City of Ramsey
Agenda
Public Works Committee
Tuesday, February 21, 2023
5:30 pm
Lake Itasca Room, 7550 Sunwood Drive NW

Remote Attendance available at www.cityoframsey.com/meetings.
Those joining remotely and requesting to speak are asked to use a webcam when speaking.

1. Call to Order

2. Citizen Input

3. Approve Agenda

4. Approve Minutes

1. Approve the following meeting minutes.
1. Public Works Committee meeting dated January 17, 2023.

5. Committee Business

1. Receive Presentation on CSAH 5 (Nowthen Boulevard) Corridor Traffic Study

2. Review COR Analysis Update

3. Review HY-10 Ramsey Improvements Feasibility Study

4. Recommend City Council Approval of Plans and Authorization to Advertise Bids for 2023 Crackseal Improvements

6. Committee/Staff Input

1. Receive Updates on Improvement Projects, Studies and Items of Interest

2. Review Future Topics Calendar

7. Adjournment

Our Mission: To work together to responsibly grow our community, and to provide quality, cost-effective, and efficient government services

Public Works Committee **4. 1.**

Meeting Date: 02/21/2023

Submitted For: Bruce Westby, Engineering/Public Works

By: MaryJo Warner, Engineering/Public Works

Title:

Approve the following meeting minutes.
1. Public Works Committee meeting dated January 17, 2023.

Purpose/Background:

Purpose: To review and approve meeting minutes.
Background: Attached are the meeting minutes for review.

Timeframe:

5 minutes.

Observations/Alternatives:

n/a

Funding Source:

n/a

Recommendation:

To review and approve meeting minutes dated January 17, 2023.

Action:

Motion to approve meeting minutes dated January 17, 2023.

Attachments

Minutes

Form Review

Inbox	Reviewed By	Date
Bruce Westby	Bruce Westby	02/16/2023 02:57 PM
Brian Hagen	Brian Hagen	02/16/2023 03:09 PM
Form Started By: MaryJo Warner		Started On: 02/13/2023 10:20 AM
Final Approval Date: 02/16/2023		

PUBLIC WORKS COMMITTEE
CITY OF RAMSEY
ANOKA COUNTY
STATE OF MINNESOTA

The Public Works Committee conducted a regular meeting on Tuesday, January 17, 2023, at the Ramsey Municipal Center, 7550 Sunwood Drive NW, Ramsey, Minnesota.

Members Present: Chairperson Chris Riley (via Zoom)
Councilmember Debra Musgrove
Councilmember Matt Woestehoff

Also Present: City Engineer/Interim Public Works Director/Interim Public Works Director/Interim Public Works Director Bruce Westby
Assistant City Engineer Joe Feriancek
Public Works Streets Supervisor Shane Turner
Civil Engineer IV Leonard Linton
City Administrator Brian Hagen

1. CALL TO ORDER

Chairperson Riley asked that Councilmember Musgrove act as Chair for the meeting as he is not in person at the meeting.

Acting Chairperson Musgrove called the regular meeting of the Public Works Committee to order at 5:30 p.m.

2. CITIZEN INPUT

There was none.

3. APPROVE AGENDA

Motion by Councilmember Woestehoff, seconded by Councilmember Riley, to approve the agenda, as presented.

A roll call vote was performed:

Acting Chairperson Musgrove	aye
Councilmember Woestehoff	aye
Councilmember Riley	aye

Motion carried.

4. APPROVE MINUTES

4.01: Approve November 15, 2023, Meeting Minutes

Motion by Councilmember Woestehoff, seconded by Councilmember Riley, to approve the following minutes:

Regular Meeting Minutes dated November 15, 2023

A roll call vote was performed:

Acting Chairperson Musgrove	aye
Councilmember Woestehoff	aye
Councilmember Riley	aye

Motion carried.

5. COMMITTEE BUSINESS

5.01: Appoint Chair and Vice Chair of the Public Works Committee.

Motion by Councilmember Woestehoff, seconded by Councilmember Riley, to appoint Chris Riley as Chair and Debra Musgrove as Vice Chairperson of the Public Works Committee for the term January 17, 2023 to December 31, 2023.

A roll call vote was performed:

Acting Chairperson Musgrove	aye
Councilmember Woestehoff	aye
Councilmember Riley	aye

Motion carried.

5.02: Consider Recommendation for City Council to Approve Pedestrian and Bicycle Facility Option as Part of Improvement Project #23-04, 167th Avenue Reconstruction

Assistant City Engineer Feriancek reviewed the staff report and recommendation for alternative #1, design option 1: bike lanes between Nowthen Boulevard and Quicksilver Street. If alternative #2 or #3 were chosen, the impacts to the project timeline would no longer allow construction to occur in 2023.

Acting Chairperson Musgrove asked if there is crash data available for Variolite and 161st as that would be similar to the scenario in option two.

City Engineer/Interim Public Works Director Westby replied that staff is not aware of any issues at that intersection but could look into it.

Councilmember Woestehoff stated that he was aware of two incidents in the past two years at Variolite Street and 161st Avenue from the reduced sightlines when vehicles are crossing. He stated that often people hit the sign on the island, but the incidents in that area are not related to the change in orientation of the roadway.

Acting Chairperson Musgrove commented that she does not need staff to look into that data. She stated that she is leaning towards option one and asked for information on the street width and bike lane dimensions.

Assistant City Engineer Feriancek clarified the drive lane width and bike lane.

Acting Chairperson Musgrove asked if Variolite would be the same dimensions.

Assistant City Engineer Feriancek replied that Variolite does not have the three-foot buffer and believed the land widths were also different.

Councilmember Woestehoff stated that he has heard that residents do not like walking south of 158th or 159th because they prefer the off-road trail rather than walking on the side of the road because of the speed of traffic. He stated that he would have hesitation with on-street facilities because of that experience. He stated that he is leaning towards option three because it would be slightly cheaper and would require less acquisition.

Assistant City Engineer Feriancek stated that staff did look internally at traffic calming and the best way to do so would be to narrow the road. He stated that staff would recommend 12-foot lanes with a center shared turn lane, providing examples of where that has been done on other roadways in the city. He stated that they would have to reduce the speed in order to provide a crossing.

Councilmember Woestehoff stated that a crossing would be needed if they chose the north route but noted that he does not prefer the north route.

Councilmember Riley asked if there is any way to include a physical barrier, such as a curb, in option one.

Assistant City Engineer Feriancek replied that staff would have to bring that concept back to Bolton and Menk to gain their input. He stated that adding that type of barrier on this type of roadway would create challenges when plowing.

Councilmember Riley stated that he agrees that he does not prefer the north side option as Elmcrest Park would be one of the largest considerations and therefore if a crosswalk is not feasible, he is not interested in that option. He recognized that a wetland delineation required for the south side option would slow the process.

Acting Chairperson Musgrove noted that option three was her second choice. She stated that when reviewing the roadway in the CIP, it seems to have different designations. She asked if there

would be potential to improve the road and trail in the future as development occurs if they choose option one at this time.

Assistant City Engineer Feriancek stated that the developer would run into the same potential issues that arose in this case. He also noted the cost for off street facilities.

Councilmember Woestehoff commented that he would agree that would be an opportunity for a private developer to move forward with that, but in reviewing the map there are only a handful of properties that could develop and they would be on the north side, which is not preferred. He was unsure that those properties would be properly aligned with the potential goal. He stated that he sees this as an opportunity to connect Elmcrest with Nowthen Boulevard.

Acting Chairperson Musgrove asked if the road could be done in stages. She asked if they could move forward with option three without delaying the road improvement.

Assistant City Engineer Feriancek replied that they could split that and do the road project in 2023 and come back with a separate trail project. He noted that there would be additional cost in doing two separate projects.

City Engineer/Interim Public Works Director Westby stated that he agrees that the projects could be done separately. He stated that his only concern would be how wide the road is made in 2023 if the trail is delayed another year, as pedestrians will still use the roadway during the interim time before the trail is completed.

Councilmember Woestehoff agreed that is a great point and stated that communication would be a factor in alerting residents that a trail will be coming in the future.

Councilmember Riley stated that he is very concerned with timing and cost. He stated that option one is a lot better than the current situation and having the three-foot buffer lines would seem to make that option acceptable. He stated that he supports option one.

Motion by Councilmember Riley, seconded by Acting Chairperson Musgrove, to recommend that the City Council authorize staff to design option #1: bike lanes as part of Improvement Project #23-03, 167th Avenue Reconstruction.

Further discussion: Councilmember Woestehoff stated that he will most likely disagree with this action. He stated that the City does not get the opportunity to do things right very often. He agreed that option one is very attractive but believes that a better job could be done with the trail. City Engineer/Interim Public Works Director Westby provided the widths of the lanes on Variolite as previously requested. Acting Chairperson Musgrove asked and received confirmation that the speed on the roadway would not change with option one. Councilmember Woestehoff asked and received confirmation that the on-road bike lane would be provided on the north and south sides but recognized a lack of safe crossing. Assistant City Engineer Feriancek stated that the scenario for crossing would remain the same as it exists today. He noted that during certain times of days a person would need to wait to cross but other times there would be no wait to cross. Councilmember Woestehoff stated that he still has a concern with a lack of crossing.

A roll call vote was performed:

Acting Chairperson Musgrove	aye
Councilmember Woestehoff	nay
Councilmember Riley	aye

Motion carried.

5.03: Committee Update on Central Park Southern Parking Lot Reconstruction as Part of 161st Avenue Reconstruction

Assistant City Engineer Feriancek reviewed the staff report and recommendation to construct the Central Park southern parking lot as part of Improvement Project #23-01, 161st Avenue Reconstruction. On November 15, 2022, the Public Works Committee recommended reconstruction of the Central Park southern parking lot after identifying that it was in similar condition as the main parking lot, and it would make the most sense to complete the reconstruction at the same time.

Acting Chairperson Musgrove asked for details on timing and potential staging for the project.

Assistant City Engineer Feriancek provided details on the 161st project, noting that there could be potential for crossover. He stated that a portion of the parking lot was going to be used for staging, so there was going to be impact either way.

Acting Chairperson Musgrove asked if there is a potential for the same contractor to bid both projects.

Assistant City Engineer Feriancek commented that it is common that a contractor would attempt to win both bids because of the proximity.

Motion by Councilmember Woestehoff, seconded by Councilmember Riley, to recommend the City Council authorize construction of the Central Park southern parking lot as part of Improvement Project #23-01, 161st Avenue Reconstruction.

A roll call vote was performed:

Acting Chairperson Musgrove	aye
Councilmember Woestehoff	aye
Councilmember Riley	aye

Motion carried.

6. COMMITTEE / STAFF INPUT

6.01: Staff Updates on Improvement Projects, Studies, and Items of Interest

City Engineer/Interim Public Works Director Westby provided updates on current and proposed City, County, and MnDOT improvement projects and studies and on other items of interest to the Committee.

Councilmember Riley asked for clarification on the estimated cost for the water treatment plant.

City Engineer/Interim Public Works Director Westby confirmed that the estimated cost was reduced by approximately $2,000,000 and provided additional details on the estimated costs.

Acting Chairperson Musgrove stated that perhaps an invitation is extended to the other members of the Council to attend the CSAH 5 corridor presentation.

Councilmember Riley noted that the study could also be shared with the other members.

Acting Chairperson Musgrove asked what the next step will be if the resident does not respond to staff related to the Sunfish Lake item.

City Engineer/Interim Public Works Director Westby stated that he has attempted to reach the resident via email and could continue to do so for a bit longer. All members of the committee stated that they would be willing to reach out to the resident as well. It was confirmed that City Engineer/Interim Public Works Director Westby would send a more formal letter in attempt to gain response.

6.02: Review Future Topics Calendar

Councilmember Riley referenced the drainage issues of 180th and asked if that should be added to this list.

City Engineer/Interim Public Works Director Westby stated that staff has been moving forward with the drainage design options and once that is completed staff will discuss those options with the property owner. He stated that staff can continue to follow that path or could involve this group. He confirmed the consensus of the group that once he meets with the property owner, he would bring a potential project back to the committee for review.

Acting Chairperson Musgrove referenced the EAB boulevard tree removal and asked if action would be needed by the committee or Council.

City Engineer/Interim Public Works Director Westby stated that the trees have been identified but the large amounts of snowfall have delayed the removal of those trees.

Councilmember Woestehoff stated that it seems the project is being handled by staff and therefore perhaps this item can be removed from the calendar and list.

City Engineer/Interim Public Works Director Westby stated that he will leave the item on for the next month and provide a better update at the next meeting related to tree replacement.

Acting Chairperson Musgrove referenced the flashing yellow arrows and asked for an update on the anticipated timeline.

City Engineer/Interim Public Works Director Westby replied that they will most likely wait for the Highway 10 project to be completed to see how that impacts the traffic patterns. He noted that the County is not proposing any improvements at the noted intersections and therefore any project would need to be led by the City.

Acting Chairperson Musgrove commented that a lot of information was learned through that process, including the high cost.

Councilmember Woestehoff stated that perhaps it would make sense to begin budgeting for intersection improvements so the City would be able to complete one in the future. He also noted that changed traffic patterns during construction could also preempt the need for that type of improvement.

City Engineer/Interim Public Works Director Westby noted that with additional home construction, an additional traffic signal may soon be needed on the south side of the Armstrong interchange.

Councilmember Woestehoff asked if a roundabout would be a feasible option for the south side of the bridge.

7. ADJOURNMENT

Motion by Councilmember Woestehoff, seconded by Councilmember Riley, to adjourn the Public Works Committee meeting.

Motion carried.

The regular meeting of the Public Works Committee adjourned at 6:47 p.m.

Respectfully submitted,

_____

Bruce Westby
City Engineer/Interim Public Works Director

Drafted by Amanda Staple
TimeSaver Off Site Secretarial, Inc.

Public Works Committee **5. 1.**

Meeting Date: 02/21/2023

By: Bruce Westby, Engineering/Public Works

Title:

Receive Presentation on CSAH 5 (Nowthen Boulevard) Corridor Traffic Study

Purpose/Background:

In 2021, Anoka County enlisted the services of SRF Consulting Group to complete a corridor traffic study for County State Aid Highway (CSAH) 5 (Nowthen Boulevard) between State Highway 47 and CSAH 64 (181st Avenue) through the City of Ramsey.

In 2022, SRF Consulting Group completed the CSAH 5 (Nowthen Boulevard) Corridor Traffic Study, which is attached for review and reference.

Jack Forslund, Transportation Planner for the Anoka County Highway Department, will attend the February Public Works Committee meeting to present the highlights, results and findings of the attached study.

Timeframe:

Staff anticipates 20 minutes will be necessary to present the final study and respond to questions.

Observations/Alternatives:

Based on the results of the existing and future year condition analysis which was completed for the CSAH 5 Corridor Traffic Study, four intersections along the CSAH 5 corridor were reviewed for capacity and safety performance. These intersections include:

· CSAH 5 and CSAH 63 (Green Valley Road and 175th Avenue)
· CASH 5 and 167th Avenue
· CSAH 5 and CSAH 56 (Ramsey Boulevard)
· CSAH 5 and Sunwood Drive

The following key findings and recommendations for each of the four intersections along CSAH 5 were developed as a result of the analysis. In general, opportunities for additional pedestrian accommodations and creating a cohesive roadside environment should be sought throughout the corridor.

CSAH 5 and CSAH 63 (175th Avenue West of CSAH 5 / Green Valley Road East of CSAH 5)

An elevated crash history was observed at both the east and west intersections of CSAH 5 and CSAH 63. Traffic volumes are anticipated to increase at this intersection as the surrounding area develops. Additional turn lanes will reduce the conflicts and crash risks under future year conditions. Furthermore, the installation of lighting will help alert drivers to the intersections at night. The marginal costs of the proposed improvements at this intersection would potentially decrease if the improvements are coordinated with future corridor investments.
Recommendation: Implement turn lane improvements and lighting as part of the next preservation investment to improve safety and modernize intersections to support future growth.

CSAH 5 and 167th Avenue NW

167th Avenue NW functions as an east-west roadway. Higher crash rates were observed at the CSAH 5 and 167th Avenue NW intersection compared to the majority of the intersections along the CSAH 5 corridor. The roundabout concept was found to be the most cost-effective improvement for this intersection with a 12-year return on investment.
Recommendation: Implement a roundabout as part of the next preservation investment to improve safety and serve the function of 167th Avenue as an east-west corridor.

CSAH 5 and CASH 56 (Ramsey Boulevard)
An elevated crash history was observed at the CSAH 56 (Ramsey Boulevard) intersection, including injury crashes. The traffic volume from northbound CSAH 56 to northbound CSAH 5 is expected to increase with the completion of the interchanges on US Highway 10. Turn lane and roundabout concepts were considered for this location; both concepts have a similar construction cost, approximately $3,000,000, and impacts. The roundabout concept provides more effective safety and traffic benefits compared to the turn lane concept. Additionally, the roundabout concept will allow the CSAH 56 intersection to function as a node between similar volume roadways and offers some reserve capacity for future traffic growth.
Recommendation: Implement a roundabout before completion of the US Highway 10 grade separation to accommodate the anticipated traffic shift.

CSAH 5 and Sunwood Drive
An elevated crash history was observed at the Sunwood Drive intersection, including injury crashes. It was determined that a roundabout concept can help slow traffic through this area and improve access to/from the side street. Additionally, the roundabout concept can project safer pedestrian and bike crossings with the trail connections at this location.
Recommendation: Implement a roundabout as soon as funding and planning allows, including opportunities for improved trail crossings.

Funding Source:

City State Aid Funds are proposed to fund the majority of the City's share of each of the proposed improvements, as needed. Stormwater Funds could also be used to fund required storm sewer improvements. Other funding sources may be explored and used for off-roadway improvements at the time each project is implemented.

Recommendation:

N/A

Action:

No action is required or requested at this time.

Attachments

Final CSAH 5 Corridor Study

Form Review

Inbox	Reviewed By	Date
Brian Hagen	Brian Hagen	02/16/2023 01:50 PM
Form Started By: Bruce Westby		Started On: 02/09/2023 01:55 PM
Final Approval Date: 02/16/2023		

CSAH 5 (Nowthen Boulevard) Corridor Traffic Study

Final Report

Draft Report Version 1

Anoka County

Prepared by:

SRF

May 2022

SRF No. 14949

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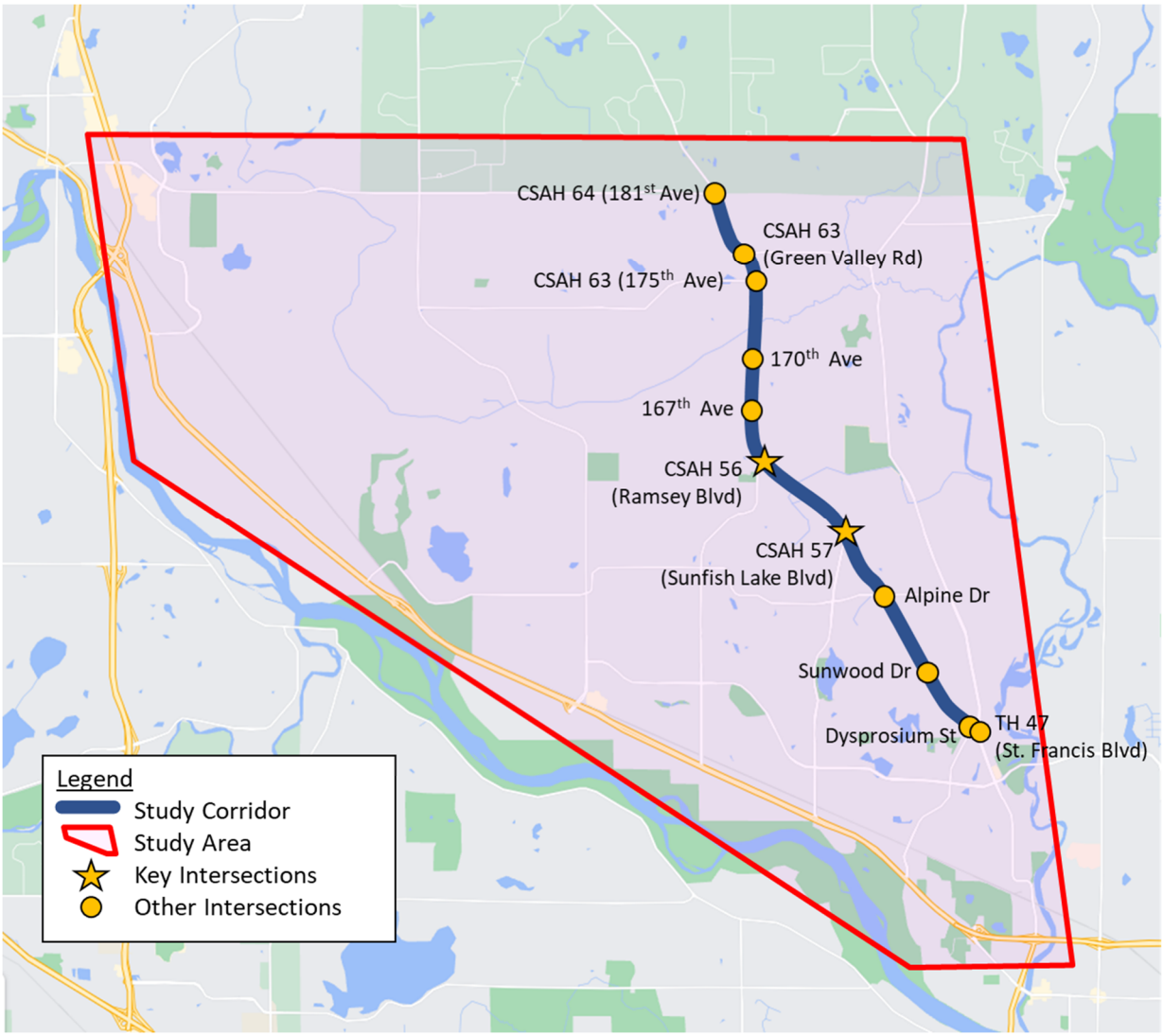
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Introduction

This report documents a traffic study completed along CSAH 5 (Nowthen Boulevard) in Ramsey, MN. The project study area is shown in Figure 1. Anoka County desires to improve its understanding of future needs along this corridor, as it is anticipated that the corridor will be impacted by current and future improvements to US Highway 10 in the cities of Anoka and Ramsey. The main objectives of this study are to review existing operations, develop/evaluate future traffic forecasts for the corridor, and analyze potential intersection improvements which may help serve future traffic demands. The following information provides the assumptions, analysis, and recommendations offered for consideration.

Figure 1: CSAH 5 Study Area



Key Findings and Recommendations

Based on the results of the of the existing and future year analysis which was completed for the CSAH 5 Corridor Traffic Study, four intersections along the CSAH 5 corridor were considered in the development of improvements to address capacity and safety performance. These intersections include:

- CSAH 5 and CSAH 63 (Green Valley Road and 175th Avenue)
- CASH 5 and 167th Avenue NW
- CSAH 5 and CSAH 56 (Ramsey Boulevard)
- CSAH 5 and Sunwood Drive

The following key findings and recommendations for each of the four intersections along CSAH 5 were developed as a result of the CSAH 5 Corridor Traffic Study

CSAH 5 and CSAH 63

An elevated crash history was observed at both the east and west intersections of CSAH 5 and CSAH 63. Traffic volumes are anticipated to increase at these intersections as the surrounding area develops. Additional turn lanes will reduce the conflicts and crash risks under future year conditions. Furthermore, the installation of lighting will help alert drivers to the intersections at night. The marginal costs of the proposed improvements at this intersection would potentially decrease if the improvements are coordinated with future corridor investments.

Recommendation: Implement turn lane improvements and lighting as part of the next preservation investment to improve safety and modernize intersections to support future growth.

CSAH 5 and 167th Ave NW

167th Avenue NW functions as an east-west roadway. Higher crash rates were observed at the CSAH 5 and 167th Avenue NW intersection compared to the majority of the intersections along the CSAH 5 corridor. The roundabout concept was found to be the most cost-effective improvement for this intersection with an estimated 12-year return on investment.

Recommendation: Implement a roundabout as part of the next preservation investment to improve safety and serve the function of 167th Ave as an east-west corridor.

CSAH 5 and CASH 56 (Ramsey Blvd)

An elevated crash history was observed at the CSAH 56 (Ramsey Boulevard) intersection, including injury crashes. The traffic volume from northbound CSAH 56 to northbound CSAH 5 is expected to increase with the completion of the interchanges on US Highway 10. Turn lane and roundabout concepts were considered for this location; both concepts have a similar construction cost, approximately $3,000,000, and impacts to surrounding land use. The roundabout concept provides

more effective safety and traffic improvement compared to the turn lane concept. Additionally, the roundabout concept will allow the CSAH 56 intersection to function as a node between similar volume roadways and offers some reserve capacity for future traffic growth.

Recommendation: Implement a roundabout before completion of US Highway 10 grade separation to accommodate the anticipated traffic shift.

CSAH 5 and Sunwood Drive

An elevated crash history was observed at the Sunwood Drive intersection, including injury crashes. It was determined that a roundabout concept can help slow traffic through this area and improve access to/from the side street. Additionally, the roundabout concept can project safer pedestrian and bike crossing with the trail connections at this location.

Recommendation: Implement a roundabout as soon as funding and planning allows, including opportunities for improved trail crossings.

Existing Conditions

Existing conditions were reviewed to establish a baseline to better understand the corridor operations and characteristics. The evaluation of existing conditions includes a review of area traffic volumes, intersection capacity analysis, and a safety analysis.

Traffic Volumes

Peak period traffic counts were collected at the following intersections along CSAH 5 during the month of November 2021:

- Key Intersections - 3-hour AM and PM peak period counts:
  - CSAH 56 (Ramsey Boulevard)
  - CSAH 57 (Sunfish Lake Boulevard)
  - TH 47 including pedestrian counts in crosswalks
- Other Major Intersections - 2-hour AM and PM peak period counts:
  - 181st Ave
  - CSAH 63 (Green Valley Road)
  - CSAH 63 (175th Avenue)
  - 170th Avenue (Brookside Elementary School) including pedestrian counts in crosswalks
  - Dysprosium Street
  - 167th Avenue
  - Sunwood Drive

In addition, recent traffic counts were supplied by Anoka County for the intersections along CSAH 5 at 167th Avenue, Alpine Drive, and Sunwood Drive.

Intersection Capacity Analysis

An intersection capacity analysis was conducted to determine how traffic is currently operating at the intersections in the study area during typical weekday AM and PM peak hour conditions. The traffic count data collected by SRF was supplemented by recent peak hour turning movement counts provided by Anoka County for the existing intersection capacity analysis. All intersections were analyzed using Synchro/SimTraffic software.

Capacity analysis results identify a Level of Service (LOS) which indicates how well an intersection is operating. Intersections are graded from LOS A though LOS F. The LOS results are based on average delay per vehicle results from SimTraffic, which correspond to the delay threshold values shown in Table 1. LOS A indicates the best traffic operation and LOS F indicates an intersection where demand exceeds capacity. Overall intersection LOS A through D is generally considered acceptable by drivers in the Twin Cities Metropolitan Area.

Table 1: Level of Service for Signalized and Unsignalized Intersections

LOS Designation	Signalized Intersection Average Delay/Vehicle (seconds)	Unsignalized Intersections Average Delay/Vehicle (seconds)
A	≤ 10	≤ 10
B	> 10 - 20	> 10 - 15
C	> 20 - 35	> 15 - 25
D	> 35 - 55	> 25 - 35
E	> 55 - 80	> 35 - 50
F	> 80	> 50

For side-street stop-controlled intersections, special emphasis is given to providing an estimate for the level of service of the side-street approach. Traffic operations at an unsignalized intersection with side-street stop control can be described in two ways. First, consideration is given to the overall intersection LOS. This takes into account the total number of vehicles entering the intersection and the capability of the intersection to support these volumes. Second, it is important to consider the delay of the minor approach. Since the mainline does not have to stop, the majority of delay is attributed to the side-street approaches. It is typical of intersections with higher mainline traffic volumes to experience high levels of delay (poor levels of service) on the side-street approaches, but have an acceptable overall intersection level of service during peak hour conditions.

Results of the existing intersection capacity analysis, shown in Table 2, indicate that all study intersections currently operate at an acceptable overall LOS C or better during the weekday peak hours.

Table 2: Existing Conditions Operations Analysis

Intersecting Roadway	AM Peak		PM Peak	
	LOS	Delay (sec.)	LOS	Delay (sec.)
CSAH 64 (181st Ave)*	A/A	5	A/A	6
CSAH 63 (Green Valley Rd)*	A/A	8	A/A	9
CSAH 63 (175th Ave)*	A/A	4	A/A	4
170th Ave	A	6	B	12
167th Ave*	A/A	9	A/A	9
Ramsey Blvd*	A/A	5	A/B	10
Sunfish Lake Blvd*	A/A	5	A/B	10
Alpine Dr*	B	14	B	19
Sunwood Dr*	A/B	10	A/A	7
Dysprosium St*	A/A	9	A/A	8
TH 47	B	14	C	24

* Side stop-controlled intersections show overall intersection LOS followed by the LOS of the worst of the worst performing approach. Delay shown is that of the worst performing approach.

Safety Analysis

Crash data along CSAH 5 was provided by MnDOT using the Minnesota Crash Mapping Analysis Tool (MnCMAT2). The crash history from 2015 to 2019 was reviewed, which represents the most recent five-year period available. The purpose of the crash review is to understand any high crash-frequency and/or any crash trends along CSAH 5 that should be addressed as part of the CSAH 5 corridor study. The crash types and severity for the study intersections are shown in Table 3 and Table 4, respectively.

Table 3: Crash Type Distribution (2015-2019)

Intersecting Roadway	Ran off Road	Sideswipe	Rear End	Head On	Left Turn	Angle	Other
CSAH 64 (181st Ave)		1	1			1	1
CSAH 63 (Green Valley Rd)			1			1	
CSAH 63 (175th Ave)			1				
167th Ave			1			4	2
Ramsey Blvd	1	1			1		2
Sunfish Lake Blvd							2
Alpine Dr	1		1			1	
Sunwood Dr		1	1			5	1
Dysprosium St			1		1		
TH 47	1	2	9	3	1	5	

Table 4: Crash Severity Distribution (2015-2019)

Intersecting Roadway	K	A	B	C	PD	Total
CSAH 64 (181st Ave)	1		1	1	1	4
CSAH 63 (Green Valley Rd)					2	2
CSAH 63(175th Ave)					1	1
167th Ave		1	3	1	2	7
Ramsey Blvd			1	1	3	5
Sunfish Lake Blvd		1			1	2
Alpine Dr				2	1	3
Sunwood Dr			1	1	6	8
Dysprosium St					2	2
TH 47			7	3	11	21

A detailed crash analysis was completed to compare the crash rates of the study intersections with other comparable intersections throughout the state. Additionally, the intersections were reviewed to determine if the crash rates are statistically significant using the critical rate method to determine if they warrant mitigation. The results of the crash analysis are shown in Table 5.

Table 5: Crash Analysis (2015-2019)

Intersecting Roadway	Crash Rate	Statewide Average	Critical Rate
CSAH 64 (181st Ave)	0.31	0.09	0.35
CSAH 63 (Green Valley Rd)	0.16	0.09	0.35
CSAH 63 (175th Ave)	0.08	0.09	0.35
167th Ave	0.45	0.09	0.32
Ramsey Blvd	0.31	0.09	0.31
Sunfish Lake Blvd	0.14	0.09	0.33
Alpine Dr	0.21	0.42	0.90
Sunwood Dr	0.46	0.09	0.30
Dysprosium St	0.09	0.09	0.27
TH 47	0.47	0.42	0.68

Results of the detailed crash analysis indicate that the crash rates at the CSAH 5 intersections with CSAH 64 (181st Avenue), CSAH 63 (Green Valley Road), CSAH 57 (Sunfish Lake Boulevard), and TH 47 exceed the statewide average crash rate of intersections with similar characteristics. These locations are shown in orange in Table 5. Additionally, a review of the critical crash rate was completed to determine if the actual crash rates are statistically significant. The results in Table 5 show the CSAH 5 intersections with 167th Avenue, Ramsey Boulevard, and Sunwood Drive exceeds the critical crash rates of intersections with similar characteristics. These locations are shown in red in Table 5. Based on the results of the detailed safety analysis, safety improvements should be considered at these locations along the CSAH 5 study corridor.

Traffic Forecasts

For this study, the Metropolitan Council Regional Activity Based Model (ABM) was used to estimate travel demand and to develop future year daily traffic forecasts.

Travel Demand Modeling and Traffic Forecasting Methodology

The ABM was developed in 2016 to analyze travel demand and assist planning efforts throughout the Twin Cities region. For this study, the ABM was reviewed to ensure roadway network and current land use assumptions were incorporated. Existing conditions model validation was performed in the study area.

Travel demand models provide an estimation of traffic forecasts that include many future year assumptions. However, all travel demand models contain residual error and results should be considered estimates with some margin of error. MnDOT currently considers long-range forecasts to have a precision of +/-15 percent. Decision-makers and designers should be aware of the uncertainty in long-range forecasts and whether that margin of error will affect outcomes of the recommended improvements.

Travel Demand Model Assumptions

Existing and future year socioeconomic (SE) development and roadway network assumptions were included in the ABM.

Socioeconomic Data

The development assumptions that were incorporated into the ABM and used for the CSAH 5 traffic study are shown in Table 6. The municipal totals are consistent with the Metropolitan Council's *Thrive MSP 2040*.

