BOLTON & MENK

Real People. Real Solutions.

The COR Analysis Update

City of Ramsey

February 24, 2023

Submitted by:
Bolton & Menk, Inc.
7533 Sunwood Drive NW #206
Ramsey, MN 55303
P: 763-433-2851
F: 763-427-0833

EXECUTIVE SUMMARY

The City of Ramsey has identified the need to prepare for continuing development of The COR. The purpose of this analysis is to provide an update to a previous analysis, dated June of 2018, and determine the necessary public infrastructure and associated costs required to allow the remaining, undeveloped portions of The COR to develop. Additional analyses have supplemented the original report since 2018, including geotechnical evaluations, Ramsey Parkway median analyses, wetland delineations, and traffic counts. Much of the information from the original report has been carried forward with this update. For reference, the following figures and exhibits are contained in the appendix of this report:

- **Appendix A** includes a previously prepared Land Use Plan for The COR, along with roadway related graphics from The COR Design Framework plan and City's Comprehensive Plan.
- **Appendix B** includes figures referenced throughout this study,
- **Appendix C** includes a geotechnical evaluation dated June 27, 2018,
- **Appendix D** includes a wetland delineation report, completed in October 2022. The delineation is currently being reviewed by the Lower Rum River Watershed Management Organization (LRRWMO),
- **Appendix E** includes the traffic counts collected in The COR in 2022,
- **Appendix F** includes previously conducted analyses within The COR, and
- **Appendix G** includes The COR Tree Inventory Tabulation

In addition to this analysis, there are other improvements under discussion and/or design. Each of the these has the potential to impact the developments within The COR area. Based on information provided by the City, project costs have also been developed for the following:

- **Regional Stormwater Retention Pond (The Waterfront) -** Construction methodologies, sequencing strategies, and timing of pond construction.
- **The Waterfront, Phase 1 -** Park features adjacent to the regional stormwater retention basin and along Center Street are currently in the schematic design phase.

Cost estimates were developed for each improvement. These estimates are based on recent bid pricing and similar projects. All costs presented in the following pages are presented as **2023** costs.

- The total for the roadway, trail, sidewalk, street lighting, sanitary sewer and water main improvements is estimated at **$10,612,000.**
- The total trunk related improvements for sanitary sewer and storm sewer is estimated at **$513,000.**
- The total landscaping improvements along Sunwood Drive from Zeolite Street to Sapphire Street is estimated at **$802,000.**
- The total for regional stormwater retention pond excavation, grading, and tree preservation is estimated at **$3,140,000.**
- The total for mass site grading of the remaining undeveloped land within The COR, including wetland mitigation and tree preservation, is estimated at **$3,796,000.**
- The total for The Waterfront Phase 1 above ground features are estimated at **$4,218,000.**
- The total for Municipal Plaza Improvements is estimated at **$4,091,000.**
- The total for Municipal Plaza Stormwater Reuse Improvements is estimated at **$2,285,000.**

The costs presented are considered project costs and include 30% contingencies and project development costs (administrative, engineering, and fiscal). A detailed breakdown is within the Cost Analysis section.

Table of Contents

Appendix

I. INTRODUCTION

The City of Ramsey has identified the need to prepare for further development of The COR. While much of The COR has been developed, additional infill is anticipated in the near future. The purpose of this analysis is to provide an update to the previous analysis, dated June of 2018, and determine the necessary public infrastructure and associated costs required to allow the remaining, undeveloped portions of The COR to develop. Additional analyses have supplemented the original report since 2018, including geotechnical evaluations, Ramsey Parkway median alternatives, wetland delineations, and traffic counts. Much of the information from the original report has been carried forward with this update. For reference, the following figures and exhibits are contained in the appendix of this report:

Our analysis consists of three separate components that, when combined, provide an overview of the study area needs:

- **Preliminary Design Layouts** – Provide graphical depictions of the public roadways and utilities,
- **Preliminary Project Cost Estimates –** Provides a baseline for fiscal planning of the improvements, and
- **Final Report** – Describes required infrastructure improvements, layouts and costs.

For reference, the following figures and exhibits are contained in the appendix of this report:

- **Appendix A** includes a previously prepared Land Use Plan for The COR, along with roadway related graphics from The COR Design Framework plan and City's Comprehensive Plan.
- **Appendix B** includes figures referenced throughout this study,
- **Appendix C** includes the geotechnical evaluation dated June 27, 2018,
- **Appendix D** includes the wetland delineation report, completed in October 2022. The delineation is currently being reviewed by the Lower Rum River Watershed Management Organization (LRRWMO),
- **Appendix E** includes the traffic counts collected in The COR in 2022,
- **Appendix F** includes previously conducted analyses within The COR Framework, and
- **Appendix G** includes The COR Tree Inventory Tabulation

II. PRELIMINARY DESIGN LAYOUTS, FIGURES AND EXHIBITS

To complete the analysis, existing conditions and proposed improvements were conceptually designed to allow for estimating construction costs. The figures contained in Appendix B form the basis for much of the analysis. The following list summarizes the figures contained in Appendix B:

- Figures 1-5: Study Area Layouts
- Figures 6-8: National Wetland Inventory & Mitigation Plan
- Figures 9-11: Public Utilities
- Figures 12-13: Site Grading & Drainage
- Figures 14: The Waterfront, Phase 1 Sketch
- Figures 15: The COR Area Tree Inventory
- Figures 16-18: The COR Roadway Typical Sections

III. ON-GOING AND RELATED STUDIES AND IMPROVEMENTS

In addition to this analysis, there are other improvements under discussion. Each of the these has the potential to impact the developments within The COR area.

Regional Stormwater Retention Pond Analysis

The regional stormwater retention pond located within The COR is often referred to as The Waterfront, and is proposed to be constructed north of Ramsey Parkway, South of Bunker Lake Boulevard, west of Center Street and east of Zeolite Street. The City is currently analyzing potential construction methodologies, sequencing strategies, and timing of pond construction.

The general pond configuration is depicted on the exhibits for this report, and the land use is considered in the analysis.

The Waterfront

There are several park related improvements in the development stage at this time. Park features around The Waterfront and along Center Street are currently in the schematic design phase.

As the current sketch plans are further refined, adjacent public infrastructure improvements may be influenced by those designs. Currently, phase 1 of the improvements, have been progressing. The phase 1 area is depicted on Figures 1 and 13.

Municipal Plaza

The proposed Municipal Plaza, located north of Sunwood Drive, south of Ramsey Parkway and west of Center Street, is also in the planning stages. A key component, previously analyzed, was focused on stormwater reuse within the park.

Regional Infiltration Basin (southeast area of The COR)

Much of The COR is restricted relative to storm water infiltration. The City constructed a regional infiltration basin in the southeast portion of The COR in 2019. The roadway alignments in this area of The COR were based upon the infiltration basin layout.

US HWY 10/169 Improvements

Interchange and frontage road improvements at Ramsey Boulevard and Sunfish Lake Boulevard are anticipated to begin in Fall of 2023 and continue through 2025. A southbound right turn lane is proposed at the intersection of Ramsey Boulevard and 143rd Avenue. The configuration is anticipated to impact final roadway and utility alignments in that portion of The COR.

Bunker Lake Boulevard

Bunker Lake Boulevard, from Ramsey Boulevard to Armstrong Boulevard, is under the jurisdiction of Anoka County. Exhibits depicting the future configuration are included in this report and are based off of information from the Anoka County 2030 Transportation Plan.

Lane geometry and vertical grades were considered as a part of this analysis, as they have the potential to impact other roadways within The COR.

See Figures 2 and 3 in Appendix B.

Traffic Counts

In order to gain an understanding of traffic patterns within The COR, traffic counts were obtained at 17 strategic locations to obtain the Annual Average Daily Traffic (AADT). Appendix E includes a figure depicting the locations of the traffic counts and the 17 locations where the counts were obtained.

Traffic counting was conducted at these 17 locations in 2017 and 2022, to provide the ability to analyze growth associated with development in, and adjacent to, The COR.

Lot Size Analysis

While performed separately from this study, the results of this analysis are contained in Appendix B. The roadways, and associated rights-of-way, form a grid pattern in The COR. The lot areas resulting from the roadway layouts then dictate available developable land on a block-by-block basis. While these are preliminary land areas based on GIS information, the information can be used in initial discussions with potential developers. The block-by-block land areas, based on the roadway geometrics in this study, are presented on Figure 4 in Appendix B.

IV. BASE DATA AND GUIDANCE

Prior to initiating the original study, the City of Ramsey provided record drawings, plan drawings and GIS information for use in creating an existing infrastructure base map. Additionally, the following information and guidance was given by the City for completing the study.

- Follow the guidance outlined in The COR Design Framework plan, dated February 28, 2012, including Amendment #1, dated November 27, 2012.
- The City is not requesting a master-planning effort for this analysis. It is unknown where internal driveways, and related curb-cuts, will be needed.
- Providing service lines for sewer and water utilities should be considered along all future roadways. While the precise locations of the service lines is unknown, costs associated with the improvements should be considered in the report.
- Cost estimating should be completed for: roadways, trails/sidewalks, storm water management features, street lighting, trunk water mains and trunk sanitary sewer mains, mass grading, tree preservation, wetland mitigation, The Waterfront park features, and Municipal Plaza Improvements.
- The City has adopted Comprehensive Sanitary Sewer and Water Plans. These plans should be reviewed and consulted for this analysis.
- Regional storm water considerations should be included in the study.

Significant planning has been completed for The COR. Understanding the thoughts behind previous studies can help avoid omissions when considering future improvements.

The following documents have been incorporated into this study by reference:

- The COR Design Framework (February 28, 2012)
    - The COR Amendment #1 (November 27, 2012)
- City of Ramsey Public Places + Vibrant Community Brochure
- The Waterfront and Municipal Plaza Site Cost Estimates (2018)
- Center Street Area Framework + Policy Plan (2020 Draft)

- The COR Land Use Plan (2040 Comp Plan)
- City of Ramsey, Engineering Design Standards (April 27, 2018)
- City of Ramsey, Capital Improvement Program 2023-2032
- City of Ramsey, Well Head Protection Plan
- Comprehensive Sanitary Sewer Study (June, 2012)
    - Update (September, 2017)
- Comprehensive Water System Study (June, 2012)
    - Update (September, 2017)
- City of Ramsey 2040 Transportation Plan Update (2022)
- Anoka County 2030 Transportation Plan (December, 2008)
- 2022 Wetland Delineation Report

V. EXISTING IMPROVEMENTS

Much of the eastern portion of The COR is developed, while larger tracts in the western portion remain vacant. The focus of this study involves public improvements required to develop the currently vacant parcels. A review of the existing infrastructure adjacent to the undeveloped parcels was completed to provide a basis of future improvements required to complete the infrastructure network in The COR.

Street and Trail Improvements

Sunwood Drive NW

The improvements completed in 2004 provided a fully developed concrete roadway adjacent to the undeveloped area located in the northwest area of The COR. The boulevard was designed to allow for future widening and expansion as development and other improvements occur.

Center Street NW

Improvements to Center Street NW were completed in 2014 and included construction of a 36-foot-wide bituminous street with a 10 foot concrete sidewalk, angled parking along the west side, and parallel parking stalls along the east side of the street.

The extension of the full Center Street typical section was completed to 100-feet north of 145th Avenue NW. Then, the eastern half north to Ramsey Parkway was reconstructed with the Sapphire Apartments. The remaining roadway was then constructed as a temporary street section with bituminous curb north to Bunker Lake Boulevard.

The alignment of Center Street between Ramsey Parkway and Bunker Lake Boulevard followed the original plat of Ramsey Town Center. This does not match the revised 2012 COR master plan alignment. See Figure 4 in Appendix B.

Willemite Street NW & Ramsey Parkway

Willemite Street from Sunwood Drive to Ramsey Parkway and Ramsey Parkway from Willemite Street to Center Street was constructed in conjunction with the Affinity at Ramsey housing. Street sections were constructed based recommendation from the original analysis.

Zeolite Street NW

Zeolite Street was constructed as a temporary rural section with bituminous surface in 2005 from Sunwood Drive to Bunker Lake Boulevard.

Utilities

All past improvements completed within The COR were consistent with the City's Sanitary Sewer and Water System Comprehensive Plans. See Figures 8-10 in Appendix B for the water, sanitary, and storm utility layouts.

Sanitary Sewer Improvements

In 2004, a 30-inch trunk sanitary sewer was extended along Sunwood Drive to serve The COR. In 2005, 15-inch and 18-inch sanitary sewer was installed from Bunker Lake Boulevard to Sunwood Drive. This main was installed in Zeolite Street from Bunker Lake Boulevard to the currently platted Ramsey Parkway alignment (from the Ramsey Town Center layout). This main then follows the un-platted Yolite Street alignment to Sunwood Drive.

The segment of sanitary sewer main that follows the platted Ramsey Parkway does not follow the revised 2012 master plan alignment of Ramsey Parkway. This main may need to be realigned when this segment of Ramsey Parkway is constructed.

The existing sanitary sewer trunk mains have capacity to provide service to The COR.

Water Distribution Improvements

The elevated storage for the City of Ramsey is adequate to provide fire flow to The COR. The trunk distribution system was also found to be adequate to serve The COR.

Storm Water Management

Center Street serves as an east/west watershed boundary within The COR. Portions of The COR located east of Center Street are routed to a pond located near Ramsey Boulevard and the BNSF railroad tracks. Portions of The COR located west of Center Street (north of Sunwood Drive) are routed to a regional storm water retention pond located north of Ramsey Parkway, just west of Center Street. The outlet from the regional stormwater retention pond is proposed to consist of storm water piping from the pond to an existing storm sewer system located in Sunwood Drive at Yolite Street. Some exceptions to the general flow patterns are anticipated, and each development will need to be reviewed to determine the most logical storm water routing on a case-by-case basis. As part of the Affinity at Ramsey Housing development, an interim ditch was constructed to connect the pond to the storm sewer infrastructure in Sunwood Drive.

A storm sewer system was previously constructed in Sunwood Drive and Center Street. The system directed roadway runoff to regional ponds located to the east and south of Center Street. Approximately 400 feet of Sunwood Drive located west of Center Street flows to the east. The remainder of Sunwood Drive adjacent to Center Street flows to the south in a pipe located at the Yolite Street alignment.

The majority of the drainage for the area west of Center Street currently flows north from Sunwood Drive to the vacant parcels, wetlands, and depressions west of Center Street. The storm water then infiltrates or flows overland to an outlet pipe near the Sunwood Drive and Yolite Street intersection.

The Veterans Drive and Peridot Street extension area currently drains to the existing wet pond located at the southeast corner of The COR. The existing wet pond and infiltration basin are shown in Figures 6 and 7 in Appendix B.

Wetlands

In the fall of 2022, a wetland delineation was conducted within The COR Study area. Those findings are still under review at the LRRWMO. Wetland delineations are depicted in Figures 6 and 7, and the full delineation report is included in Appendix D. Mitigation will be required for a portion of the existing wetlands if they are impacted by development.

VI. ROADWAY CLASSIFICATIONS AND DESIGN CONSIDERATIONS

This analysis includes examining the feasibility of constructing roadways and other supporting public infrastructure in The COR. Roadways included in the study are as follows, see Appendix B:

- **Ramsey Parkway** – Willemite Street NW to Sunwood Drive NW,
- **Center Street NW** - from the existing developed section north to Bunker Lake Boulevard,
- **Zeolite Street NW** – from Sunwood Drive to Bunker Lake Boulevard,
- **Yolite Street NW** - Sunwood Drive to Ramsey Parkway,
- **Veterans Drive NW** - Rhinestone Street to Ramsey Boulevard, and
- **Peridot Street NW** - Sunwood Drive to Veterans Drive.

Street Hierarchy

The COR Design Framework plan establishes a street hierarchy designation for roadways within The COR (see Appendix A). The 2040 Comprehensive Plan establishes road classifications to create a safe and efficient roadway network throughout the City (see Appendix A). The following table presents a summary of roadway classifications.

Street Segment	From	To	The COR Framework	2040 Comp Plan
Center Street	Sunwood Drive	Ramsey Parkway	Downtown	Local
Center Street	Ramsey Parkway	Bunker Lake Blvd	Parkway	Local
Ramsey Parkway	Armstrong Blvd	Ramsey Boulevard	Parkway	Local
Willemite Street	Sunwood Drive	Ramsey Parkway	Downtown	Local
Zeolite Street	Sunwood Drive	Bunker Lake Blvd	Connector	Local
Bunker Lake Blvd	Armstrong Blvd	Ramsey Boulevard	Arterial	A Minor Reliever

Roadway segments not depicted in The COR Design Framework and designated as local streets:

- Yolite Street from Sunwood Drive to Ramsey Parkway,
- Peridot Street from Veterans Drive to Sunwood Drive, and
- Veterans Drive from Rhinestone Street to Ramsey Boulevard.

Design Assumptions

The COR Design Framework establishes roadway, boulevard, and walk widths in The COR. The table below shows the design assumptions that were used for this analysis. The notes following the table describe differences between The COR Design Framework and the design assumptions used.

Street Segment	Parking Lane(s)	F-F Width*	Center Median	Blvd Width	Walk Width	ROW Width
Center Street (South)	10' (1 Side)	44'	NA	NA	10' (1 Side)	60'
Center Street (North)	10'	24' Each	5' - 20'	6'	10'	60'-105'
Ramsey Parkway	10'	24' Each	20'	6'	6'	92'
Willemite Street	10' (1 Side)	36'	NA	6'	6'	60'
Yolite Street	10' (1 Side)	36'	NA	6'	6'	60'
Zeolite Street	8'	40'	NA	6'	6'	80'
Veteran's Drive	8' (1 Side)	36'	NA	6'	6'	60'
Peridot Street	8' (1 Side)	36'	NA	6'	6'	60'
Bunker Lake Blvd	8' Shoulders	32' Each	12'	8'	10' N Side	120'

** Face of Curb to Face of Curb Width*

Design Notes:

Ramsey Parkway – An analysis was performed to determine the benefits and costs associated with construction of a bioretention basin in the median area of Ramsey Parkway. The benefits associated with a bioretention basin include water quality improvements, potential traffic calming and creation of a landscaping feature within this area of The COR. The City proceeded with construction of the biofiltration basin in the median from Center Street to Willemite Street, and will likely continue the construction to Sunwood Drive. The Ramsey Parkway typical section is shown on Figure 15 in Appendix B. The median design analysis dated February 19, 2018, is included in Appendix F for reference.

Center Street – For the analysis, the existing Center Street configuration (south of Ramsey Parkway) was used for that section of roadway. Between Ramsey Parkway and Bunker Lake Boulevard, a parkway section was used per The COR Framework plan. At the Bunker Lake Boulevard intersection, the roadway expands to match the travel lanes north of Bunker Lake Boulevard. Stormwater management and

stormwater reuse improvements estimated separately from the roadway improvements in the Cost Allocation section below.

Willemite Street – The COR Design Framework plan depicts the section as 50 ft face-to-face, 6 ft boulevards, and 6 ft walks.

Yolite Street – The COR Design Framework plan depicts the section as 36 ft face-to-face, 6 ft boulevards, and 10 ft walks. This is a local Street, bordering on Subdistricts 1 and 2a.

Zeolite Street - The COR Design Framework plan depicts this roadway as a Connector Street. Within The COR, Rhinestone Street, Zeolite Street and Veterans Drive (between Rhinestone Street and Zeolite Street) are considered Connector Streets. Our analysis matches the previously constructed Rhinestone Street cross section, which consists of a 40 ft face-to-face street section with 6 ft boulevards, and 6 ft walks.

Veterans Drive - The COR Design Framework plan depicts this roadway as a Local Street, located within Subdistrict 3, and requiring 6 ft boulevards and 10 ft walks.

Peridot Street - The COR Design Framework plan depicts this roadway as a Local Street, located within Subdistrict 3, and requiring 6 ft boulevards and 10 ft walks.

Bunker Lake Boulevard – The Anoka County 2030 Comprehensive plan identifies this roadway as a 4-lane, divided highway.

VII. ADDITIONAL PUBLIC INFRASTRUCTURE ANALYSIS

As a portion of this analysis, we reviewed the City Comprehensive Plans for sanitary sewer and water main needs. The following is a summary of results for the various analyses and reviews.

Sanitary Sewer

The segment of trunk sanitary sewer main following the currently platted Ramsey Parkway does not follow the revised 2012 master plan alignment. This main may need to be realigned when this segment of Ramsey Parkway is constructed.

An 8-inch gravity sanitary sewer main will be adequate to convey flows from the area. For this analysis, we included an allowance for 8-inch service lines to be extended to properties along the corridors.

Water Main

Ramsey Parkway includes a 12-inch watermain, which completes an east-west trunk system through The COR. All existing streets include provisions to extend 8-inch watermain into the study area. Future roadway construction (other than Ramsey Parkway) should include 8-inch watermain to complete looping in the study area. In the case that a high-water user plans to develop within the project area, additional flow analysis should be performed to verify they will have adequate flow and pressure for their individual needs.

Figure 8 in Appendix B depicts watermain and Figure 9 depicts the sanitary sewer improvements within the study area.

Storm Water Management

Storm water management concepts were developed to maintain existing drainage patterns and preserve the conveyance and flood storage capacity of the existing site.

Storm water runoff west of Center Street is generally planned to flow north from Sunwood Drive and to a large future regional pond proposed on the north side of Ramsey Parkway. The outlet for this regional pond will most likely be extended along the future Yolite Street, where an existing 30-inch arch pipe has been extended into the study area from Sunwood Drive. The existing hydraulic model was reviewed to allow for the analysis of storm water within The COR area. Preliminary storm water management conditions and requirements were then developed to determine the elevations required for building pads in the area.

The sub-watersheds were modeled using future land use conditions to generally size the regional storm water basin. The basin was sized to ensure proposed discharge rates were equal to existing flow rates. The pond was also reviewed with respect to potential storm sewer depths and potential aesthetic park function.

The current pond footprint used in the analysis is derived from sketch designs from LHB Landscape Architects. The normal water level was determined by using the elevation of the outlet pipe located near Sunwood Drive. Additional design parameters and regional storm water management planning should be further refined as the areas begin to develop. Figure 1 shows the general shape and location of the pond used in the analysis.

Along with the final pond configuration, proposed construction methodologies, including the requirement for pretreatment of all stormwater (public and private) prior to discharge to the regional pond, are currently being considered by the City. Cost considerations currently include stripping topsoil and vegetation, excavating the pond, installing a 2' impervious clay liner, and fine grading the site.

Much of The COR is located within a Drinking Water Supply Management Area. Because of this, the required infiltration (1 inch over all new impervious area) is provided by the City in a regional infiltration basin. Developers then pay a share of the cost for creation of the regional facility.

Site Grading

Existing hydraulic modeling was reviewed to analyze storm water conditions for future development scenarios. The regional stormwater retention pond elevation was then used to determine the minimum elevations required for building pads in the area.

The results of the modeling indicate the regional stormwater retention pond could reach a high-water elevation of ±866.5 during a 100-year storm event. This should be considered a preliminary result at this time, as the actual pond size and shape could be revised based upon other studies occurring at the City.

The Lower Rum River Watershed Management Organization requires the lowest floor elevation be a minimum of 2-feet above the 100-year high water level. Based on that requirement, the minimum building elevation should be 868.5.

Figures 11 and 12 depict the average existing lot elevations, the proposed minimum lot elevations required, and an approximate fill volume required to raise each of the sites to the minimum elevation. Each site requires an average of approximately 3-feet of fill to meet minimum elevations required.

Tree Inventory

Per the City's tree preservation ordinance, a tree inventory survey was completed to determine various characteristics of trees meeting the size requirements of the ordinance. The tree inventory species and quantity are depicted in Figure 14 and tabulated in Appendix G. Due to the nature of the mass site grading anticipated within all of the undeveloped land at The COR, deep excavations and large earth fills, it is expected that all trees inventoried will need to be removed. City ordinances includes removal thresholds

and requires 125% replacement of significant trees, with some exceptions to dedicated public rights-of-way and invasive tree species. Invasive species documented within The COR area include Siberian Elm.

Street Lighting

Street lighting will be in conformance with The COR Design Framework's Master Streetlight Plan. The costs included for street lighting assumes the light units will be owned, operated, maintained, and installed with City appropriated funds. Costs include conduit, wiring and the actual light fixtures to be installed. The density of the lighting fixtures is similar to the level provided along Riverdale Drive, east of Armstrong Boulevard.

Trails/Sidewalks

Trails were previously constructed along the center of the Ramsey Parkway median east of Center Street. A bioretention basin was constructed within the center median of Ramsey Parkway from Center Street to Willemite Street and is proposed to continue from Willemite Street to Sunwood Drive. 6-foot concrete walk is proposed on the north and south side of Ramsey Parkway to extend the pedestrian facilities to the west.

A 10-foot concrete sidewalk is proposed along the west side of Center Street. All other roadways are proposed to include a 6-foot concrete sidewalk on either side of the road segment. Figures 15-17 in Appendix B show these typical sections.

Landscaping

The base project includes a very utilitarian approach to landscaping for the area. Pedestrian paths, trees and lighting were included, but other features, such shrubs, decorative features and monuments are not included in the estimated project costs. Developers will be responsible to construct boulevard landscaping improvements consistent with the City's zoning code. The exception to this is Sunwood Drive NW, where the boulevard costs include continuing the landscaping along the north side of Sunwood Drive as it exists east of Sapphire Street.

The Ramsey Parkway median is being developed as a filtration median, with plantings typical for bioretention basins.

Right-of-Way Requirements

The COR was originally platted as Ramsey Town Center in 2003, with roadway rights-of-way (ROW) being established over a portion of the area. Future improvements within The COR will be primarily development driven, and ROW secured through the platting process. Understanding and documenting potential ROW needs will allow the City to plan in advance for acquisitions. Additionally, currently platted ROW can be vacated during the development process, allowing for larger areas of development.

Figure 4 shows the existing ROW that does not follow the current master plan roadway alignments, and also shows new ROW required for future public improvements.

The ROW depicted on the exhibits takes into account the width required for streets, boulevards, sidewalks, etc. as depicted in The COR Design Framework plan.

Wetland Delineation

The recent wetland delineation concluded there are multiple wetland areas within the study area. These areas are shown in Figure 6 in Appendix B and Appendix D and are still under review at the LRRWMO.

In 2003 the City delineated these wetlands and completed a wetland mitigation strategy for replacement of impacted wetlands. Several of these wetlands may be impacted without mitigation since they are considered excavated storm water ponds. However, 3 historic wetland areas are still subject to mitigation, shown in Figure 7 in Appendix B and Appendix D. "Wetland 1" located in the northwest corner of The COR, is a remnant historical wetland that has not previously been mitigated. "Wetland 2" located directly adjacent to Wetland 1, is a mitigation banking site constructed to mitigate impacts occurring from the Bunker Lake Boulevard Improvements, therefore can be treated as a historical wetland. A portion of "Wetland 7" located in the northeast quadrant of Sunwood Drive and Zeolite Street, is a remnant historical wetland that has not previously been mitigated.

Jurisdictional Authority/Approvals/Permits

As the project moves from the planning stages to design and construction, permits will be required from various agencies. Understanding and planning for requirements associated with obtaining permits and approvals at this time will be critical to the ultimate success of the process. The following agencies will be permitting entities for considered improvements:

- Minnesota Department of Transportation (MnDOT) State Aid: Sunwood Drive NW, Zeolite Street, Veterans Drive from Zeolite Street to Ramsey Boulevard, Rhinestone Street from Veterans Drive to Bunker Lake Boulevard, and Center Street from Sunwood Drive to Bunker Lake Boulevard are State Aid routes,
- Minnesota Pollution Control Agency (MPCA): NPDES Storm Water Permit,
- Metropolitan Council Environmental Services (MCES): Sanitary Sewer Extension Review,
- Minnesota Pollution Control Agency (MPCA): Sanitary Sewer Extension Permit,
- Minnesota Department of Health (MDH): Watermain Extension,
- Department of Natural Resources (DNR): Dewatering,
- Lower Rum River Watershed Management Organization: Storm Water.

Timing of Improvements

While the improvements discussed and depicted in the figures will be required to support the area, timing of the improvements will most likely be dependent upon each proposed development.

As individual developments are considered, the public infrastructure will need to be reviewed and determinations made as to its adequacy to serve the properties. As upgrades, extensions and improvements are determined to be necessary, funding strategies will need to be developed which may include full or partial assessments to benefitting properties.

VIII. DESIGN SUMMARY

While there is a general understanding of the total public improvements required to serve the area, sequencing of the improvements will allow for planning and fiscal responsibility. Our understanding of the most likely individual segments to be developed are shown in Figure 2 in Appendix B, and include:

- **Ramsey Parkway - Segments A-1 and A-2**
  - Extension of Ramsey Parkway from Willemite Street NW to Sunwood Drive Roundabout.
    - Two 24-foot one way roadways
      - 6-foot concrete sidewalks on the north and south sides

        - Construct bioretention basin in median, lined to prevent infiltration
    - Extension of sanitary sewer, storm sewer and watermain.
        - Reroute existing 18-inch sanitary sewer to new alignment if required with A-1.
- **Center Street - Segment B-1 and B-2:**
    - Extension of Center Street NW to Bunker Lake Boulevard.
        - Extend the existing typical section from the south to 146th Avenue
        - Widen Center Street to a Parkway from 146th Avenue to Bunker Lake Boulevard
        - Subject to Anoka County approval.
    - Extension of storm sewer as needed for roadway drainage.
- **Willemite Street – Segment C**
    - Constructed with Affinity at Ramsey Housing
- **Sunwood Drive Boulevard - Segments D-1, D-2, D-3 and D-4:**
    - Construction of sidewalk and plantings along the north side of Sunwood Drive.
        - Extend the existing boulevard layout used east of Sapphire Street NW
- **Yolite Street - Segment E:**
    - Construction of Yolite Street NW from Sunwood Drive to Ramsey Parkway.
        - 36-foot roadway with 6-foot sidewalks on both sides
    - Extension of watermain.
    - Extension of storm sewer for regional pond outlet.
- **Zeolite Street - Segment F-1 and F-2:**
    - Construction of Zeolite Street NW from Sunwood Drive to Bunker Lake Boulevard.
        - 40-foot roadway with 6-foot sidewalks on both sides.
    - Adjust watermain to proposed grades
    - Extension of storm sewer for roadway drainage
    - Extension of sanitary sewer for service to adjacent parcels
- **Bunker Lake Boulevard - Segment G:**
    - Construction of Bunker Lake Boulevard from Armstrong Boulevard to Ramsey Boulevard.
        - 4-lane divided roadway with concrete median as depicted in the Anoka County 2030 Transportation Plan, costs not included in this analysis.
    - Anoka County State Aid Highway 116
- **Veterans Drive - Segment H:**
    - Construction of Veterans Drive from Rhinestone Street to Ramsey Boulevard.
        - 36-foot roadway with 6-foot sidewalks on both sides.
        - Subject to Anoka County approval.
    - Extension of watermain.
    - Extension of storm sewer for roadway drainage.
- **Peridot Street - Segment I:**
    - Construction of Peridot Street NW from Sunwood Drive to Veterans Drive.
        - 36-foot roadway with 6-foot sidewalks on both sides.
    - Extension of sanitary sewer south from Sunwood Drive.
    - Extension of watermain.
    - Extension of storm sewer for roadway drainage.

Estimated project costs for each segment were developed to allow for the City to plan for the sequenced implementation of the improvements and are summarized later in this report.

IX. COST ANALYSIS

Costs estimates were developed for each improvement type. These estimates are based on recent bid pricing and similar projects. The segments are depicted on Figure 2 in Appendix B. All costs are presented as 2023 costs.

	Ramsey Parkway	
Improvement	**Segment A-1**	**Segment A-2**
Roadway	$ 988,000	$ 500,000
Trails/Sidewalks	$ 196,000	$ 99,000
Street Lighting	$ 289,000	$ 146,000
Storm Sewer	$ 530,000	$ 268,000
Trunk Storm Sewer	$ 26,000	$ 0
Watermain	$ 246,000	$ 173,000
Sanitary Sewer	$ 104,000	$ 97,000
Trunk Sanitary Sewer	$ 294,000	$ 0
Total Costs	$ 2,673,000	$ 1,283,000

	Center Street	
Improvement	**Segment B-1**	**Segment B-2**
Roadway	$ 114,000	$ 543,000
Trails/Sidewalks	$ 44,000	$ 153,000
Street Lighting	$ 74,000	$ 204,000
Storm Sewer	$ 40,000	$ 132,000
Watermain	$ 0	$ 0
Sanitary Sewer	$ 0	$ 0
Total Costs	$ 272,000	$ 1,032,000

	Yolite Street	Zeolite Street	
Improvement	**Segment E**	**Segment F-1**	**Segment F-2**
Roadway	$ 419,000	$ 412,000	$ 426,000
Trails/Sidewalks	$ 118,000	$ 116,000	$ 120,000
Street Lighting	$ 157,000	$ 155,000	$ 159,000
Storm Sewer	$ 102,000	$ 66,000	$ 68,000
Trunk Storm Sewer	$ 112,000	$ 0	$ 81,000
Watermain	$ 169,000	$ 136,000	$ 140,000
Sanitary Sewer	$ 92,000	$ 88,000	$ 91,000
Total Costs	$ 1,169,000	$ 973,000	$ 1,085,000

Veterans Drive	Peridot Street	
Improvement	**Segment H**	**Segment I**
Roadway	$ 763,000	$ 360,000
Trails/Sidewalks	$ 254,000	$ 120,000
Street Lighting	$ 339,000	$ 159,000
Storm Sewer	$ 120,000	$ 41,000
Watermain	$ 245,000	$ 143,000
Sanitary Sewer	$ 0	$ 94,000
Total Costs	$ 1,721,000	$ 917,000

Segments D-1, D-2, D-3 and D-4 include sidewalks and miscellaneous street scape improvements along Sunwood Drive. The Segments, and associated costs, are presented in the following table.

Segment	Location	Estimated Cost
D-1	Center Street to Sapphire Street	$ 134,000
D-2	Willemite Street to Center Street	$ 201,000
D-3	Yolite Street to Willemite Street	$ 230,000
D-4	Zeolite Street to Yolite Street	$ 237,000
Total		$ 802,000

The above costs are considered project costs and include 30% contingencies and project development costs. Project development costs include administrative, engineering, and fiscal related costs.

Summary of Costs

The total for the roadway, trail, sidewalk, and street lighting improvements is estimated at **$8,794,000.**

The total for sanitary sewer and water main extension improvements is estimated at **$1,818,000.**

The total trunk related improvements for sanitary sewer and storm sewer is estimated at **$513,000.**

The total landscaping improvements along Sunwood Drive from Zeolite Street to Sapphire Street is estimated at **$802,000.**

The total for regional stormwater retention pond excavation, grading, and impervious liner is estimated at **$2,980,000.** Tree removal and preservation associated with the regional pond area is estimated at **$160,000.**

The total for mass site grading of the remaining undeveloped land within The COR, including wetland mitigation is estimated at **$3,002,000.** Tree removal and preservation associated with the undeveloped area is estimated at **$794,000.**

The total for The Waterfront, Phase 1 is estimated at **$4,218,000.** The Waterfront's park features are still considered preliminary. Costs and improvements are based on 2018 City Cost Estimating effort, adjusted for 2023 pricing and include a recreational splash pad, wading fountain, vehicle access, parking, associated concrete walkways, a bituminous trail circumnavigating the stormwater feature, and miscellaneous landscaping. The proposed community buildings, pergola, and future phases are not included in these estimates.

The total for Municipal Plaza Improvements is estimated at **$4,091,000.** Costs and improvements are based on 2018 City Cost Estimating effort, adjusted for 2023 pricing. Additionally, an analysis was completed focused on stormwater, stormwater reuse, and irrigation alternatives. Current stormwater reuse project costs are estimated at **$2,285,000.** The analysis memorandum dated June 25, 2019, is in Appendix F for reference.

General Cost Estimating Assumptions

- Dewatering will be required for sewer and water installation.
- Fill will be required for all roadways, with exception of Zeolite Street.
- Aggregate base cost does not assume use of City stockpile.
- Costs associated with creating the bioretention basin are included in the storm utility portions of Ramsey Parkway (Segments A-1 and A-2).

Segment A Assumptions

- Removal of existing 42-inch storm sewer included in trunk storm sewer cost. A portion was removed with the Affinity at Ramsey housing project.
- Sanitary sewer is assumed to extend to midpoint of last parcels serviced by sewer line.
- Includes an allotment for (2) 6 ft wide sidewalks along the roadway boulevard areas.
- Costs for the median include restoration and plantings.
- 8-inch sanitary sewer is assumed to extend to midpoint of last parcels serviced by sewer line.

Segment B-2 Assumptions

- Realignment of Center Street as shown in the COR Framework Plan included in the project cost.
    - The cost for B-2 could be eliminated from the project if the existing roadway were to remain in place.

Segment E Assumptions

- 30-inch regional pond outlet pipe included in trunk storm sewer cost.
- Extension of sanitary sewer laterals to the right of way included in sanitary sewer cost.

Segments H & I Assumptions

- 8-inch sanitary sewer is assumed to extend to midpoint of last parcels serviced by sewer line.

Grading Assumptions

- Wetland Mitigation will be completed via purchasing wetland credits. Credit costs are continually modified and subject to change. Wetland credits must be purchased at a ratio of twice the acreage of impact.
- Swell factor of excavated material is estimated at 10%.
- Shrinkage factor of installed/compacted material is estimated at 25%.
- Borrow material cost assumes use of regional pond excavation. Additional import material will be required if excavation material is depleted. Preliminary calculations indicate borrow material will not be required, however it will be dependent on individual site plans.
- Trees will be replaced in accordance with City ordinances.

Additional Assumptions

- No costs associated with construction of individual storm water ponds are included, as it is anticipated the regional pond will address all storm water runoff requirements. The regional pond

will be sized to address all impervious surfaces within the developable area including the public improvements and all individual site development within the study area west of Center Street.

X. COST ALLOCATION

The costs, or a portion of the costs, of the improvements are typically allocated back to adjacent properties through the use of assessments, fees and other methods. The costs are typically allocated in a way that is equitable to the properties benefitting from the improvements. Public improvements that will become City owned and maintained are typically constructed through a public process, while secondary improvements are constructed by the property owner. For our analysis, we assumed the following items would be constructed through the public process:

- Roadways, including storm water conveyance systems,
- Water System Facilities,
- Sanitary Sewer Facilities,
- Trails,
- Street Lighting, and
- City Parks

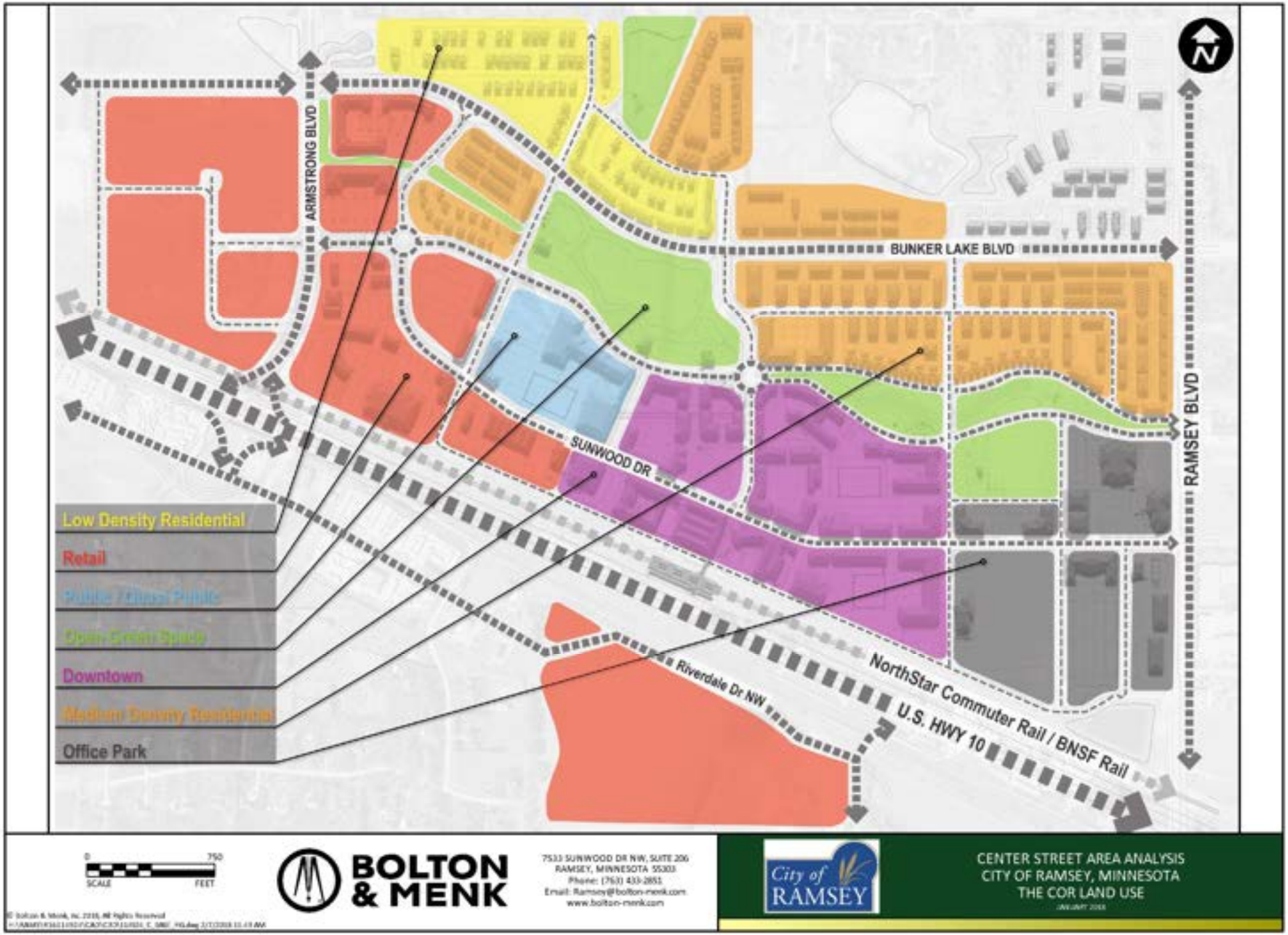
While the streetlights will most likely be installed by a private utility and the trails could potentially be constructed by the property owner, we have included these items as public improvements. Other improvements were considered secondary and are typically the property owner's responsibility:

- Sanitary Sewer Service Extensions,
- Water Service Extensions,
- Natural Gas Lines to Buildings,
- Telephone Service to Buildings,
- Electric Service to Buildings,
- Site Grading,
- Site Landscaping,
- Site Storm Water Conveyance, and Easement Dedication.

These types of improvements are typically inspected by the City for conformity with applicable codes and standards, but are constructed by the property owner.

APPENDIX A: LAND USE EXHIBITS

Figure 13: Existing Functional Classification



BOLTON & MENK

7533 SUNWOOD DR NW, SUITE 200
RAMSEY, MINNESOTA 55303
Phone: (763) 433-2851
Email: Ramsey@bolton-menk.com
www.bolton-menk.com

City of RAMSEY

CENTER STREET AREA ANALYSIS
CITY OF RAMSEY, MINNESOTA
THE COR LAND USE
JANUARY 2018

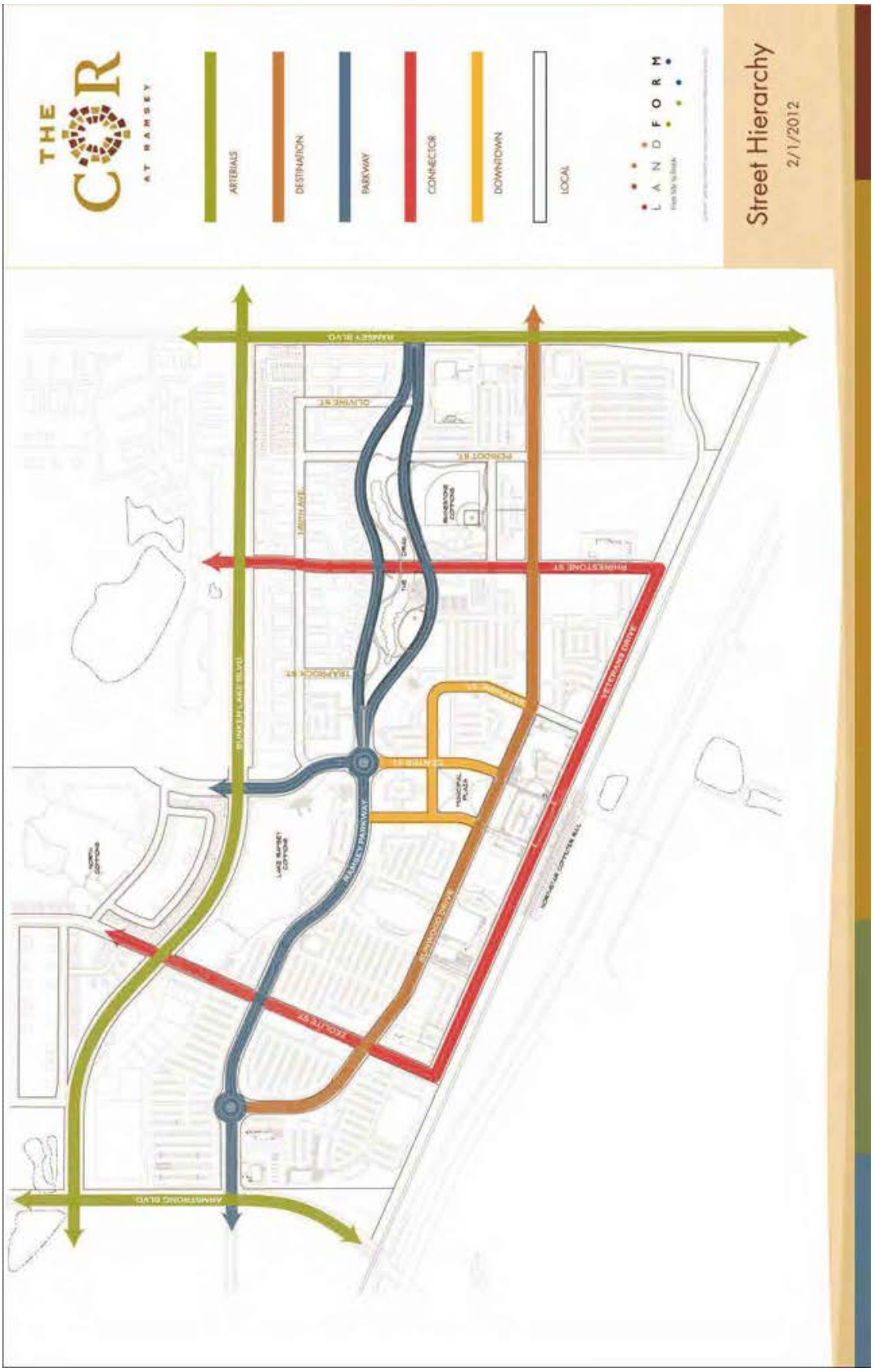


Figure 1: Street Hierarchy Map

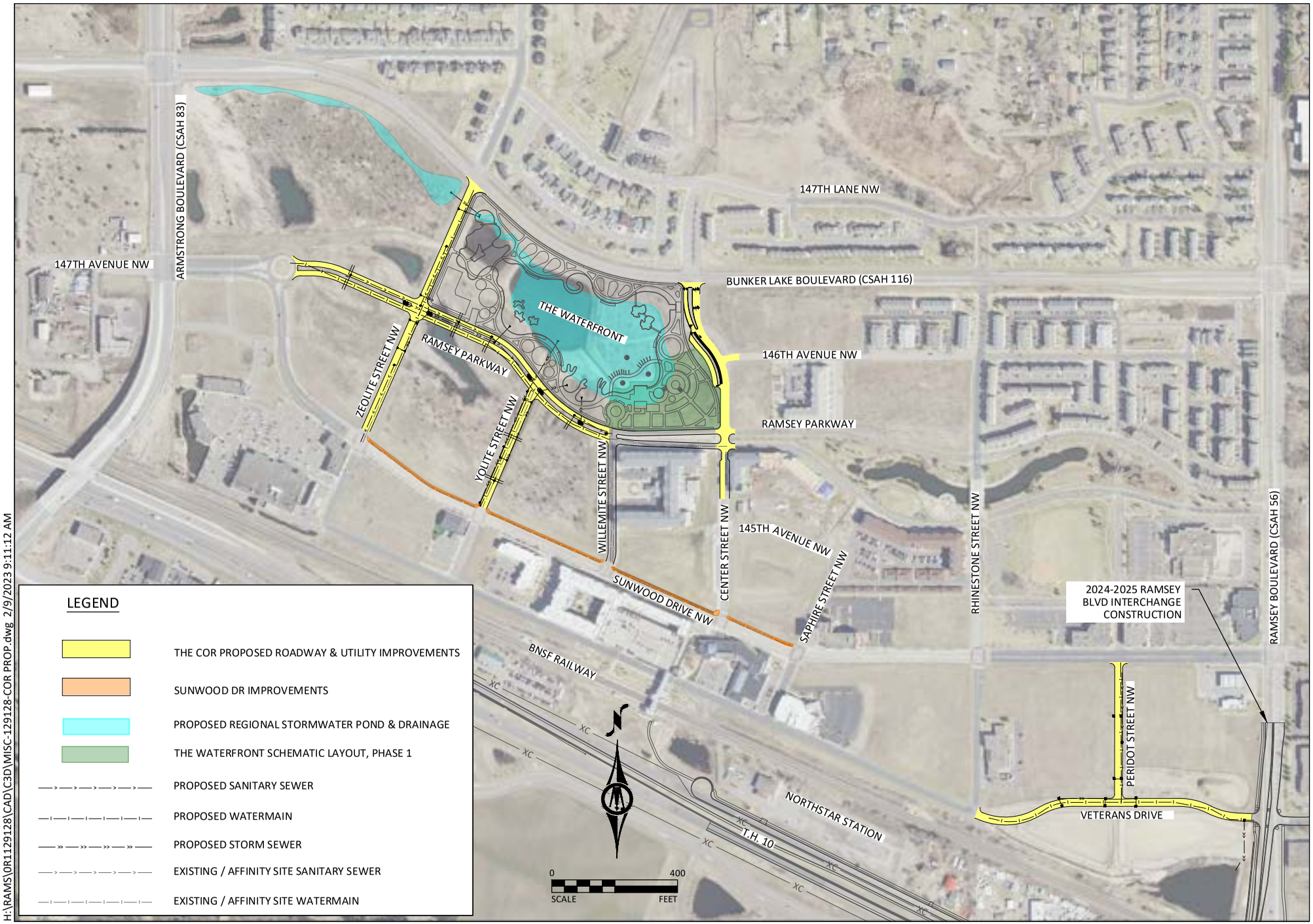
APPENDIX B: FIGURES

2023 THE COR PUBLIC INFRASTRUCTURE ANALYSIS

CITY OF RAMSEY, MINNESOTA

FIGURE 1 - IMPROVEMENT AREAS

FEBRUARY 2023

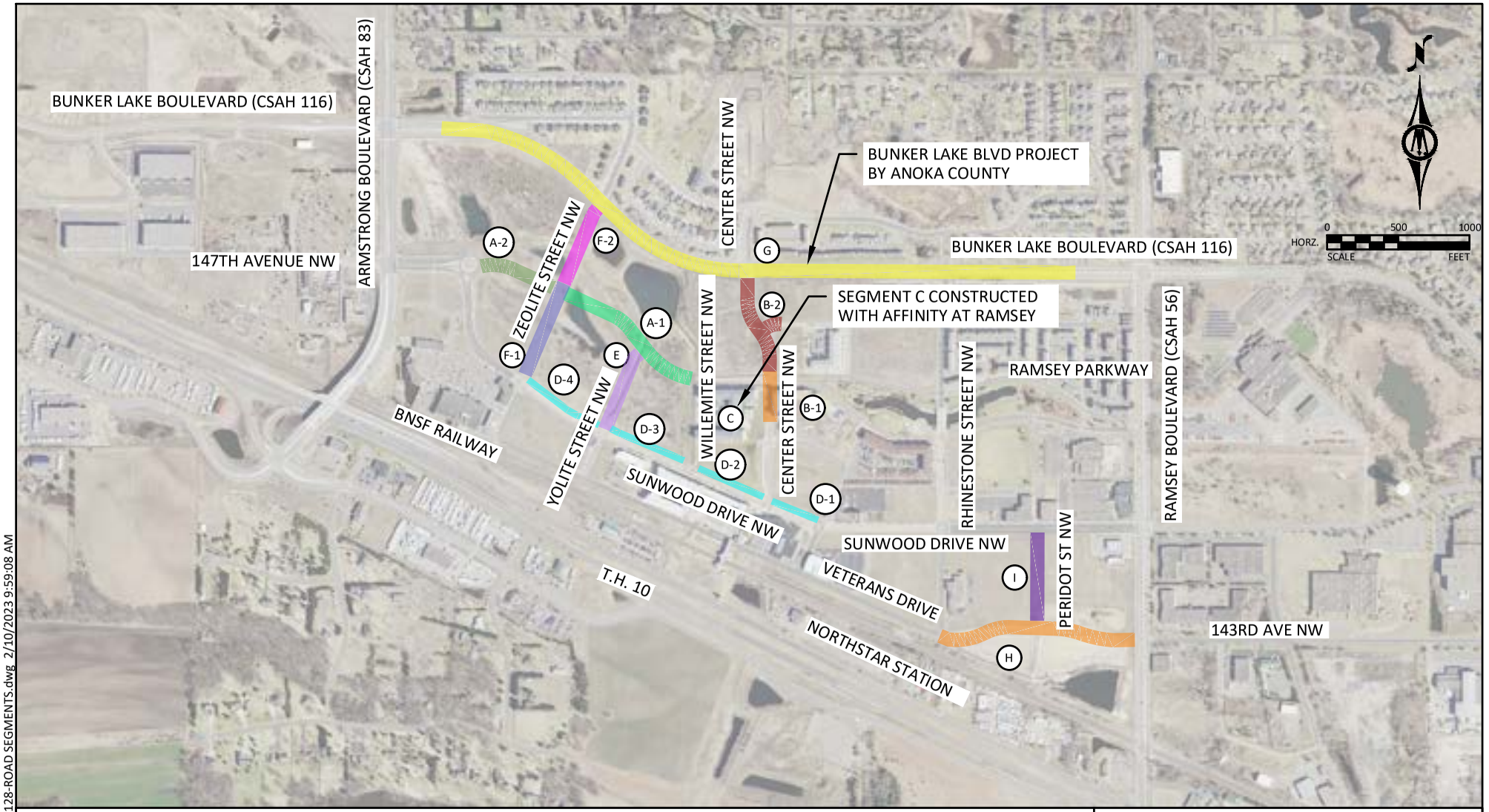


H:\RAMS\0R1129128\CAD\C3D\MISC-129128-COR PROP.dwg 2/9/2023 9:11:12 AM

2023 THE COR PUBLIC INFRASTRUCTURE ANALYSIS FIGURE 2 - ROAD SEGMENTS & COST BREAKDOWN

CITY OF RAMSEY, MINNESOTA

FEBRUARY 2023



LEGEND

SEGMENT A-1	$2,673,000	SEGMENT D	$802,000	SEGMENT G	BY COUNTY
SEGMENT A-2	$1,283,000	SEGMENT E	$1,169,000	SEGMENT H	$1,721,000
SEGMENT B-1	$272,000	SEGMENT F-1	$973,000	SEGMENT I	$917,000
SEGMENT B-2	$1,032,000	SEGMENT F-2	$1,085,000		

NOTE:

ESTIMATED TOTAL PROJECT COSTS FOR EACH SEGMENT INCLUDES SURFACE AND SUBSURFACE PUBLIC INFRASTRUCTURE USING 2023 DOLLARS (EARTHWORK, ROADWAY, SANITARY SEWER, WATERMAIN, STORM SEWER, TRAILS, LIGHTING, TREES, WETLANDS.)

