



New Mixed-Use Residential Development in Manchester, Iowa

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Outline

Project Statement

Lot Design

Stormwater Management

Storm Sewer

Roads

Grading

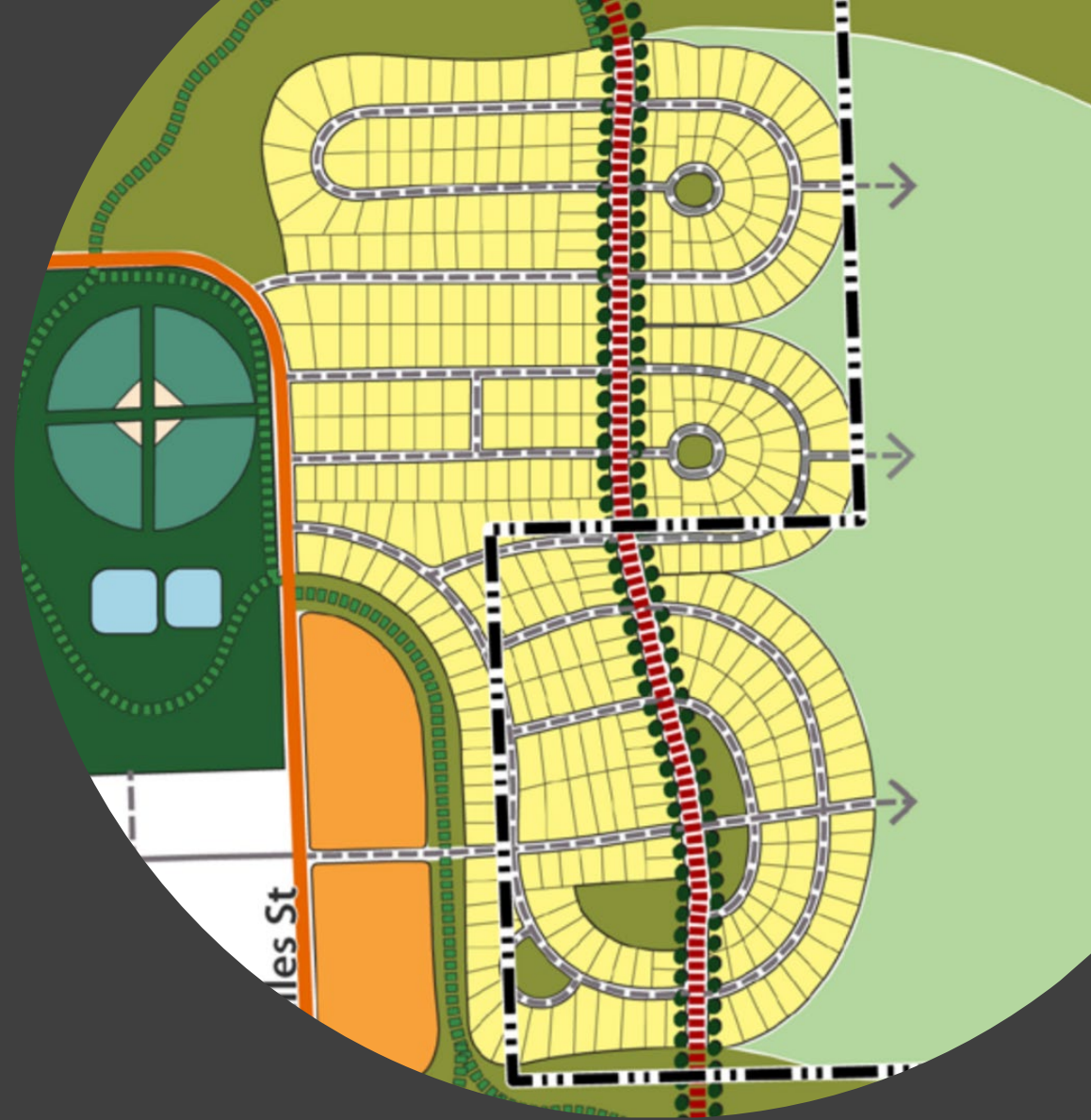
Utilities

Phasing Plan

Cost Estimates

Project Statement

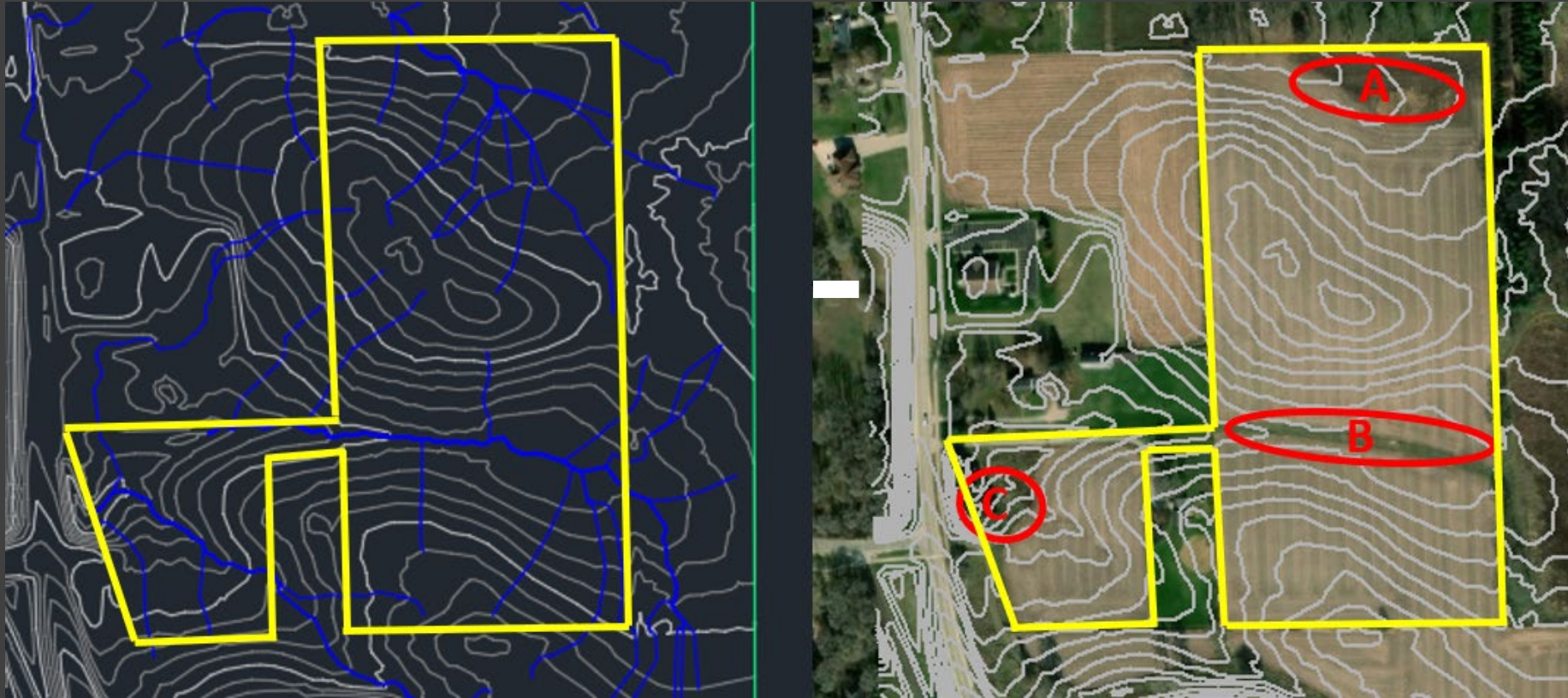
- Design a neighborhood development that supports a mix of housing options while maximizing land use
 - Utilities connecting to existing networks
 - A lift station needed for storm water runoff
- The layout must be cohesive with the city's comprehensive plan, which includes future residential development surrounding the site
- Final products includes:
 - Street layouts
 - Building setbacks
 - Utility networks
 - Stormwater system
 - Phasing plan
 - Cost Estimate
 - Master plan of surrounding properties