Table 6: CSAH 5 Study Area Development Assumptions

Municipality	Year 2018			Year 2040		
	Population	Households	Employment	Population	Households	Employment
Andover	32,610	10,532	5,864	39,800	13,500	7,100
Anoka	18,522	7,544	14,593	21,200	8,900	14,400
Elk River	24,891	8,658	11,783	26,900	9,900	11,500
Nowthen	4,703	1,518	693	5,500	2,100	680
Ramsey	26,821	9,226	7,142	39,150	13,500	8,400

Roadway Network

A total of six forecast scenarios were prepared for the CSAH 5 Corridor Traffic Study. This includes existing year 2018 conditions along with five scenarios representing future year 2040 conditions. The following scenarios were included in the CSAH 5 Corridor Traffic Study:

- Existing (2018) - year 2018 SE data and the year 2018 roadway network
- 2040 No Improvement – year 2040 SE data with year 2018 roadway network
- 2040 Baseline – year 2040 SE data with all programmed improvements; CSAH 5 as 2-lane undivided with 8-foot shoulders
- 2040 Alternative 1 – year 2040 SE data; CSAH 5 as 2-lane rural section with painted center median, 8-foot shoulders, and left and/or right turn lanes at major intersections
- 2040 Alternative 2 – year 2040 SE data; CSAH 5 as 2-lane rural section with a raised center median, 8-foot shoulders, and left and/or right turn lanes at major intersections
- 2040 Alternative 3 – year 2040 SE data; CSAH 5 as 4-lane rural section with a raised center median, 8-foot shoulders, and left and/or right turn lanes at major intersections

Additionally, the following programmed roadway capacity improvements within the study area were incorporated into the ABM roadway network for the year 2040 Baseline and Alternative Scenarios:

- Highway 47 and County Road 116/Bunker Lake Boulevard intersection improvements
- Highway 47/169 resurfacing
- Highway 10 Ramsey Boulevard /Sunfish Lake Boulevard interchange construction
- Highway 10 Rum River bridge replacement and corridor improvements
- Fairoak/Thurston/W Main Street interchange construction
- Highway 47 BNSF Railroad grade separation
- Highway 10 strategic congestion mitigation
- Highway 10 at Round Lake Boulevard intersection improvements
- Highway 169 Redefine/freeway construction

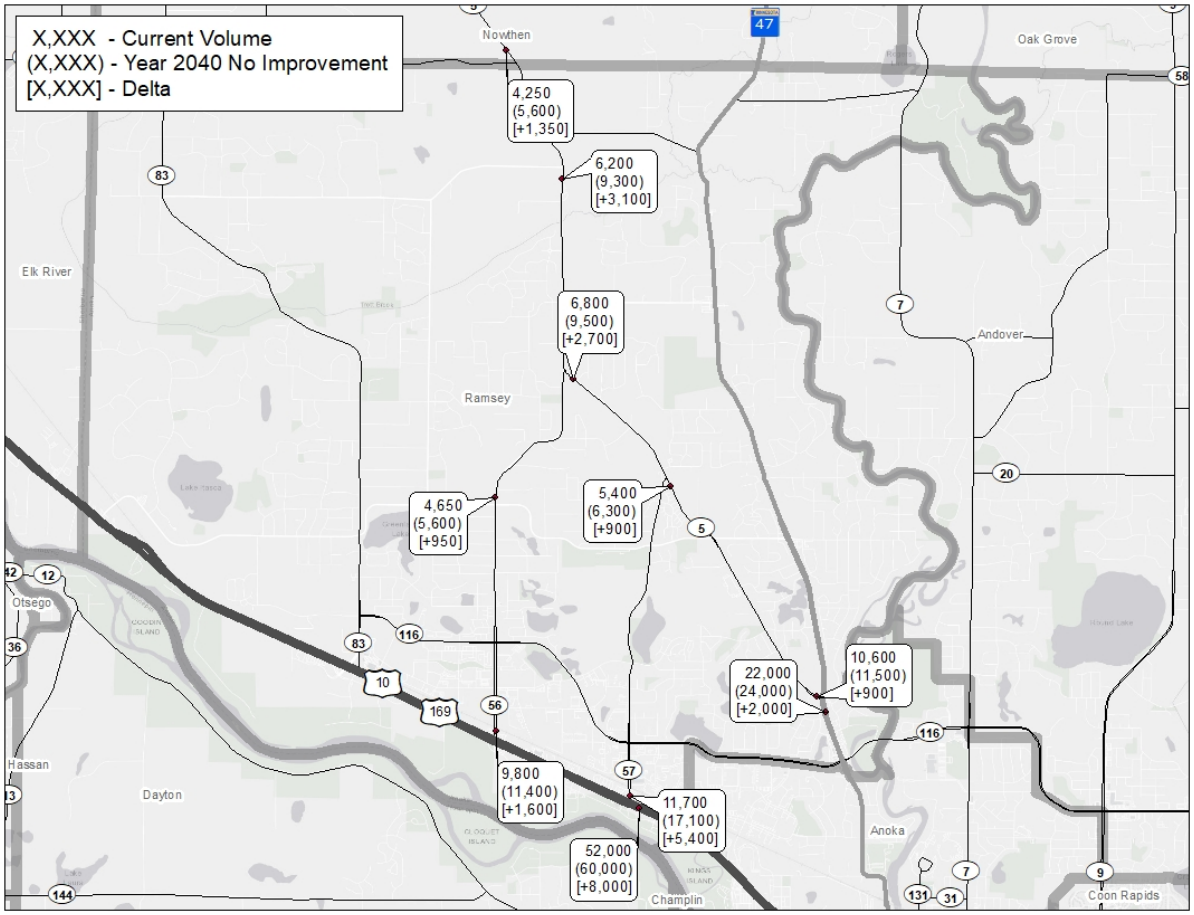
Travel Demand Model Validation

For this study, the ABM validation was reviewed in the study area shown in Figure 1. Validation is defined as the degree to which the travel demand model replicates known ground counts. The traffic counts used for the validation were obtained from the MnDOT Traffic Forecasting and Analysis published data. Based on the ABM validation review completed for this study, the model validates to accepted industry standards.

Traffic Forecast Results

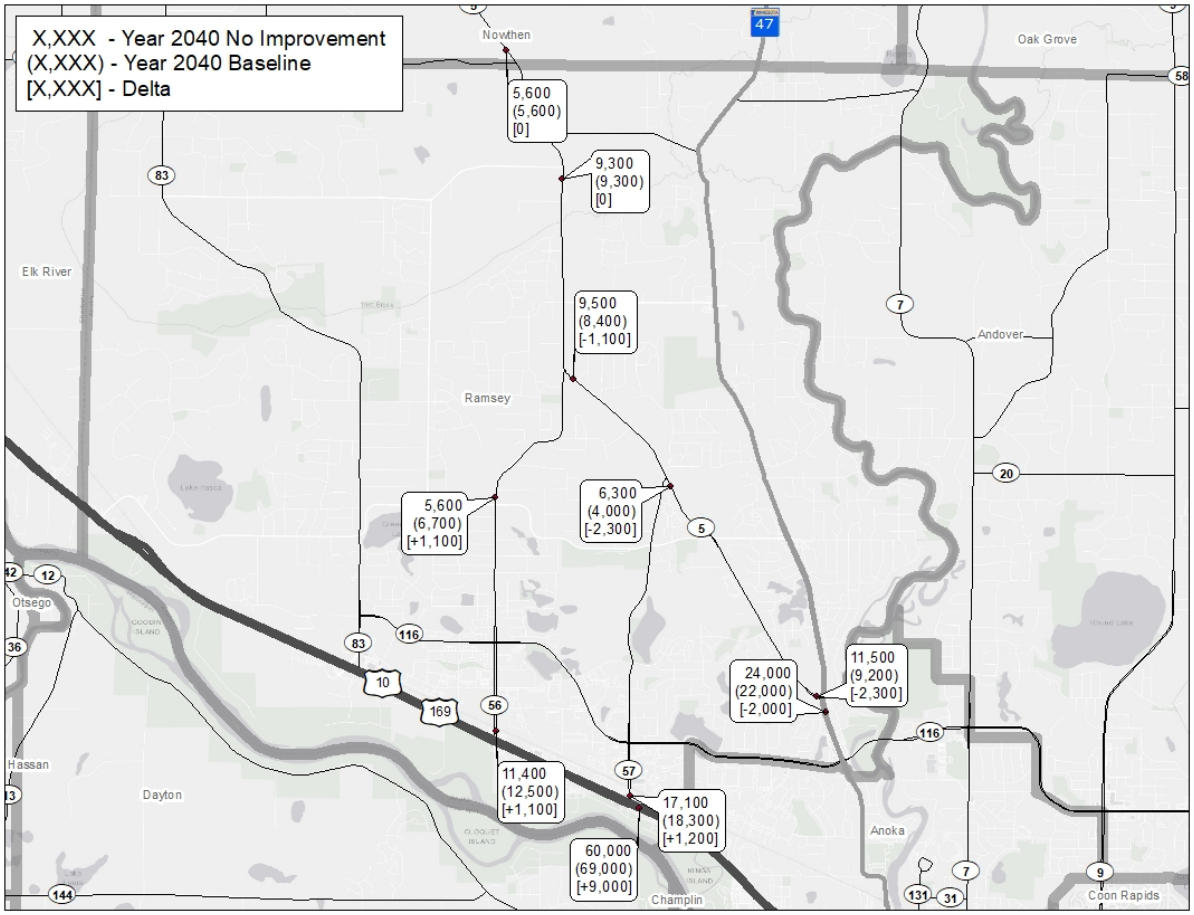
Daily traffic forecasts were prepared for the No Improvement scenario to capture the growth in the study area due to development growth. The No Improvement scenario forecasts are shown in Figure 2.

Figure 2: Year 2040 No Improvement Scenario Daily Traffic Forecasts



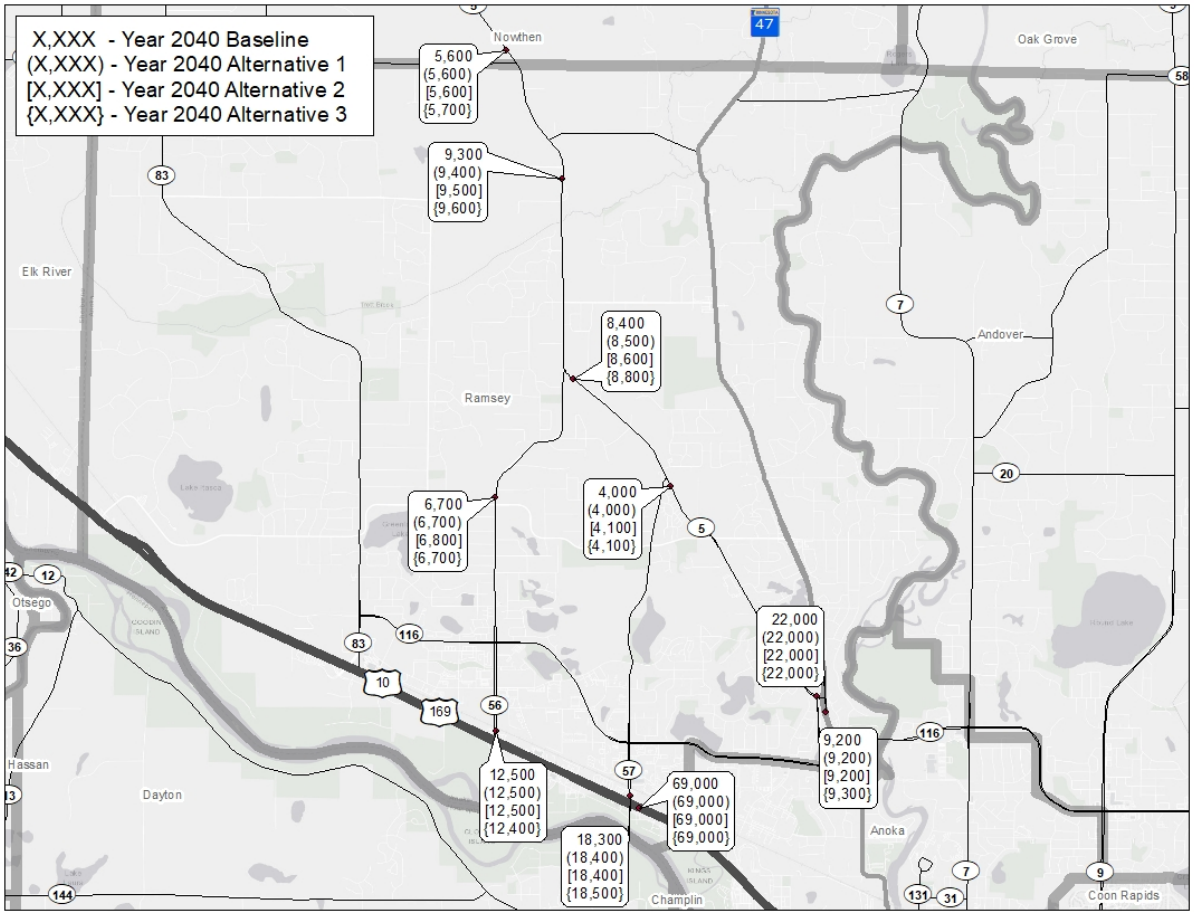
Daily traffic forecasts were prepared for the Baseline scenario to capture the impacts of the programmed improvements. The improvements on US 10 result in a significant number of regional trips shifting to US Highway 10 under the Baseline scenario. Additionally, under this scenario just over 2,000 daily trips in the study area shift from TH 47/Ferry Street to Sunfish Lake Boulevard and Ramsey Boulevard. The Baseline scenario daily traffic forecasts are shown in Figure 3.

Figure 3: Year 2040 Baseline Scenario Daily Traffic Forecasts



The daily traffic forecasts for Alternatives 1-3 are shown in Figure 4. There is a minimal increase in volumes along CSAH 5 at the daily level under all alternative conditions.

Figure 4: Year 2040 Alternative Scenario Daily Traffic Forecasts



Future Year Traffic Operations Analysis

Turning movements were estimated for the year 2040 No Improvement and Baseline scenarios. The future year turning movements were estimated using the existing turning movements and adjustments were applied based on future traffic growth and travel pattern shifts predicted for each scenario. These future year turning movements were evaluated in the traffic operations model to evaluate the performance of each scenario. The results of the future year traffic operations analysis are reported as level of service (LOS) and include estimated delay at each approach.

Year 2040 No Improvement Scenario

The Year 2040 No Improvement Scenario includes the year 2040 SE data assumptions and the existing year 2018 roadway network. To determine how the CSAH 5 corridor will accommodate the Year 2040 No Improvement Scenario forecasts, an intersection capacity analysis was completed using Synchro/SimTraffic software. Results of the Year 2040 No Improvement Scenario capacity analysis are shown in Table 7.

Table 7: Year 2040 No Improvement Scenario Operations Analysis

Intersecting Roadway	AM Peak		PM Peak	
	LOS	Delay (sec.)	LOS	Delay (sec.)
CSAH 64 (181st Ave)*	A/A	8	A/A	9
CSAH 63 (Green Valley Rd)*	A/C	18	**C/F**	**71**
CSAH 63 (175th Ave)*	A/A	6	A/A	7
170th Ave	A	8	B	17
167th Ave*	A/C	16	A/D	33
Ramsey Blvd*	A/A	7	A/C	25
Sunfish Lake Blvd*	A/A	5	A/B	12
Alpine Dr*	B	16	B	20
Sunwood Dr*	A/B	13	A/A	10
Dysprosium St*	A/A	9	A/A	9
TH 47	B	14	C	26

* Side stop-controlled intersections show overall intersection LOS followed by the LOS of the worst of the worst performing approach. Delay shown is that of the worst performing approach.

Results of the Year 2040 No Improvement scenario capacity analysis indicate that all study intersections currently operate at an overall acceptable overall LOS C or better during the weekday peak hours. The westbound approach at the CSAH 62 (Green Valley Road) intersection operates at a LOS F with a delay of 71 seconds.

Year 2040 Baseline Scenario

The year 2040 Baseline Scenario includes the year 2040 SE data and all programmed roadway network improvements. CSAH 5 is a 2-lane undivided section with 8-foot shoulders under this scenario. To determine how the CSAH 5 corridor will accommodate the Year 2040 Baseline Scenario forecasts, an intersection capacity analysis was completed using Synchro/SimTraffic software. Results of the Year 2040 No Improvement Scenario capacity analysis are shown in Table 8.

Table 8: Year 2040 Baseline Scenario Operations Analysis

Intersecting Roadway	AM Peak		PM Peak	
	LOS	Delay (sec.)	LOS	Delay (sec.)
CSAH 64 (181st Ave)*	A/A	8	A/A	9
CSAH 63 (Green Valley Rd)*	A/C	18	**B/F**	**56**
CSAH 63 (175th Ave)*	A/A	7	A/A	7
170th Ave	A	8	B	18
167th Ave*	A/C	19	A/D	33
Ramsey Blvd*	A/A	7	**A/E**	**45**
Sunfish Lake Blvd*	A/A	5	A/B	12
Alpine Dr*	B	17	C	21
Sunwood Dr*	A/B	10	A/A	7
Dysprosium St*	A/A	6	A/A	7
TH 47	B	15	C	27

*Side stop-controlled intersections show overall intersection LOS followed by the LOS of the worst of the worst performing approach. Delay shown is that of the worst performing approach.

Results of the Year 2040 Baseline scenario capacity analysis indicate that all study intersections currently operate at an overall acceptable overall LOS C or better during the weekday peak hours. Both the CSAH 63 (Green Valley Road) and Ramsey Boulevard intersections have approaches which operate below LOS C. Additionally, the results of the Year 2040 Baseline scenario capacity forecasts showed that the improvements to US Highway 10 are expected to shift traffic from TH 47 to CSAH 56 (Ramsey Boulevard) and CSAH 57 (Sunfish Lake Boulevard). The operations results shown here demonstrate that the CSAH 56 northbound approach to CSAH 5 deteriorates to a poor level of service when accounting for the traffic shift anticipated from the improvement to US Highway 10.

Concept Development

Intersection improvement concepts were developed at the intersections of CSAH 5 at CR 63, 167th Avenue, CSAH 56 (Ramsey Boulevard), and Sunwood Drive NW. Each intersection was examined for any possible minor improvements that could accommodate future volumes as well as increase safety. Additional turn lanes, realignments, and full intersection alterations were considered at each location.

CSAH 5 and CR 63

Concepts were developed for both CR 63 intersections with CSAH 5 - Green Valley Road to the north and 175th Avenue NW to the south. The concept for the improvements at CSAH 5 and CR 63 (Green Valley Road) is shown in Figure 5.

Figure 5: CSAH 5 and CR 63 (Green Valley Road) Intersection Improvement Concept



The improvements for this concept include:

- Slight realignment of CR 63 (Green Valley Road) to be more perpendicular to CSAH 5
- Right turn lane addition to CR 63
- Changed southbound bypass lane configuration to dedicated left turn and through lane

The estimated construction cost of the intersection improvement at CSAH 5/CR 63 (Green Valley Road) is $3,100,000.

The concept for the improvements at CSAH 5 and CR 63 (175th Avenue NW) is shown in Figure 6.

Figure 6: CSAH 5 and CR 63 (175th Avenue NW) Intersection Improvement Concept



The improvements for this concept include:

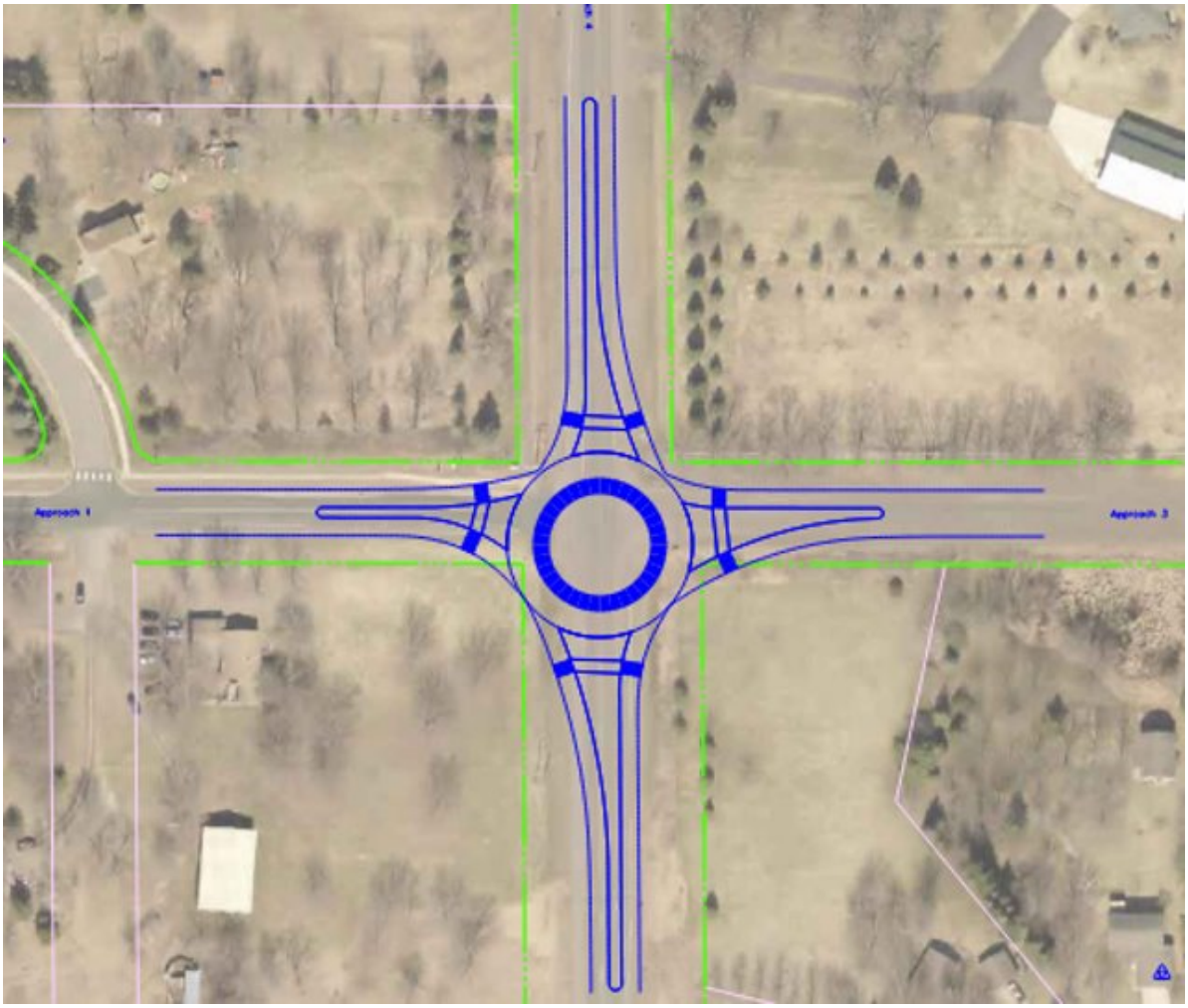
- Northbound and Southbound bypass at CR 63 (175th Avenue NW) lanes converted to dedicated left turn lanes.

The estimated construction cost of the intersection improvement at CSAH 5/CR 63 (175th Avenue NW) is $1,200,000.

CSAH 5 and 167th Avenue

The intersection improvement concept for the CSAH 5/167th Avenue intersection includes converting the intersection into a roundabout. The roundabout option slows traffic to allow for safer turn moves and improved sightlines. The roundabout improvement concept for the CSAH 5/167th Avenue intersection is shown in Figure 7.

Figure 7: CSAH 5 and 167th Avenue Intersection Improvement Concept

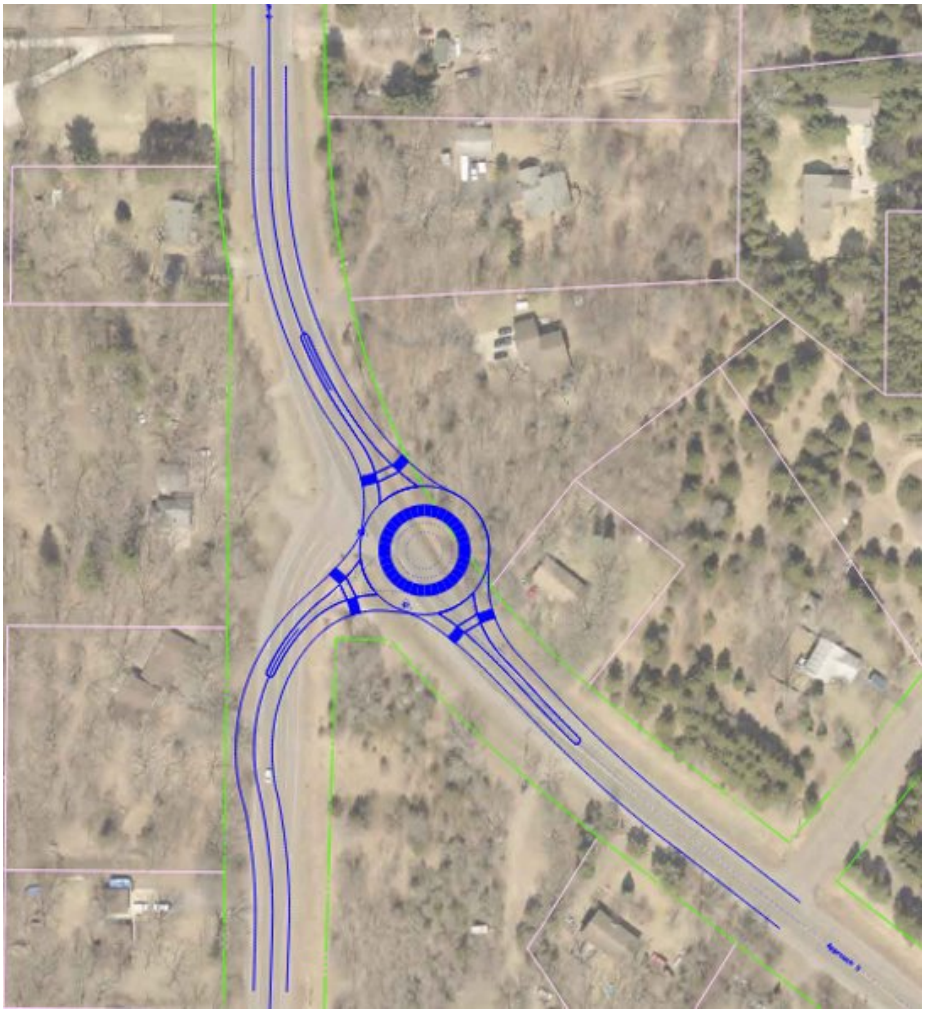


This improvement concept would require new right of way and would likely require a pond. The estimated construction cost of this improvement concept is $3,000,000 - $4,000,000.

CSAH 5 and CSAH 56 (Ramsey Boulevard)

Two intersection improvement concepts were developed for the CSAH 5/CSAH 56 (Ramsey Boulevard) intersection. The first improvement includes converting the intersection into a roundabout. The roundabout option slows traffic to allow for safer turn moves and improves sightlines. The roundabout improvement concept for the CSAH 5/CSAH 56 (Ramsey Boulevard) Ave intersection is shown in Figure 8.

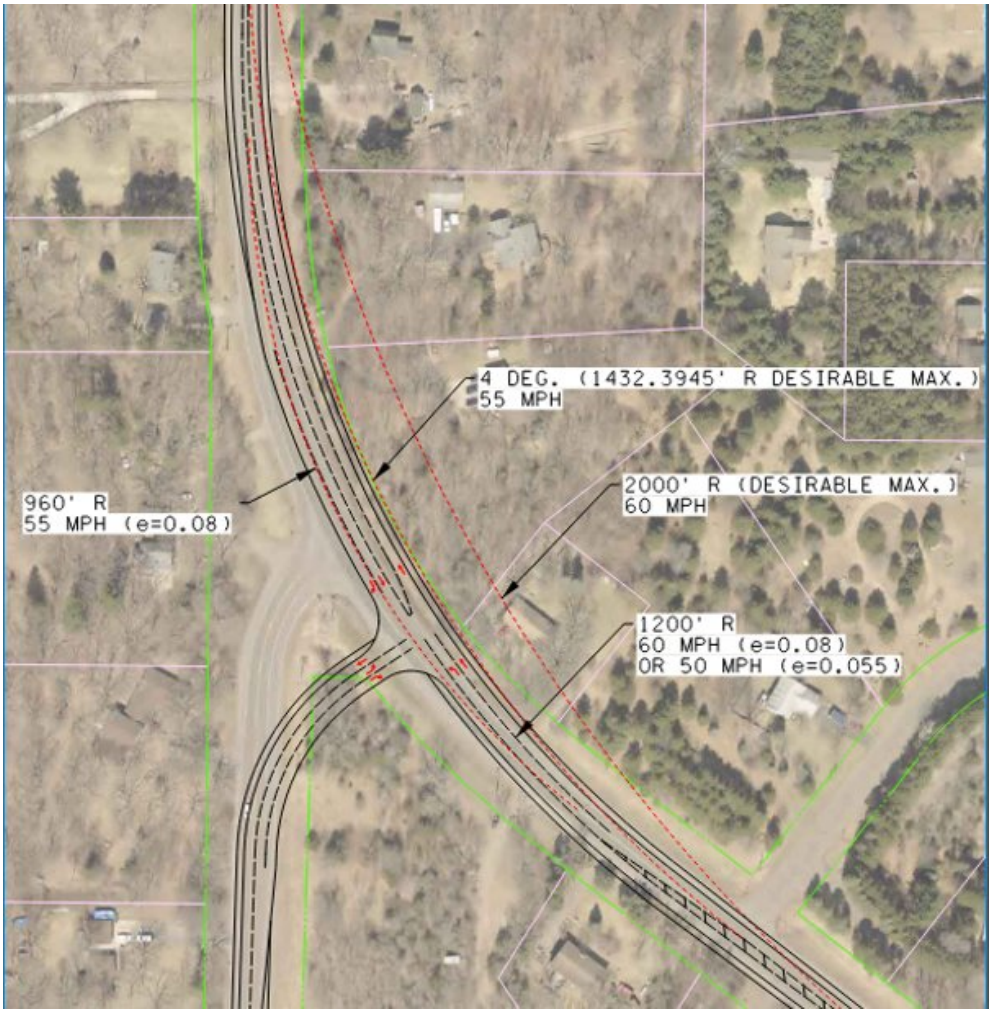
Figure 8: CSAH 5 and CSAH 56 (Ramsey Boulevard) Roundabout Improvement Concept



The intersection improvement concept shown in Figure 8 will require new right of way and would likely require a pond. The estimated construction cost for the roundabout improvement concept at CSAH 5/CSAH 56 (Ramsey Boulevard) is $3,000,000 - $4,000,000.

The second improvement concept for the CSAH 5/CSAH 56 (Ramsey Boulevard) intersection includes a realignment of CSAH 56 (Ramsey Boulevard) and CSAH 5. This concept is shown in Figure 9.

Figure 9: CSAH 5 and CSAH 56 (Ramsey Boulevard) Realignment Improvement Concept



This intersection improvement includes:

- Realignment of CSAH 56 (Ramsey Boulevard) to be more perpendicular to CSAH 5
- Converted northbound CSAH 5 bypass lane configuration to dedicated left turn and through lane
- Increased centerline radius of CSAH 5 to 1,200 feet from 870 feet. This brings the curve closer to the existing speed limit of 55 mph.

The estimated construction cost for the realignment improvement concept at CSAH 5/CSAH 56 (Ramsey Boulevard) is $2,300,000 - $3,100,000.

Various realignment alternatives were considered to balance safety improvements and property impacts. As shown in Figure 9 the larger the radii, the longer the length of improvements needed as well as more property impacts to the east. While larger radii allow vehicles to navigate a curve at a more consistent rate of speed for the corridor, a design speed can vary based on the superelevation cross slope corresponding to a specific centerline radii. A comparison of various realignment alternatives for this intersection is shown in Table 9.

Table 9: CSAH 5/CSAH 56 (Ramsey Boulevard) Comparison Table

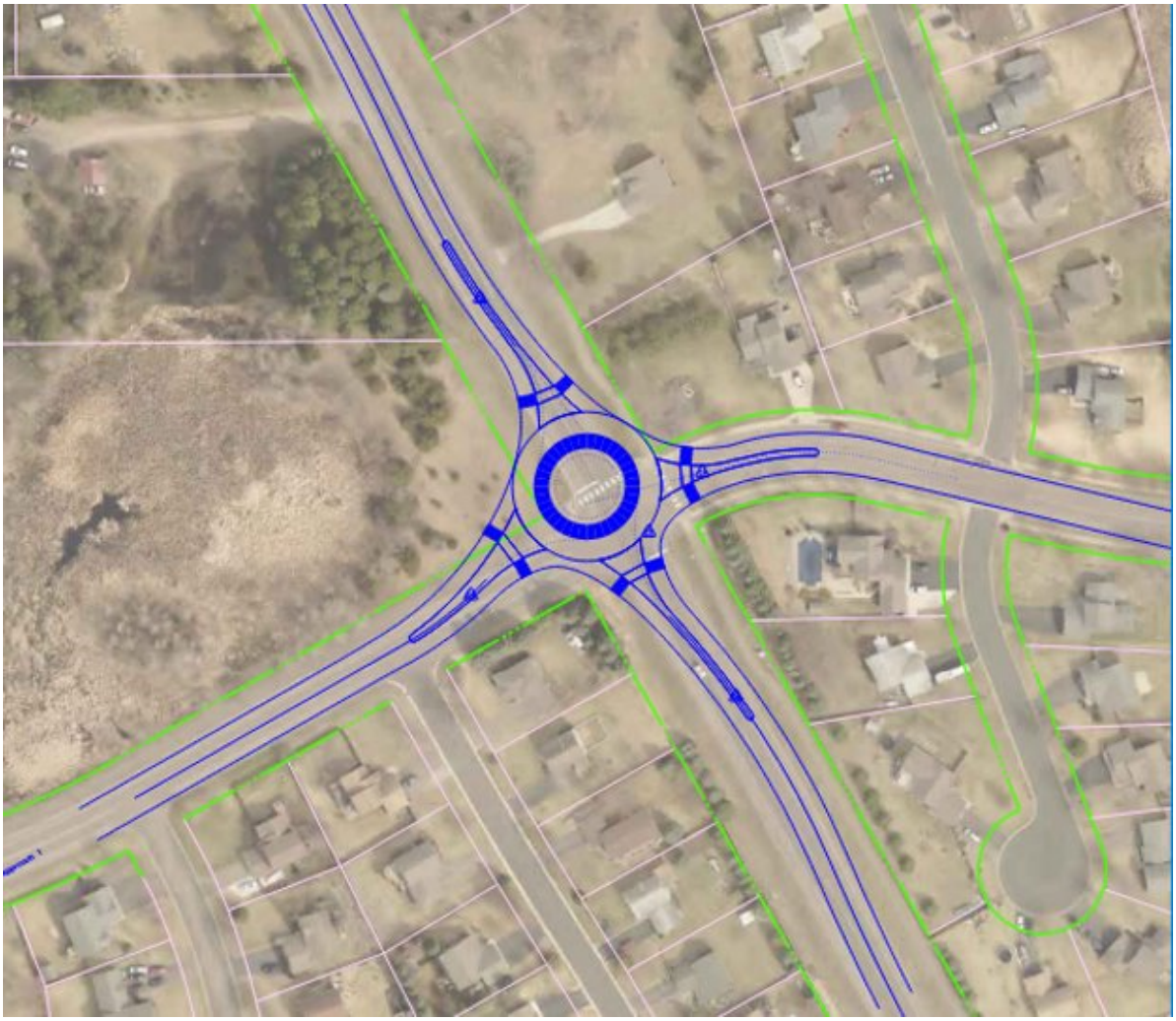
Radius (Feet)	Superelevation	Design/Advisory Speed	Right of Way Impacts	Cost
870 (existing)	0.06	50 mph advisory	N/A	N/A
960	0.08	55 mph	Minor	$2,300,000
1,200	0.08	60 mph	Moderate	$2,300,000
1,200	0.055	55 mph advisory	Moderate	$2,300,000
1,432	0.057	55 mph	Possible total takes	$2,600,000
2,000	0.054	60 mph	Total Takes	$3,100,000

The optimal design among these options is understood to be the 1,200 foot radius with a 0.055 superelevation and 55 mph advisory speed. This option balances brining the design of the curve up to the posted speed without incurring extreme right of way cost impacts.

CSAH 5 and Sunwood Drive NW

The improvement concept developed for the CSAH 5/Sunwood Drive intersection includes converting the intersection into a roundabout. The roundabout improvement concept for the CSAH 5/Sunwood Drive NW intersection is shown in Figure 10.

Figure 10: CSAH 5 and Sunwood Drive NW Intersection Improvement Concept



The roundabout option slows traffic to allow for safer turn moves. Additionally, the roundabout concept provides safer pedestrian accommodations. The roundabout concept does require new right of way and may require a pond. The estimated construction cost for the realignment improvement concept at CSAH 5/Sunwood Drive is $2,000,000 - $4,000,000.

Future Year Concept Traffic Analysis

Future Year Safety Analysis

To quantify the reduction in crashes for each concept, the CMF Clearinghouse website was used. The Clearinghouse website provides crash modification factors (CMFs) for various countermeasures implemented on a segment or at an intersection. Using the Clearinghouse, CMFs were selected based on the relevance of the countermeasure to the concept analyzed. The CMFs used for the various improvement concepts are shown in Table 10 through Table 13.

