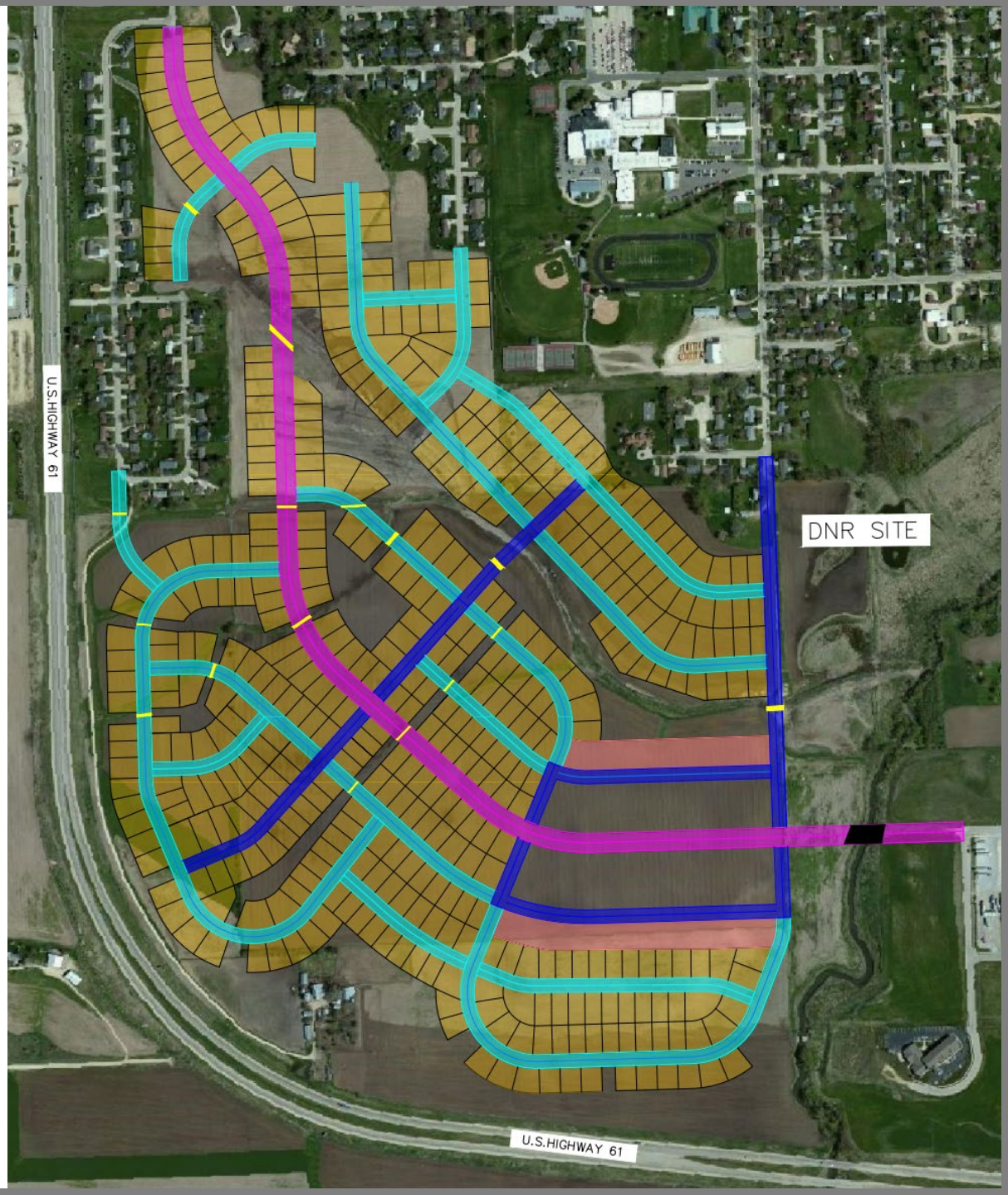
Street Network

ROAD CLASSIFICATION	LENGTH (LF)	LENGTH (MILE)
ARTERIAL	6597	1.2
COLLECTOR	7667	1.5
LOCAL	20755	3.9
TOTAL	35019	6.6

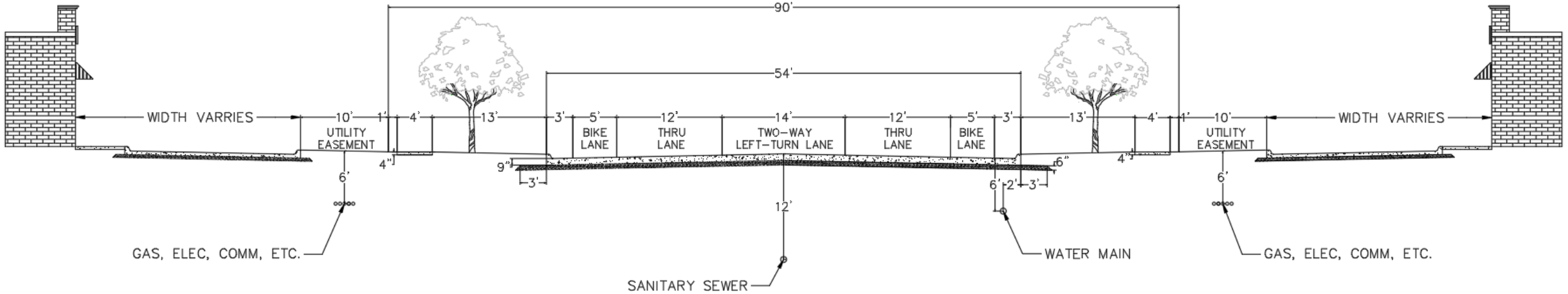
ARTERIAL ROAD ROW

COLLECTOR ROAD ROW

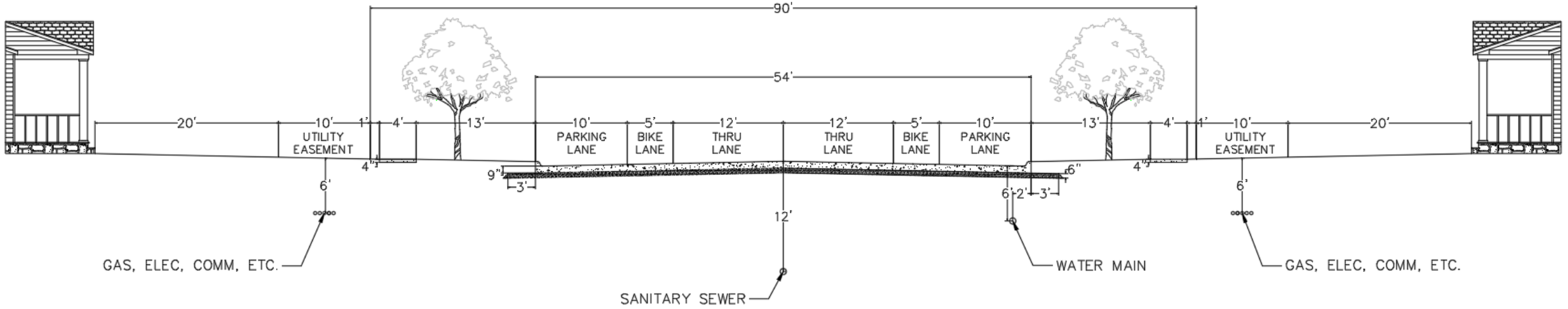
LOCAL ROAD ROW



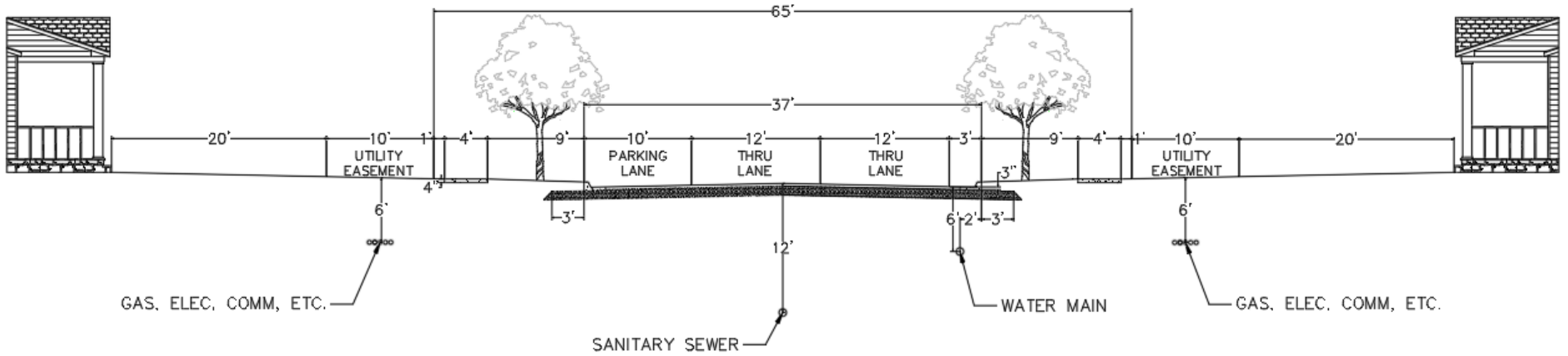
ARTERIAL STREET CROSS–SECTION COMMERCIAL AREA



