McCordsville Town Center

Master Drainage Plan

August 2020

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context DESIGN

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Executive Summary

The final concept plan from the Town Center Master Plan was reviewed in relation to the relevant County Drainage Ordinance. It was noted during the drainage review that the proposed layout would need to be modified in order to bring the plan into congruence with the Federal and County Stormwater and Floodway Standards. The following key adjustments were made in coordinate with Town staff and the Town Center Steering Committee.

Southeast Regional Detention Added: The existing stormwater amenity layout did not provide enough detention to meet county standards. After a thorough review with key stakeholders, it was determined that the best approach to resolve the stormwater detention shortfall is to add a regional detention basin near Stansbury Ditch. Regional detention will minimize the cost of infrastructure and simplify development. This simplified stormwater approach can also be leveraged to remove potential barriers to private investment in Town Center.

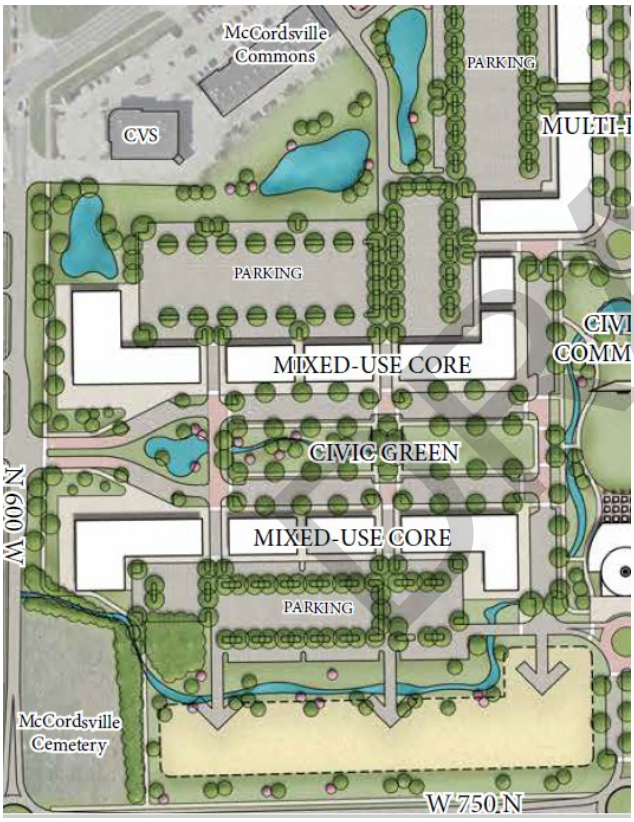


Figure 1: Original Town Center Layout

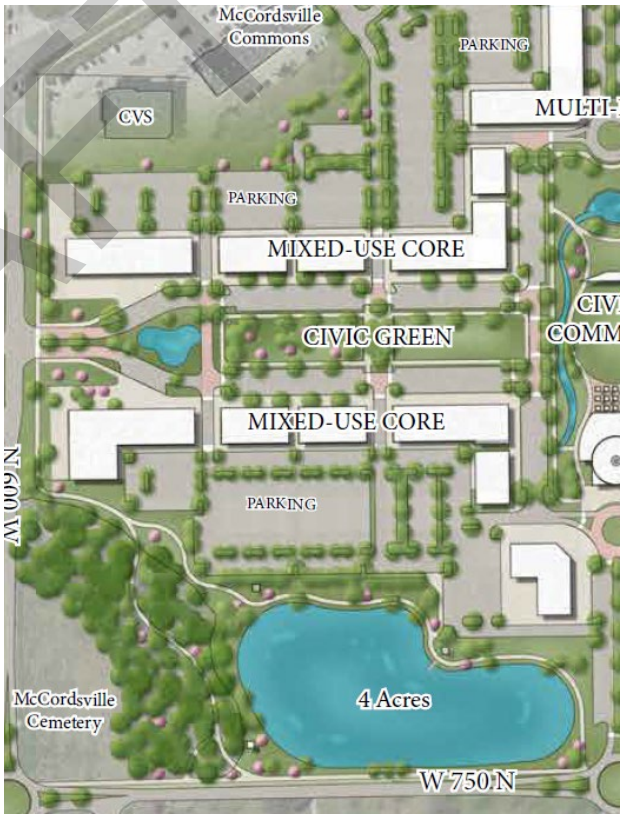


Figure 2: Revised Town Center Layout

The regional detention basin will also provide an enhanced trail system and options for interaction with the enlarged water feature. Expanded and enhances greenspace will connect to the existing Stansbury Ditch ecosystem. The revised layout will also shift buildings a safe distance away from the floodway. This approach will allow McCordsville to avoid complex permitting and design required to alter the Stansbury Ditch floodplain/floodway.

Figure 3: Inspiration: Quarry Lake (4.1AC), Downtown Naperville, IL. Includes Fishing, Paddleboats, Amphitheatre, Water Features & Trail System adjacent to downtown core and City Hall.

The revised plan has been developed to embrace the spirit of the Town Center Master Plan by incorporating the following features:

Open Water & Water Features: The revised plan embraces the desire for open water features from the original plan and provides unique opportunity for water interaction in an urban core. The water features from the original master plan are included in this report.