Table 10: Roundabout Crash Modification Factors

CMF	Crash Type	Crash Severity	Area Type
0.57 - 0.62	All	All	All
0.17 - 0.21	All	K,A,B,C	All

Table 11: Bypass to Turn Lane Crash Modification Factors

CMF	Crash Type	Crash Severity	Area Type
0.88*	All	All	All

*Value was calculated by combining two CMFs since there was no CMF for bypass to dedicated turn lane

Table 12: Turn Lane on Minor Approach Crash Modification Factors

CMF	Crash Type	Crash Severity	Area Type
0.75	All	All	All

Table 13: Increased Horizontal Curve Radius Crash Modification Factors

CMF	Crash Type	Crash Severity	Area Type
0.77	All	All	Rural

The CMFs for increased horizontal curve radius show in Table 13 were calculated using the following equation:

$$CMF = \frac{e^{\left[4.101 * \left(\frac{V^2 proposed}{15 * R_{proposed}} - 0.01 * X_{proposed}\right)\right]}}{e^{\left[4.101 * \left(\frac{V^2 existing}{15 * R_{existing}} - 0.01 * X_{existing}\right)\right]}}$$

$V_{proposed}$ = proposed posted speed limit (mph)

$R_{proposed}$ = proposed horizontal curve radius (ft)

$X_{proposed}$= proposed curve superelevation (degrees)

$V_{existing}$ = existing speed limit (mph)

$R_{existing}$ = existing horizontal curve radius (ft)

$X_{existing}$ = existing curve superelevation (degrees)

CMFs are used to estimate safety performance after implementation of an improvement by multiplying the CMF with the historical crash rate to compute the estimated future crash rate.

Future Year Capacity Analysis

A year 2040 intersection capacity analysis was completed to evaluate how the study intersections are expected to operate in the future when the roundabout concepts are implemented. The operational analysis for the roundabout concepts was performed using RODEL. RODEL is a software program that is based on existing roundabout operational research and uses an empirical formula method to determine roundabout delay based on geometric features and traffic flows. RODEL results for a Confidence Level (CL) of 50 percent were determined, which is typically used for roundabout analysis and is considered comparable to other analysis software. The results of the roundabout operational analysis for Year 2040 forecast conditions is shown in Table 14. For the roundabout operational analysis, all RODEL models were built as the roundabouts were designed in the intersection improvement concepts shown in Figure 5 to Figure 10.

Table 14: Year 2040 Roundabout Operations Analysis

Intersecting Roadway	AM Peak		PM Peak	
	LOS	Delay (sec.)	LOS	Delay (sec.)
167th Ave	A	8	A	10
Ramsey Blvd (CSAH 56)	A	8	A	7
Sunwood Dr	A	5	A	5

Operations analysis results for future year conditions indicate the roundabout control alternatives operate at acceptable levels of service.

Future year intersection operational analysis for the remaining intersections was not completed for this study due to the minimal increase in traffic volumes under Year 2040 conditions. In addition, with the roadway network improvements along Highway 10 under the Year 2040 conditions, volume decreases along CSAH 5 east of CSAH 56 (Ramsey Boulevard) were observed compared to existing conditions. Therefore, it was assumed that the study area intersection operations would not worsen under future year conditions and a future year operations analysis for the non-roundabout intersections was not completed.

Future Year Warrants Analysis

Based on existing and future year operations at the CSAH 5 intersections with Ramsey Blvd and Sunwood Drive, a traffic signal warrant analysis was performed to see if a traffic signal is warranted. The results of the traffic signal warrant analysis are shown in Table 15 and Table 16.

Table 15: CSAH 5/Ramsey Boulevard Warrant Analysis

	Existing Volumes		Year 2040 Volumes	
Warrant	**Hours Met**	**Hours Required**	**Hours Met**	**Hours Required**
1A: Minimum Vehicular Volume	0	8	1	8
1B: Interruption of Continuous Traffic	3	8	6*	8
1C: Combination of Warrants	0	8	0	8
2: Four Hour Volumes	0	4	3	4
3: Peak Hour Volume	0	1	**2**	**1**
All-Way-Stop-Control	1	8	4	8

*Six hours of counts available with current data; warrant 1B likely to be met in 2040

Table 16: CSAH 5/Sunwood Drive Warrant Analysis

	Existing Volumes		Year 2040 Volumes	
Warrant	**Hours Met**	**Hours Required**	**Hours Met**	**Hours Required**
1A: Minimum Vehicular Volume	0	8	0	8
1B: Interruption of Continuous Traffic	4	8	0	8
1C: Combination of Warrants	4	8	0	8
2: Four Hour Volumes	**4**	**4**	0	4
3: Peak Hour Volume	0	1	0	1
All-Way-Stop-Control	1	8	1	8

Based on the traffic signal warrant analysis, under future year conditions warrant 1B is likely satisfied and warrant 3 is satisfied for the CSAH 5/Ramsey Boulevard intersection while warrant 2 is satisfied for the CSAH 5/Sunwood Drive intersection.

Cost Estimates and Effectiveness Evaluation

Planning-level cost estimates were prepared for each concept. These estimates use unit cost estimates multiplied by estimated quantities for key elements such as pavement and shoulder area, as well as other major items such as earthwork, erosion control, and traffic control.

Cost Estimates

The cost estimates for intersection improvements on CSAH 5 at CR 63 (Green Valley Road), 175th Avenue, and CSAH 56 (Ramsey Boulevard) assumed full highway reconstruction within the limits of geometric improvements. The roundabout cost estimate is a general cost based on the size and configuration of the concept. For the realignment concepts it was assumed the county road would remain a rural typical section with no signals, or shared use paths, and intersection lighting only. A conservative pavement section was included to determine pavement, excavation, and subgrade costs. A detailed fee sheet is included in the appendix.

Cost Savings from Improvements

Year 2040 crashes were estimated using the existing crash data and existing year and year 2040 daily volumes at each study area intersection. The expected reduction in crashes were calculated by applying the crash reduction factors for each concept to the year 2040 crashes. To convert the crash reductions into a dollar amount, the crash cost for each severity type was applied to the reduction in that corresponding severity. The crash costs for each crash severity were provided by the *Highway Safety Improvement Program* from the Minnesota Department of Transportation. The expected crash cost savings are shown in Table 17 to Table 22.

Table 17: Expected Cost Savings from Improvements - CSAH 5/ CR 63 (Green Valley Road)

Crash Severity	Cost per Crash	Recorded Crashes	Crash Reduction	Savings/5 Years
K	$13,300,000	0		
A	$750,000	0		
B	$230,000	0		
C	$120,000	0		
PD	$13,000	2	0.68	$8,840
			Total	$8,840

Table 18: Expected Cost Savings from Improvements - CSAH 5/ CR 63 (175th Avenue NW)

Crash Severity	Cost per Crash	Recorded Crashes	Crash Reduction	Savings/5 Years
K	$13,300,000	0		
A	$750,000	0		
B	$230,000	0		
C	$120,000	0		
PD	$13,000	1	0.34	$4,420
			Total	$4,420

Table 19: Expected Cost Savings from Improvements - CSAH 5/167th Avenue

Crash Severity	Cost per Crash	Recorded Crashes	Crash Reduction	Savings/5 Years
K	$13,300,000	0		
A	$750,000	1	0.81	$607,500
B	$230,000	3	2.43	$558,900
C	$120,000	1	0.81	$97,200
PD	$13,000	2	1.62	$21,060
			Total	$1,284,660

Table 20: Expected Cost Savings from Improvements - CSAH 5/CSAH 56 (Ramsey Boulevard) Roundabout Concept

Crash Severity	Cost per Crash	Recorded Crashes	Crash Reduction	Savings/5 Years
K	$13,300,000	0		
A	$750,000	0		
B	$230,000	1	0.81	$186,300
C	$120,000	1	0.81	$97,200
PD	$13,000	3	2.43	$31,590
			Total	$255,090

In addition to the expected cost savings shown in Table 20, there is estimated to be savings from reduced delay of approximately 1,000 hours per year or $29,000 per year.

Table 21: Expected Cost Savings from Improvements - CSAH 5/CSAH 56 (Ramsey Blvd) Realignment Concept

Type of Crash	Cost per Crash	Recorded Crashes	Crash Reduction	Savings/5 Years
K	$13,300,000	0		
A	$750,000	0		
B	$230,000	1	0.32	$73,600
C	$120,000	1	0.32	$38,400
PD	$13,000	3	0.96	$12,480
			Total	$124,480

Table 22: Expected Cost Savings from Improvements - CSAH 5/Sunwood Dr Roundabout Concept

Type of Crash	Cost per Crash	Recorded Crashes	Crash Reduction	Savings/5 Years
K	$13,300,000	0		
A	$750,000	0		
B	$230,000	1	0.81	$186,300
C	$120,000	1	0.81	$97,200
PD	$13,000	6	4.86	$63,180
			Total	$346,680

Results and Findings

Based on the results of the of the existing and future year condition analysis which was completed for the CSAH 5 Corridor Traffic Study, four intersections along the CSAH 5 corridor were reviewed for capacity and safety performance. These intersections include:

- CSAH 5 and CSAH 63 (Green Valley Road and 175th Avenue)
- CASH 5 and 167th Avenue NW
- CSAH 5 and CSAH 56 (Ramsey Boulevard)
- CSAH 5 and Sunwood Drive

The following key findings and recommendations for each of the four intersections along CSAH 5 were developed as a result of the analysis. In general, opportunities for additional pedestrian accommodations and create a cohesive roadside environment should be sought throughout the corridor.

CSAH 5 and CSAH 63

An elevated crash history was observed at both the east and west intersections of CSAH 5 and CSAH 63. Traffic volumes are anticipated to increase at this intersection as the surrounding area develops. Additional turn lanes will reduce the conflicts and crash risks under future year conditions. Furthermore, the installation of lighting will help alert drivers to the intersections at night. The marginal costs of the proposed improvements at this intersection would potentially decrease if the improvements are coordinated with future corridor investments.

Recommendation: Implement turn lane improvements and lighting as part of the next preservation investment to improve safety and modernize intersections to support future growth.

CSAH 5 and 167th Avenue NW

167th Avenue NW functions as an east-west roadway. Higher crash rates were observed at the CSAH 5 and 167th Avenue NW intersection compared to the majority of the intersections along the CSAH 5 corridor. The roundabout concept was found to be the most cost-effective improvement for this intersection with a 12-year return on investment.

Recommendation: Implement a roundabout as part of the next preservation investment to improve safety and serve function of 167th Avenue as an east-west corridor.

CSAH 5 and CASH 56 (Ramsey Boulevard)

An elevated crash history was observed at the CSAH 56 (Ramsey Boulevard) intersection, including injury crashes. The traffic volume from northbound CSAH 56 to northbound CSAH 5 is expected to increase with the completion of the interchanges on US Highway 10. Turn lane and roundabout concepts were considered for this location; both concepts have a similar construction cost,

approximately $3,000,000, and impacts. The roundabout concept provides more effective safety and traffic benefits compared to the turn lane concept. Additionally, the roundabout concept will allow the CSAH 56 intersection to function as a node between similar volume roadways and offers some reserve capacity for future traffic growth.

Recommendation: Implement a roundabout before completion of the US Highway 10 grade separation to accommodate anticipated traffic shift.

CSAH 5 and Sunwood Drive

An elevated crash history was observed at the Sunwood Drive intersection, including injury crashes. It was determined that a roundabout concept can help slow traffic through this area and improve access to/from the side street. Additionally, the roundabout concept can project safer pedestrian and bike crossings with the trail connections at this location.

Recommendation: Implement a roundabout as soon as funding and planning allows, including opportunities for improved trail crossings.

Public Works Committee **5. 2.**

Meeting Date: 02/21/2023

By: Bruce Westby, Engineering/Public Works

Title:

Review COR Analysis Update

Purpose/Background:

PURPOSE:

The purpose of this case is to review the current status of The COR Analysis Update.

BACKGROUND:

Attached are copies of related agenda cases with attachments from the following meetings;

- EDA meeting - October 13, 2022
- City Council regular meeting - October 25, 2022
- City Council work session - December 13, 2022

The attached agenda cases and attachments outline all relevant details associated with this case. Also attached is the current draft of The COR Analysis Update, dated February 14, 2023. City staff will provide a summary of the information included in the attached COR Analysis Update during the meeting, and will be available to respond to questions.

This information will be presented to the City Council during their February 28th work session.

Timeframe:

Staff anticipates up to 45 minutes will be necessary to present this case and respond to questions.

Observations/Alternatives:

N/A

Funding Source:

N/A

Recommendation:

Staff has no recommendations to offer at this time.

Action:

No action is required or requested at this time.

Attachments

Oct 13, 2022 EDA case

Oct 25, 2022 CC case

Dec 13, 2022 CC case

COR Analysis Update

Form Review

Inbox	Reviewed By	Date

Brian Hagen	Bruce Westby	02/16/2023 04:07 PM
Bruce Westby (Originator)	Bruce Westby	02/16/2023 04:09 PM
Brian Hagen	Brian Hagen	02/16/2023 04:15 PM

Form Started By: Bruce Westby Started On: 02/16/2023 05:24 AM

Final Approval Date: 02/16/2023

Economic Development Authority (EDA) 4. 1.
Meeting Date: 10/13/2022
Submitted For: Sean Sullivan, Community Development
By: Sean Sullivan, Community Development

Title:
Request Recommendation to Complete COR Site Improvements, Infrastructure and Wetland Analysis

Purpose/Background:
The purpose of this case is to consider a recommendation to complete COR infrastructure and wetland analysis.

On January 18, 2022 the Public Works Committee discussed the COR Site improvement and Infrastructure needs and asked staff to obtain cost estimates for the work. The EDA meeting in February 2022 and supported getting more information. Staff has not been able to complete the work in-house so Staff asked Bolton and Menk (they completed the previous COR infrastructure Study) to put together proposals to complete analysis and cost estimates on completing the following items:

• Ramsey Parkway from Willemite Street to Sunwood Drive (Roundabout)
• Zeolite Street from Sunwood Drive to Bunker Lake Boulevard,
• Yolite Street from Sunwood Drive to Ramsey Parkway,
• Center Street Realignment,
• Veterans Drive between Rhinestone Street and Ramsey Boulevard,
• The Waterfront Pond and Park Area,
• Filling of stormwater ponds in the southeast quadrant of the Bunker Lake Boulevard and Armstrong Boulevard intersection
• Filling of a wetland in the southeast quadrant of the Bunker Lake Boulevard and Armstrong Boulevard intersection and related analysis.

Bolton and Menk has provided two proposals that cover the work needed to provide feasibility and costs of completing the work. Construction and contracting costs have changed significantly since the last time analysis was done in 2018. During initial investigation it has become apparent that the wetland analysis and delineation need to be completed to determine the feasibility of the wetland and stormwater pond relocation and coordinated excavation of The Waterfront to make Parcel 46 a developable lot by adding fill excavated from The Waterfront to it. Staff has already asked Bolton and Menk to begin work on the wetland delineation component due to the time of the year and ability to complete the delineation while vegetation is still identifiable. There is additional work and analysis that is included in the attached wetland proposal that is also underway. Many of these items are interrelated and should be coordinated to maximize efficiency to compete the work. Staff has been told that there should be information regarding the status of the wetlands by the time of the EDA meeting that will help guide decision making moving forward. Kevin Kielb from Bolton and Menk will be present at the meeting to provide an update and to answer questions on the proposals.

Some of the items in the proposals (streets, site improvements, cost of study) could be paid for in full, or in part by TIF District 14. In order to be able to fund these items out of TIF 14 the work needs to be completed or in process prior to November 2023. Based on this short time period, staff is suggesting that costs are quantified as soon as possible so that the City Council and determine which projects should move forward and how they can be funded most efficiently.

The work being proposed is consistent with the mission of the EDA by helping facilitate and encourage quality development.

Notification:
N/A

Observations/Alternatives:
Financing options for needed improvements in the COR will become more limited after November 2023. According to the CIP, Zeolite Street is planned to be reconstructed in 2026 and to be funded by TIF District 2 but development pressure for Parcel 46 could likely move the need for reconstruction forward. Some costs, such as the excavation of the Waterfront basin to obtain fill for Parcel 46 is a TIF eligible expense and would need to occur before November 2023 to be included in the TIF 14 budget. Completion of the attached proposals is needed to determine the feasibility of projects and to identify costs so the projects can coordinated and be budgeted efficiently.

Alternatives:
1) Recommendation to City Council to authorize the Wetland and COR Infrastructure proposals utilizing TIF District (2,14) funds.
2) Recommendation to City Council to authorize the Wetland and COR Infrastructure proposals utilizing EDA funds.
3) Something else.

Funding Source:
To be determined. It is likely that different facets of this project would be handled by different funding sources. Potential funding sources include:

- TIF
- Sewer and/or Water Fund
- Park Dedication / Trust Fund,
- PIR
- EDA
- Wetland bank

Recommendation:
N/A

Action:
Motion to recommend to City Council to authorize the Wetland and COR Infrastructure proposals utilizing TIF District (2,14) funds.

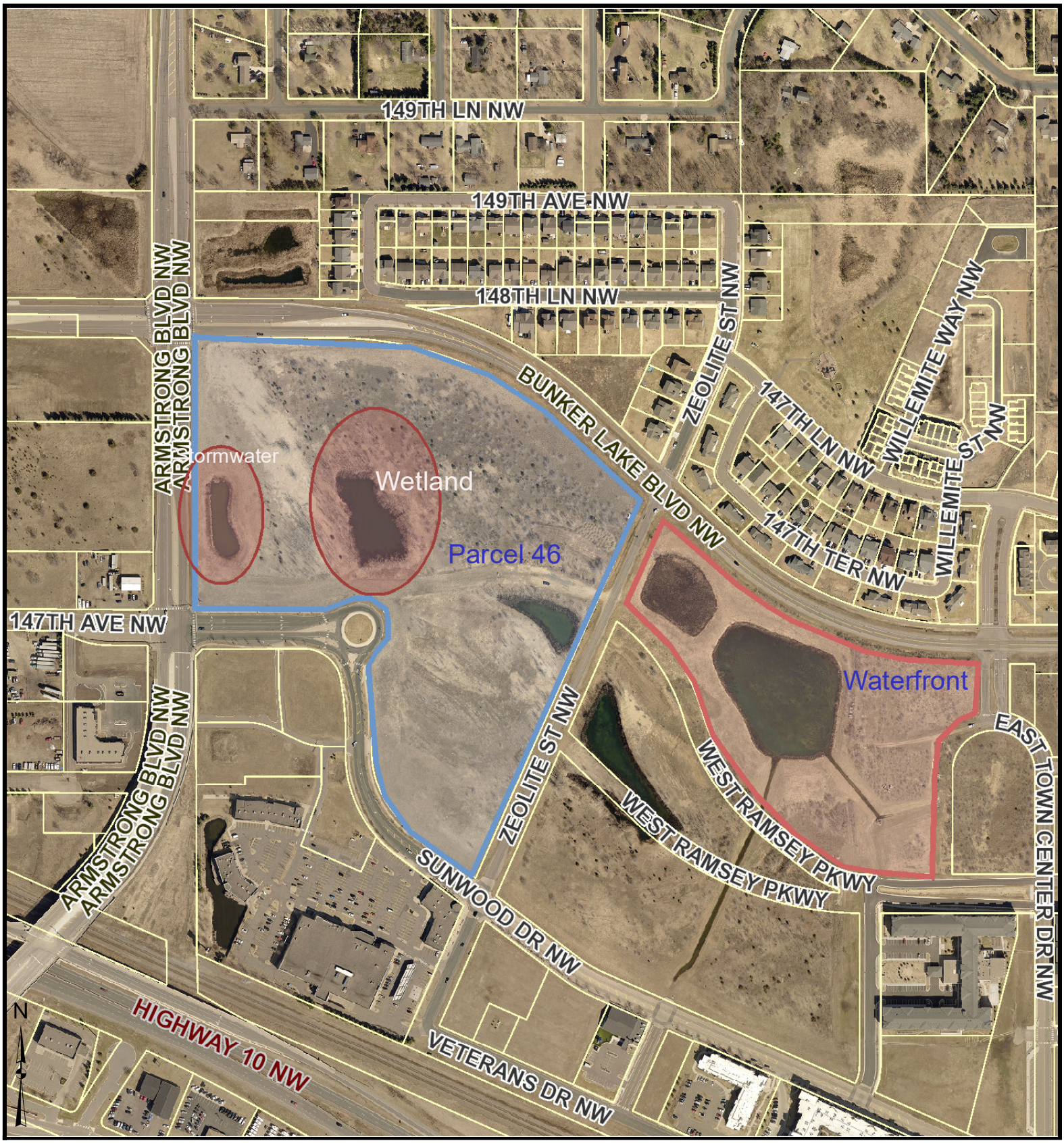
Attachments

Site Location Map
ACTION - COR Infrastructure Analysis
ACTION - COR Wetland Analysis

Form Review

Inbox	Reviewed By	Date
Sean Sullivan (Originator)	Sean Sullivan	09/29/2022 04:22 PM
Bruce Westby	Bruce Westby	09/30/2022 09:22 AM
Sean Sullivan (Originator)	Sean Sullivan	09/30/2022 10:03 AM
Brian Hagen	Brian Hagen	10/06/2022 02:40 PM
Form Started By: Sean Sullivan		Started On: 09/29/2022 02:46 PM
Final Approval Date: 10/06/2022		

Site Location Map (Parcel 46 /Waterfront)



Parcel Information:
28-32-25-12-0008
7446 149TH AVE NW
RAMSEY
MN 55303
Plat: PINEVIEW ESTATES 2ND ADDITION

Approx. Acres: 2.35
Commissioner: MATT LOOK

Owner Information:

Sean Sullivan | 1:4,800 | Date: 1/12/2022

Disclaimer: Map and parcel data are believed to be accurate, but accuracy is not guaranteed. This is not a legal document and should not be substituted for a title search, appraisal, survey, or for zoning verification.

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7533 Sunwood Drive NW
Suite 206
Ramsey, MN 55303-5119

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Fax: (763) 427-0833
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September 26, 2022

Mr. Bruce Westby, P.E.
City Engineer/Interim Public Works Director
City of Ramsey
7550 Sunwood Drive NW
Ramsey, Minnesota 55303

RE: City of Ramsey - The COR – Public Infrastructure Analysis

Dear Mr. Westby:

In response to our recent meeting related to The COR, we have prepared a scope of services and fee estimate for analysis associated with public infrastructure for the following improvements:

- Ramsey Parkway from Willemite Street to Sunwood Drive (Roundabout),
- Zeolite Street from Sunwood Drive to Bunker Lake Boulevard,
- Yolite Street from Sunwood Drive to Ramsey Parkway,
- Center Street Realignment,
- Veterans Drive between Rhinestone Street and Ramsey Boulevard,
- The Waterfront Pond and Park Area,
- Filling of stormwater ponds in the southeast quadrant of the Bunker Lake Boulevard and Armstrong Boulevard intersection, and
- Filling of a wetland in the southeast quadrant of the Bunker Lake Boulevard and Armstrong Boulevard intersection.

We will draw from the initial concepts and strategies that were detailed in the Center Street report and The COR report. Our proposal is based upon carrying these concepts and principals forward into the new analysis, with an updated project cost estimate for the work. Each street segment analyzed will include public utilities (sanitary sewer and water main), along with storm sewer, trails and sidewalks.

The material generated from the regional storm water retention pond can be used as fill for the remaining undeveloped portion of The COR. We will analyze the amounts of fill required for each lot and will make estimates for how much material will be generated from excavation of the Waterfront.

See attached figure for the general area of the analysis.

CONSTRUCTION COST ESTIMATES

Previous analyses presented project costs associated with the street and public utility related improvements. Those amounts were based on 2018 construction costs, and included a 30 percent allowance for contingencies and project development. No costs were included in The COR report for the Waterfront. Based on conversations with the City, the work will most likely consist of the following:

Bolton & Menk is an equal opportunity employer.

- Clear and grub the area of The COR bounded by Sunwood Drive, Bunker Lake Boulevard, Armstrong Boulevard and Center Street,
- Strip off topsoil for the above area and stockpile the material,
- Dewater the area to allow for deep excavations to occur,
- Excavate the pond, placing the material in locations identified within The COR,
- Place a 2 ft thick clay liner in the pond from the bottom up to the normal water level,
- Fine grade the area of the regional stormwater retention pond, and
- Revegetate all areas disturbed by construction.

We will provide construction cost estimates associated with the improvements.

SCOPE OF SERVICES

Our anticipated scope of services will be as follows:

- Complete a drone flight of the area to provide a current aerial image of the area. The drone flight will provide a level of accuracy of 0.1 ft horizontal and 0.3 ft vertical. This will allow for accurate estimations of excavations and fill volumes required to construct the Waterfront and move the material to adjacent lots within The COR area.
- Update the stormwater model to analyze elevations within the Waterfront and impacts associated with filling existing stormwater ponds across The COR.
- Analyze the potential for filling the wetland that was created in the southeast quadrant of Bunker Lake Boulevard and Armstrong Boulevard. This will be completed under a separate contract and the results will be discussed in the updated report.
- Analyze previous report assumptions and update proposed horizontal and vertical elevations associated with the roadways and public utilities within The COR area. Develop current construction cost estimates based on the analysis.
- Prepare a report detailing the findings of our analyses. This will likely be in the form of an update to previously prepared reports.

No geotechnical analysis will be performed for the project, although previous soil borings completed for the area will be reviewed.

SUMMARY OF FEES

We have prepared preliminary fee estimates based on our understanding of the work to be performed. We estimate fees will be as presented below:

Task	Fees
Drone Flight	$ 2,880.00
Stormwater Analysis	$ 7,200.00
Roadway and Public Utility Analysis	$ 9,680.00
Report preparation, Including Figures	$ 4,420.00
Not-To-Exceed Fees	**$24,180.00**

The fees in the above table represent not-to-exceed costs based on the scope present above.

If there are any questions or concerns, please call me at (651) 968-7760.

Sincerely,

Bolton & Menk, Inc.

Kevin P. Kielb, P.E.
Project Manager

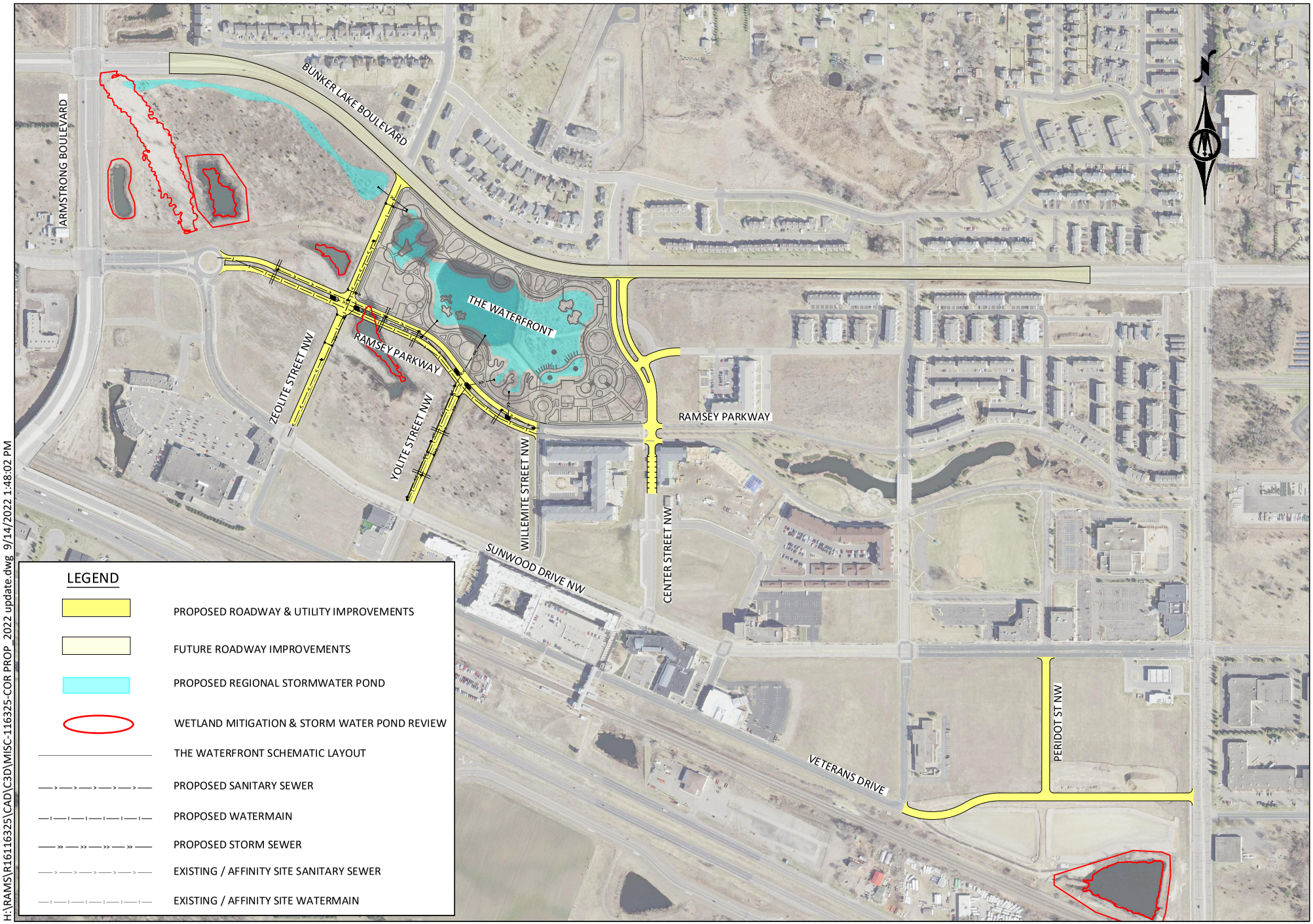
Attachment: Area of Analysis

2022 COR PUBLIC INFRASTRUCTURE ANALYSIS

CITY OF RAMSEY, MINNESOTA

IMPROVEMENT AREAS

AUGUST 2022



H:\RAMS\R16116325\CAD\C3D\MISC-116325-COR PROP_2022 update.dwg, 9/14/2022 1:48:02 PM

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September 22, 2022

Mr. Sean Sullivan, EDFP
Economic Development Manager
City of Ramsey
7550 Sunwood Drive NW
Ramsey, Minnesota 55303

RE: City of Ramsey - The COR – Wetland Analysis

Dear Mr. Sullivan:

Bolton & Menk, Inc. has prepared this proposal for natural resources related services for The COR area in Ramsey. We propose to investigate available background information needed prior to visiting the site. This includes compiling information as follows:

1. Available Aerial Photographs,
2. Anoka County LiDAR Maps,
3. National Wetlands Inventory Maps,
4. Anoka County Soil Survey Maps, and
5. MnDNR Public Waters Maps.

We are proposing to complete the following tasks as a portion of the project:

Task 1 – Level II Aquatic Resource Delineation: We will visit the study area to delineate the wetland boundaries within the COR area. The delineation will include performing transects and sampling in the vicinity of any aquatic resources, placing 3-foot pin flags at the limits of any aquatic resources found. Our delineator will use a sub-meter GPS unit to accurately locate and map each point and prepare a written report of our findings. This report will be submitted to the appropriate agencies for approval.

Task 2 – Historical Analysis: Bolton & Menk staff will review each delineated aquatic resource to determine their historical status. This will include reviewing historical imagery and mitigation plans. If the wetlands are found to be constructed within upland areas, then they will be considered incidental under the WCA and non-jurisdictional under section 401 of the Clean Water Act.

Task 3 – Meetings and Additional Requests: Reviewing agencies generally request additional information and/or an on-site meeting during the review process. Our attendance is typically requested at these meetings to discuss the acceptance of the delineated boundaries or to provide the agencies with additional information.

SUMMARY OF FEES

We have prepared preliminary fee estimates based on our understanding of the work to be performed. We estimate fees will be as presented below:

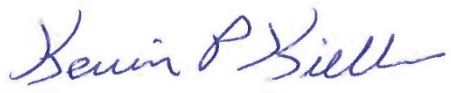
Task	Fees
Task 1 – Level II Aquatic Resource Delineation	$ 4,900.00
Task 2 – Historical Analysis	$ 1,800.00
Task 3 - Additional Requests & Meetings	$ 1,100.00
Not-To-Exceed Fees	**$ 7,800.00**

The fees in the above table represent not-to-exceed costs based on the scope present above.

If there are any questions or concerns, please call me at (651) 968-7760.

Sincerely,

Bolton & Menk, Inc.



Kevin P. Kielb, P.E.
Principal Engineer

Meeting Date: 10/25/2022
By: Sean Sullivan, Community Development

Information
Title:
Adopt Resolution #22-241 Authorizing COR Public Infrastructure and Wetland Analysis

Purpose/Background:
The purpose of this case is to consider a recommendation to complete COR infrastructure and wetland analysis.

On January 18, 2022 the Public Works Committee discussed the COR Site improvement and Infrastructure needs and asked staff to obtain cost estimates for the work. The EDA meeting in February 2022 and supported getting more information. Staff has not been able to complete the work in-house so Staff asked Bolton and Menk (they completed the previous COR infrastructure Study) to put together proposals to complete analysis and cost estimates on completing the following items:

• Ramsey Parkway from Willemite Street to Sunwood Drive (Roundabout)
• Zeolite Street from Sunwood Drive to Bunker Lake Boulevard,
• Yolite Street from Sunwood Drive to Ramsey Parkway,
• Center Street Realignment,
• Veterans Drive between Rhinestone Street and Ramsey Boulevard,
• The Waterfront Pond and Park Area,
• Filling of stormwater ponds in the southeast quadrant of the Bunker Lake Boulevard and Armstrong Boulevard intersection and related analysis
• Filling of wetlands in the southeast quadrant of the Bunker Lake Boulevard and Armstrong Boulevard intersection and related analysis.

Bolton and Menk has provided two proposals that cover the work needed to provide feasibility and costs of completing the work. Construction and contracting costs have changed significantly since the last time analysis was done in 2018. During initial investigation it has become apparent that the wetland analysis and delineation need to be completed to determine the feasibility of the wetland and stormwater pond relocation and coordinated excavation of The Waterfront to make Parcel 46 a developable lot by adding fill excavated from the future Waterfront to it. Bolton and Menk has completed the wetland delineation component due to the time of the year and ability to complete the delineation while vegetation is still identifiable. There is additional work and analysis that is included in the attached wetland proposal that is also underway. Many of these items are interrelated and should be coordinated to maximize efficiency to compete the work. Preliminary analysis of the delineated Wetlands indicates that there are four defined wetlands on site but more analysis is needed. Kevin Kielb provided information to the EDA regarding the process to buy wetland credits off-site and that more research was needed to identify the cost and ability to fill them.

Some of the items in the proposals (construction of streets, site improvements, cost of study) could be paid for in full, or in part by TIF District 14 or other TIF Districts that have eligible funds. In order to be able to fund these items out of TIF 14 the work needs to be completed or in process prior to November 2023. Based on this short time period, staff is suggesting that costs are quantified as soon as possible so that the City Council can determine which projects should move forward and how they can be funded most efficiently.

The work being proposed is consistent with the mission of the EDA by helping facilitate and to encourage quality development.

Notification:
N/A

Observations/Alternatives:
Financing options for improvements in the COR will become more limited after November 2023. According to the CIP, Zeolite Street is planned to be reconstructed in 2026 and to be funded by TIF District 2 but development pressure for Parcel 46 could likely move the need for reconstruction forward. Some costs, such as the excavation of the Waterfront basin to obtain fill for Parcel 46 is a TIF eligible expense and would need to occur before November 2023 to be included in the TIF 14 budget. Completion of the attached proposals is needed to determine the feasibility of projects and to identify costs so the projects can coordinated and be budgeted efficiently.

Alternatives:
1) Recommendation to City Council to authorize the Wetland and COR Infrastructure proposals utilizing TIF District (2,14) funds.
2) Recommendation to City Council to authorize the Wetland and COR Infrastructure proposals utilizing EDA funds.
3) Something else.