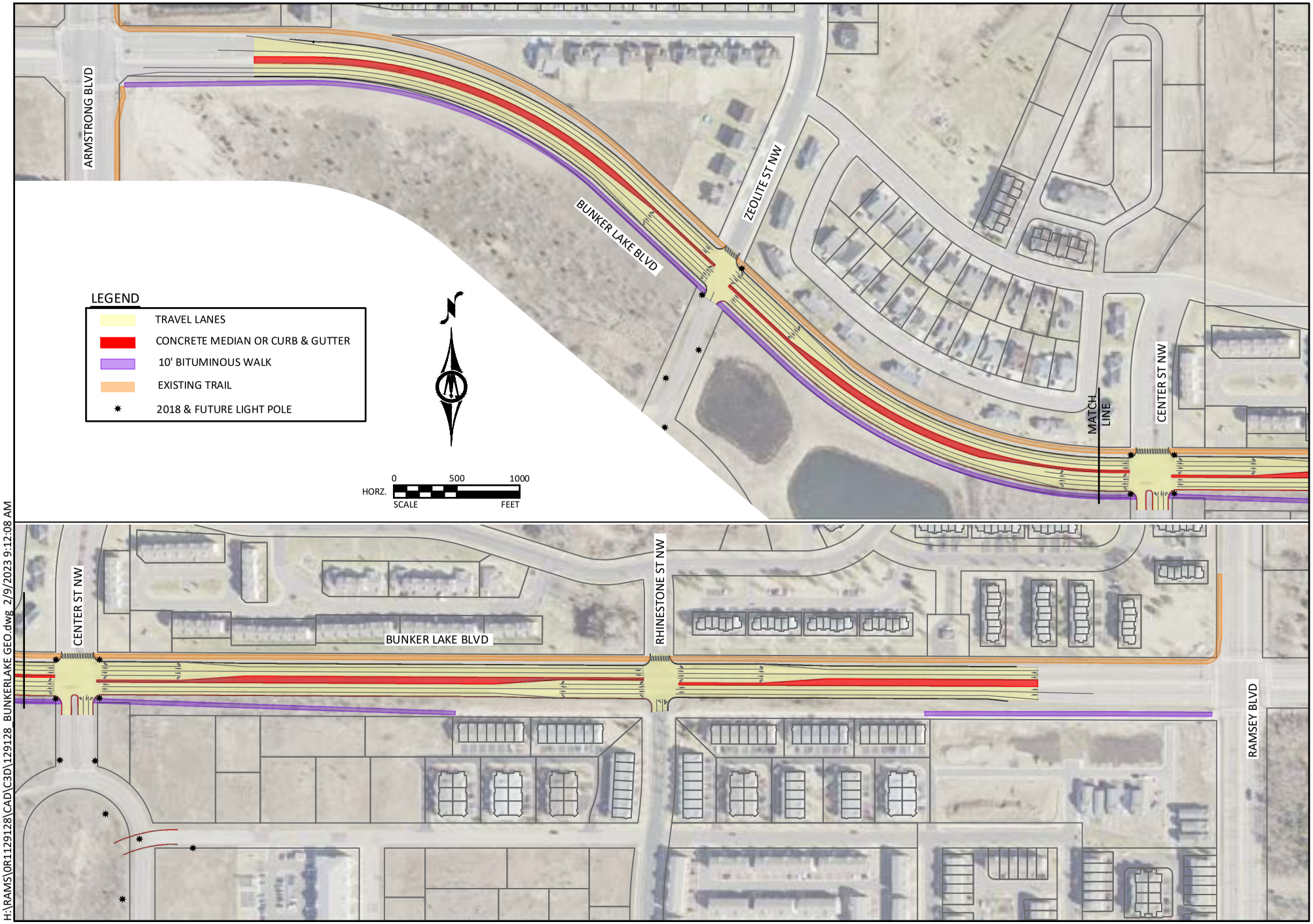
H:\RAMS\0R1129128\CAD\C3D\MISC-129128-ROAD SEGMENTS.dwg 2/10/2023 9:59:08 AM

2023 THE COR PUBLIC INFRASTRUCTURE ANALYSIS

CITY OF RAMSEY, MINNESOTA

FIGURE 3 - FUTURE ANOKA COUNTY PROJECT

FEBRUARY 2023



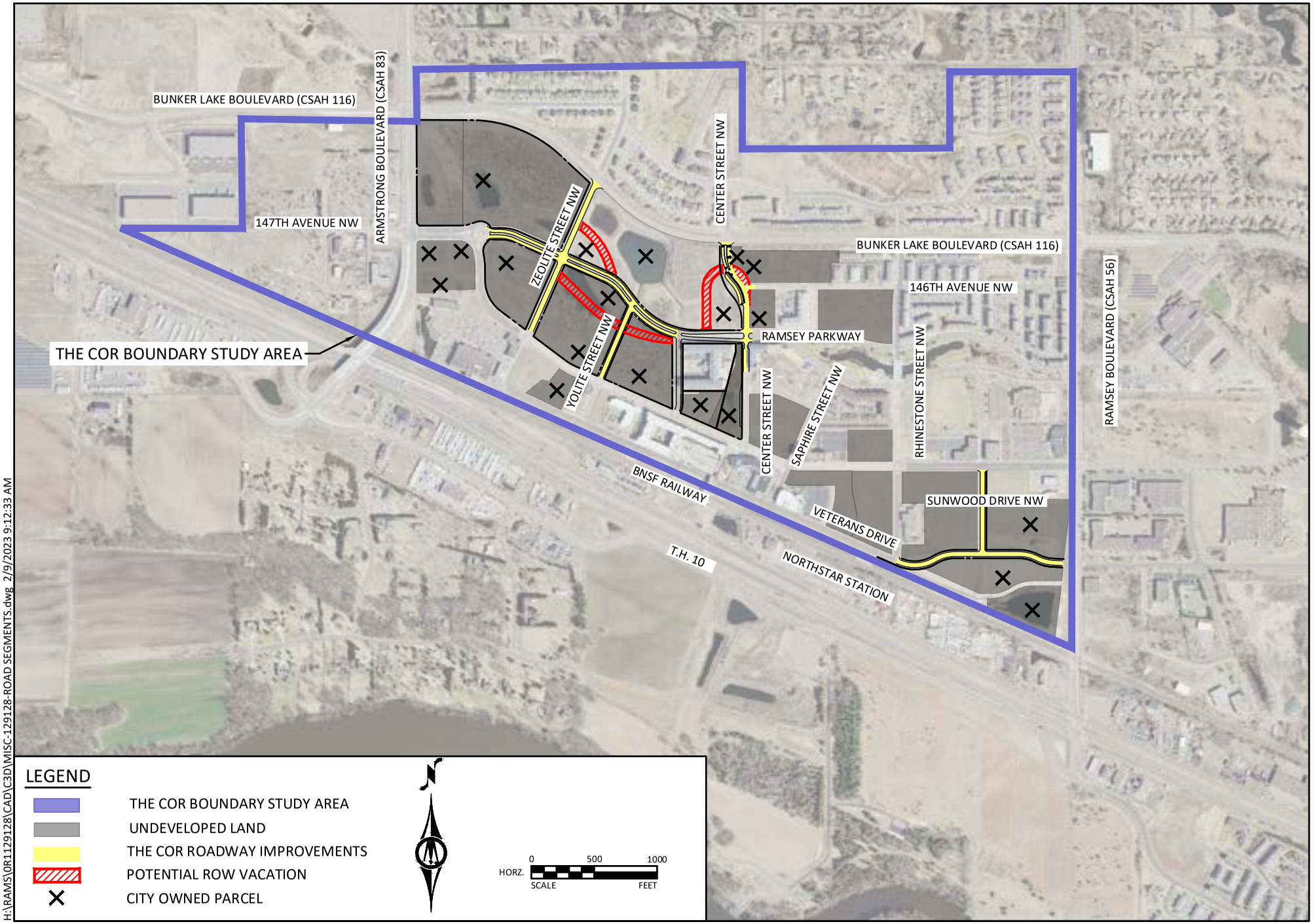
H:\RAMS\0R1129128\CAD\C3D\129128_BUNKERLAKE GEO.dwg 2/9/2023 9:12:08 AM

2023 THE COR PUBLIC INFRASTRUCTURE ANALYSIS

CITY OF RAMSEY, MINNESOTA

FIGURE 4 - ROW LAYOUT

FEBRUARY 2023



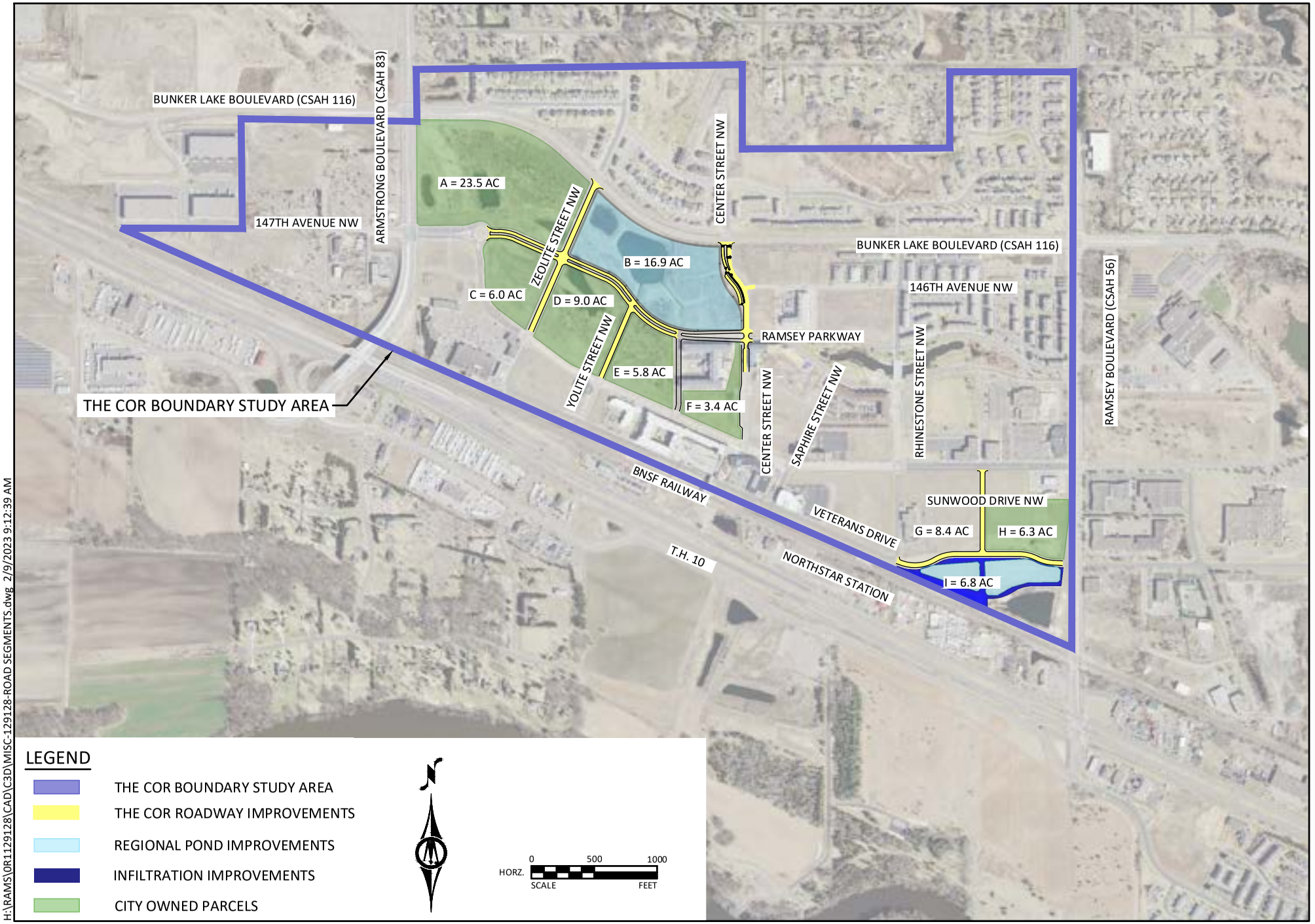
H:\RAMS\0R1129128\CAD\C3D\MISC-129128-ROAD SEGMENTS.dwg 2/9/2023 9:12:33 AM

2023 THE COR PUBLIC INFRASTRUCTURE ANALYSIS

CITY OF RAMSEY, MINNESOTA

FIGURE 5 - CITY PARCEL AREAS

FEBRUARY 2023



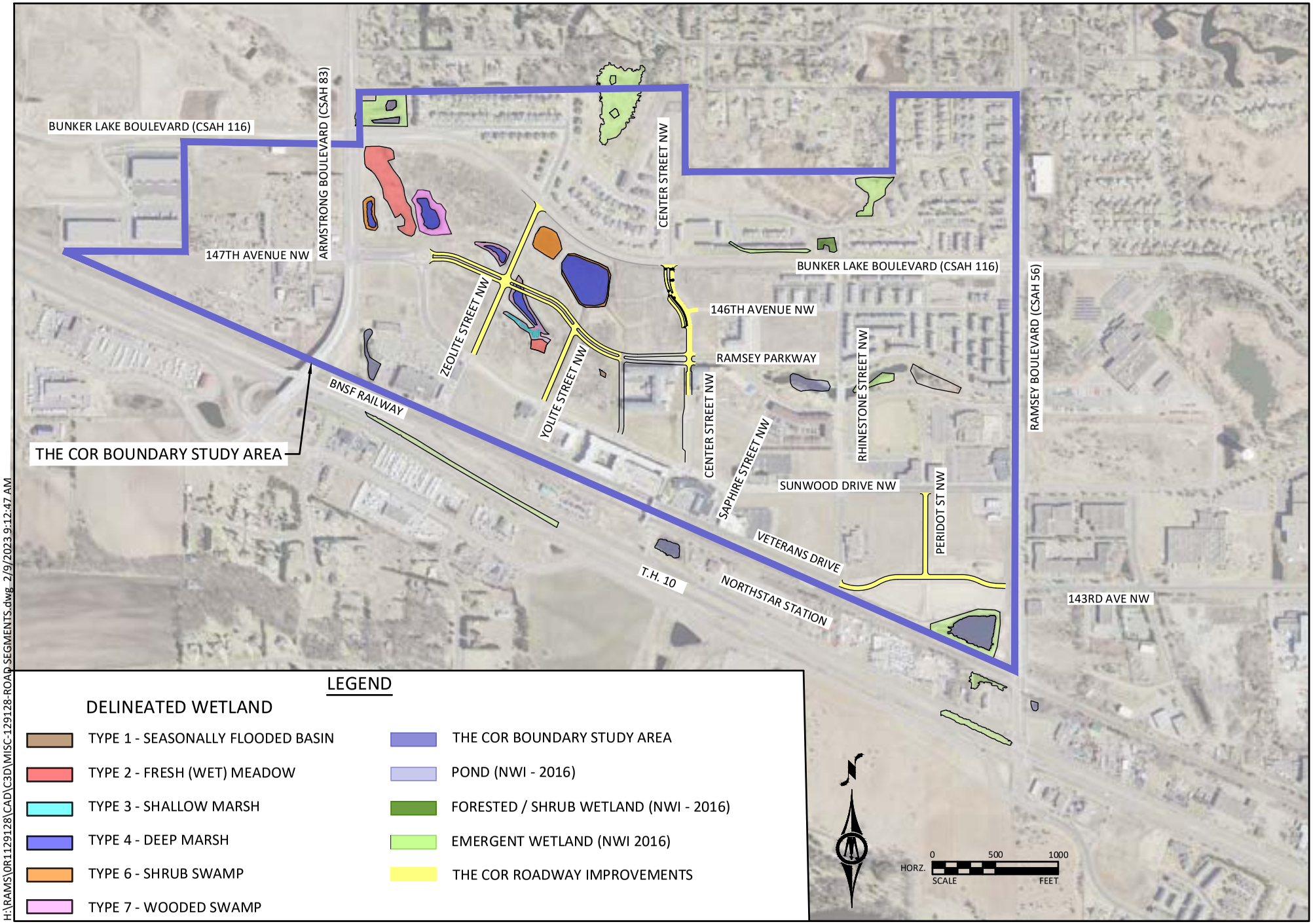
H:\RAMS\0R1129128\CAD\C3D\MISC-129128-ROAD SEGMENTS.dwg 2/9/2023 9:12:39 AM

2023 THE COR PUBLIC INFRASTRUCTURE ANALYSIS

CITY OF RAMSEY, MINNESOTA

FIGURE 6 - WETLAND INVENTORY

FEBRUARY 2023



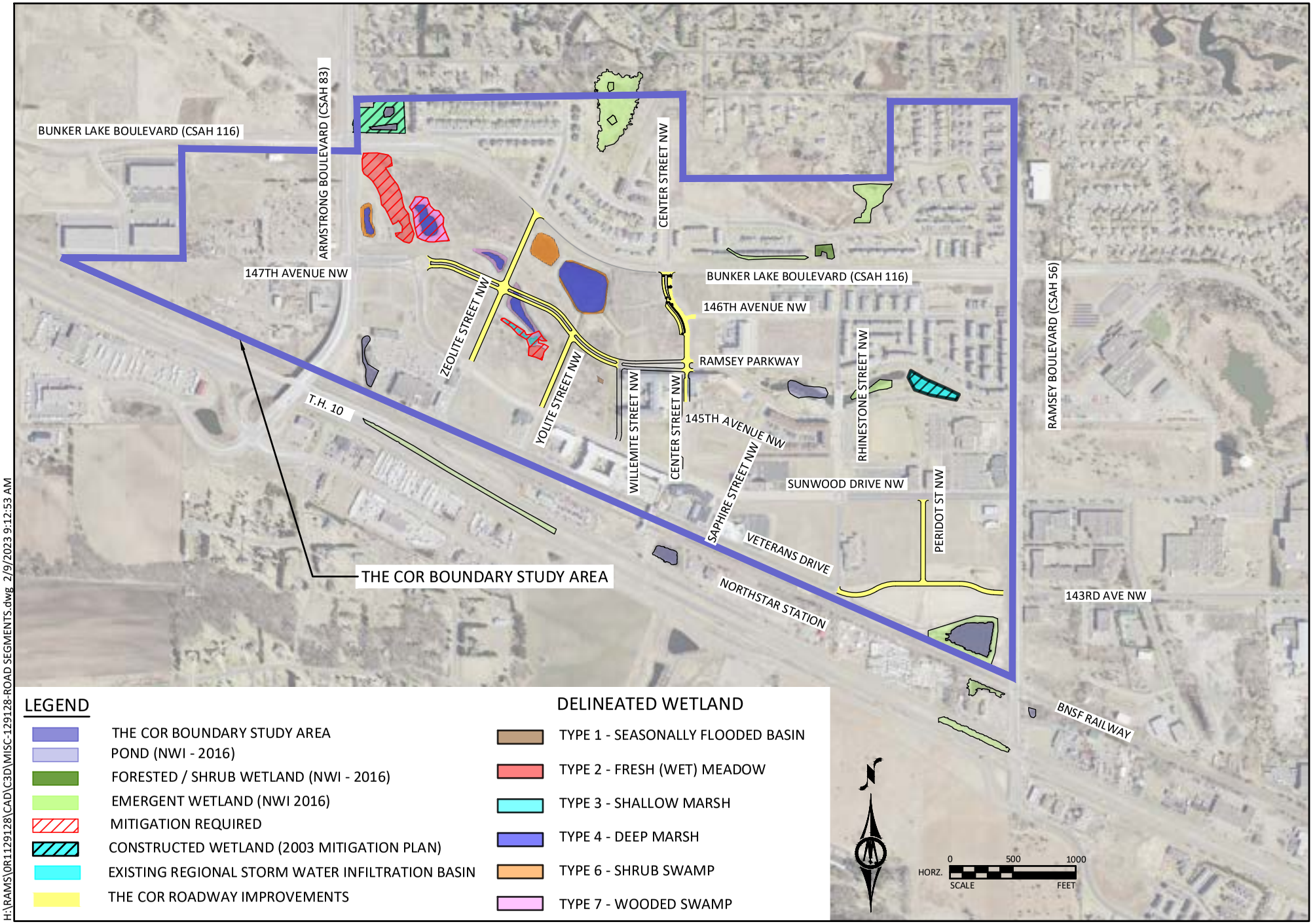
H:\RAMS\0R1129128\CAD\C3D\MISC-129128-ROAD SEGMENTS.dwg 2/9/2023 9:12:47 AM

2023 THE COR PUBLIC INFRASTRUCTURE ANALYSIS

CITY OF RAMSEY, MINNESOTA

FIGURE 7 - WETLAND MITIGATION PLAN

FEBRUARY 2023



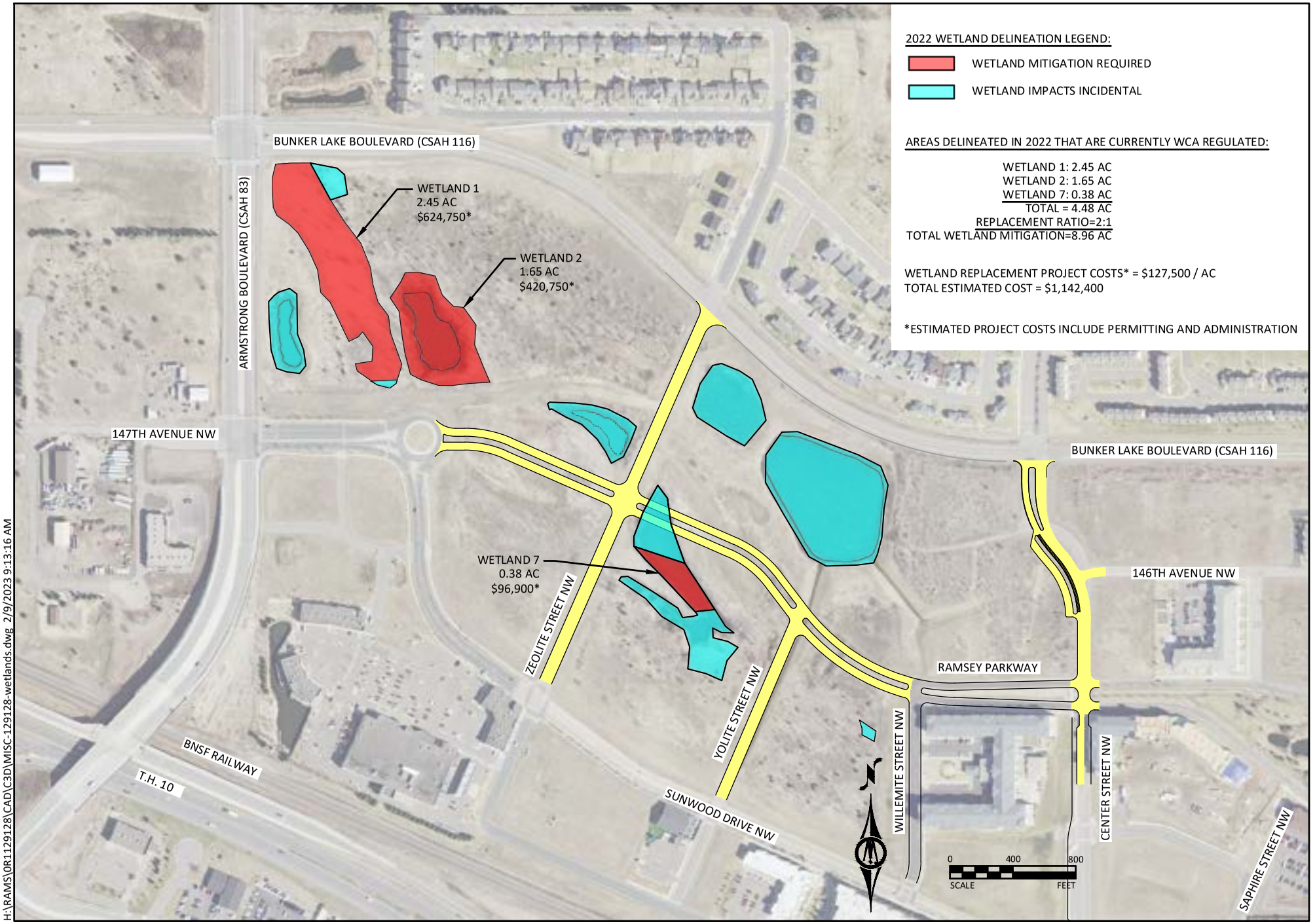
H:\RAMS\0R1129128\CAD\C3D\MISC-129128-ROAD SEGMENTS.dwg 2/9/2023 9:12:53 AM

2023 THE COR PUBLIC INFRASTRUCTURE ANALYSIS

CITY OF RAMSEY, MINNESOTA

FIGURE 8 - WETLAND MITIGATION COST

FEBRUARY 2023



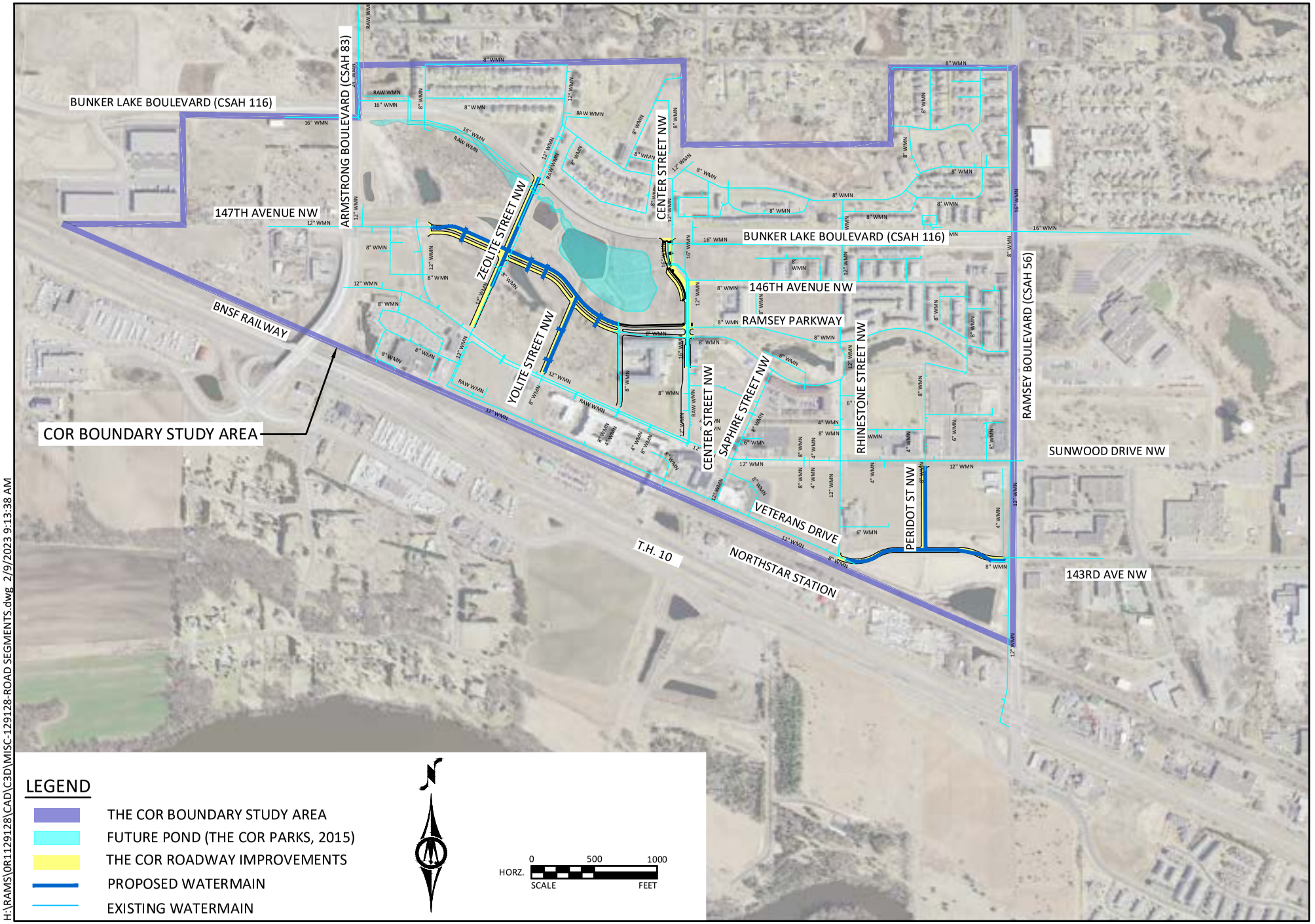
H:\RAMS\0R1129128\CAD\C3D\MISC-129128-wetlands.dwg 2/9/2023 9:13:16 AM

2023 THE COR PUBLIC INFRASTRUCTURE ANALYSIS

CITY OF RAMSEY, MINNESOTA

FIGURE 9 - WATERMAIN UTILITIES

FEBRUARY 2023



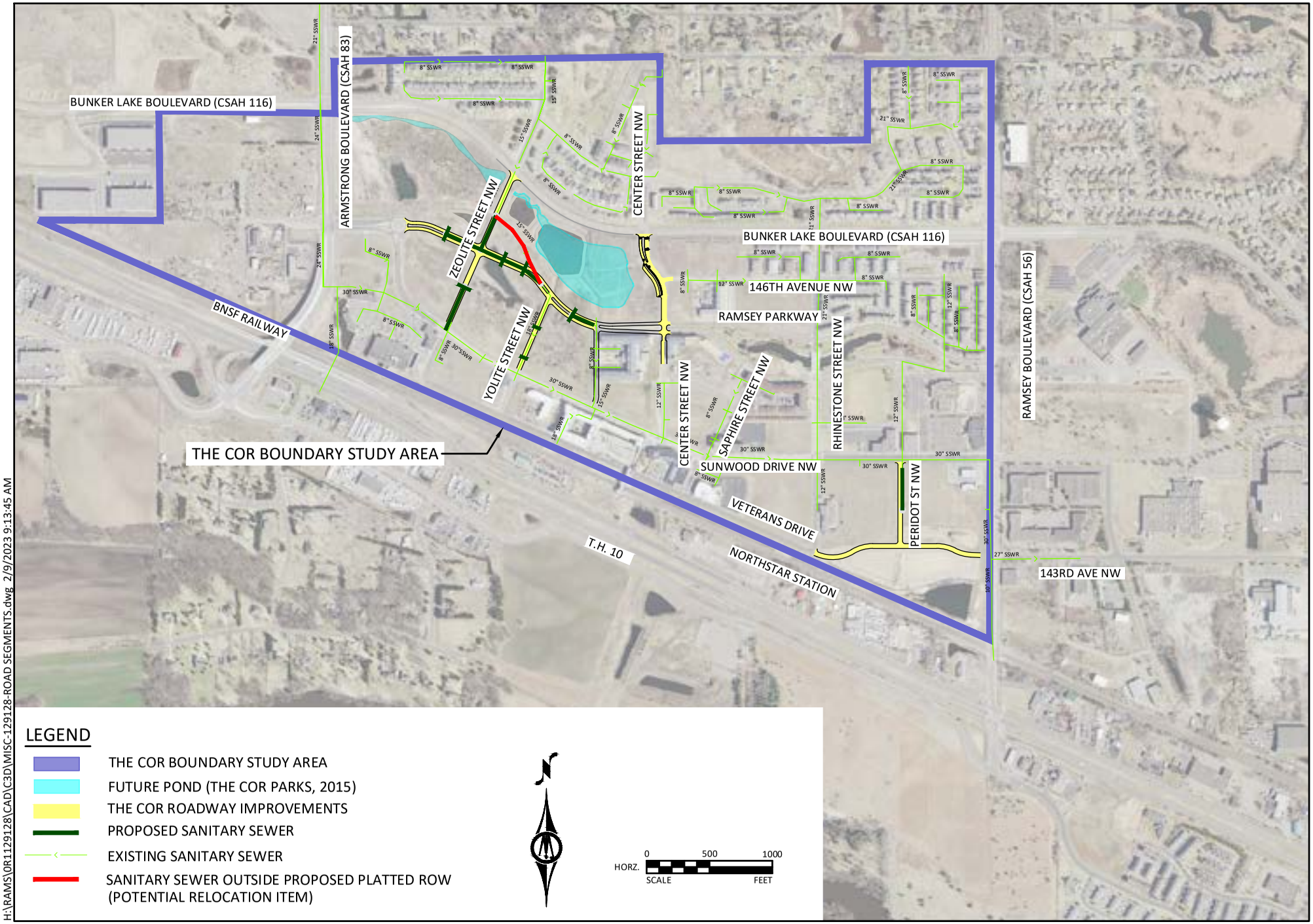
H:\RAMS\0R1129128\CAD\C3D\MISC-129128-ROAD SEGMENTS.dwg 2/9/2023 9:13:38 AM

2023 THE COR PUBLIC INFRASTRUCTURE ANALYSIS

CITY OF RAMSEY, MINNESOTA

FIGURE 10 - SANITARY UTILITIES

FEBRUARY 2023



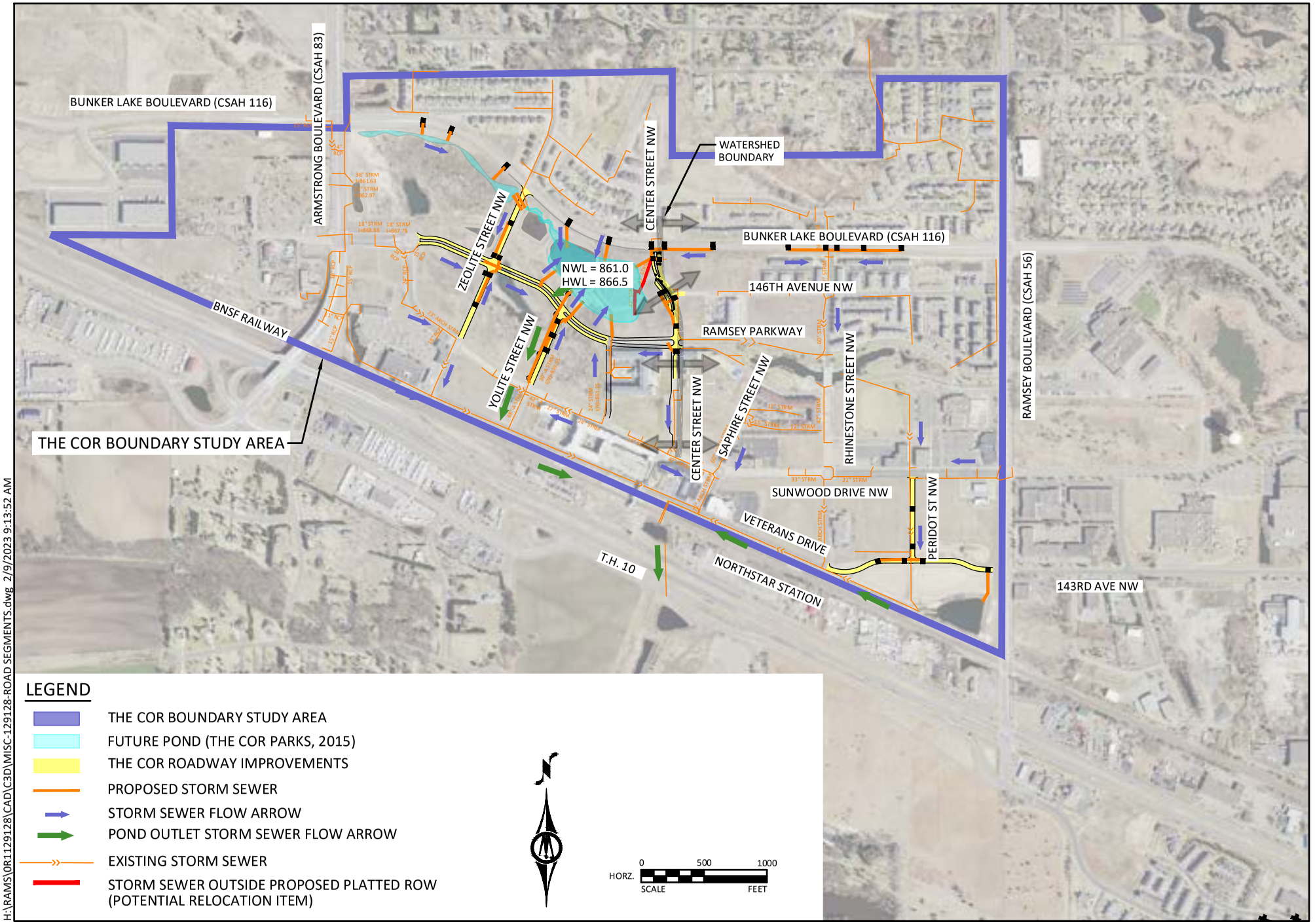
H:\RAMS\0R1129128\CAD\C3D\MISC-129128-ROAD SEGMENTS.dwg 2/9/2023 9:13:45 AM

2023 THE COR PUBLIC INFRASTRUCTURE ANALYSIS

CITY OF RAMSEY, MINNESOTA

FIGURE 11 - STORM UTILITIES

FEBRUARY 2023



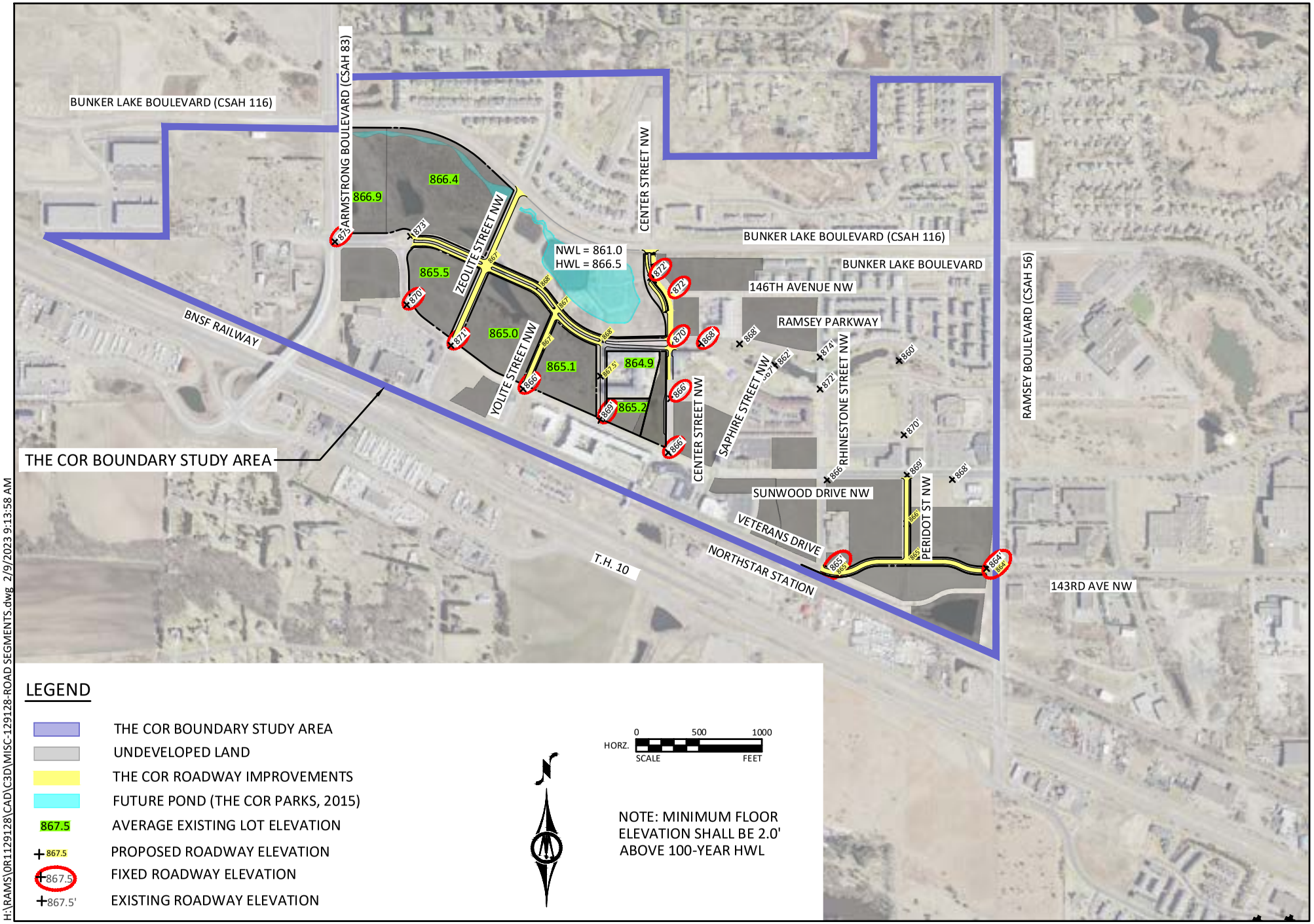
H:\RAMS\0R1129128\CAD\C3D\MISC-129128-ROAD SEGMENTS.dwg 2/9/2023 9:13:52 AM

2023 THE COR PUBLIC INFRASTRUCTURE ANALYSIS

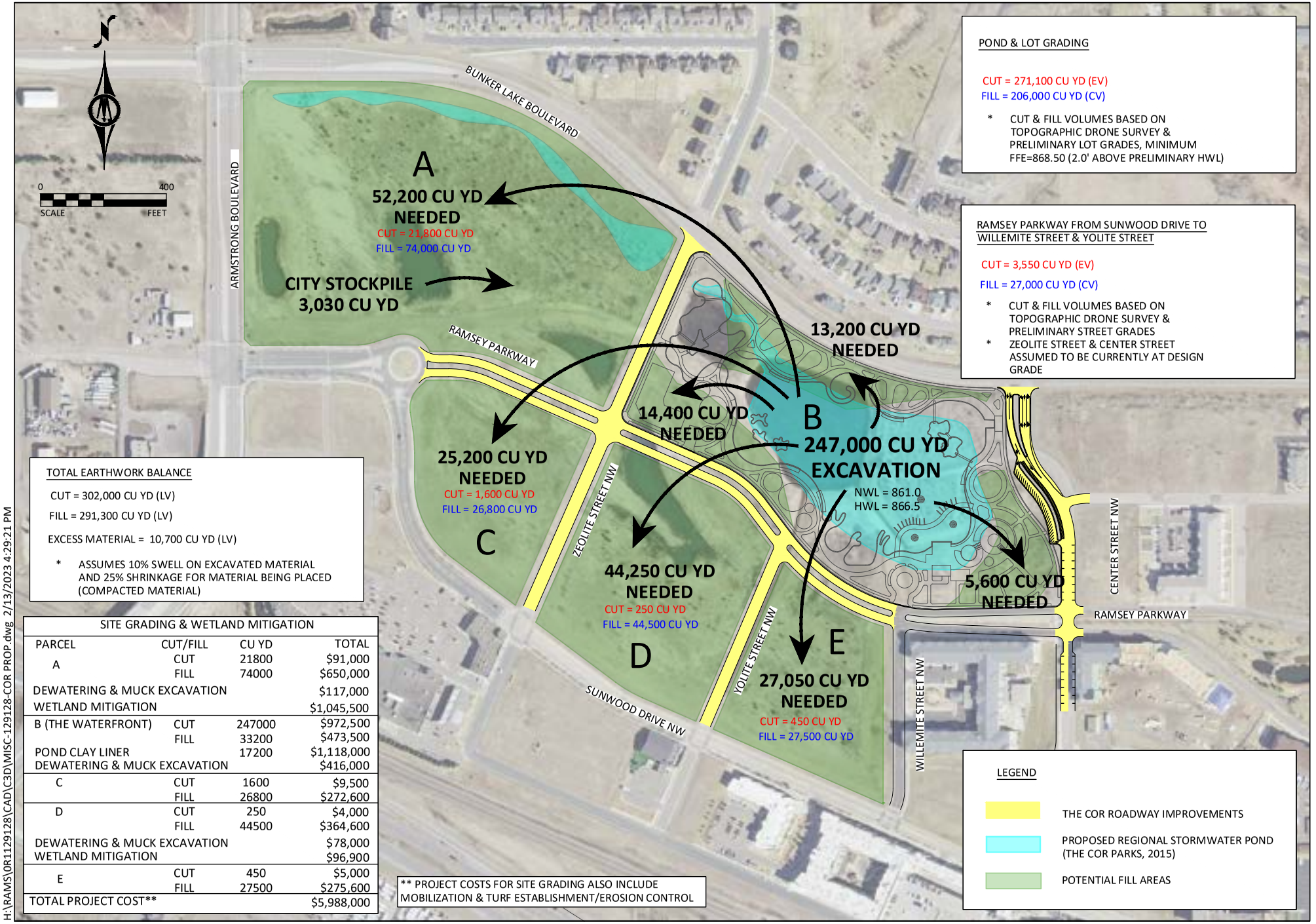
CITY OF RAMSEY, MINNESOTA

FIGURE 12 - ROADWAY GRADING PLAN

FEBRUARY 2023



H:\RAMS\0R1129128\CAD\C3D\MISC-129128-ROAD SEGMENTS.dwg 2/9/2023 9:13:58 AM



POND & LOT GRADING

CUT = 271,100 CU YD (EV)
FILL = 206,000 CU YD (CV)

* CUT & FILL VOLUMES BASED ON TOPOGRAPHIC DRONE SURVEY & PRELIMINARY LOT GRADES, MINIMUM FFE=868.50 (2.0' ABOVE PRELIMINARY HWL)

RAMSEY PARKWAY FROM SUNWOOD DRIVE TO WILLEMITE STREET & YOLITE STREET

CUT = 3,550 CU YD (EV)

FILL = 27,000 CU YD (CV)

* CUT & FILL VOLUMES BASED ON TOPOGRAPHIC DRONE SURVEY & PRELIMINARY STREET GRADES
* ZEOLITE STREET & CENTER STREET ASSUMED TO BE CURRENTLY AT DESIGN GRADE

TOTAL EARTHWORK BALANCE

CUT = 302,000 CU YD (LV)

FILL = 291,300 CU YD (LV)

EXCESS MATERIAL = 10,700 CU YD (LV)

* ASSUMES 10% SWELL ON EXCAVATED MATERIAL AND 25% SHRINKAGE FOR MATERIAL BEING PLACED (COMPACTED MATERIAL)

SITE GRADING & WETLAND MITIGATION

PARCEL	CUT/FILL	CU YD	TOTAL
A	CUT	21800	$91,000
	FILL	74000	$650,000
DEWATERING & MUCK EXCAVATION			$117,000
WETLAND MITIGATION			$1,045,500
B (THE WATERFRONT)	CUT	247000	$972,500
	FILL	33200	$473,500
POND CLAY LINER		17200	$1,118,000
DEWATERING & MUCK EXCAVATION			$416,000
C	CUT	1600	$9,500
	FILL	26800	$272,600
D	CUT	250	$4,000
	FILL	44500	$364,600
DEWATERING & MUCK EXCAVATION			$78,000
WETLAND MITIGATION			$96,900
E	CUT	450	$5,000
	FILL	27500	$275,600
TOTAL PROJECT COST**			$5,988,000

** PROJECT COSTS FOR SITE GRADING ALSO INCLUDE MOBILIZATION & TURF ESTABLISHMENT/EROSION CONTROL

LEGEND

- THE COR ROADWAY IMPROVEMENTS
- PROPOSED REGIONAL STORMWATER POND (THE COR PARKS, 2015)
- POTENTIAL FILL AREAS

H:\RAMS\0R1129128\CAD\C3D\MISC-129128-COR PROP.dwg 2/13/2023 4:29:21 PM

H:\RAMS\0R1129128\CAD\C3D\129128_C_BASE_2.dwg 2/9/2023 9:15:43 AM

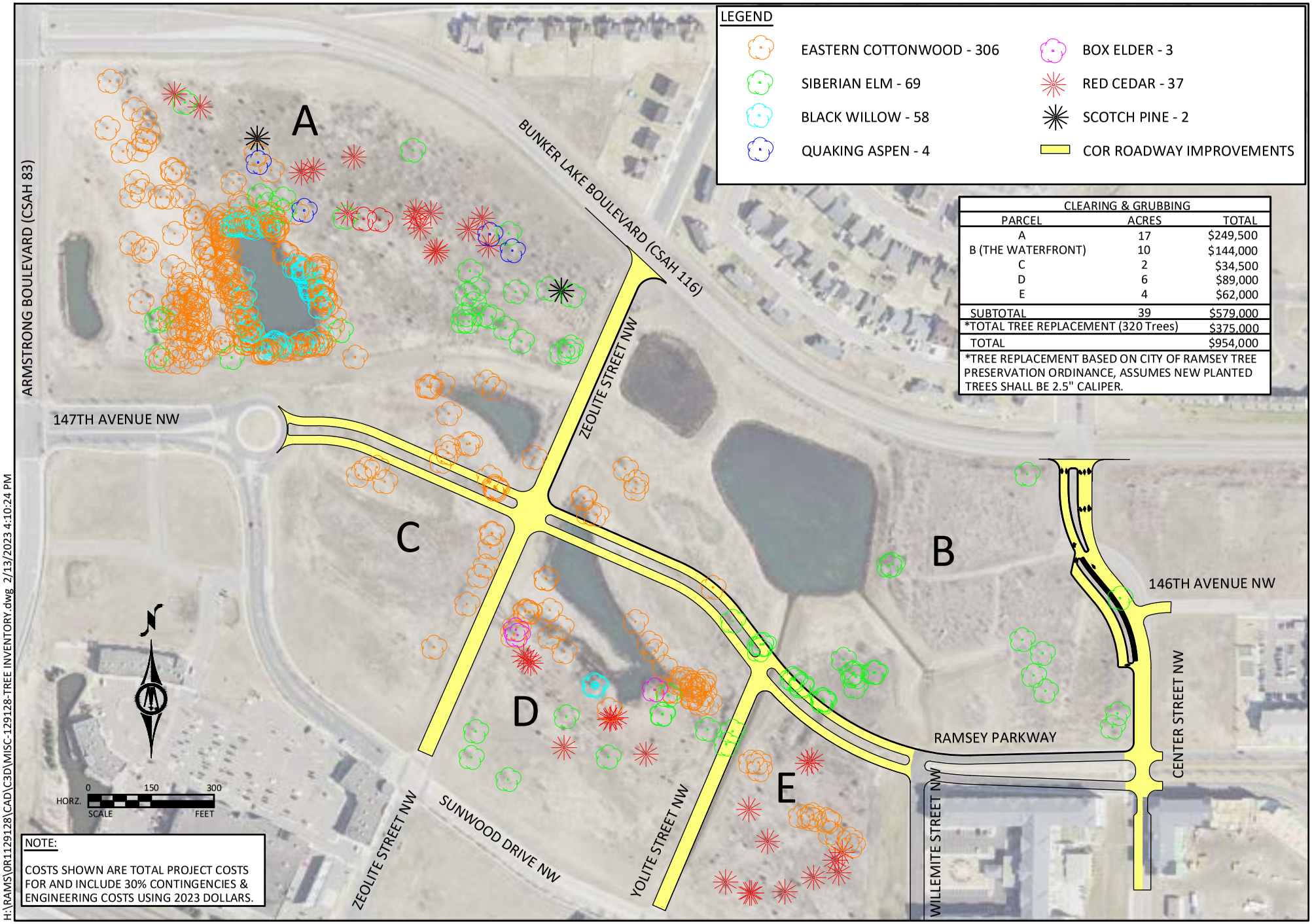
2023 THE COR PUBLIC INFRASTRUCTURE ANALYSIS

CITY OF RAMSEY, MINNESOTA

FIGURE 15 - TREE INVENTORY

FEBRUARY 2023

BOLTON & MENK



CLEARING & GRUBBING		
PARCEL	ACRES	TOTAL
A	17	$249,500
B (THE WATERFRONT)	10	$144,000
C	2	$34,500
D	6	$89,000
E	4	$62,000
SUBTOTAL	39	$579,000
*TOTAL TREE REPLACEMENT (320 Trees)		$375,000
TOTAL		$954,000

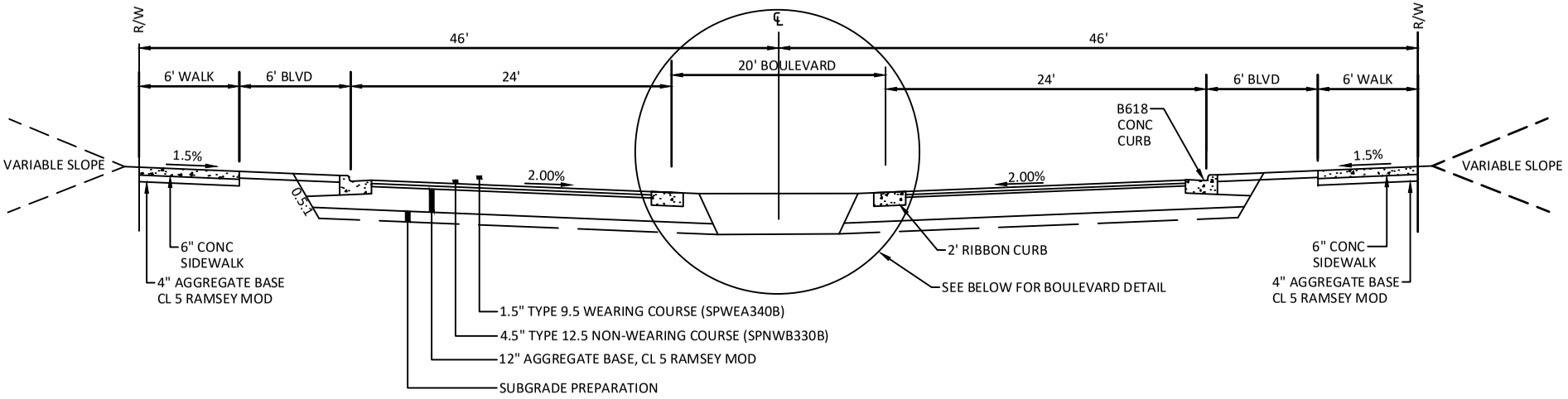
*TREE REPLACEMENT BASED ON CITY OF RAMSEY TREE PRESERVATION ORDINANCE, ASSUMES NEW PLANTED TREES SHALL BE 2.5" CALIPER.