Lot Design

- Total 52
 - 37 current development
 - 15 additional in future development
- Ranch Style Housing
 - Min. 100' Wide x 115' Deep for non-corner lots
 - Min 115' Wide x 120' Deep for corner lots
- Town housing along the southern boundary
- Large commercial lot along the southern access road





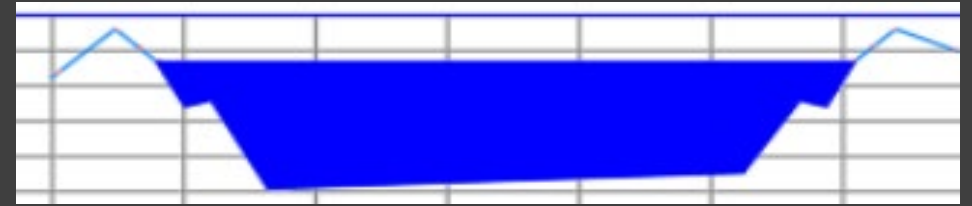
Storm Water Management

- Catchment areas drain into 3 stormwater management regions (A, B, and C)
- Largest runoffs come from post development onsite storms plus predevelopment offsite storms
- Designs keep runoff from 100-year storms under 5-year storm values

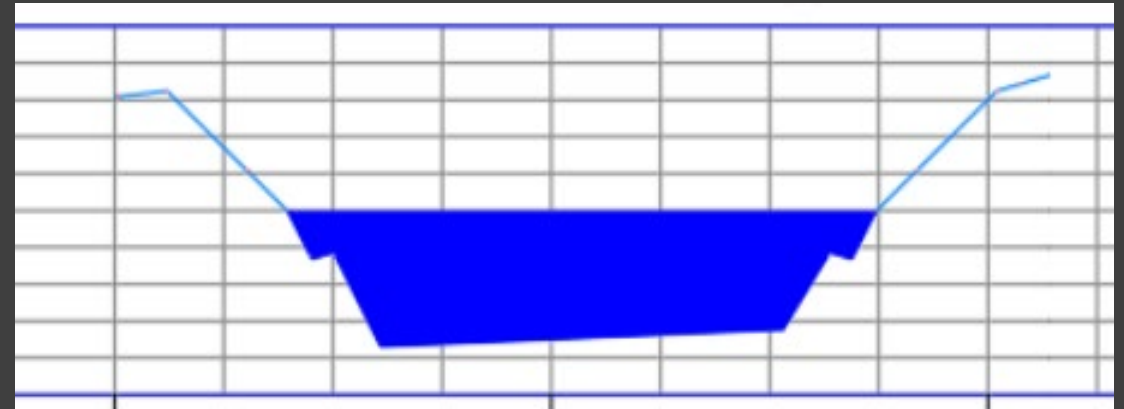
Wet Detention Pond (Region A and C)

- Deep pool
 - Holds 2x the water quality volumes
 - 3:1 slope
 - 10 feet deep
- Shallow pool
 - Holds the total storage volume to keep runoff of 100-year storms at 5-year storm flow rates
 - 3:1 slope for 1 ft above deep pool
 - 6:1 slope above that for 5 ft
- Safety bench
 - 5 ft wide, back pitched
 - 2.5 ft below surface of deep pool
- Maintenance path
 - 12 ft wide
- Multistage outlet set above the permanent pool