Funding Source:
To be determined. The proposals being consider by the City Council are TIF eligible expenses. It is likely that different facets of this project would be handled by different funding sources. Potential funding sources include:

- TIF 14, TIF 2
- Sewer and/or Water Fund
- Park Dedication / Trust Fund,
- PIR
- EDA
- Wetland bank

Recommendation:
The EDA met on October 13th and unanimously approved a recommendation to the City Council to authorize the Bolton and Menk Wetland and COR Infrastructure proposals utilizing TIF District (2, 14) funds.

Action:
Motion to Adopt Resolution #22-241 Authorizing COR Public Infrastructure and Wetland Analysis

Attachments

ACTION - Resolution #22-241
ACTION - COR Infrastructure Analysis
ACTION - COR Wetland Analysis
REFERNCE - Draft EDA Minutes 10-13-22

Form Review

Inbox	Reviewed By	Date
Sean Sullivan (Originator)	Sean Sullivan	10/18/2022 09:45 AM
Brian Hagen	Brian Hagen	10/20/2022 10:04 AM
Form Started By: Sean Sullivan		Started On: 10/14/2022 09:03 AM
Final Approval Date: 10/20/2022		

Councilmember _____ introduced the following resolution and moved for its adoption:

RESOLUTION #22-241

RESOLUTION AUTHORIZING COR PUBLIC INFRASTRUCTURE AND WETLAND ANALYSIS

WHEREAS, the City of Ramsey owns over 60 acres in the COR development and site improvements are needed to make many of the parcels developable; and

WHEREAS, the Bolton and Menk completed an Infrastructure Study for the COR in 2018 identifying costs for the construction of public infrastructure; and

WHEREAS, the current interest rate environment and inflation has increased the cost of public infrastructure and more information is needed relating to existing wetlands and the ability to fill them and construction of the Waterfront in the COR; and

WHEREAS, Bolton and Menk has provided two proposals to complete both the Wetland and Public Infrastructure Analysis in an amount not to exceed $31,980; and

WHEREAS, the Ramsey EDA met on October 13, 2022 and unanimously made a recommendation to the City Council to approve the Wetland and Infrastructure Analysis by Bolton and Menk and to fund it with TIF 14 or TIF 2.

NOW THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF RAMSEY, ANOKA COUNTY, STATE OF MINNESOTA, as follows:

1) That the City Council hereby authorizes completion of the COR Public Infrastructure and Wetland Analysis proposals from Bolton and Menk in an amount not to exceed $31,908.
2) That The City Council authorizes the funding source of the proposals to come from TIF District 14 and/or TIF District 2

The motion for the adoption of the foregoing resolution was duly seconded by Councilmember ____, and upon vote being taken thereon, the following voted in favor thereof:

and the following voted against the same:

and the following abstained:

and the following were absent:

Whereupon said resolution was declared duly passed and adopted by the Ramsey City Council this the 25th day of October, 2022.

_____
Mayor

ATTEST:

_____
City Clerk

BOLTON & MENK
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September 26, 2022

Mr. Bruce Westby, P.E.
City Engineer/Interim Public Works Director
City of Ramsey
7550 Sunwood Drive NW
Ramsey, Minnesota 55303

RE: City of Ramsey - The COR – Public Infrastructure Analysis

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See attached figure for the general area of the analysis.

CONSTRUCTION COST ESTIMATES

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- Prepare a report detailing the findings of our analyses. This will likely be in the form of an update to previously prepared reports.

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Bolton & Menk, Inc.

Kevin P. Kielb, P.E.
Project Manager

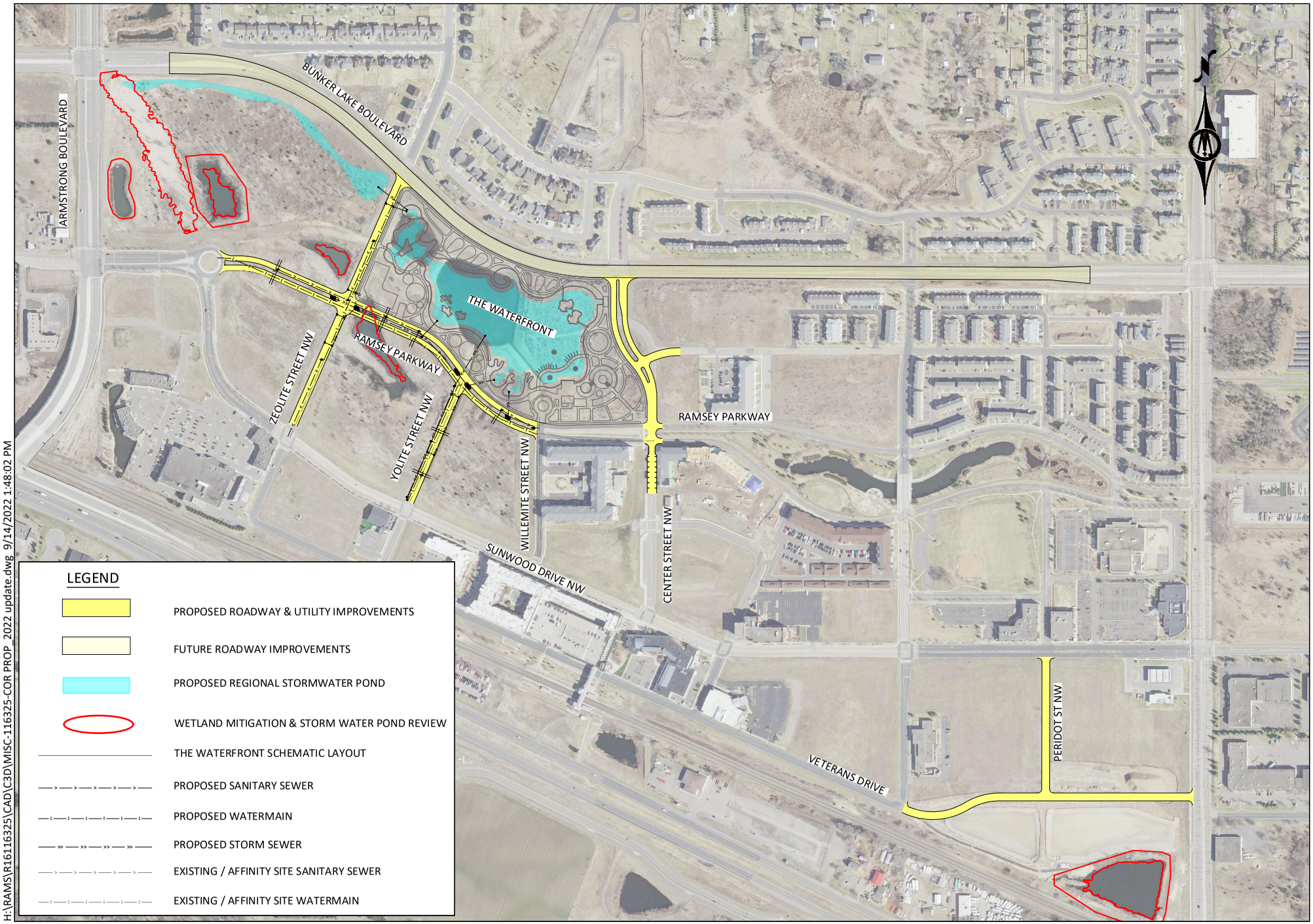
Attachment: Area of Analysis

2022 COR PUBLIC INFRASTRUCTURE ANALYSIS

CITY OF RAMSEY, MINNESOTA

IMPROVEMENT AREAS

AUGUST 2022



H:\RAMS\R16116325\CAD\C3D\MISC-116325-COR PROP_2022 update.dwg, 9/14/2022 1:48:02 PM

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September 22, 2022

Mr. Sean Sullivan, EDFP
Economic Development Manager
City of Ramsey
7550 Sunwood Drive NW
Ramsey, Minnesota 55303

RE: City of Ramsey - The COR – Wetland Analysis

Dear Mr. Sullivan:

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1. Available Aerial Photographs,
2. Anoka County LiDAR Maps,
3. National Wetlands Inventory Maps,
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We are proposing to complete the following tasks as a portion of the project:

Task 1 – Level II Aquatic Resource Delineation: We will visit the study area to delineate the wetland boundaries within the COR area. The delineation will include performing transects and sampling in the vicinity of any aquatic resources, placing 3-foot pin flags at the limits of any aquatic resources found. Our delineator will use a sub-meter GPS unit to accurately locate and map each point and prepare a written report of our findings. This report will be submitted to the appropriate agencies for approval.

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SUMMARY OF FEES

We have prepared preliminary fee estimates based on our understanding of the work to be performed. We estimate fees will be as presented below:

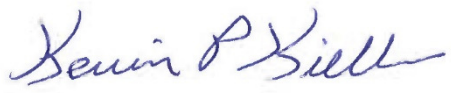
Task	Fees
Task 1 – Level II Aquatic Resource Delineation	$ 4,900.00
Task 2 – Historical Analysis	$ 1,800.00
Task 3 - Additional Requests & Meetings	$ 1,100.00
Not-To-Exceed Fees	**$ 7,800.00**

The fees in the above table represent not-to-exceed costs based on the scope present above.

If there are any questions or concerns, please call me at (651) 968-7760.

Sincerely,

Bolton & Menk, Inc.



Kevin P. Kielb, P.E.
Principal Engineer

ECONOMIC DEVELOPMENT AUTHORITY
CITY OF RAMSEY
ANOKA COUNTY
STATE OF MINNESOTA

The City of Ramsey Economic Development Authority (EDA) conducted a regular meeting on Thursday, October 13, 2022, at the Ramsey Municipal Center, 7550 Sunwood Drive NW, Ramsey, Minnesota.

Members Present:	Chairperson Michael Olson Member Chelsee Howell Member Rachal Johnson Member William MacLennan Member Chris Riley Member Shanna Stewart
Members Absent:	Member Scott Wiyninger
Also Present:	Sean Sullivan, Economic Development Manager

DRAFT

4. EDA BUSINESS

4.01: Request Recommendation to Complete COR Site Improvements, Infrastructure and Wetland Analysis

Economic Development Manager Sullivan presented the staff report.

Member Howell asked if task one has already been completed or whether there would be more work needed to complete that in addition to the delineation that was completed.

Economic Development Manager Sullivan replied that the delineation work in task one has been completed but more wetland analysis was yet to be done. He explained that in order to complete a delineation, the vegetation has to be growing and therefore that was completed during the appropriate season to ensure there would not be additional delay to complete the report.

Member Howell asked how these project costs would be recouped through development.

Economic Development Manager Sullivan replied that some of these costs have been identified in the CIP, such as Zeolite Street improvements. He stated that the other costs are able to be funded through TIF or could be schedule through the CIP or street improvement program. He stated that most of the costs, aside from building the waterfront park, are TIF eligible expenses. He explained that those costs could be spent now and reimbursed later if TIF is used. He stated that once the costs are better known, staff would present more specific options for funding. He noted that the study itself could be funded through TIF.

Member Stewart asked for clarification on purchasing wetland somewhere else.

Economic Development Manager Sullivan replied that in the past if you filled a wetland there were a few options in that you could create additional wetlands onsite, you could purchase wetland credits, or purchase wetlands offsite.

Member Stewart asked where the new wetlands would be purchased and whether that would be somewhere the City does not want to develop in the future.

Kevin Kielb, Bolton & Menk, stated that people establish wetlands in certain watersheds and areas in the state. These wetlands are "certified and banked" and are available for purchase to offset other wetlands that are filled in. He noted that other parties can then purchase the credits from that bank to offset their wetland impacts. He provided additional details on the process for the creation of wetland credits. He provided some general estimates of the cost for wetland credits, noting that price fluctuates depending on availability and geographic location. He stated that thus far they have delineated the wetlands in the COR and they are researching where wetlands have been moved or created. He explained that if one acre of wetlands is disturbed, two acres would need to be replaced. He reviewed some of the additional details that would be within the report that will help to eliminate hidden costs.

Chairperson Olson asked if the wetland credits would be local.

Mr. Kielb replied that the credits would need to be within a reasonable watershed, noting that he was unsure of the exact boundaries but advising that it would be within the regional area.

Member Johnson recognized that there would be a water feature in The COR and asked if there is a plan to have more wetlands or water features within that area.

Economic Development Manager Sullivan replied that the areas marked in red are anticipated to be filled to create more buildable area within The COR. He stated that once they have the costs known, they would determine if that is a cost the City would want to bear. He stated that the City could then choose whether that cost is rolled into the land price or split between the City and future development. He stated that staff believes that there will be an economy of scale in using the dirt from the excavation of the waterfront area to fill the desired areas.

Member Riley commented that this would seem to be follow up to the decision the EDA made in February. He stated that the work has not been able to be done inhouse and therefore this action would contract that work out.

Economic Development Manager Sullivan confirmed that to be true and noted that the intention was to keep the EDA informed in the process. He recognized that there may be more cost than originally anticipated due to wetland replacement and that will be flushed out through this study.

DRAFT

Member Riley stated that his other question was whether this would be the right time to complete this work but acknowledged that the TIF funds are available now and the work would need to be done prior to November of 2023 if that funding is going to be used.

Motion by Member Stewart, seconded by Member MacLennan, to recommend to City Council to authorize the Wetland and COR Infrastructure proposals utilizing TIF District (2, 14) funds.

Motion carried. Voting Yes: Chairperson Olson, Members Stewart, MacLennan, Howell, Johnson, and Riley. Voting No: None. Absent: Member Wiyninger.

6. ADJOURNMENT

Motion by Member MacLennan, seconded by Member Stewart, to adjourn the meeting.

Motion carried. Voting Yes: Chairperson Olson, Members MacLennan, Stewart, Howell, Johnson, and Riley. Voting No: None. Absent: Member Wiyninger.

The regular meeting of the Economic Development Authority adjourned at 8:05 a.m.

Respectfully submitted,

_____
Sean Sullivan
Economic Development Manager

ATTEST:

_____
Wendy Schlueter
Economic Development Administrative Assistant

Draft by Amanda Staple
TimeSaver Off Site Secretarial, Inc.

DRAFT

Information
Title:
The Waterfront - Status of Community Building/Splash Pad Planning and COR Study Update

Purpose/Background:
The Waterfront
The community and city leadership have been engaged in planning and envisioning [and building] a vibrant, successful downtown in Ramsey for two decades. The Draw park & amphitheater was completed in 2010 and has been proven to be a popular and valued resource for residents throughout the city—and at the same time, public investments in parks (and other infrastructure) have increased adjacent land values, with favorable private development following. West of The COR as an example, Pearson Park helped facilitate the Riverstone Development to rapidly build-out with its residential product. Within The COR, PACT Charter School was built following the commitment of the city to construct the athletic field there. Townhomes continue to be desirable near The Draw—and Greenway Terrace was named after the planned-for greenway connecting the downtown parks to the rest of Ramsey via trails. And, even though PSD Land Development had developable property in the downtown, it purchased land from the city and built a highly successful market rate apartment named Parkside Village, over-looking The Draw. Additionally, the 55+ Affinity building (at a present occupancy of 93% or full by industry standards), purchased their property from the city only upon the promise that the park plans for The COR would be fulfilled. The above examples, demonstrate that public investments in quality parks and trails help facilitate many valuable returns, including tens-of-millions in private investments in the community, development fees paid, and ongoing property tax revenue to take care of trails and park facilities.

At the joint City Council, Planning Commission and Economic Development Authority meeting this Spring, discussion included strategies for ensuring that the city may successfully complete the ambitious project of developing Ramsey's downtown *and* selling city-owned land at the same time. There appeared to be unanimous consensus that investments in infrastructure and grading of the NW Quadrant in The COR, to include excavation of The Waterfront for fill—along with advancing park development—all should be investigated together for obvious synergies and for the value the park development would have for the community at large, as well as for the sale and development of land in the NW Quadrant (known as Parcel #46).

Following the aforementioned joint meeting, the Economic Development Authority recommended approval of The COR – Public Infrastructure Analysis which is anticipated to be completed in the coming weeks with the findings to be presented to the EDA and City Council for direction and next steps (which is expected to occur in January 2023). Concurrent with this study, staff began work with an architectural firm to examine various aspects of the proposed community building at The Waterfront—to identify an array of options for the project, that would yield the maximum value to the community at-large for an investment of an appropriate scope.

Architect Gregory Houck, Principal at Cuningham will represent with staff, this preliminary work on how the park building could serve Ramsey residents and the community. Program elements at this juncture include a two-story indoor playground and climbing wall, fitness area and locker/restrooms, concessions, and restaurant with outdoor seating and attendant lawn games. The proposed second floor would have a rooftop patio with banquet space to rent for large events as well as a community room. Additional information will be available

at the work session, and based upon a consensus to proceed, more 'proof-of-concept' and preliminary cost estimates will be developed for subsequent Council consideration.

COR and Wetland Study Update
Bolton and Menk is nearing completion of the Wetland delineations and approval of those delineations by the WMO and COR infrastructure/site preparation studies. These studies will set the baseline information for options and cost relating to the installation of remaining infrastructure in the COR, These studies will also include information that will assist in development of The Waterfront park, the potential filling of wetlands for site preparation for Parcel 46 and other parcels in the COR. Staff anticipates that the findings of these studies will be presented in a future work session in January or February.

Timeframe:
Background and planning on The Waterfront's proposed community building: 10-15 minutes
Discussion and inquiries on the park's planning process and timeline: 5 minutes
Status of The COR – Public Infrastructure Analysis: <5 minutes

Total Timeframe: 20 minutes

Funding Source:
Park planning work is being performed by staff and consultants funded by the 2022 General Fund parks operating budget.

The COR – Public Infrastructure Analysis is being performed by consultants and funded by TIF District 14 and/or District 2.

Responsible Party(ies):
Mark Riverblood will provide a very brief introduction and background on The Waterfront project, and architect Greg Houck will present preliminary design of the proposed park building, together with a description of its utility and feasibility.

Sean Sullivan will be available to address the wetland delineation/mitigation process (an element of the attached COR – Public Infrastructure Analysis and Wetland Delineation scope of work) and site preparation work required for Parcel #46 and other lands in the COR, if needed.

Bruce Westby will be available to address the status and next steps of The COR – Public Infrastructure Analysis, if needed.

Outcome:
This work session case is a brief report to Council on the potential of a community building and associated park elements proposed for The Waterfront. (A more in depth discussion on the park and The COR – Public Infrastructure Analysis is anticipated early in 2023.)

Attachments

2018 planning for The COR parks
community building site plan features
rendering of splash pad area
working model of community building
Architect portfolio
public infrastructure scope of work
Wetland scope of work

Form Review

Inbox	Reviewed By	Date
Sean Sullivan	Sean Sullivan	12/08/2022 09:20 AM
Mark Riverblood (Originator)	Mark Riverblood	12/08/2022 10:41 AM
Bruce Westby	Bruce Westby	12/08/2022 11:56 AM
Brian Hagen	Brian Hagen	12/08/2022 12:39 PM

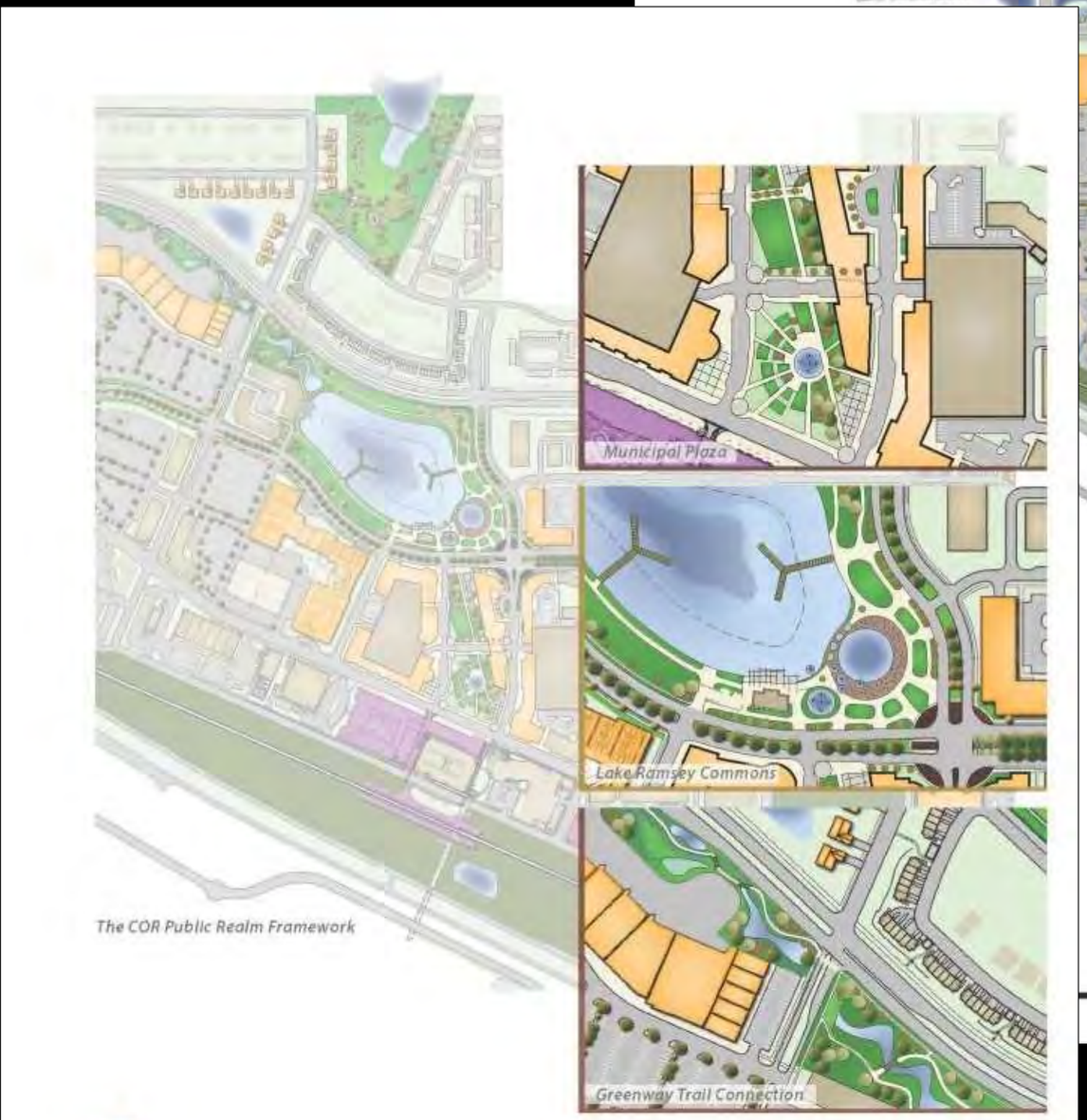
Form Started By: Mark Riverblood Started On: 11/23/2022 09:44 AM
Final Approval Date: 12/08/2022



The COR parks

Schematic Design Review

12 April 2018



The COR Parks + Public Places
City of Ramsey, Minnesota
Public Realm Framework + Cost Evaluation
December 2015



THE COR
RAMSEY, MINNESOTA

DEVELOPMENT STATUS
- EXISTING DEVELOPMENT
- PROPOSED DEVELOPMENT
- ACTIVE DEALS
- UNDER CONTRACT
- COMPLETED

ACCESS
- EXISTING SIGNALIZED INTERSECTION
- FUTURE SIGNALIZED INTERSECTION
- F — FULL INTERSECTION
- 3/4 — NO LEFT OUTBOUND MOVEMENTS
- P — PARKING RAMP