Community Events: The revised plan will provide ample opportunity for Community Events in the Civic Green area and the Civic Commons areas.

Sense of Place & Identity: The inclusion of open water and water features provides a differentiating factor from nearby town centers where the downtowns have minimal water and little interaction between pedestrians and natural water features.

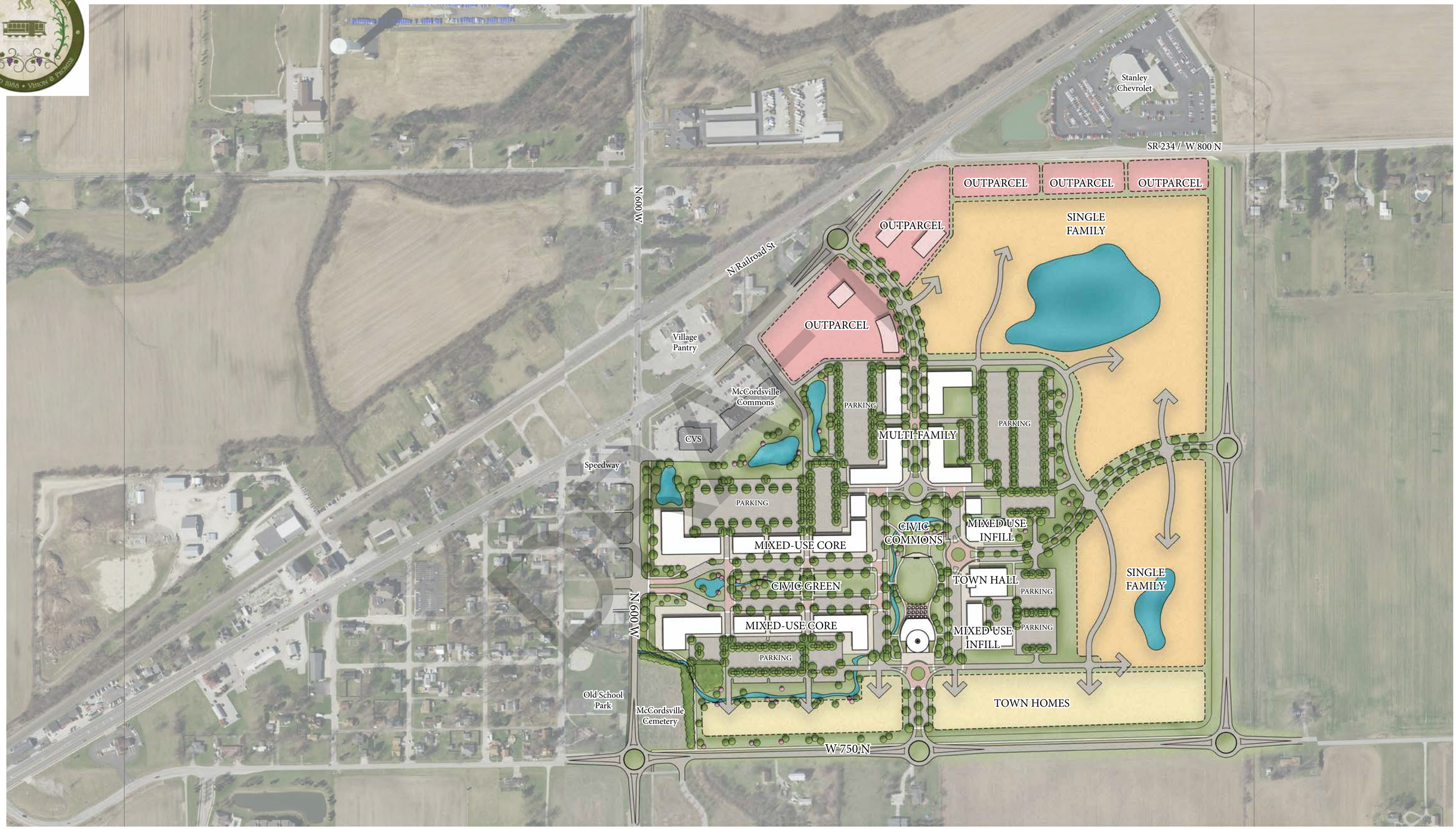
Water Play: Water play remains a key component of the Town Center Master Drainage Plan.

Activated Spaces: The elements of rich, activated spaces remain from the original plan.

Cost: Ultimately, cost must be considered. After a review with key stakeholders, it was determined that a primary goal is to bring Town Center to life while minimizing the burden on taxpayers. Altogether, the revised layout will streamline and minimize stormwater and water quality infrastructure requirements.