Detention A Profile



Detention C Profile



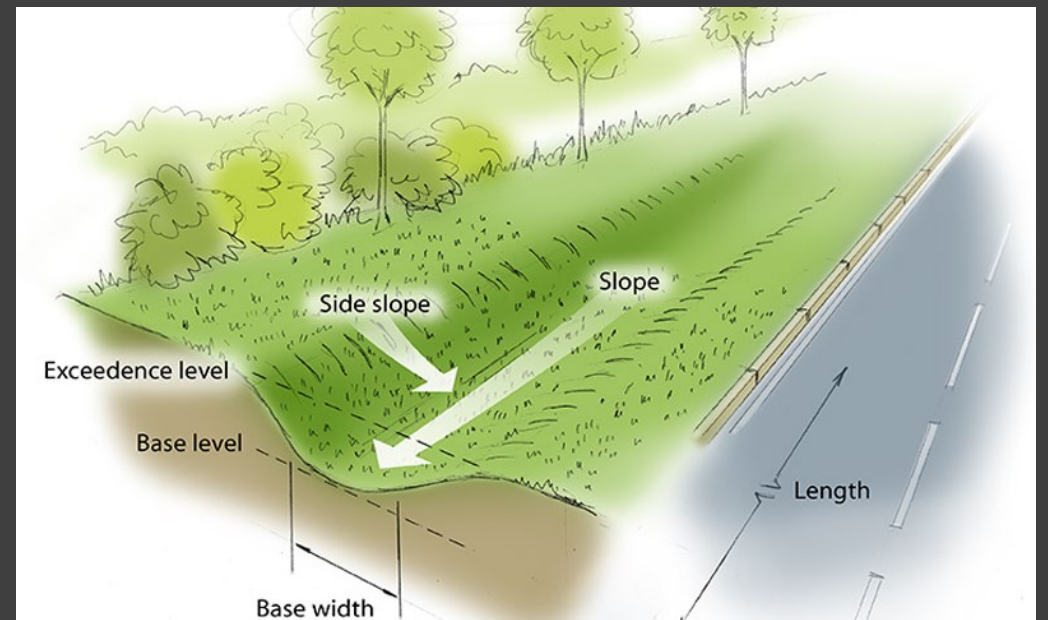
Bioswale (Region B)

- Goal:
 - Clean the water
 - Slow the flowrate
- Sized to carry 100-year storm events
- Flow enters through a culvert and exits through an outlet structure
 - The outlet directs the flow into a culvert that joins with the storm sewer system and deposits in wet detention basin C
- Velocities
 - < 5 ft/s entering
 - < 1 ft/s within the bioswale