NOTE:

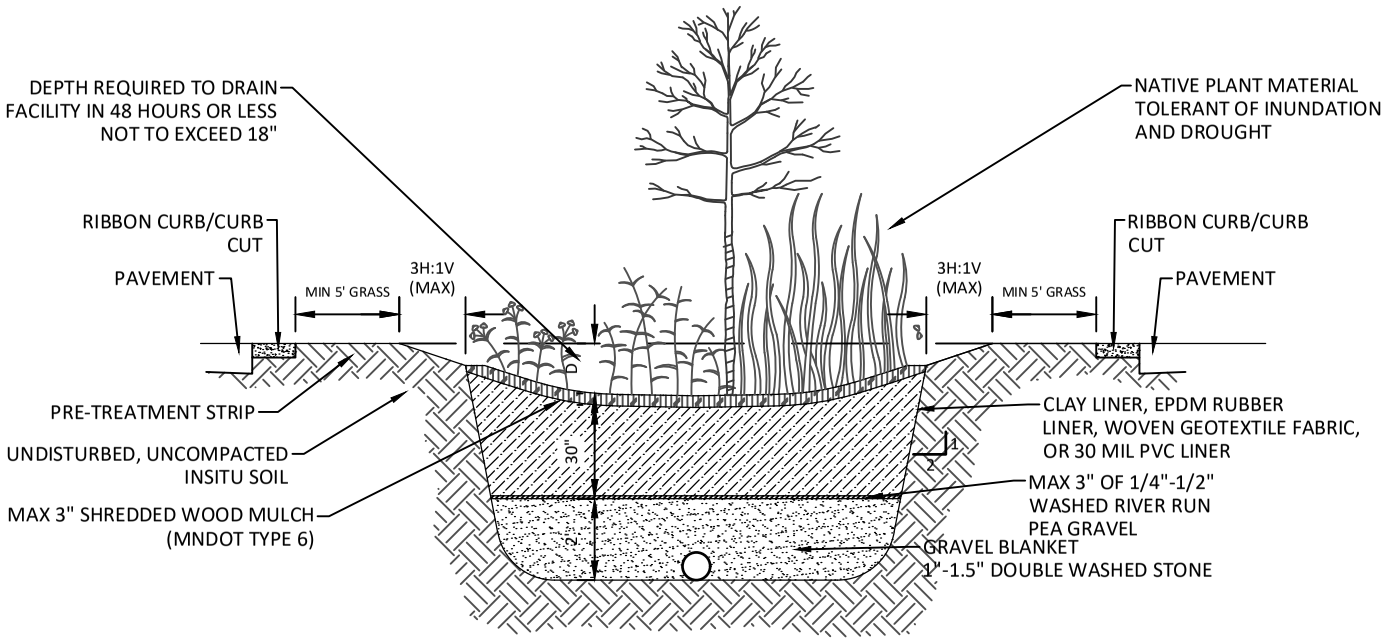
COSTS SHOWN ARE TOTAL PROJECT COSTS FOR AND INCLUDE 30% CONTINGENCIES & ENGINEERING COSTS USING 2023 DOLLARS.

H:\RAMS\0R1129128\CAD\C3D\MISC-129128-TREE INVENTORY.dwg 2/13/2023 4:10:24 PM

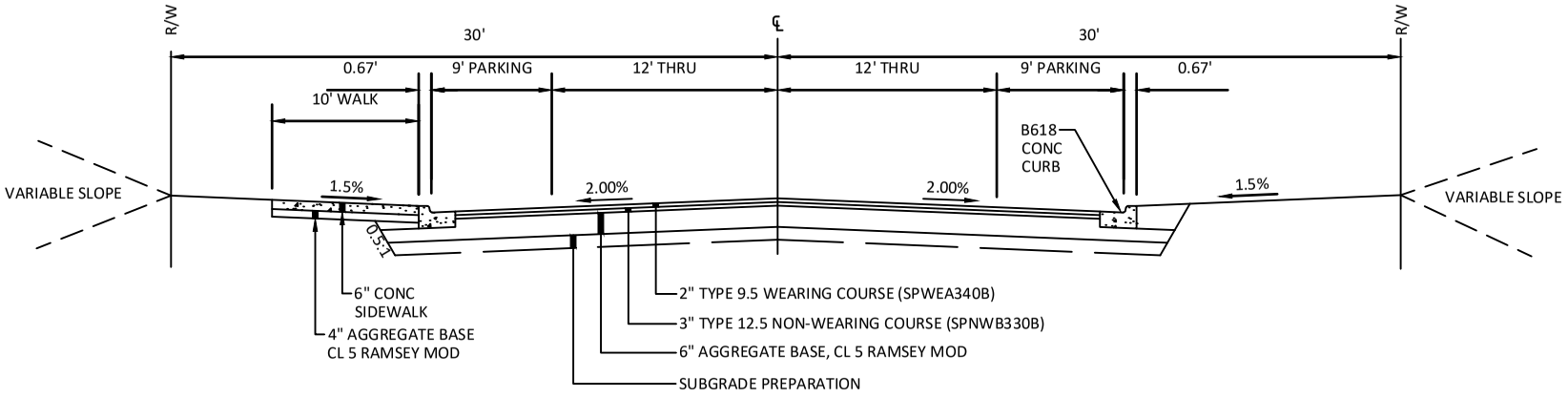
SEGMENT A / RAMSEY PARKWAY



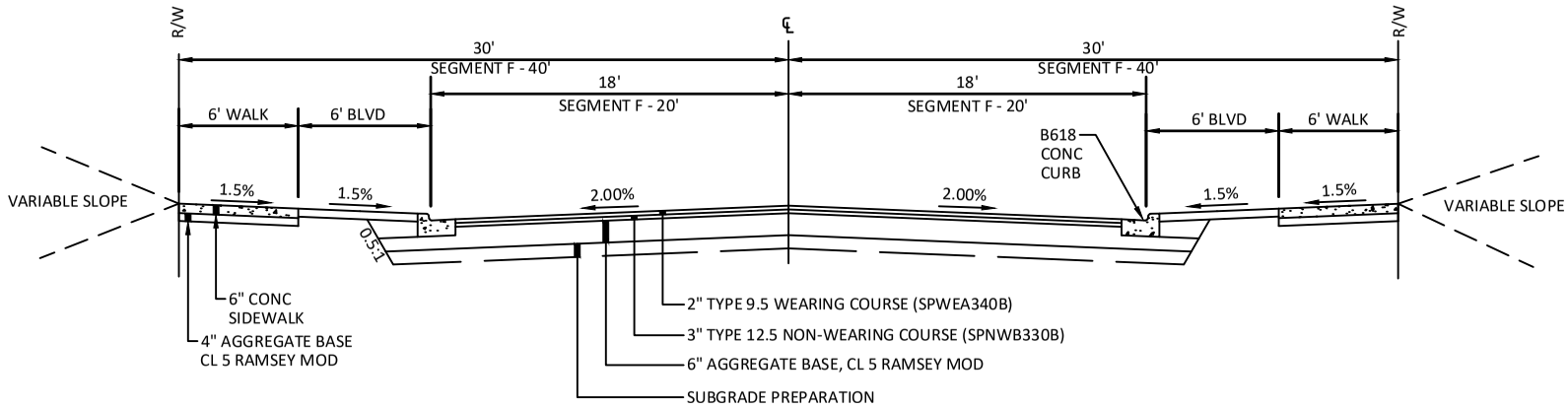
BIORETENTION FACILITY - RAMSEY PARKWAY BOULEVARD



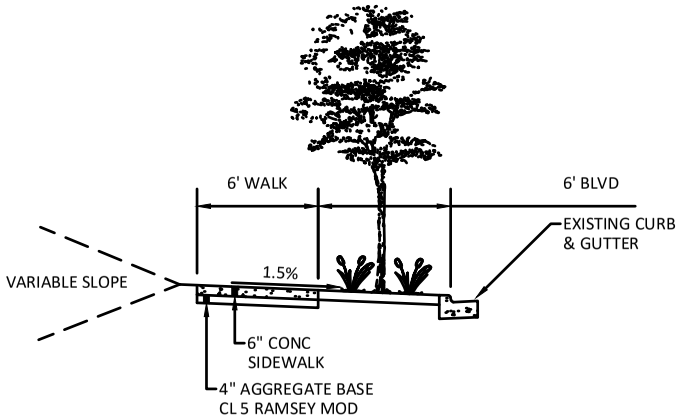
SEGMENT B-1 / CENTER STREET



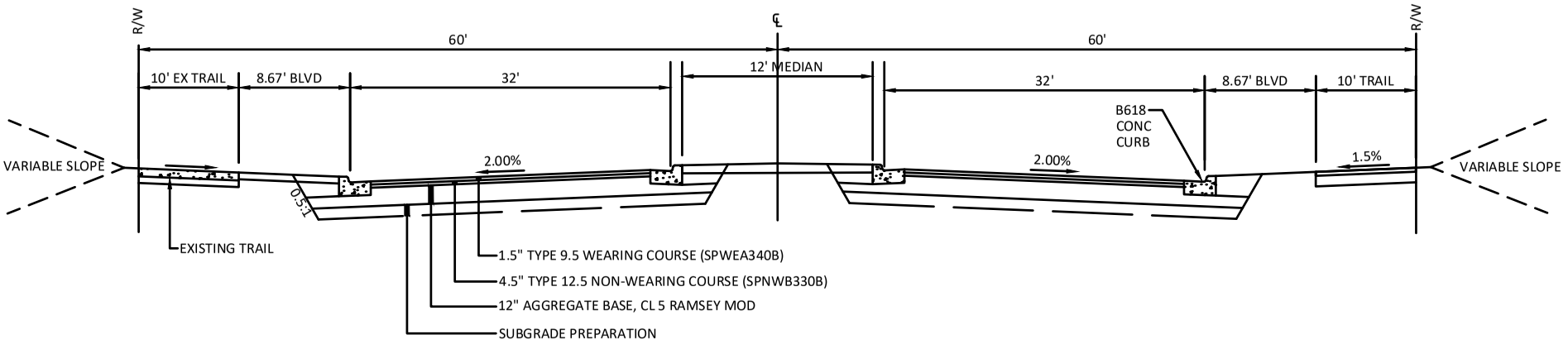
SEGMENT E, F, H, I/YOLITE STREET NW, ZEOLITE STREET NW VETERANS DRIVE, & PERIDOT STREET NW



SEGMENT D / SUNWOOD DRIVE BOULEVARD (LANDSCAPING IMPROVEMENTS)



SEGMENT G / BUNKER LAKE BOULEVARD (BY ANOKA COUNTY)



APPENDIX C: GEOTECHNICAL EVALUATION

FACTUAL

GEOTECHNICAL EXPLORATION AND ENGINEERING REVIEW

Lake Front

Zeolite Street NW and Bunker Lake Boulevard

Ramsey

Minnesota

NTI Project No. 18.MSP05470.000

***Prepared For**:*

Bolton & Menk, Inc.
7533 Sunwood Drive NW, Suite 206
Ramsey, Minnesota 55303

NTI
NORTHERN TECHNOLOGIES, LLC
6160 Carmen Avenue East
Inver Grove Heights, MN 55076
P: 651.389.4191 F: 651.389.4190
www.NTIgeo.com

Unearthing confidence™

June 27, 2018

Bolton & Menk, Inc.
7533 Sunwood Drive NW, Suite 206
Ramsey, Minnesota 55303

Attention: Mr. Kevin KP. Kielb, P.E.

Subject: Factual Geotechnical Exploration and Engineering Review
Lake Front
Ramsey, Minnesota
NTI Project No. 18.MSP05470.000

Dear Mr. Kielb,

In accordance with your request and subsequent authorization, Northern Technologies, LLC (NTI) conducted a Geotechnical Exploration for the above referenced project. Our services included advancement of nine (9) standard penetration test (SPT) soil borings, and the preparation of a factual engineering report with the results of our fieldwork. Our work was performed in general accordance with our proposal dated May 3, 2018.

Soil samples obtained at the site will be held for 60 days at which time they will be discarded. Please advise us in writing if you wish to have us retain them for a longer period. You will be assessed an additional fee if soil samples are retained beyond 60 days.

We appreciate the opportunity to have been of service on this project. If there are any questions regarding the soils explored or our review and recommendations, please contact us at your convenience at (651) 389-4203.

Northern Technologies, LLC

Morgan Bakeman, E.I.T.
Staff Engineer

Steven D. Gerber, P.E.
Senior Engineer

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a Duly Licensed Professional Engineer under the Laws of the State of Minnesota.

Steven D. Gerber
Date: 6/27/2018 Reg. No. 45298

Contents

1.0 INTRODUCTION

1.1 Site / Project Description

The proposed project consists of the utilizing the on-site materials for construction in various locations.

1.2 Scope of Services

The purpose of this factual report is to present a summary of our geotechnical exploration and provide the soil conditions encountered at the project area. Our "Scope of Services" was limited to the following:

1. Explore the project subsurface by means of nine (9) SPT soil borings. Six (6) SPT borings were advanced to depths between 23 and 30 feet and three (3) SPT borings were advanced to depths of approximately 14.5 feet existing grade.
2. Conduct laboratory test(s) on representative samples for characterizing the index and engineering properties of soils strata.
3. Provide a factual geotechnical report with the results of our field and laboratory tests.

2.0 EXPLORATION PROGRAM RESULTS

2.1 Exploration Scope

Site geotechnical exploration began on May 15, 2018, with individual SPT soil borings advanced to varying feet below existing grade at approximate locations as presented on the diagram within the appendices. Soil samples were taken at 2 ½-foot intervals to termination depth of the borings.

NTI located the borings relative to existing site features, and determined the approximate elevation of the borings using MnTOPO LiDAR maps. Boring elevations should be considered to be approximate. Please refer to the Boring/Probe Location Diagram and the Boring Logs in Appendix C.

The boreholes were backfilled with auger cuttings, or were abandoned using high solids bentonite or neat cement grout as per appropriate local and state statutes. Minor settlement of the boreholes will occur. Owner is responsible for final closure of the boreholes.

2.2 Subsurface Conditions

Please refer to the boring logs within the appendices for a detailed description and depths of stratum at the boring locations.

2.3 Groundwater Conditions

The drill crew observed the boreholes for groundwater (if any) during and at the completion of drilling activities. Table 1 details the approximate elevations where groundwater was observed.

Table 1: Apparent elevation of groundwater

Borehole	Estimated Ground Surface Elevation[1] (ft)	Boring Depth to Groundwater	Apparent Elevation of Groundwater
SB-1	867	5.5	861.5
SB-2	869	4.0	865.0
SB-3	868	5.5	862.5
SB-4	869	9.0	860.0
SB-5	871	8.0	863.0
SB-6	869	10.0	859.0
SB-7	868	10.5	857.5
SB-8	872	8.0	864.0
SB-9	871	10.5	860.5

1: Elevations were estimated using MnTopo LiDAR maps.

2.4 Laboratory Test Program

Our analysis and recommendations of this report are based upon our interpretation of the standard penetration test resistance determined while sampling soils, laboratory test results and experience with similar soils from other sites near the project. The results of such tests are summarized on the boring logs or attached laboratory test reports.

3.0 CLOSURE

As the widely spaced, small diameter borings provide only a limited amount of data regarding the existing fill, the existing fill may contain soft zones, debris or significantly greater amounts of unsuitable materials than could be reasonably inferred from the boring information. Unsuitable materials may not be discovered during construction and may remain buried within the fill below the slabs and pavements, resulting in greater than anticipated settlements of the slabs and pavements. These risks cannot be eliminated without completely removing the fill, but can be reduced by thorough exploration and testing during site preparation and construction.

The scope of services for this project does not include either specifically or by implication any environmental or biological assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

This report has been prepared for the exclusive use of Bolton & Menk, Inc. and their agents for specific application to the proposed Lake Front project in Ramsey, Minnesota. Northern Technologies, LLC has endeavored to comply with generally accepted geotechnical engineering practice common to the local area. Northern Technologies, LLC makes no other warranty, express or implied.

Northern Technologies, LLC

Morgan Bakeman, E.I.T.
Staff Engineer

Steven D. Gerber, P.E.
Senior Engineer

APPENDIX A

GEOTECHNICAL EVALUATION OF RECOVERED SOIL SAMPLES

FIELD EXPLORATION PROCEDURES

GENERAL NOTES

WATER LEVEL SYMBOL

DESCRIPTIVE TERMINOLOGY

RELATIVE PROPORTIONS

PARTICLE SIZES

CLASSIFICATION OF SOILS FOR ENGINEERING PURPOSES

GEOTECHNICAL EVALUATION OF RECOVERED SOIL SAMPLES

We visually examined recovered soil samples to estimate distribution of grain sizes, plasticity, consistency, moisture condition, color, presence of lenses and seams, and apparent geologic origin. We then classified the soils according using the Unified Soil Classification System (ASTM D2488). A chart describing this classification system and general notes explaining soil sampling procedures are presented within appendices attachments.

The stratification depth lines between soil types on the logs are estimated based on the available data. In-situ, the transition between type(s) may be distinct or gradual in either the horizontal or vertical directions. The soil conditions have been established at our specific boring locations only. Variations in the soil stratigraphy may occur between and around the borings, with the nature and extent of such change not readily evident until exposed by excavation. These variations must be properly assessed when utilizing information presented on the boring logs.

We request that you, your design team or contractors contact NTI immediately if local conditions differ from those assumed by this report, as we would need to review how such changes impact our recommendations. Such contact would also allow us to revise our recommendations as necessary to account for the changed site conditions.

FIELD EXPLORATION PROCEDURES

Soil Sampling – Standard Penetration Boring:

Soil sampling was performed according to the procedures described by ASTM D-1586. Using this procedure, a 2 inch O.D. split barrel sampler is driven into the soil by a 140-pound weight falling 30 inches. After an initial set of six inches, the number of blows required to drive the sampler an additional 12 inches is recorded (known as the penetration resistance (i.e. “N-value”) of the soil at the point of sampling. The N-value is an index of the relative density of cohesionless soils and an approximation of the consistency of cohesive soils.

Soil Sampling – Power Auger Boring:

The boring(s) was/were advanced with a 6-inch nominal diameter continuous flight auger. As a result, samples recovered from the boring are disturbed, and our determination of the depth, extend of various stratum and layers, and relative density or consistency of the soils is approximate

Soil Classification:

Soil samples were visually and manually classified in general conformance with ASTM D-2488 as they were removed from the sampler(s). Representative fractions of soil samples were then sealed within respective containers and returned to the laboratory for further examination and verification of the field classification. In addition, select samples were submitted for laboratory tests. Individual sample information, identification of sampling methods, method of advancement of the samples and other pertinent information concerning the soil samples are presented on boring logs and related report attachments.

GENERAL NOTES

DRILLING and SAMPLING SYMBOLS		*LABORATORY TEST SYMBOLS*	
SYMBOL	**DEFINITION**	**SYMBOL**	**DEFINITION**
C.S.	Continuous Sampling	W	Moisture content-percent of dry weight
P.D.	2-3/8" Pipe Drill	D	Dry Density-pounds per cubic foot
C.O.	Cleanout Tube	LL, PL	Liquid and plastic limits determined in accordance with ASTM D 423 and D 424
3 HSA	3 ¼" I.D. Hollow Stem Auger	Q_U	Unconfined compressive strength-pounds per square foot in accordance with ASTM D 2166-66
4 FA	4" Diameter Flight Auger		
6 FA	6" Diameter Flight Auger		
2 ½ C	2 ½" Casing		
4 C	4" Casing		
D.M.	Drilling Mud	Pq	Penetrometer reading-tons/square foot
J.W.	Jet Water	S	Torvane reading-tons/square foot
H.A.	Hand Auger	G	Specific Gravity – ASTM D 854-58
NXC	Size NX Casing	SL	Shrinkage limit – ASTM 427-61
BXC	Size BX Casing	Ph	Hydrogen ion content-meter method
AXC	Size AX casing	O	Organic content-combustion method
SS	2" O.D. Split Spoon Sample	M.A.	Grain size analysis
2T	2" Thin Wall Tube Sample	C*	One dimensional consolidation
3T	3" Thin Wall Tube Sample	Q_C	Triaxial Compression
		* See attached data Sheet and/or graph	

WATER LEVEL SYMBOL

Water levels shown on the boring logs were determined at the time and under the conditions indicated. In sand, the indicated levels can be considered relatively reliable for most site conditions. In clay soils, it is not possible to determine the ground water level within the normal scope of a test boring investigation, except where lenses or layers of more pervious water bearing soil are present; and then a long period of time may be necessary to reach equilibrium. Therefore, the position of the water level symbol for cohesive or mixed soils may not indicate the true level of the ground water table. The available water level information is given at the bottom of the log sheet.

DESCRIPTIVE TERMINOLOGY

RELATIVE DENSITY		*CONSISTENCY*	
TERM	**N_{60} Value** (corrected)	**TERM**	**N_{60} Value** (corrected)
Very Loose	0 – 4	Soft	0-4
Loose	5 – 8	Medium	5-8
Medium Dense	9 – 16	Rather Stiff	9 – 15
Dense	16 – 30	Stiff	16 – 30
Very Dense	Over 30	Very Stiff	Over 30

RELATIVE PROPORTIONS

TERMS	**RANGE**
Trace	0 – 5%
A little	5 – 15%
Some	15 – 30%

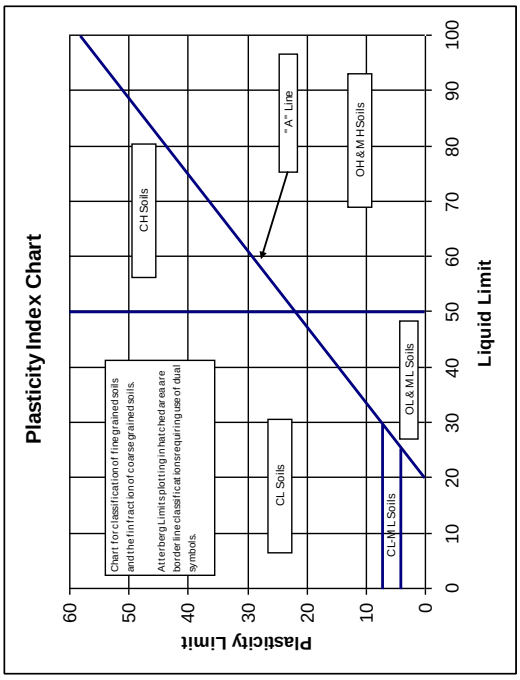
PARTICLE SIZES

MATERIAL	**DESCRIPTION**	**U.S. SIEVE SIZE**
Boulders		Over 3"
Gravel	Coarse	3" to ¾"
	Medium	¾" to #4
Sand	Coarse	#4 to #10
	Medium	#10 to #40
	Fine	#40 to #200
Silt and Clay	Determined by Hydrometer Test	

CLASSIFICATION OF SOILS FOR ENGINEERING PURPOSES

ASTM Designation D-2487 and D2488 (Unified Soil Classification System)

Major Divisions			Group Symbol	Typical Name	Classification Criteria		
Course Grained Soils More than 50% retained on No. 200 sieve *	Gravels 50% or more of coarse fraction retained on No. 4 sieve.	Clean Gravels	GW	Well –graded gravels and gravel-sand mixtures, little or no fines.	**Classification on basis of percentage of fines.** Less than 5% passing No. 200 Sieve: GW, GP, SW, SP. More than 12% passing No. 200 Sieve: GM, GC, SM, SC. From 5% to 12% passing No. 200 Sieve: Borderline Classification requiring use of duel symbols.	Cu = D60 / D10 greater than 4. Cz = (D30)2 / (D10 x D60) between 1 & 3.	
			GP	Poorly graded gravels and gravel-sand mixtures, little or no fines.		Not meeting both criteria for GW materials.	
		Gravels with Fines	GM	Silty gravels, gravel-sand-silt mixtures.		Atterberg limits below "A" line, or P.I. less than 4.	Atterberg limits plotting in hatched area are borderline classifications requiring use of dual symbols.
			GC	Clayey gravels, gravel-sand-clay mixtures.		Atterberg limits above "A" line with P.I. greater than 7.	
	Sands More than 50% of coarse fraction passes No 4 sieve.	Clean Sands	SW	Well-graded sands and gravelly sands, little or no fines.		Cu = D60 / D10 greater than 6. Cz = (D30)2 / (D10 x D60) between 1 & 3.	
			SP	Poorly-graded sands and gravelly sands, little or no fines.		Not meeting both criteria for SW materials.	
		Sands with Fines	SM	Silty sands, sand-silt mixtures.		Atterberg limits below "A" line, or P.I. less than 4.	Atterberg limits plotting in hatched area are borderline classifications requiring use of dual symbols.
			SC	Clayey sands, sand-clay mixtures.		Atterberg limits above "A" line with P.I. > 7.	
Fine Grained Soils More than 50% passes No. 200 sieve *	Silts and Clays Liquid Limit of 50% or less		ML	Inorganic silts, very fine sands, rock flour, silty or clayey fine sands.			
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.			
			OL	Organic silts and organic silty clays of low plasticity.			
	Silts and Clays Liquid Limit greater than 50%.		MH	Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts.			
			CH	Inorganic clays of high plasticity, fat clays.			
			OH	Organic clays of medium to high plasticity.			
	Highly Organic Soils		Pt	Peat, muck and other highly organic soils.			



APPENDIX B

BORING/PROBE LOCATION DIAGRAM

SOIL BORING LOGS


Center Street NW
Bunker Lake Boulevard
Zeolite Street NW
SB-1
SB-2
SB-3
SB-4
SB-5
SB-6
SB-7
SB-8
SB-9

Inver Grove Heights
6160 Carmen Avenue East
Inver Grove Heights, MN, 55076
P: 651-389-4191

BORING NUMBER SB-1

CLIENT Bolton & Menk, Inc. **PROJECT NAME** Lake Front

PROJECT NUMBER 18.MSP.05470.000 **PROJECT LOCATION** Ramsey, MN

DATE STARTED 5/15/18 **COMPLETED** 5/15/18 **GROUND ELEVATION** 866.5 feet **HOLE SIZE** 6 1/2 in.

DRILLING CONTRACTOR NTI **GROUND WATER LEVELS:**

DRILLING METHOD 3 1/4 in H.S.A ▽ **AT TIME OF DRILLING** 5.50 ft / Elev 861.00 ft

LOGGED BY Morgan Bakeman **CHECKED BY** Steve Gerber **AT END OF DRILLING** ---

CAVE IN (ft) --- **FROST DEPTH (ft)** --- **AFTER DRILLING** ---

NOTES Elevations provided by client.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION		SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES
0		0.5 TOPSOIL (6.0 Inches)	866.0	SS 1	89	3-3-4 (7)							
		POORLY GRADED SAND WITH SILT, (SP-SM) brown, medium to coarse grained, moist, loose, trace gravel (Glacial Outwash)		SS 2	78	2-3-3 (6)							6
		3.0	863.5	SS 3	89	2-4-3 (7)							
5		POORLY GRADED SAND WITH SILT, (SP-SM) light brown, medium to coarse grained, moist, loose to medium dense, trace gravel (Glacial Outwash) ▽		SS 4	89	3-4-4 (8)							
				SS 5	78	4-5-4 (9)							
10				SS 6	56	5-5-4 (9)							
		14.5	852.0	SS 7	89	3-4-5 (9)							

Bottom of borehole at 14.5 feet.

Inver Grove Heights
6160 Carmen Avenue East
Inver Grove Heights, MN, 55076
P: 651-389-4191

BORING NUMBER SB-2

CLIENT Bolton & Menk, Inc. **PROJECT NAME** Lake Front

PROJECT NUMBER 18.MSP.05470.000 **PROJECT LOCATION** Ramsey, MN

DATE STARTED 5/15/18 **COMPLETED** 5/15/18 **GROUND ELEVATION** 862 feet **HOLE SIZE** 6 1/2 in.

DRILLING CONTRACTOR NTI **GROUND WATER LEVELS:**

DRILLING METHOD 3 1/4 in H.S.A ▽ **AT TIME OF DRILLING** 4.00 ft / Elev 858.00 ft

LOGGED BY Morgan Bakeman **CHECKED BY** Steve Gerber **AT END OF DRILLING** ---

CAVE IN (ft) --- **FROST DEPTH (ft)** --- **AFTER DRILLING** ---

NOTES Elevations provided by client.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES
0		0.2 TOPSOIL (2.0 Inches) 861.8	SS 1	44	3-3-4 (7)							
		1.5 POORLY GRADED SAND WITH SILT, (SP-SM) brown, medium to coarse grained, moist, loose, trace gravel (FILL) 860.5	SS 2	89	4-5-7 (12)							
		▽ POORLY GRADED SAND WITH SILT, (SP-SM) light brown, medium to coarse grained, moist, loose to medium dense, trace gravel (Glacial Outwash)	SS 3	56	4-7-7 (14)							
5			SS 4	78	3-3-3 (6)							
		NOTE: Soil gray at 8.0 feet	SS 5	89	4-4-4 (8)							
10			SS 6	100	4-5-4 (9)							
		NOTE: Soil light brown at 13.0 feet.	SS 7	89	5-5-6 (11)							
15												
		NOTE: Gravel layer at 18.0 feet. NOTE: Soil gray at 18.0 feet.	SS 8	56	5-7-7 (14)							
20												
		24.5 837.5	SS 9	67	5-5-5 (10)							

Bottom of borehole at 24.5 feet.

Inver Grove Heights
6160 Carmen Avenue East
Inver Grove Heights, MN, 55076
P: 651-389-4191

BORING NUMBER SB-3

CLIENT Bolton & Menk, Inc. **PROJECT NAME** Lake Front

PROJECT NUMBER 18.MSP.05470.000 **PROJECT LOCATION** Ramsey, MN

DATE STARTED 5/15/18 **COMPLETED** 5/15/18 **GROUND ELEVATION** 868 feet **HOLE SIZE** 6 1/2 in.

DRILLING CONTRACTOR NTI **GROUND WATER LEVELS:**

DRILLING METHOD 3 1/4 in H.S.A ▽ **AT TIME OF DRILLING** 5.50 ft / Elev 862.50 ft

LOGGED BY Morgan Bakeman **CHECKED BY** Steve Gerber **AT END OF DRILLING** ---

CAVE IN (ft) --- **FROST DEPTH (ft)** --- **AFTER DRILLING** ---

NOTES Elevations provided by client.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES
0		0.3 TOPSOIL (3.0 Inches) 867.7										
		POORLY GRADED SAND WITH SILT, (SP-SM) brown, medium to coarse grained, moist, loose to medium dense, trace gravel (Glacial Outwash)	SS 1	33	4-5-5 (10)							
		NOTE: Slight iron oxide staining at 1.5 feet.	SS 2	100	5-7-7 (14)							
			SS 3	100	3-4-5 (9)							
5		▽										
			SS 4	78	3-3-3 (6)							
			SS 5	100	1-3-3 (6)							
10												
			SS 6	44	4-5-6 (11)							
			SS 7	44	4-5-7 (12)							
15												
		NOTE: Soil gray at 18.0 feet.	SS 8	56	5-6-7 (13)							
20												
25												
		27.0 841.0	SS 9	56	5-5-7 (12)							
		Bottom of borehole at 27.0 feet.										

Inver Grove Heights
6160 Carmen Avenue East
Inver Grove Heights, MN, 55076
P: 651-389-4191

BORING NUMBER SB-4

CLIENT Bolton & Menk, Inc. **PROJECT NAME** Lake Front

PROJECT NUMBER 18.MSP.05470.000 **PROJECT LOCATION** Ramsey, MN

DATE STARTED 5/15/18 **COMPLETED** 5/15/18 **GROUND ELEVATION** 868 feet **HOLE SIZE** 6 1/2 in.

DRILLING CONTRACTOR NTI **GROUND WATER LEVELS:**

DRILLING METHOD 3 1/4 in H.S.A ▽ **AT TIME OF DRILLING** 9.00 ft / Elev 859.00 ft

LOGGED BY Morgan Bakeman **CHECKED BY** Steve Gerber **AT END OF DRILLING** ---

CAVE IN (ft) --- **FROST DEPTH (ft)** --- **AFTER DRILLING** ---

NOTES Elevations provided by client.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION		SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES
0		0.3 TOPSOIL (3.0 Inches)	867.8	SS 1	89	2-4-4 (8)							
		1.5 POORLY GRADED SAND WITH SILT, (SP-SM) dark brown, medium to coarse grained, moist, loose, trace gravel (FILL)	866.5	SS 2	100	3-4-5 (9)							
		POORLY GRADED SAND WITH SILT, (SP-SM) light brown, medium to coarse grained, moist, loose to medium dense, trace gravel (Glacial Outwash)		SS 3	100	3-4-3 (7)							
5				SS 4	100	3-3-3 (6)							
		▽		SS 5	78	3-3-5 (8)							
10		NOTE: Gray soil at 10.5 feet.		SS 6	56	3-6-5 (11)							
		NOTE: Brown soil layer at 13.0 feet.		SS 7	56	3-3-4 (7)							
15													
				SS 8	56	4-5-7 (12)							
20													
25		25.0	843.0	SS 9	78	4-5-5 (10)							

Bottom of borehole at 25.0 feet.

Inver Grove Heights
6160 Carmen Avenue East
Inver Grove Heights, MN, 55076
P: 651-389-4191

BORING NUMBER SB-5

CLIENT Bolton & Menk, Inc. **PROJECT NAME** Lake Front

PROJECT NUMBER 18.MSP.05470.000 **PROJECT LOCATION** Ramsey, MN

DATE STARTED 5/15/18 **COMPLETED** 5/15/18 **GROUND ELEVATION** 871.5 feet **HOLE SIZE** 6 1/2 in.

DRILLING CONTRACTOR NTI **GROUND WATER LEVELS:**

DRILLING METHOD 3 1/4 in H.S.A ▽ **AT TIME OF DRILLING** 8.00 ft / Elev 863.50 ft

LOGGED BY Morgan Bakeman **CHECKED BY** Steve Gerber **AT END OF DRILLING** ---

CAVE IN (ft) --- **FROST DEPTH (ft)** --- **AFTER DRILLING** ---

NOTES Elevations provided by client.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES
0		1.0 TOPSOIL (1.0 Inches) 870.5	SS 1	78	3-3-3 (6)							
		POORLY GRADED SAND WITH SILT, (SP-SM) brown, medium to coarse grained, moist, loose to dense, trace gravel (Glacial Outwash)	SS 2	67	3-4-3 (7)							
		NOTE: Slight iron oxide staining at 3.0 feet.	SS 3	67	4-3-3 (6)							
5			SS 4	78	4-5-5 (10)							
		▽	SS 5	33	5-7-7 (14)							
10			SS 6	78	7-8-9 (17)							
			SS 7	78	6-7-8 (15)							
15		NOTE: Gravel layer at 18.0 feet.	SS 8	22	6-10-9 (19)							
20												
25		NOTE: Gray soil at 25.5 feet.	SS 9	67	7-7-10 (17)							1
		27.0 844.5 Bottom of borehole at 27.0 feet.										

Inver Grove Heights
6160 Carmen Avenue East
Inver Grove Heights, MN, 55076
P: 651-389-4191

BORING NUMBER SB-6

CLIENT Bolton & Menk, Inc. **PROJECT NAME** Lake Front

PROJECT NUMBER 18.MSP.05470.000 **PROJECT LOCATION** Ramsey, MN

DATE STARTED 5/15/18 **COMPLETED** 5/15/18 **GROUND ELEVATION** 871 feet **HOLE SIZE** 6 1/2 in.

DRILLING CONTRACTOR NTI **GROUND WATER LEVELS:**

DRILLING METHOD 3 1/4 in H.S.A ▽ **AT TIME OF DRILLING** 10.00 ft / Elev 861.00 ft

LOGGED BY Morgan Bakeman **CHECKED BY** Steve Gerber **AT END OF DRILLING** ---

CAVE IN (ft) --- **FROST DEPTH (ft)** --- **AFTER DRILLING** ---

NOTES Elevations provided by client.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES
0		0.2 TOPSOIL (2.0 Inches) 870.8										
		POORLY GRADED SAND WITH SILT, (SP-SM) brown, fine to coarse grained, moist, very loose to loose, trace gravel (FILL)	SS 1	44	1-1-1 (2)							
			SS 2	100	2-3-3 (6)							1
		NOTE: Organic soil layer at 1.5 feet.	SS 3	100	3-4-4 (8)							
5		4.5 866.5										
		POORLY GRADED SAND WITH SILT, (SP-SM) brown, fine to coarse grained, moist, very loose to medium dense, trace gravel (Glacial Outwash)	SS 4	89	4-4-4 (8)							
		NOTE: Slight iron oxide staining at 4.5 feet.	SS 5	100	2-2-2 (4)							
10		▽	SS 6	100	4-5-5 (10)							
			SS 7	100	4-5-6 (11)							
15												
		NOTE: Soil light brown below 18.0 feet.	SS 8	56	3-4-5 (9)							
20												
			SS 9	78	4-5-5 (10)							
25												
		29.5 841.5	SS 10	67	5-5-6 (11)							

Bottom of borehole at 29.5 feet.

Inver Grove Heights
6160 Carmen Avenue East
Inver Grove Heights, MN, 55076
P: 651-389-4191

BORING NUMBER SB-7

CLIENT Bolton & Menk, Inc. **PROJECT NAME** Lake Front

PROJECT NUMBER 18.MSP.05470.000 **PROJECT LOCATION** Ramsey, MN

DATE STARTED 5/15/18 **COMPLETED** 5/15/18 **GROUND ELEVATION** 870.5 feet **HOLE SIZE** 6 1/2 in.

DRILLING CONTRACTOR NTI **GROUND WATER LEVELS:**

DRILLING METHOD 3 1/4 in H.S.A ▽ **AT TIME OF DRILLING** 10.50 ft / Elev 860.00 ft

LOGGED BY Morgan Bakeman **CHECKED BY** Steve Gerber **AT END OF DRILLING** ---

CAVE IN (ft) --- **FROST DEPTH (ft)** --- **AFTER DRILLING** ---

NOTES Elevations provided by client.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES
0		0.2 TOPSOIL (2.0 Inches) 870.3										
		POORLY GRADED SAND WITH SILT, (SP-SM) brown, fine to coarse grained, moist, loose to medium dense, trace gravel (FILL)	SS 1	78	1-2-2 (4)							
			SS 2	100	5-7-7 (14)							
		4.5 866.0	SS 3	100	3-3-4 (7)							
5		POORLY GRADED SAND WITH SILT, (SP-SM) light brown, fine to coarse grained, moist, loose to dense, trace gravel (Glacial Outwash)										
			SS 4	100	4-5-4 (9)							1
			SS 5	100	3-4-4 (8)							
10		▽										
			SS 6	100	3-3-3 (6)							
			SS 7	100	4-5-7 (12)							
15												
			SS 8	78	5-7-8 (15)							
20												
		NOTE: Soil gray below 23.0 feet.	SS 9	100	7-9-11 (20)							
25												
		29.5 841.0	SS 10	100	6-7-7 (14)							

Bottom of borehole at 29.5 feet.

Inver Grove Heights
6160 Carmen Avenue East
Inver Grove Heights, MN, 55076
P: 651-389-4191

BORING NUMBER SB-8

CLIENT Bolton & Menk, Inc. **PROJECT NAME** Lake Front

PROJECT NUMBER 18.MSP.05470.000 **PROJECT LOCATION** Ramsey, MN

DATE STARTED 5/15/18 **COMPLETED** 5/15/18 **GROUND ELEVATION** 869 feet **HOLE SIZE** 6 1/2 in.

DRILLING CONTRACTOR NTI **GROUND WATER LEVELS:**

DRILLING METHOD 3 1/4 in H.S.A ▽ **AT TIME OF DRILLING** 8.00 ft / Elev 861.00 ft

LOGGED BY Morgan Bakeman **CHECKED BY** Steve Gerber **AT END OF DRILLING** ---

CAVE IN (ft) --- **FROST DEPTH (ft)** --- **AFTER DRILLING** ---

NOTES Elevations provided by client.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION		SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES
0		0.9 TOPSOIL (10.0 Inches)	868.1	SS 1	89	3-4-5 (9)							
		POORLY GRADED SAND WITH SILT, (SP-SM) dark brown, fine to coarse grained, moist, trace gravel, trace organics (Fill)		SS 2	89	3-3-3 (6)							
		3.0 POORLY GRADED SAND WITH SILT, (SP-SM) light brown, medium to coarse grained, moist, loose, trace gravel, iron oxide staining (Glacial Outwash)	866.0	SS 3	78	3-4-4 (8)							3
5				SS 4	100	3-3-3 (6)							
		▽		SS 5	100	3-3-4 (7)							
10				SS 6	89	3-4-4 (8)							
		14.5	854.5	SS 7	100	2-3-4 (7)							

Bottom of borehole at 14.5 feet.

Inver Grove Heights
6160 Carmen Avenue East
Inver Grove Heights, MN, 55076
P: 651-389-4191

BORING NUMBER SB-9

CLIENT Bolton & Menk, Inc. **PROJECT NAME** Lake Front

PROJECT NUMBER 18.MSP.05470.000 **PROJECT LOCATION** Ramsey, MN

DATE STARTED 5/15/18 **COMPLETED** 5/15/18 **GROUND ELEVATION** 870.5 feet **HOLE SIZE** 6 1/2 in.

DRILLING CONTRACTOR NTI **GROUND WATER LEVELS:**

DRILLING METHOD 3 1/4 in H.S.A ▽ **AT TIME OF DRILLING** 10.50 ft / Elev 860.00 ft

LOGGED BY Morgan Bakeman **CHECKED BY** Steve Gerber **AT END OF DRILLING** ---

CAVE IN (ft) --- **FROST DEPTH (ft)** --- **AFTER DRILLING** ---

NOTES Elevations provided by client.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES
0		POORLY GRADED SAND WITH SILT, (SP-SM) brown, medium to coarse grained, moist, loose, trace gravel (Fill)	SS 1	100	2-3-3 (6)							
			SS 2	100	3-3-3 (6)							
			SS 3	100	3-2-3 (5)							
5		4.5 866.0 POORLY GRADED SAND WITH SILT, (SP-SM) light brown, medium to coarse grained, moist, loose to medium dense, trace gravel (Glacial Outwash)	SS 4	89	3-4-4 (8)							
			SS 5	100	3-2-3 (5)							
10		▽ NOTE: Soil coarse grained at 11.0 feet.	SS 6	100	3-4-4 (8)							
		14.5 856.0	SS 7	89	4-5-5 (10)							7

Bottom of borehole at 14.5 feet.

APPENDIX D: WETLAND DELINEATION

Ramsey COR Analysis Delineation

Type & Boundary Application

City of Ramsey
October 20th, 2022

Submitted by:
Bolton & Menk, Inc.
3721 23rd Street South
Suite 102
St Cloud, MN 56301

BOLTON & MENK
Real People. Real Solutions.

Table Of Contents

Appendix

PART ONE: Applicant Information

If applicant is an entity (company, government entity, partnership, etc.), an authorized contact person must be identified. If the applicant is using an agent (consultant, lawyer, or other third party) and has authorized them to act on their behalf, the agent's contact information must also be provided.

Applicant/Landowner Name:	City of Ramsey | Brian Hagen | City Administrator
Mailing Address:	7550 Sunwood Drive NW | Ramsey, MN | 55303
Phone:	763-433-9826
Email Address:	bhagen@cityoframsey.com

Authorized Contact (do not complete if same as above):	
Mailing Address:	
Phone:	
E-mail Address:	

Agent Name:	Bolton & Menk, Inc.| Kristina Bloomquist | Senior Natural Resource Specialist
Mailing Address:	3721 23rd Street South | Suite 102 | St Cloud, MN | 56301
Phone:	507-327-6014
E-mail Address:	kristina.bloomquist@bolton-menk.com

PART TWO: Site Location Information

County: Anoka **City/Township: City of Ramsey**

Parcel ID and/or Address: 283225310024, 283225240002, 283225240003, 283225240016, 283225240006, 283225240017, 283225220058, 283225310025

Legal Description (Section, Township, Range): 28, 32N, 25W

Lat/Long (decimal degrees):

Attach a map showing the location of the site in relation to local streets, roads, highways.

Approximate size of site (acres) or if a linear project, length (feet): 88.16 acres

If you know that your proposal will require an individual Permit from the U.S. Army Corps of Engineers, you must provide the names and addresses of all property owners adjacent to the project site. This information may be provided by attaching a list to your application or by using block 25 of the Application for Department of the Army permit which can be obtained at:

http://www.mvp.usace.army.mil/Portals/57/docs/regulatory/RegulatoryDocs/engform_4345_2012oct.pdf

PART THREE: General Project/Site Information

If this application is related to a delineation approval, exemption determination, jurisdictional determination, or other correspondence submitted ***prior to*** this application then describe that here and provide the Corps of Engineers project number.

N/A

Describe the project that is being proposed, the project purpose and need, and schedule for implementation and completion. The project description must fully describe the nature and scope of the proposed activity including a description of all project elements that effect aquatic resources (wetland, lake, tributary, etc.) and must also include plans and cross section or profile drawings showing the location, character, and dimensions of all proposed activities and aquatic resource impacts.

PART FOUR: Aquatic Resource Impact[1] Summary

If your proposed project involves a direct or indirect impact to an aquatic resource (wetland, lake, tributary, etc.) identify each impact in the table below. Include all anticipated impacts, including those expected to be temporary. Attach an overhead view map, aerial photo, and/or drawing showing all of the aquatic resources in the project area and the location(s) of the proposed impacts. Label each aquatic resource on the map with a reference number or letter and identify the impacts in the following table.