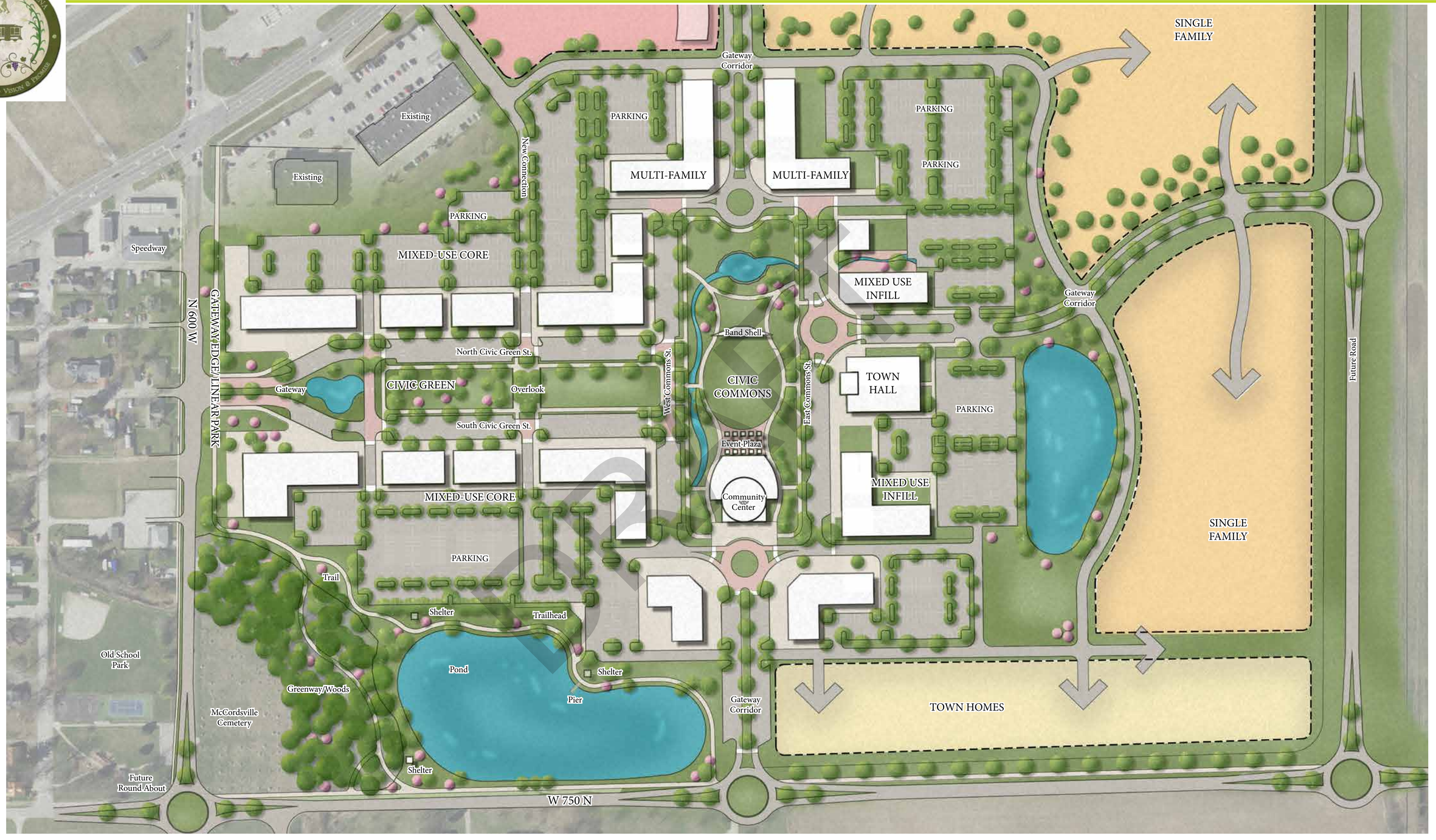
Safety: Water features provide great joy for children, but ponds and waterways also create dangers. The drainage plan has also closely considered the safety of children and includes recommendations to keep children at McCordsville Town Center safe.

Waterfowl: Open water often attracts Canadian Geese. This species – while beautiful in the wild – are often aggressive and unsanitary in urban settings. The plan includes recommendations on how to mitigate the influx of geese to McCordsville Town Center.