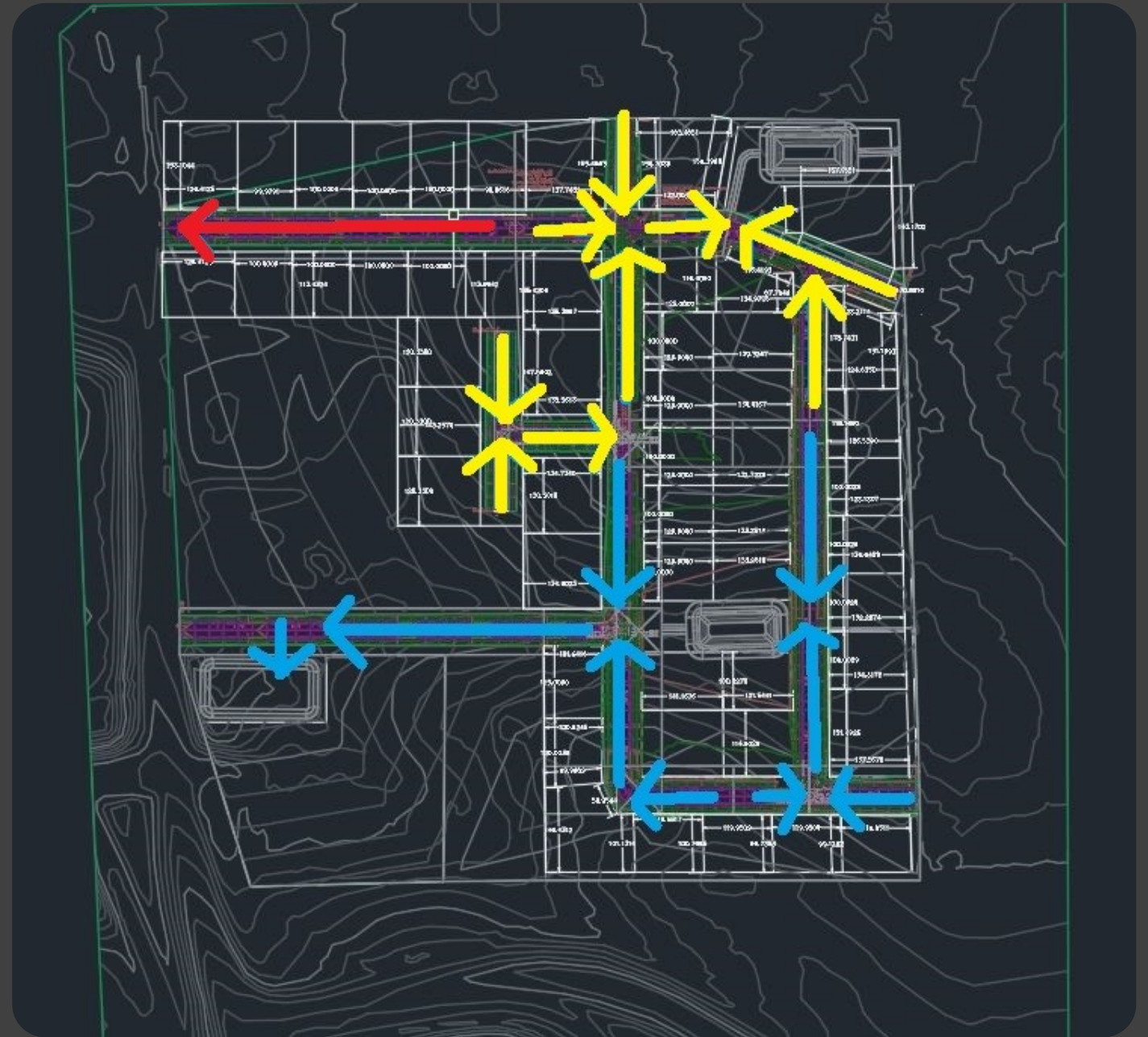
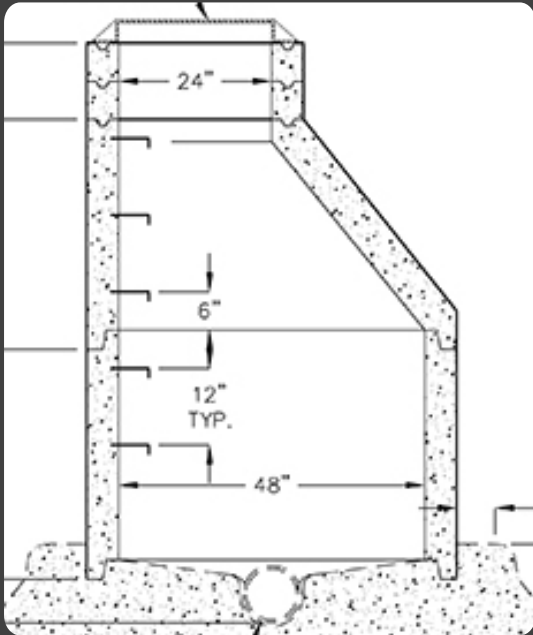
Overland Routes and Culverts

- Overland Routes
 - Sized to carry the 100-year storms
 - Buffalo grass turf application
 - <math>< 5\text{ ft/s}</math> velocity
 - Emergency overland routes are used to direct excess water from the wet detention basins offsite
- Culverts
 - 2 culverts: west and east of the bioswale
 - Sized to carry the 100-year storm without roadway over topping
 - 30-inch diameter
 - Reinforced Concrete Pavement
 - Mitered to conform with existing slope