Aquatic Resource ID (as noted on overhead view)	**Aquatic Resource Type** (wetland, lake, tributary etc.)	**Type of Impact** (fill, excavate, drain, or remove vegetation)	**Duration of Impact** Permanent (P) or Temporary (T)[1]	**Size of Impact**[2]	**Overall Size of Aquatic Resource** [3]	**Existing Plant Community Type(s)** in Impact Area[4]	**County, Major Watershed #, and Bank Service Area #** of Impact Area[5]

[1]If impacts are temporary; enter the duration of the impacts in days next to the "T". For example, a project with a temporary access fill that would be removed after 220 days would be entered "T (220)".
[2]Impacts less than 0.01 acre should be reported in square feet. Impacts 0.01 acre or greater should be reported as acres and rounded to the nearest 0.01 acre. Tributary impacts must be reported in linear feet of impact and an area of impact by indicating first the linear feet of impact along the flowline of the stream followed by the area impact in parentheses). For example, a project that impacts 50 feet of a stream that is 6 feet wide would be reported as 50 ft (300 square feet).
[3]This is generally only applicable if you are applying for a de minimis exemption under MN Rules 8420.0420 Subp. 8, otherwise enter "N/A".
[4]Use *Wetland Plants and Plant Community Types of Minnesota and Wisconsin* 3rd Ed. as modified in MN Rules 8420.0405 Subp. 2.
[5]Refer to Major Watershed and Bank Service Area maps in MN Rules 8420.0522 Subp. 7.

If any of the above identified impacts have already occurred, identify which impacts they are and the circumstances associated with each:

N/A

PART FIVE: Applicant Signature

☐ Check here if you are requesting a pre-application consultation with the Corps and LGU based on the information you have provided. Regulatory entities will not initiate a formal application review if this box is checked.

By signature below, I attest that the information in this application is complete and accurate. I further attest that I possess the authority to undertake the work described herein.

Signature: _____ Date: 10-26-22

I hereby authorize **Bolton & Menk, Inc** to act on my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this application.

[1] **The term "impact" as used in this joint application form is a generic term used for disclosure purposes to identify activities that may require approval from one or more regulatory agencies. For purposes of this form it is not meant to indicate whether or not those activities may require mitigation/replacement.**

Attachment A

Request for Delineation Review, Wetland Type Determination, or Jurisdictional Determination

By submission of the enclosed wetland delineation report, I am requesting that the U.S. Army Corps of Engineers, St. Paul District (Corps) and/or the Wetland Conservation Act Local Government Unit (LGU) provide me with the following (check all that apply):

☒ **Wetland Type Confirmation**

☒ **Delineation Concurrence**. Concurrence with a delineation is a written notification from the Corps and a decision from the LGU concurring, not concurring, or commenting on the boundaries of the aquatic resources delineated on the property. Delineation concurrences are generally valid for five years unless site conditions change. Under this request alone, the Corps will not address the jurisdictional status of the aquatic resources on the property, only the boundaries of the resources within the review area (including wetlands, tributaries, lakes, etc.).

☐ **Preliminary Jurisdictional Determination**. A preliminary jurisdictional determination (PJD) is a non-binding written indication from the Corps that waters, including wetlands, identified on a parcel may be waters of the United States. For purposes of computation of impacts and compensatory mitigation requirements, a permit decision made on the basis of a PJD will treat all waters and wetlands in the review area as if they are jurisdictional waters of the U.S. PJDs are advisory in nature and may not be appealed.

☒ **Approved Jurisdictional Determination**. An approved jurisdictional determination (AJD) is an official Corps determination that jurisdictional waters of the United States are either present or absent on the property. AJDs can generally be relied upon by the affected party for five years. An AJD may be appealed through the Corps administrative appeal process.

In order for the Corps and LGU to process your request, the wetland delineation must be prepared in accordance with the 1987 Corps of Engineers Wetland Delineation Manual, any approved Regional Supplements to the 1987 Manual, and the *Guidelines for Submitting Wetland Delineations in Minnesota* (2013).
http://www.mvp.usace.army.mil/Missions/Regulatory/DelineationJDGuidance.aspx

An AJD is being requested for Wetlands 1, 2, 3, 4, 5, 6, 7, and 8. These wetlands are being requested as non-jurisdictional under Section 404 of the CWA.

Wetlands 3, 5 and 6 are ponds excavated in upland and were not constructed with the intent of creating a wetland. These wetlands were observed to have distinct slopes and were excavated to be significantly lower than the surrounding area. Wetland 3 was constructed in 2011. Wetlands 5 and 6 were constructed in 2012.

Wetlands 1, 2, 4, 7, and 8 are isolated basins that are not adjacent to or connected to any Waters of the U.S.

Attachment B

Supporting Information for Applications Involving Exemptions, No Loss Determinations, and Activities Not Requiring Mitigation

Complete this part ***if*** you maintain that the identified aquatic resource impacts in Part Four do not require wetland replacement/compensatory mitigation OR ***if*** you are seeking verification that the proposed water resource impacts are either exempt from replacement or are not under CWA/WCA jurisdiction.

Identify the specific exemption or no-loss provision for which you believe your project or site qualifies:

8420.00105 Subpart 2.D – Incidental Wetlands

Provide a detailed explanation of how your project or site qualifies for the above. Be specific and provide and refer to attachments and exhibits that support your contention. Applicants should refer to rules (e.g. WCA rules), guidance documents (e.g. BWSR guidance, Corps guidance letters/public notices), and permit conditions (e.g. Corps General Permit conditions) to determine the necessary information to support the application. Applicants are strongly encouraged to contact the WCA LGU and Corps Project Manager prior to submitting an application if they are unsure of what type of information to provide:

8420.00105 Subpart 2.D – Incidental Wetlands

Figure 1 shows historical imagery of the proposed incidental wetlands. Wetlands 3, 5, and 6, and portions of Wetland 2 and 7 are being requested as incidental wetlands.

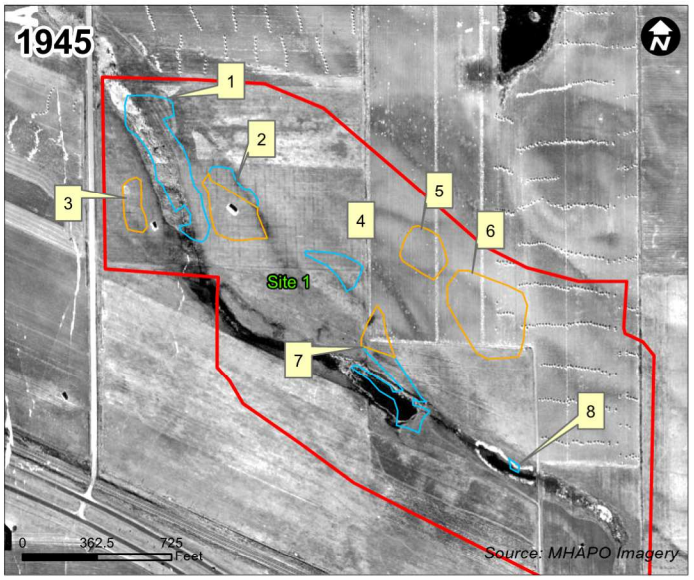
Wetlands 3, 5 and 6, and portions of Wetlands 2 and 7 are ponds excavated in upland and were not constructed with the intent of creating a wetland. These wetlands were observed to have distinct slopes and were excavated to be significantly lower than the surrounding area. Wetland 3 was constructed in 2011. Wetlands 5 and 6 were constructed in 2012. Wetland 2 was excavated between 1997 and 2000. Wetland 7 was excavated between 2005-2006.

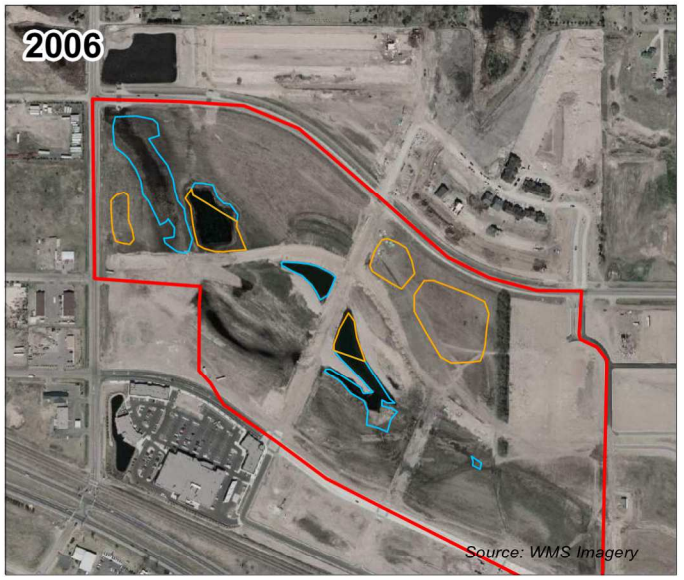
Appendix

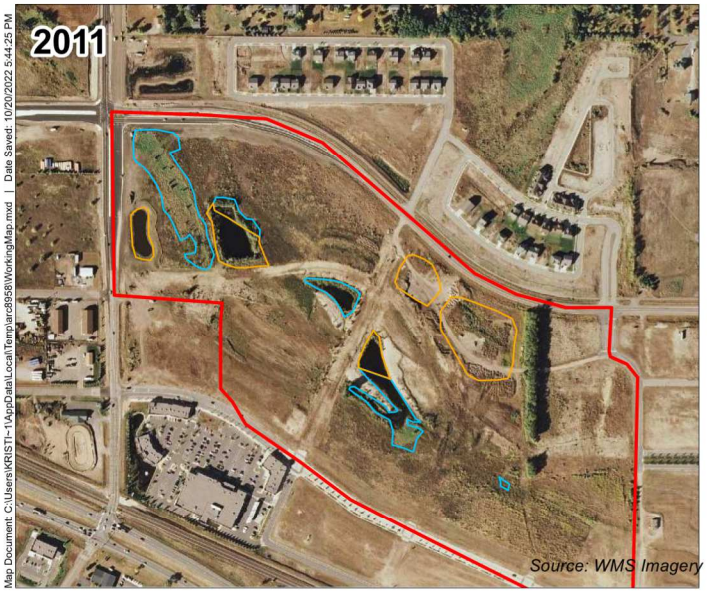
Figure 1: Historical Imagery 1945-2021

October 2022

BOLTON & MENK
Real People. Real Solutions.







Ramsey COR Analysis Delineation

Delineated Aquatic Resources Report

City of Ramsey
October 20th, 2022

Submitted by:
Bolton & Menk, Inc.
3721 23rd Street South
Suite 102
St Cloud, MN 56301

BOLTON & MENK
Real People. Real Solutions.

Table of Contents

Tables

Exhibits

Appendix

I. INTRODUCTION

The City of Ramsey is considering improvements to several parcels known as COR, within the City. This delineation was completed to aid in the design and permitting of the project.

The project is found in Sections 28, in Township 32 North of Range 25 West.

II. WETLAND DELINEATION METHODOLOGY

The wetland boundaries were delineated and staked in the field in September of 2022 using methods described in the "Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral/Northeast Region (Version 2.0)". Wetlands identified were classified using "Classification of Wetlands and Deepwater Habitats of the United States (Cowardin, et al., 1979)", "Wetlands of the United States (United States Fish and Wildlife Service Circular No. 39, 1971 edition)" and "Wetland Plants and Plant Communities of Minnesota and Wisconsin" (Eggers and Reed Third Edition). Subsequently, the three mandatory technical criteria for wetland determinations are as follows:

Hydrophytic Vegetation. A hydrophytic plant community is present when the dominant plant species present can endure prolonged inundation and/or soil saturation during the growing season. A plant's Wetland Indicator Status is determined using the 2020 National Wetland Plant List for Minnesota, published by the Army Corp of Engineers.

Hydric Soils. A hydric soil is defined as a soil that is formed under conditions of saturation, flooding or ponding long enough during the growing season (the portion of the year when there is above ground growth and development of vascular plants and/or soil temperature at 12 inches below the soil surface is above 41 degrees Fahrenheit or higher) to develop anaerobic conditions in the upper part.

Wetland Hydrology. An area has wetland hydrology if it experiences 14 or more consecutive days of flooding, ponding or a water table within 12 inches of the surface during the growing season at a minimum frequency of five out of ten years. This is determined by using both primary and secondary Wetland Hydrology indicators.

III. BACKGROUND INFORMATION

Prior to conducting a field investigation of this site, Exhibits A through E were used to complete a preliminary evaluation. The data gathered during the preliminary investigation was used as described below:

Exhibit A is a location map of the study area.

Exhibits B is an aerial photo with topographic information overlaid on it. This provides information regarding topography of the site, helping to identify areas that may have wetland characteristics.

Exhibit C is the National Wetlands Inventory of the site and surrounding properties. This information is used to complete a preliminary investigation of the wetlands that may or may not exist on the site.

Exhibit D is used to identify waters that are regulated by the DNR. This exhibit shows where there are DNR public waters relative to the site.

Exhibit E is the Anoka County Soil Survey and is used to identify hydric soils that may lie within the study area.

Delineation Exhibits F and G were prepared from the information gathered at the site.

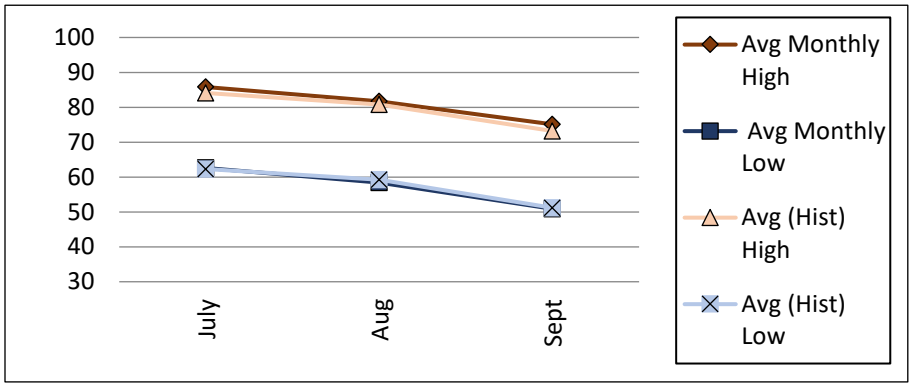
Exhibit F are the site maps showing the delineated aquatic resources.

Exhibit G includes the wetland delineation data sheets.

IV. CLIMATE DATA

The monthly temperature table below shows the average high and low temperatures for the three months prior to the field delineation, along with the historical averages for these months. The monthly low and high temperatures have been within normal ranges for this time period.

MONTHLY TEMPERATURE RANGE



Antecedent precipitation was evaluated using a combination of the NRCS Method and the Rolling Totals Method. The analysis found that precipitation was normal at the time of the delineation.

ANTECEDENT PRECIPITATION CONDITIONS

This climatic data was gathered using the Climatology Working Group Website, http://climate.umn.edu/ and the National Weather Service Forecast Office, http://w2.weather.gov/climate/. The information for the investigation was retrieved from the WETS Station at Andover 1 N, MN; Station ID – 210190.

V. FINDINGS

In September of 2022 a field investigation was performed to evaluate and verify the existence and boundary of any aquatic resources located within the study area. Eight wetlands were found to exist within the study area. The following describes the aquatic resources identified, together with a brief description of wetland types and observations made during the field investigation.

Wetland 1 (W1):
NWI Cowardin: PEM1A
PWI (Hydro) ID: None
Field Observation Circular 39: Type 2
Field Observation Eggers and Reed: Fresh (wet) Meadow
Soil Mapping Unit(s): Duelm loamy sand/Hubbard loamy sand/Isan sandy loam

W1

Wetland 1 is located in the northwest corner of the study area. Wetland 1 is believed to be a historical wetland.

The field investigation found the site has met all three wetland indicators and this wetland should be considered palustrine emergent persistent seasonally saturated (PEM1B) wetland. One transect and several sample points were taken to determine the wetland boundary. Soils, hydrology and topography aided in determining the wetland boundary.

At the wetland pit location W1A the plant community is dominated by reed canary grass and quaking aspen. The upland pit location W1B is dominated by smooth brome, reed canary grass, and quaking aspen. Both plant communities are considered hydrophytic.

Soils in the wetland pit location W1A were marked as Other and assumed to meet a hydric soil indicator below the thick dark surface. Soils in the upland pit location W1B did not meet any hydric soil indicators.

Soils in the wetland pit W1A were not saturated. The pit location met secondary hydrology indicators D2 – Geomorphic Position and D5 – FAC-Neutral Test. Soils in the upland pit location W1B were not saturated and did not meet any hydrology indicators.

The determining factor for this delineation was the lack of hydric soil and wetland hydrology indicators at the upland pit location. The boundaries were determined by following the topographic breaks.

Wetland 2 (W2):
NWI Cowardin: PSS1A/PUBH
PWI (Hydro) ID: None
Field Observation Circular 39: Type 4/7
Field Observation Eggers and Reed: Deep Marsh/Wooded Swamp
Soil Mapping Unit(s): Duelm loamy sand/Hubbard loamy sand

Wetland 2 is located in the northeast part of the study area, just to the east of Wetland 1. A portion of W2 is believed to be historical with the other portion being a pond excavated in upland.

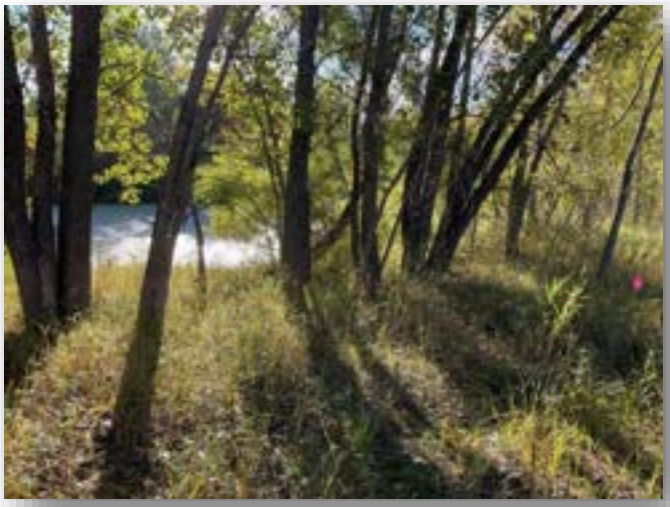
The field investigation found the site has met all three wetland indicators and this portion of the wetland should be considered a palustrine emergent semipermanently flooded/palustrine forested

broad-leaved deciduous temporarily flooded (PEMF/PFO1A) wetland. One transect and several sample points were taken to determine the wetland boundary. Soils, hydrology and topography aided in determining the wetland boundary.

At the wetland pit location W2A the plant community is dominated by common black willow, quaking aspen, sandbar willow, and reed canary grass. The upland pit location for this transect is W1B.

Soils in the wetland pit location W2A met hydric soil indicator F6 – Redox Dark Surface.

Soils in the wetland pit W2A were not saturated. The wetland pit location met secondary hydrology indicators D2 and D5.



W2

The determining factor for this delineation was the lack of hydric soil and wetland hydrology indicators at the upland pit location. The boundaries were determined by following the topographic break and vegetative break.

W3

<u>Wetland 3 (W3):</u>
NWI Cowardin: None
PWI (Hydro) ID: None
Field Observation Circular 39: Type 4/6
Field Observation Eggers and Reed: Deep Marsh/Shrub Swamp
Soil Mapping Unit(s): Duelm loamy sand/Hubbard loamy sand

Wetland 3 is found in the northwest part of the study area. W3 is believed to be a pond excavated in upland.

The field investigation found the site has met all three wetland indicators and this portion of the wetland should be considered a palustrine emergent semipermanently flooded/palustrine scrub shrub broad-leaved deciduous temporarily flooded (PEMF/PSS1A) wetland. No transect but several sample points were taken to determine the wetland boundary. Soils, hydrology and topography aided in determining the wetland boundary.

Wetland 3 is dominated by sandbar willow and cattails. The upland areas adjacent to W3 are dominated by Canada goldenrod and smooth brome.

The determining factor for this delineation was the lack of hydrophytic vegetation in the surrounding upland areas. The boundaries were determined by following the topographic break and vegetative break.

Wetland 4 (W4):
NWI Cowardin: PUBHx
PWI (Hydro) ID: None
Field Observation Circular 39: Type 3/7
Field Observation Eggers and Reed: Shallow Marsh/Wooded Swamp
Soil Mapping Unit(s): Duelm loamy sand/Hubbard loamy sand

W4

Wetland 4 is located in the west-central part of the study area. W4 is believed to be partially excavated in a historical wetland and partially excavated in upland.

The field investigation found the site has met all three wetland indicators and this portion of the wetland should be considered a palustrine emergent persistent seasonally flooded/palustrine forested broad-leaved deciduous temporarily flooded (PEM1C/PFO1A) wetland. One transect and several sample points were taken to determine the wetland boundary. Soils, hydrology and topography aided in determining the wetland boundary.

At the wetland pit location W4A the plant community is dominated by common Canada bluejoint, giant goldenrod, riverbank grape, sandbar willow, quaking aspen, and black willow. The upland pit location W4B is dominated by white sweet clover, Canada bluejoint, quaking aspen, and sandbar willow. Both plant communities are considered hydrophytic.

Soils in the wetland pit location W4A met hydric soil indicator F3 – Depleted Matrix. Soils in the upland pit location W4B did not meet any hydric soil indicators.

W4 Transect

Soils in the wetland pit W4A were not saturated. The wetland pit location met secondary hydrology indicators D2 and D5. Soils in the upland pit location W4B were not saturated and only met secondary hydrology indicator D5.

The determining factor for this delineation was the lack of hydric soil and wetland hydrology indicators at the upland pit location. The boundaries were determined by following the topographic break and vegetative break.

Wetland 5 (W5):
NWI Cowardin: None
PWI (Hydro) ID: None
Field Observation Circular 39: Type 6
Field Observation Eggers and Reed: Shrub Swamp
Soil Mapping Unit(s): Hubbard loamy sand

W5

Wetland 5 is found in the north-central part of the study area. W5 is believed to be a pond excavated in upland.

The field investigation found the site has met all three wetland indicators and this portion of the wetland should be considered a palustrine scrub shrub broad-leaved deciduous seasonally flooded (PSS1C) wetland. No transect but several sample points were taken to determine the wetland boundary. Soils, hydrology and topography aided in determining the wetland boundary.

Wetland 5 is dominated by sandbar willow and cattails. The upland areas adjacent to W3 are dominated by Kentucky bluegrass.

The determining factor for this delineation was the lack of hydrophytic vegetation in the surrounding upland areas. The boundaries were determined by following the topographic break and vegetative break.

W6

Wetland 6 (W6):
NWI Cowardin: None
PWI (Hydro) ID: None
Field Observation Circular 39: Type 4/6
Field Observation Eggers and Reed: Deep Marsh/Shrub Swamp
Soil Mapping Unit(s): Hubbard loamy sand

Wetland 6 is found in the northeast part of the study area. W6 is believed to be a pond excavated in upland.

The field investigation found the site has met all three wetland indicators and this portion of the wetland should be considered a palustrine emergent semipermanently flooded/palustrine scrub shrub broad-leaved deciduous seasonally saturated (PEMF/PSS1B) wetland. No transect but several sample points were taken to determine the wetland boundary. Soils, hydrology and topography aided in determining the wetland boundary.

Wetlands 6 is dominated by sandbar willow and cattails. The upland areas adjacent to W3 are dominated by Canada goldenrod and smooth brome.

The determining factor for this delineation was the lack of hydrophytic vegetation in the surrouning upland areas. The boundaries were determined by following the topographic break and vegetative break.

Wetland 7 (W7):

NWI Cowardin: PEM1A/PUBHx
PWI (Hydro) ID: None
Field Observation Circular 39: Type 2/3/4/7
Field Observation Eggers and Reed: Fresh (wet) Meadow/Shallow Marsh/Deep Marsh/Wooded Swamp
Soil Mapping Unit(s): Duelm loamy sand/Hubbard loamy sand/Isan sandy loam

W7

Wetland 7 is located in the central part of the study area. A portion of W7 is believed to be excavated in historical wetland, with the remaining portion being excavated in upland.

The field investigation found the site has met all three wetland indicators and this portion of the wetlands should be considered a palustrine emergent persistent seasonally saturated/seasonally flooded/semipermanently flooded/palustrine forested broad-leaved deciduous temporarily flooded (PEM1B/C/F/PFO1A) wetland. One transect and several sample points were taken to determine the wetland boundary. Soils, hydrology and topography aided in determining the wetland boundary.

At the wetland pit location W7A the plant community is dominated by reed canary grass and sandbar willow. The upland pit location W7B is dominated by white sweet clover, quaking aspen, and sandbar willow. Both plant communities are considered hydrophytic.

Soils in the wetland pit location W7A met hydric soil indicator A11 – Depleted Below Dark Surface. Soils in the upland pit location W7B did not meet any hydric soil indicators.

Soils in the wetland pit W7A were not saturated. The wetland pit location met secondary hydrology indicators D2 and D5. Soils in the upland pit location W7B were not saturated and did not meet any hydrology indicators.

The determining factor for this delineation was the lack of hydric soil and wetland hydrology indicators at the upland pit location. The boundaries were determined by following the topographic break and vegetative break.

Wetland 8 (W8):

W8

NWI Cowardin: PEM1A
PWI (Hydro) ID: None
Field Observation Circular 39: Type 1
Field Observation Eggers and Reed: Seasonally Flooded Basin
Soil Mapping Unit(s): Isan sandy loam

Wetland 8 is located in the southeast part of the study area and is believed to be a historical wetland.

The field investigation found the site has met all three wetland indicators and this portion of the wetlands should be considered a palustrine emergent temporarily flooded (PEMA) wetland. One transect and several sample points

were taken to determine the wetland boundary. Soils, hydrology and topography aided in determining the wetland boundary.

At the wetland pit location W8A the plant community is dominated by a sedge species and Canada bluejoint. The upland pit location W8B is dominated by Canada goldenrod, Siberian elm, and quaking aspen. Only the wetland plant community is considered hydrophytic.

Soils in the wetland pit location W8A were marked as Other and assumed to meet a hydric soil indicator below the thick dark surface. Soils in the upland pit location W8B did not meet any hydric soil indicators.

Soils in the wetland pit W8A were not saturated. The wetland pit location met secondary hydrology indicators D2 and D5. Soils in the upland pit location W8B were not saturated and did not meet any hydrology indicators.

The determining factor for this delineation was the lack of all three indicators at the upland pit location. The boundaries were determined by following the topographic break and vegetative break.

VI. CONCLUSION

This delineation was performed in September of 2022. The boundaries of the wetlands were staked in the field with three foot "Wetland Delineation" pin flags. The location of the pin flags were surveyed by Bolton & Menk, Inc. using a sub-foot GPS Data Collector and tied to the Anoka County coordinate system. The delineated limits are believed to be the upper limits of where all three of the required wetland criteria were present.

Bolton & Menk, Inc., was asked to determine the boundaries of those jurisdictional wetlands that exist upon this property as defined by the Wetland Conservation Act.

Based upon all available information, the existing conditions that currently prevail, and the on-site investigation, evidence supports the presence of eight wetlands within the boundaries of the study corridor.

WETLAND SUMMARY

Id #	Wetland Type^	Size*
W1	Type 2	2.65 ac
W2	Type 4/7	1.65 ac
W3	Type 4/6	0.53 ac
W4	Type 3/7	0.53 ac
W5	Type 6	0.91 ac
W6	Type 4/6	2.78 ac
W7	Type 2/3/4/7	1.60 ac
W8	Type 1	0.04 ac

**size measured within study area.*
^wetland type within study area

Sincerely,
BOLTON & MENK, INC.

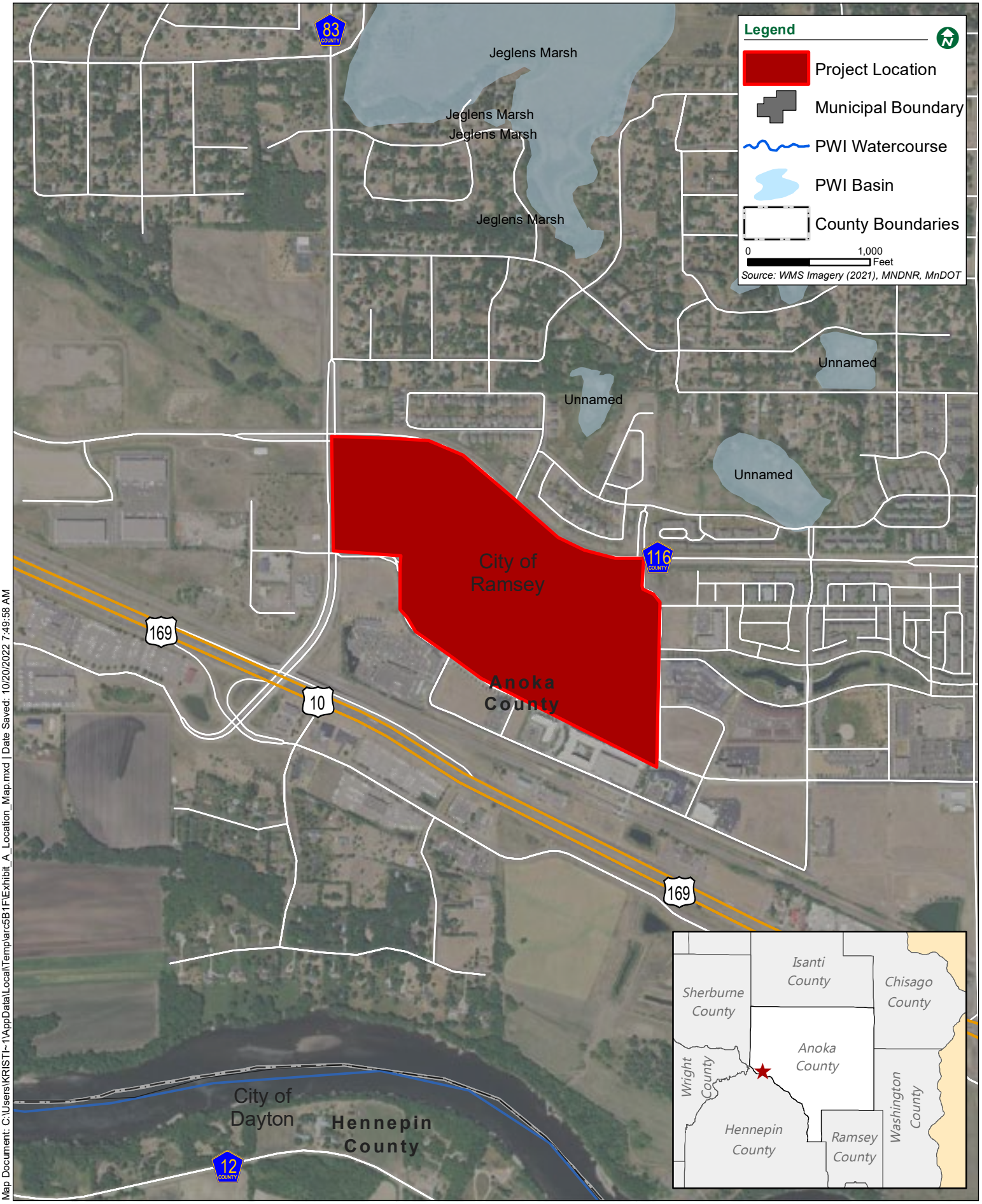
Kristina Bloomquist, PWS
Certified Wetland Delineator, No. 1340

APPENDIX

Exhibit A: Location Map

October 2022

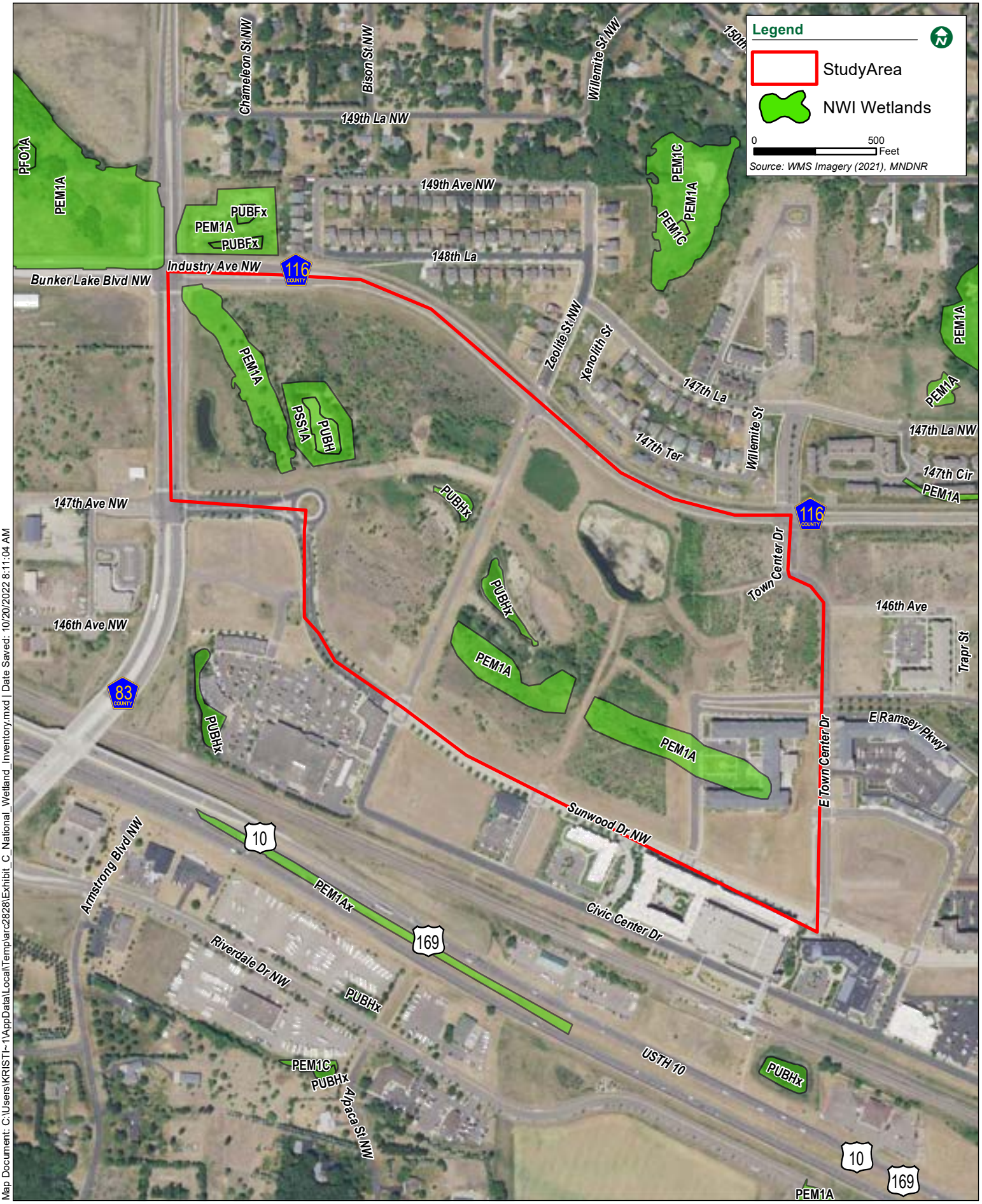
BOLTON & MENK
Real People. Real Solutions.



Map Document: C:\Users\KRISTI~1\AppData\Local\Temp\arc5B1F\Exhibit_A_Location_Map.mxd | Date Saved: 10/20/2022 7:49:58 AM

Exhibit C: National Wetland Inventory

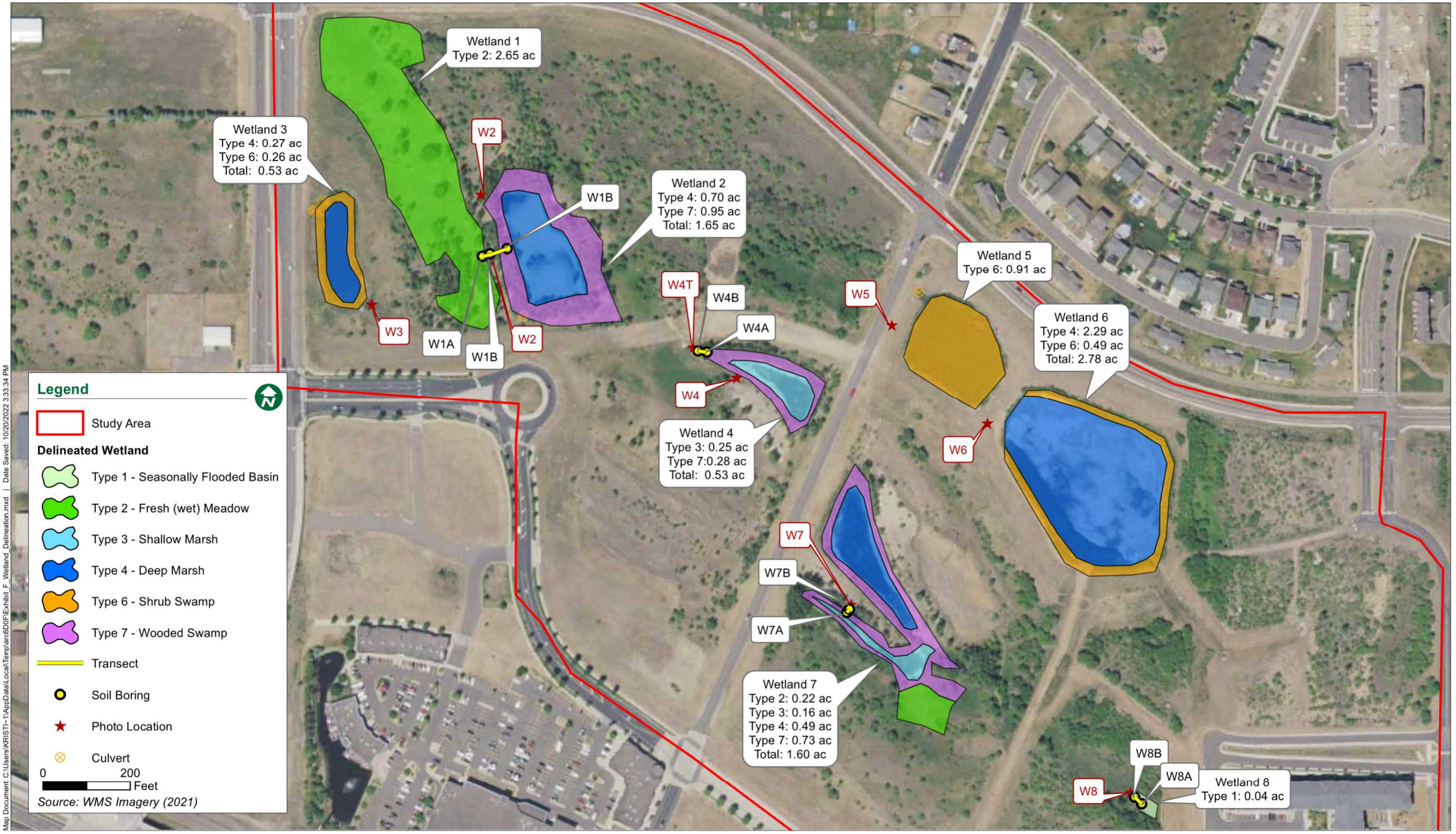
BOLTON & MENK
Real People. Real Solutions.



Map Document: C:\Users\KRISTI~1\AppData\Local\Temp\arc978B\Exhibit_D_Public_Water_Inventory.mxd | Date Saved: 10/20/2022 8:29:27 AM

Symbol	Name	Slopes	Hydric Rating	Hydric Class
Dp	Duelm loamy sand	0-2%	No	7%
D67A	Hubbard loamy sand	0-2%	No	1%
Is	Isan sandy loam	0-1%	Yes	93%

Map Document: C:\Users\KRISTI~1\AppData\Local\Temp\arc3BFB\Exhibit_E_County_Soil_Survey.mxd | Date Saved: 10/20/2022 8:50:56 AM



Map Document: C:\Users\KRIST~1\AppData\Local\Temp\arc600\Exhibit_F_Wetland_Delineation.mxd | Date Saved: 10/20/2022 3:33:34 PM

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ramsey COR Delineation City/County: Anoka County Sampling Date: 2022-09-29

Applicant/Owner: City Of Ramsey State: Minnesota Sampling Point: W1A

Investigator(s): Kristina Bloomquist Section, Township, Range: sec 28 T032N R025W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-2

Subregion (LRR or MLRA): LRR K, MLRA 91A Lat: 45.238347 Long: -93.468561 Datum: WGS84

Soil Map Unit Name: Isan-Isan, frequently ponded, complex, 0 to 2 percent slopes NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No (If no, explain in Remarks.)

Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No

Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No	**Is the Sampled Area within a Wetland?** **Yes ✔** **No**
Hydric Soil Present?	Yes ✔	No	
Wetland Hydrology Present?	Yes ✔	No	If yes, optional Wetland Site ID:

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)
- Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- Marl Deposits (B15)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Crayfish Burrows (C8)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- ✔ Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- ✔ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes No ✔ Depth (inches):

Water Table Present? Yes No ✔ Depth (inches):

Saturation Present? (includes capillary fringe) Yes No ✔ Depth (inches):

Wetland Hydrology Present? Yes ✔ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: W1A

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Populus tremuloides*	25	Y	FAC
2. *Fraxinus pennsylvanica*	5	N	FACW
3.			
4.			
5.			
6.			
7.			
	30 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Herb Stratum (Plot size: 5)			
1. *Phalaris arundinacea*	80	Y	FACW
2. *Symphyotrichum lateriflorum*	5	N	FAC
3. *Solidago gigantea*	5	N	FACW
4. *Asclepias syriaca*	5	N	UPL
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	95 = Total Cover		

Woody Vine Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0.00	x 1 =	0.00
FACW species	90.00	x 2 =	180.00
FAC species	30.00	x 3 =	90.00
FACU species	0.00	x 4 =	0.00
UPL species	5.00	x 5 =	25.00
Column Totals:	125.00 (A)		295.00 (B)

Prevalence Index = B/A = 2.36

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ☑ **No** ☐

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: W1A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-24	10YR 2/1	100					SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ☐ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ☐ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ☐ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ☐ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ☐ Dark Surface (S7) (**LRR K, L**)
- ☐ Polyvalue Below Surface (S8) (**LRR K, L**)
- ☐ Thin Dark Surface (S9) (**LRR K, L**)
- ☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ☐ Red Parent Material (F21)
- ☐ Very Shallow Dark Surface (TF12)
- ☑ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☑ **No** ☐

Remarks:

Assuming hydric soils are present below thick dark surface.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ramsey COR Delineation City/County: Anoka County Sampling Date: 2022-09-29

Applicant/Owner: City Of Ramsey State: Minnesota Sampling Point: W1B

Investigator(s): Kristina Bloomquist Section, Township, Range: sec 28 T032N R025W

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope (%): 0-2

Subregion (LRR or MLRA): LRR K, MLRA 91A Lat: 45.238338 Long: -93.468439 Datum: WGS84

Soil Map Unit Name: Isan-Isan, frequently ponded, complex, 0 to 2 percent slopes NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No _____	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** ✔
Hydric Soil Present?	Yes _____	No ✔	
Wetland Hydrology Present?	Yes _____	No ✔	If yes, optional Wetland Site ID: _____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No ✔	Depth (inches): _____
Water Table Present?	Yes _____	No ✔	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✔	Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: W1B

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Populus tremuloides*	35	Y	FAC
2. *Ulmus pumila*	5	N	FACU
3.			
4.			
5.			
6.			
7.			
	0	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		= Total Cover	

Herb Stratum (Plot size: 5)			
1. *Bromus inermis*	45	Y	UPL
2. *Phalaris arundinacea*	20	Y	FACW
3. *Asclepias syriaca*	8	N	UPL
4. *Melilotus officinalis*	8	N	FACU
5. *Symphyotrichum laeve*	5	N	FACU
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	86	= Total Cover	

Woody Vine Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.67 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0.00	x 1 =	0.00
FACW species	20.00	x 2 =	40.00
FAC species	35.00	x 3 =	105.00
FACU species	18.00	x 4 =	72.00
UPL species	53.00	x 5 =	265.00
Column Totals:	126.00 (A)		482.00 (B)

Prevalence Index = B/A = 3.83

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ☑ **No** ☐

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: W1B

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 2/1	100					SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ☐ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ☐ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ☐ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ☐ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ☐ Dark Surface (S7) (**LRR K, L**)
- ☐ Polyvalue Below Surface (S8) (**LRR K, L**)
- ☐ Thin Dark Surface (S9) (**LRR K, L**)
- ☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ☐ Red Parent Material (F21)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Compacted

Depth (inches): 6

Hydric Soil Present? Yes ☐ No ☑

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ramsey COR Delineation City/County: Anoka County Sampling Date: 2022-09-29

Applicant/Owner: City Of Ramsey State: Minnesota Sampling Point: W2A

Investigator(s): Kristina Bloomquist Section, Township, Range: sec 28 T032N R025W

Landform (hillslope, terrace, etc.): Toeslope Local relief (concave, convex, none): Concave Slope (%): 0-2

Subregion (LRR or MLRA): LRR K, MLRA 91A Lat: 45.238392 Long: -93.468351 Datum: WGS84

Soil Map Unit Name: Duelm loamy sand, 0 to 2 percent slopes NWI classification: PSS1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No ____	**Is the Sampled Area within a Wetland?** **Yes** ✔ **No** ____
Hydric Soil Present?	Yes ✔	No ____	If yes, optional Wetland Site ID: ____
Wetland Hydrology Present?	Yes ✔	No ____	

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ✔ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ✔ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No ✔	Depth (inches): ____
Water Table Present?	Yes ____	No ✔	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No ✔	Depth (inches): ____

Wetland Hydrology Present? **Yes** ✔ **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: W2A

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Salix nigra*	20	Y	OBL
2. *Populus tremuloides*	15	Y	FAC
3.			
4.			
5.			
6.			
7.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. *Salix interior*	10	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
	10	= Total Cover	
Herb Stratum (Plot size: 5)			
1. *Phalaris arundinacea*	50	Y	FACW
2. *Melilotus officinalis*	8	N	FACU
3. *Symphyotrichum lateriflorum*	5	N	FAC
4. *Anemone canadensis*	5	N	FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	68	= Total Cover	
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	20.00	x 1 =	20.00
FACW species	65.00	x 2 =	130.00
FAC species	20.00	x 3 =	60.00
FACU species	8.00	x 4 =	32.00
UPL species	0.00	x 5 =	0.00
Column Totals:	113.00 (A)		242.00 (B)

Prevalence Index = B/A = 2.14

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ☑ **No** ☐

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: W2A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/1	85	7.5YR 4/6	15	C	M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ☐ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ☐ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ☐ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☑ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ☐ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ☐ Dark Surface (S7) (**LRR K, L**)
- ☐ Polyvalue Below Surface (S8) (**LRR K, L**)
- ☐ Thin Dark Surface (S9) (**LRR K, L**)
- ☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ☐ Red Parent Material (F21)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☑ **No** ☐

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ramsey COR Delineation City/County: Anoka County Sampling Date: 2022-09-29

Applicant/Owner: City Of Ramsey State: Minnesota Sampling Point: W4A

Investigator(s): Kristina Bloomquist Section, Township, Range: sec 28 T032N R025W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-2

Subregion (LRR or MLRA): LRR K, MLRA 91A Lat: 45.237725 Long: -93.466506 Datum: WGS84

Soil Map Unit Name: Duelm loamy sand, 0 to 2 percent slopes NWI classification: PSS1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No ____	**Is the Sampled Area within a Wetland?** **Yes** ✔ **No** ____
Hydric Soil Present?	Yes ✔	No ____	
Wetland Hydrology Present?	Yes ✔	No ____	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ✔ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ✔ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No ✔	Depth (inches): ____
Water Table Present?	Yes ____	No ✔	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No ✔	Depth (inches): ____

Wetland Hydrology Present? **Yes** ✔ **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: W4A

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Populus tremuloides*	15	Y	FAC
2. *Salix nigra*	10	Y	OBL
3.			
4.			
5.			
6.			
7.			
	5	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. *Salix interior*	60	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
	60	= Total Cover	
Herb Stratum (Plot size: 5)			
1. *Calamagrostis canadensis*	20	Y	OBL
2. *Solidago gigantea*	10	Y	FACW
3. *Melilotus indicus*	8	N	FACU
4. *Symphyotrichum lateriflorum*	5	N	FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	43	= Total Cover	
Woody Vine Stratum (Plot size: 30)			
1. *Vitis riparia*	5	Y	FAC
2.			
3.			
4.			
	5	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	30.00	x 1 =	30.00
FACW species	70.00	x 2 =	140.00
FAC species	25.00	x 3 =	75.00
FACU species	8.00	x 4 =	32.00
UPL species	0.00	x 5 =	0.00
Column Totals:	133.00 (A)		277.00 (B)

Prevalence Index = B/A = 2.08

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ☑ **No** ☐

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: W4A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 4/1	85	7.5YR 4/6	15	C	M	COS	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ☐ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ☐ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ☐ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ☐ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ☐ Dark Surface (S7) (**LRR K, L**)
- ☐ Polyvalue Below Surface (S8) (**LRR K, L**)
- ☐ Thin Dark Surface (S9) (**LRR K, L**)
- ☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ☐ Red Parent Material (F21)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☑ **No** ☐

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ramsey COR Delineation City/County: Anoka County Sampling Date: 2022-09-29

Applicant/Owner: City Of Ramsey State: Minnesota Sampling Point: W4B

Investigator(s): Kristina Bloomquist Section, Township, Range: sec 28 T032N R025W

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope (%): 0-2

Subregion (LRR or MLRA): LRR K, MLRA 91A Lat: 45.237730 Long: -93.466582 Datum: WGS84

Soil Map Unit Name: Isan-Isan, frequently ponded, complex, 0 to 2 percent slopes NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No (If no, explain in Remarks.)

Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No

Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No	**Is the Sampled Area within a Wetland?** **Yes** **No ✔**
Hydric Soil Present?	Yes	No ✔	
Wetland Hydrology Present?	Yes	No ✔	If yes, optional Wetland Site ID:

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)
- Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- Marl Deposits (B15)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Crayfish Burrows (C8)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- ✔ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes No ✔ Depth (inches):

Water Table Present? Yes No ✔ Depth (inches):

Saturation Present? (includes capillary fringe) Yes No ✔ Depth (inches):

Wetland Hydrology Present? **Yes** **No ✔**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: W4B

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Populus tremuloides*	20	Y	FAC
2. *Ulmus thomasii*	5	Y	FAC
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1. *Populus tremuloides*	5	Y	FAC
2. *Salix interior*	5	Y	FACW
3.			
4.			
5.			
6.			
7.			
	10 = Total Cover		
Herb Stratum (Plot size: 5)			
1. *Melilotus indicus*	30	Y	FACU
2. *Calamagrostis canadensis*	30	Y	OBL
3. *Symphyotrichum ericoides*	15	N	FACU
4. *Centaurea jacea*	5	N	FACU
5. *Solidago gigantea*	5	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	85 = Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 83.33 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	30.00	x 1 =	30.00
FACW species	10.00	x 2 =	20.00
FAC species	30.00	x 3 =	90.00
FACU species	50.00	x 4 =	200.00
UPL species	0.00	x 5 =	0.00
Column Totals:	120.00 (A)		340.00 (B)

Prevalence Index = B/A = 2.83

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ☑ **No** ☐

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: W4B

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 6/6	100					COS	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ☐ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ☐ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ☐ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ☐ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ☐ Dark Surface (S7) (**LRR K, L**)
- ☐ Polyvalue Below Surface (S8) (**LRR K, L**)
- ☐ Thin Dark Surface (S9) (**LRR K, L**)
- ☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ☐ Red Parent Material (F21)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☐ **No** ✔

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ramsey COR Delineation City/County: Anoka County Sampling Date: 2022-09-29

Applicant/Owner: City Of Ramsey State: Minnesota Sampling Point: W7A

Investigator(s): Kristina Bloomquist Section, Township, Range: sec 28 T032N R025W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-2

Subregion (LRR or MLRA): LRR K, MLRA 91A Lat: 45.236086 Long: -93.465254 Datum: WGS84

Soil Map Unit Name: Isan-Isan, frequently ponded, complex, 0 to 2 percent slopes NWI classification: PSS1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No ____	**Is the Sampled Area within a Wetland?** **Yes** ✔ **No** ____
Hydric Soil Present?	Yes ✔	No ____	If yes, optional Wetland Site ID: ____
Wetland Hydrology Present?	Yes ✔	No ____	

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ✔ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ✔ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No ✔	Depth (inches): ____
Water Table Present?	Yes ____	No ✔	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No ✔	Depth (inches): ____

Wetland Hydrology Present? **Yes** ✔ **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: W7A

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1. *Salix interior*	70	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
	70 = Total Cover		
Herb Stratum (Plot size: 5)			
1. *Phalaris arundinacea*	5	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	5 = Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 0.00	x 1 = 0.00
FACW species 75.00	x 2 = 150.00
FAC species 0.00	x 3 = 0.00
FACU species 0.00	x 4 = 0.00
UPL species 0.00	x 5 = 0.00
Column Totals: 75.00 (A)	150.00 (B)

Prevalence Index = B/A = 2.0

Hydrophytic Vegetation Indicators:

- ✔ 1 - Rapid Test for Hydrophytic Vegetation
- ✔ 2 - Dominance Test is >50%
- ✔ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ✔ **No** ☐

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: W7A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 2/1	100	7.5YR 4/6				COS	
2-12	10YR 6/1	80	7.5YR 4/6	20	C	M	COS	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☑ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ☐ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ☐ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ☐ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ☐ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ☐ Dark Surface (S7) (**LRR K, L**)
- ☐ Polyvalue Below Surface (S8) (**LRR K, L**)
- ☐ Thin Dark Surface (S9) (**LRR K, L**)
- ☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ☐ Red Parent Material (F21)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☑ **No** ☐

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ramsey COR Delineation City/County: Anoka County Sampling Date: 2022-09-29

Applicant/Owner: City Of Ramsey State: Minnesota Sampling Point: W7B

Investigator(s): Kristina Bloomquist Section, Township, Range: sec 28 T032N R025W

Landform (hillslope, terrace, etc.): Sideslope Local relief (concave, convex, none): None Slope (%): 8-15

Subregion (LRR or MLRA): LRR K, MLRA 91A Lat: 45.236119 Long: -93.465249 Datum: WGS84

Soil Map Unit Name: Isan-Isan, frequently ponded, complex, 0 to 2 percent slopes NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No (If no, explain in Remarks.)

Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No

Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No	**Is the Sampled Area within a Wetland?** Yes No ✔
Hydric Soil Present?	Yes	No ✔	If yes, optional Wetland Site ID:
Wetland Hydrology Present?	Yes	No ✔	

Remarks: (Explain alternative procedures here or in a separate report.)
Between w1 & w2 (storm pond)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)
- Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- Marl Deposits (B15)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Crayfish Burrows (C8)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes No ✔ Depth (inches):

Water Table Present? Yes No ✔ Depth (inches):

Saturation Present? (includes capillary fringe) Yes No ✔ Depth (inches):

Wetland Hydrology Present? Yes No ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: W7B

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Populus tremuloides*	30	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1. *Populus tremuloides*	5	Y	FAC
2. *Salix interior*	5	Y	FACW
3.			
4.			
5.			
6.			
7.			
	10 = Total Cover		
Herb Stratum (Plot size: 5)			
1. *Melilotus indicus*	20	Y	FACU
2. *Sonchus arvensis*	5	N	FACU
3. *Symphyotrichum ericoides*	5	N	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	30 = Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 0.00	x 1 = 0.00
FACW species 5.00	x 2 = 10.00
FAC species 35.00	x 3 = 105.00
FACU species 30.00	x 4 = 120.00
UPL species 0.00	x 5 = 0.00
Column Totals: 70.00 (A)	235.00 (B)

Prevalence Index = B/A = 3.36

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ☑ **No** ☐

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: W7B

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 6/6	100					COS	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ☐ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ☐ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ☐ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ☐ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ☐ Dark Surface (S7) (**LRR K, L**)
- ☐ Polyvalue Below Surface (S8) (**LRR K, L**)
- ☐ Thin Dark Surface (S9) (**LRR K, L**)
- ☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ☐ Red Parent Material (F21)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☐ **No** ✔

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ramsey COR Delineation City/County: Anoka County Sampling Date: 2022-09-29

Applicant/Owner: City Of Ramsey State: Minnesota Sampling Point: W8A

Investigator(s): Kristina Bloomquist Section, Township, Range: sec 28 T032N R025W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-2

Subregion (LRR or MLRA): LRR K, MLRA 91A Lat: 45.234898 Long: -93.462686 Datum: WGS84

Soil Map Unit Name: Isan-Isan, frequently ponded, complex, 0 to 2 percent slopes NWI classification: PEM1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No ____	**Is the Sampled Area within a Wetland?** **Yes** ✔ **No** ____
Hydric Soil Present?	Yes ✔	No ____	
Wetland Hydrology Present?	Yes ✔	No ____	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ✔ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ✔ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No ✔	Depth (inches): ____
Water Table Present?	Yes ____	No ✔	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No ✔	Depth (inches): ____

Wetland Hydrology Present? **Yes** ✔ **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: W8A

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5)			
1. *Carex spp.*	20	Y	FACW
2. *Calamagrostis canadensis*	5	Y	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	25 = Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	5.00	x 1 =	5.00
FACW species	20.00	x 2 =	40.00
FAC species	0.00	x 3 =	0.00
FACU species	0.00	x 4 =	0.00
UPL species	0.00	x 5 =	0.00
Column Totals:	25.00 (A)		45.00 (B)

Prevalence Index = B/A = 1.8

Hydrophytic Vegetation Indicators:

- ✔ 1 - Rapid Test for Hydrophytic Vegetation
- ✔ 2 - Dominance Test is >50%
- ✔ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ✔ **No** ☐

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: W8A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-24	10YR 2/1	100					SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ☐ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ☐ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ☐ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ☐ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ☐ Dark Surface (S7) (**LRR K, L**)
- ☐ Polyvalue Below Surface (S8) (**LRR K, L**)
- ☐ Thin Dark Surface (S9) (**LRR K, L**)
- ☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ☐ Red Parent Material (F21)
- ☐ Very Shallow Dark Surface (TF12)
- ☑ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☑ **No** ☐

Remarks:

Assuming hydric soils are present below thick dark surface.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ramsey COR Delineation City/County: Anoka County Sampling Date: 2022-09-29

Applicant/Owner: City Of Ramsey State: Minnesota Sampling Point: W8B

Investigator(s): Kristina Bloomquist Section, Township, Range: sec 28 T032N R025W

Landform (hillslope, terrace, etc.): Backslope Local relief (concave, convex, none): None Slope (%): 3-7

Subregion (LRR or MLRA): LRR K, MLRA 91A Lat: 45.234927 Long: -93.462689 Datum: WGS84

Soil Map Unit Name: Isan-Isan, frequently ponded, complex, 0 to 2 percent slopes NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✔	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** ✔
Hydric Soil Present?	Yes _____	No ✔	
Wetland Hydrology Present?	Yes _____	No ✔	If yes, optional Wetland Site ID: _____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No ✔	Depth (inches): _____
Water Table Present?	Yes _____	No ✔	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✔	Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: W8B

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Populus tremuloides*	20	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	20 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1. *Ulmus pumila*	10	Y	FACU
2. *Populus tremuloides*	5	Y	FAC
3.			
4.			
5.			
6.			
7.			
	15 = Total Cover		
Herb Stratum (Plot size: 5)			
1. *Solidago canadensis*	10	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	10 = Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0.00	x 1 =	0.00
FACW species	0.00	x 2 =	0.00
FAC species	25.00	x 3 =	75.00
FACU species	20.00	x 4 =	80.00
UPL species	0.00	x 5 =	0.00
Column Totals:	45.00 (A)		155.00 (B)

Prevalence Index = B/A = 3.44

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ☐ No ☑

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: W8B

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-24	10YR 2/1	100					SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ☐ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ☐ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ☐ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ☐ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ☐ Dark Surface (S7) (**LRR K, L**)
- ☐ Polyvalue Below Surface (S8) (**LRR K, L**)
- ☐ Thin Dark Surface (S9) (**LRR K, L**)
- ☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ☐ Red Parent Material (F21)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☐ **No** ✔

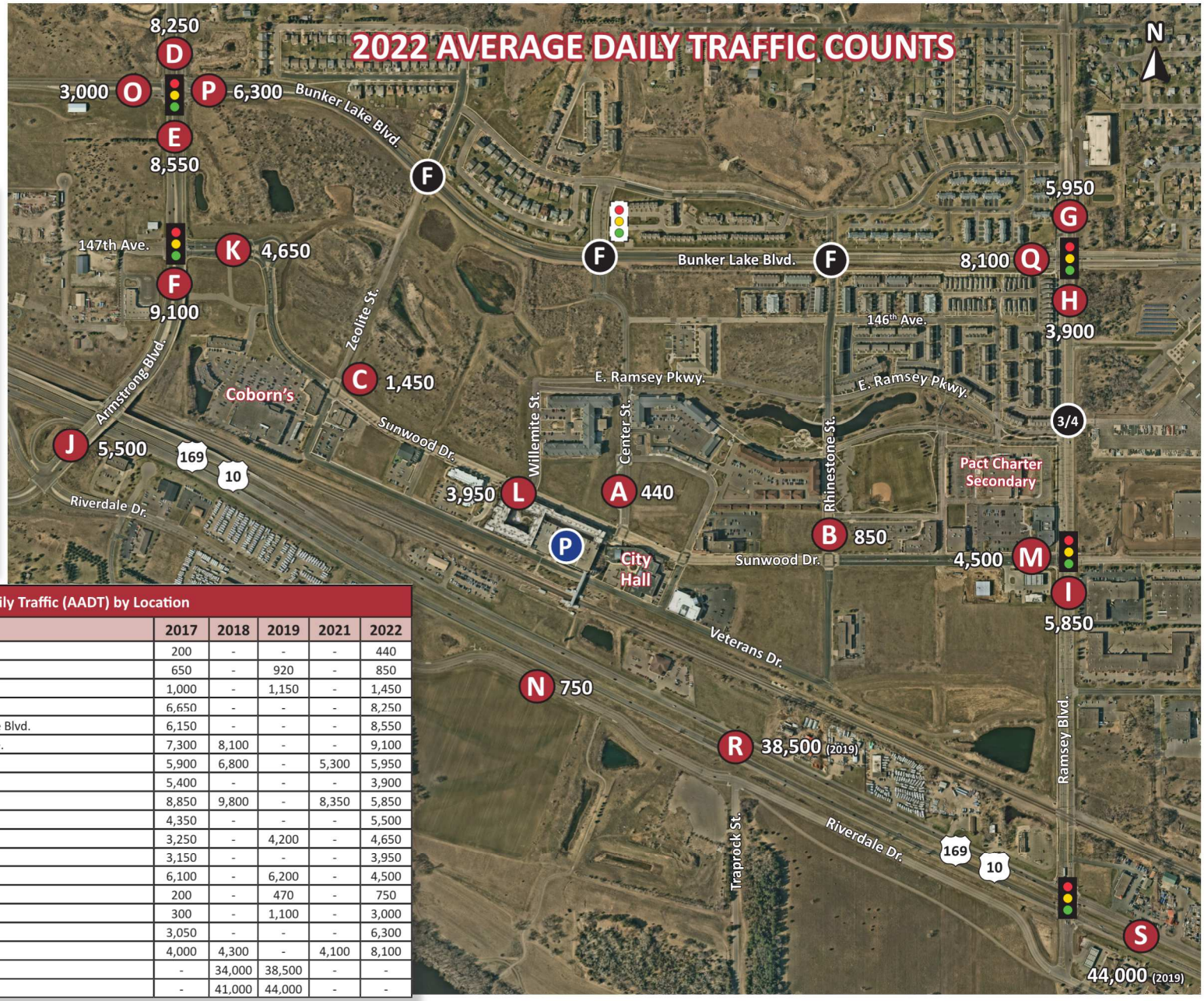
Remarks:

APPENDIX E: TRAFFIC COUNT EXHIBIT

THE COR AT RAMSEY

LEGEND

- 1,000 — Annual Average Daily Traffic (AADT)
- Existing Signalized Intersection
- Future Signalized Intersection
- A — Location Marker
- P — Parking Ramp
- F — Full Intersection
- 3/4 — No Left Outbound Movements

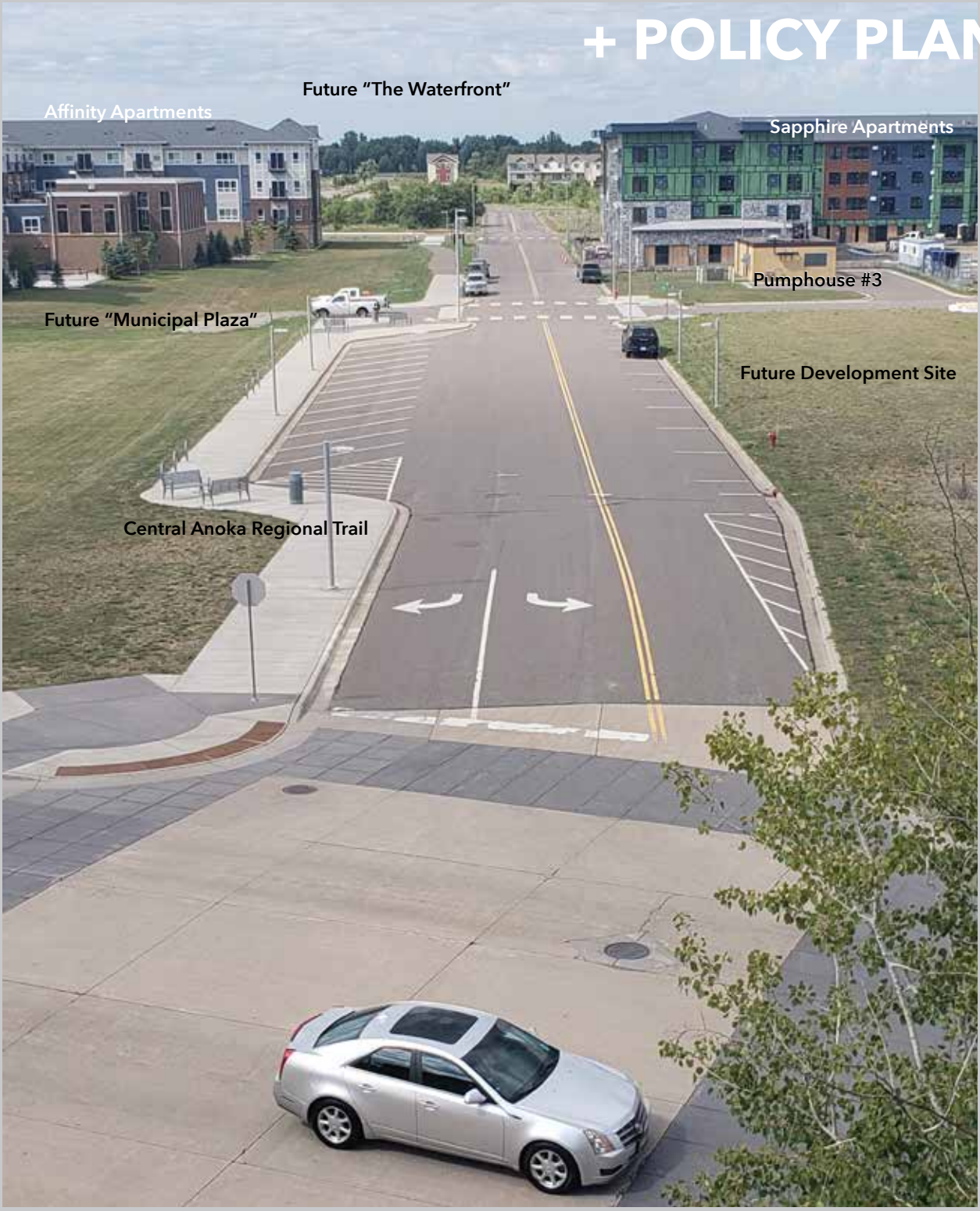


Annual Average Daily Traffic (AADT) by Location

	Location	2017	2018	2019	2021	2022
A	Center St.	200	-	-	-	440
B	Rhinestone St.	650	-	920	-	850
C	Zeolite St.	1,000	-	1,150	-	1,450
D	Armstrong Blvd. - North of Bunker Lake Blvd.	6,650	-	-	-	8,250
E	Armstrong Blvd. - Sunwood Dr./147th Ave. to Bunker Lake Blvd.	6,150	-	-	-	8,550
F	Armstrong Blvd. - Hwy. 10/169 to Sunwood Dr./147th Ave.	7,300	8,100	-	-	9,100
G	Ramsey Blvd. - North of Bunker Lake Blvd.	5,900	6,800	-	5,300	5,950
H	Ramsey Blvd. - Sunwood Dr. to Bunker Lake Blvd.	5,400	-	-	-	3,900
I	Ramsey Blvd. - Hwy. 10/169 to Sunwood Dr.	8,850	9,800	-	8,350	5,850
J	Armstrong Blvd. - Between Hwy. 10/169 Ramps	4,350	-	-	-	5,500
K	Sunwood Dr. - East of Armstrong Blvd.	3,250	-	4,200	-	4,650
L	Sunwood Dr. - City Hall	3,150	-	-	-	3,950
M	Sunwood Dr. - West of Ramsey Blvd.	6,100	-	6,200	-	4,500
N	Riverdale Dr. - West of Traprock St.	200	-	470	-	750
O	Bunker Lake Blvd. - West of Armstrong Blvd.	300	-	1,100	-	3,000
P	Bunker Lake Blvd. - East of Armstrong Blvd.	3,050	-	-	-	6,300
Q	Bunker Lake Blvd. - West of Ramsey Blvd.	4,000	4,300	-	4,100	8,100
R	Hwy. 10/169 - Armstrong Blvd. to Ramsey Blvd.	-	34,000	38,500	-	-
S	Hwy. 10/169 - Ramsey Blvd. to Sunfish Lake Blvd.	-	41,000	44,000	-	-

APPENDIX F: PREVIOUS ANALYSES, THE COR & CENTER STREET FRAMEWORKS

CENTER STREET AREA FRAMEWORK + POLICY PLAN



Pump House Plaza + Pump House Building + Municipal Plaza + Center Street

City of Ramsey, Minnesota
August, 2020 (Preliminary Draft)

ACKNOWLEDGMENTS

This Framework and Policy Plan focuses on the very center of The Center of Ramsey's 320 acre downtown referred to as The COR. The fact that the community is succeeding in the primary vision of having its own downtown and identity cannot be understated. The COR is over half built-out according to plan, with favorable progress continuing even within and through the Great Recession. This is attributable to Ramsey residents, and leadership, holding to the original vision for a pedestrian oriented, successful, vibrant downtown–this Center Street Area Framework and Policy Plan is an implementation strategy that supports the vison and objectives of The COR Design Framework which cites an 'implied responsibility' to carry forth the goals in site planning and design:

"All participants in the development of The COR recognize the local and regional impacts of this project and the various systems that play an important role. Each parcel and each building must fit within the context of the entire plan. Individual projects must complement, not compete with, adjacent development in terms of public green space, walk and trail connections, stormwater management solutions, street layout, parking strategies, land use mix and building design." The Center Street Area Framework and Policy Plan does just this, by integrating and interrelating the above tenets.

The COR Design Framework goes on to list the three Objectives:

- *Overall COR design (and all new private development within The COR) will accommodate stormwater from new projects and from off-site, and highlight stormwater features as an amenity.*
- *Bikeways and pedestrian routes into The COR from adjacent neighborhoods must be designed for safety and ease of access, suggesting that a person on a bicycle has an equally accessible route to [and within] downtown.*
- *Parks and open space will be easily accessible to all COR residents, visitors, people who work here and also for the citizens of Ramsey and the surrounding area. *This connected green system is reminiscent of the world renowned 'Grand Rounds' of Minneapolis.*

* The above is also mirrored in The Circle of Ramsey Greenway, of which The COR, is an integral part and a destination within.

The COR was an organic, citizen led movement in delivering an urban downtown with its amenities for the whole community, while also 'taking some of the development pressure off' the more rural areas of the city. The success in finding that balance has been due to thoughtful, reasoned residents–unified in mission and vision. Future Ramsey residents can thank today's residents and Planning Commission, Economic Development Authority, the Park and Recreation Commission, and City Council for coming together in their collective service to the community.

Parks & Assist. Public Works Superintendent,
Mark Riverblood

TABLE OF CONTENTS

Background + Purpose

Overview

The purpose of the Center Street Area Framework + Policy Plan is to advance the planning activity for several interrelated projects within this district. Several of these project have timelines that require the work to commence as soon as possible. A summary list of current and potential future projects includes:

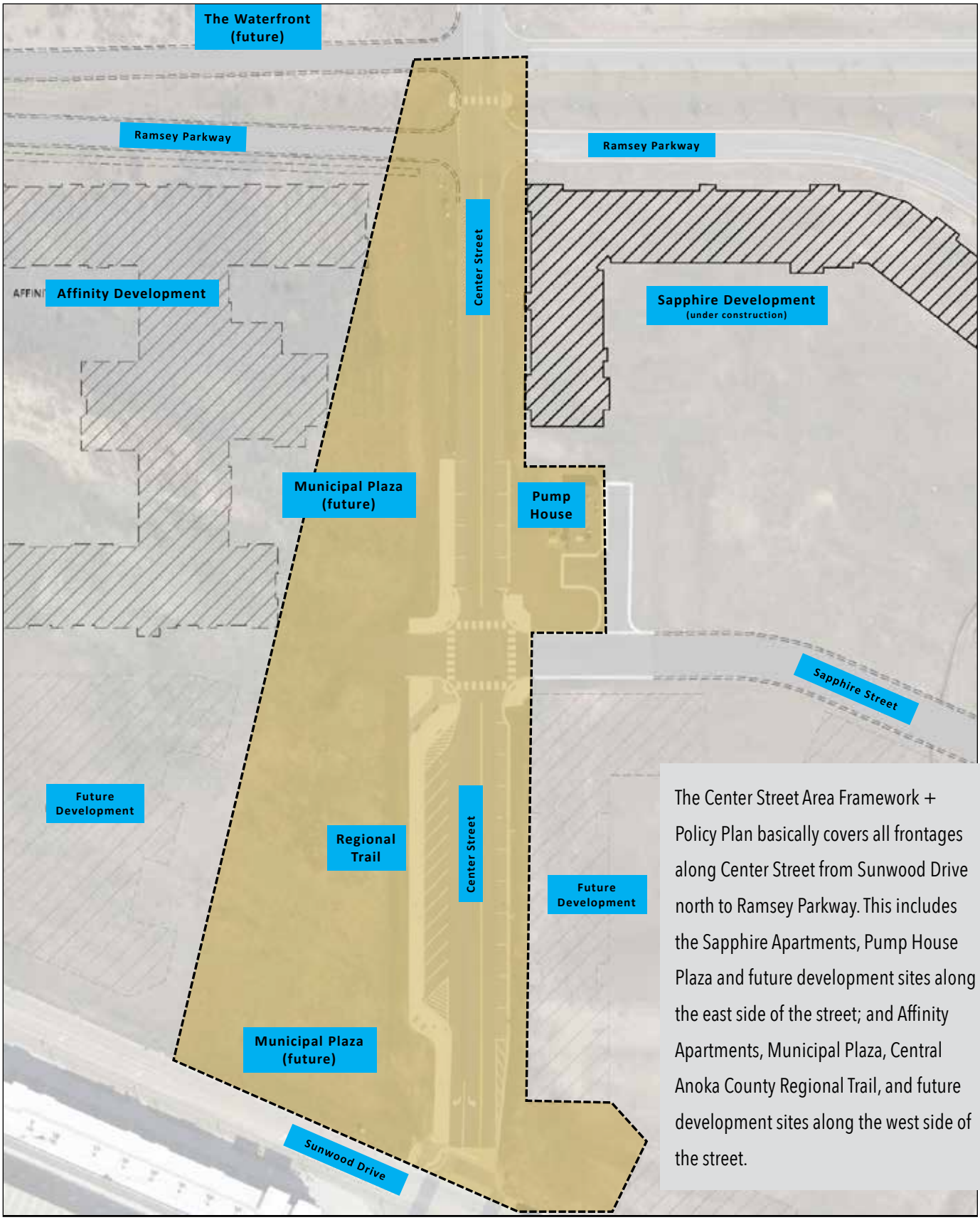
- Center Street sidewalk(s) in front of the Sapphire building;
- Center Street streetscape/trail (west side) near the interface of the Affinity and Municipal Plaza;
- Municipal Plaza (north) at the interface with Affinity;
- Municipal Plaza (south) the larger Happy Days site;
- Pump House Plaza the area immediately surrounding the small Pump House No. #3;
- Pump House Exterior potential facade improvements;
- 145th Avenue sidewalk connecting to Center Street.

Outcomes + Deliverables

As indicated, the above project listing is merely a summary outline of the work to be performed; the detailed Scope of Services (provided by the Consultant Team), will result in design guidelines to allow the city to develop specifications (cross-sections with details) such that quotations may be sought for work that must be completed like the sidewalk/streetscape adjoining the Sapphire building. Additionally, the scope and cost of other features may be better understood, and accordingly, will result in the ability to proceed with improvements to Municipal Plaza, and the Pump House site (plaza, concrete, landscaping and conceivably an attached public restroom), at such time it is authorized by City Council, (in 2020 or 2021).

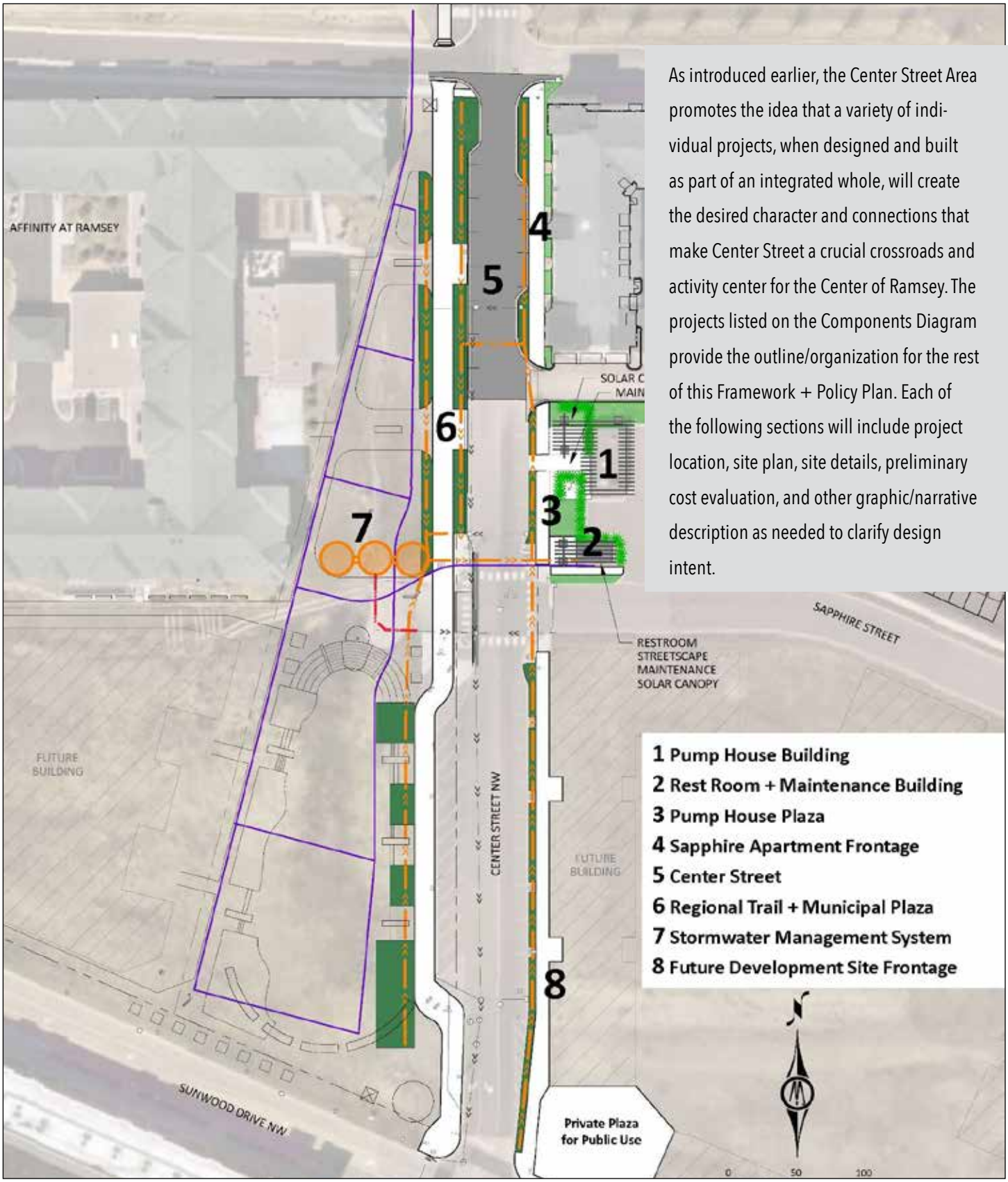
Further, the above referenced Scope of Services will develop the design for the Pump House facade and related architectural treatments, and result in a Design-build RFP that will provide City Council with the cost and contractor (upon approval) that can complete the 2020 Capital Improvement Project for Municipal Pump House #3.

Coverage Diagram



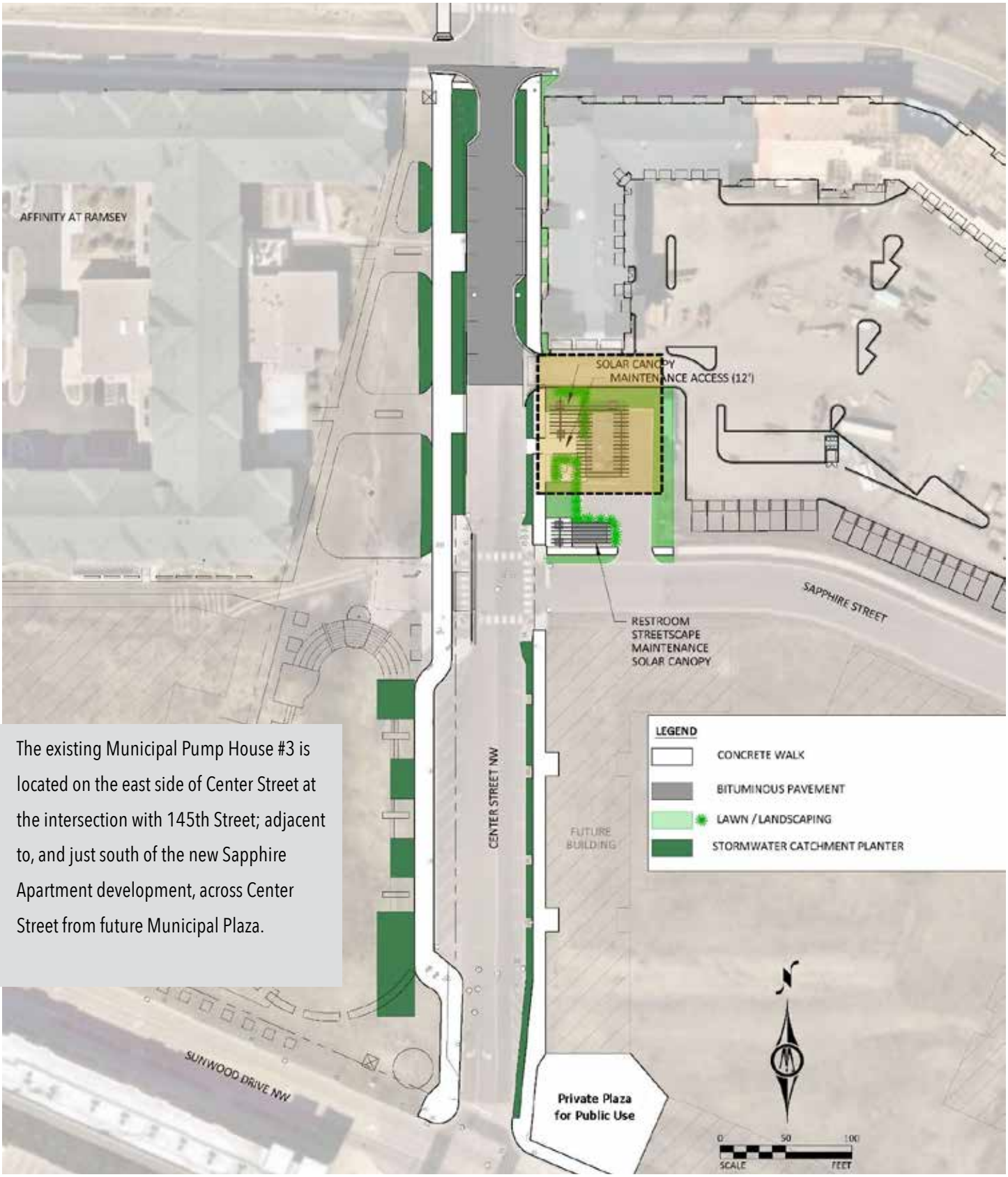
The Center Street Area Framework + Policy Plan basically covers all frontages along Center Street from Sunwood Drive north to Ramsey Parkway. This includes the Sapphire Apartments, Pump House Plaza and future development sites along the east side of the street; and Affinity Apartments, Municipal Plaza, Central Anoka County Regional Trail, and future development sites along the west side of the street.

Components Diagram



As introduced earlier, the Center Street Area promotes the idea that a variety of individual projects, when designed and built as part of an integrated whole, will create the desired character and connections that make Center Street a crucial crossroads and activity center for the Center of Ramsey. The projects listed on the Components Diagram provide the outline/organization for the rest of this Framework + Policy Plan. Each of the following sections will include project location, site plan, site details, preliminary cost evaluation, and other graphic/narrative description as needed to clarify design intent.

Pump House Building Location Map



The existing Municipal Pump House #3 is located on the east side of Center Street at the intersection with 145th Street; adjacent to, and just south of the new Sapphire Apartment development, across Center Street from future Municipal Plaza.

Pump House Building

PROJECT DESCRIPTION

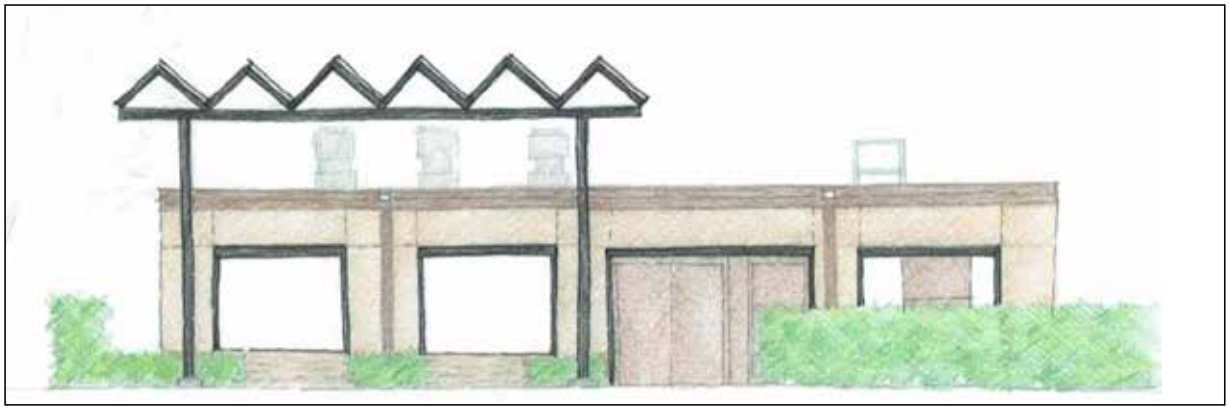
Since the time of its construction, Municipal Pump House #3 has been a simple concrete masonry building. As new development occurs around it, Pump House #3's appearance can contribute to the character of surrounding buildings and the proposed plaza by applying new exterior finishes to the existing building. Stone, wood, and metal finishes and colors compliment other civic buildings in Ramsey Downtown District.

Note: the sequence of project design and construction will begin with Pump House Building facade improvements, followed by Pump House Plaza site and landscape improvements, and then additional project feasibility evaluation and detailed design related to the Rest Room + Maintenance Building.

The feasibility of adding photo-voltaic array over Pump House #3 and the adjacent plaza.

Pump House Building Project Elements

Three alternative exterior façade treatments have been considered:



- Concept A: Split-faced concrete masonry & cement board siding

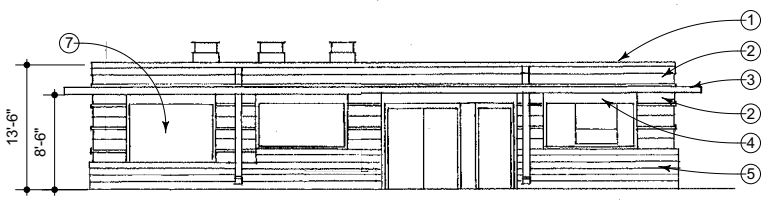
- Concept B: Limestone & wood siding

- Concept C: Limestone & brick

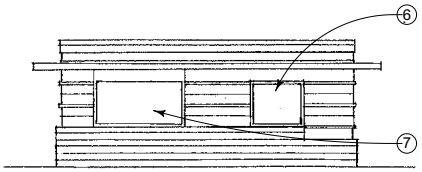
Based on design refinements, cost considerations, the limestone and wood siding alternative has been selected for design development.

Pump House Building Project Elements

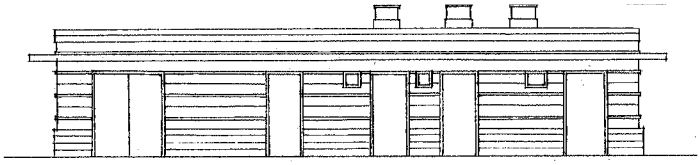
Concept C Developed Design.



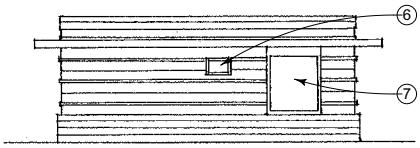
WEST ELEVATION



SOUTH ELEVATION



EAST ELEVATION



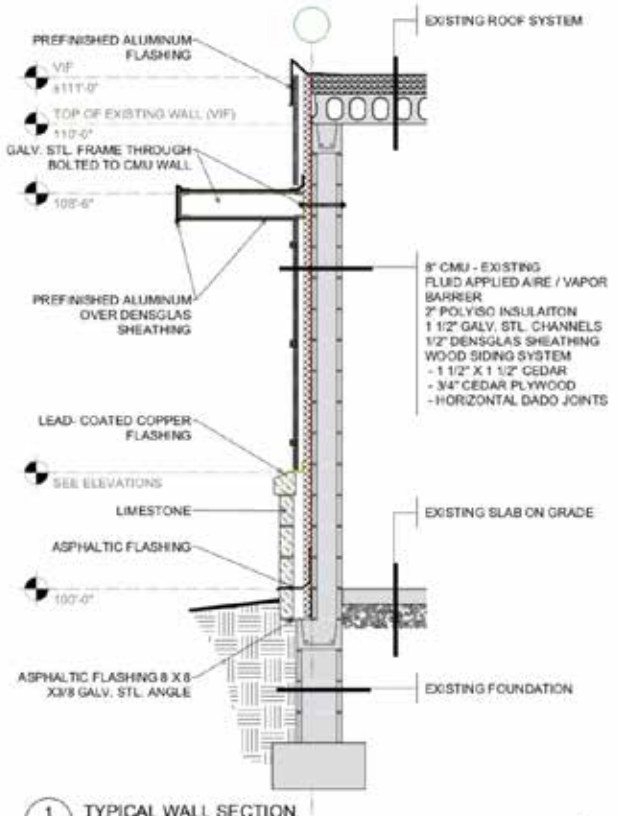
NORTH ELEVATION

BUILDING ELEVATIONS AT PUMP HOUSE- CONCEPT B.1

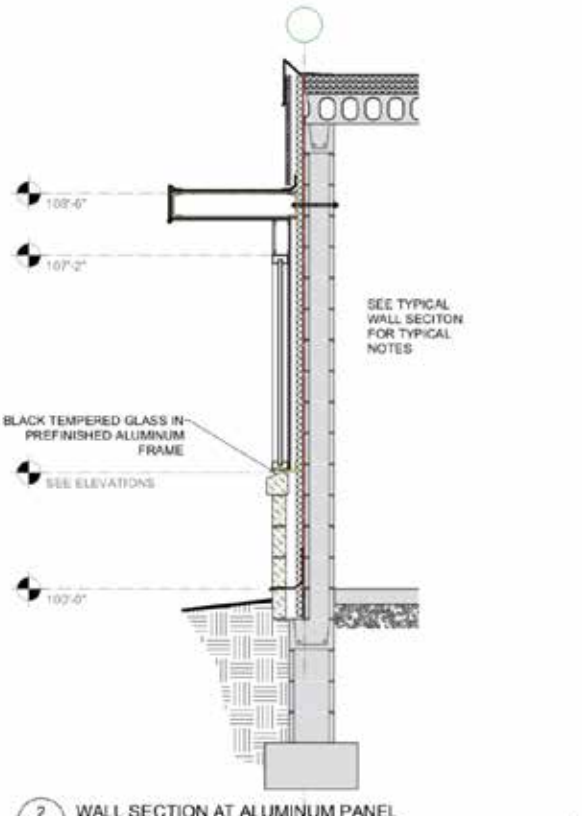
SCALE: 1/8" = 1'-0"

NOTES

1. ALUMNINUM CAP FLASHING
2. WOOD SIDING
3. ALUMINUM EYEBROW
4. ALUMINUM FRAME
5. LIMESTONE BASE
6. EXISTING VENT
7. SMOKED GLASS WITH ALUMINUM FRAME

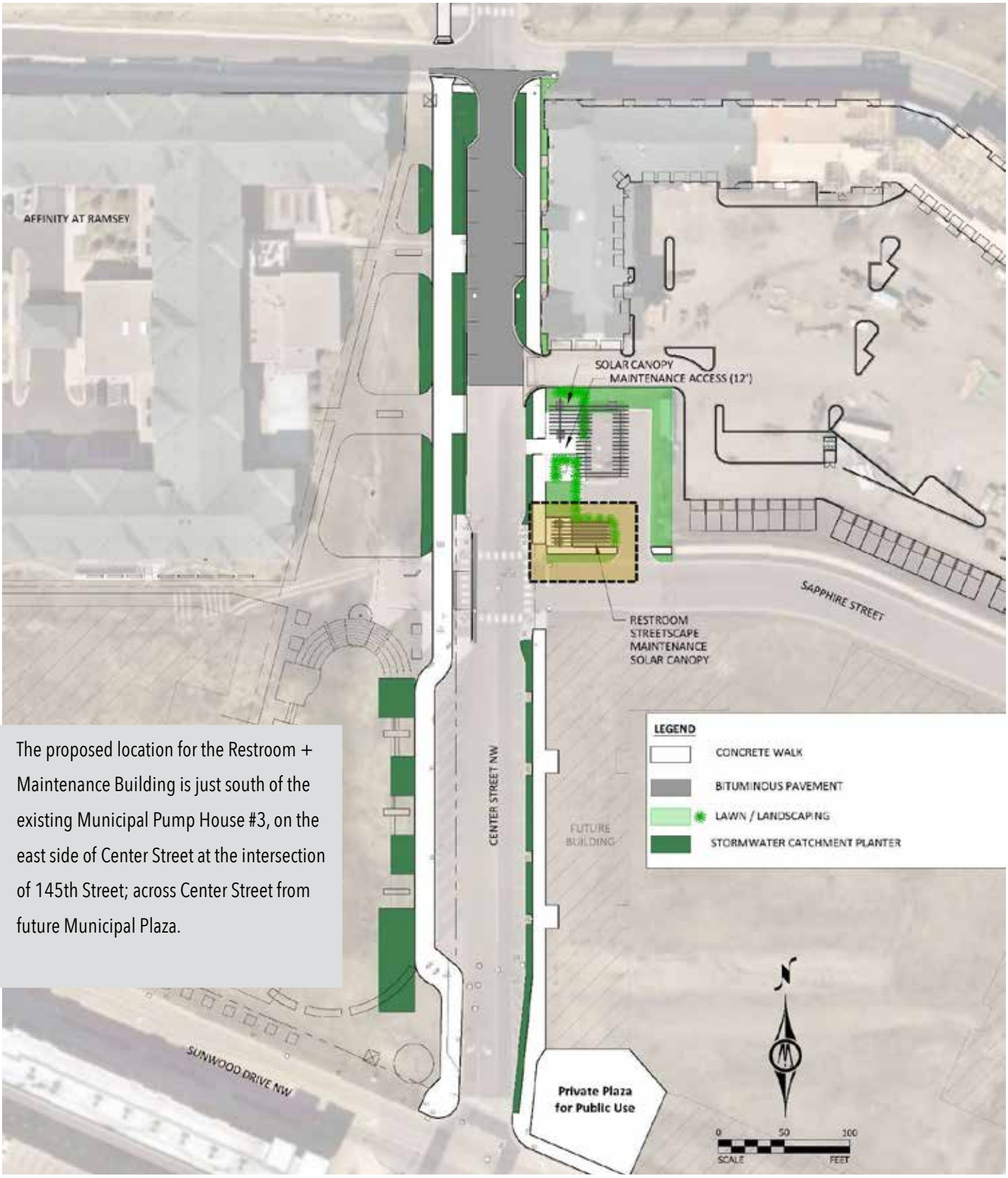


1 / A5.1 TYPICAL WALL SECTION
Scale: 1/2" = 1'-0"



2 / A5.1 WALL SECTION AT ALUMINUM PANEL
Scale: 1/2" = 1'-0"

Restroom + Maintenance Building Location Map



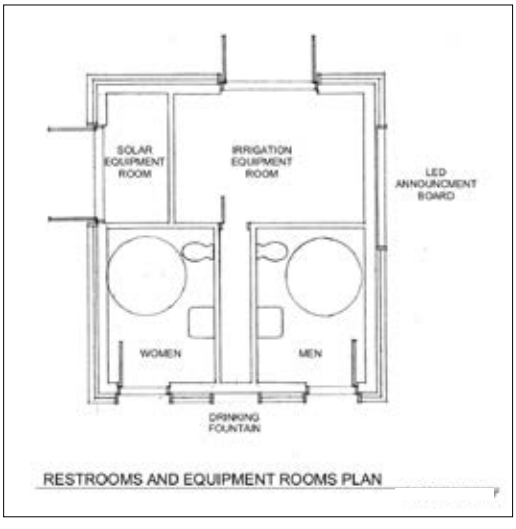
The proposed location for the Restroom + Maintenance Building is just south of the existing Municipal Pump House #3, on the east side of Center Street at the intersection of 145th Street; across Center Street from future Municipal Plaza.

Restroom + Maintenance Bldg

PROJECT DESCRIPTION

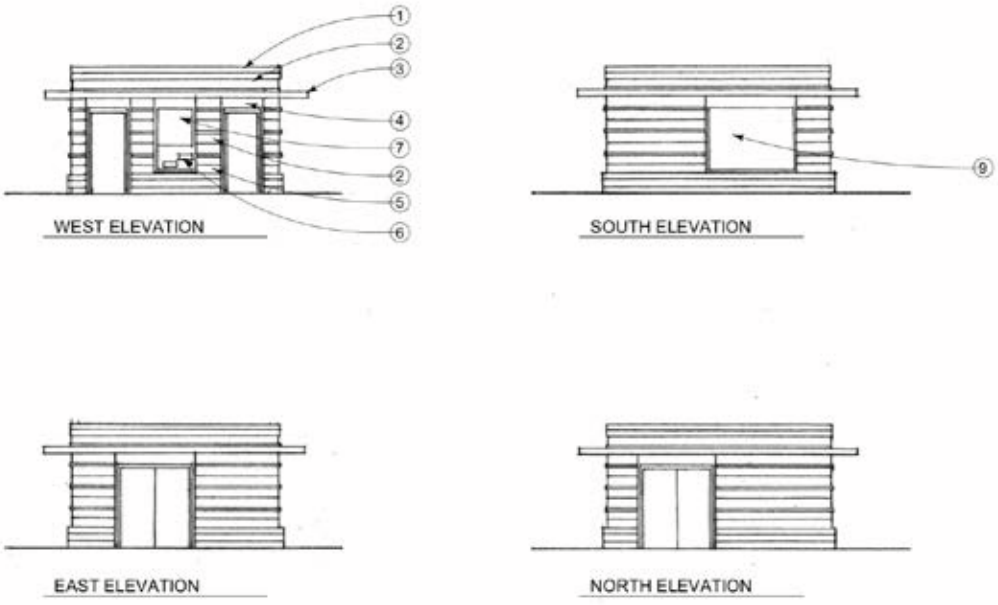
A proposed Restroom + Maintenance Building will be sided with the same materials as the adjacent Pump House #3. This building will support community activities at Center Street's Municipal Plaza. It will also house equipment for the plaza's irrigation system and for the solar array at the Pump House building.

Note: the sequence of project design and construction will begin with Pump House Building facade improvements, followed by Pump House Plaza site and landscape improvements, and then additional project feasibility evaluation and detailed design related to the Rest Room + Maintenance Building.