SITE OVERALL PLAN

REVISED SITE OVERALL PLAN



REVISED SITE OVERALL PLAN - ENLARGEMENT

Naturalized Edge

Naturalized water play feature Zone - No Stormwater

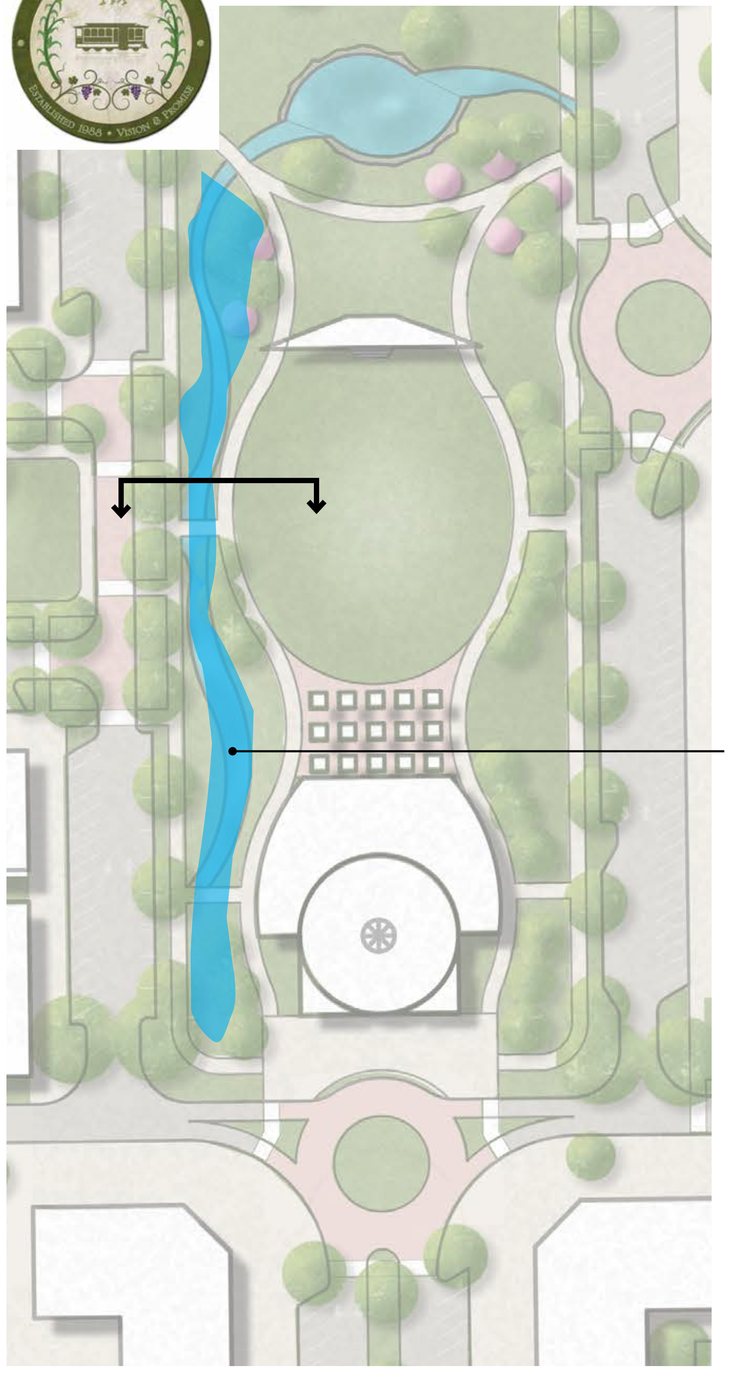
Linear Bioretention / Rain Gardens - Organized Plantings