Storm Sewer

- Reinforced concrete piping
- Eccentric grated intakes
- 3 sections



Roads

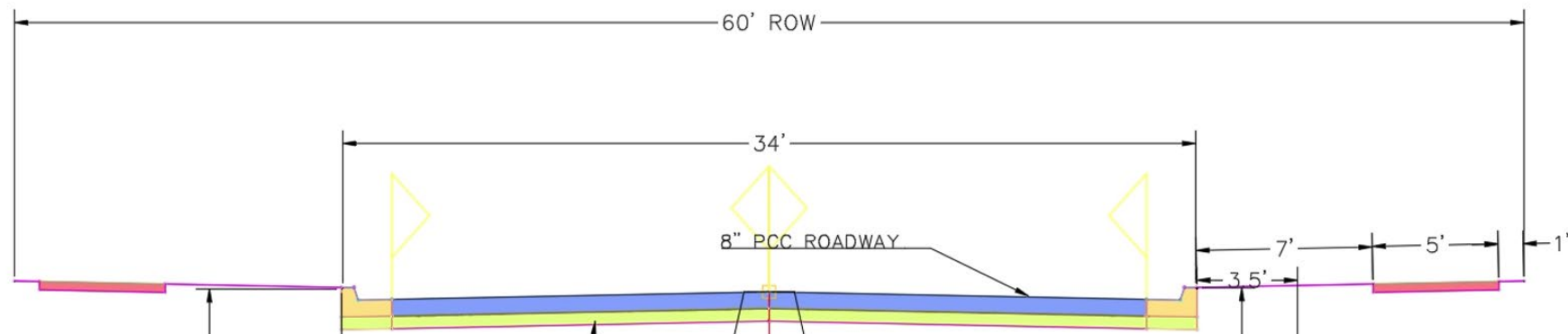
Arterial Street:

- 34' wide
- 60' ROW
- 8" PCC Pavement
- 6" Gravel Subbase

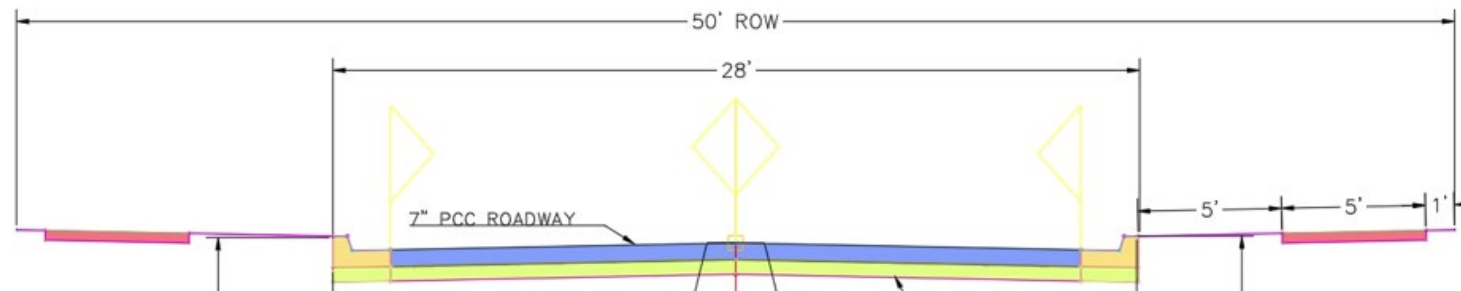
Local Street:

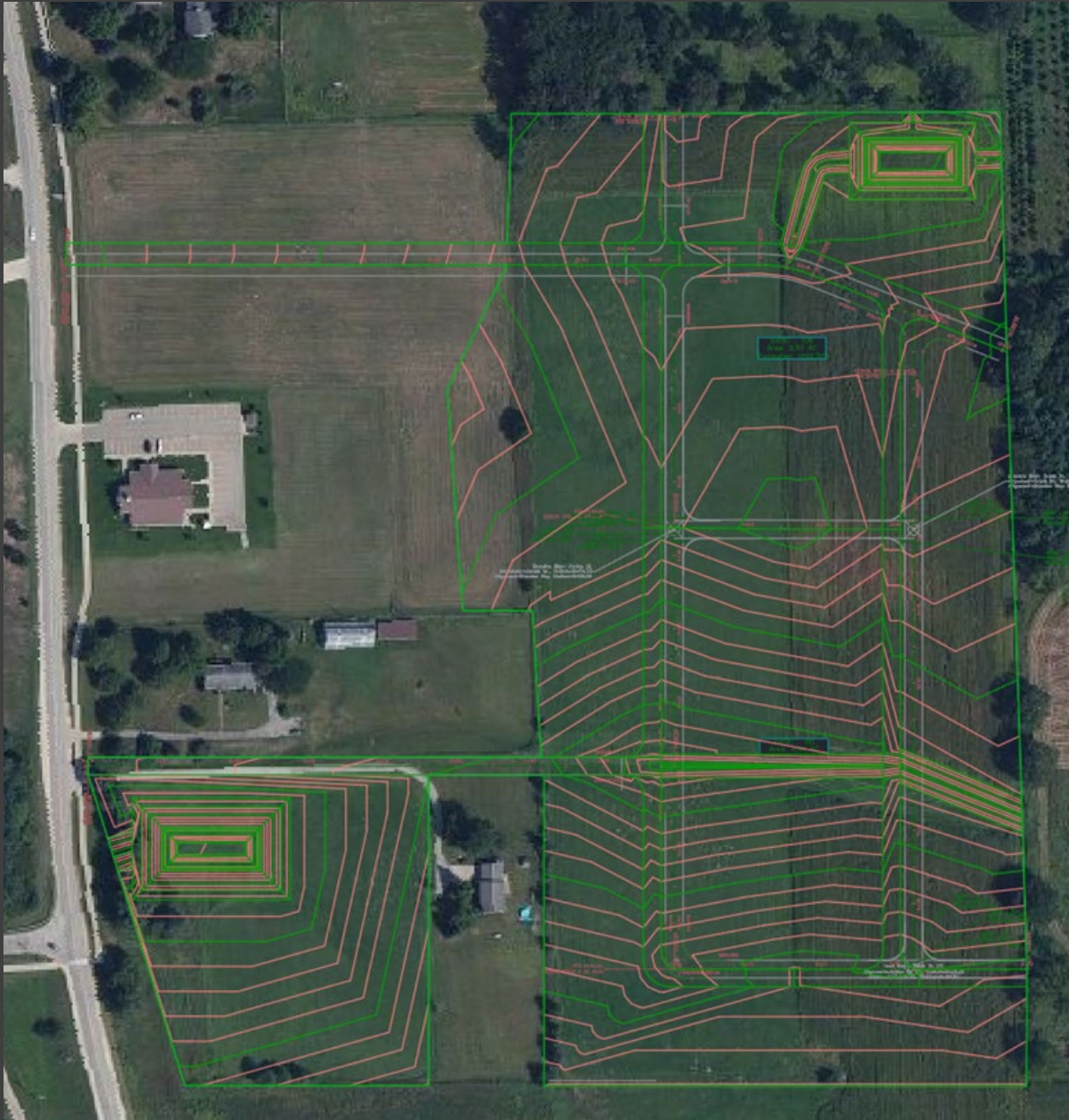
- 28' wide
- 50' ROW
- 7" PCC Pavement
- 6" Gravel Subbase