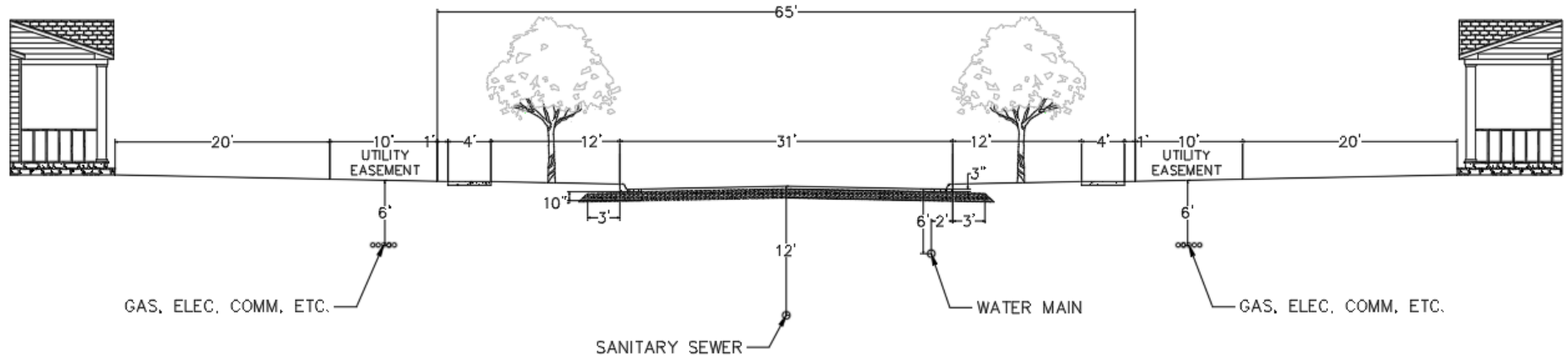
ARTERIAL STREET CROSS–SECTION RESIDENTIAL AREA



COLLECTOR STREET CROSS–SECTION



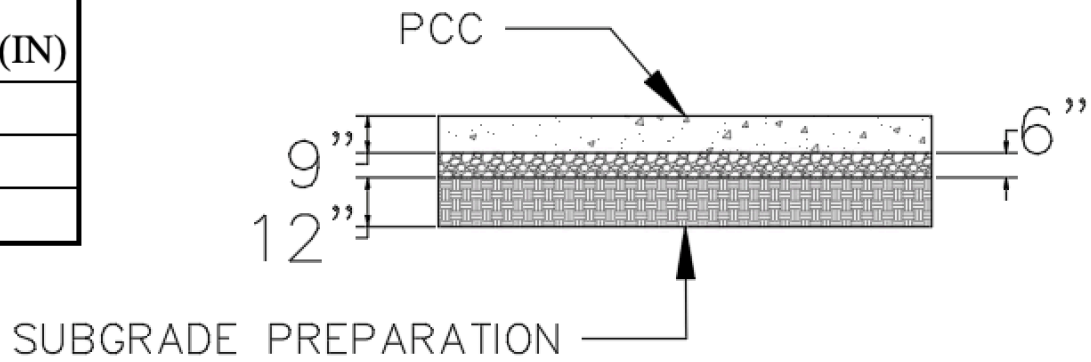
LOCAL STREET CROSS–SECTION



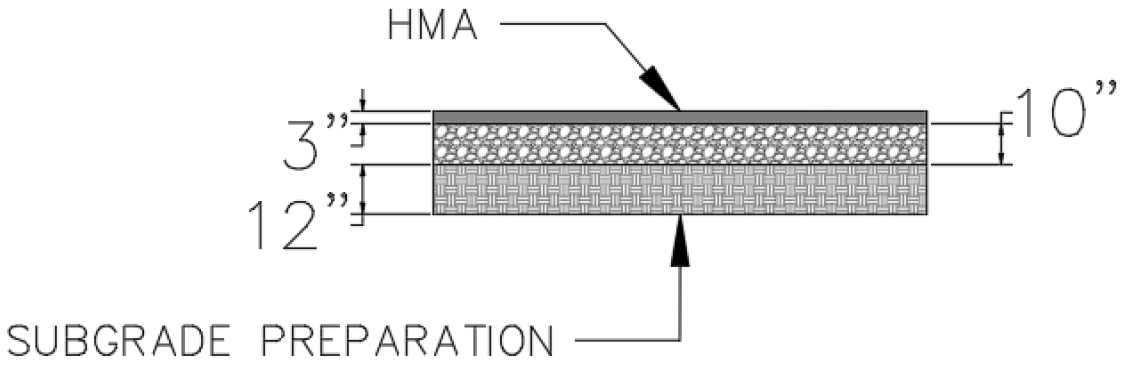
Pavement Design

PAVMENT DESIGN			
ROAD CLASSIFICATION	PAVEMENT TYPE	PAVEMENT THICKNESS (IN)	BASE THICKNESS (IN)
ARTERIAL	PCC	9	6
COLLECTOR	HMA	3	10
LOCAL	HMA	3	10