Linear recirculating stormwater steam feature

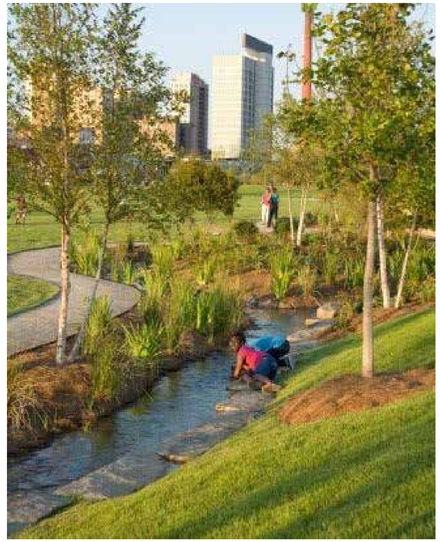
LINEAR BIORETENTION / RAIN GARDEN

LINEAR RECIRCULATING FEATURE

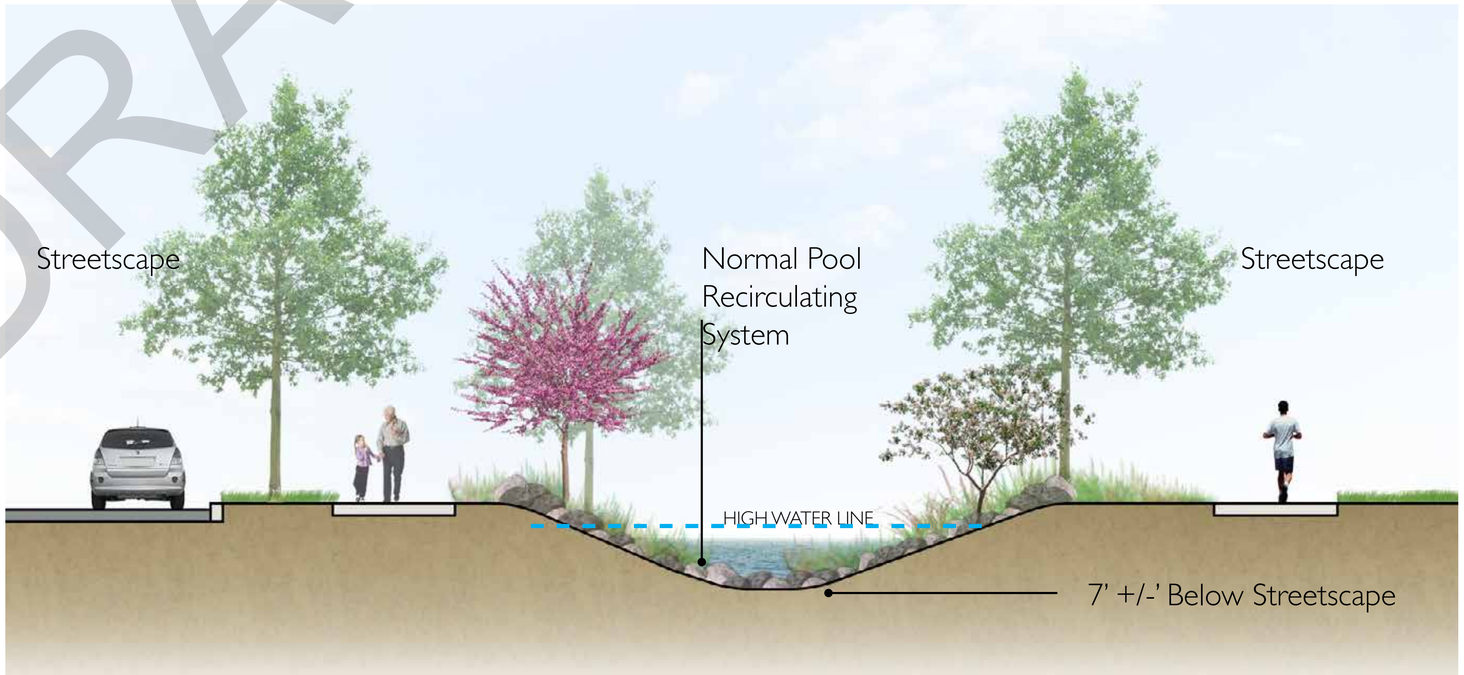
POND AND OVERLOOK



Linear recirculating stormwater steam feature



LINEAR RECIRCULATING FEATURE



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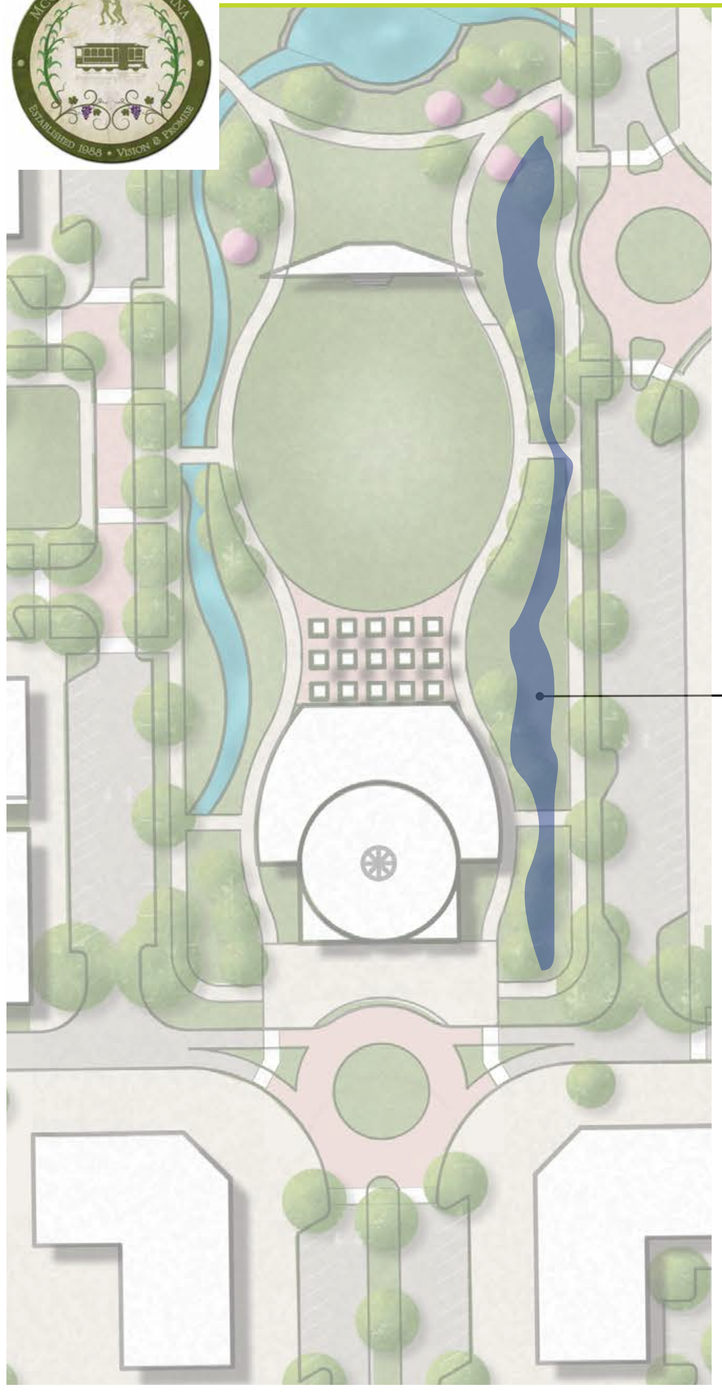
COMMONS



Linear Bioretention
/ Rain Gardens -
Organized Plantings

LINEAR BIORETENTION / RAIN GARDEN

Canadian Geese Mitigation Strategy

Several deterrants have been proven effective in the mitigation of Canadian Geese, which are attracted to environments that include open greenspace and open water. Since this project will include both of these features, it will be critical to understand geese behavior in order to mitigate habitat attractiveness.