TRAFFIC INFORMATION

ADT INFORMATION TAKEN FROM 2009 ACTUAL COUNTS AND 2030 PROJECTED VOLUMES

NORTH 0 300 600

LANDFORM

DEVELOPMENT PLAN 6.0

05.15.2012



2 The Waterfront

Affinity Development

1 Municipal Plaza

Ramsey City Hall

RAMSEY COR – PARK SYSTEM COMPONENTS







1
Municipal Plaza

RAMSEY COR – PARK SYSTEM COMPONENTS



1
Municipal Plaza

RAMSEY COR – PARK SYSTEM COMPONENTS



Forest walk, conncetion to lake Ramsey



Woonerf, & commercial edge



Fountain, iconic tree, & Open field



Entryway



1
Municipal Plaza


EAST RAI
CENTER STREET
145TH A
W
E
S


lite
lite






EAST RA
CENTER STREET
145TH A








EAST RAI
CENTER STREET
145TH A





the promenade



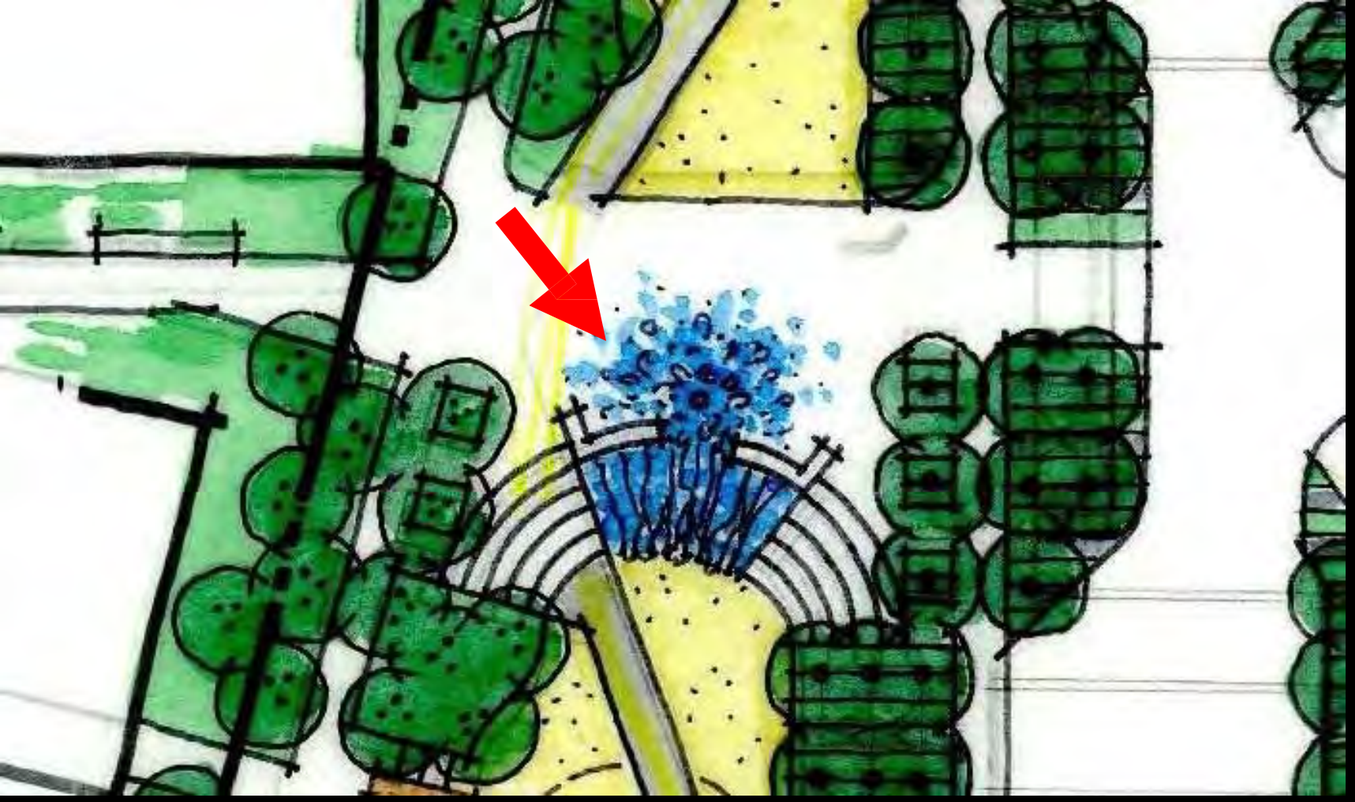


serpentine stone wall

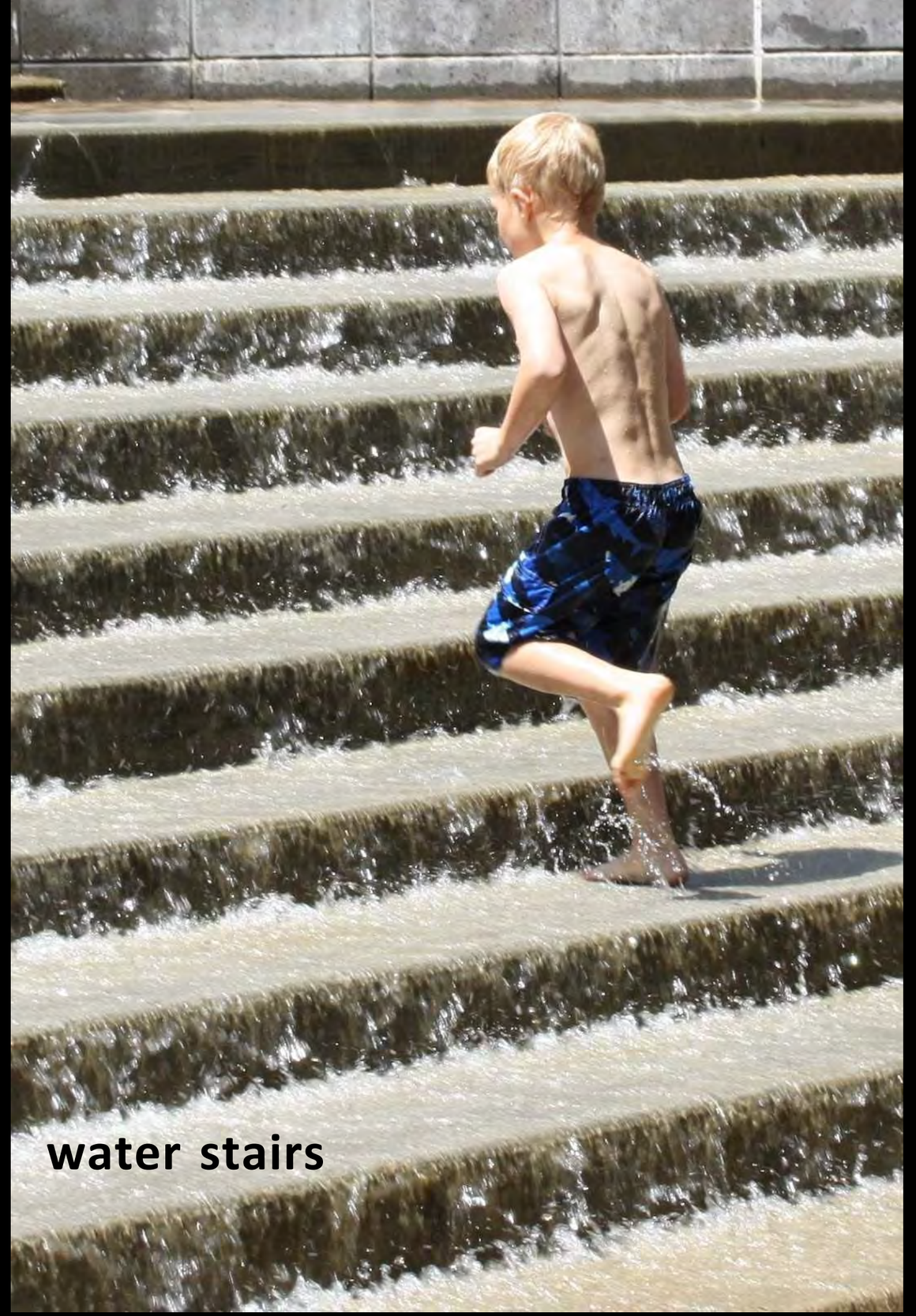


forest trail









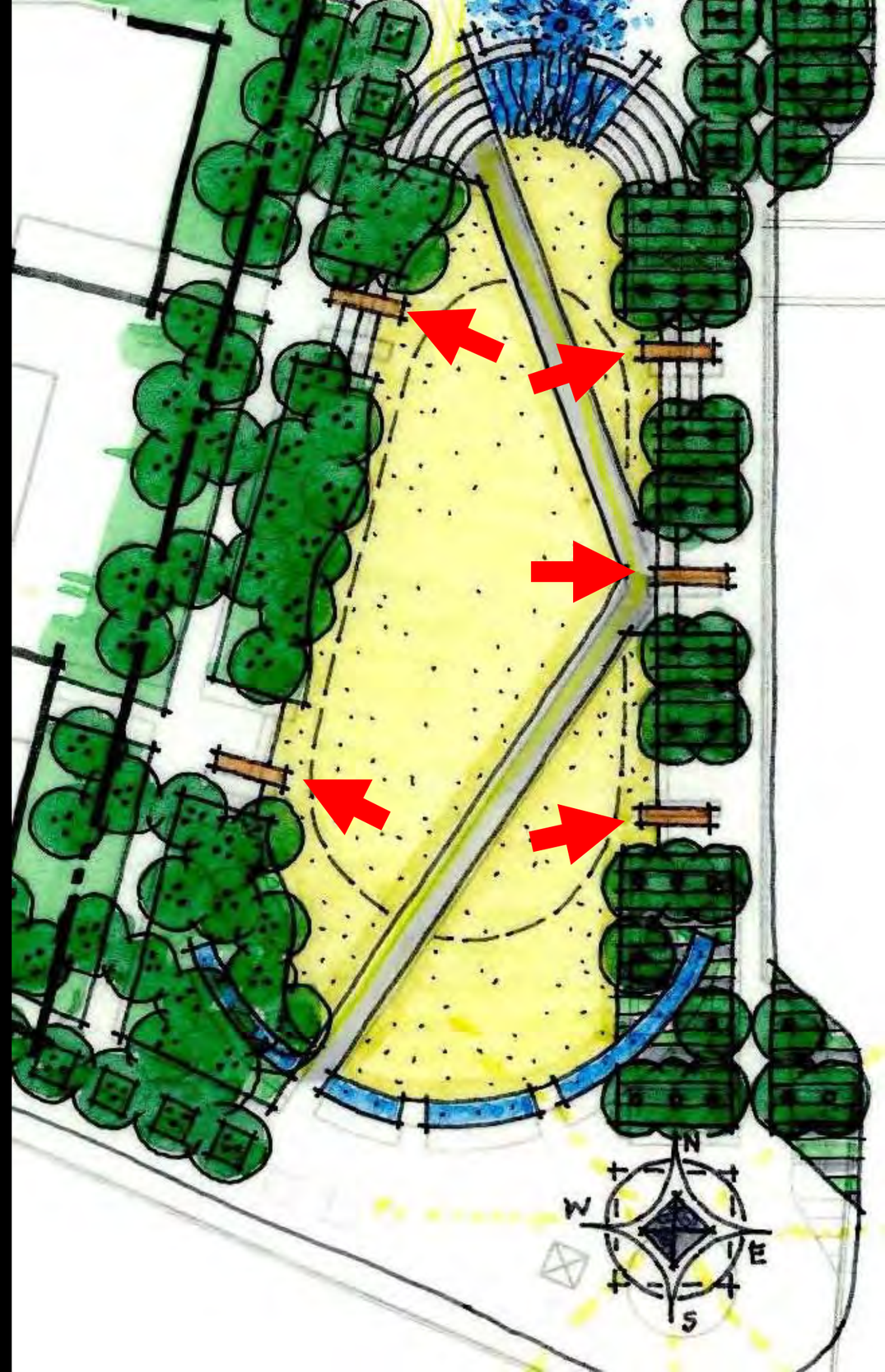
water stairs

ribbon fountain

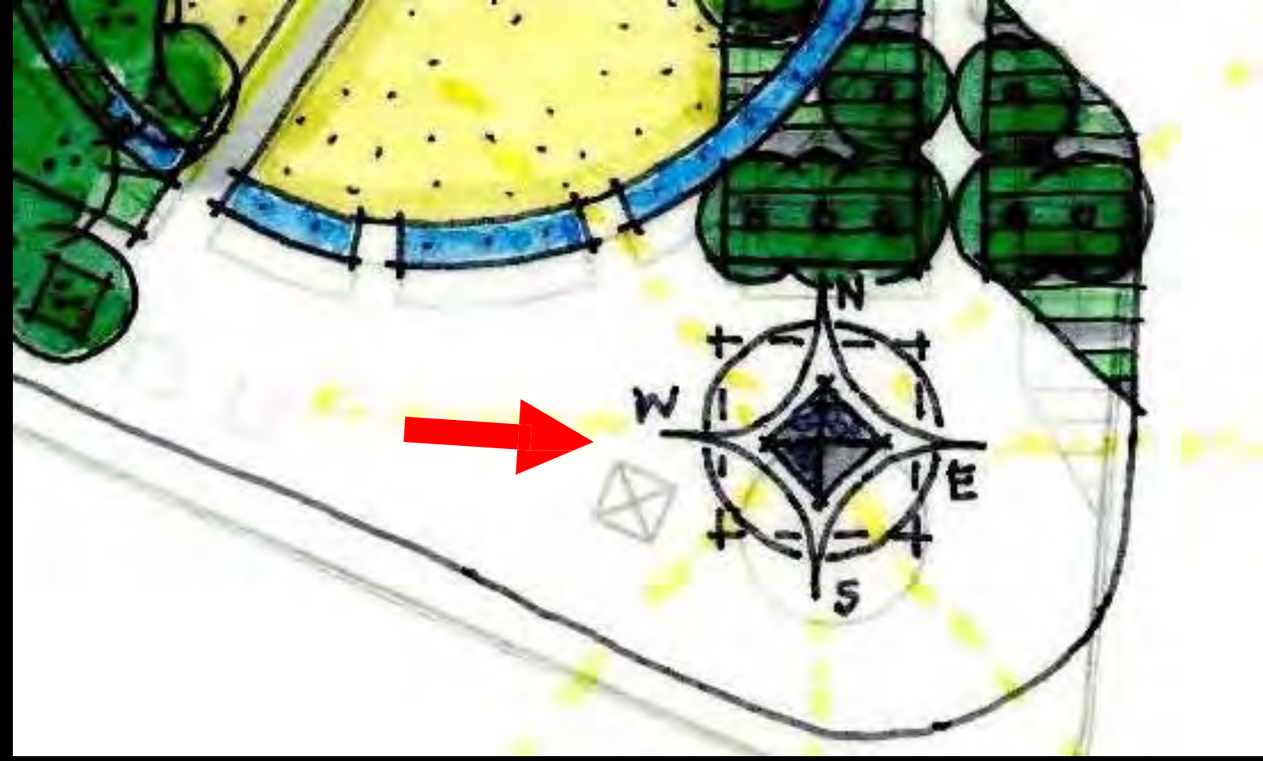




outdoor (gas) hearth




MISSISSIPPI
MINNEHAHA
MINNESOTA
VERMILLION
CANNON


N
W
E
S

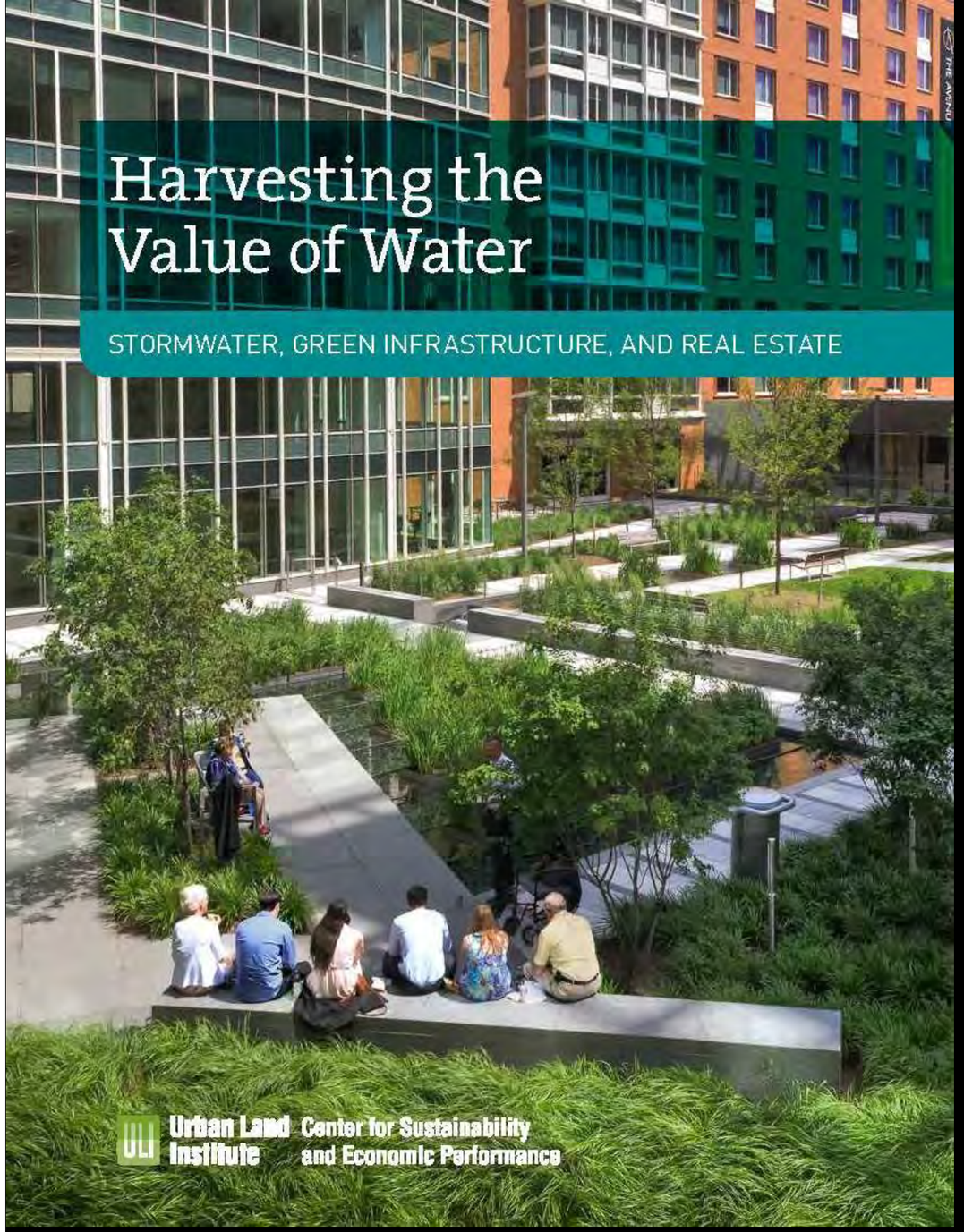



Whitmore Square /
Iparrityi

wayfinding

Harvesting the Value of Water

STORMWATER, GREEN INFRASTRUCTURE, AND REAL ESTATE



Urban Land Institute Center for Sustainability and Economic Performance



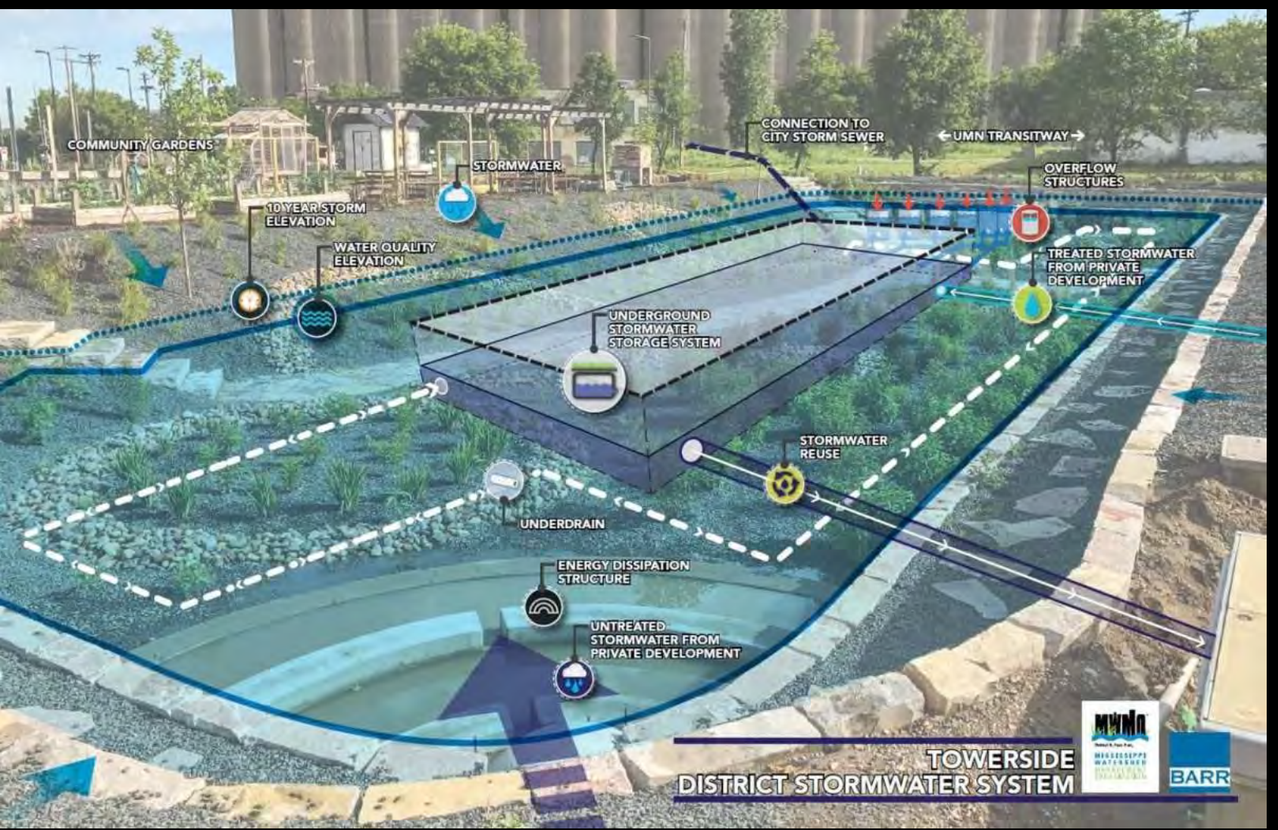


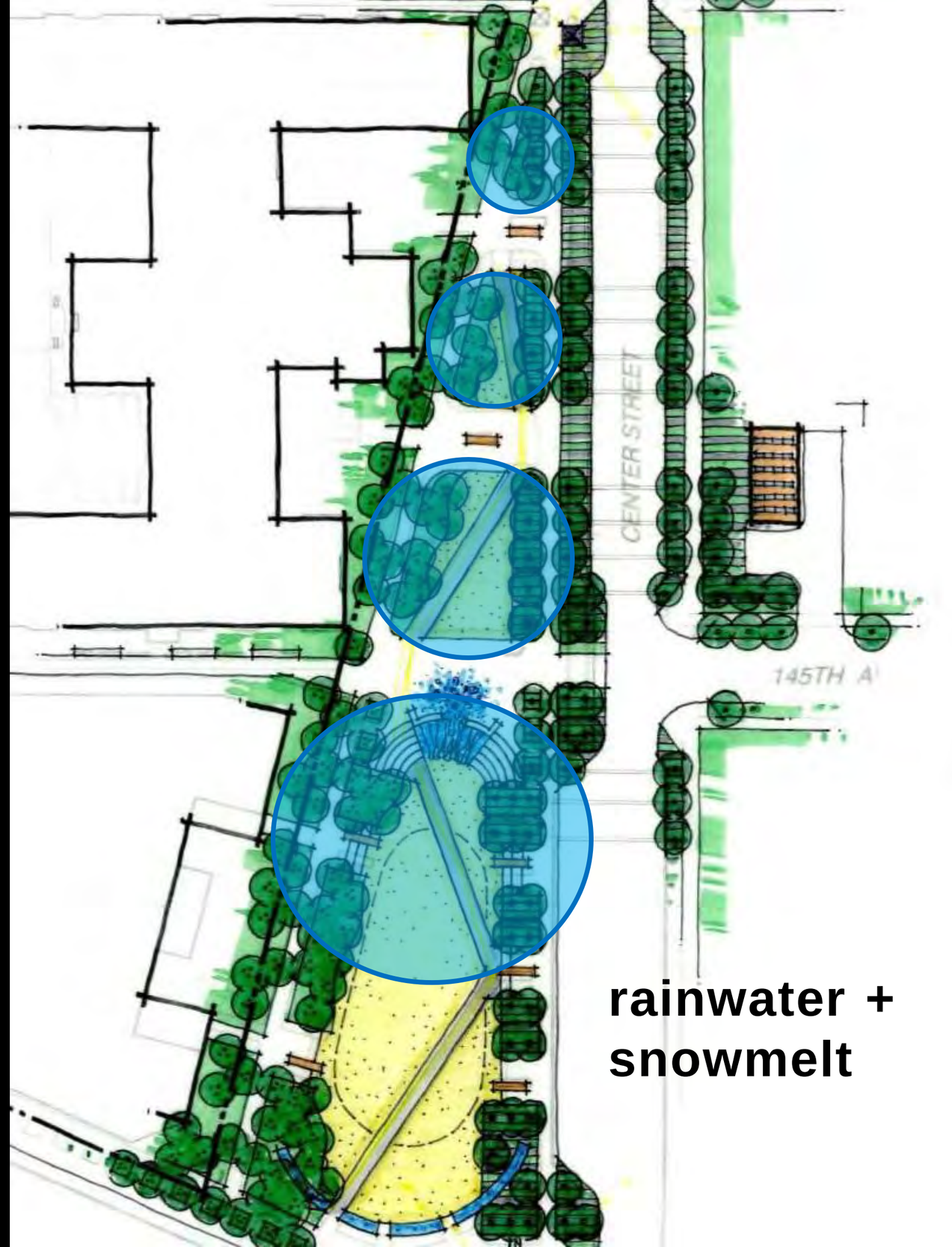
green infrastructure

PARK AND POND



IN MINNEAPOLIS, A DISTRICT-SCALE STORMWATER SYSTEM DOUBLES AS PUBLIC SPACE.





RAMSEY COR – PARK SYSTEM COMPONENTS



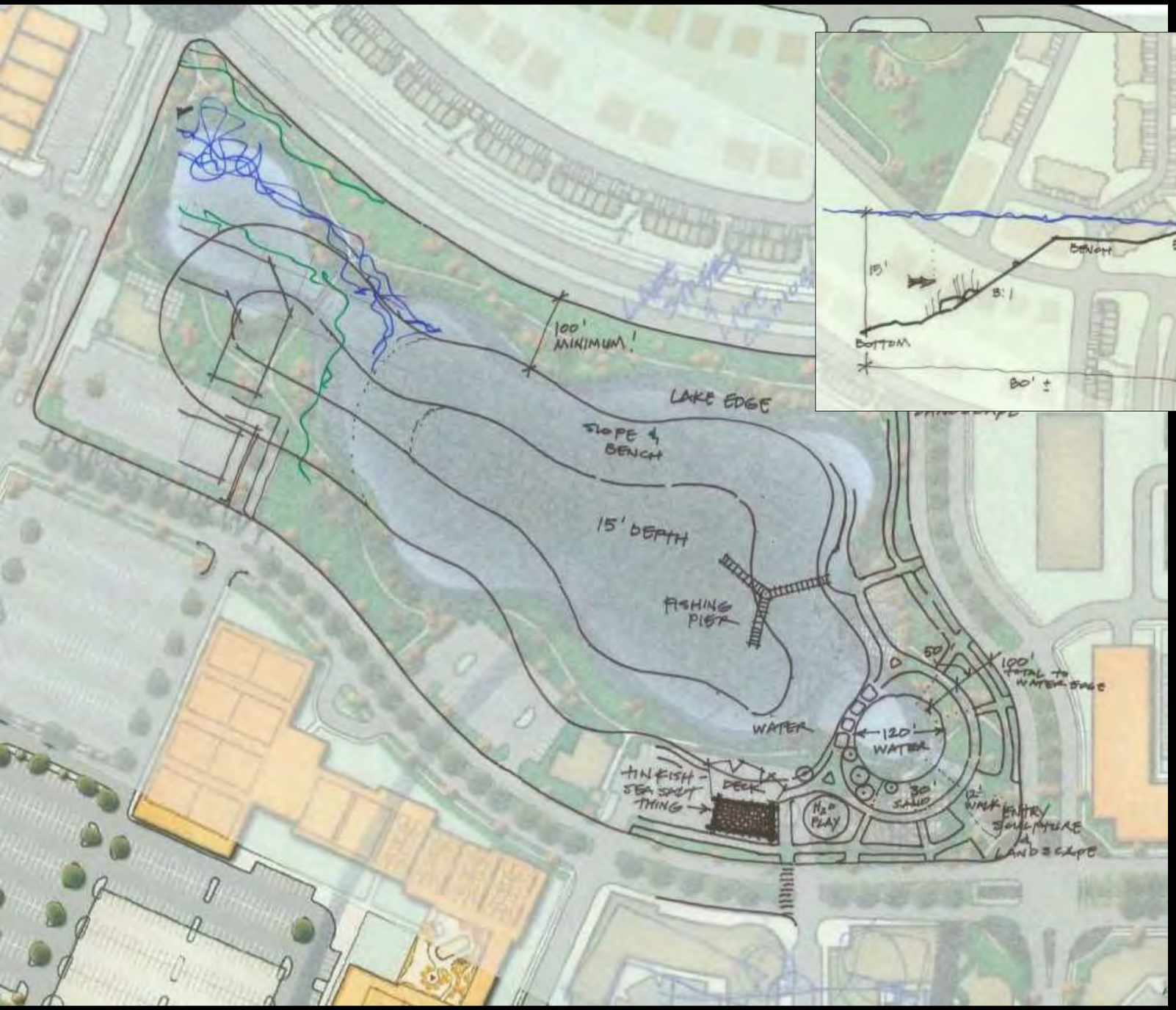
concept idea – street + plaza + connections

1
Municipal Plaza

shared street

145TH

RAMSEY COR – PARK SYSTEM COMPONENTS





program sketch study

2
The Waterfront

RAMSEY COR – PARK SYSTEM COMPONENTS

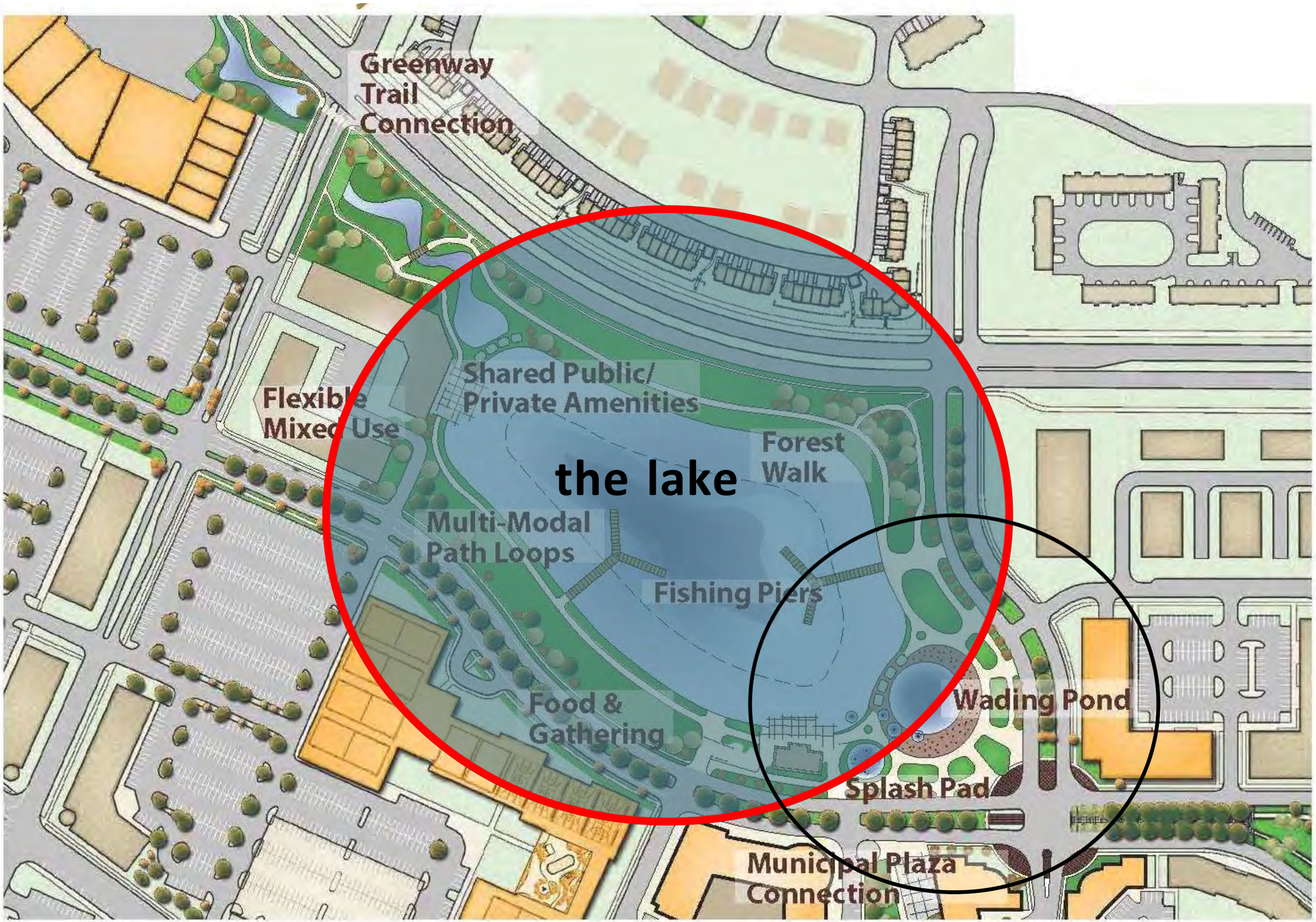


concept plan

2

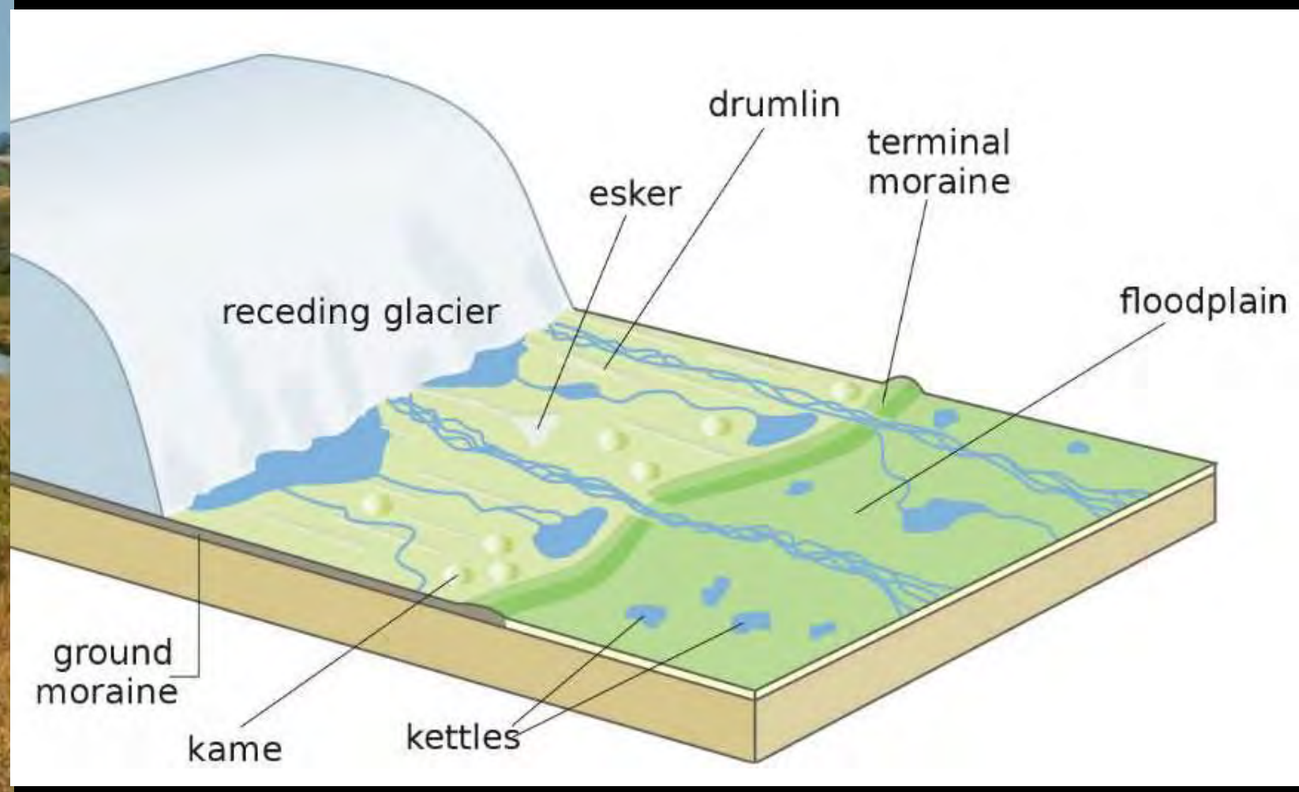
The Waterfront)

The Waterfront



Lake Ramsey Commons Plan (Jacobson/LHB 2015)

The Glacier Did It

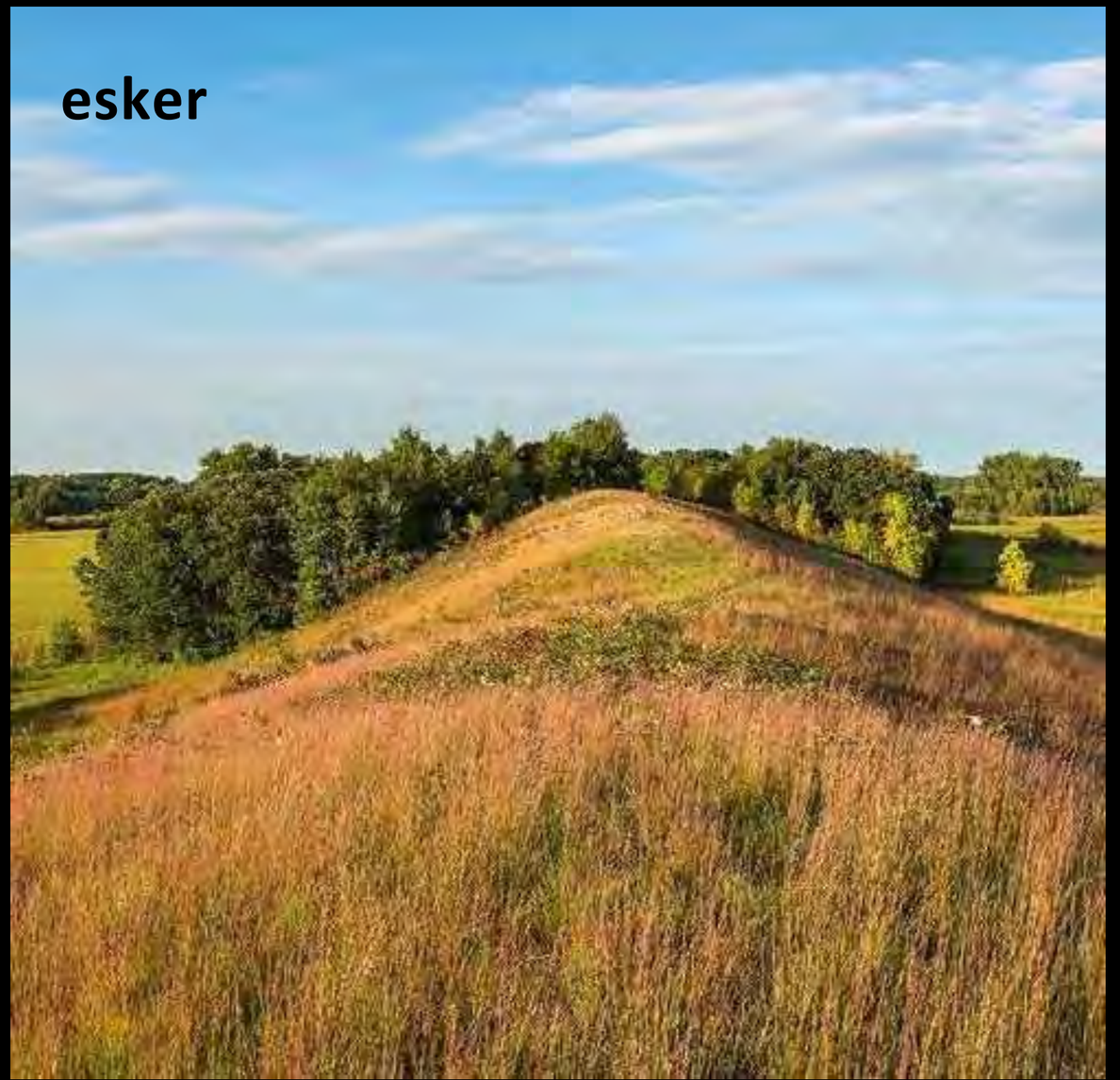


geologic history

kettle lake



esker



kames



erratic



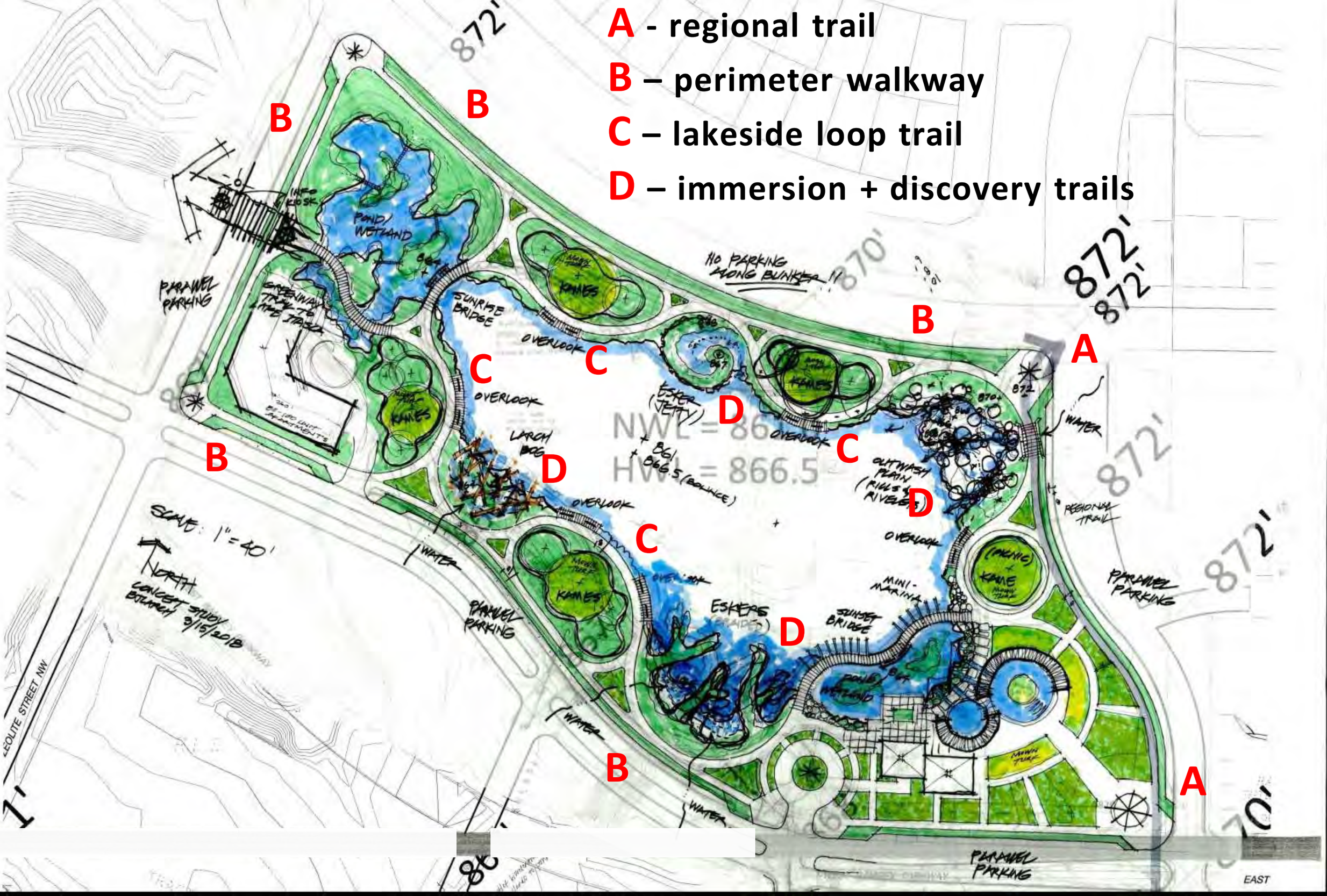
drumlin

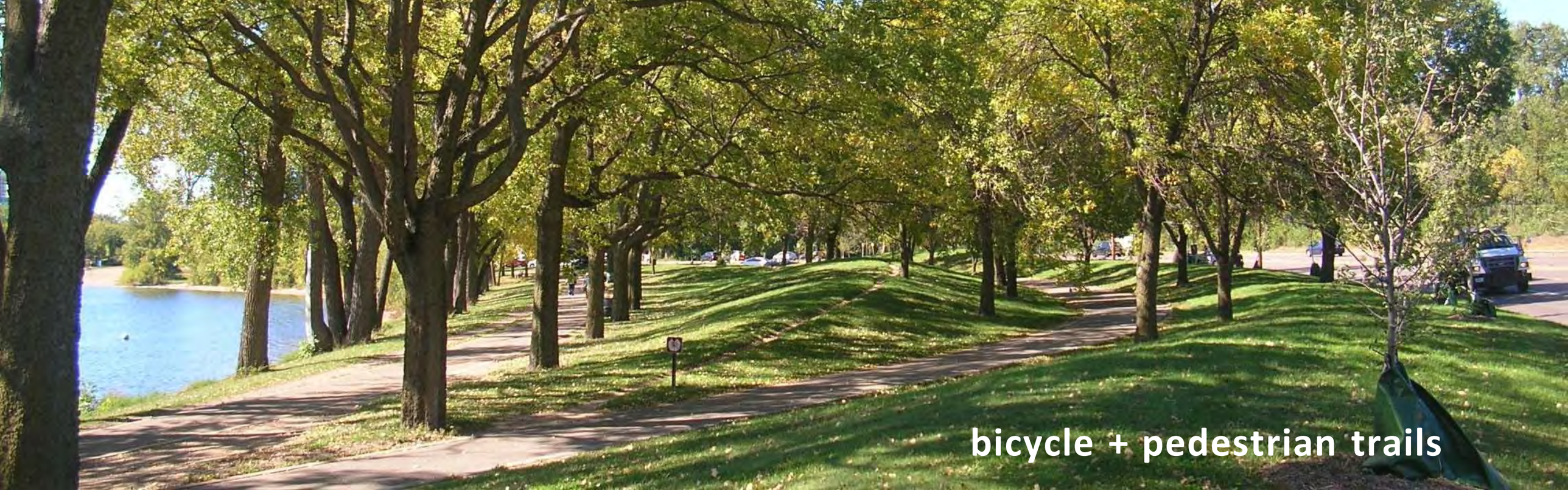
A - regional trail

B – perimeter walkway

C – lakeside loop trail

D – immersion + discovery trails



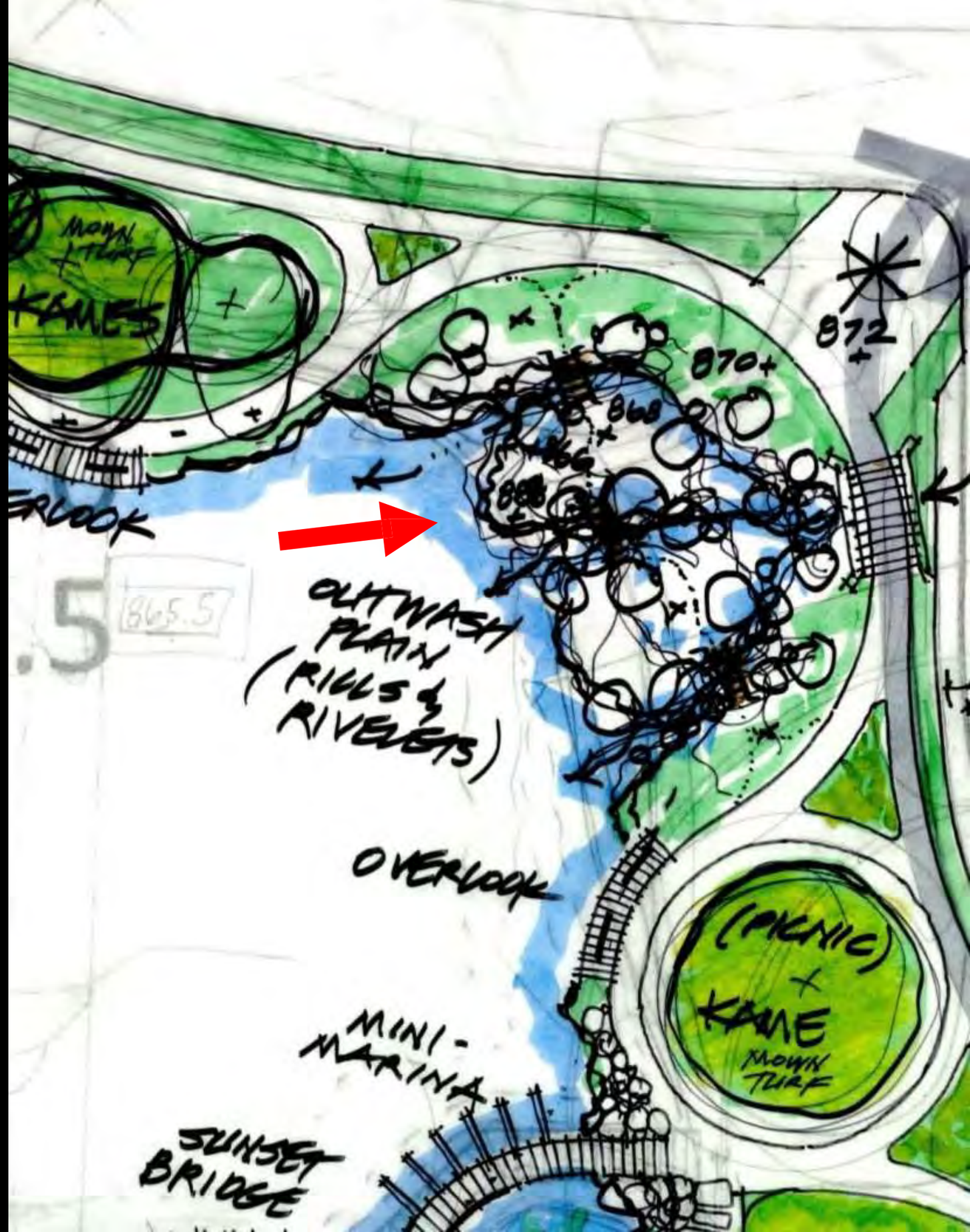

bicycle + pedestrian trails



boulder hopping



outwash plain




larch bog




SUNRISE
BRIDGE
OVERLOOK
OVERLOOK
LARCH
BOG
WATER
MOWN TURF
+
KAMES


esker


erratic


kame


OVERLOOK
MOWN TURF
+
KAMES
OVERLOOK
ESKERS
(BRAIDED)
WINTER






NO PARKING ALONG BUNKER
870'
SUNRISE BRIDGE
OVERLOOK
KAMES
sunrise bridge
ESKER (JETTY)
NWL = 86
HWL = 866.5
LARCH BOG
OUTWASH PLAIN (RIDGES & RIVERBEDS)
sunset bridge
WATER
PARKING
ESKERS
MINI-MARINA
SUNSET BRIDGE