ARTERIAL PAVEMENT SECTION

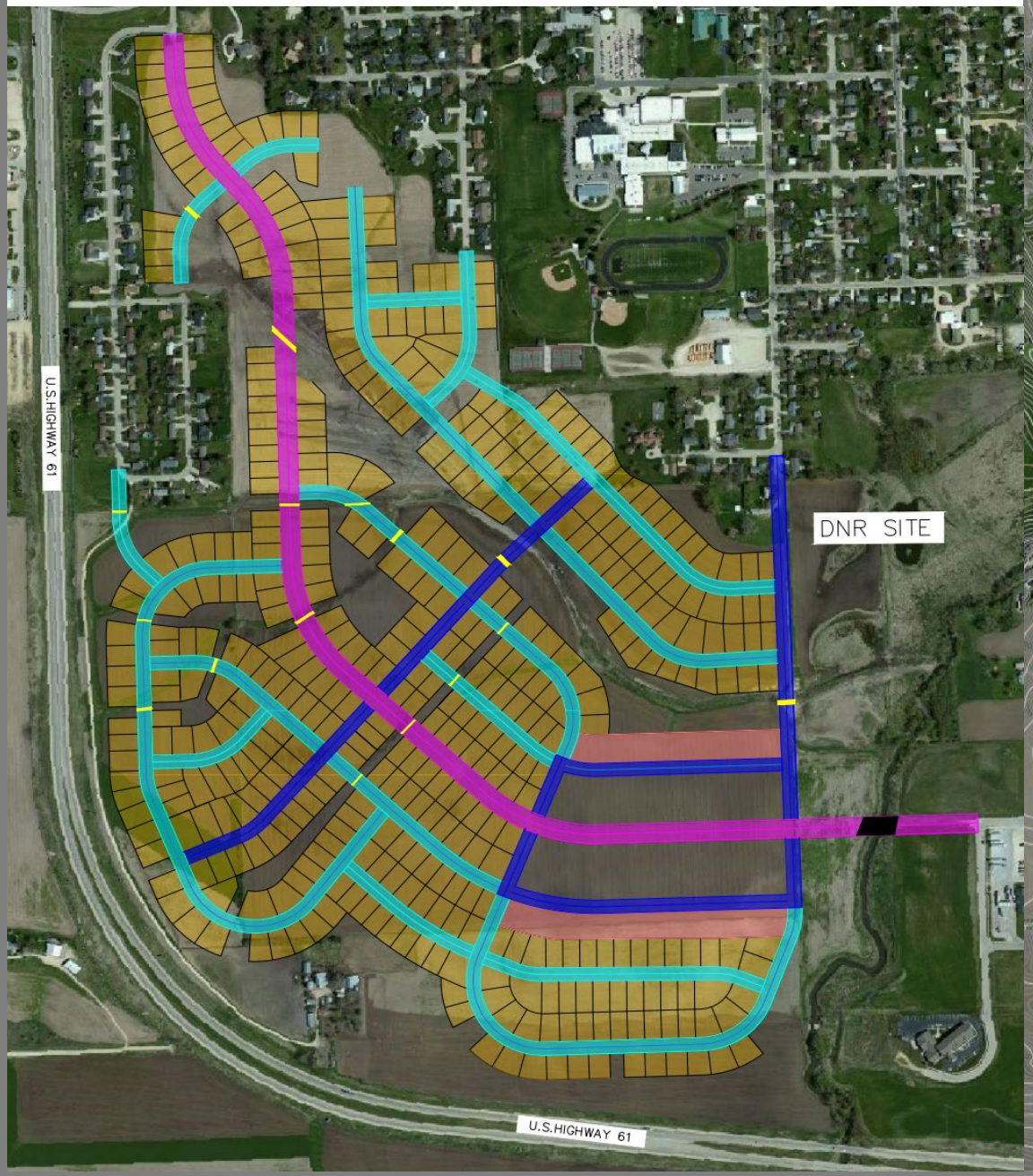


COLLECTOR AND LOCAL PAVEMENT SECTION



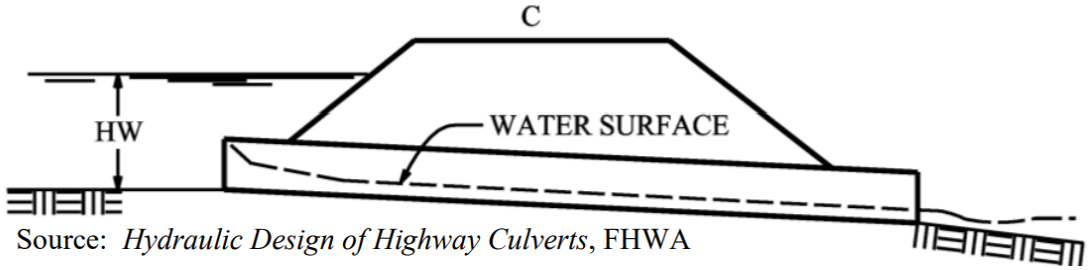
Iowa SUDAS
STATEWIDE URBAN DESIGN AND SPECIFICATIONS

Stormwater



Culverts and Channels

Figure 2E-2.01C: Inlet Submerged



Source: *Hydraulic Design of Highway Culverts*, FHWA

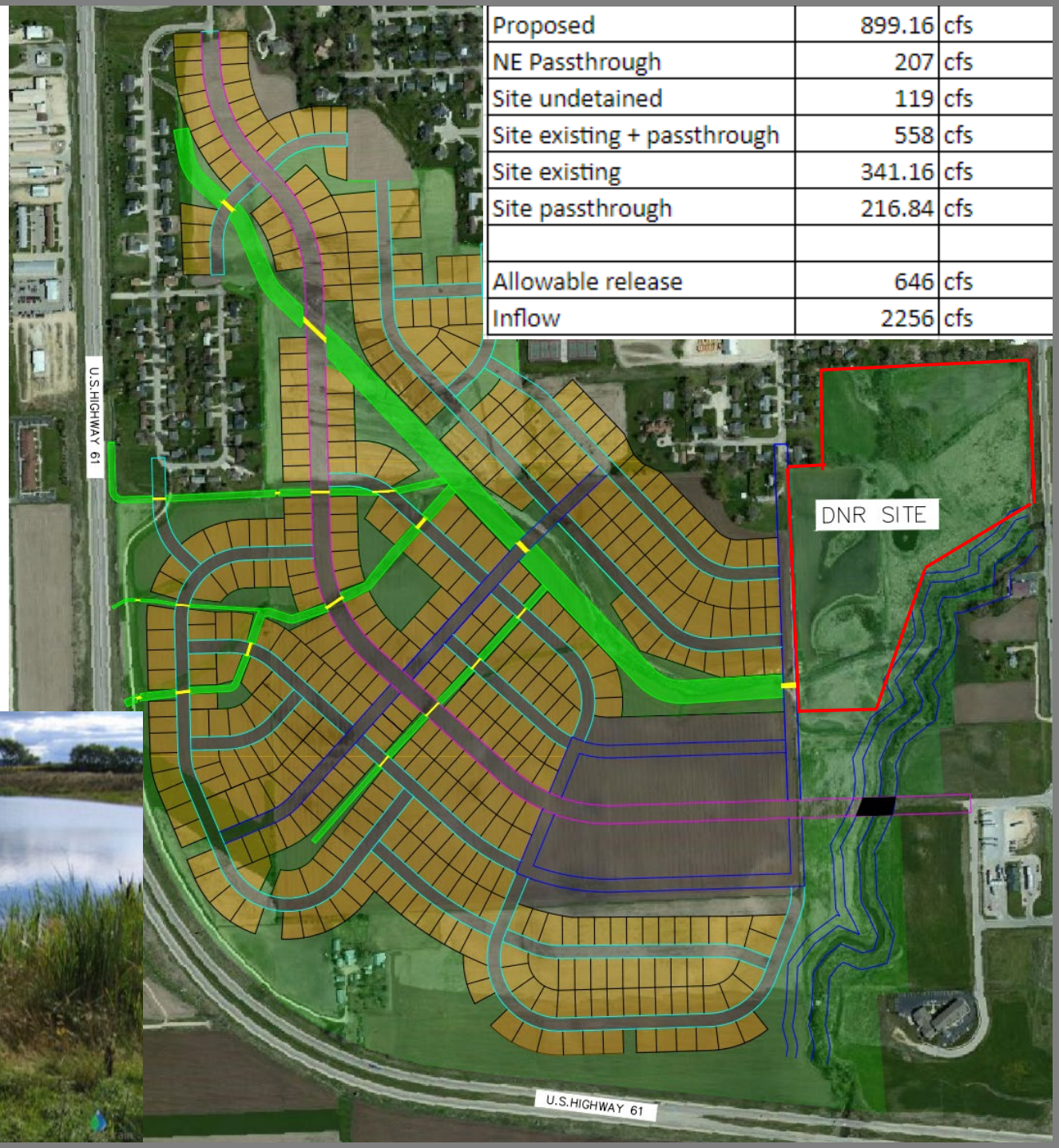
CULVERT	DESCRIPTION	CULVERT LENGTH (FT)	CHANNEL TYPE	BOTTOM WIDTH (FT)	SIDE SLOPE (X H:1 V)	CHANNEL DEPTH (FT)	EMBANKMENT HEIGHT ABOVE CULVERT INVERT (FT)
1	DOUBLE 5' W x 8' H BOX	65	TRAPEZOIDAL	8	4	8.5	11.80
2	DOUBLE 5.5' W x 8' H BOX	145	TRAPEZOIDAL	8	4	9.0	12.20
3	DOUBLE 10' W x 10' H BOX	65	TRAPEZOIDAL	8	4	12.5	14.50
4	DOUBLE 10' W x 10' H BOX	85	TRAPEZOIDAL	8	4	13.0	15.50