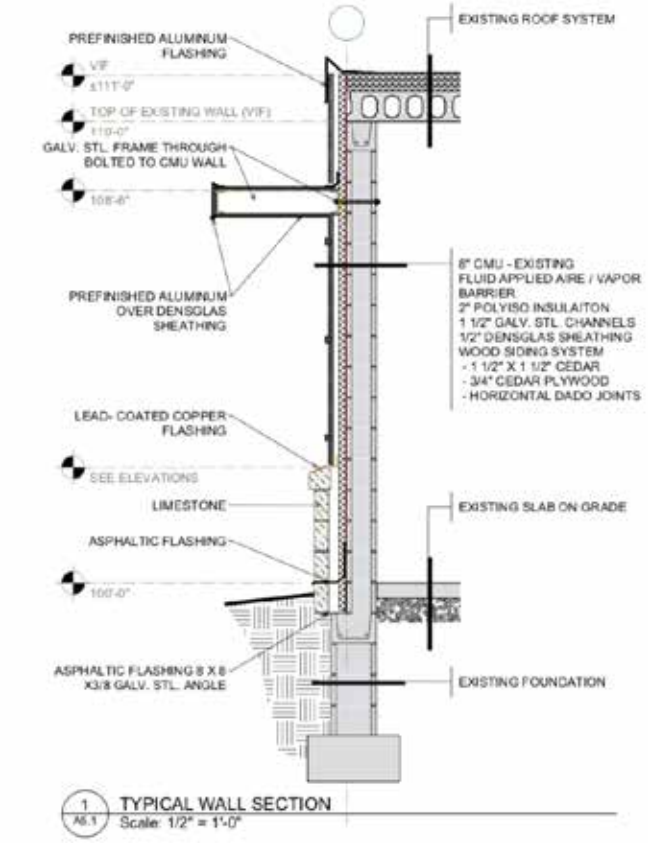
RESTROOMS AND EQUIPMENT ROOMS PLAN

Restroom + Maintenance Bldg Project Elements

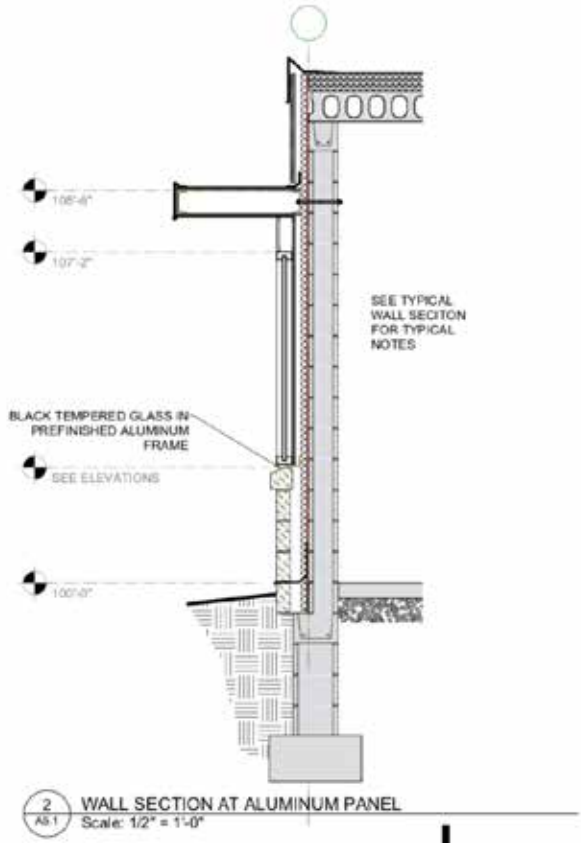


NOTES

1 ALUMNINUM CAP FLASHING
2 WOOD SIDING
3 ALUMINUM EYEBROW
4 ALUMINUM FRAME
5 LIMESTONE BASE
6 DRINKING FOUNTAIN
7 LED DISPLAY
8 EXISTING VENT
9 SMOKED GLASS WITH ALUMINUM FRAME



1 A5.1 TYPICAL WALL SECTION
Scale: 1/2" = 1'-0"

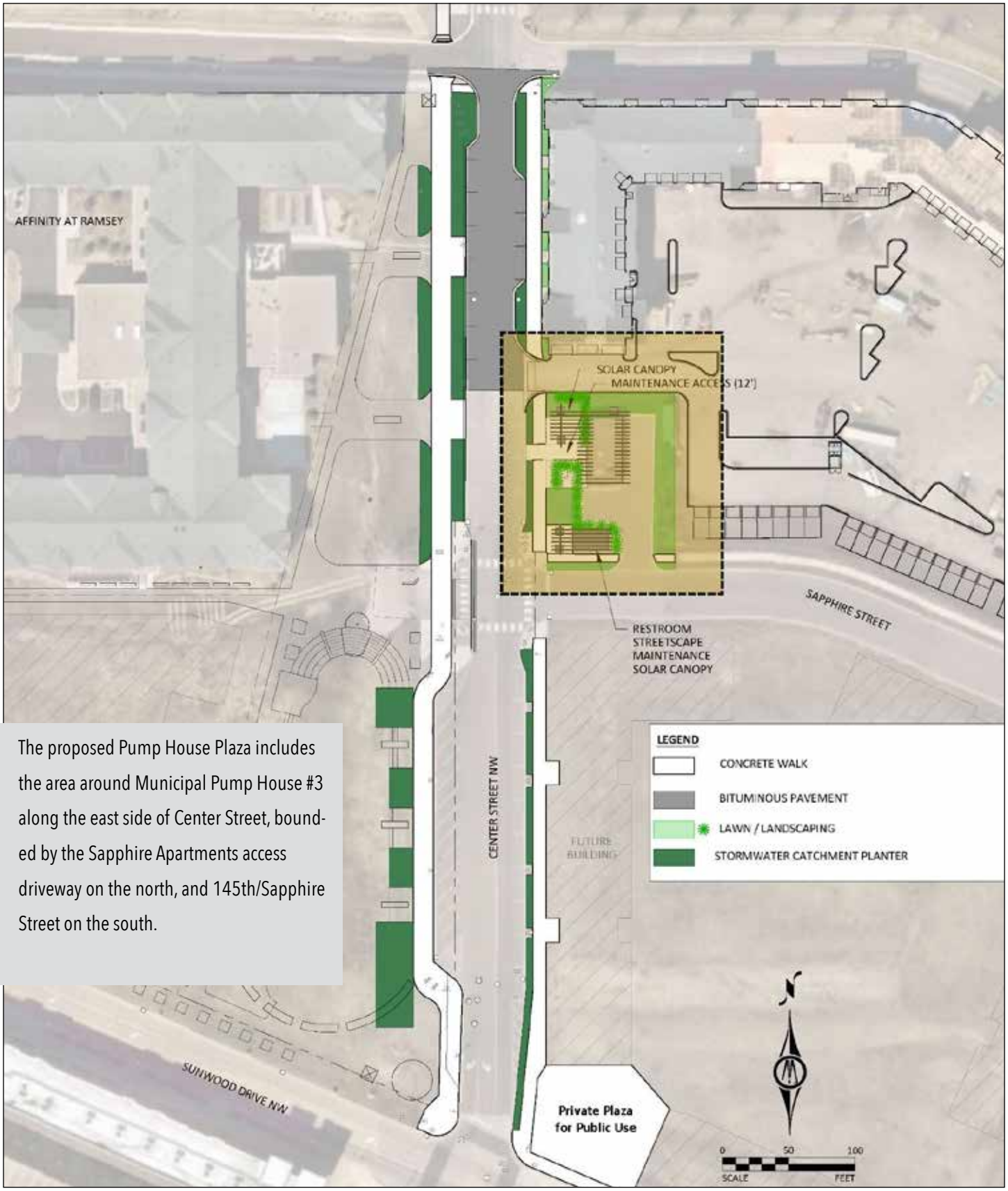


2 A5.1 WALL SECTION AT ALUMINUM PANEL
Scale: 1/2" = 1'-0"

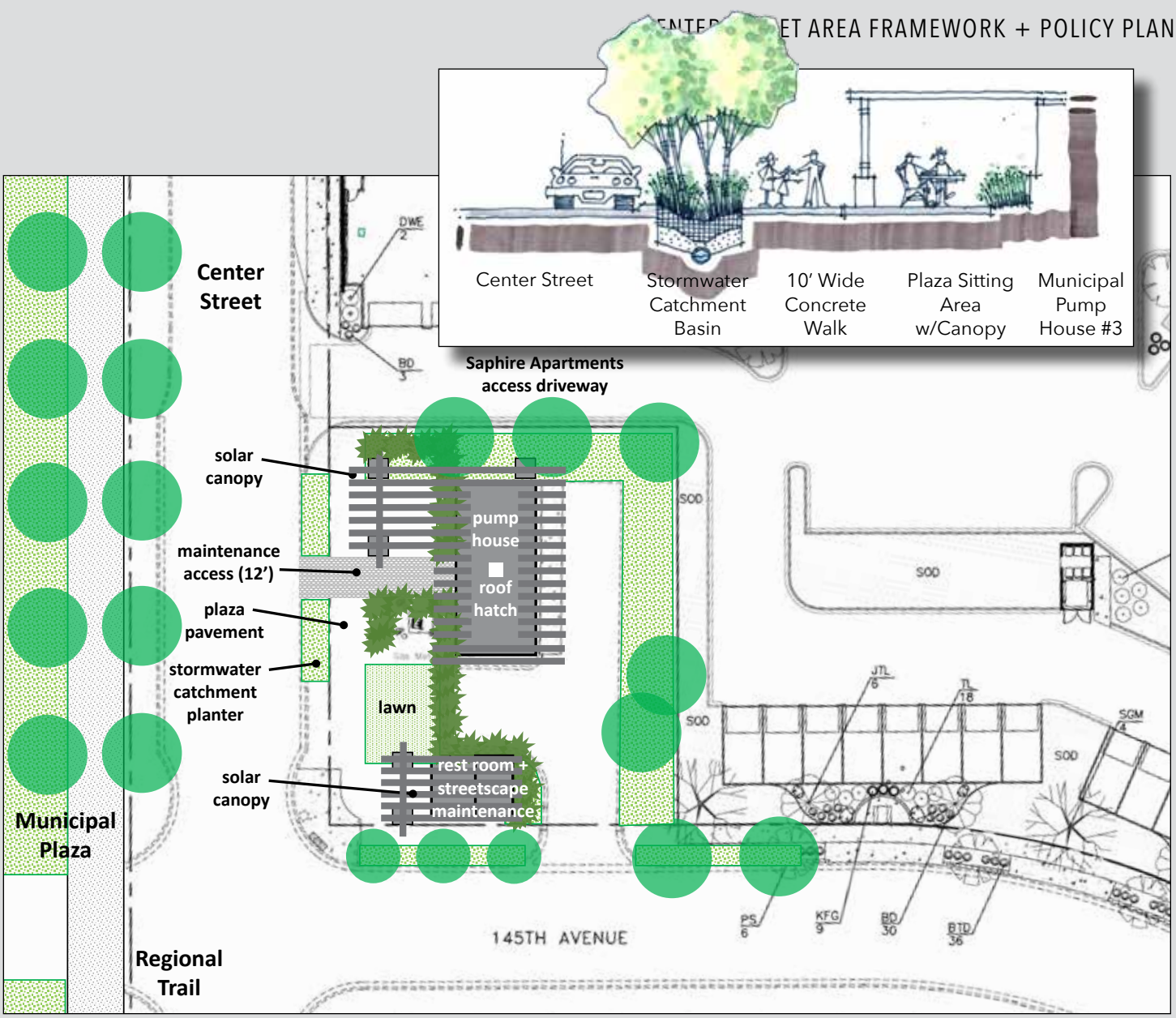
Restroom + Maintenance Bldg Project Elements

A LED Community Information Board is proposed for the Sapphire Street façade of the Restroom + Maintenance Building. This LED display panel can be used to announce events of community interest, to present the schedule for Municipal Plaza activities, display digital art, etc.(These images shows the capabilities of LED panels.)

Pump House Plaza Location Map



The proposed Pump House Plaza includes the area around Municipal Pump House #3 along the east side of Center Street, bounded by the Sapphire Apartments access driveway on the north, and 145th/Sapphire Street on the south.



Pump House Plaza

PROJECT DESCRIPTION

The Conceptual Site Plan for Pump House Plaza includes the following elements:

- Paved plaza/sitting area along east façade of the Pump House Building;
- Solar canopy/shade structure over the plaza/sitting area;
- Paved (10' minimum width) north/south pedestrian walkway;
- Stormwater catchment basin/planters between pedestrian walk and Center Street;
- Small open lawn/flex space for information/crafts/food tent and other uses;
- Variety of landscape plantings to provide shade, color, screening.

Note: the sequence of project design and construction will begin with Pump House Building facade improvements, followed by Pump House Plaza site and landscape improvements, and then additional project feasibility evaluation and detailed design related to the Rest Room + Maintenance Building.

The primary objective is to create a series of smaller, pedestrian-scaled public spaces along the east side of Center Street to complement and enhance Municipal Plaza, especially for various events that include the temporary closure of the street. All three of these major elements (Municipal Plaza, Center Street, east frontage public spaces) will seamlessly fit together, including consistent materials, finishes and furnishings to create a unique identity and inviting destination crossroads in the heart of the COR District.

Pump House Plaza Project Elements

Pavement



Concrete plaza with broom finish and tooled joints to create interesting pattern is preferred; color additives, acid tints or etching, and exposed aggregate are other acceptable options.

Furniture



Light weight (moveable) and stackable furniture in a variety of colors is preferred; many choices available, but should consider consistent or complimentary 'family' of furniture for all COR public places.

Stormwater Basins



Curb-cuts on both street side and plaza side of each basin direct surface water flow, but still create a physical/visual separation for pedestrian circulation, snowplowing and other maintenance operations.

Pump House Plaza Project Elements

Water Feature



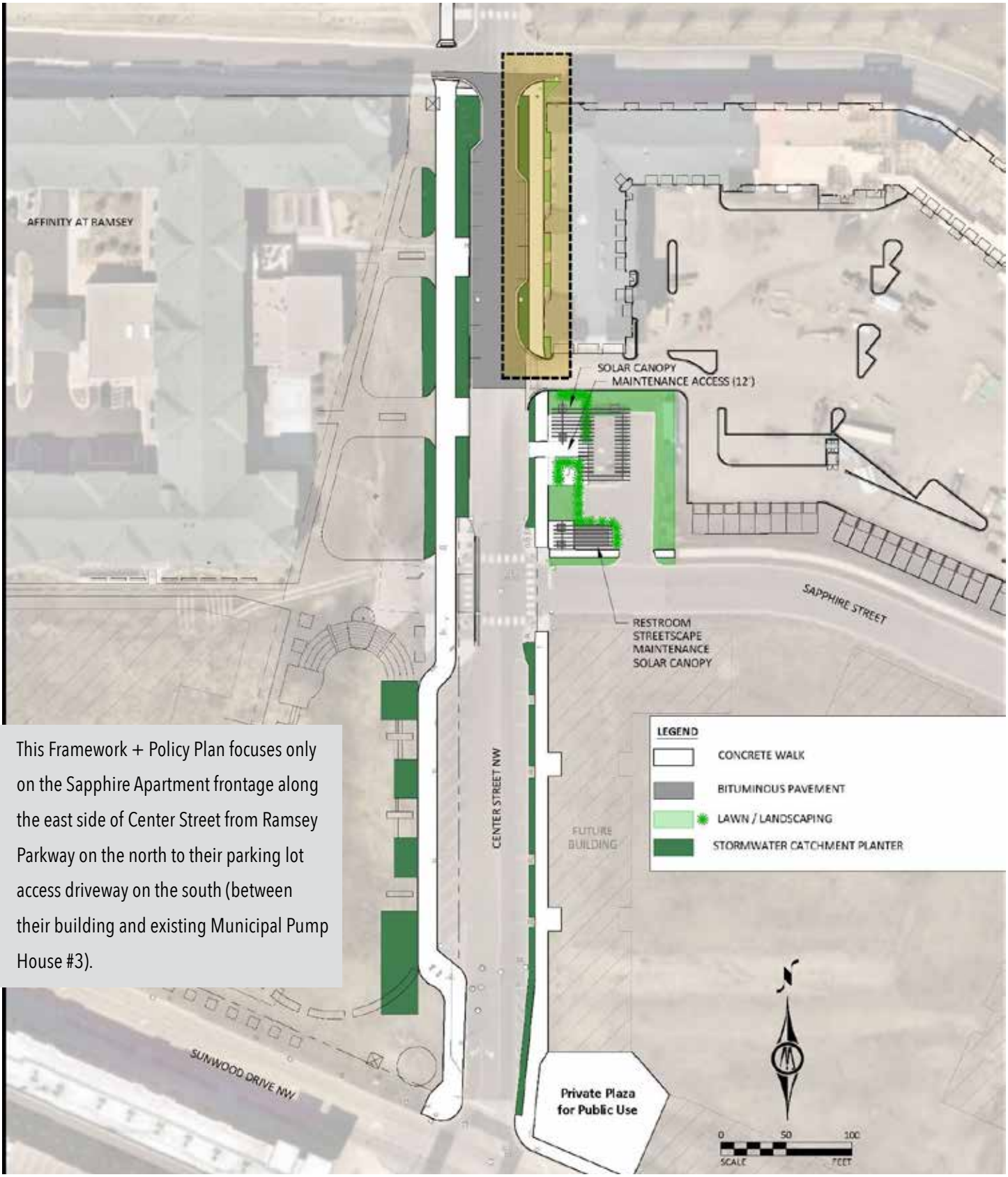
The soothing sound of water can be an important element in the design of public places; small, self-contained water features are preferred, for ease of maintenance, winter shut-down and other considerations.

Landscape

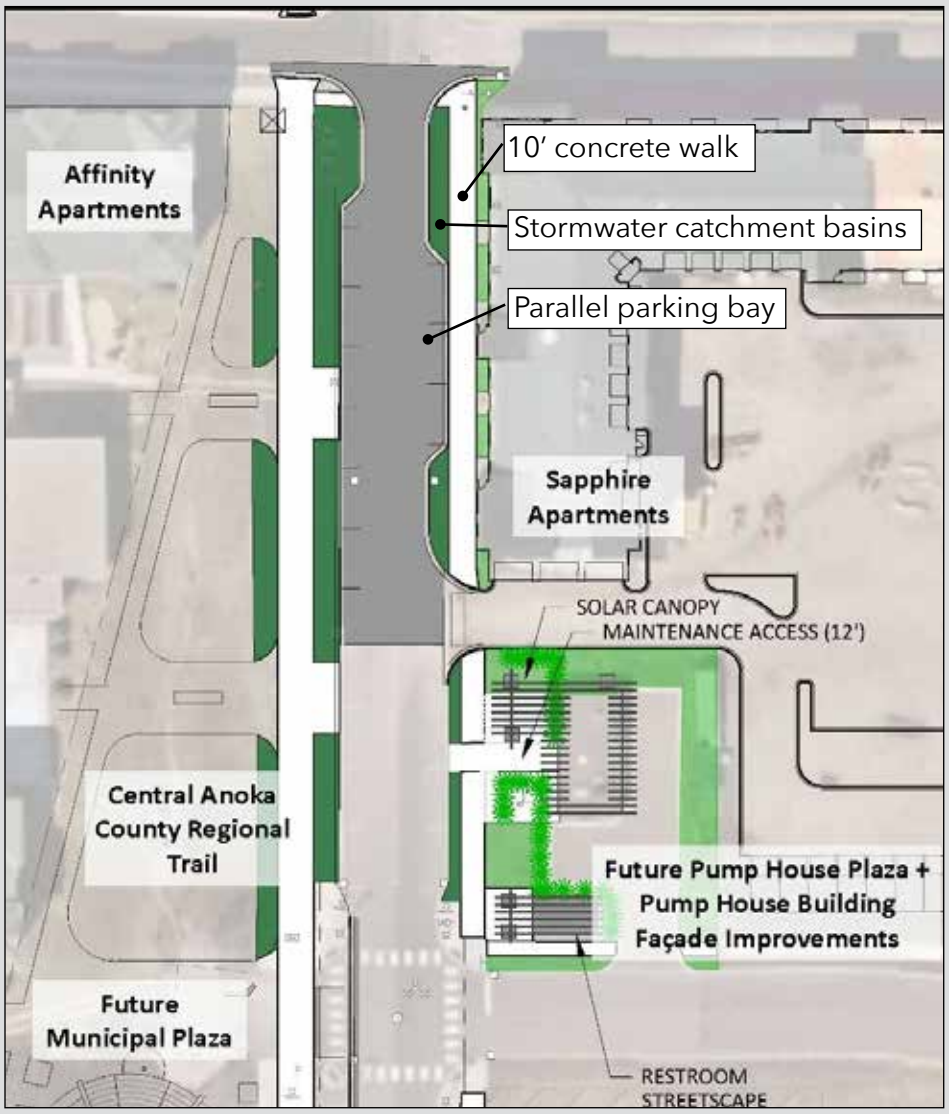



Landscape elements should reflect, or compliment, existing streetscape plantings, and further promote a consistent COR District identity and character; a simple landscape palette provides shade, seasonal color, screening (parking areas/utility boxes), and softens building elevations.

Sapphire Apartment Frontage Location Map



This Framework + Policy Plan focuses only on the Sapphire Apartment frontage along the east side of Center Street from Ramsey Parkway on the north to their parking lot access driveway on the south (between their building and existing Municipal Pump House #3).



Sappphire Apartment Frontage

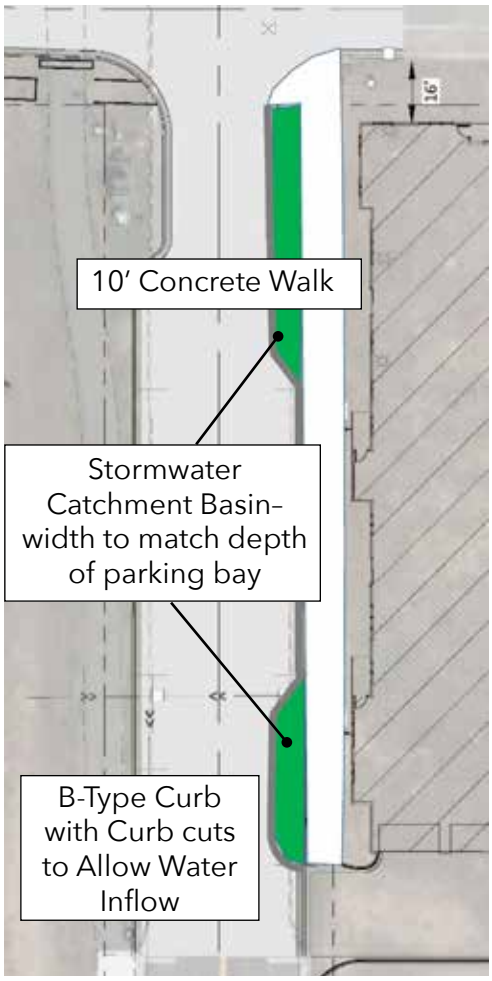
PROJECT DESCRIPTION

The Concept Site Plan for the Sapphire Apartment Frontage along the east side of Center Street includes three primary elements:

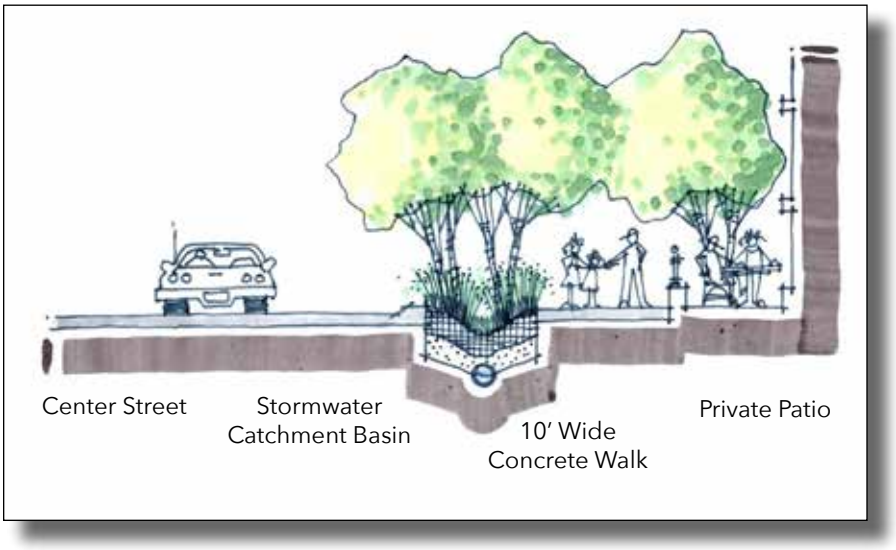
- A 10' wide concrete walk;
- Stormwater catchment basins;
- Parallel parking bay.

The Sapphire Apartment Frontage will be the first segment of public (pedestrian) realm to be completed, and as such plays an important role in establishing these elements as the benchmark for future projects along the east side of Center Street. A gracious walkway width (10'), connected stormwater basins, and landscape plantings that complement existing streetscape, will not only further enhance the desired Downtown District street character, but also set design expectations for Pump House Plaza and the now-vacant development site at Sunwood Drive.

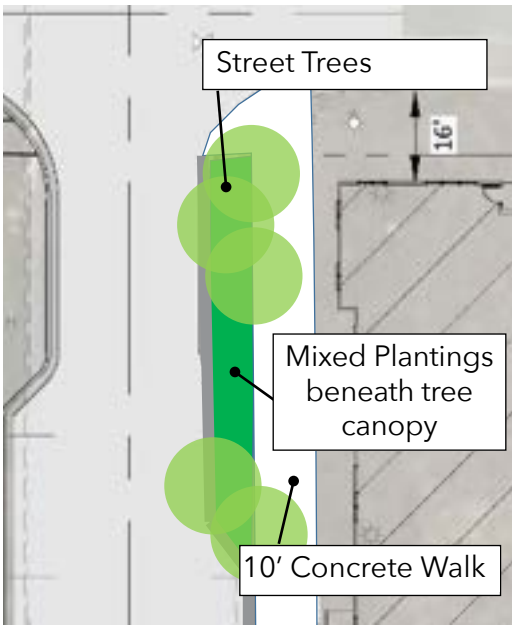
Sapphire Apartment Frontage Project Elements

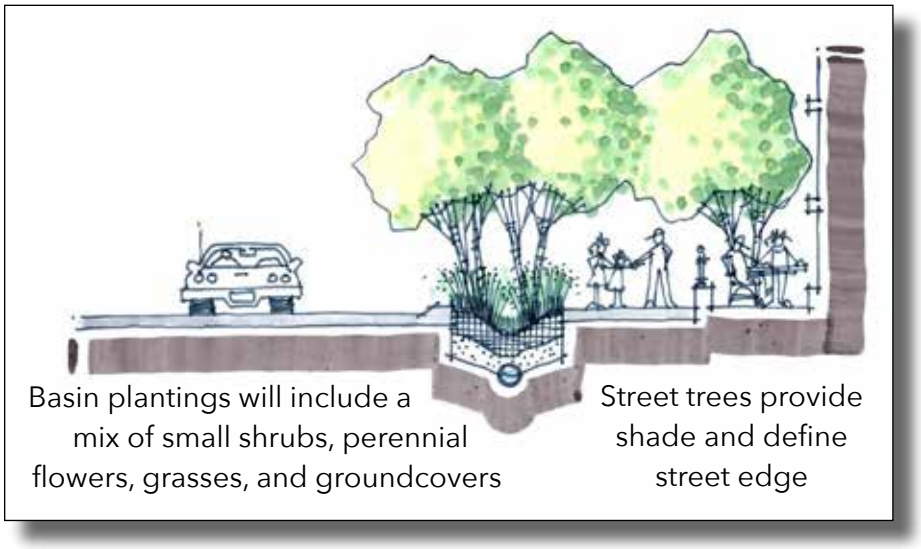


Stormwater catchment basins will be connected to existing storm sewer located in Center Street – future phases will route this water to underground cisterns in Municipal Plaza for irrigation and other re-use purposes.

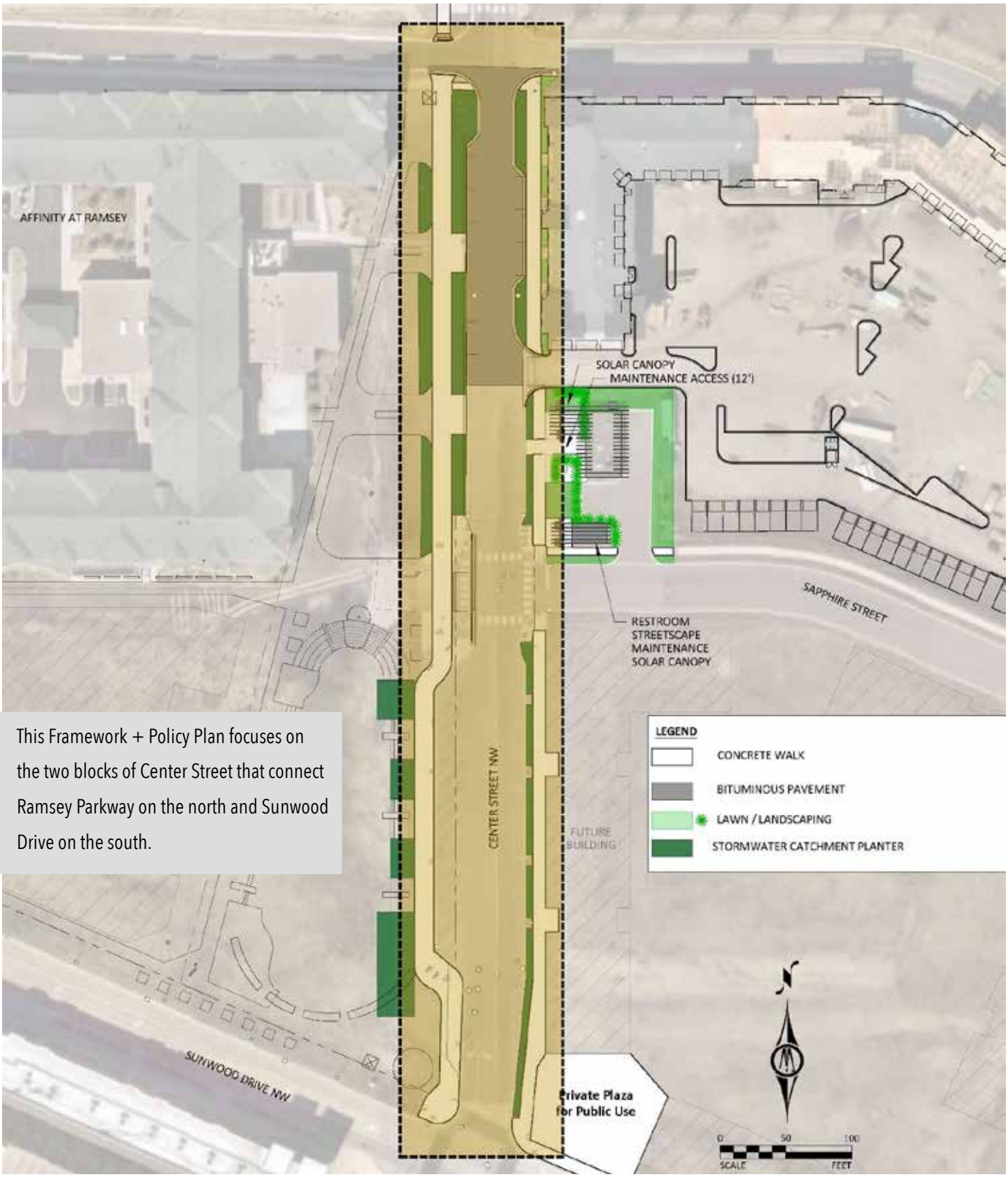


Sapphire Apartment Frontage Project Elements

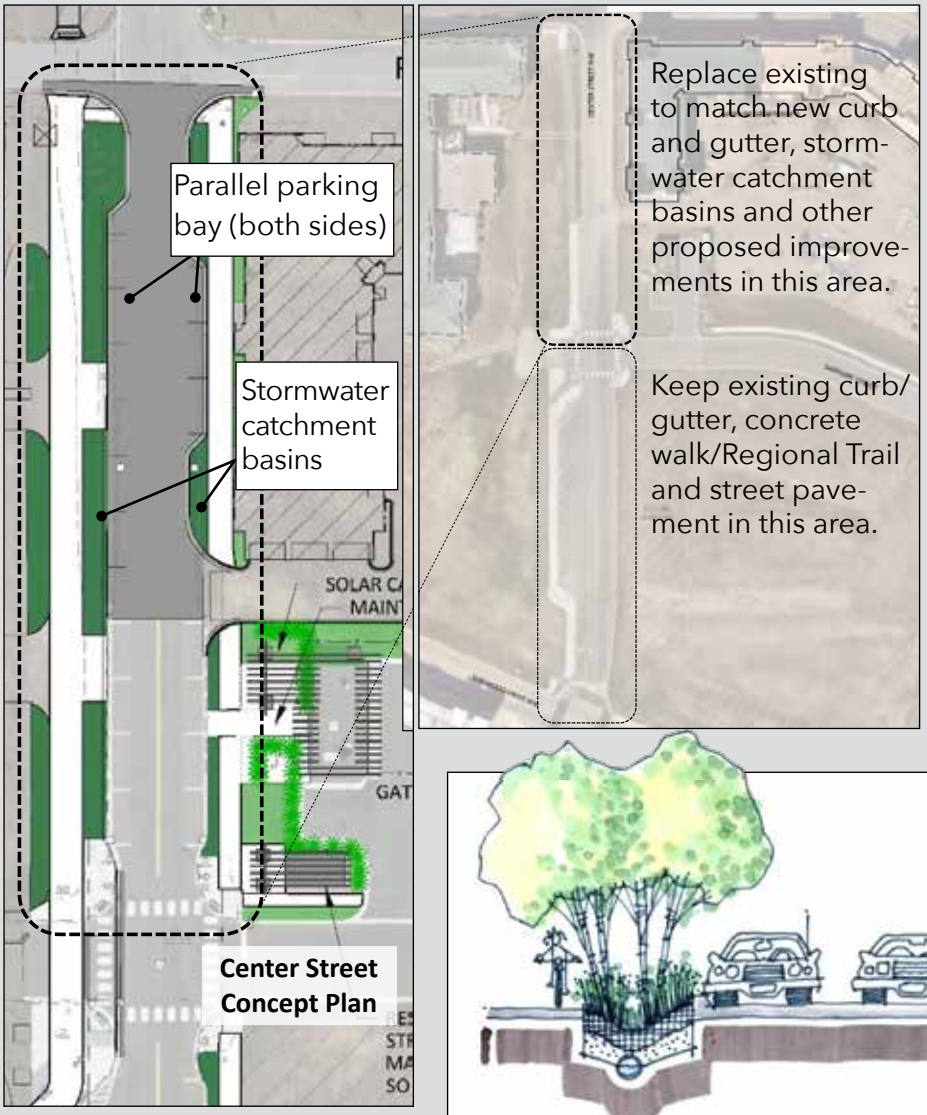


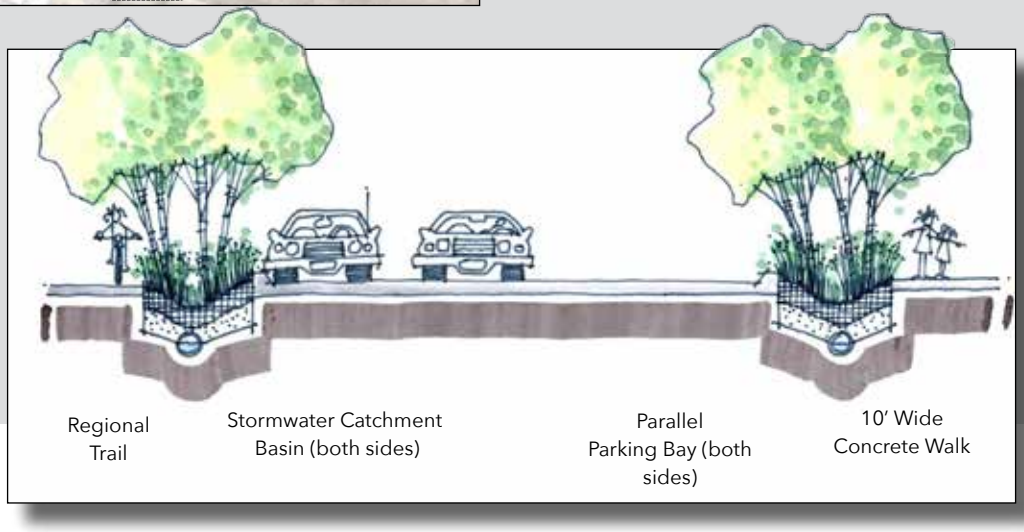


Center Street Location Map



This Framework + Policy Plan focuses on the two blocks of Center Street that connect Ramsey Parkway on the north and Sunwood Drive on the south.





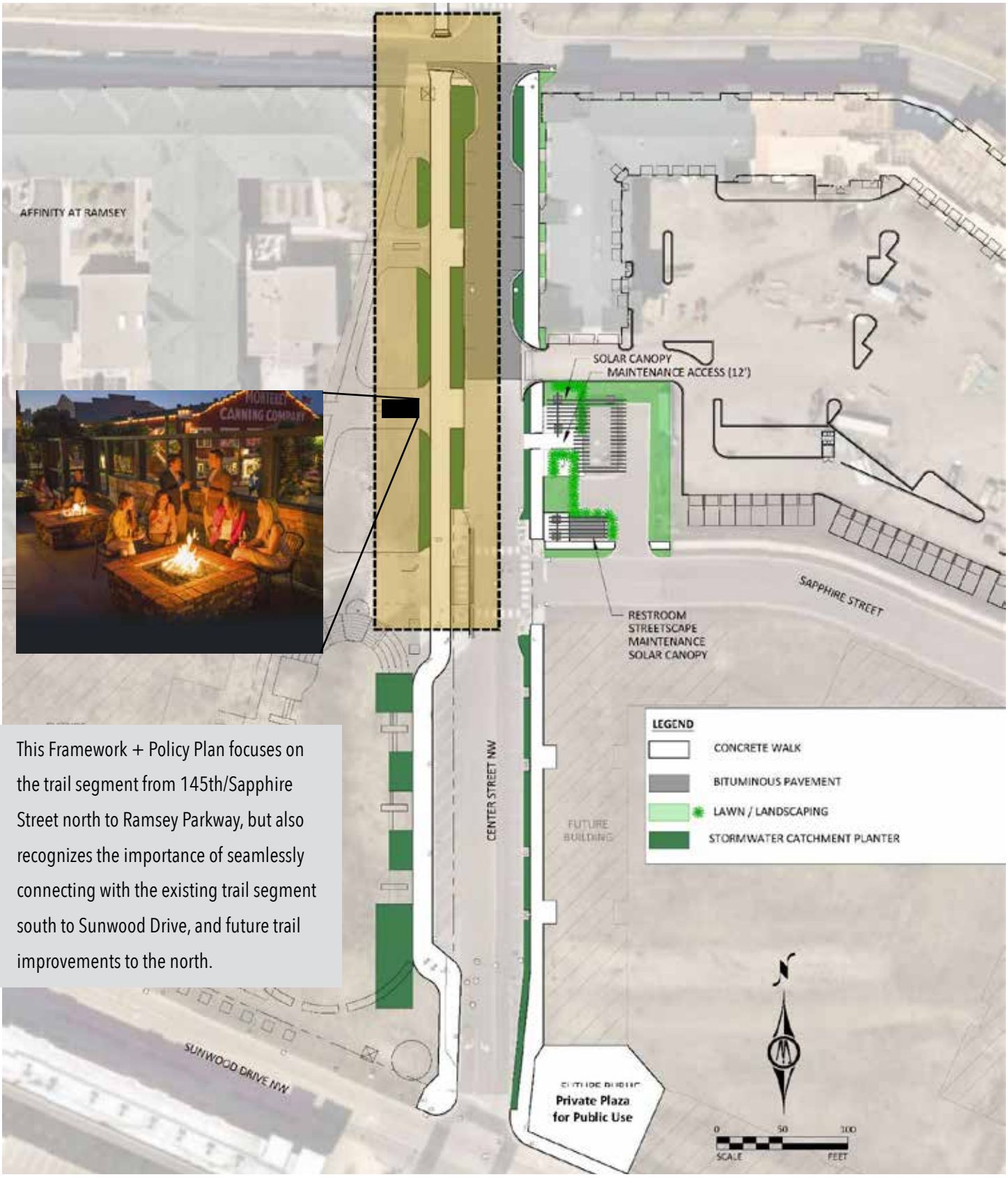
Center Street

PROJECT DESCRIPTION

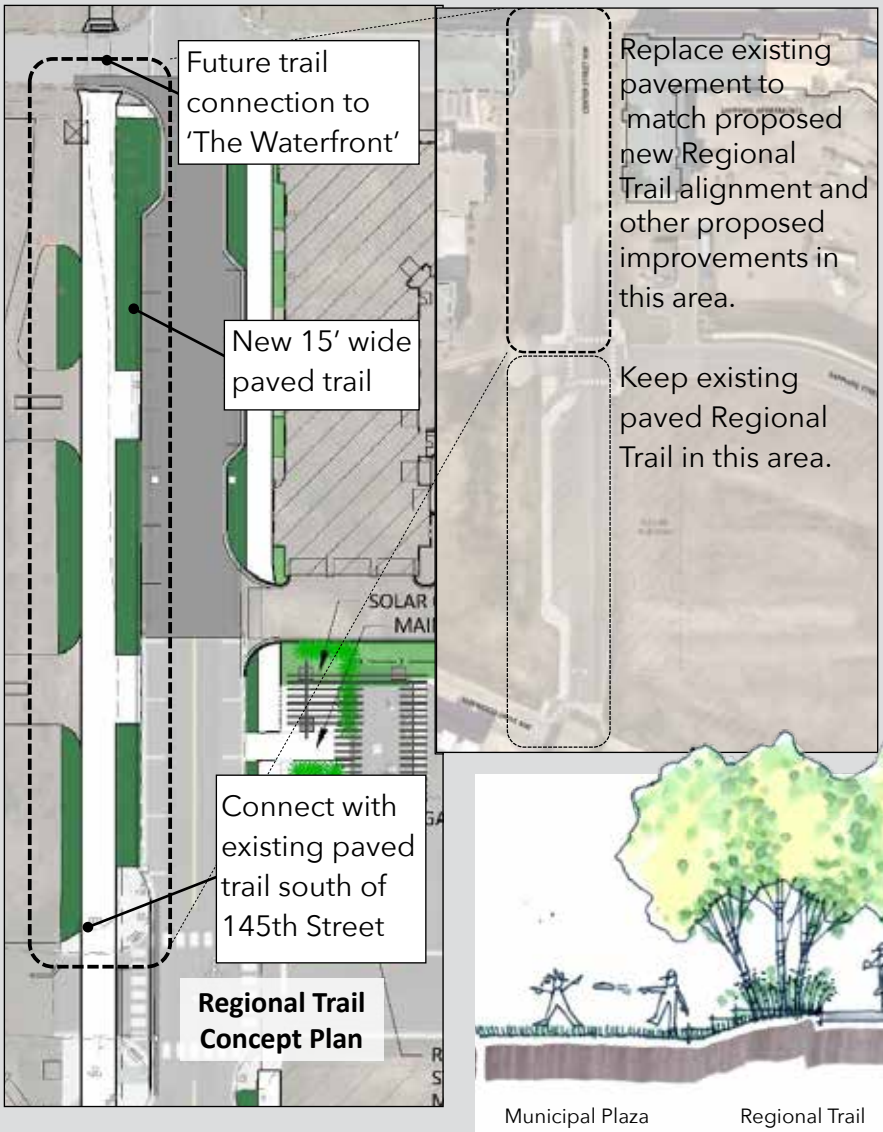
The primary purpose of the Conceptual Site Plan for Center Street is to illustrate how this key north/south connector ties together all the other pieces of this Framework + Policy Plan. At the same time, it also promotes various opportunities for innovative district infrastructure as an integral part of current and proposed street, park, trail and private development project design – suggesting shared systems for stormwater capture/reuse, energy production/distribution, waste handling/recycling and other technologies.

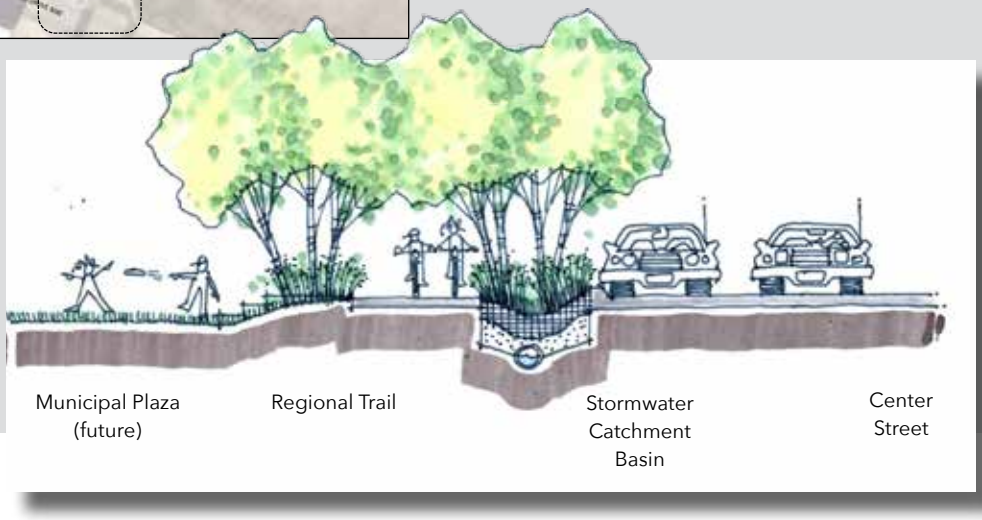
It's important to note however, that this document also presents a somewhat cautious approach, seeking to minimize disruption to existing Center Street improvements. The basic objective is to work with existing curb lines, parking bays and other pavement dimensions as the starting point for completing street construction to Ramsey Parkway and northward to Bunker Lake Boulevard. (Also refer to the Sapphire Apartments Frontage and Central Anoka County Regional Trail information in this Plan)

Regional Trail + Municipal Plaza Location Map



This Framework + Policy Plan focuses on the trail segment from 145th/Sapphire Street north to Ramsey Parkway, but also recognizes the importance of seamlessly connecting with the existing trail segment south to Sunwood Drive, and future trail improvements to the north.





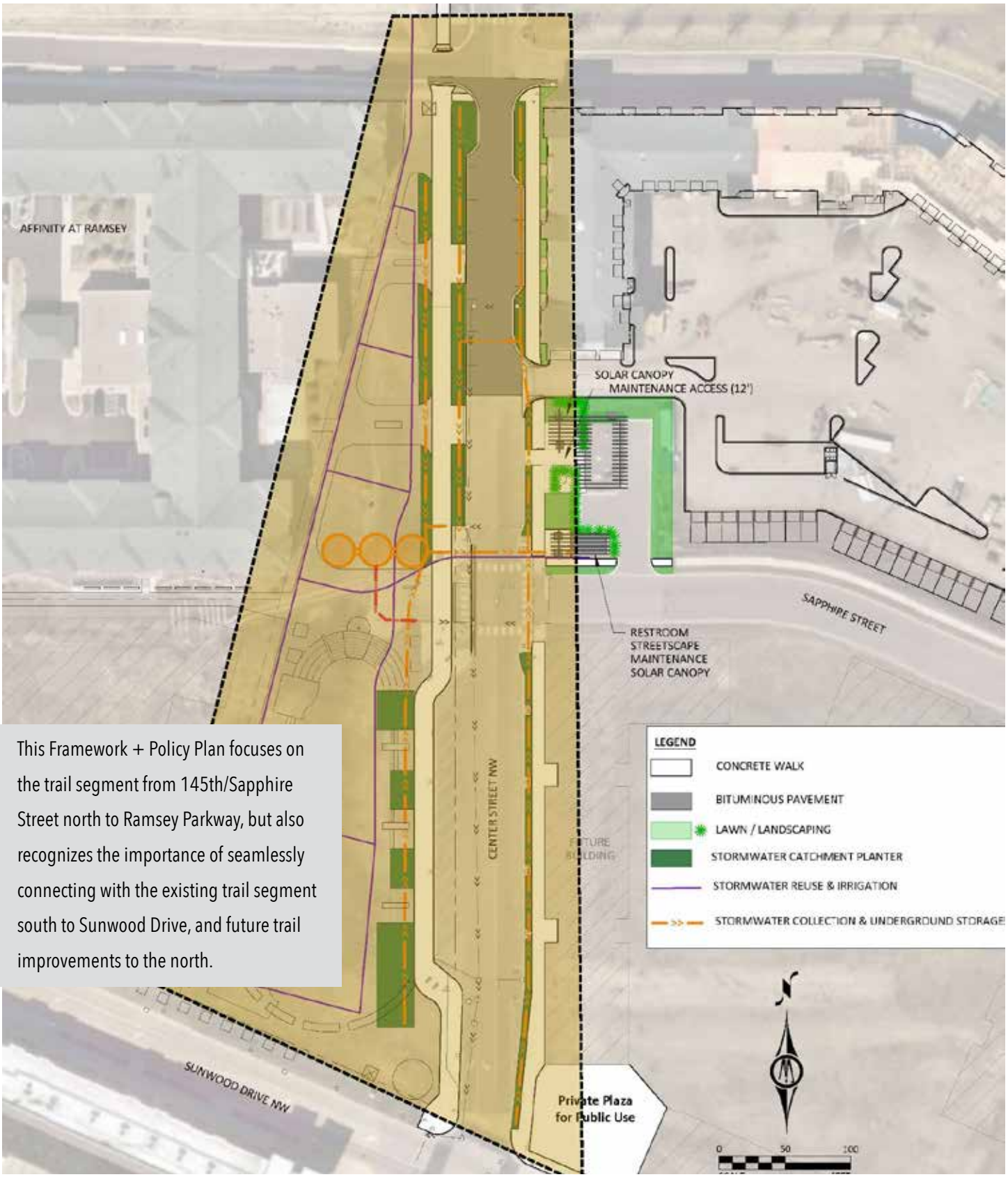
Regional Trail + Municipal Plaza

PROJECT DESCRIPTION

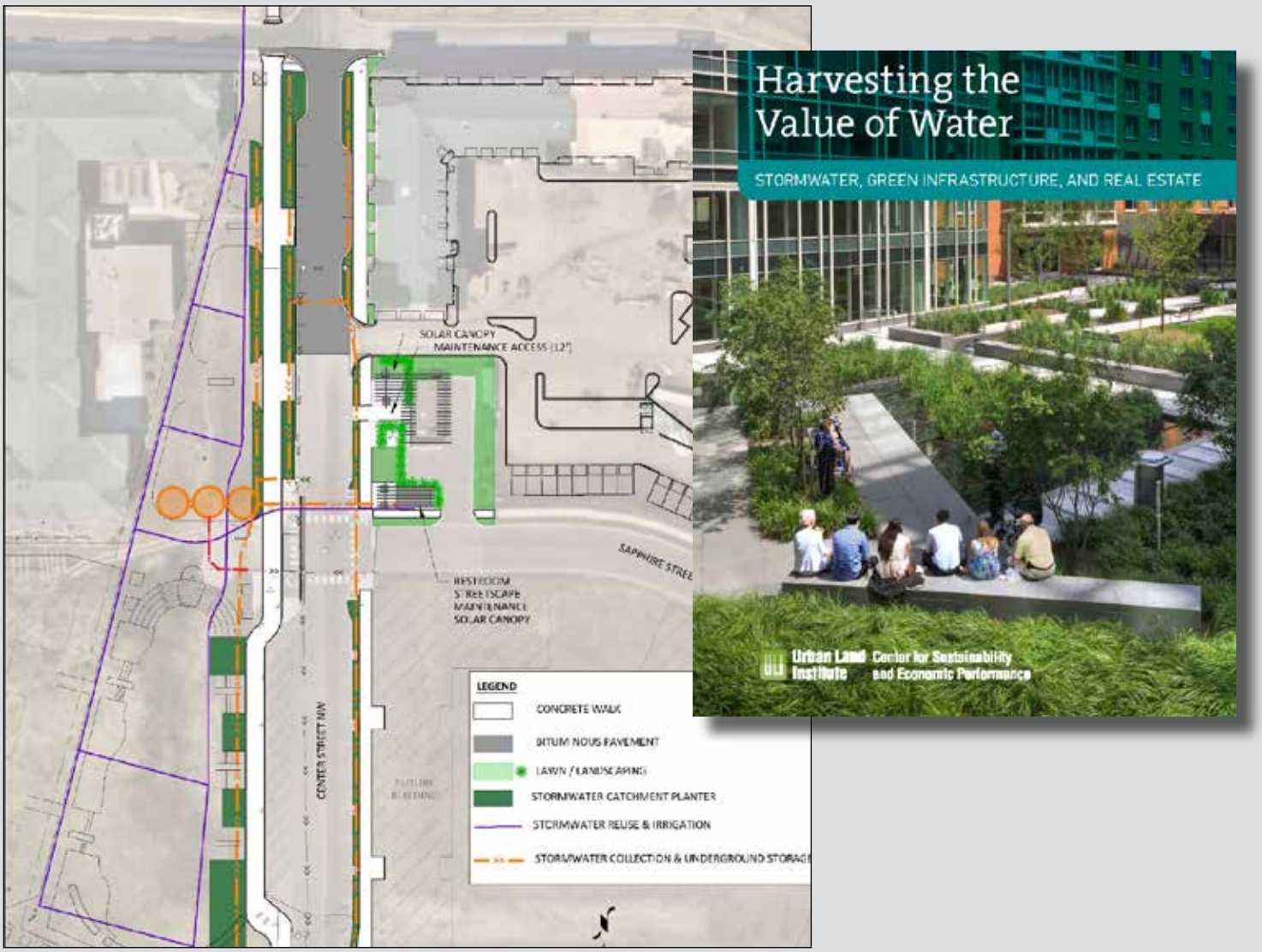
The Central Anoka County Regional Trail is a 26 - mile paved regional trail that traverses the middle of the county connecting Mississippi West Regional Park in Ramsey, to Bunker Lake Regional Park, on to the Rice Creek Chain of Lakes Park Reserve in Lino Lakes and Centerville, MN. All but a portion of this Regional Trail in Ham Lake is off-roadway, in place, and in use today, linking residents and trail users to many different destinations and facilities in the county–recreational, business, schools and residential. The trail will be an important connection to the Mississippi River and Mississippi West Regional Park once the remaining portions of the elevated pedestrian crossing over Hwy #10 are funded and the bridge is in place. This pedestrian and bicycle route links not only the isolated Mississippi Recreation District to the other of the 10 districts (and the rest of the city)–but also welcomes all the residents on the South side of Hwy #10, safely to Ramsey's downtown businesses and related recreational opportunities.

It may be noted, that this trail is an integral part of the Circle of Ramsey Greenway, and accordingly, this downtown area in Ramsey becomes both the nexus of the regional trail system, local trail system, as well as providing non-motorized opportunities in connecting the rest of Ramsey to The COR.

Stormwater Management System Location Map



This Framework + Policy Plan focuses on the trail segment from 145th/Sapphire Street north to Ramsey Parkway, but also recognizes the importance of seamlessly connecting with the existing trail segment south to Sunwood Drive, and future trail improvements to the north.