Arterial Street



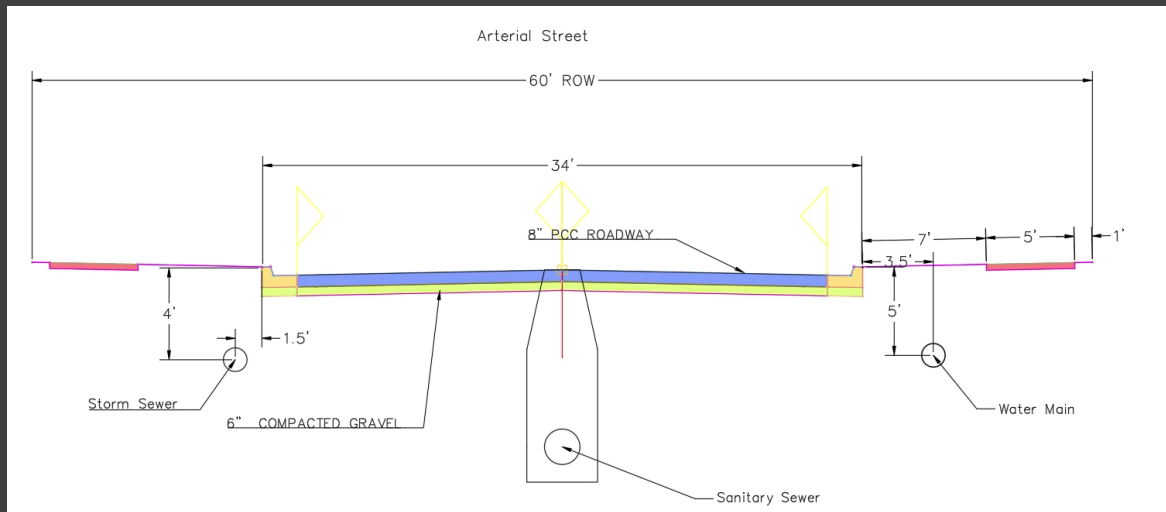
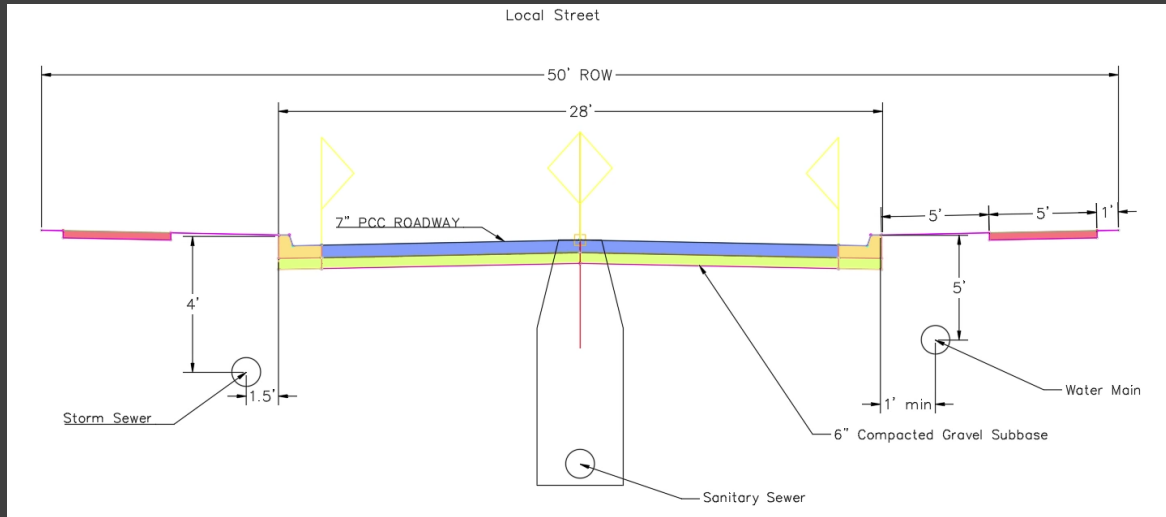
Local Street





Grading

- Overall Constraints
 - Tie into existing on all sides
 - Manage cut fill keeping natural high and low points
 - Ensuring water makes it correct spot
 - Earthwork cost as minimal as possible
 - Avoid grading into neighboring properties
- Specifics
 - All slopes less than 4:1 for mowing
 - Front yards 2%
 - Overland routes less than 4%



Utilities

- Sanitary System
 - North Section: 12" diameter PVC pipe
 - Flows to a manhole on Bailey Dr.
 - South Section: 8" diameter PVC
 - Flows to a lift station
 - Depth: 12'-20'
- Water Main:
 - 8" PVC Pressure Network
 - 5' Cover



Phasing Plan

- Three Part Plan
 - North Section
 - 14 initial lots
 - 14 future lots
 - Commercial Area
 - Can be sold for a large profit to recuperate costs
 - South Section
 - 22 initial lots
 - 12 future lots

Costs

- Avg. costs from Iowa DOT Bid Price Data
- Costs include:
 - Excavation
 - Roadwork
 - Water, Sanitary, Storm Systems

Total Cost of the Development of the Project		
Task		Cost
Earth Work		\$ 501,092.00
Sanitary Sewers		\$ 593,171.00
Storm Sewers		\$ 613,734.00
Water Main		\$ 253,900.00
Portland Cement Concrete Pavement		\$ 838,679.00
Shared Use Paths		\$ 98,750.00
Seeding, Plant Material and Planting, Plants, Erosion control		\$ 44,587.00
Mobilization		\$ 10,000.00
	Total	\$ 2,953,913.00

Thank You

Questions