5	60" DIAMETER	60	TRIANGULAR	0	3	5.0	7.10
6	66" DIAMETER	90	TRIANGULAR	0	3	5.0	7.20
7	30' DIAMETER	65	TRIANGULAR	0	3	2.0	4.70
8	DOUBLE 5' W x 6' H BOX	95	TRIANGULAR	0	3	6.5	9.50
9	DOUBLE 6' W x 6' H BOX	65	TRIANGULAR	0	3	6.0	8.60
10	DOUBLE 5' W x 5.5' H BOX	65	TRIANGULAR	0	3	6.0	8.00
11	DOUBLE 5' W x 6' H BOX	65	TRIANGULAR	0	3	5.0	8.50
12	54" DIAMETER	65	TRIANGULAR	0	3	4.0	6.60
13	60" DIAMETER	95	TRIANGULAR	0	3	5.0	7.30
14	5.5' W x 5' H BOX	70	TRIANGULAR	0	3	5.0	7.30
15	6' W x 5' H BOX	65	TRIANGULAR	0	3	5.0	7.60
16	DOUBLE 5' W x 5.5' H BOX	20	TRIANGULAR	0	3	6.0	8.00
17	30" DIAMETER	20	TRIANGULAR	0	3	2.0	4.70
18	66" DIAMETER	20	TRIANGULAR	0	3	5.0	7.20
19	54" DIAMETER	140	TRIANGULAR	0	3	5.0	7.40