- **Avoid Simple Transistions Between Water & Turf:** Geese are very attracted to environments than include easy transition between open water and open turf grass areas. The simplest way to keep geese away is to create barriers and distance between open grass areas and open water environments where the geese thrive. Specifically, this report recommends:
    - **Tall Wetland Plantings Surrounding Basin:** Tall wetland plantings around the edge of the detention basin will eliminate line of sight between grass areas and the pond. This will also require geese to fly from grass to the pond. This extra effort will significantly reduce the chance of geese at McCordsville Town Center
    - **Create Separation Between Turf and Pond:** If possible, this report recommends maximizing distance between open grass common areas and the basins. Here again, the extra effort required will reduce the likelihood of the geese selecting the Town Center as their primary habitat.

By leveraging these simple techniques, the likelihood of geese at McCordsville Town Center will reduce dramatically. Other techniques exist for geese mitigation, but the above recommendations are the simplest, least costly, and most effective approaches to gees mitigation.

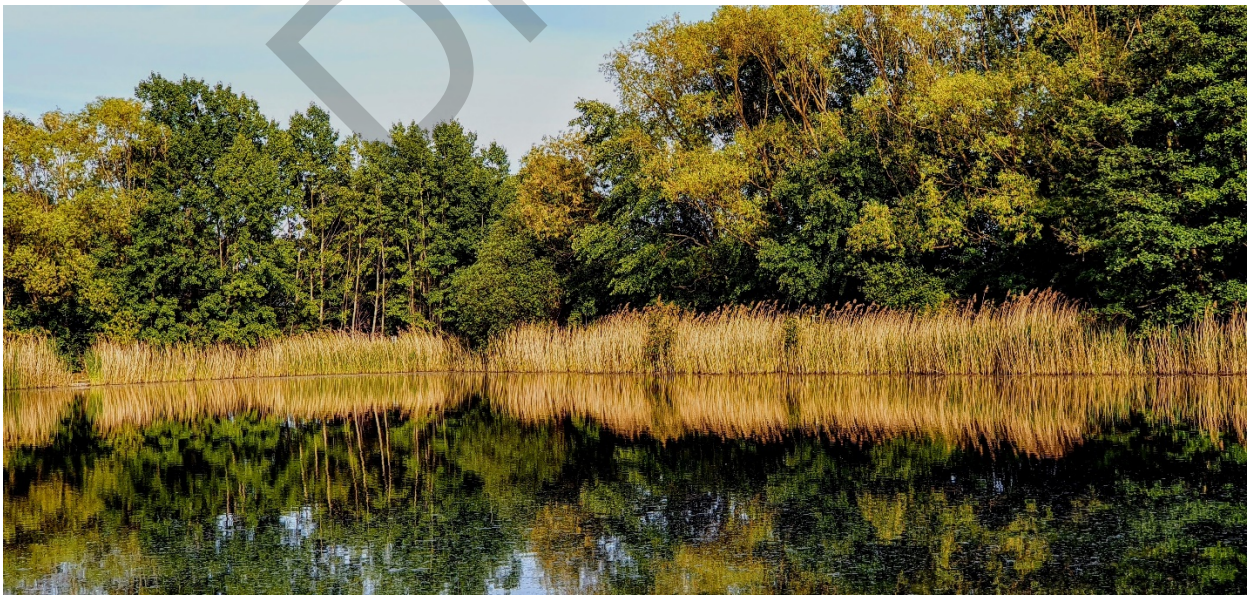


Figure 4: Inspiration for the wet detention basin near Stansbury Ditch. Tall wetland plantings surrounding the basin are an effective deterrent to geese.

Existing Conditions

In the existing condition, the project site is divided into two major catchments. The southwest catchment includes approximately 10 acres and drains to Stansbury Ditch. The east catchment includes approximately 105 acres of row crops that drain to a storm culvert that crosses Broadway (SR 36) near the intersection of Railroad Street.

During major storm events, the storm culvert that crosses SR 36 does not have sufficient capacity to convey the stormwater. Thus, water backs up into the farm field and creates a natural detention basin. This is not considered depression storage since there is a free-flowing outfall at the bottom of the storage area.

The McCordsville Town Center site falls within the Stansbury & Schultz watershed. The county has established more restrictive release rates for this area as shown on Figure 5.