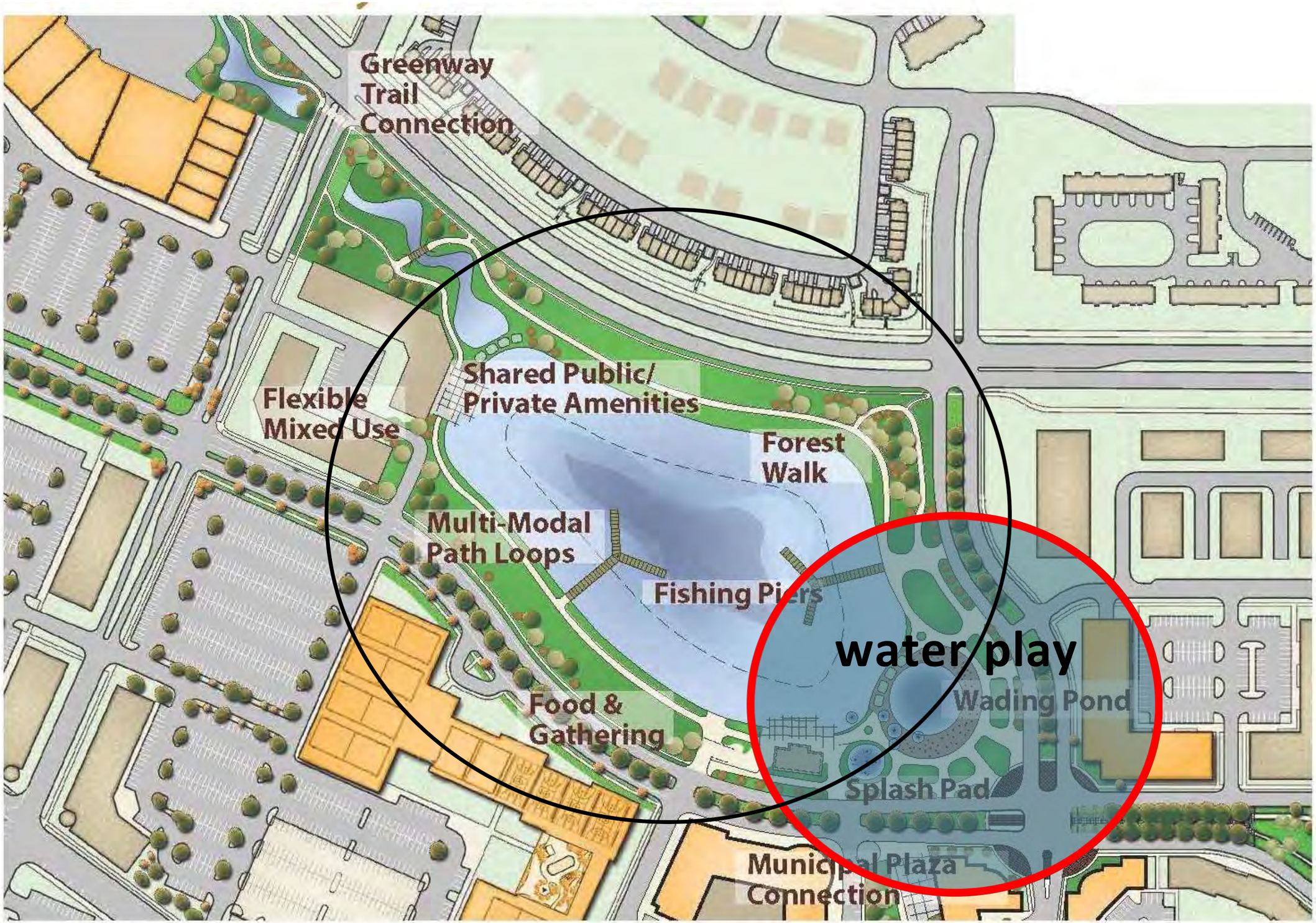




directed rainwater + snowmelt

habitat restoration

The Waterfront



Lake Ramsey Commons Plan (Jacobson/LHB 2015)

A – picnic mound

B – wading pond

C – splash pad

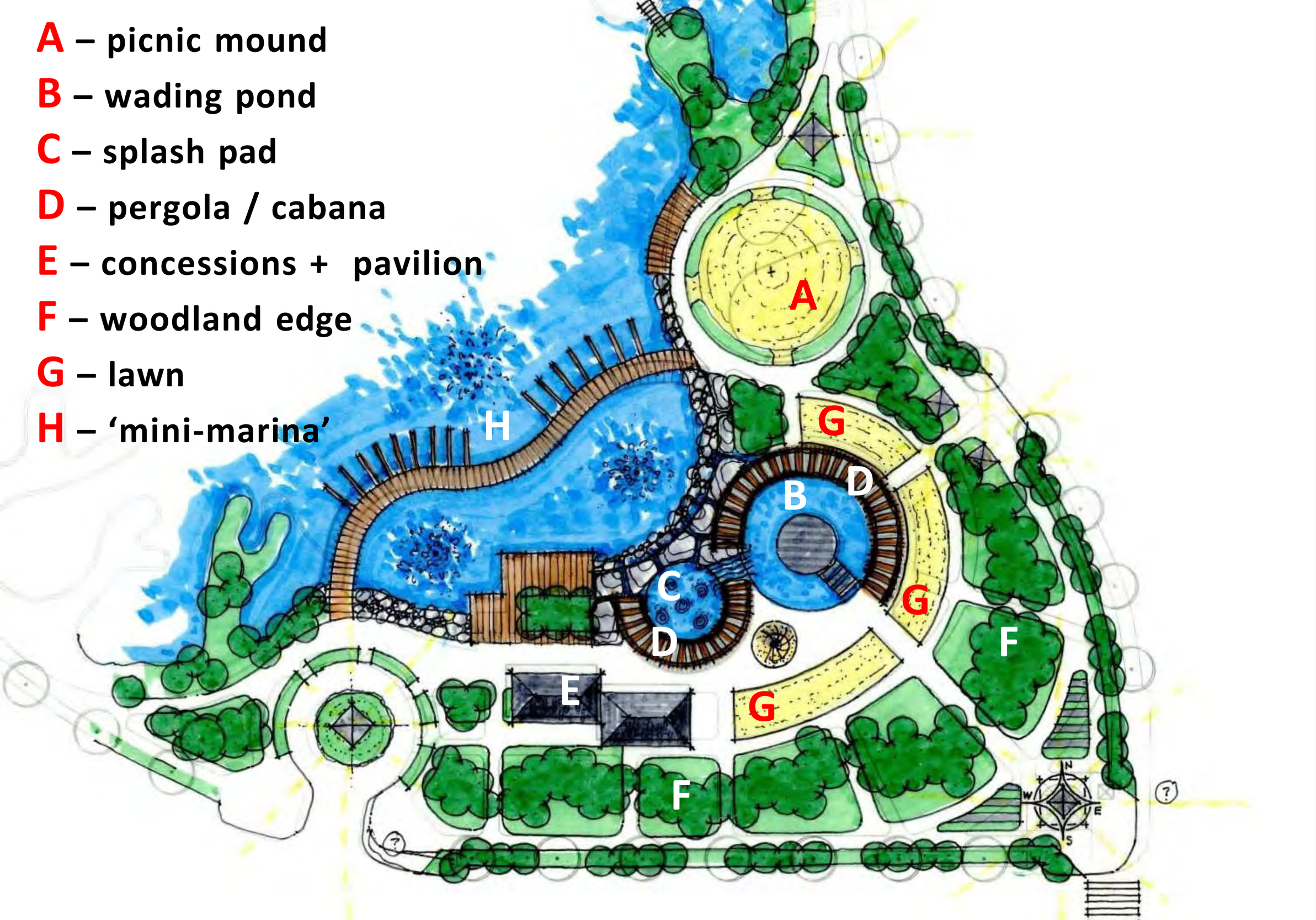
D – pergola / cabana

E – concessions + pavilion

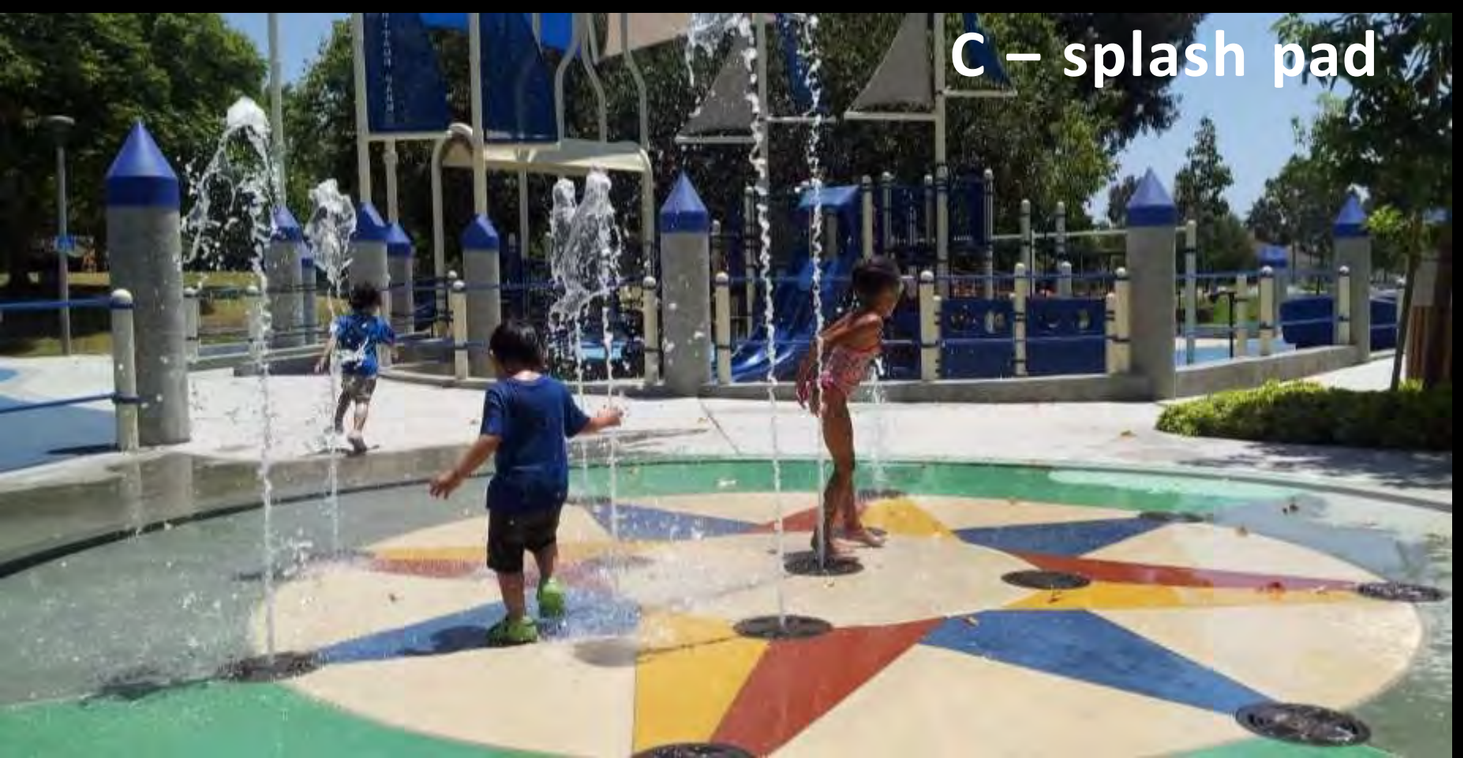
F – woodland edge

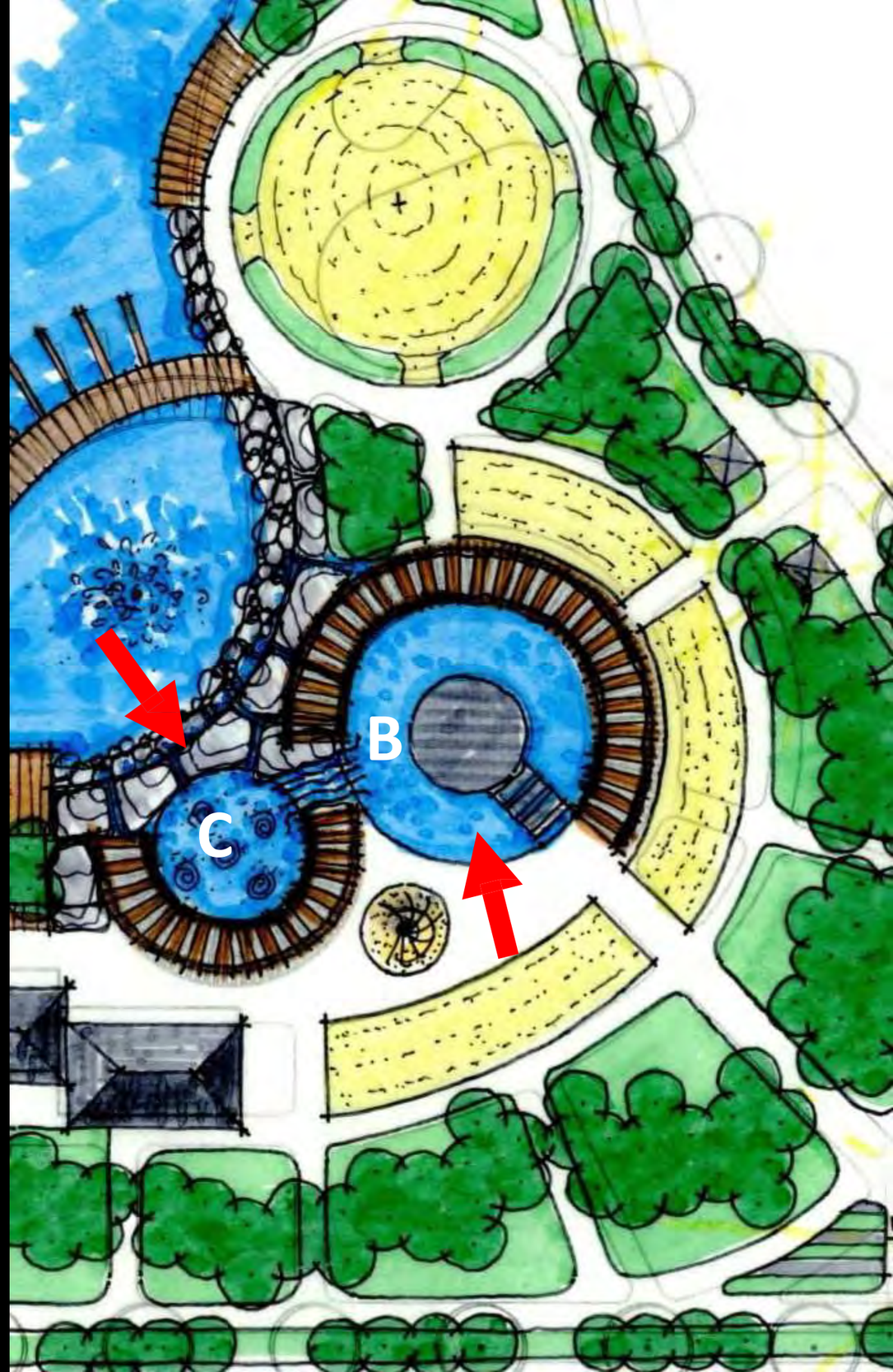
G – lawn

H – ‘mini-marina’



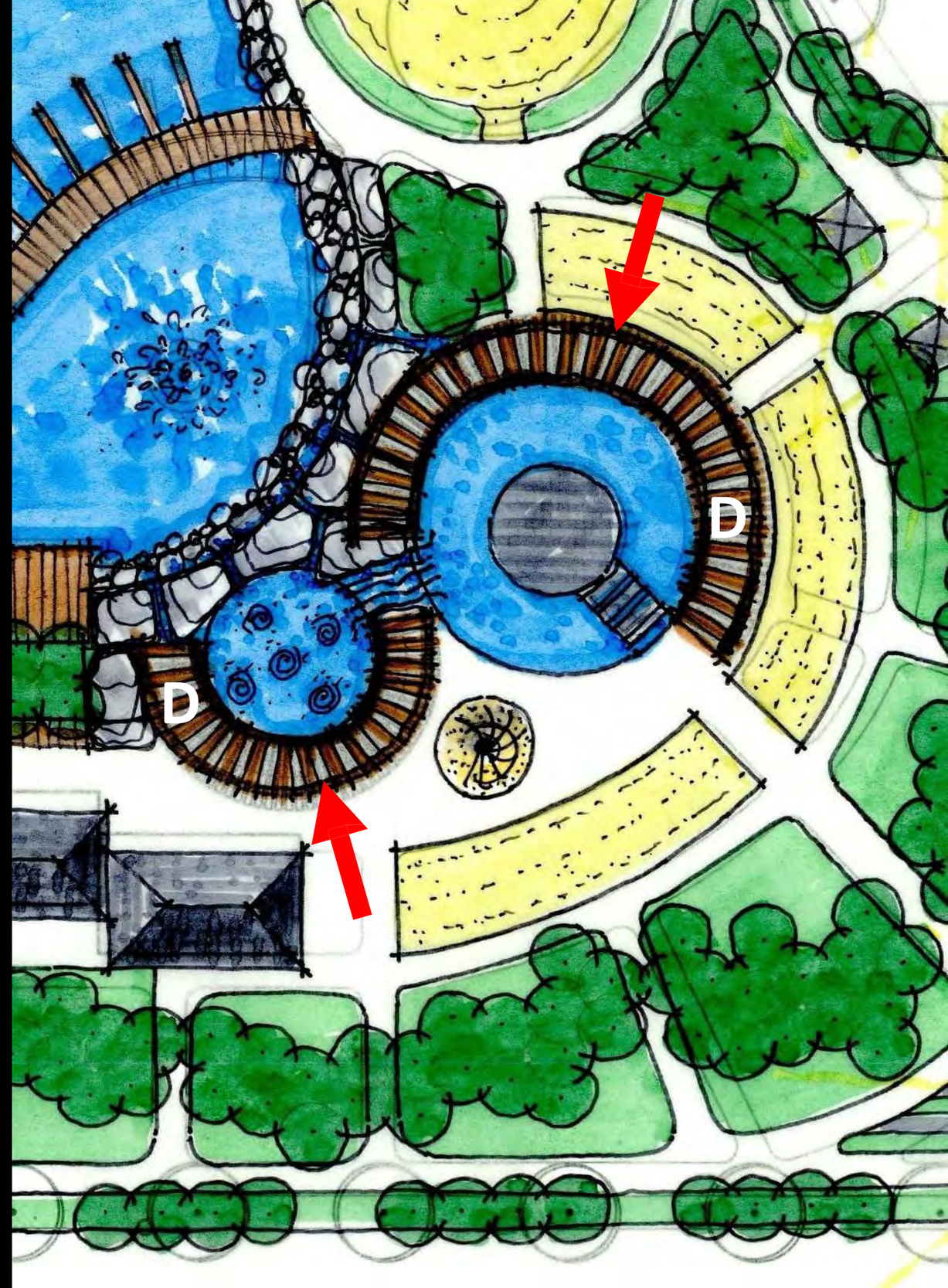

B – wading pond


C – splash pad


B
C


D – pergola / cabana




D
D



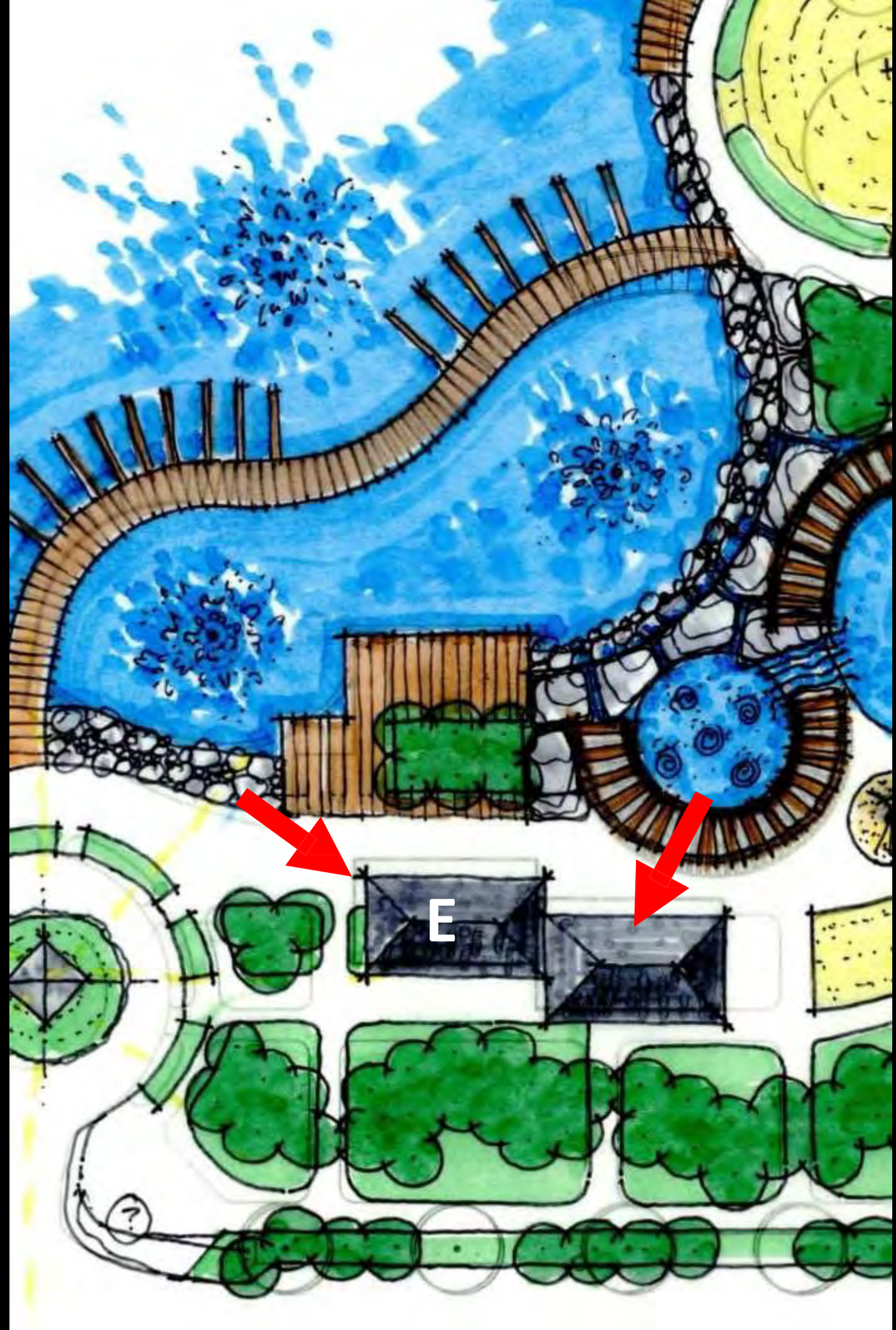
H – ‘mini-marina’

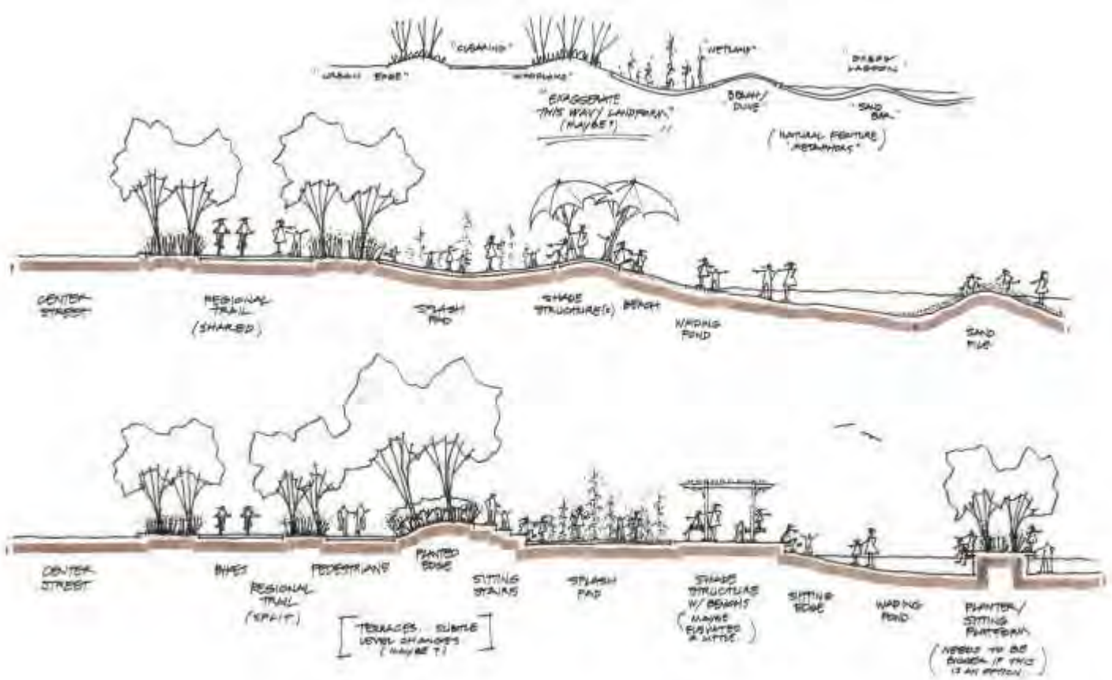


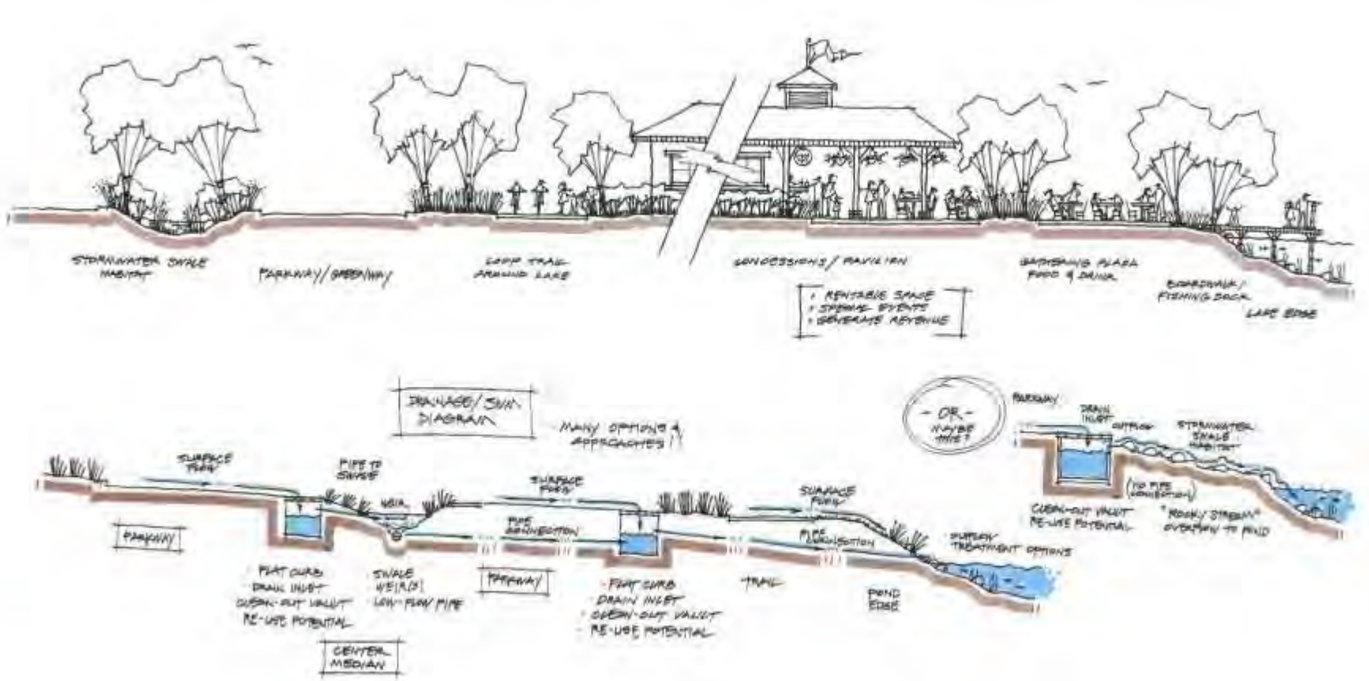


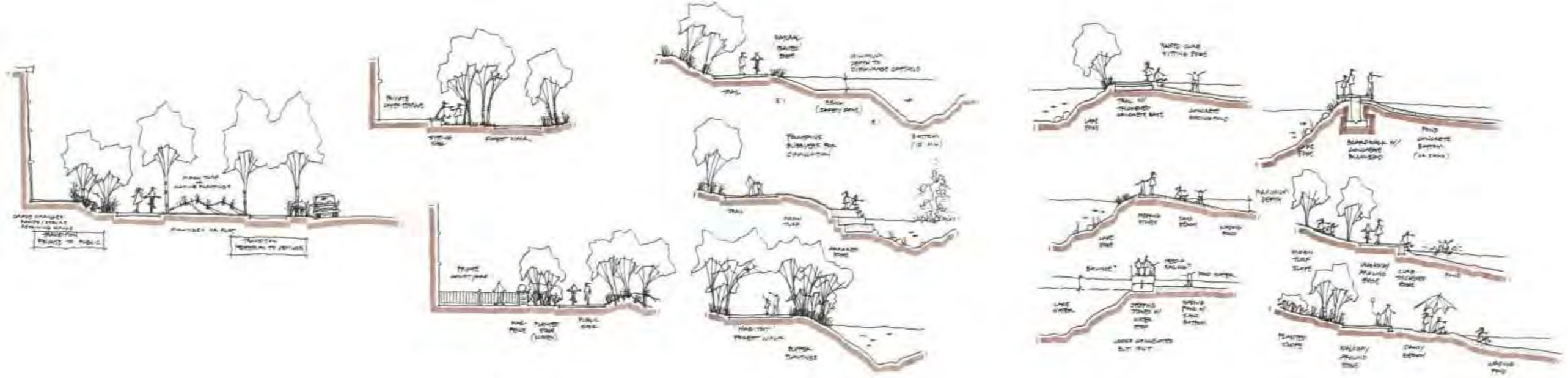


E – concessions + pavilion









cross-sections for various park elements





preliminary grading studies

The Waterfront

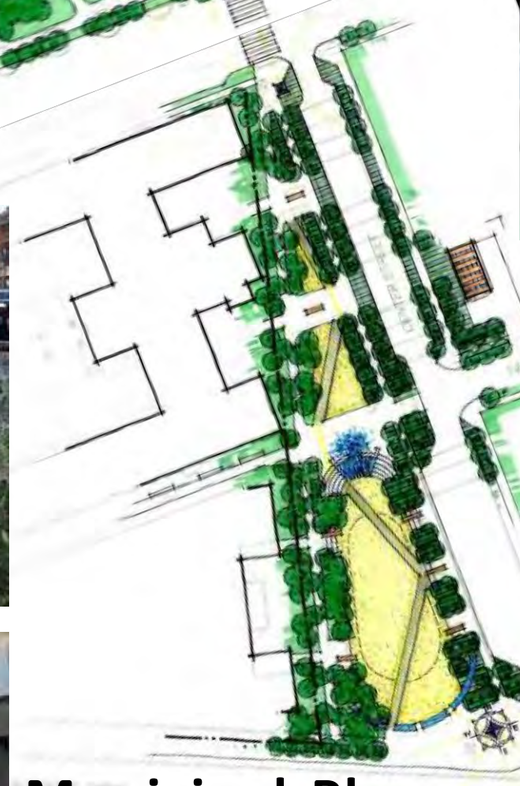




Waterplay Area





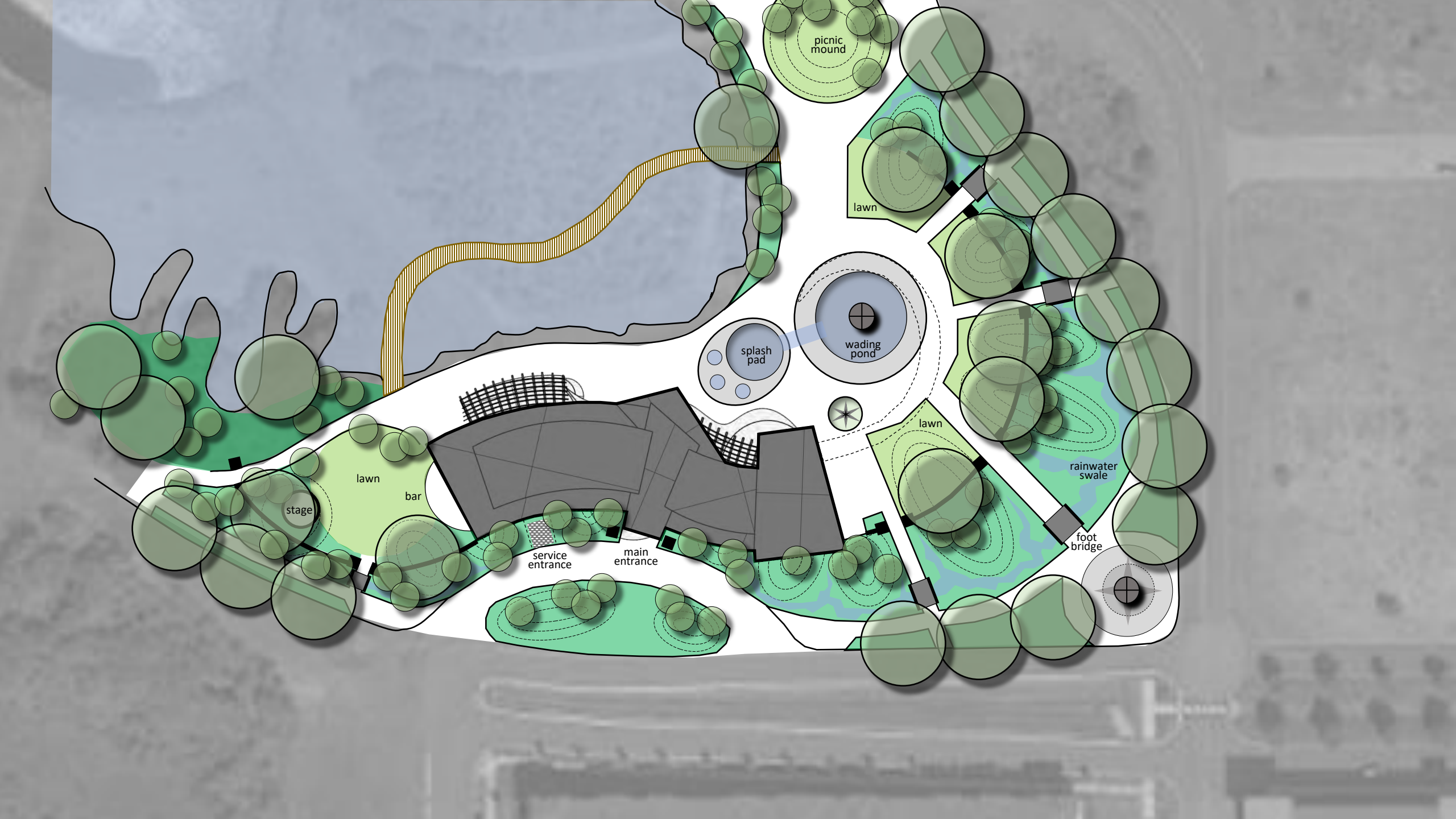


Municipal Plaza








picnic mound
lawn
splash pad
wading pond
lawn
rainwater swale
foot bridge
lawn
bar
stage
service entrance
main entrance