Stormwater Detention

Existing property only			
Description	CN	Area	Area
		(sf)	(ac)
Impervious	98	107282	2.46
Straight row crop	81	11444103	262.72
Open Space	74	2863177	65.73
Total	79.7	14414562	330.91
Pe =	4.9	in	

Proposed property only			
Description	CN	Area	Area
		(sf)	(ac)
Impervious	98	2620095	60.15
Residential 0.3 ac	82	5517215	126.66
Open Space	74	5054169	116.03
Commercial	94	906095	20.80
Residential 1/8 ac	90	316988	7.28
Total	83.0	14414562	330.91
Pe =	5.24	in	
Storage	9.38	ac-ft	

Proposed	899.16	cfs
NE Passthrough	207	cfs
Site undetained	119	cfs
Site existing + passthrough	558	cfs
Site existing	341.16	cfs
Site passthrough	216.84	cfs
Allowable release	646	cfs
Inflow	2256	cfs



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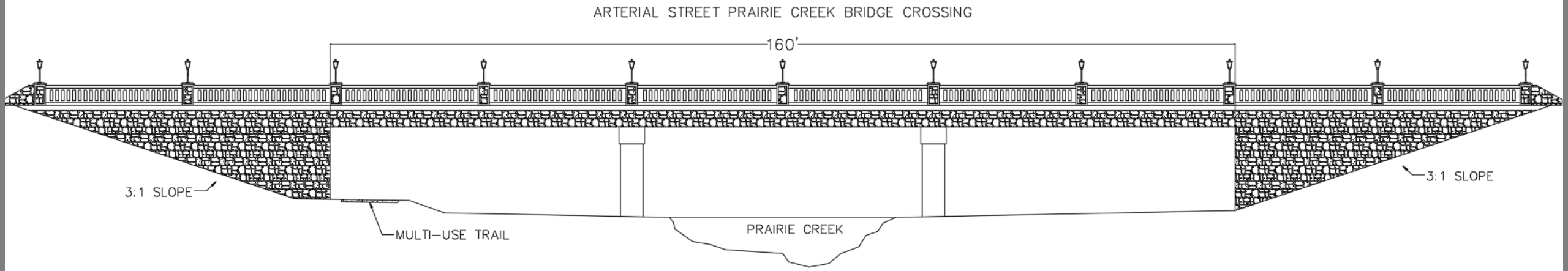
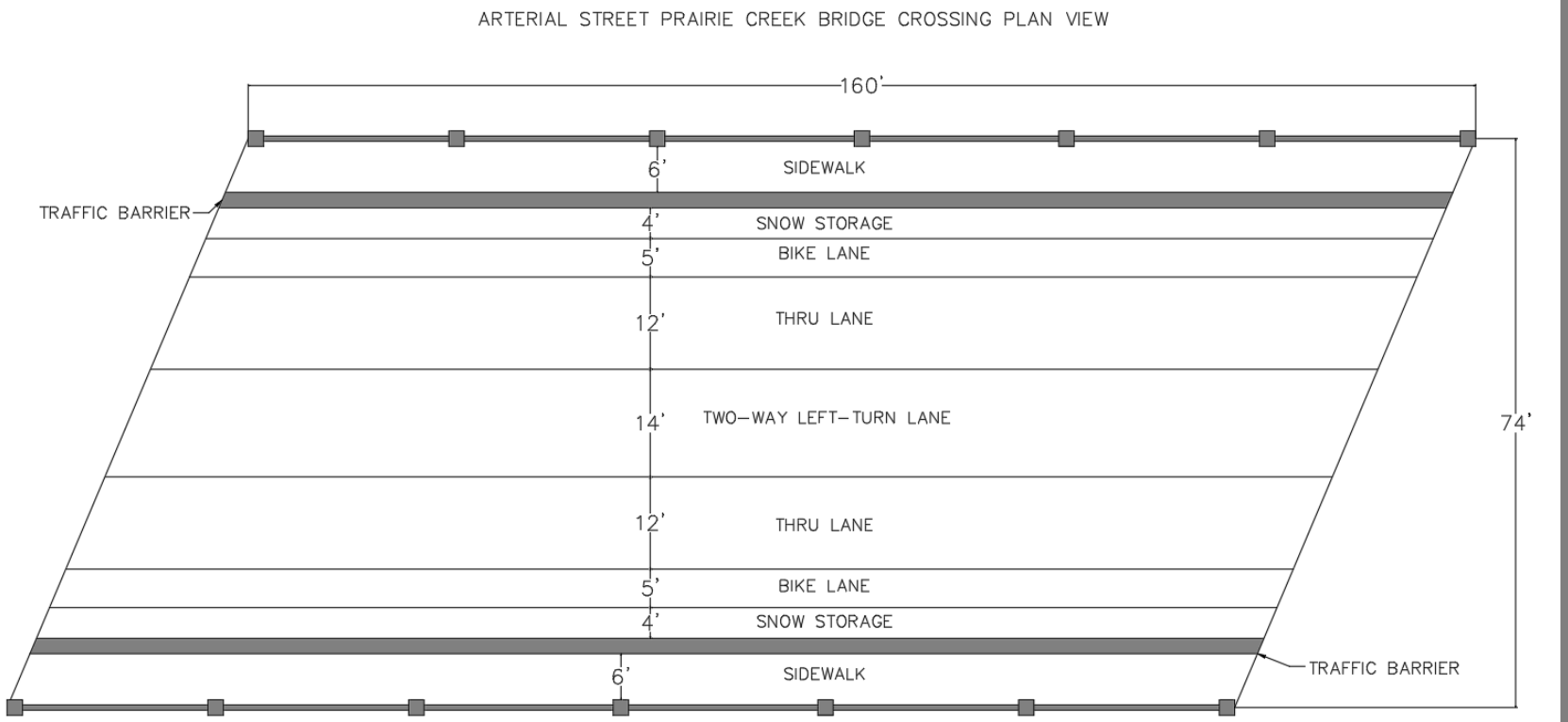
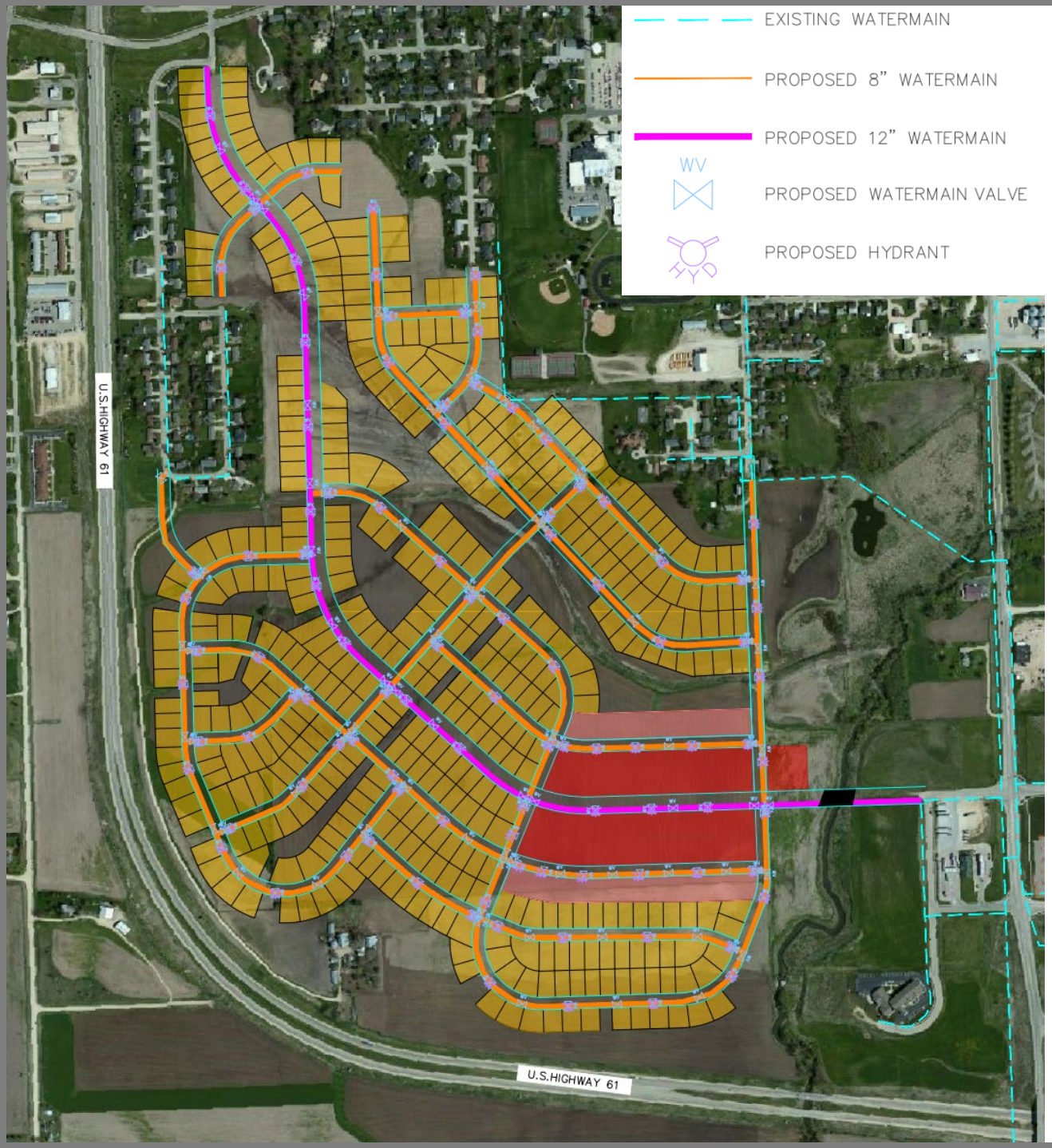