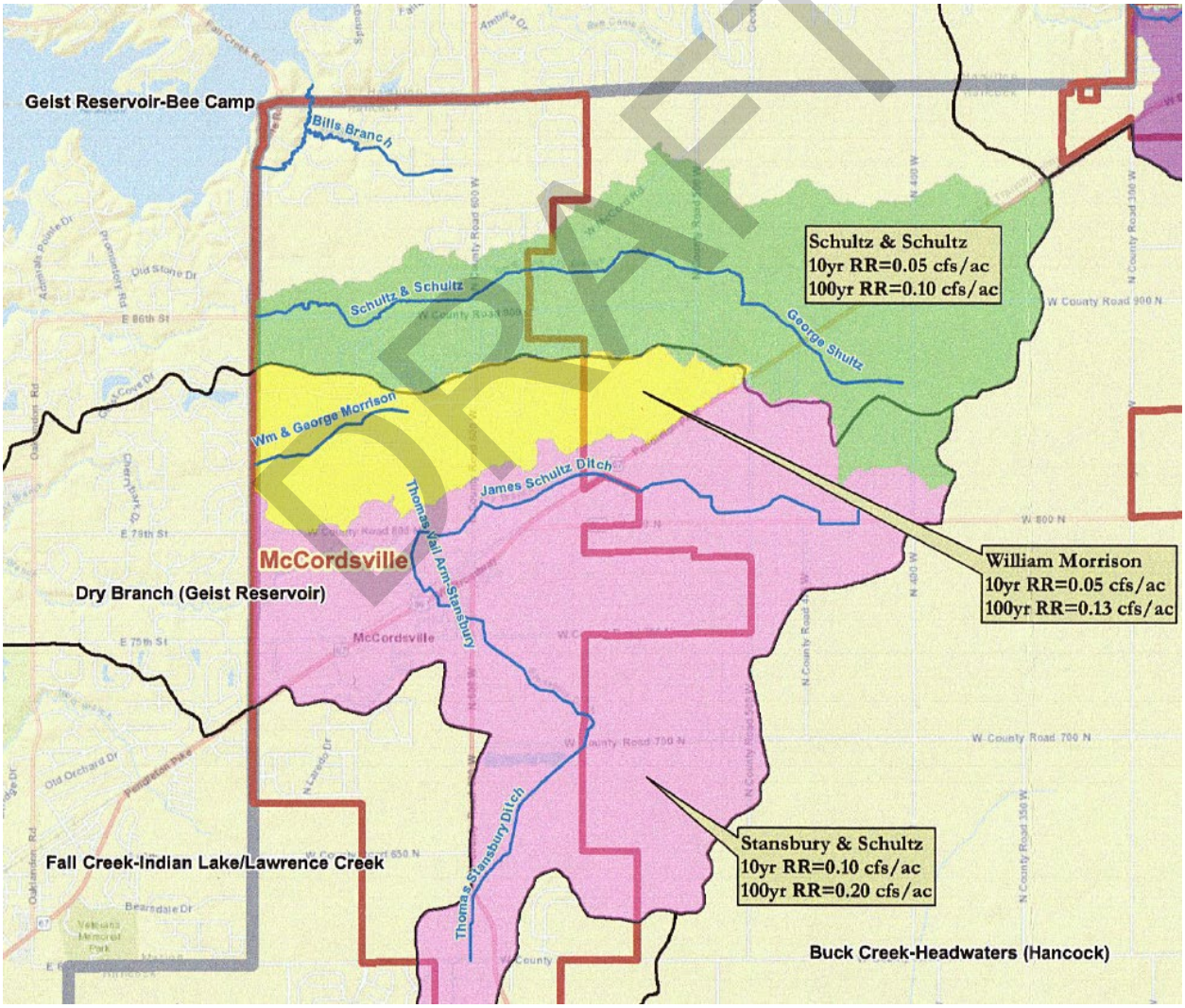


Figure 5: Allowable Release Rates per Hancock County Ordinance

Existing Wetlands

A Wetland and Waterbody Determination by Little River Consultants, LLC, dated May 25,2020, indicates the three wetland areas exist within the site as shown on Figure 6. The report offers an opinion that Wetland Areas 1 & 3 would be exempt, but that Wetland Area 2 will require a State Isolated Wetland Permit from IDM.