ephemeral stream



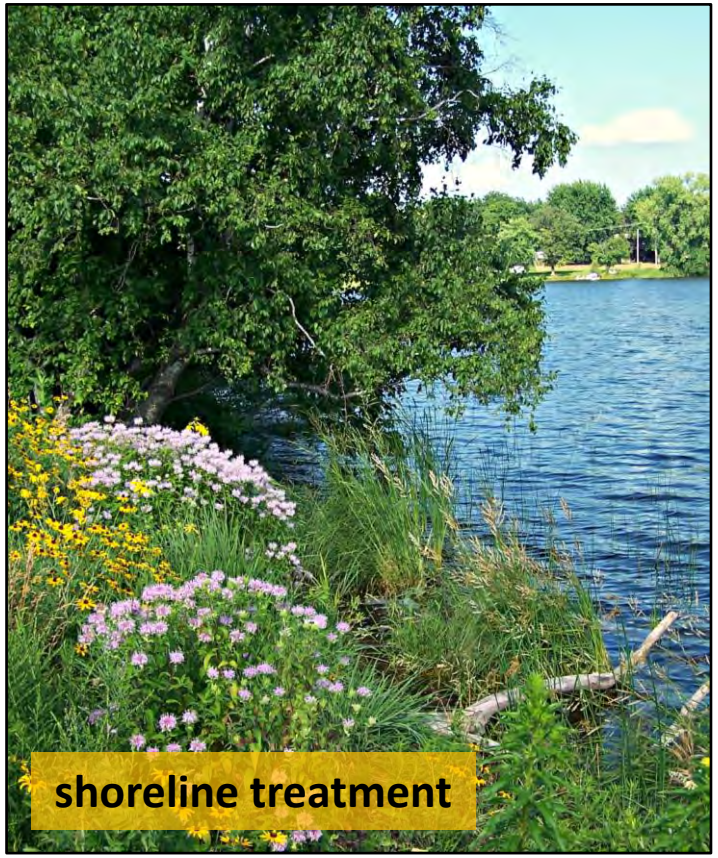



stormwater swale




grading for aesthetics


lighting effects


shoreline treatment

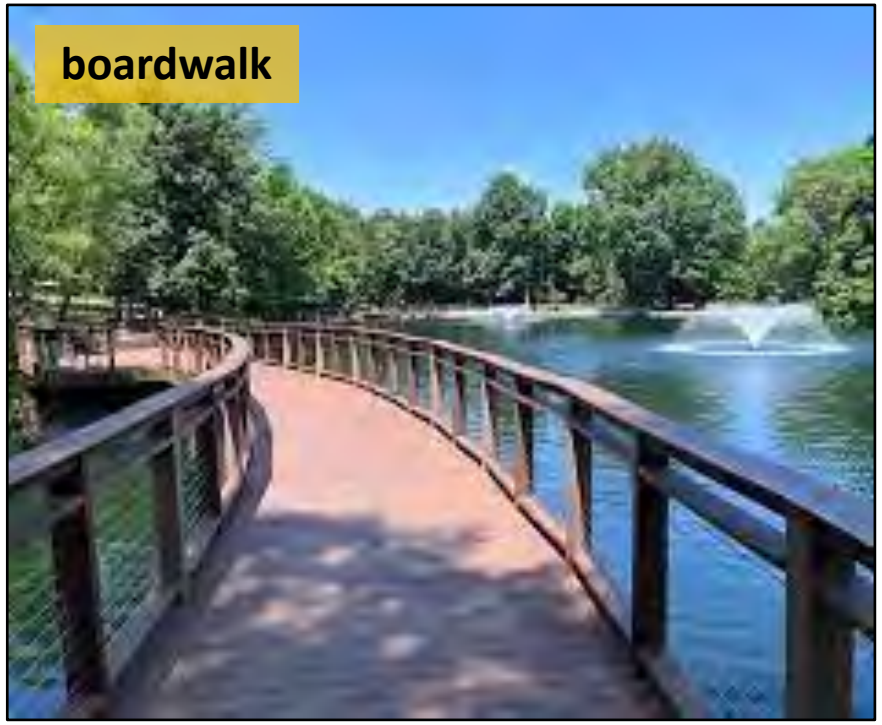

open savana character


bee-friendly lawn


shoreline treatment


multi-trunk understory


short-grass prairie


boardwalk


wading pond


outdoor hearth
MONTEREY
CANNING COMPANY


outdoor game area


outdoor game area
Stone Brewery World Bistro & Gardens in Libe







Working model for The Waterfront community building

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

September 26, 2022

Mr. Bruce Westby, P.E.
City Engineer/Interim Public Works Director
City of Ramsey
7550 Sunwood Drive NW
Ramsey, Minnesota 55303

RE: City of Ramsey - The COR – Public Infrastructure Analysis

Dear Mr. Westby:

In response to our recent meeting related to The COR, we have prepared a scope of services and fee estimate for analysis associated with public infrastructure for the following improvements:

- Ramsey Parkway from Willemite Street to Sunwood Drive (Roundabout),
- Zeolite Street from Sunwood Drive to Bunker Lake Boulevard,
- Yolite Street from Sunwood Drive to Ramsey Parkway,
- Center Street Realignment,
- Veterans Drive between Rhinestone Street and Ramsey Boulevard,
- The Waterfront Pond and Park Area,
- Filling of stormwater ponds in the southeast quadrant of the Bunker Lake Boulevard and Armstrong Boulevard intersection, and
- Filling of a wetland in the southeast quadrant of the Bunker Lake Boulevard and Armstrong Boulevard intersection.

We will draw from the initial concepts and strategies that were detailed in the Center Street report and The COR report. Our proposal is based upon carrying these concepts and principals forward into the new analysis, with an updated project cost estimate for the work. Each street segment analyzed will include public utilities (sanitary sewer and water main), along with storm sewer, trails and sidewalks.

The material generated from the regional storm water retention pond can be used as fill for the remaining undeveloped portion of The COR. We will analyze the amounts of fill required for each lot and will make estimates for how much material will be generated from excavation of the Waterfront.

See attached figure for the general area of the analysis.

CONSTRUCTION COST ESTIMATES

Previous analyses presented project costs associated with the street and public utility related improvements. Those amounts were based on 2018 construction costs, and included a 30 percent allowance for contingencies and project development. No costs were included in The COR report for the Waterfront. Based on conversations with the City, the work will most likely consist of the following:

Bolton & Menk is an equal opportunity employer.

- Clear and grub the area of The COR bounded by Sunwood Drive, Bunker Lake Boulevard, Armstrong Boulevard and Center Street,
- Strip off topsoil for the above area and stockpile the material,
- Dewater the area to allow for deep excavations to occur,
- Excavate the pond, placing the material in locations identified within The COR,
- Place a 2 ft thick clay liner in the pond from the bottom up to the normal water level,
- Fine grade the area of the regional stormwater retention pond, and
- Revegetate all areas disturbed by construction.

We will provide construction cost estimates associated with the improvements.

SCOPE OF SERVICES

Our anticipated scope of services will be as follows:

- Complete a drone flight of the area to provide a current aerial image of the area. The drone flight will provide a level of accuracy of 0.1 ft horizontal and 0.3 ft vertical. This will allow for accurate estimations of excavations and fill volumes required to construct the Waterfront and move the material to adjacent lots within The COR area.
- Update the stormwater model to analyze elevations within the Waterfront and impacts associated with filling existing stormwater ponds across The COR.
- Analyze the potential for filling the wetland that was created in the southeast quadrant of Bunker Lake Boulevard and Armstrong Boulevard. This will be completed under a separate contract and the results will be discussed in the updated report.
- Analyze previous report assumptions and update proposed horizontal and vertical elevations associated with the roadways and public utilities within The COR area. Develop current construction cost estimates based on the analysis.
- Prepare a report detailing the findings of our analyses. This will likely be in the form of an update to previously prepared reports.

No geotechnical analysis will be performed for the project, although previous soil borings completed for the area will be reviewed.

SUMMARY OF FEES

We have prepared preliminary fee estimates based on our understanding of the work to be performed. We estimate fees will be as presented below:

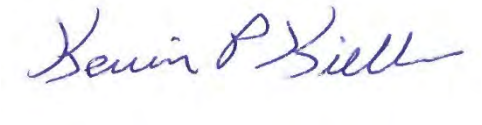
Task	Fees
Drone Flight	$ 2,880.00
Stormwater Analysis	$ 7,200.00
Roadway and Public Utility Analysis	$ 9,680.00
Report preparation, Including Figures	$ 4,420.00
Not-To-Exceed Fees	**$24,180.00**

The fees in the above table represent not-to-exceed costs based on the scope present above.

If there are any questions or concerns, please call me at (651) 968-7760.

Sincerely,

Bolton & Menk, Inc.



Kevin P. Kielb, P.E.
Project Manager

Attachment: Area of Analysis

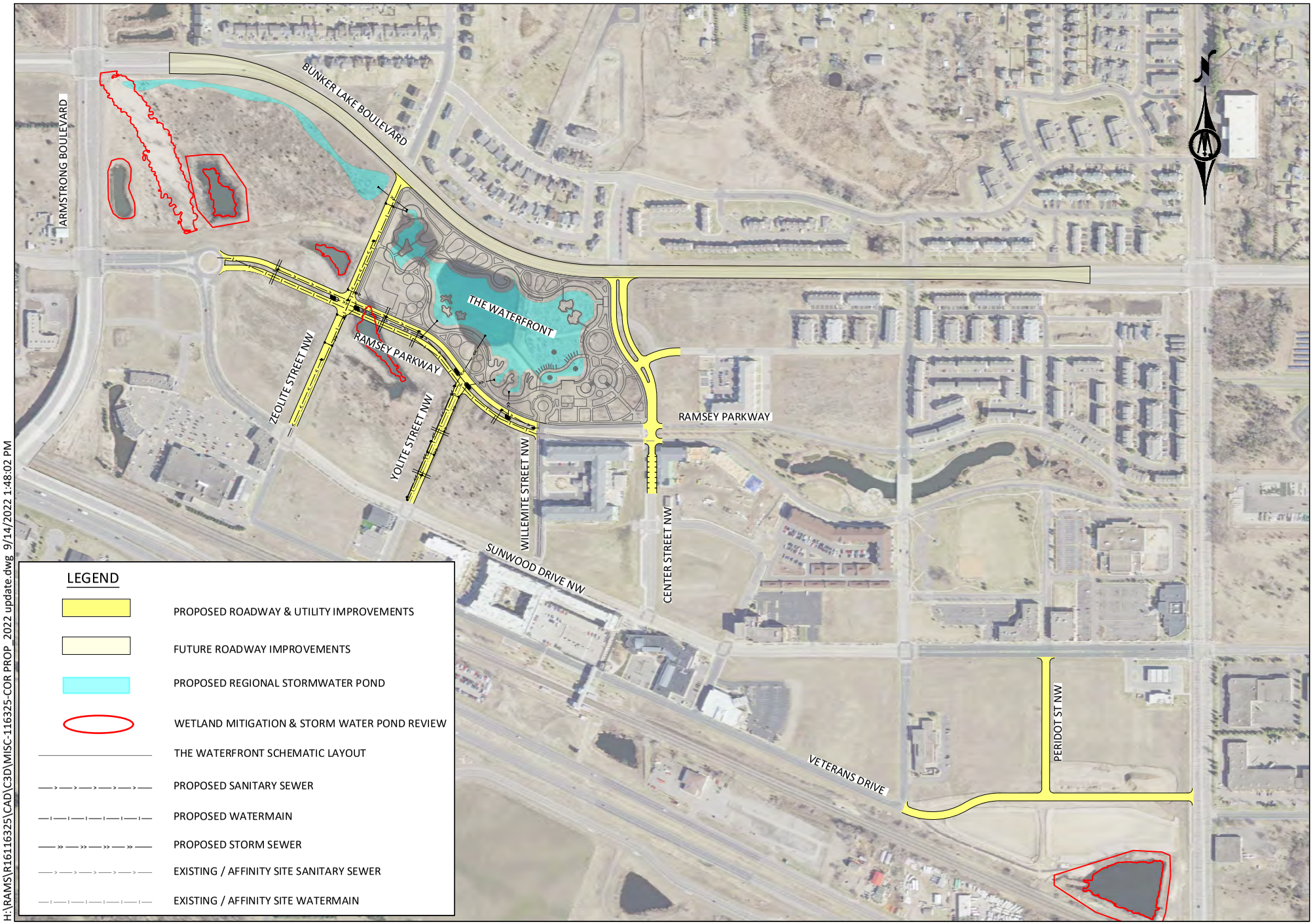
2022 COR PUBLIC INFRASTRUCTURE ANALYSIS

CITY OF RAMSEY, MINNESOTA

IMPROVEMENT AREAS

AUGUST 2022

BOLTON & MENK



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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

September 22, 2022

Mr. Sean Sullivan, EDFP
Economic Development Manager
City of Ramsey
7550 Sunwood Drive NW
Ramsey, Minnesota 55303

RE: City of Ramsey - The COR – Wetland Analysis

Dear Mr. Sullivan:

Bolton & Menk, Inc. has prepared this proposal for natural resources related services for The COR area in Ramsey. We propose to investigate available background information needed prior to visiting the site. This includes compiling information as follows:

1. Available Aerial Photographs,
2. Anoka County LiDAR Maps,
3. National Wetlands Inventory Maps,
4. Anoka County Soil Survey Maps, and
5. MnDNR Public Waters Maps.

We are proposing to complete the following tasks as a portion of the project:

Task 1 – Level II Aquatic Resource Delineation: We will visit the study area to delineate the wetland boundaries within the COR area. The delineation will include performing transects and sampling in the vicinity of any aquatic resources, placing 3-foot pin flags at the limits of any aquatic resources found. Our delineator will use a sub-meter GPS unit to accurately locate and map each point and prepare a written report of our findings. This report will be submitted to the appropriate agencies for approval.

Task 2 – Historical Analysis: Bolton & Menk staff will review each delineated aquatic resource to determine their historical status. This will include reviewing historical imagery and mitigation plans. If the wetlands are found to be constructed within upland areas, then they will be considered incidental under the WCA and non-jurisdictional under section 401 of the Clean Water Act.

Task 3 – Meetings and Additional Requests: Reviewing agencies generally request additional information and/or an on-site meeting during the review process. Our attendance is typically requested at these meetings to discuss the acceptance of the delineated boundaries or to provide the agencies with additional information.

SUMMARY OF FEES

We have prepared preliminary fee estimates based on our understanding of the work to be performed. We estimate fees will be as presented below:

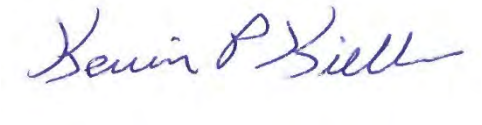
Task	Fees
Task 1 – Level II Aquatic Resource Delineation	$ 4,900.00
Task 2 – Historical Analysis	$ 1,800.00
Task 3 - Additional Requests & Meetings	$ 1,100.00
Not-To-Exceed Fees	**$ 7,800.00**

The fees in the above table represent not-to-exceed costs based on the scope present above.

If there are any questions or concerns, please call me at (651) 968-7760.

Sincerely,

Bolton & Menk, Inc.



Kevin P. Kielb, P.E.
Principal Engineer

BOLTON & MENK

Real People. Real Solutions.

The COR Analysis Update

City of Ramsey

February 14, 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 and tree inventory tabulation,
- **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, and
- **Appendix F** includes previously conducted analyses within The COR

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 more detailed cost breakdown is included in the Cost Analysis section.

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Appendix

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APPENDIX B: FIGURES

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APPENDIX D: WETLAND DELINEATION REPORT

APPENDIX E: TRAFFIC COUNT EXHIBIT

APPENDIX F: PREVIOUS ANALYSES

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 and tree inventory tabulation,
- **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, and
- **Appendix F** includes previously conducted analyses within The COR Framework

Figure 1 in Appendix B depicts the general location and improvements of the study area associated with this analysis.

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 6-7: National Wetland Inventory & Mitigation Plan
- Figures 8-10: Public Utilities
- Figures 11-12: Site Grading & Drainage
- Figures 13: The Waterfront, Phase 1 Sketch
- Figures 14: The COR Area Tree Inventory
- Figures 15-17: 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:

- **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.

Figures 1 and 2 in Appendix B depict the roadway segments and geometrics included in this analysis.

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 B. 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





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SCALE FEET

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City of RAMSEY

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

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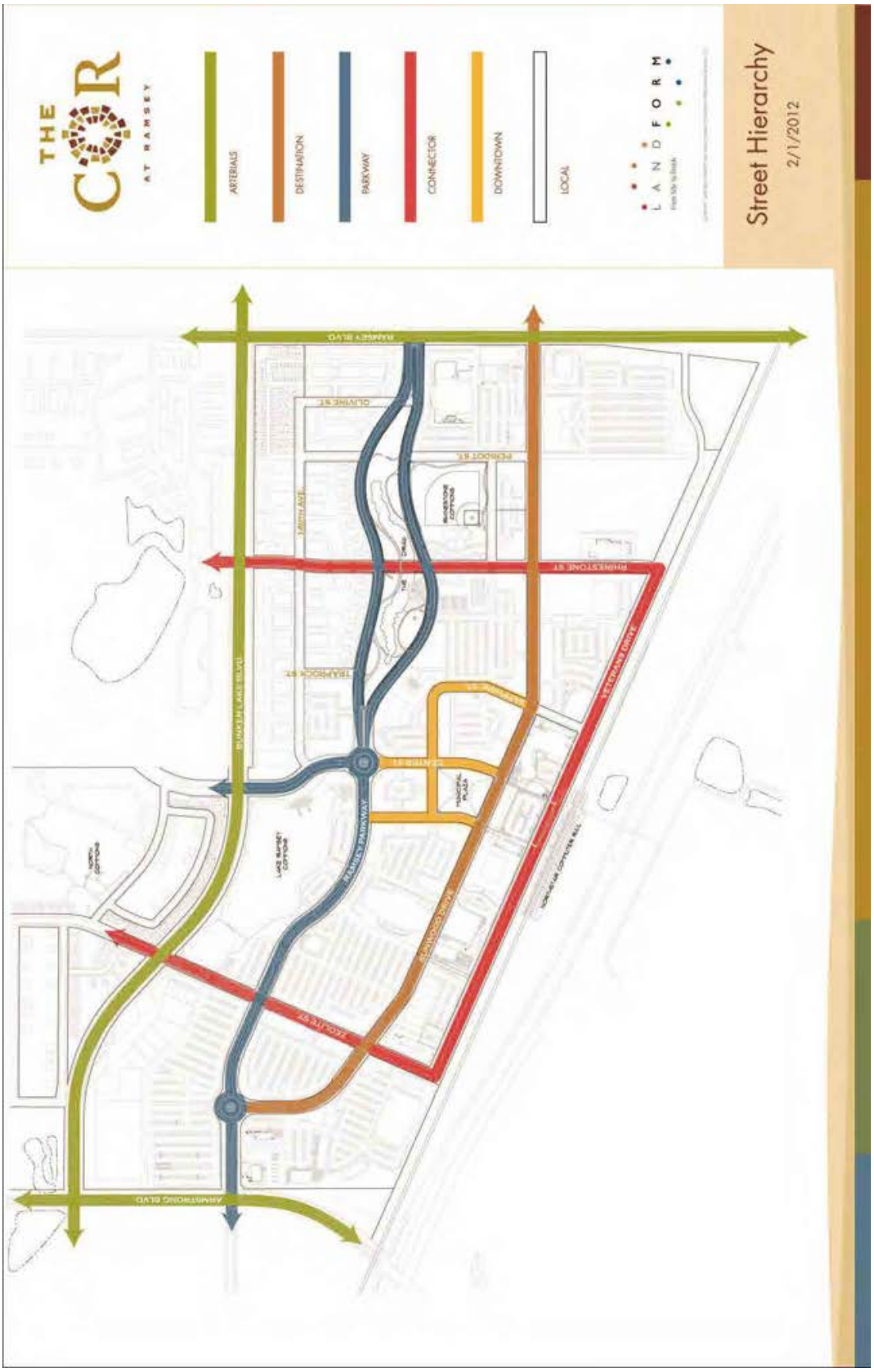


Figure 1: Street Hierarchy Map

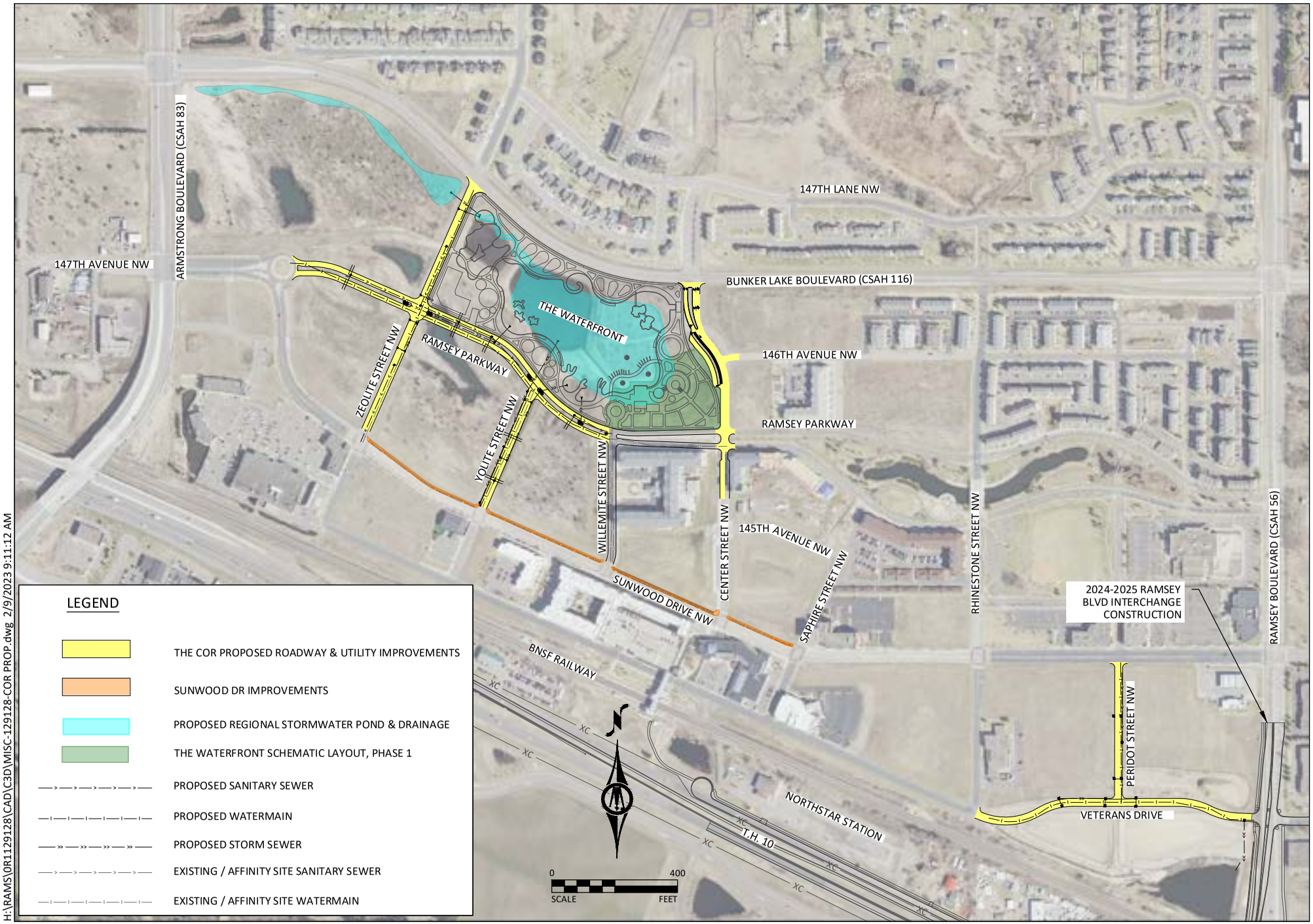
APPENDIX B: FIGURES

2023 THE COR PUBLIC INFRASTRUCTURE ANALYSIS

CITY OF RAMSEY, MINNESOTA

FIGURE 1 - IMPROVEMENT AREAS

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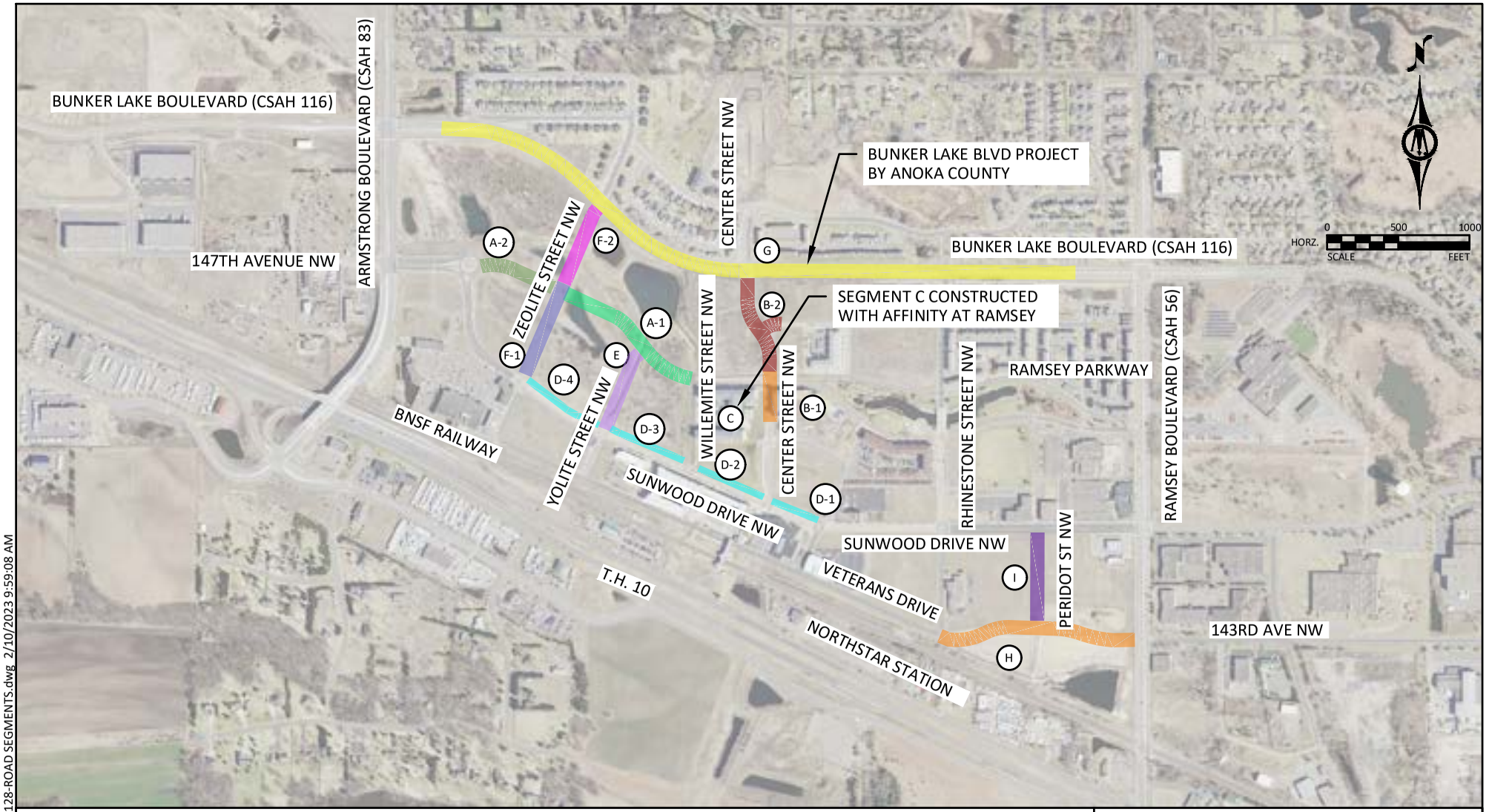


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2023 THE COR PUBLIC INFRASTRUCTURE ANALYSIS FIGURE 2 - ROAD SEGMENTS & COST BREAKDOWN

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.)