Prairie Creek Bridge


SYCAMORE
STREET



Water Main

Distance Between Buildings	Needed Fire Flow
Over 100'	500 gpm
31' to 100'	750 gpm
11' to 30'	1,000 gpm
10' or less	1,500 gpm

WATER MAIN QUANTITIES	
NUMBER OF HYDRANTS	101
NUMBER OF VALVES	199
LENGTH OF 12" PIPE (LF)	6597
LENGTH OF 8" PIPE (LF)	28422

Sanitary Sewer

EXISTING SANITARY SEWER LINE

PROPOSED 8" SANITARY SEWER LINE

PROPOSED 10" SANITARY SEWER LINE

EXISTING SANITARY SEWER MANHOLE

PROPOSED SANITARY SEWER MANHOLE

SANITARY SEWER QUANTITIES	
LENGTH OF 8" PIPE (LF)	29813
LENGTH OF 12" PIPE (LF)	3202
NUMBER OF MANHOLES	140

Public Open Space and Trail Network

MULTI–USE PCC TRAIL WITH 5" DEPTH

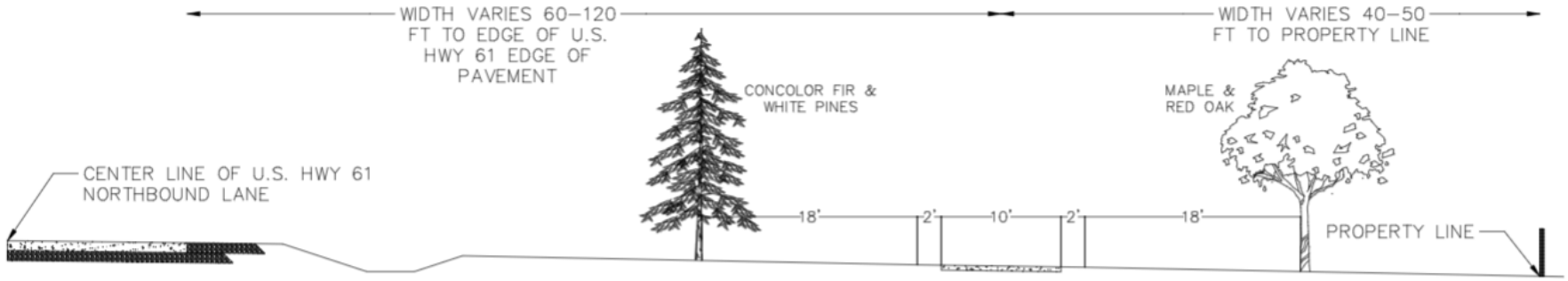
MULTI–USE PCC TRAIL WITH 7" DEPTH

MULTI–USE PCC TRAIL WITH 5" DEPTH ON PROPERTY OF MAQUOKETA HIGH SCHOOL

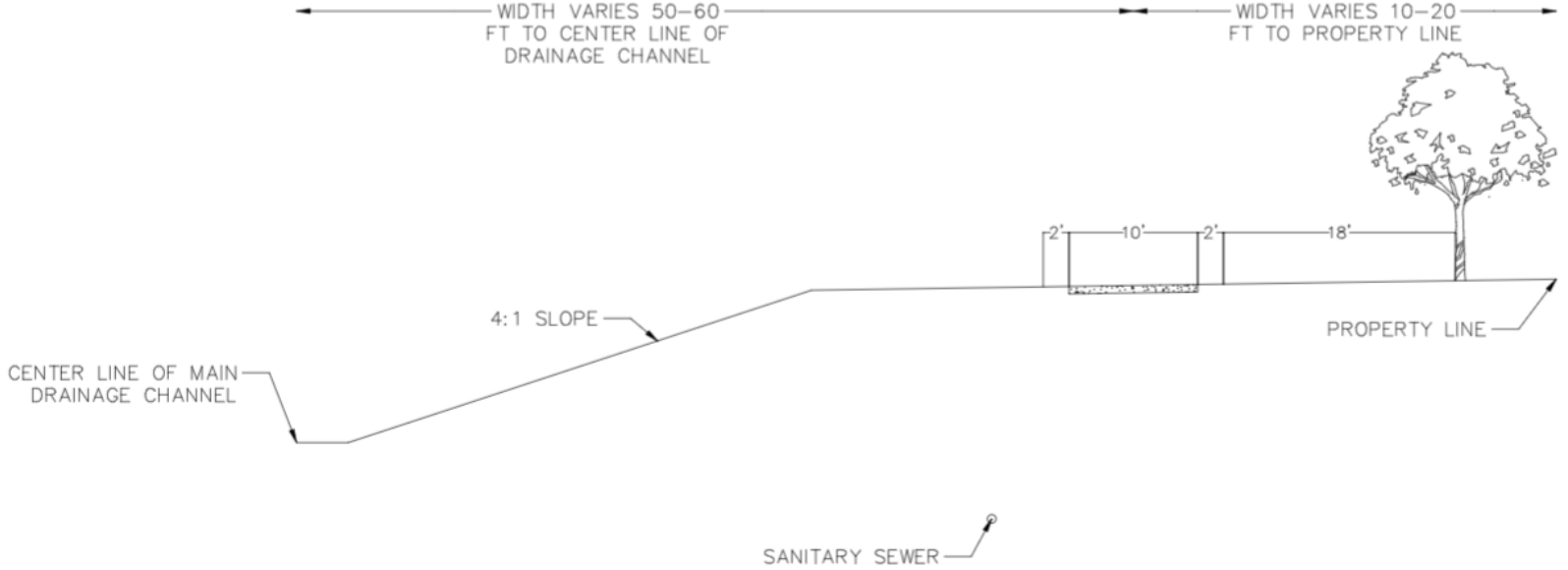
PCC TRAIL QUANTITIES	
AREA OF 5" PCC (SF)	136890
AREA OF 7" PCC (SF)	31878
LENGTH OF MAIN LOOP (MILES)	2.35