Stormwater Management System

PROJECT DESCRIPTION

Bolton & Menk, has completed a preliminary study that analyzes the feasibility of integrating stormwater reuse for irrigation of the proposed Municipal Plaza and adjacent Center Street landscape improvements. The reuse system envisioned will include best management practices to collect and treat runoff, storage tanks to store the runoff, and a pump station and piping to convey the reuse water to the irrigation areas. Most of the stormwater runoff will be generated from Center Street NW and the sidewalks on either side of the road. Stormwater runoff is proposed to be collected and treated by a combination of tree vaults and rain gardens located within the boulevard and parking 'bump-outs on both sides of the street. It is assumed that the runoff would drain directly into each of the rain gardens and tree vaults through surface capture systems (i.e.. curb cuts).

Water collected and stored within the storage tanks will discharge via gravity flow to the pump house wet well, where it will be filtered and treated. The Metropolitan Council Storm water Reuse Guide Water Balance Tool for Constant Irrigation Demand was used to determine the percent of time the stormwater reuse system would be functioning, and assumed 1" of water over the irrigable area per week is required for adequate vegetation growth and health.

Stormwater Management System Project Elements

SOURCE Site Data				
Impervious Area	83,417	square feet		
Impervious Area	1.91	acres		
USE Demand Data				
Irrigation Area	57,206	square feet		
Irrigation Area	1.31	acres		
Irrigation Season	13	39	week number	
Storage Data				
Storage Provided	150,000	gallons		
Total Storage Required	454,037	gallons		%
Weeks that Flows Must be Augmented	85	weeks		10.2%
Weeks that Reuse System will Meet Demand	752	weeks		89.8%

Exhibit 1: Excerpt from the Met Council Reuse Water Balance Tool.

Exhibit 2: Example concrete vault storage tank (Storm Trap).

Exhibit 3: Example underground fiberglass storage tanks (Xerxes).

Exhibit 1 summarizes the preliminary reuse system sizing. According to the reuse calculator, there will be enough captured stormwater water in approximately 90% of the pumping season weeks to apply I-inch per week of water over the area to be irrigated (a total of 454,000 gallons required). Since rainfall contributes to that total, as well as stored water in that tank, the total required volume per year does not translate to the size of the tank required. Instead, the volume of the tank can be modified to target an irrigation efficiency.

The storage volume could be a single concrete vault or multiple fiberglass underground units. Given the size of individual cisterns, plastic is not available. Fiberglass tanks generally are available up to 50,000 gallons in size. A 50,000-gallon tank has dimensions of approximately 68 feet long with a 12-foot diameter. Three tanks, with space between, could fill a footprint of approximately 5,000 square feet. Concrete vaults can be sized to fit multiple footprint sizes.

Stormwater Management System Project Elements

Rainfall Event	Rainfall Depth (IN)	Runoff Volume (CF)	Runoff Volume (GA)
1" Event	1.00	5,500	41,140
1-Year	2.46	14,700	109,956
2-Year	2.86	17,600	131,648
5-Year	3.58	22,700	169,796
10-Year	4.26	27,500	205,700

Table 1: Summary of expected runoff volumes.

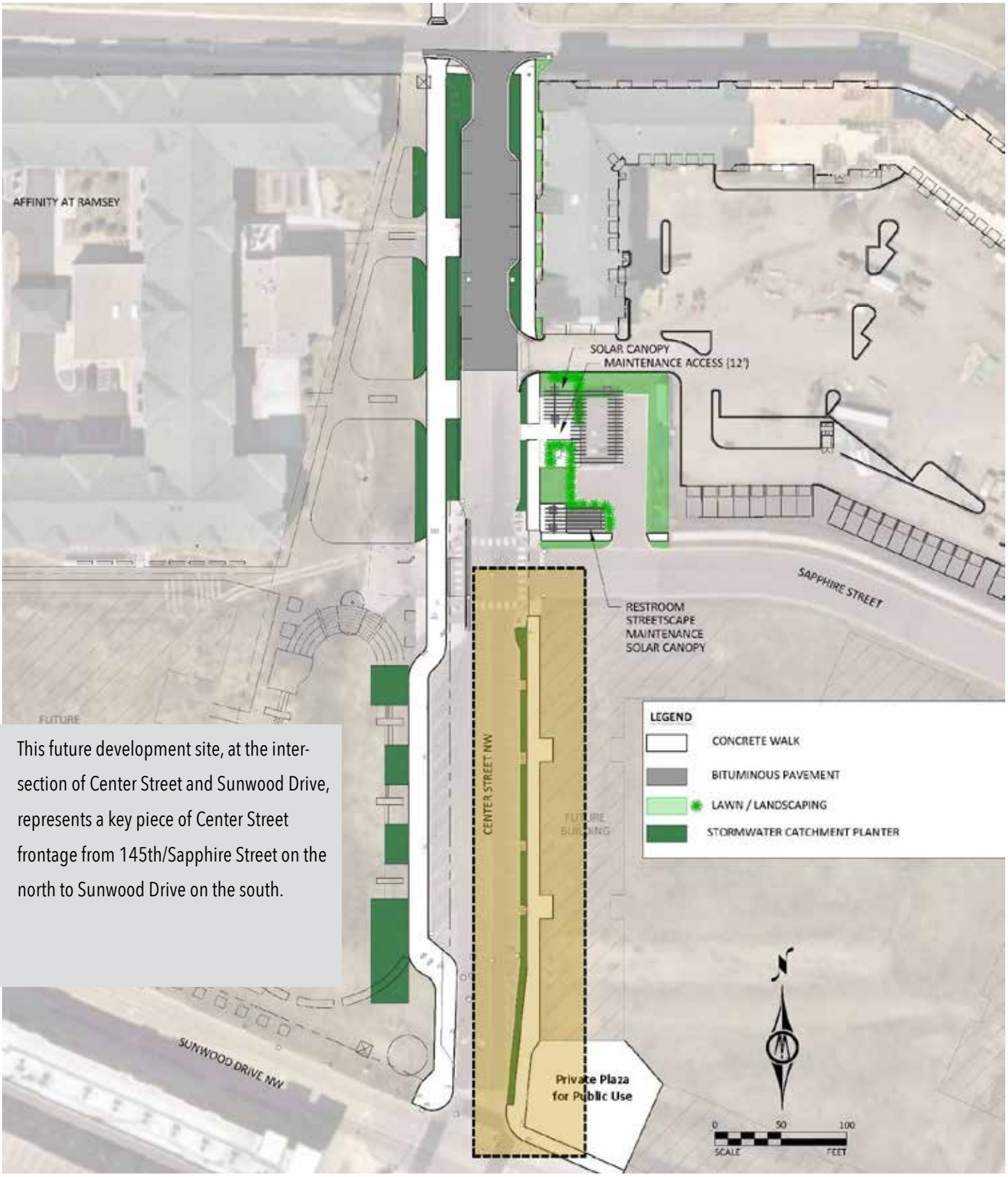
Additional Considerations

A simplified estimate of stormwater runoff expected from the street section was assembled to ensure the watershed can produce enough runoff to adequately fill the tanks. Table 1 is a summary of expected runoff volumes for a variety of events. A rainfall event producing between 3.6 and 4.3 inches in 24 hours (5-year to IO-year return interval) can completely fill the tank.

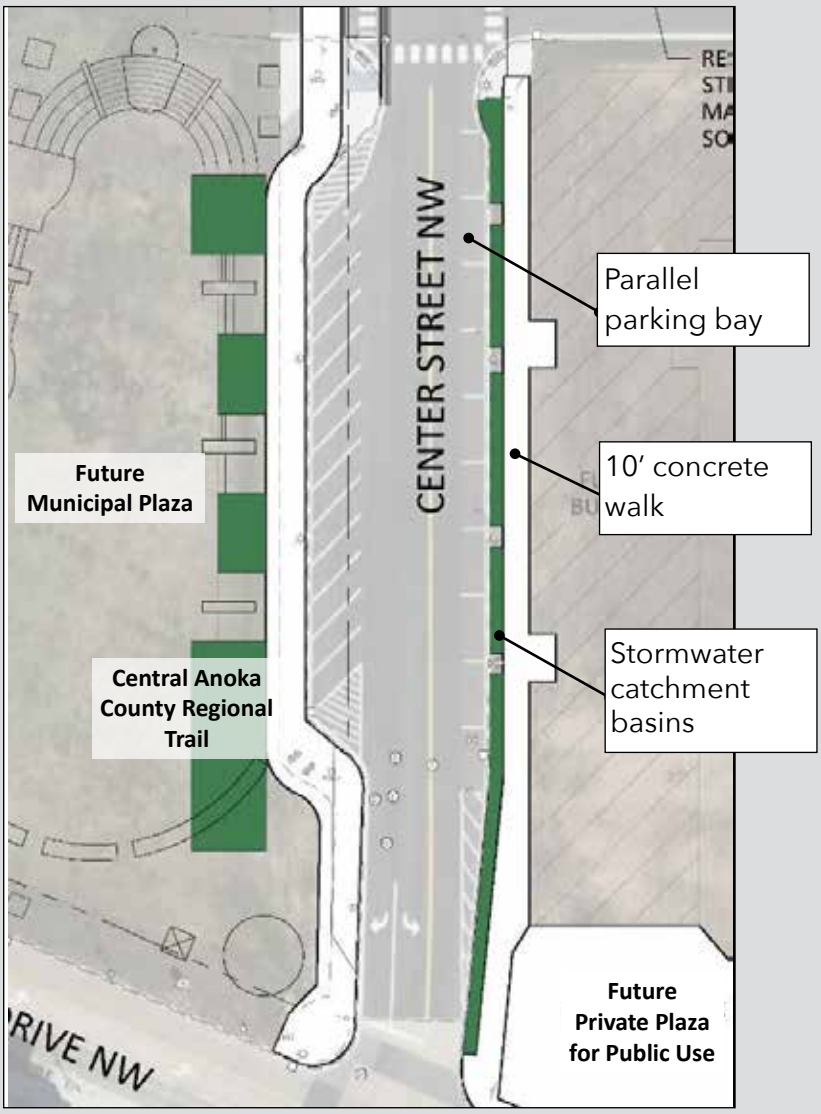
During final design, additional hydraulic information will be provided to provide an effective high flow bypass system. In other words, if the tank is full and the City experiences a 100-year rainfall event, there will be adequate bypass capacity to reduce local flooding and protect the tank(s). Also, since the COR trunk storm sewer system is already designed to accommodate a 100-year rainfall event with discharge to regional flood storage areas, the bypass system will effectively mimic the originally designed scenario. In between events when irrigation is occurring, or the tanks is being filled, there will be hydraulic relief on the trunk system and volume control provided.

Since the reuse water will pass through a filter and potentially other treatment methods, the impact to groundwater resources through the infiltration of irrigation water is expected to be very minimal. Impacts to groundwater resources in the ERA are

Future Development Site Frontage Location Map



This future development site, at the intersection of Center Street and Sunwood Drive, represents a key piece of Center Street frontage from 145th/Sapphire Street on the north to Sunwood Drive on the south.



Future Development Site Frontage

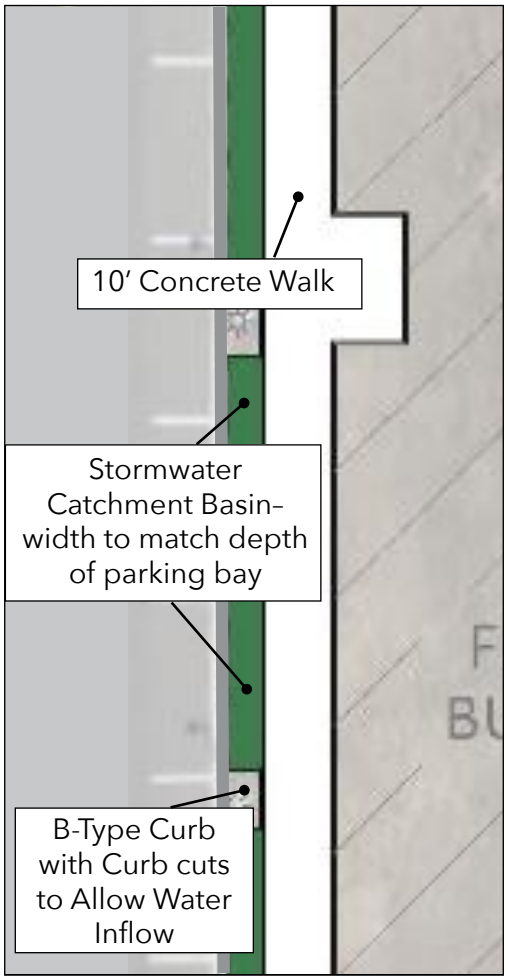
PROJECT DESCRIPTION

The Concept Site Plan for the Future Development Site Frontage along the east side of Center Street matches recommendations for Sapphire Apartment Frontage and Pump House Plaza to the north, including three primary elements:

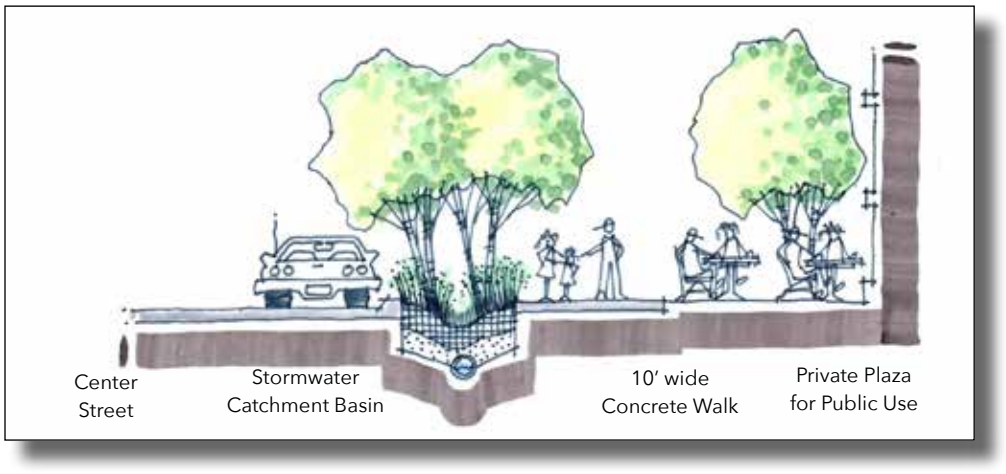
- A 10' wide concrete walk;
- Stormwater catchment basins;
- Parallel parking bay.

Following in the footsteps of the Sapphire Apartment project, future development of this site will also include a gracious pedestrian walkway (10' width), connected stormwater basins, and landscape plantings that complement existing streetscape, further enhancing the desired Downtown District street character as a welcoming local and regional destination.

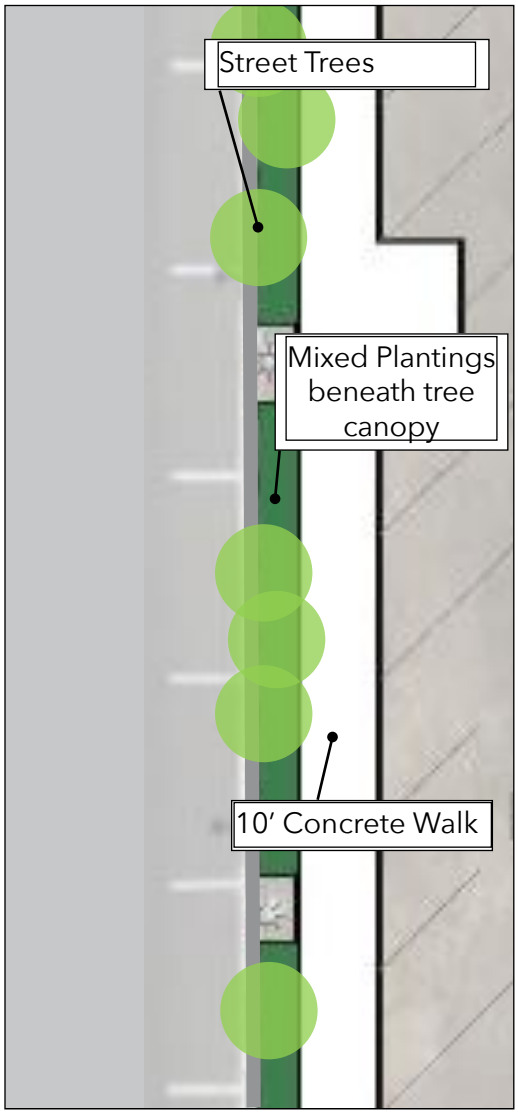
Future Development Site Frontage Project Elements

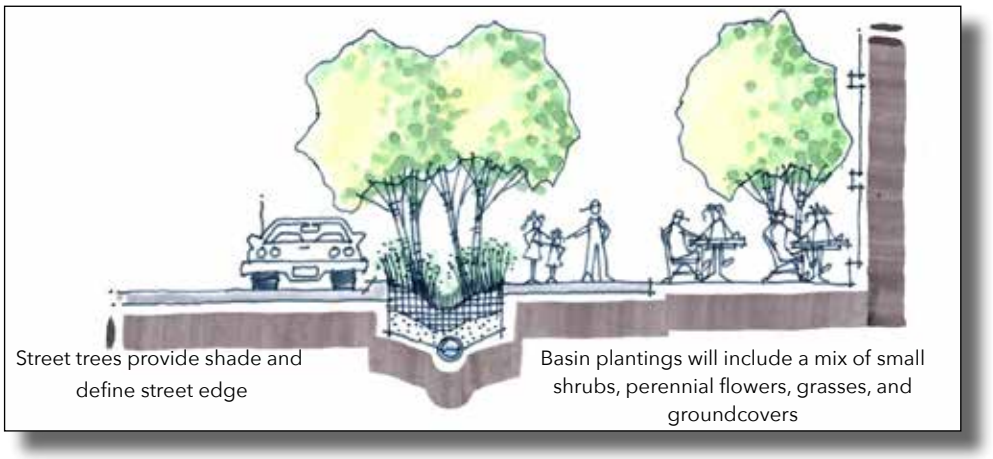


Stormwater catchment basins will be connected to existing storm sewer located in Center Street – future phases will route this water to underground cisterns in Municipal Plaza for irrigation and other re-use purposes.



Future Development Site Frontage Project Elements





BOLTON & MENK
Real People. Real Solutions.

7533 Sunwood Drive NW
Suite 206
Ramsey, MN 55303-5119

Ph: (763) 433-2851
Fax: (763) 427-0833
Bolton-Menk.com

June 25, 2019

RE: Technical Memorandum
2019 Municipal Plaza and Center Street Concept Stormwater Reuse
City of Ramsey, MN

Bolton & Menk, Inc has completed a preliminary study that analyzes the feasibility of integrating stormwater reuse for irrigation of the proposed Municipal Plaza in conjunction with Center Street Improvements. The reuse system envisioned will include best management practices to collect and treat runoff, storage tanks to store the runoff, and a pump station and piping to convey the reuse water to the irrigation areas. The pump station will include pumps, a control system to monitor flow and pressure, and a treatment unit and self-flushing filter to protect the public from potential pathogens in the stormwater. The site analyzed for the stormwater reuse system includes Center Street Northwest from East Ramsey Parkway to Sunwood Drive Northwest.

Current Conditions

The COR Area of Ramsey is under active development. Since its inception, regional stormwater management has been constructed to maintain stormwater discharge rates to the undeveloped condition and provide water quality and volume control to meet state and local standards. Therefore, the development area surrounding Center Street was planned to discharge into a trunk storm sewer system, sized for the 100-year storm (7.1" in 24 hours) to the regional collection system.

The area surrounding Center Street NW is largely undeveloped, but is proposed to include commercial businesses including the Affinity at Ramsey building, which is currently under construction near the Southwest quadrant of Center Street NW and E Ramsey Parkway. Affinity at Ramsey is responsible for their own stormwater requirements and none of their site was considered for collection in the stormwater reuse system. Additional multi-family residential and mixed-use facilities will also be constructed adjacent to the corridor, also assumed to discharge into the Center Street trunk storm sewer independent of the proposed Center Street treatment and stormwater reuse system.

Center Street NW is currently paved with concrete curb and gutter on each side. Each side of the road includes a driving lane and a parking lane. A 10' path runs along the west side of the road. Drainage patterns run from north to south and stormwater runoff is currently captured by catch basins that route the water offsite to the south.

Proposed Conditions

Municipal Plaza is a proposed 1.7-acre green space accessible to the public. Municipal Plaza will be located on the west side of Center Street NW from E Ramsey Parkway to Sunwood Drive NW. The east side of Center Street NW is proposed commercial/residential buildings. The site resides in the City's moderate vulnerability Drinking Water Supply Management Area (DWSMA) and the emergency response area. Therefore, traditional infiltration practices are prohibited.

Preliminary Roadway Runoff Treatment

The majority of the stormwater runoff will be generated from Center Street NW and the sidewalks on either side of the road. Stormwater runoff is proposed to be collected and treated by a combination of tree vaults and rain gardens located in the boulevard and on either side of the road. It is assumed that the runoff would drain directly into each of the raingardens and tree vaults through surface capture systems (i.e. curb cuts, ribbon curb, pretreatment structures, et). Granular filter media will be used for treatment and a perforated underdrain will connect the tree vaults and raingardens and route all the stormwater to the storage tanks.

Preliminary Stormwater Reuse System

Water collected and stored within the storage tanks will discharge via gravity flow to the pump house wet well, where it will be filtered and treated. The reuse water will be disinfected using UV treatment to address any fecal coliform, pathogens or other health concerns related to use of reuse water for irrigation.

The assumed operating season for the irrigation systems is a 26-week period; beginning April 1st and extending through September 30th. The Metropolitan Council Stormwater Reuse Guide Water Balance Tool for Constant Irrigation Demand was used to determine the percent of time over the assumed 26-week irrigation season that the stormwater reuse system would be functional while operating within the assumed conditions. The tool assumes 1" of water over the irrigable area per week is required for adequate vegetation growth and health. The method uses historic rainfall data spanning 31 years to determine the functionality of the stormwater reuse system within the 26-week pumping period.

Exhibit 1 summarizes the preliminary reuse system sizing. The "Irrigation Season" is assumed to be weeks 13 to 39 of the year, or approximately April 1 to September 30. In the calculator, these fields are used to look up weekly average rainfall to estimate the total potential volume of runoff that could be used for irrigation and how often we get 1 inch or more rain. Narrowing or widening the irrigation season changes the irrigation demand. The "Weeks that Flows Must be Augmented" and "Weeks that Reuse System will Meet Demand" cells cover the total period of record (837 weeks, or 16 years). So, 10% of the weeks (85 weeks) during the entire period of record result in a tank volume and rainfall volume less than the demand for that week.

According to the reuse calculator, there will be enough captured stormwater water in approximately 90% of the pumping season weeks to apply 1-inch per week of water over the assumed 1.31-acre turf irrigation area (57,206 sq. ft.). The calculator provides a preliminary need of 454,00 gallons required to apply 1-inch per week during the irrigation season. Since rainfall contributes to that total, as well as stored water in that tank, the total required volume per year does not translate to the size of the tank required. Instead, the volume of the tank can be modified to target an irrigation efficiency. Therefore, the storage tank or tanks should be approximately 150,000 gallons in size to irrigate with stormwater for 90% of the year. Additional irrigation to meet the 1-inch demand, should the City choose to irrigation at that rate, would need to be supplemented with potable sources.

SOURCE Site Data			
Impervious Area	83,417	square feet	
Impervious Area	1.91	acres	
USE Demand Data			
Irrigation Area	57,206	square feet	
Irrigation Area	1.31	acres	
Irrigation Season	13	39	week number
Storage Data			
Storage Provided	150,000	gallons	
Total Storage Required	454,037	gallons	%
Weeks that Flows Must be Augmented	85	weeks	10.2%
Weeks that Reuse System will Meet Demand	752	weeks	89.8%

Exhibit 1: Excerpt from the Met Council Reuse Water Balance Tool.

Footprint Considerations

The storage volume could be a single concrete vault or multiple fiberglass underground units. Given the size of individual cisterns, plastic is not available. Fiberglass tanks generally are available up to 50,000 gallons in size. A 50,000-gallon tank has dimensions of approximately 68 feet long with a 12-foot diameter. Three tanks, with space between, could fill a footprint of approximately 5,000 square feet. Concrete vaults can be sized to fit multiple footprint sizes. If a maximum active depth of water in the vault of 8' is assumed, the footprint would be approximately 2,500 square feet.

Exhibit 2: Example concrete vault storage tank (StormTrap).

Exhibit 3: Example underground fiberglass storage tanks (Xerxes).

Additional Considerations

A simplified estimate of stormwater runoff expected from the street section was assembled to ensure the watershed can produce enough runoff to adequately fill the tanks. Table 1 is a summary expected runoff volumes for a variety of events. A rainfall event producing between 3.6 and 4.3 inches in 24 hours (5-year to 10-year return interval) can completely fill the tank.

Table 1: Summary of expected runoff volumes.

Rainfall Event	Rainfall Depth (IN)	Runoff Volume (CF)	Runoff Volume (GA)
1" Event	1.00	5,500	41,140
1-Year	2.46	14,700	109,956
2-Year	2.86	17,600	131,648
5-Year	3.58	22,700	169,796
10-Year	4.26	27,500	205,700

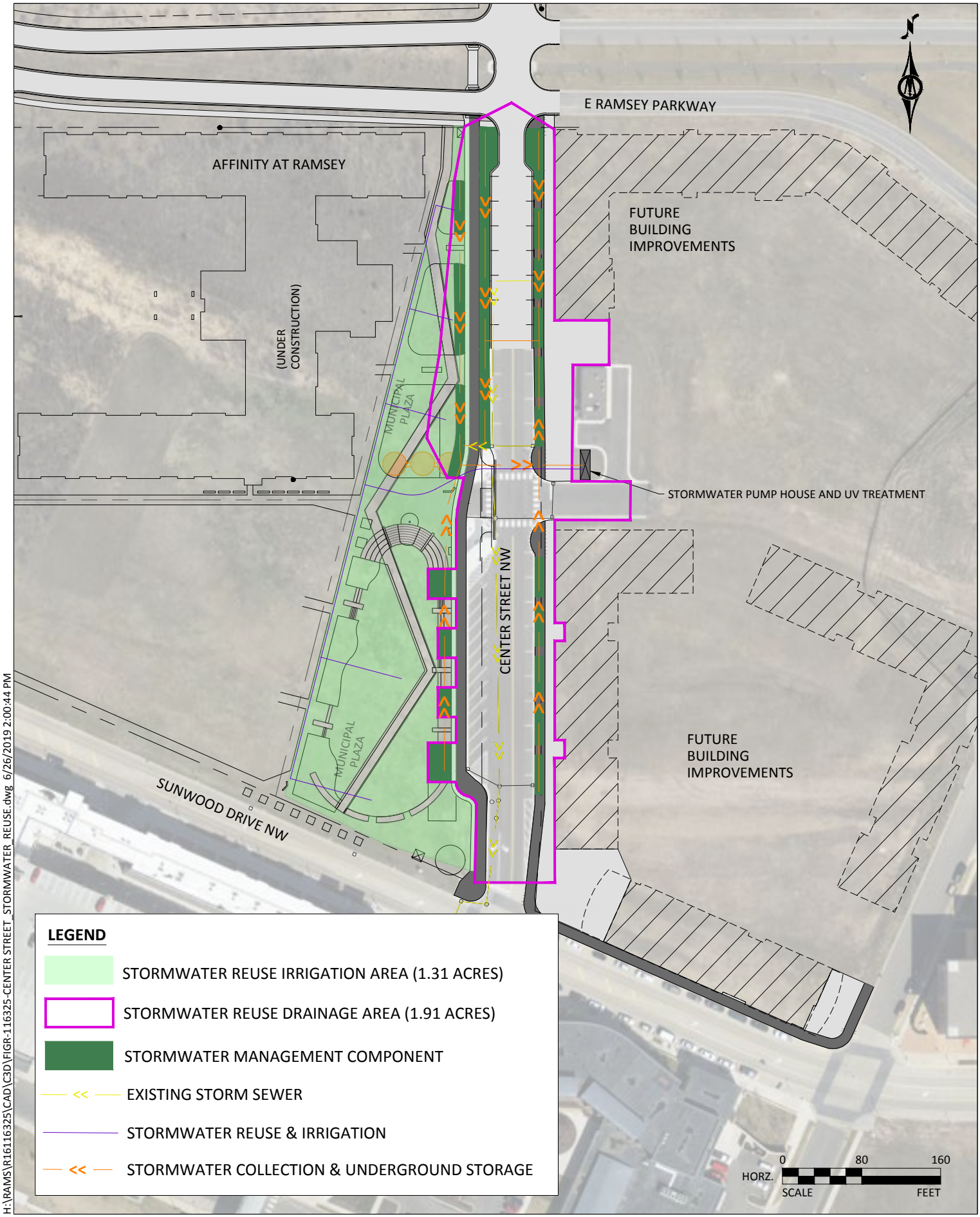
During final design, additional hydraulic information will be provided to provide an effective high flow bypass system. In other words, if the tank is full and the City experiences a 100-year rainfall event, there will be adequate bypass capacity to reduce local flooding and protect the tank(s). Also, since the COR trunk storm sewer system is already designed to accommodate a 100-year rainfall event with discharge to regional flood storage areas, the bypass system will effectively mimic the originally designed scenario. In between events when irrigation is occurring, or the tanks is being filled, there will be hydraulic relief on the trunk system and volume control provided.

Since the reuse water will pass through a filter and UV treatment system, the impact to groundwater resources through the infiltration of irrigation water is expected to be very minimal. Impacts to groundwater resources in the ERA are not anticipated.

Sincerely,

Bolton & Menk, Inc.

Timothy J. Olson, PE, CFM
Water Resources Project Manager



H:\RAMS\R16116325\CAD\C3D\FIGR-116325-CENTER STREET_STORMWATER_REUSE.dwg 6/26/2019 2:00:44 PM

PRELIMINARY ENGINEER'S ESTIMATE

COR PARKS & PARKVIEW WEST DEVELOPMENT
STORMWATER COLLECTION, REUSE, & SIDEWALK
CITY OF RAMSEY
BMI PROJECT NO. R12.118998
6/26/2019

ITEM NO.	NOTES	ITEM	TOTAL
1		STORMWATER STORAGE TANKS	$360,000.00
2		REUSE STATION BUILDING / WET WELL	$350,000.00
3		IRRIGATION SYSTEM	$65,000.00
4		STORMWATER BIORETENTION/FILTRATION AREAS	$480,000.00
5	A	CONCRETE WALK	$350,000.00
6		EROSION CONTROL & RESTORATION	$50,000.00

$1,655,000.00

NOTES:

A AREA INCLUDES CONCRETE WALK IN ADDITION TO CITY STANDARD OF 10' WIDTH

Probable Construction Costs

Municipal Plaza - North

DIVISION	DESCRIPTION	TOTAL ESTIMATED QUANTITY	UNITS	UNIT COST	TOTAL COST
GENERAL REQUIREMENTS					**$ 27,900**
	MOBILIZATION (3%)	1	LUMP	$ 27,900.00	$ 27,900
EARTHWORK					**$ 108,467**
	COMMON EXCAVATION	2 281	CU YD	$ 20.00	$ 45,626
	SLOPE PROTECTION	507	SQ YD	$ 8.50	$ 4,309
	SELECT GRANULAR BORROW AND ROUGH GRADING	2 281	CU YD	$ 25.00	$ 57,032
	TOPSOIL BORROW AND ARCHITECTURAL GRADING	50	CU YD	$ 30.00	$ 1,500
CONCRETE WALKS AND STREET					**$ 444,559**
	CURB AND GUTTER	830	LF	$ 18.00	$ 14,940
	DETECTABLE CURB RAMPS	4	EA	$ 1,500.00	$ 6,000
	4" CONCRETE WALK	14 925	SF	$ 6.00	$ 89,550
	BITUMINOUS TRAILS		LF	$ 4.00	$ -
	PERVIOUS PAVERS (INCL BASE)	2 050	SF	$ 30.00	$ 61,500
	BITUMINOUS WEAR COURSE (2")	285	TON	$ 100.00	$ 28,507
	BITUMINOUS NON-WEAR COURSE (2")	285	TON	$ 90.00	$ 25,657
	AGGREGATE BASE	728	CY	$ 22.00	$ 16,005
FOUNTAINS					
ARCHITECTURE					
STAIRS AND WALLS					$ -
FENCE/SCREEN					**$ 40,000**
	DECORATIVE FENCE	400	LF	$ 100.00	$ 40,000
FURNISHING					**$ 61,200**
	KIOSK (ARTFUL STRUCTURE, PARK SIGN AND INTERPRETIVE SIGN)	1	EA	$ 15,000.00	$ 15,000
	RECEPTACLES	4	EA	$ 1,500.00	$ 6,000
	BENCHES	4	EA	$ 2,500.00	$ 10,000
	BIKE RACKS	2	EA	$ 1,500.00	$ 3,000
	FIRE TABLE	2	EA	$ 3,000.00	$ 6,000
	DRINKING FOUNTAIN	1	EA	$ 5,000.00	$ 5,000
	PICNIC TABLES	5	EA	$ 3,000.00	$ 15,000
	PLAY EQUIPMENT?		EA	$ 50,000.00	$ -
	TREE GRATE	1	EA	$ 1,200.00	$ 1,200
LIGHTING					**$ 55,800**
	PEDESTRIAN POLE LIGHTS	31	EA	$ 1,800.00	$ 55,800
STORMWATER RE-USE AND TREATEMENT					**$ 195,500**
	COLLECTION, CLEAN AND REUSE	0.9	ACRE	$ 230,000.00	$ 195,500
GENERAL PLANTING					**$ 112,400**
	TREES	35	EA	500.00	17,500.00
	SM TREES	31	EA	400.00	12,400.00
	PLANTING SOIL	730	CY	30.00	21,900.00
	PERENNIALS/SHRUBS	2700	SF	8.00	21,600.00
	NATIVE SEEDING W/ PLUGS	0.3	ACRE	5000.00	1,500.00
	SOD	650	SY	8.00	5,200.00
	IRRIGATION	19700	SF	1.00	19,700.00
	ALUMINUM EDGING	1200	LF	8.00	9,600.00
	MULCH W FABRIC	300	SY	10.00	3,000.00
UTILITIES					**$ 50,000**
	STORM, WATER, POWER	1	LUMP	$50,000.00	$ 50,000

	ESTIMATED CONSTRUCTION COSTS		$ 1,095,826
10% DESIGN CONTINGENCY		10%	$ 109,600
	ESTIMATED CONSTRUCTION COSTS		$ 1,205,426

Probable Construction Costs

Municipal Plaza - North

DIVISION	DESCRIPTION	TOTAL ESTIMATED QUANTITY	UNITS	UNIT COST	TOTAL COST
			GENERAL CONDITIONS	10%	$ 120,600
			TESTING	1%	$ 12,054.26
			8% CONSTRUCTION CONTINGENCY	8%	$ 96,500
			TOTAL ESTIMATED CONSTRUCTION COSTS		$ 1,434,500
			PERMITS/BONDS/INSURANCE	3%	$ 43,000
			DESIGN FEES	12%	$ 172,100
			TOTAL PROJECT COSTS		**$ 1,649,600**

Probable Construction Costs

Municipal Plaza - South

DIVISION	DESCRIPTION	TOTAL ESTIMATED QUANTITY	UNITS	UNIT COST	TOTAL COST
GENERAL REQUIREMENTS					**$ 48,000**
	MOBILIZATION (3%)	1	LUMP	$ 48,000.00	$ 48,000
EARTHWORK					**$ 53,714**
	COMMON EXCAVATION	959	CU YD	$ 20.00	$ 19,187
	SLOPE PROTECTION	213	SQ YD	$ 8.50	$ 1,812
	SELECT GRANULAR BORROW AND ROUGH GRADING	959	CU YD	$ 25.00	$ 23,983
	TOPSOIL BORROW AND ARCHITECTURAL GRADING	291	CU YD	$ 30.00	$ 8,732
CONCRETE WALKS AND STREET					**$ 223,853**
	CURB AND GUTTER		LF	$ 18.00	$ -
	DETECTABLE CURB RAMPS		EA	$ 1,500.00	$ -
	4" CONCRETE WALK	23 200	SF	$ 6.00	$ 139,200
	BITUMINOUS TRAILS		LF	$ 4.00	$ -
	PERVIOUS PAVERS (INCL BASE)	2 470	SF	$ 30.00	$ 74,100
	BITUMINOUS WEAR COURSE (2")		TON	$ 100.00	$ -
	BITUMINOUS NON-WEAR COURSE (2")		TON	$ 90.00	$ -
	AGGREGATE BASE	480	CY	$ 22.00	$ 10,553
FOUNTAINS					**$ 310,000**
	RIBBON	1	LUMP	$ 60,000.00	$ 60,000
	STEPS (INCLUDES CONCRETE STEPS, MECHANICAL, FINISHES)	1	LUMP	$ 250,000.00	$ 250,000
ARCHITECTURE					
	?		SF		$ -
STAIRS AND WALLS					**$ 225,630**
	6" RISERS	232	SF	$ 90.00	$ 20,880
	12" H SEAT WALLS (+18" buried)	1 353	LF	$ 150.00	$ 202,950
	RAILINGS	24	LF	$ 75.00	$ 1,800
FENCE/SCREEN					**$ 30,000**
	DECORATIVE FENCE	300	LF	$ 100.00	$ 30,000
FURNISHING					**$ 71,100**
	KIOSK (ARTFUL STRUCTURE, PARK SIGN AND INTERPRETIVE SIGN)	1	EA	$ 15,000.00	$ 15,000
	RECEPTACLES	6	EA	$ 1,500.00	$ 9,000
	BENCHES	6	EA	$ 2,500.00	$ 15,000
	BIKE RACKS	1	EA	$ 1,500.00	$ 1,500
	FIRE TABLE	4	EA	$ 3,000.00	$ 12,000
	DRINKING FOUNTAIN		EA	$ 5,000.00	$ -
	PICNIC TABLES	1	EA	$ 3,000.00	$ 3,000
	TREE GRATE	13	EA	$ 1,200.00	$ 15,600
	PLAY EQUIPMENT?		EA	$ 50,000.00	$ -
LIGHTING					**$ 68,400**
	PEDESTRIAN POLE LIGHTS	38	EA	$ 1,800.00	$ 68,400
STORMWATER RE-USE AND TREATEMENT					**$ 299,000**
	COLLECTION, CLEAN AND REUSE	1.3	ACRE	$ 230,000.00	$ 299,000
GENERAL PLANTING					**$ 265,128**
	TREES	33	EA	500.00	16,500.00
	SM TREES	27	EA	400.00	10,800.00
	PLANTING SOIL	1200	CY	30.00	36,000.00
	PERENNIALS/SHRUBS	15485	SF	8.00	123,880.00
	NATIVE SEEDING W/ PLUGS	0	ACRE	5000.00	-
	SOD	2266	SY	8.00	18,128.00
	IRRIGATION	32700	SF	1.00	32,700.00
	ALUMINUM EDGING	1240	LF	8.00	9,920.00
	MULCH W FABRIC	1720	SY	10.00	17,200.00
UTILITIES					
	STORM, WATER, POWER	1	LUMP	$50,000.00	$ 50,000

ESTIMATED CONSTRUCTION COSTS		$	1,644,824
10% DESIGN CONTINGENCY	10%	$	164,500
ESTIMATED CONSTRUCTION COSTS		$	1,809,324

Probable Construction Costs

Municipal Plaza - South

DIVISION	DESCRIPTION	TOTAL ESTIMATED QUANTITY	UNITS	UNIT COST	TOTAL COST
			GENERAL CONDITIONS	10%	$ 181,000
			TESTING	1%	$ 18,093.24
			8% CONSTRUCTION CONTINGENCY	8%	$ 144,800
			TOTAL ESTIMATED CONSTRUCTION COSTS		$ 2,153,200
			PERMITS/BONDS/INSURANCE	3%	$ 64,500
			DESIGN FEES	12%	$ 258,300
			TOTAL PROJECT COSTS		**$ 2,476,000**

Probable Construction Costs

Waterfront Park - Main Area

DIVISION	DESCRIPTION	TOTAL ESTIMATED QUANTITY	UNITS	UNIT COST	TOTAL COST
GENERAL REQUIREMENTS					**$ 123,000**
	MOBILIZATION (3%)	1	LUMP	$ 123,000.00	$ 123,000
EARTHWORK					**$ 120,006**
	COMMON EXCAVATION	2 497	CU YD	$ 20.00	$ 49,932
	SLOPE PROTECTION	555	SQ YD	$ 8.50	$ 4,715
	SELECT GRANULAR BORROW AND ROUGH GRADING	2 497	CU YD	$ 25.00	$ 62,415
	TOPSOIL BORROW AND ARCHITECTURAL GRADING	98.148 148	CU YD	$ 30.00	$ 2,944
CONCRETE WALKS AND STREET					**$ 360,837**
	CURB AND GUTTER	325	LF	$ 18.00	$ 5,850
	DETECTABLE CURB RAMPS	6	EA	$ 1,500.00	$ 9,000
	4" CONCRETE WALK	51 055	SF	$ 6.00	$ 306,330
	BITUMINOUS TRAILS	400	LF	$ 4.00	$ 1,600
	PERVIOUS PAVERS (INCL BASE)	1	SF	$ 30.00	$ 30
	BITUMINOUS WEAR COURSE (2")	78	TON	$ 100.00	$ 7,764
	BITUMINOUS NON-WEAR COURSE (2")	78	TON	$ 90.00	$ 6,987
	AGGREGATE BASE	1058	CY	$ 22.00	$ 23,276
FOUNTAINS					**$ 285,000**
	RIBBON FOUNTAIN	1	LUMP	$ 60,000.00	$ 60,000
	WADING POOL	1	LUMP	$ 100,000.00	$ 100,000
	SPLASH PAD	1	LUMP	$ 125,000.00	$ 125,000
ARCHITECTURE					**$ 2,867,000**
	CONCESSION PAVILION ($300 - 375/SF)	4 200	SF	$ 375.00	$ 1,575,000
	PERGOLA	6 800	SF	$ 190.00	$ 1,292,000
STAIRS AND WALLS					**$ 7,500**
	RAILINGS	100	LF	$ 75.00	$ 7,500
FENCE/SCREEN					$ -
FURNISHING					**$ 128,000**
	KIOSK (ARTFUL STRUCTURE, PARK SIGN AND INTERPRETIVE SIGN)	1	EA	$ 15,000.00	$ 15,000
	RECEPTACLES	8	EA	$ 1,500.00	$ 12,000
	BENCHES	10	EA	$ 2,500.00	$ 25,000
	BIKE RACKS	2	EA	$ 1,500.00	$ 3,000
	FIRE TABLE	1	EA	$ 3,000.00	$ 3,000
	DRINKING FOUNTAIN	1	EA	$ 5,000.00	$ 5,000
	PICNIC TABLES	5	EA	$ 3,000.00	$ 15,000
	PLAY EQUIPMENT	1	EA	$ 50,000.00	$ 50,000
LIGHTING					**$ 158,400**
	PEDESTRIAN POLE LIGHTS	88	EA	$ 1,800.00	$ 158,400
STORMWATER RE-USE AND TREATEMENT					**$ -**
GENERAL PLANTING					**$ 332,053**
	TREES	40	EA	500.00	20,000.00
	SM TREES	25	EA	400.00	10,000.00
	PLANTING SOIL	2150	CY	30.00	64,500.00
	PERENNIALS/SHRUBS	5300	SF	8.00	42,400.00
	NATIVE SEEDING W/ PLUGS	1	ACRE	5000.00	4,200.00
	SOD	15900	SY	8.00	127,200.00
	IRRIGATION	57953	SF	1.00	57,953.00
	ALUMINUM EDGING	0	LF	8.00	-
	MULCH W FABRIC	580	SY	10.00	5,800.00
UTILITIES					
	STORM, WATER, POWER	1	LUMP	$50,000.00	$ 50,000

ESTIMATED CONSTRUCTION COSTS		$ 4,431,797
10% DESIGN CONTINGENCY	10%	$ 443,200
ESTIMATED CONSTRUCTION COSTS		$ 4,874,997

Probable Construction Costs

Waterfront Park - Main Area

DIVISION	DESCRIPTION	TOTAL ESTIMATED QUANTITY	UNITS	UNIT COST	TOTAL COST
				GENERAL CONDITIONS 10%	$ 487,500
				TESTING 1%	$ 48,749.97
				8% CONSTRUCTION CONTINGENCY 8%	$ 390,000
				TOTAL ESTIMATED CONSTRUCTION COSTS	$ 5,801,200
				PERMITS/BONDS/INSURANCE 3%	$ 174,000
				DESIGN FEES 12%	$ 696,100
				TOTAL PROJECT COSTS	**$ 6,671,300**

Probable Construction Costs

Waterfront Park - Outer Area

DIVISION	DESCRIPTION	TOTAL ESTIMATED QUANTITY	UNITS	UNIT COST	TOTAL COST
GENERAL REQUIREMENTS					$ 33,000
	MOBILIZATION (3%)	1	LUMP	$ 33,000.00	$ 33,000
EARTHWORK					**$ 157,433**
	COMMON EXCAVATION	3 255	CU YD	$ 20.00	$ 65,102
	SLOPE PROTECTION	723	SQ YD	$ 8.50	$ 6,148
	SELECT GRANULAR BORROW AND ROUGH GRADING	3 255	CU YD	$ 25.00	$ 81,378
	TOPSOIL BORROW AND ARCHITECTURAL GRADING	160.185 185	CU YD	$ 30.00	$ 4,806
CONCRETE WALKS AND STREET					**$ 237,671**
	DETECTABLE CURB RAMPS	9	EA	$ 1,500.00	$ 13,500
	4" CONCRETE WALK	15 200	SF	$ 6.00	$ 91,200
	BITUMINOUS TRAILS	4 543	LF	$ 4.00	$ 18,172
	AGGREGATE BASE	955	CY	$ 22.00	$ 20,999
	BOARDWALKS/DOCK	1340	LF	$ 70.00	$ 93,800
FOUNTAINS					
ARCHITECTURE					
STAIRS AND WALLS					$ -
FENCE/SCREEN					$ -
FURNISHING					**$ 113,000**
	KIOSK (ARTFUL STRUCTURE, PARK SIGN AND INTERPRETIVE SIGN)	2	EA	$ 15,000.00	$ 30,000
	RECEPTACLES	8	EA	$ 1,500.00	$ 12,000
	BENCHES	12	EA	$ 2,500.00	$ 30,000
	BIKE RACKS	4	EA	$ 1,500.00	$ 6,000
	DRINKING FOUNTAIN	1	EA	$ 5,000.00	$ 5,000
	PICNIC TABLES	10	EA	$ 3,000.00	$ 30,000
	PLAY EQUIPMENT		EA	$ 50,000.00	$ -
LIGHTING					**$ 216,000**
	PEDESTRIAN POLE LIGHTS	120	EA	$ 1,800.00	$ 216,000
STORMWATER RE-USE AND TREATEMENT					**$ -**
GENERAL PLANTING					**$ 524,961**
	TREES	100	EA	500.00	50,000.00
	SM TREES	0	EA	400.00	-
	PLANTING SOIL	5333	CY	30.00	159,990.00
	PERENNIALS/SHRUBS	8650	SF	8.00	69,200.00
	NATIVE SEEDING W/ PLUGS	1.7	ACRE	5000.00	8,500.00
	KAME & DRUMLIN AREA NATIVE SEEDING W/ PLUGS	0.7	ACRE	5000.00	3,500.00
	KAME & DRUMLIN SOD	6350.0	SY	8.00	50,800.00
	SOD	1265	SY	8.00	10,120.00
	IRRIGATION	86351	SF	1.00	86,351.00
	ALUMINUM EDGING	0	LF	8.00	-
	MULCH W FABRIC	8650	SY	10.00	86,500.00
UTILITIES					
	STORM, WATER, POWER	1	LUMP	$50,000.00	$ 50,000

	ESTIMATED CONSTRUCTION COSTS	$	1,332,066
10% DESIGN CONTINGENCY	10%	$	133,300
	ESTIMATED CONSTRUCTION COSTS	$	1,465,366

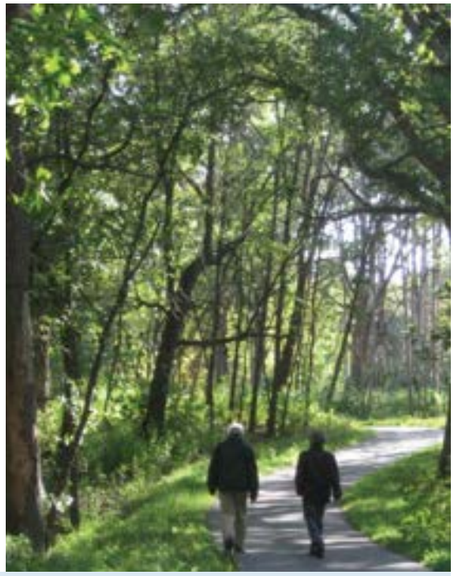
Probable Construction Costs

Waterfront Park - Outer Area

DIVISION	DESCRIPTION	TOTAL ESTIMATED QUANTITY	UNITS	UNIT COST	TOTAL COST
				GENERAL CONDITIONS 10%	$ 146,600
				TESTING 1%	$ 14,653.66
				8% CONSTRUCTION CONTINGENCY 8%	$ 117,300
				TOTAL ESTIMATED CONSTRUCTION COSTS	$ 1,743,900
				PERMITS/BONDS/INSURANCE 3%	$ 52,300
				DESIGN FEES 12%	$ 209,200
				TOTAL PROJECT COSTS	**$ 2,005,400**

CITY OF RAMSEY

Public Places + Vibrant Community



THE COR

Multiple Intiatives and Measurable Benefits...

Encourage Investment + Promote Healthy Living +
Connecting Natural Resources & People = QUALITY OF LIFE

You Are Here...

The intersection of a desired rural character with inviting urban amenities.

An imperative for designing and implementing a variety of public spaces that offer basic people needs - places to sit, sun and shade, food and beverage, and a place to interact with neighbors.

Encourage private sector investment that meets The COR economic development objectives.