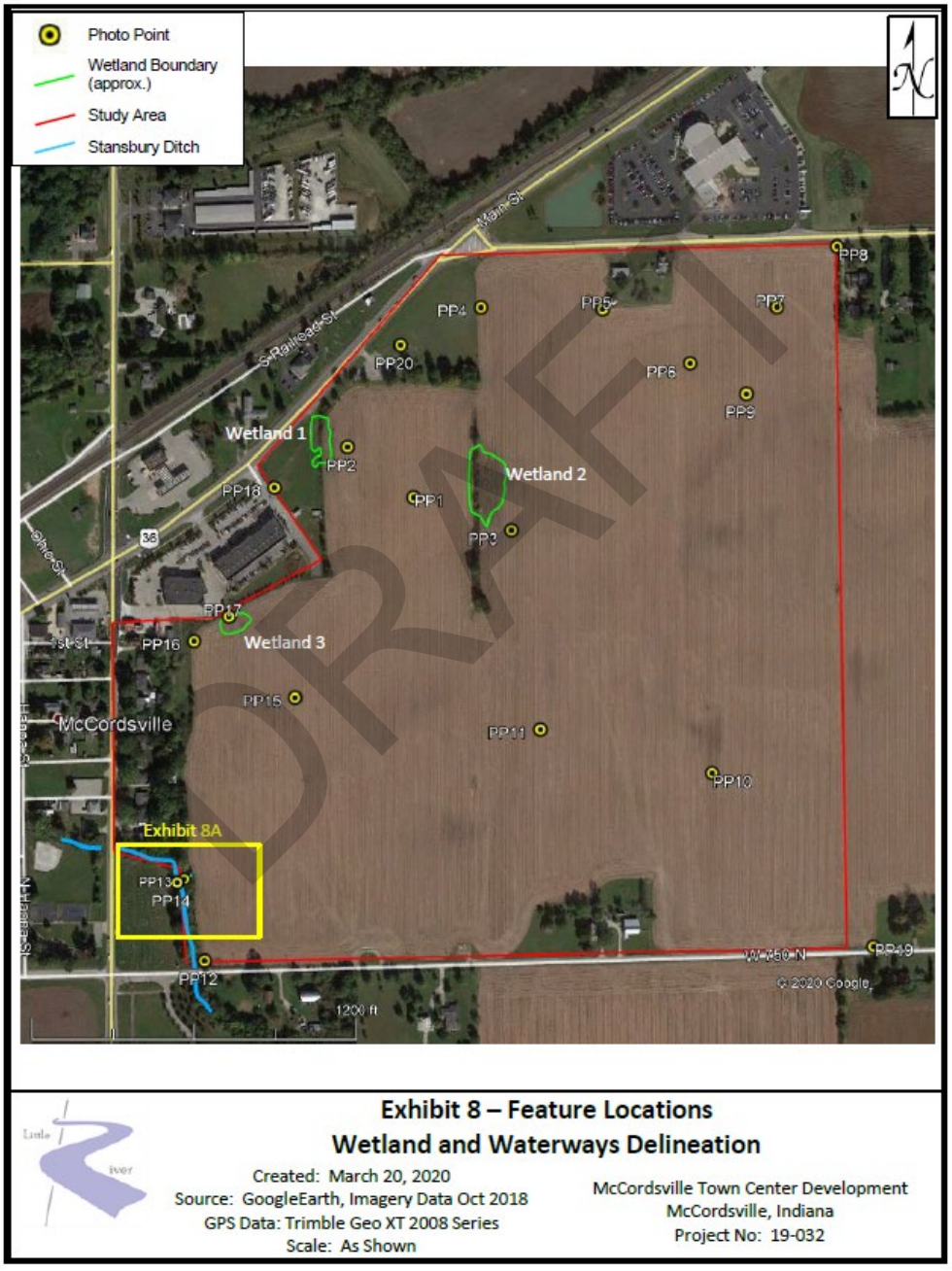


Figure 6: Initial Wetland Determination

Existing Soils

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Br	Brookston silty clay loam, 0 to 2 percent slopes	68.8	52.7%
CrA	Crosby silt loam, 0 to 2 percent slopes	46.3	35.4%
MmB2	Miami silt loam, 2 to 6 percent slopes, eroded	10.8	8.2%
YbvA	Brookston silty clay loam-Urban land complex, 0 to 2 percent slopes	1.6	1.2%
YcuA	Crosby silt loam-Urban land complex, 0 to 2 percent slopes	3.2	2.4%
Totals for Area of Interest		**130.7**	**100.0%**

The existing soils include Brookstone Silty Clay, Crosby Silt Loam and Miami Silt Loam at varying slopes, which is typical in central Indiana.

Stansbury Ditch

Stansbury Ditch is part of US Jurisdictional Waters and has been mapped by FEMA for the 10-year and 100-year storm events. Per coordination with the County Surveyor's office, the 10-year HWL in the ditch (848.3) should be used as the tailwater level for the proposed design.

WATER QUALITY

The wet detention basins will serve as water quality features for the basin.

STORM WATER SEWERS AND INLETS

Storm water sewer inlet calculations and hydraulic grade line calculations have been prepared which demonstrate that the proposed storm water sewer system (inlets and pipes) has been properly designed to both intercept and convey the rational method 10-year storm event and therefore is compliant per Town of McCordsville standards.

RETENTION INCLUDING MODELING AND RELEASE

SW POND

Retention is provided with a maximum release rate of 0.2 cfs / acre for the 100-year 24-hour and 0.1 cfs / acre for the 10-year 24-hour rainfall events, as required by the Town of McCordsville. A bottom of pond is planned with an elevation of 847.0 feet. 6.0 feet above that, 853.00 is proposed as the normal pool elevation (elevation at which water begins to flow out of the pond). An outlet structure has been designed to both achieve less than the maximum release rates, and to protect the dam. HydroCAD was used to model the retention.

NE POND

Retention is provided with a maximum release rate of 0.2 cfs / acre for the 100-year 24-hour and 0.1 cfs / acre for the 10-year 24-hour rainfall events, as required by the Town of McCordsville. A bottom of pond is planned with an elevation of 850.0 feet. 7.0 feet above that, 857.00 is proposed as the normal pool elevation (elevation at which water begins to flow out of the pond). An outlet structure has been designed to both achieve less than the maximum release rates, and to protect the dam. HydroCAD was used to model the retention.

SE POND

Retention is provided with a maximum release rate of 0.2 cfs / acre for the 100-year 24-hour and 0.1 cfs / acre for the 10-year 24-hour rainfall events, as required by the Town of McCordsville. A bottom of pond is planned with an elevation of 855.0 feet. 5.0 feet above that, 860.00 is proposed as the normal pool elevation (elevation at which water begins to flow out of the pond). An outlet structure has been designed to both achieve less than the maximum release rates, and to protect the dam. HydroCAD was used to model the retention.