Trail Cross-Sections

MULTI–USE TRAIL AND NATURAL BUFFER ALONG U.S. HWY 61



MULTI–USE TRAIL ALONG MAIN DRAINAGE CHANNEL



Increased Tax Base for the City of Maquoketa, IA

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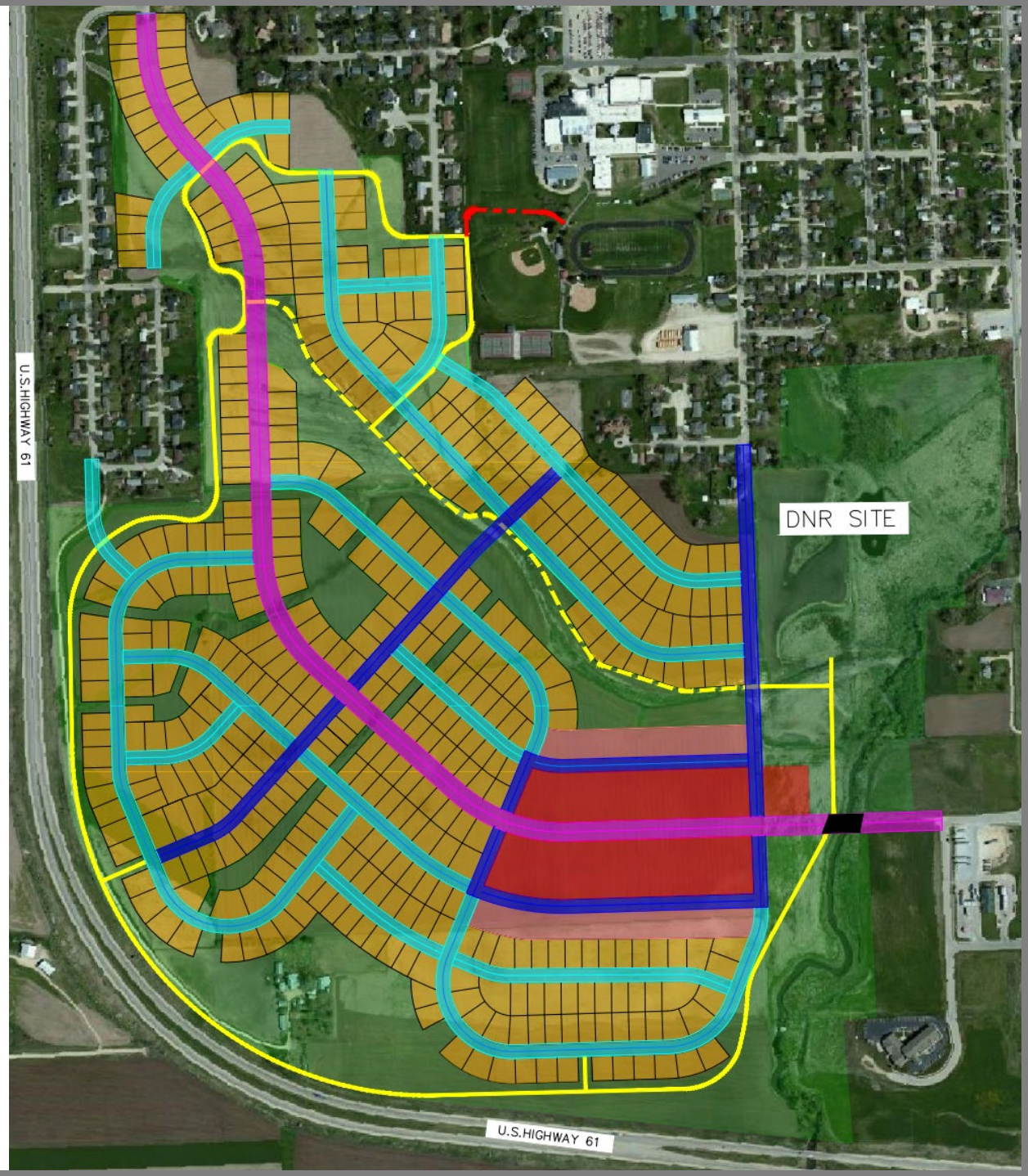

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Increased Infrastructure Value and Total Development Cost

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TOTAL INFRASTRUCTURE VALUE FOLLOWING FULL DEVELOPMENT	
STORM WATER	$ 5,414,558.76
WATER MAIN	$ 2,625,300.55
SANITARY SEWER	$ 2,313,266.76
ROAD NETWORK	$ 8,980,447.26
PRAIRIE CREEK BRIDGE	$ 1,149,068.00
TRAIL NETWORK	$ 469,839.88
TOTAL VALUE OF INFRASTRUCTURE	$ 20,952,500.00

TOTAL DEVELOPMENT COST	
CONSTRUCTION SUBTOTAL	$ 20,952,481.21
25% EARTH WORK & CONTINGENCIES	$ 5,238,120.30
8% ENGINEERING & ADMINISTRATION	$ 1,676,198.50
TOTAL DEVELOPMENT COST	$ 27,867,000.00

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