"An attractive public realm continues to be a major catalyst for private investment, creating signature addresses for a variety of new development projects." - John LeTourneau, Mayor of Ramsey

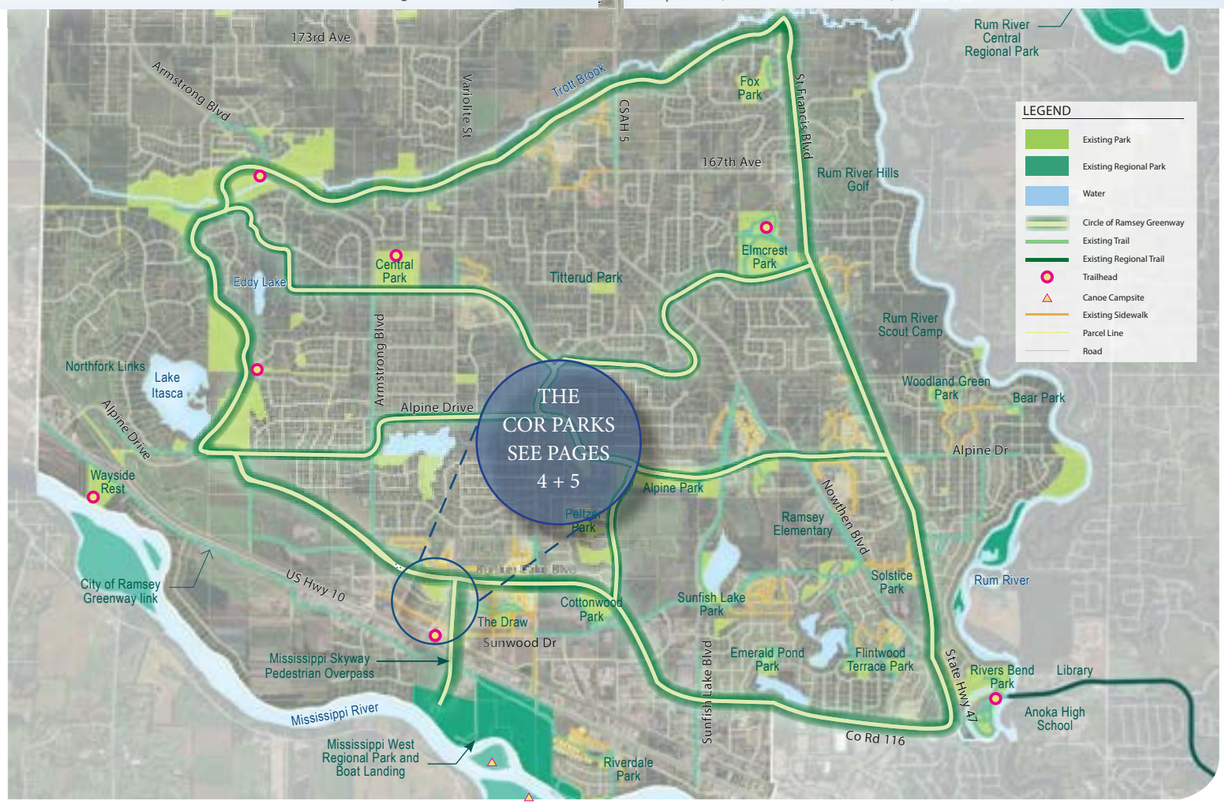
City of RAMSEY
CIRCLE OF RAMSEY GREENWAY

Circle of Ramsey Greenway

A continuous loop trail that connects neighborhoods to destinations, amenities and regional systems

Continue to build a connected network of local and regional trails

Respect for, and connections with, valued natural resources



"A mix of uses and quality amenities that serve residents will become a regional destination" - James Steffen, Economic Development Authority Chair

URBAN AMENITIES

The COR plan is built on recent success and future opportunity - creates great places for people!

The Waterfront

As the major public amenity illustrated in the Development Plan 6.0, Lake Ramsey Commons will become a spectacular water-centric addition to the emerging park and trail system that connects the whole community. It holds a key position as the connecting hub between The Draw to the east, the proposed Greenway Trail Connection to the west, the Municipal Plaza and Commuter Rail Station to the south, with the proposed Mississippi Skyway linking the regional park and trail to The COR.

Municipal Plaza

In each of the many different planning frameworks over the years, the Municipal Plaza has been identified as the primary civic space at the very heart of The COR. Located directly across Sunwood Drive from Ramsey City Hall, this crucial public amenity will serve as the central gathering space for day-to-day activities and will certainly attract heightened private sector interest in development of adjacent properties.

Lake Itasca and Greenway Connection

Various scenarios and alignments were studied and, each in their own way, serve to illustrate the strategic opportunity to connect amenities in The COR with Lake Itasca to the west via a public greenway trail. The greenway provides visual continuity east-west through The COR, and becomes the preferred access route for the hundreds of residential units between Lake Itasca and the retail destinations within The COR–strengthening the vitality of these commercial enterprises.

CONNECTING NEIGHBORHOODS

A Park System Plan built on a foundation of existing natural features integrated with a growing, connected system of public parks, trails and open space, including the following elements:

Mississippi Skyway

The Mississippi Skyway pedestrian bridge will provide a critical direct pedestrian and bicycle connection between the City of Ramsey's pedestrian-oriented COR development, the Ramsey Northstar Station, Ramsey Park & Ride and the resources associated with the Mississippi River and attendant regional amenities. The Mississippi Skyway project is about overcoming boundaries to safe bicycle and pedestrian circulation while expanding and enhancing multi-modal transportation, economic development and recreational options to promote a livable, vibrant region and community.

Amphitheater at The Draw

The Draw is a blend of natural and planned open space for programmed activities, hardscape, and passive uses. Located in the heart of The COR (acronym for City of Ramsey), park components include; recreational green space, natural stormwater filtration/reuse, established wildlife corridor and trail connections. The Draw provides an attractive combination of water and landscape as a welcome visual relief and aesthetic experience that contributes to the long-term livability and lasting vitality of the Downtown District and the City.

Trott Brook Greenway

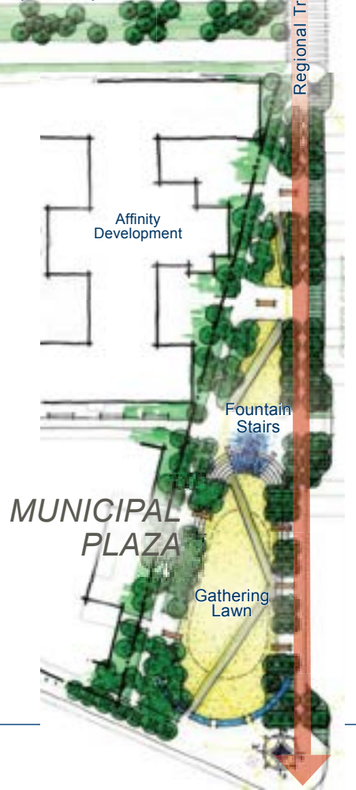
Parks and natural open space are vital to the quality of life in Ramsey and in many ways define the community. Ramsey is fortunate to have retained many natural resources within its boundaries. One such example is Trott Brook with its associated wetlands and uplands, creating a natural greenway spanning the northern third of the City. Future completion of this important community amenity will provide a significant east/west connection in terms of trail use, but will also preserve, protect and enhance of the regions important natural areas.

THE WATERFRONT + MUNICIPAL PLAZA

The Waterfront supports a range of both active and passive uses emphasizing variety in terms of outdoor spaces (rooms), including mown turf/open lawn areas within prairie, woodland, lake edge and other natural landscapes.

The Waterfront introduces a series of natural outdoor spaces that recreate and interpret native Minnesota landscapes both as an overall design aesthetic but also as a hands-on, immersion experience for park visitors.

District parking strategies will be explored and pursued to address issues related to vehicle movement, convenient access, and to provide maximum benefit for mixed-use development throughout The COR—and this is true for the park spaces too. While district parking is likely to begin with centrally located surface lots, over time, as new development intensifies, these surface lots will be converted to structured parking, either as stand-alone facilities or fully integrated within creatively designed development sites.



Municipal Plaza will become a signature destination, leveraging private-sector investment with specific focus on adjacent, plaza-frontage uses (such as brew pub, coffee house, with roof terrace) that contribute to the intensity and vibrant street life that characterize successful placemaking

Municipal Plaza will continue to support special events such as the community Happy Days festival, providing a recognized central gathering space for special events, music performances, art shows and other family-friendly activities.

The Central Anoka County Regional Trail (along the east edge of Municipal Plaza) creates an important north/south public promenade through The COR connecting The Draw, North Commons and the Mississippi Regional Park via the Mississippi Skyway (known as the pedestrian bridge over Highway 10).

MUNICIPAL PLAZA

Municipal Plaza is an important component of The COR Public Realm Framework. It is the place to meet, the orientation point for wayfinding in The COR, and the primary gateway connection to other public amenities and attractions nearby. Poised at the crossroads of strong civic presence, residential density, transit options and an expanding variety of retail storefronts, this location brings together all the elements of innovative and sustainable city-building.

Municipal Plaza will become a magnet for spontaneous day-to-day uses, filling the need for a comfortable place to enjoy a cup of coffee, gather with friends, or otherwise pass the time around the community hearth. This will also serve to extend park hours to encourage evening activities and social time.

Municipal Plaza will incorporate water in various ways, from attractive surface features such as interactive fountains, to stormwater management system components such as infiltration areas (water cleaning) and underground storage vaults for water reuse purposes.

Municipal Plaza will take advantage of subtle level changes and landscape plantings to create a safe buffer/separation from the street and promote a unique character that defines various outdoor spaces and uses, connected by ramps and stairs to ensure universal accessibility.

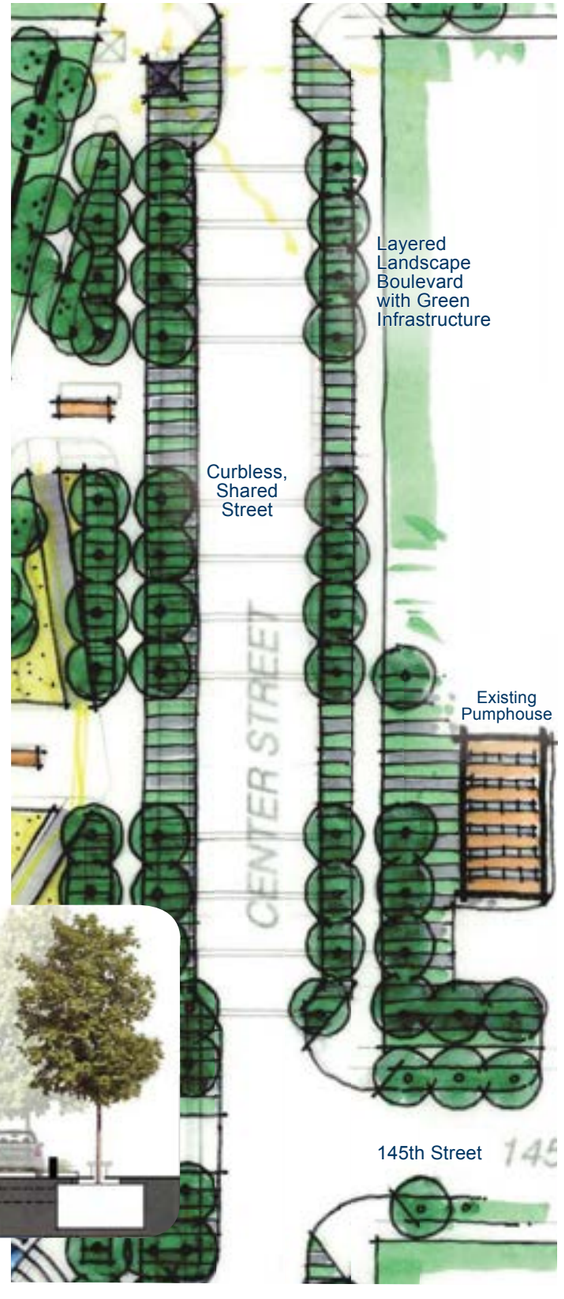
CENTER STREET

A linear park and civic space that expands Municipal Plaza to best accomodate special events.

Mixed mode street design promotes ‘pedestrian first’ amentities.

Additional park uses and activity areas seemlessly blend within street right of way.

Typical street cross section.



Walkways, paths, boardwalks and benches will be located throughout The Waterfront, promoting universal access to park amenities.

The Water Play Area will also be home to the first waterside concession/restaurant in the City; learning from area examples (such as Tin Fish and Sea Salt in Minneapolis), This exciting opportunity will grow to become a full-service food venue attracting both community residents and a regional audience - as well as providing a local venue for business incubation.

The Water Play Area will promote a high level of activity throughout the day, providing places to sit in the shade (beneath the cabana) in proximity to primary play spaces.

The Water Play Area will feature two primary amenities: a concrete-lined wading pond and a multizoned splash pad designed to attract children of all ages and abilities to The COR.

THE WATERFRONT: WATER PLAY AREA

As a major new public amenity, The Waterfront will fulfill a list of community-desired objectives related to water-oriented recreational uses within a native/natural landscape that characterizes the entire park. Along with the proposed wading pond and splash pad, additional facilities such as concessions/restaurant building, pavilion, pergola/cabana and other amenities, will further enhance the Water Play Area as a significant community destination.

MULTIPLE INTIATIVES + MEASURABLE BENEFITS

Investing in a system of public parks, trails and open space that support high quality recreational amenities, and promotes other healthy living objectives remains a high priority for the City. Creative approaches to design of public places can positively impact energy consumption, air quality, carbon reduction, property prices, recreation and other elements of community health and vitality that have monetary or other social value. In short, it is this network of connected spaces that attracts private development interest, defines the qualities and character of The COR as a vibrant, dynamic, must-experience local and regional destination that brings measurable triple-bottom-line benefits maximizing the City's return on their investment. Multiple benefits and measurable value as highlighted in this diagram and the brief descriptions below.

SOCIAL

Improved Quality of Life and Aesthetics - many studies have shown the positive impacts on quality of life in urban areas from improved aesthetics/ people-comforts, increased recreational space, and a connection to the natural environment. This has a direct bearing on increased job satisfaction, lower crime rates, decreased stress and, when combined with transportation improvements that increase walking and biking, significant public health benefits are realized.

ECONOMIC

Multi-Function Public Space, Green Technology and Increased Property Values – green technologies integrated within public space reduce costs and offset the need to build and maintain additional conventional infrastructure. Well-documented research suggests that proximity to parks, trails and open space amenities at a minimum stabilizes, and in many cases increases, property values. In addition, new technologies and approaches to public space and infrastructure systems have spurred a new wave of job opportunities across the spectrum of design, construction, maintenance and ongoing operations.

ENVIRONMENTAL

Captured Stormwater, Reduced Pollution and Habitat Creation - strategies to capture and clean stormwater will help reduce system volume, reduce pollutant loadings to area waterways, and increase the level of service of the City's stormwater infrastructure. Integrated approaches to the design of public parks, trails and open space provide opportunities to create multiple-function, natural systems and wildlife habitat; ponds, wetlands and other water-resource related features create and enhance the unique setting and ecological benefit derived from a more innovative approach to public places design.

City of RAMSEY

CONTACT

Mark Riverblood
Parks & Assistant Public Works Superintendent
763.433.9853
mriverblood@cityoframsey.com

Bruce Jacobson
Landscape Architect
LHB

BOLTON & MENK
Real People. Real Solutions.

7533 Sunwood Drive NW
Suite 206
Ramsey, MN 55303-5119

Ph: (763) 433-2851
Fax: (763) 427-0833
Bolton-Menk.com

MEMORANDUM

Date: February 19, 2018

To: Mr. Patrick Brama, Economic Development Manager
Mr. Time Gladhill, Community Development Director
Mr. Bruce Wetsby, City Engineer

From: Kevin P. Kielb, P.E.

Subject: Ramsey Parkway Center Median Analysis
City of Ramsey

Introduction

The City of Ramsey is reviewing the potential for revising the proposed design of the Ramsey Parkway center median between Center Street and Zeolite Street. The median is currently proposed as a raised, vegetated median with trees, shrubs and grasses. The total length of median area, not including the paved intersections, is approximately 1,565 feet. The area analyzed is depicted on Figure 1.

The City is exploring the potential of creating a depressed median design, with stormwater directed to the median from the travel lanes of Ramsey Parkway.

Based on recent conversations with City staff, infiltration is not allowed within The COR area. Depressed medians will need to be designed as filtration systems, rather than infiltration systems. This adds significantly to project costs when compared to a typical depressed, vegetated median.

Recommendations

The median areas through the COR are located in the moderate vulnerability Drinking Water Supply Management Area. Groundwater protection will be required if the medians are depressed.

A table was prepared depicting estimated project costs associated with the various alternatives reviewed. Either woven geotextile liner, clay liner, or EPDM rubber liner could be used for lining the median area. The City should consider the benefits and costs for the various options when deciding which option to select.

Design Considerations

Construction stormwater best management practices (BMPs) in the median areas include directing stormwater runoff volume from the street into the median through curb cuts or pipe and depressing the median area to create stormwater capture volume. Additional infrastructure is necessary to keep soils dry (i.e. perforated tile) and/or overflow structures to capture and discharge flood level flows.

The majority of the COR is in the Moderate Vulnerability drinking water supply management area, with certain sections within the Emergency Response Area. Based on conversations with the City, these areas

are restricted from infiltration. Therefore, the water quality medians must be filtration systems (rather than infiltration systems), with a perforated underdrain and impermeable liner. Three liner types were considered for this analysis:

- Woven geotextile with very low permeability,
- Clay liner, and
- Rubber liner (ethylene propylene diene monomer, EPDM, rubber).

Figure 2 depicts a typical section commonly used for filtration applications.

For depressed median alternatives, we assumed tree, shrub and perennial plantings would be used in the intersection and high visibility areas. Native seeding (prairie grasses with flowering plants) would be used in other areas. This type of vegetation provides for nutrient uptake, volume reduction, offers aesthetic benefits, and provide a traffic calming effect. Native, salt-tolerant plant species are typically utilized to offer the greatest potential for long-term sustainability.

Trees are recommended throughout the median area per The COR Design Framework (November 27, 2012). For comparative purposes, a planting plan similar to that used in the median east of Center Street was used for the raised median option.

Benefits and Disadvantages of Liner Options

Given the infiltration restrictions on site, an impermeable liner is recommended to ensure that that critical groundwater resources are protected from unexpected contamination. The advantages and disadvantages of each liner option considered are presented below:

1) Woven Geotextile: Woven geotextile fabric is a cost effective option for separating the bioretention medium from the underlying sandy soils. While the geotextile has a very low permeability, it is not 100% impermeable. The underlying coarse filter aggregate and perforated drain tile will naturally force water along the path of least resistance into the tile. Little water is expected to pass through the geotextile layer.

2) Clay Liner: Clay liners have a long history of use and are a popular choice in bioretention basins that have difficulty holding water. The clay liner must be thick (up to 12”) to be truly impermeable. These liners have a tendency to fail over time and must be continually monitored for effectiveness. If the liner were to fail, a portion of the bioretention basin would have to be removed for repair of the clay liner.

3) EPDM Rubber Liner: The EPDM liner is the safest choice for groundwater protection because it is 100% impermeable and has a relatively long service life. EPDM liners are the most expensive option and can be difficult to install.

Estimated Costs

Costs are based on standard cross sections and median widths, as shown in Figure 2.

The filtration medium, planting medium, and under drain depths are based on the Minnesota Pollution Control Agencies recommended design for a bioretention facility with an underdrain.

Estimated costs are summarized in the following table. Costs are shown per linear foot, with project costs reflective of 1,565 feet of total depressed or raised median length. Costs do not include curb and gutter,

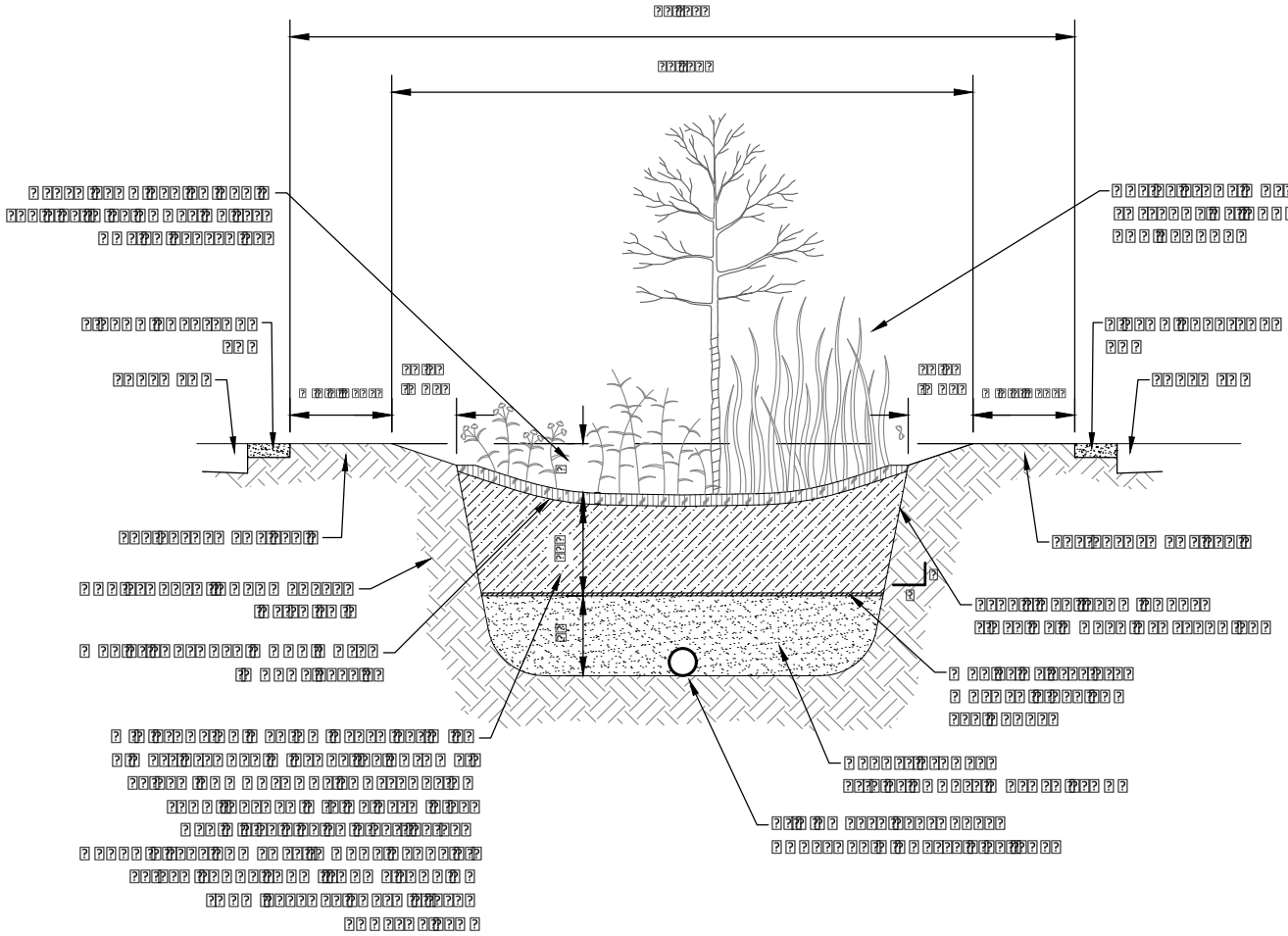
overflow structures, adjacent vegetation, erosion and sediment control, and any other construction item not related to the bioretention facilities. Costs include 30 percent for construction contingencies and administrative allowances.

Median Width/Type	Liner Type	Estimated Cost / LF	Estimated Project Cost
20' Raised	NA	$41.00	$64,000
47' Raised	NA	$114.00	$178,000
20' Depressed	Woven Geotextile Liner	$216.00	$338,000
20' Depressed	Clay Liner	$221.00	$346,000
20' Depressed	EPDM Rubber Liner	$237.00	$371,000
47' Depressed	Woven Geotextile Liner	$599.00	$937,000
47' Depressed	Clay Liner	$618.00	$967,000
47' Depressed	EPDM Rubber Liner	$703.00	$1,100,000

* Project costs are rounded to the nearest $1,000.

BOLTON & MENK

City of RAMSEY



[illegible]

[illegible]

BOLTON & MENK

[illegible]

City of RAMSEY

[illegible]

APPENDIX G: TREE INVENTORY

TABLE 1: TREE INVENTORY
THE COR SITE GRADING & THE WATERFRONT
CITY OF RAMSEY, MINNESOTA
1/10/2023

Nothing	Easting	Species	DBH	Condition	Removed	Preserved	Reason
173993.355	448087.48	Black Willow	9	Good	x		Site/Roadway Grading
173987.936	448092.07	Black Willow	9	Good	x		Site/Roadway Grading
174003.541	448083.58	Black Willow	9	Good	x		Site/Roadway Grading
174011.693	448083.16	Black Willow	9	Good	x		Site/Roadway Grading
174008.848	448084.62	Black Willow	9	Good	x		Site/Roadway Grading
174020.254	448077.11	Black Willow	9	Good	x		Site/Roadway Grading
174033.379	448077.13	Black Willow	9	Good	x		Site/Roadway Grading
174039.055	448075.81	Black Willow	9	Good	x		Site/Roadway Grading
174050.124	448070.93	Black Willow	12	Good	x		Site/Roadway Grading
174088.628	448067.28	Black Willow	12	Good	x		Site/Roadway Grading
174091.333	448067.45	Black Willow	12	Good	x		Site/Roadway Grading
174132.654	448063.46	Black Willow	12	Good	x		Site/Roadway Grading
173995.209	448250.91	Black Willow	15	Good	x		Site/Roadway Grading
173981.827	448231.48	Black Willow	9	Good	x		Site/Roadway Grading
173979.032	448203.16	Black Willow	9	Good	x		Site/Roadway Grading
173981.466	448208.2	Black Willow	9	Good	x		Site/Roadway Grading
173973.653	448156.26	Black Willow	9	Good	x		Site/Roadway Grading
173975.528	448151.7	Black Willow	9	Good	x		Site/Roadway Grading
173979.758	448143.11	Black Willow	9	Good	x		Site/Roadway Grading
173980.893	448140.07	Black Willow	9	Good	x		Site/Roadway Grading
173975.178	448136.93	Black Willow	12	Good	x		Site/Roadway Grading
173979.192	448136.13	Black Willow	9	Good	x		Site/Roadway Grading
173971.753	448127.2	Black Willow	9	Good	x		Site/Roadway Grading
173964.459	448126.39	Black Willow	9	Good	x		Site/Roadway Grading
174227.287	448028.44	Black Willow	9	Good	x		Site/Roadway Grading
174229.742	448020.51	Black Willow	9	Good	x		Site/Roadway Grading
174224.406	448018.05	Black Willow	9	Good	x		Site/Roadway Grading
174256.618	448030.08	Black Willow	9	Good	x		Site/Roadway Grading
174280.309	448052.91	Black Willow	9	Good	x		Site/Roadway Grading
174259.053	448039.78	Black Willow	9	Good	x		Site/Roadway Grading
174262.003	448044.49	Black Willow	9	Good	x		Site/Roadway Grading
174261.022	448046.3	Black Willow	9	Good	x		Site/Roadway Grading
174262.186	448049.46	Black Willow	9	Good	x		Site/Roadway Grading
174260.037	448057.09	Black Willow	9	Good	x		Site/Roadway Grading
174261.193	448058.3	Black Willow	9	Good	x		Site/Roadway Grading
174264.142	448064.87	Black Willow	12	Good	x		Site/Roadway Grading
174264.48	448071.39	Black Willow	9	Good	x		Site/Roadway Grading
174257.342	448083.18	Black Willow	9	Good	x		Site/Roadway Grading
174253.725	448089.17	Black Willow	12	Good	x		Site/Roadway Grading
174273.592	448120.91	Black Willow	9	Good	x		Site/Roadway Grading
174265.753	448124.38	Black Willow	9	Good	x		Site/Roadway Grading
174259.981	448107.99	Black Willow	9	Good	x		Site/Roadway Grading
174263.533	448110.94	Black Willow	9	Good	x		Site/Roadway Grading
174258.719	448128.95	Black Willow	9	Good	x		Site/Roadway Grading
174259.435	448130.74	Black Willow	9	Good	x		Site/Roadway Grading
174257.882	448134.65	Black Willow	9	Good	x		Site/Roadway Grading
174260.605	448132.38	Black Willow	9	Good	x		Site/Roadway Grading
174159.906	448194.49	Black Willow	9	Good	x		Site/Roadway Grading
174161.303	448187.75	Black Willow	9	Good	x		Site/Roadway Grading
174152.663	448208.9	Black Willow	9	Good	x		Site/Roadway Grading
174151.528	448209.81	Black Willow	9	Good	x		Site/Roadway Grading
174148.3	448209.77	Black Willow	9	Good	x		Site/Roadway Grading
174149.649	448212.45	Black Willow	9	Good	x		Site/Roadway Grading

TABLE 1: TREE INVENTORY
THE COR SITE GRADING & THE WATERFRONT
CITY OF RAMSEY, MINNESOTA
1/10/2023

Nothing	Easting	Species	DBH	Condition	Removed	Preserved	Reason
174137.737	448216.67	Black Willow	12	Good	x		Site/Roadway Grading
174135.869	448218.93	Black Willow	9	Good	x		Site/Roadway Grading
174119.475	448224.43	Black Willow	9	Good	x		Site/Roadway Grading
174113.751	448226.33	Black Willow	9	Good	x		Site/Roadway Grading
174109.33	448228.44	Black Willow	9	Good	x		Site/Roadway Grading
174106.614	448227.66	Black Willow	9	Good	x		Site/Roadway Grading
174106.778	448231.32	Black Willow	9	Good	x		Site/Roadway Grading
174098.032	448234.49	Black Willow	9	Good	x		Site/Roadway Grading
174095.917	448246.93	Black Willow	9	Good	x		Site/Roadway Grading
174064.353	448250.67	Black Willow	9	Good	x		Site/Roadway Grading
174066.059	448249.16	Black Willow	9	Good	x		Site/Roadway Grading
173161.428	448907.46	Black Willow	15	Good	x		Site/Roadway Grading
173160.771	448905.01	Black Willow	18	Good	x		Site/Roadway Grading
173164.299	448903.35	Black Willow	15	Good	x		Site/Roadway Grading
		Subtotal DBH Inches:	**654**				
173151.366	449048.19	Box Elder	9	Good	x		Site/Roadway Grading
173294.79	448716.43	Box Elder	9	Good	x		Site/Roadway Grading
173281.976	448720.88	Box Elder	12	Good	x		Site/Roadway Grading
		Subtotal DBH Inches:	**30**				
173705.563	448760.89	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173628.582	448671.54	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173631.411	448668.86	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173633.685	448666.98	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173637.09	448665.77	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173659.688	448652.77	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173523.484	448660.27	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173525.888	448658.95	Eastern Cottonwood	9	Fair	x		Site/Roadway Grading
173491.228	448655.69	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173446.844	448644.46	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173423.478	448629.23	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173356.257	448599.76	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173253.164	448520.92	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173647.969	448403.8	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173663.612	448341.19	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173679.25	448360.09	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173682.543	448384.61	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173696.694	448539.49	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173716.774	448555.5	Eastern Cottonwood	12	Good	x		Site/Roadway Grading
173731.404	448552.7	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173737.756	448600.17	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173739.107	448606.29	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173810.617	448556.42	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173875.362	448505.45	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173874.743	448509.37	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173873.587	448513.77	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173880.909	448540.17	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173886.071	448646.95	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173870.61	448663.85	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174391.315	448132.74	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174604.604	447747.38	Eastern Cottonwood	12	Good	x		Site/Roadway Grading
174492.535	447740.61	Eastern Cottonwood	15	Good	x		Site/Roadway Grading

TABLE 1: TREE INVENTORY
THE COR SITE GRADING & THE WATERFRONT
CITY OF RAMSEY, MINNESOTA
1/10/2023

Nothing	Easting	Species	DBH	Condition	Removed	Preserved	Reason
174536.812	447805.36	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174514.152	447828.55	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174482.479	447836.67	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174464.906	447827.93	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174462.387	447836.96	Eastern Cottonwood	15	Good	x		Site/Roadway Grading
174440.526	447815.91	Eastern Cottonwood	12	Good	x		Site/Roadway Grading
174436.935	447778.86	Eastern Cottonwood	12	Good	x		Site/Roadway Grading
174363.837	447810.66	Eastern Cottonwood	15	Good	x		Site/Roadway Grading
174330.343	447799.62	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174342.534	447823.75	Eastern Cottonwood	12	Good	x		Site/Roadway Grading
174327.903	447868.22	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174327.469	447883.51	Eastern Cottonwood	18	Good	x		Site/Roadway Grading
174241.191	447901.65	Eastern Cottonwood	12	Good	x		Site/Roadway Grading
174203.937	447833.03	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174198.926	447828.03	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174217.244	447799.3	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174161.249	447897.32	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174143.046	447923.13	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174119.336	447914.56	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174119.342	447935.51	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174115.284	447936.6	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174106.459	447937.77	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174099.075	447910.87	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174075.421	447900.7	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174073.309	447899.98	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174085.831	447926.92	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174076.87	447927.42	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174071.247	447938.61	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174071.159	447943.16	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174075.841	447942.75	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174081.879	447952.24	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174088.71	447956.65	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174067.671	447952.64	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174058.661	447954.32	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174047.756	447954.62	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174043.891	447959.23	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174033.914	447957.71	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174036.01	447939.51	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174042.023	447909.75	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174054.514	447913.92	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174042.489	447891.1	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174077.028	447821.51	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173951.747	447879.33	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173937.397	447869.18	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173933.977	447904.32	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173946.387	447925.42	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173933.392	447941.66	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173951.409	447962.71	Eastern Cottonwood	12	Good	x		Site/Roadway Grading
173966.579	447976.59	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173966.436	447946.32	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173993.999	447934.75	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173994.478	447943.39	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173990.096	447958.67	Eastern Cottonwood	9	Good	x		Site/Roadway Grading

TABLE 1: TREE INVENTORY
THE COR SITE GRADING & THE WATERFRONT
CITY OF RAMSEY, MINNESOTA
1/10/2023

Nothing	Easting	Species	DBH	Condition	Removed	Preserved	Reason
174003.621	447963.07	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174008.969	447959.05	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174007.135	447946.42	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174011.418	447932.08	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174016.549	447919.1	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174013.149	447912.09	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174014.327	447893.93	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173970.575	447908.41	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173964.034	447914.57	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173977.907	448013.16	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173984.55	448011.25	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173983.282	448023.32	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173991.933	448012.38	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173977.561	448071.29	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173979.753	448071.2	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173982.31	448089.38	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173983.91	448088.54	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173984.284	448087.05	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173996.557	448071.86	Eastern Cottonwood	12	Good	x		Site/Roadway Grading
173995.628	448085	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174001.65	448084.59	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174000.641	448085.43	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174002.967	448082.95	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173996.333	448071.8	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174015.851	448078.06	Eastern Cottonwood	9	Fair	x		Site/Roadway Grading
174039.299	448069.72	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174021.296	448059.15	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174023.62	448056.58	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174033.943	448052.55	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174049.25	448050.34	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174065.619	448055.51	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174072.818	448063.23	Eastern Cottonwood	12	Good	x		Site/Roadway Grading
174078.152	448039.08	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174087.574	448049.69	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174086.756	448066.68	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174096.612	448046.4	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174103.518	448045.07	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174107.385	448038.12	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174100.564	448030.47	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174107.823	448038.25	Eastern Cottonwood	12	Good	x		Site/Roadway Grading
174111.83	448033.38	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174116.946	448041.21	Eastern Cottonwood	15	Good	x		Site/Roadway Grading
174115.072	448050.01	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174123.778	448025.42	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174136.952	448029.37	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174114.031	448009.6	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174126.245	447993.22	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174131.572	447988.05	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174162.955	447980.17	Eastern Cottonwood	12	Good	x		Site/Roadway Grading
174158.061	447998.87	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174154.092	448021.63	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174152.943	448026.79	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174158.732	448025.45	Eastern Cottonwood	9	Good	x		Site/Roadway Grading

TABLE 1: TREE INVENTORY
THE COR SITE GRADING & THE WATERFRONT
CITY OF RAMSEY, MINNESOTA
1/10/2023

Nothing	Easting	Species	DBH	Condition	Removed	Preserved	Reason
174162.188	448022.73	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174168.952	448030.89	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174190.641	448027.25	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174194.578	448030.18	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174208.2	448023.18	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174213.831	448025.01	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174187	447988.45	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174182.438	447991.01	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174192.295	447970.93	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174204.378	447975.6	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174206.196	447977.55	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174235.594	447971.25	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174276.555	447952.51	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174278.633	447953.11	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174291.246	447952.47	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174328.692	447920.14	Eastern Cottonwood	12	Good	x		Site/Roadway Grading
174383.434	447906.33	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174391.107	447897.81	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174394.268	447896.33	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174362.018	448041.8	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174430.233	448096.87	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174289.93	448191.29	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173945.752	448332.7	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174014.57	448276.44	Eastern Cottonwood	12	Good	x		Site/Roadway Grading
174042.338	448280.84	Eastern Cottonwood	15	Good	x		Site/Roadway Grading
173988.143	448246.04	Eastern Cottonwood	12	Good	x		Site/Roadway Grading
173977.927	448255.85	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173979.435	448248.87	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173977.295	448246.86	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173974.31	448239.32	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173976.511	448227.8	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173975.655	448218.12	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173973.508	448216.77	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173973.494	448208.98	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173966.648	448194.3	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173966.097	448189.06	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173978.564	448183.7	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173971.747	448175.18	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173962.486	448163.82	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173969.491	448162.38	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173957.279	448129.65	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173961.269	448125.81	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173958.057	448119.64	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173961.695	448116.61	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173955.493	448112.99	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173956.366	448118.19	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174227.69	448017.36	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174233.18	448016.21	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174240.424	448018.25	Eastern Cottonwood	12	Good	x		Site/Roadway Grading
174247.018	448014.91	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174249.137	448017.25	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174255.979	448016.44	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174259.355	448017.4	Eastern Cottonwood	9	Good	x		Site/Roadway Grading

TABLE 1: TREE INVENTORY
THE COR SITE GRADING & THE WATERFRONT
CITY OF RAMSEY, MINNESOTA
1/10/2023

Nothing	Easting	Species	DBH	Condition	Removed	Preserved	Reason
174264.681	448007.96	Eastern Cottonwood	15	Good	x		Site/Roadway Grading
174250.665	448001.45	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174267.458	448000.31	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174276.576	448005.63	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174284.222	448016.04	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174313.852	448058.56	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174303.019	448061.98	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174274.605	448046.37	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174259.554	448095.2	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174261.228	448089.35	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174272.616	448083.88	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174274.89	448079.43	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174277.061	448071.08	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174288.812	448114.77	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174284.565	448118.29	Eastern Cottonwood	12	Good	x		Site/Roadway Grading
174286.514	448133.14	Eastern Cottonwood	12	Good	x		Site/Roadway Grading
174264.436	448112.55	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174263.336	448133.17	Eastern Cottonwood	12	Good	x		Site/Roadway Grading
174267.541	448137.41	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174260.691	448143.97	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174256.238	448142.55	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174250.858	448142.57	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174249.593	448144.61	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174247.581	448144.92	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174193.097	448167.47	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174192.363	448166.31	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174195.658	448163.57	Eastern Cottonwood	12	Good	x		Site/Roadway Grading
174173.053	448191.95	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174164.824	448201.25	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174151.766	448240.79	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174155.902	448239.65	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174158.295	448240.92	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174163.843	448242.14	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174157.792	448259.31	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174136.049	448259.31	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174132.007	448249.08	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174114.585	448251.55	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174106.246	448249.08	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174108.285	448252.48	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174091.217	448253.3	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174089.297	448257.04	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174087.04	448257.53	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174085.081	448259.51	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174080.24	448260.16	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174073.846	448270.36	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
174062.702	448254.91	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173271.045	449925.9	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173238.211	449974.11	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173185.801	449953.08	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173148.511	449981.23	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173395.955	449187.48	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173631.094	449003.13	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173647.877	449003.4	Eastern Cottonwood	9	Good	x		Site/Roadway Grading

TABLE 1: TREE INVENTORY
THE COR SITE GRADING & THE WATERFRONT
CITY OF RAMSEY, MINNESOTA
1/10/2023

Nothing	Easting	Species	DBH	Condition	Removed	Preserved	Reason
173679.106	448977.99	Eastern Cottonwood	12	Good	x		Site/Roadway Grading
173569.111	448908.05	Eastern Cottonwood	12	Good	x		Site/Roadway Grading
173573.802	448889.83	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173608.715	448879.8	Eastern Cottonwood	12	Good	x		Site/Roadway Grading
173609.477	448878.4	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173417.276	448788.87	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173416.001	448789.52	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173340.517	448739.06	Eastern Cottonwood	12	Good	x		Site/Roadway Grading
173337.913	448739.22	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173337.137	448747.11	Eastern Cottonwood	15	Good	x		Site/Roadway Grading
173336.307	448749.87	Eastern Cottonwood	12	Good	x		Site/Roadway Grading
173341.463	448797.51	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173300.707	448824.57	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173314.399	449002.09	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173263.295	449035.16	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173243.9	449048.97	Eastern Cottonwood	12	Good	x		Site/Roadway Grading
173206.087	449071.52	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173177.166	449114.88	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173178.638	449105.72	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173167.246	449107.89	Eastern Cottonwood	12	Good	x		Site/Roadway Grading
173175.849	449126.62	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173168.439	449139.15	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173161.916	449137.2	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173160.29	449137.98	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173149.749	449136.69	Eastern Cottonwood	12	Good	x		Site/Roadway Grading
173150.149	449145.14	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173154.654	449150.03	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173159.956	449162.24	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173165.1	449160.49	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173172.772	449164.36	Eastern Cottonwood	12	Good	x		Site/Roadway Grading
173140.551	449165.72	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173137.543	449138.55	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173132.097	449140.43	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173127.621	449154.05	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173117.446	449158.75	Eastern Cottonwood	15	Good	x		Site/Roadway Grading
173119.786	449178.53	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173147.535	449093.74	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173147.413	449080.37	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
173103.93	448939.37	Eastern Cottonwood	12	Good	x		Site/Roadway Grading
173242.455	448831.92	Eastern Cottonwood	24	Good	x		Site/Roadway Grading
173277.033	448798.19	Eastern Cottonwood	24	Good	x		Site/Roadway Grading
173300.46	448718.46	Eastern Cottonwood	30	Good	x		Site/Roadway Grading
173283.645	448712.84	Eastern Cottonwood	30	Good	x		Site/Roadway Grading
172978.174	449295.6	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
172960.755	449298.47	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
172979.106	449277.07	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
172779.178	449520.31	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
172795.238	449513.73	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
172795.913	449485.6	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
172809.615	449466.77	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
172837.664	449463.66	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
172841.401	449458.19	Eastern Cottonwood	9	Good	x		Site/Roadway Grading
172841.759	449426.94	Eastern Cottonwood	9	Good	x		Site/Roadway Grading

TABLE 1: TREE INVENTORY
THE COR SITE GRADING & THE WATERFRONT
CITY OF RAMSEY, MINNESOTA
1/10/2023

Nothing	Easting	Species	DBH	Condition	Removed	Preserved	Reason
172852.989	449424.97	Eastern Cottonwood	9	Good	X		Site/Roadway Grading
172849.101	449417.06	Eastern Cottonwood	9	Good	X		Site/Roadway Grading
172849.118	449396.99	Eastern Cottonwood	9	Good	X		Site/Roadway Grading
		Subtotal DBH Inches:	**2916**				
174199.749	448708.36	Quaking Aspen	9	Good	X		Site/Roadway Grading
174238.932	448654.95	Quaking Aspen	9	Good	X		Site/Roadway Grading
174410.443	448101.5	Quaking Aspen	9	Good	X		Site/Roadway Grading
174295.978	448211.2	Quaking Aspen	9	Good	X		Site/Roadway Grading
		Subtotal DBH Inches:	**36**				
174212.012	448651.11	Red Cedar	6	Good	X		Site/Roadway Grading
174277.383	448636.34	Red Cedar	4	Good	X		Site/Roadway Grading
174250.912	448603.64	Red Cedar	4	Good	X		Site/Roadway Grading
174195.751	448523.7	Red Cedar	4	Good	X		Site/Roadway Grading
174200.464	448528.11	Red Cedar	4	Good	X		Site/Roadway Grading
174254.09	448488.19	Red Cedar	4	Good	X		Site/Roadway Grading
174289.266	448513.74	Red Cedar	4	Good	X		Site/Roadway Grading
174275.357	448473.83	Red Cedar	4	Good	X		Site/Roadway Grading
174293.908	448478.17	Red Cedar	4	Good	X		Site/Roadway Grading
174423.437	448330.33	Red Cedar	4	Good	X		Site/Roadway Grading
174393.735	448233.61	Red Cedar	4	Good	X		Site/Roadway Grading
174386.293	448204.66	Red Cedar	4	Good	X		Site/Roadway Grading
174542.805	447962.92	Red Cedar	4	Good	X		Site/Roadway Grading
174573.675	447901.73	Red Cedar	4	Good	X		Site/Roadway Grading
174289.09	448314.58	Red Cedar	4	Good	X		Site/Roadway Grading
174275.449	448353.22	Red Cedar	4	Good	X		Site/Roadway Grading
174273.468	448391.59	Red Cedar	6	Good	X		Site/Roadway Grading
173084.918	448955.39	Red Cedar	4	Good	X		Site/Roadway Grading
173083.284	448943.7	Red Cedar	4	Good	X		Site/Roadway Grading
173080.578	448941.01	Red Cedar	4	Good	X		Site/Roadway Grading
173231.385	448735.3	Red Cedar	4	Good	X		Site/Roadway Grading
173220.415	448745.77	Red Cedar	4	Good	X		Site/Roadway Grading
173215.097	448752.27	Red Cedar	4	Good	X		Site/Roadway Grading
173013.322	448831.84	Red Cedar	4	Good	X		Site/Roadway Grading
172998.062	449027.35	Red Cedar	4	Good	X		Site/Roadway Grading
172865.83	449273.11	Red Cedar	4	Good	X		Site/Roadway Grading
172789.452	449317.76	Red Cedar	4	Good	X		Site/Roadway Grading
172692.499	449217.44	Red Cedar	4	Good	X		Site/Roadway Grading
172666.128	449275.02	Red Cedar	4	Good	X		Site/Roadway Grading
172666.59	449279.1	Red Cedar	4	Good	X		Site/Roadway Grading
172669.316	449359.31	Red Cedar	4	Good	X		Site/Roadway Grading
172703.262	449427.6	Red Cedar	4	Good	X		Site/Roadway Grading
172714.595	449487.63	Red Cedar	4	Good	X		Site/Roadway Grading
172744.705	449478.89	Red Cedar	4	Good	X		Site/Roadway Grading
172763.133	449496.12	Red Cedar	4	Good	X		Site/Roadway Grading
172976.075	449413.01	Red Cedar	4	Good	X		Site/Roadway Grading
172982.737	449423.51	Red Cedar	4	Good	X		Site/Roadway Grading
		Subtotal DBH Inches:	**152**				
174104.599	448825.19	Scotch Pine	6	Good	X		Site/Roadway Grading
174467.718	448099.14	Scotch Pine	6	Good	X		Site/Roadway Grading
		Subtotal DBH Inches:	**12**				

TABLE 1: TREE INVENTORY
THE COR SITE GRADING & THE WATERFRONT
CITY OF RAMSEY, MINNESOTA
1/10/2023

Nothing	Easting	Species	DBH	Condition	Removed	Preserved	Reason
173983.405	448729.76	Siberian Elm	9	Good	X		Site/Roadway Grading
174014.944	448691.64	Siberian Elm	12	Good	X		Site/Roadway Grading
174041.413	448658.76	Siberian Elm	9	Good	X		Site/Roadway Grading
174046.412	448639.29	Siberian Elm	12	Good	X		Site/Roadway Grading
174030.957	448604.89	Siberian Elm	9	Good	X		Site/Roadway Grading
174030.344	448590.65	Siberian Elm	9	Good	X		Site/Roadway Grading
174046.446	448594.76	Siberian Elm	9	Good	X		Site/Roadway Grading
174095.468	448600.67	Siberian Elm	12	Good	X		Site/Roadway Grading
174073.52	448615.4	Siberian Elm	9	Good	X		Site/Roadway Grading
174101.607	448716.17	Siberian Elm	9	Good	X		Site/Roadway Grading
174108.727	448794.81	Siberian Elm	9	Good	X		Site/Roadway Grading
174092.514	448852.79	Siberian Elm	9	Good	X		Site/Roadway Grading
173970.049	448847.77	Siberian Elm	9	Good	X		Site/Roadway Grading
173958.924	448845.08	Siberian Elm	9	Good	X		Site/Roadway Grading
173956.328	448826.53	Siberian Elm	9	Good	X		Site/Roadway Grading
174241.057	448699.64	Siberian Elm	9	Good	X		Site/Roadway Grading
174439.443	448470.75	Siberian Elm	9	Good	X		Site/Roadway Grading
174553.82	447926.28	Siberian Elm	9	Good	X		Site/Roadway Grading
174036.66	447870.05	Siberian Elm	9	Good	X		Site/Roadway Grading
174032.032	447859.37	Siberian Elm	9	Good	X		Site/Roadway Grading
173946.866	447860.02	Siberian Elm	9	Good	X		Site/Roadway Grading
173944.741	448038.17	Siberian Elm	9	Good	X		Site/Roadway Grading
174323.632	448160.4	Siberian Elm	9	Good	X		Site/Roadway Grading
174279.351	448308.69	Siberian Elm	9	Good	X		Site/Roadway Grading
174151.408	448607.27	Siberian Elm	9	Good	X		Site/Roadway Grading
174108.551	448622.51	Siberian Elm	9	Good	X		Site/Roadway Grading
174008.762	448297.79	Siberian Elm	9	Good	X		Site/Roadway Grading
174310.183	448124.9	Siberian Elm	9	Good	X		Site/Roadway Grading
174331.14	448105.54	Siberian Elm	9	Good	X		Site/Roadway Grading
174293.063	448160.41	Siberian Elm	9	Good	X		Site/Roadway Grading
173122.101	449452.26	Siberian Elm	9	Good	X		Site/Roadway Grading
173126.89	449450.78	Siberian Elm	9	Good	X		Site/Roadway Grading
173128.7	449447.96	Siberian Elm	9	Good	X		Site/Roadway Grading
173159.281	449398.31	Siberian Elm	9	Good	X		Site/Roadway Grading
173163.346	449397.83	Siberian Elm	9	Good	X		Site/Roadway Grading
173174.634	449382.56	Siberian Elm	9	Good	X		Site/Roadway Grading
173178.45	449376.81	Siberian Elm	9	Good	X		Site/Roadway Grading
173224.242	449498.66	Siberian Elm	12	Good	X		Site/Roadway Grading
173190.277	449519.43	Siberian Elm	9	Good	X		Site/Roadway Grading
173192.027	449523.56	Siberian Elm	9	Good	X		Site/Roadway Grading
173182.299	449528.7	Siberian Elm	9	Good	X		Site/Roadway Grading
173159.134	449527.44	Siberian Elm	9	Good	X		Site/Roadway Grading
173192.635	449570.57	Siberian Elm	9	Good	X		Site/Roadway Grading
173192.935	449574.6	Siberian Elm	9	Good	X		Site/Roadway Grading
173062.397	450141.62	Siberian Elm	9	Good	X		Site/Roadway Grading
173094.404	450153.37	Siberian Elm	9	Good	X		Site/Roadway Grading
173370.218	450159.5	Siberian Elm	9	Good	X		Site/Roadway Grading
173666.203	449937.57	Siberian Elm	9	Good	X		Site/Roadway Grading
173447.689	449606.73	Siberian Elm	9	Good	X		Site/Roadway Grading
173450.929	449615.89	Siberian Elm	9	Good	X		Site/Roadway Grading
173259.217	449301.51	Siberian Elm	9	Good	X		Site/Roadway Grading
173246.693	449297.62	Siberian Elm	9	Good	X		Site/Roadway Grading

TABLE 1: TREE INVENTORY
THE COR SITE GRADING & THE WATERFRONT
CITY OF RAMSEY, MINNESOTA
1/10/2023

Nothing	Easting	Species	DBH	Condition	Removed	Preserved	Reason
173259.876	449307.74	Siberian Elm	9	Good	x		Site/Roadway Grading
173315.07	449234.68	Siberian Elm	9	Good	x		Site/Roadway Grading
173132.156	449137.79	Siberian Elm	9	Good	x		Site/Roadway Grading
173056.812	449174.3	Siberian Elm	9	Good	x		Site/Roadway Grading
173137.814	449080.23	Siberian Elm	9	Good	x		Site/Roadway Grading
173093.62	449067.28	Siberian Elm	9	Good	x		Site/Roadway Grading
173092.678	449065.9	Siberian Elm	12	Good	x		Site/Roadway Grading
173052.006	448620.78	Siberian Elm	9	Good	x		Site/Roadway Grading
172989.907	448610.18	Siberian Elm	9	Good	x		Site/Roadway Grading
172937.23	448698.08	Siberian Elm	9	Good	x		Site/Roadway Grading
173087.203	448837.05	Siberian Elm	9	Good	x		Site/Roadway Grading
172990.753	448937.42	Siberian Elm	9	Good	x		Site/Roadway Grading
173021.487	449219.1	Siberian Elm	9	Good	x		Site/Roadway Grading
173052.496	449234.13	Siberian Elm	9	Good	x		Site/Roadway Grading
		Subtotal DBH Inches:	**609**				
		Grand Total DBH Inches:	**4,409**				