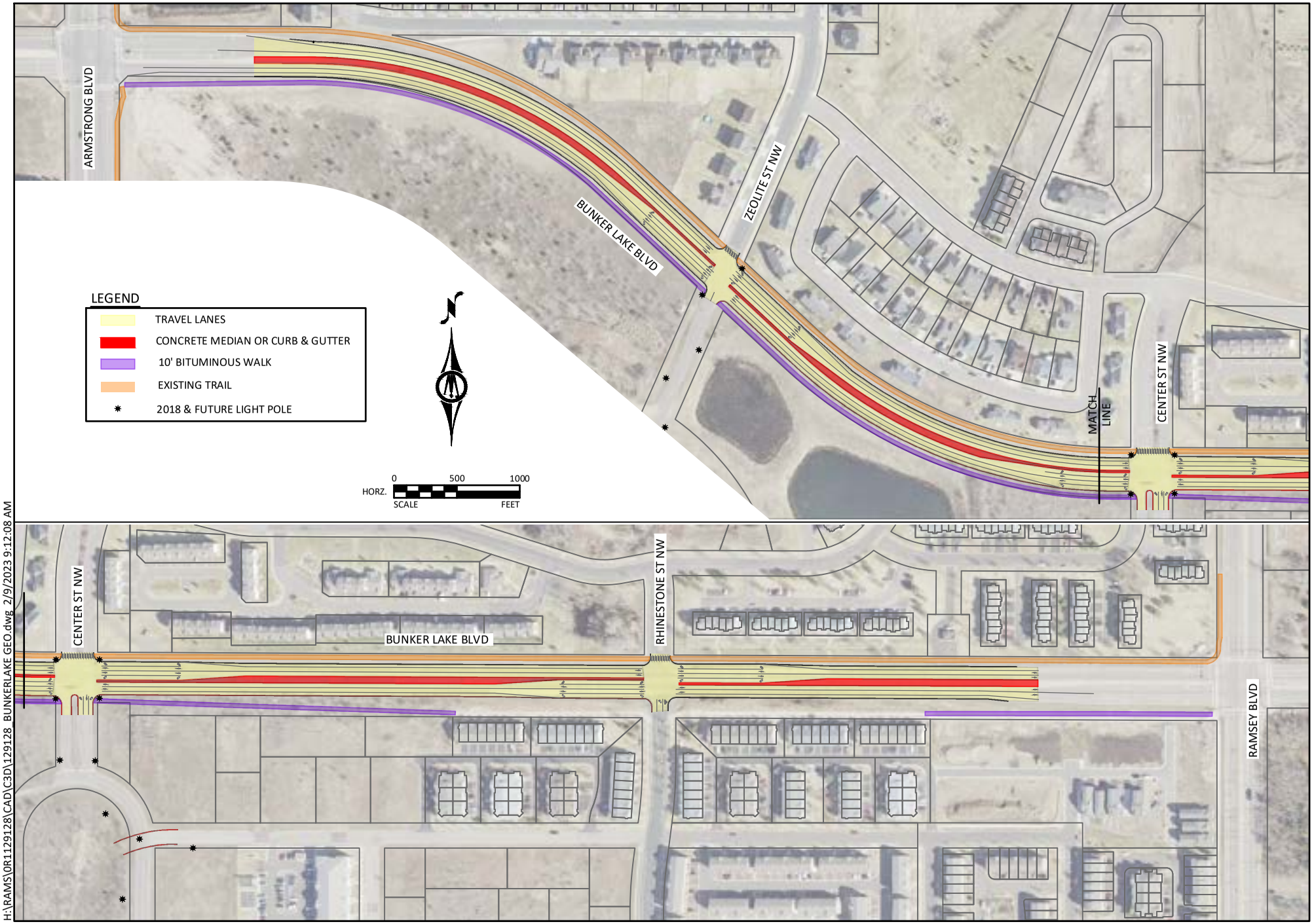
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2023 THE COR PUBLIC INFRASTRUCTURE ANALYSIS

CITY OF RAMSEY, MINNESOTA

FIGURE 3 - FUTURE ANOKA COUNTY PROJECT

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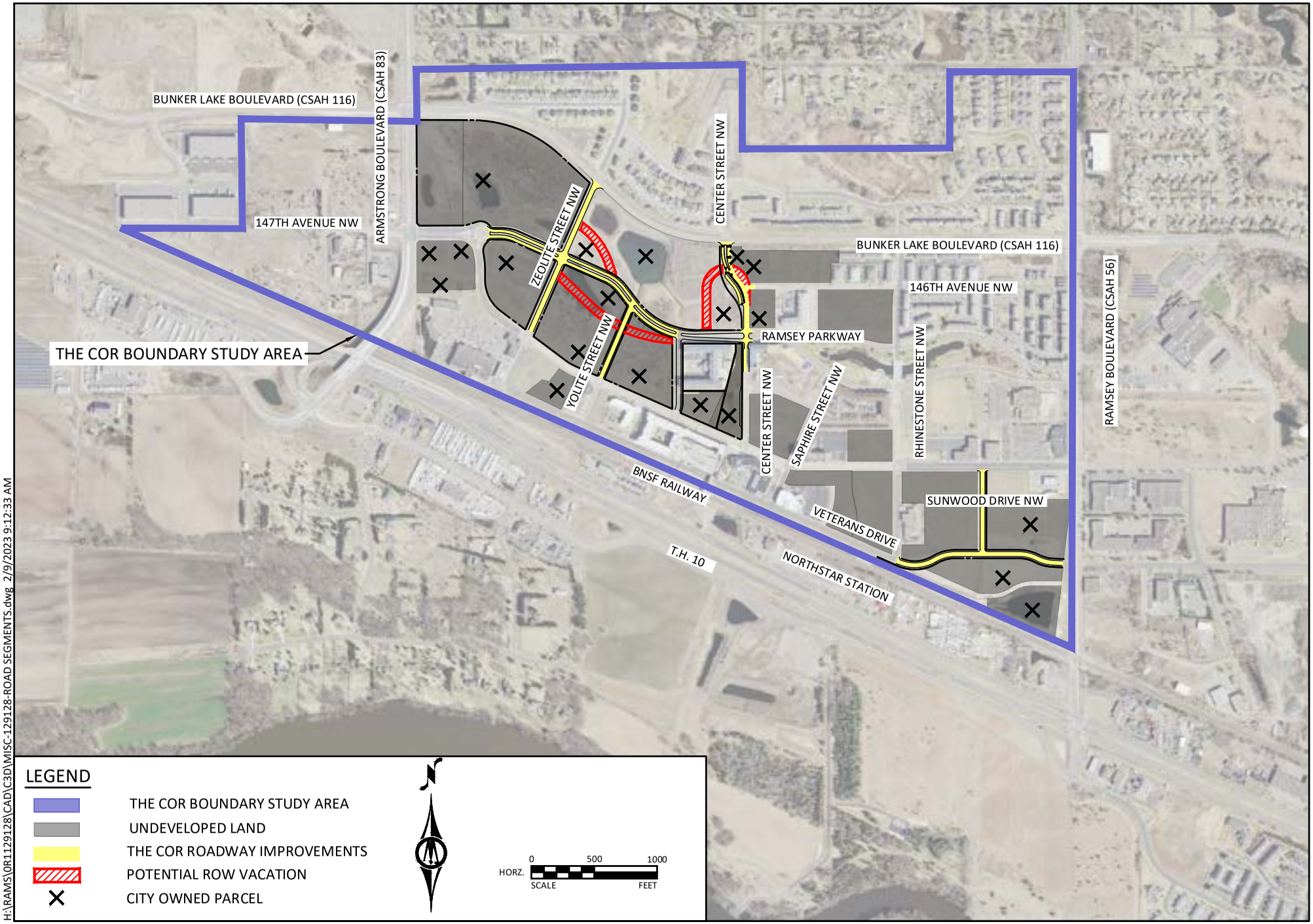
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2023 THE COR PUBLIC INFRASTRUCTURE ANALYSIS

CITY OF RAMSEY, MINNESOTA

FIGURE 4 - ROW LAYOUT

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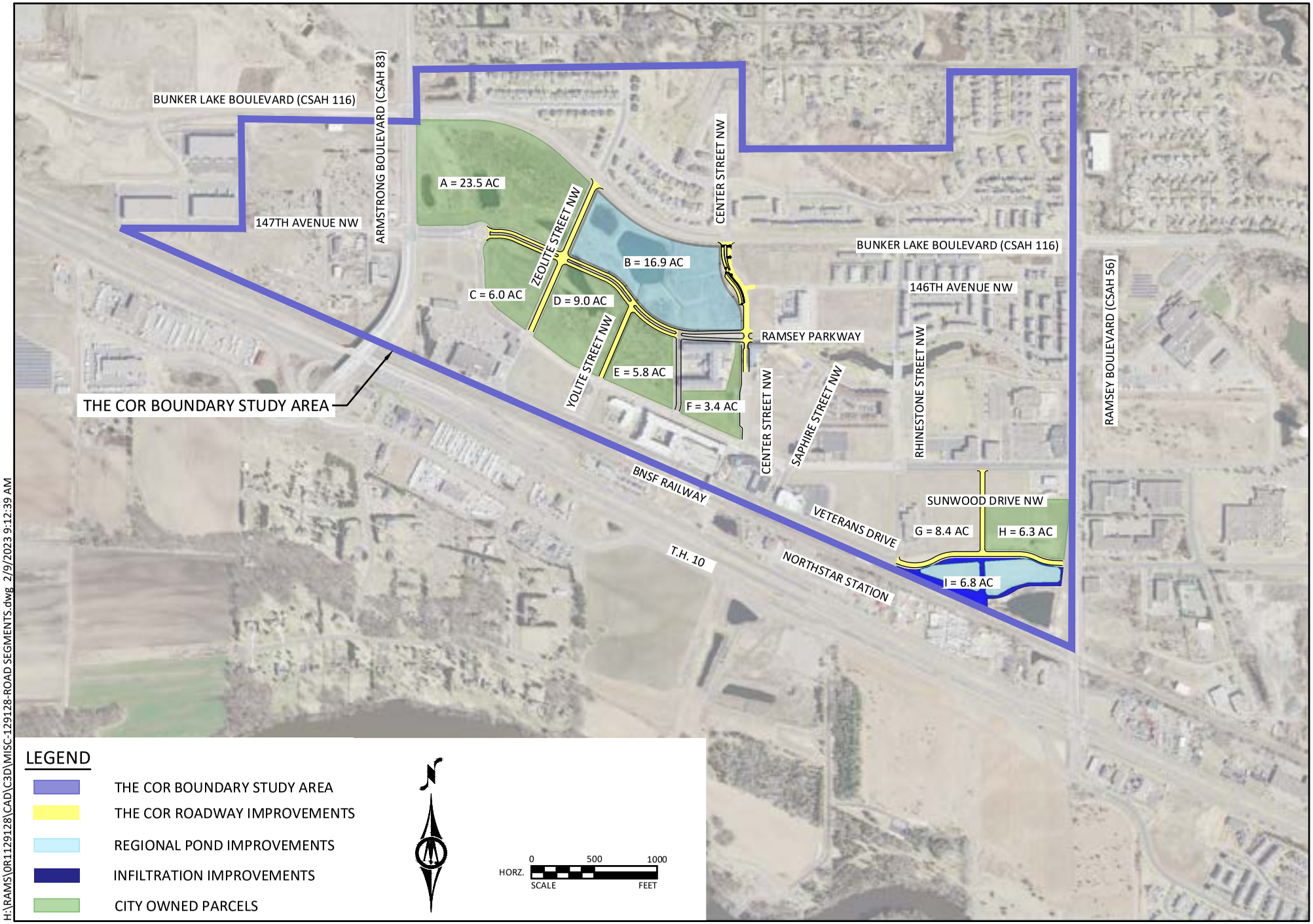
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2023 THE COR PUBLIC INFRASTRUCTURE ANALYSIS

CITY OF RAMSEY, MINNESOTA

FIGURE 5 - CITY PARCEL AREAS

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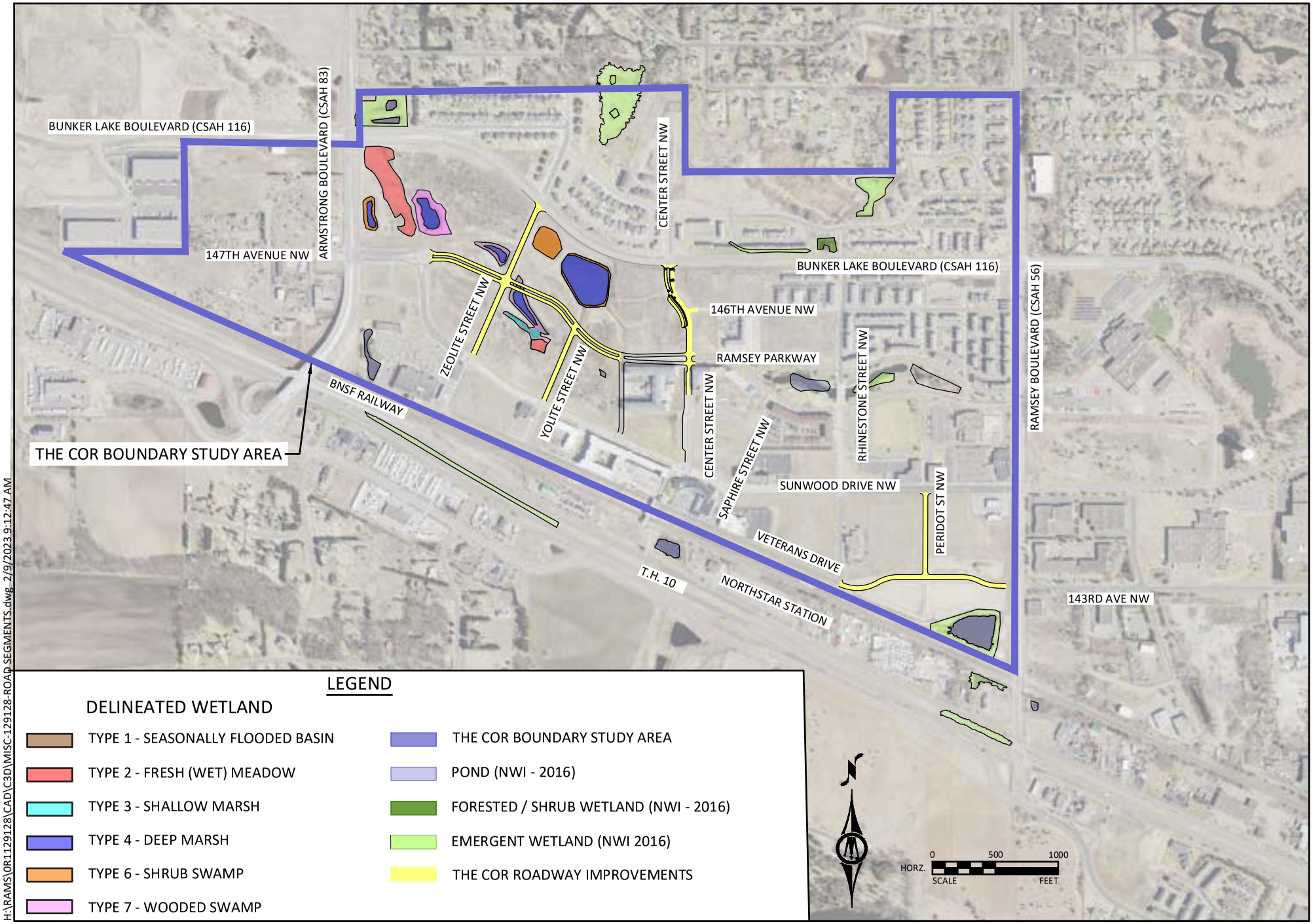
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2023 THE COR PUBLIC INFRASTRUCTURE ANALYSIS

CITY OF RAMSEY, MINNESOTA

FIGURE 6 - WETLAND INVENTORY

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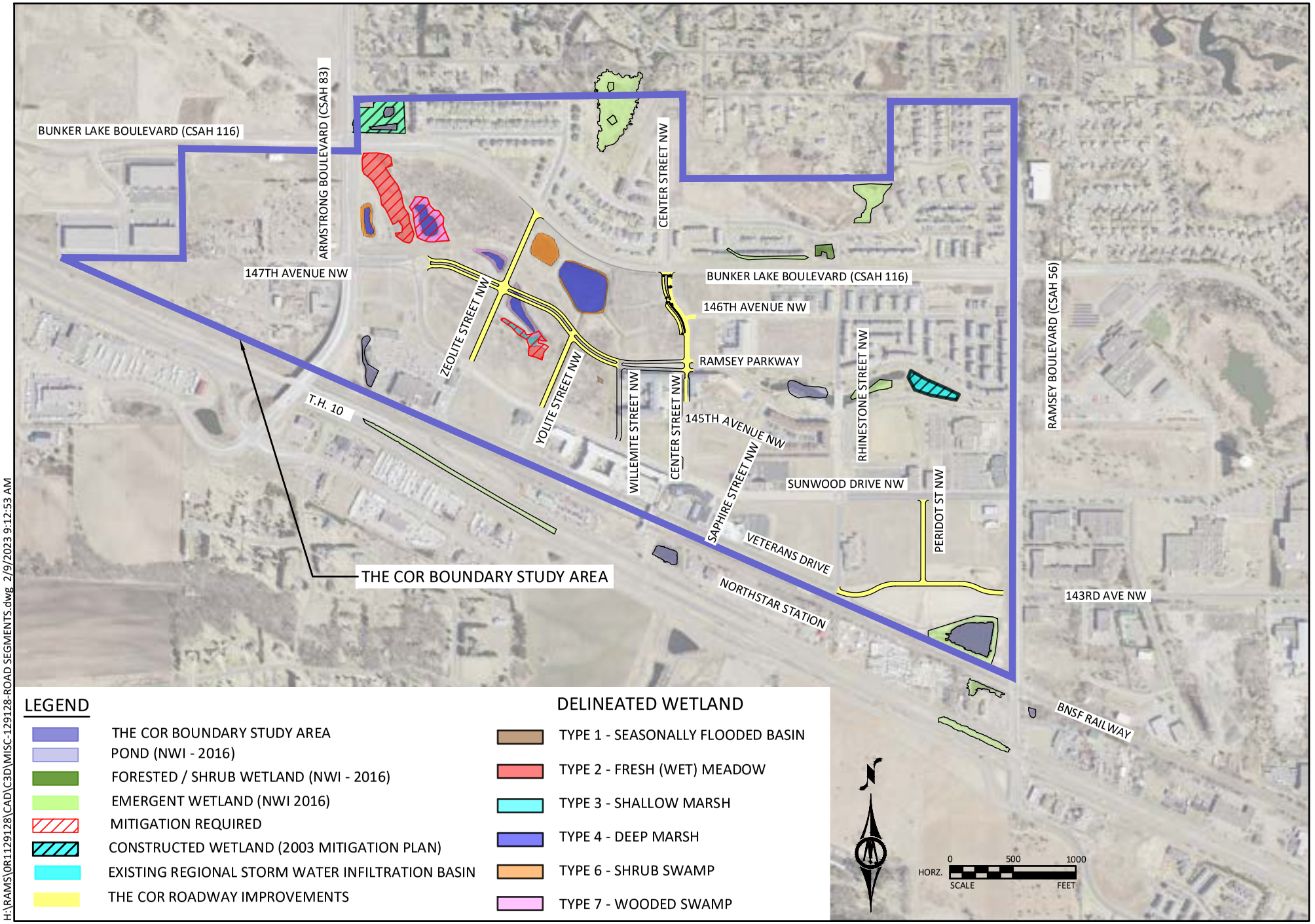
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2023 THE COR PUBLIC INFRASTRUCTURE ANALYSIS

CITY OF RAMSEY, MINNESOTA

FIGURE 7 - WETLAND MITIGATION PLAN

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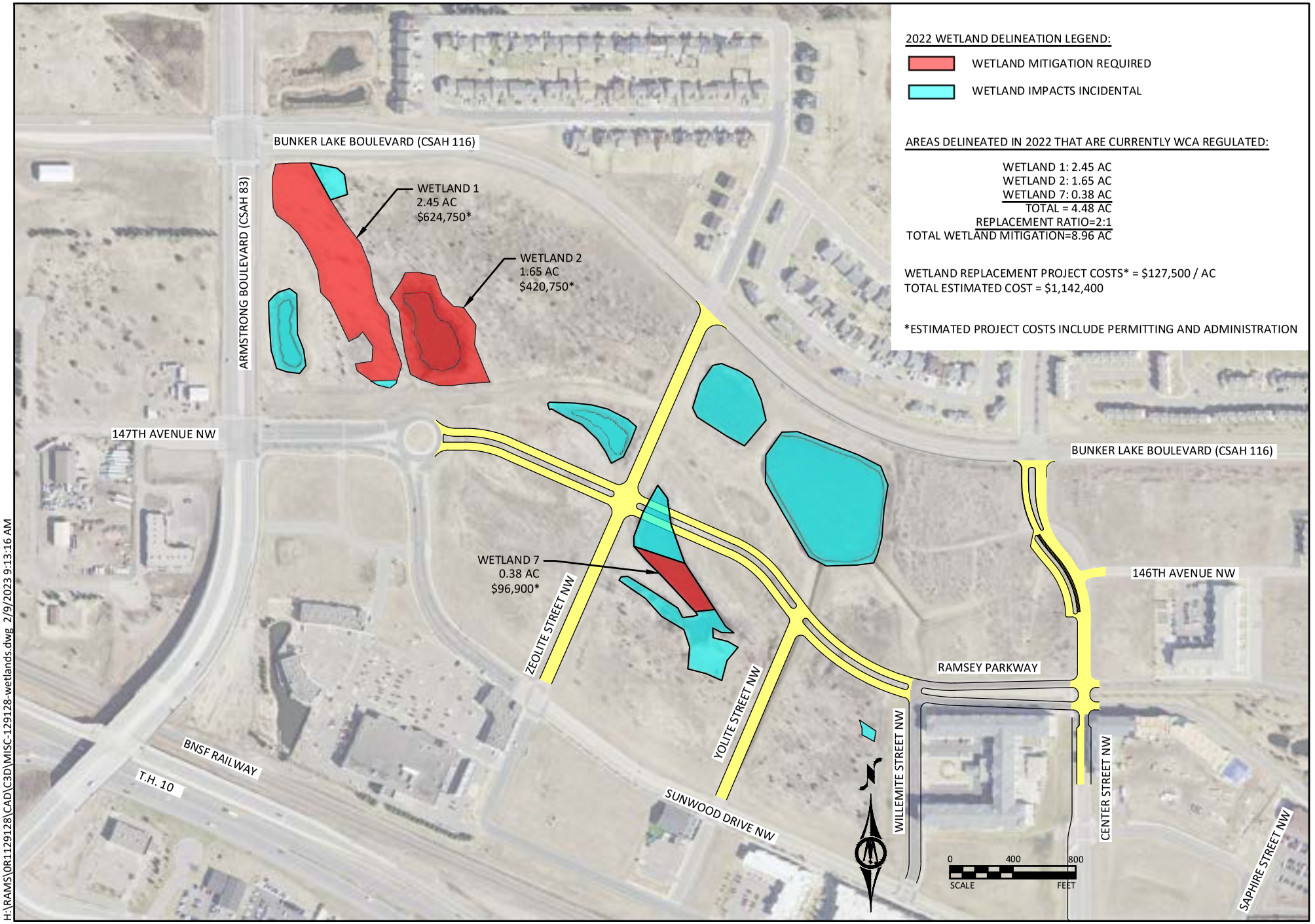
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2023 THE COR PUBLIC INFRASTRUCTURE ANALYSIS

CITY OF RAMSEY, MINNESOTA

FIGURE 8 - WETLAND MITIGATION COST

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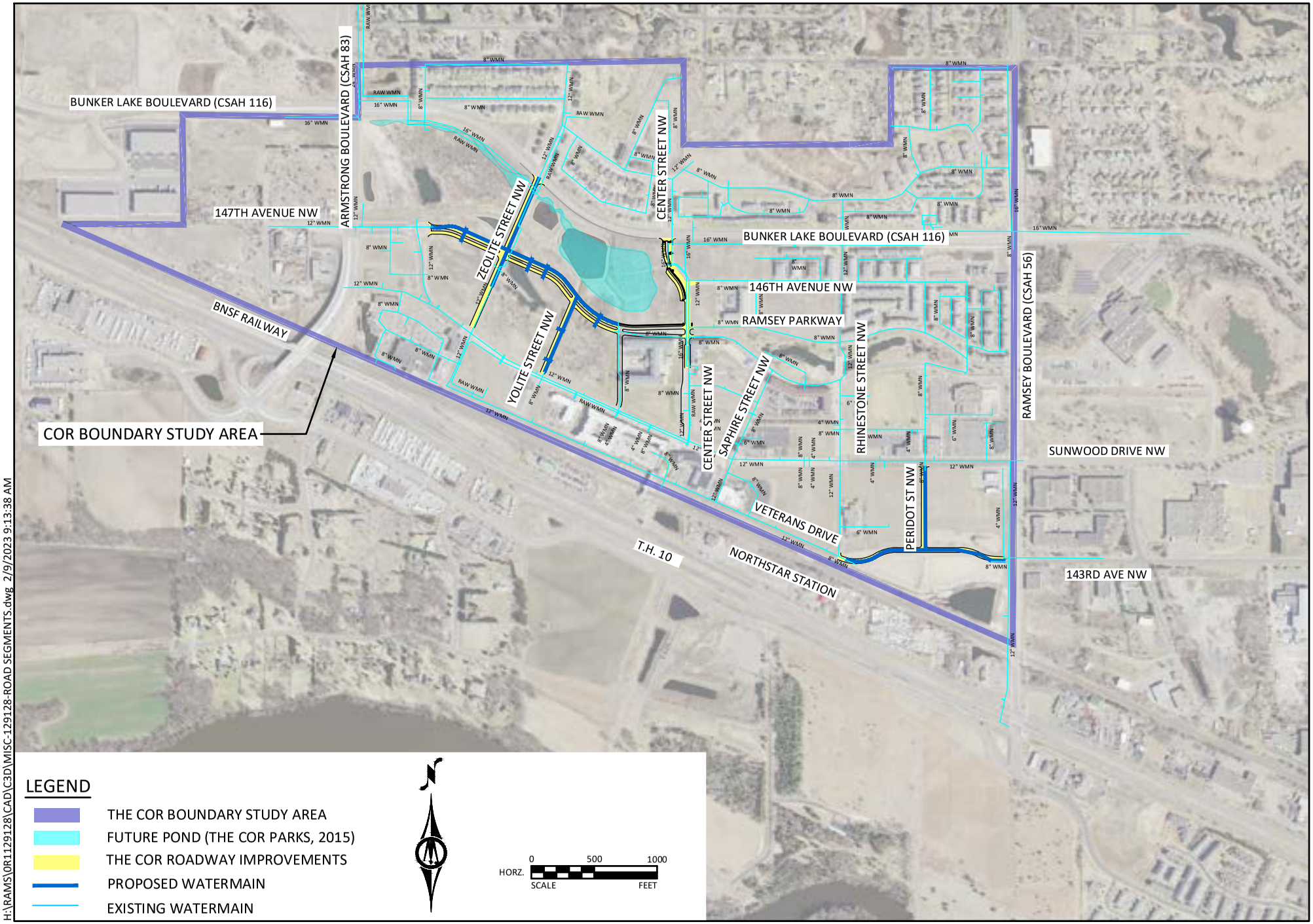
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2023 THE COR PUBLIC INFRASTRUCTURE ANALYSIS

CITY OF RAMSEY, MINNESOTA

FIGURE 9 - WATERMAIN UTILITIES

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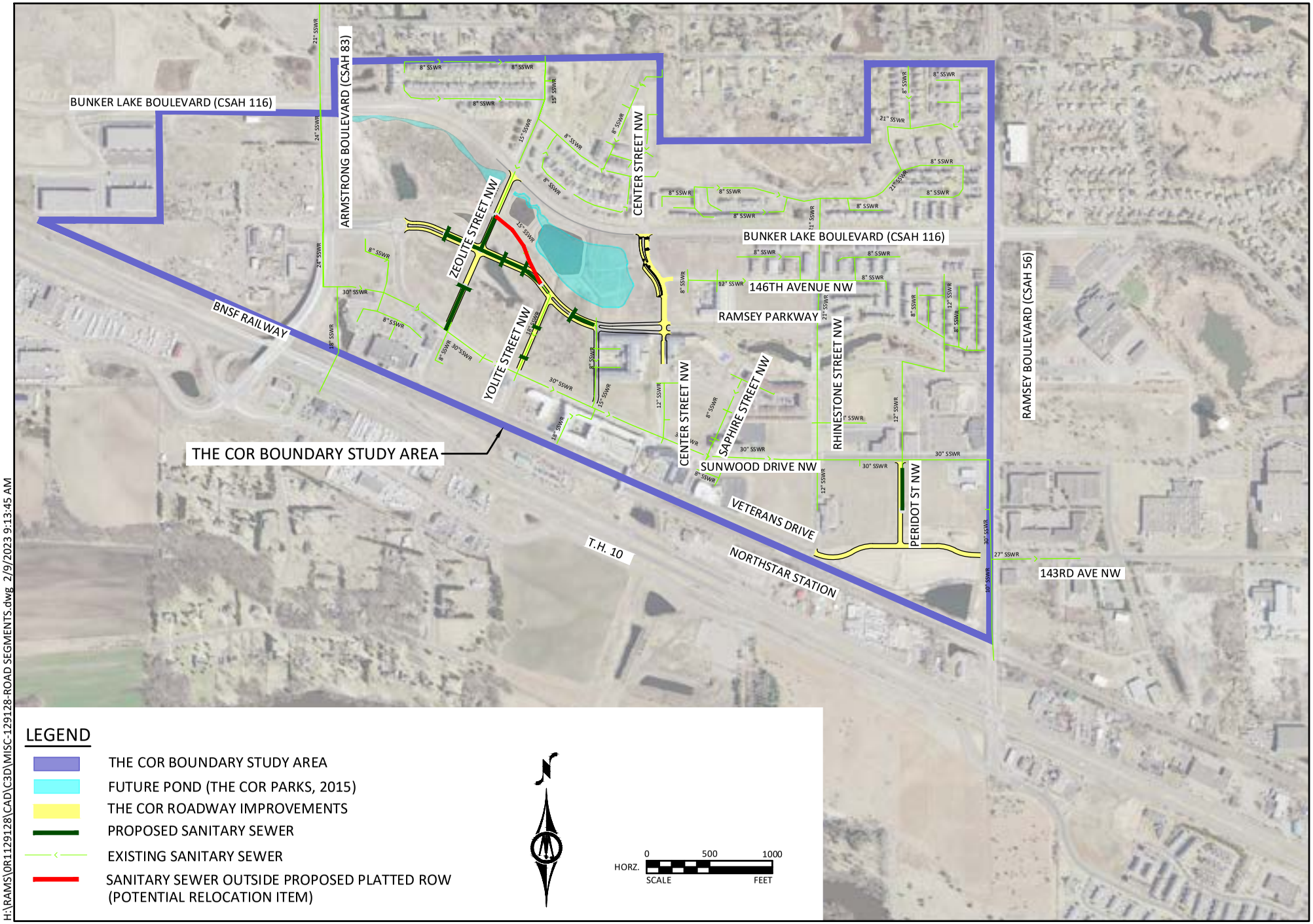
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2023 THE COR PUBLIC INFRASTRUCTURE ANALYSIS

CITY OF RAMSEY, MINNESOTA

FIGURE 10 - SANITARY UTILITIES

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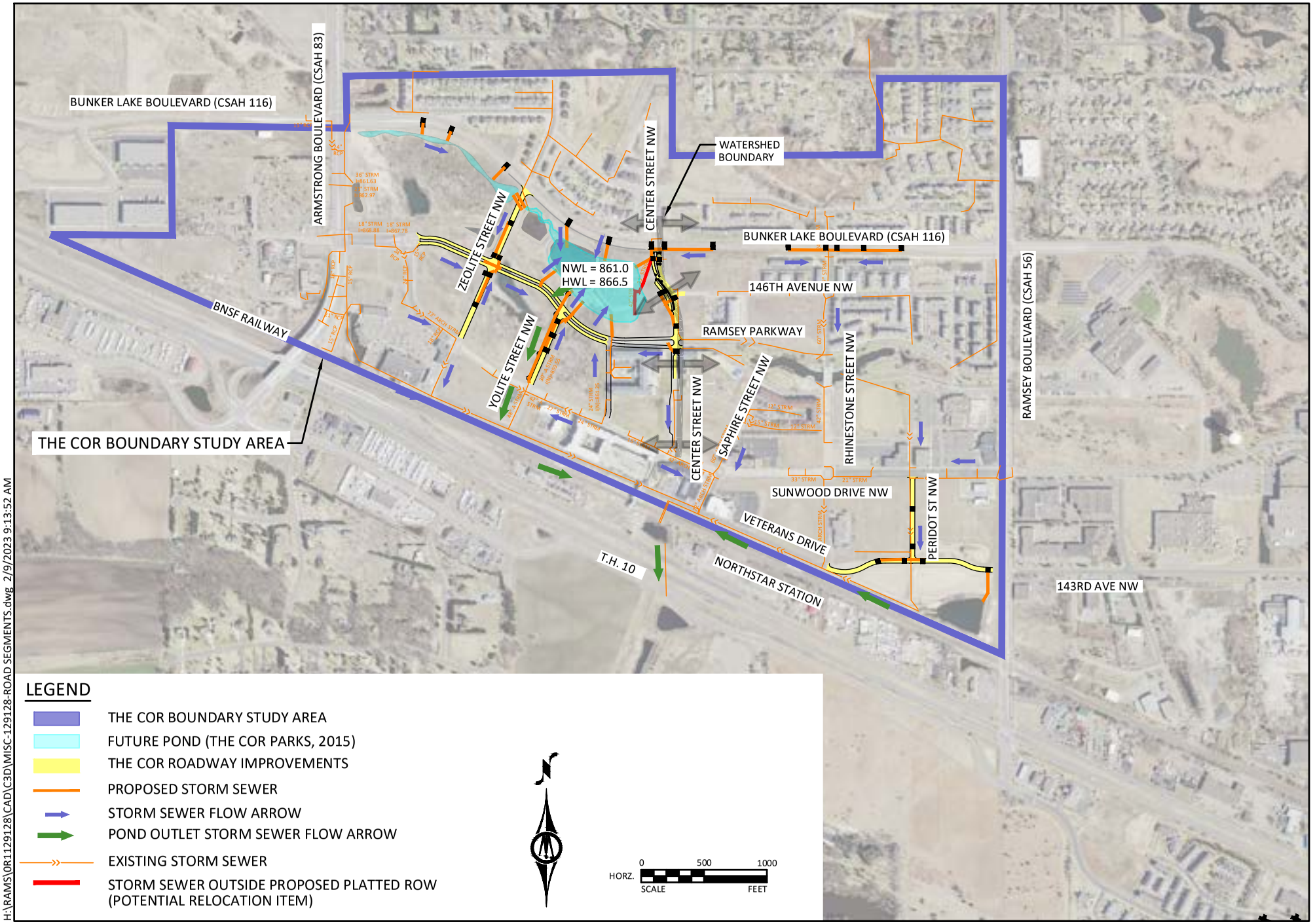
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2023 THE COR PUBLIC INFRASTRUCTURE ANALYSIS

CITY OF RAMSEY, MINNESOTA

FIGURE 11 - STORM UTILITIES

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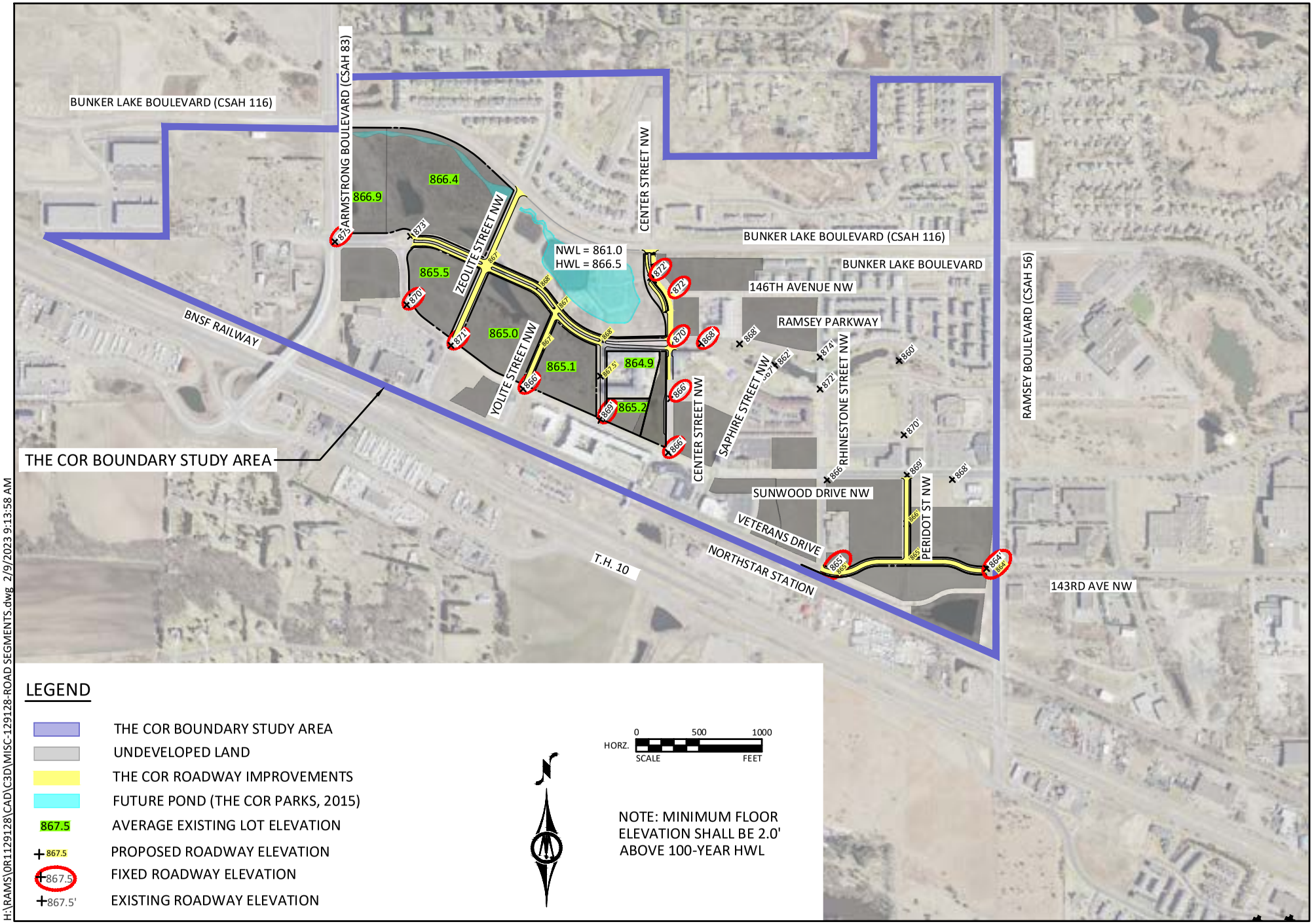
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2023 THE COR PUBLIC INFRASTRUCTURE ANALYSIS

CITY OF RAMSEY, MINNESOTA

FIGURE 12 - ROADWAY GRADING PLAN

FEBRUARY 2023



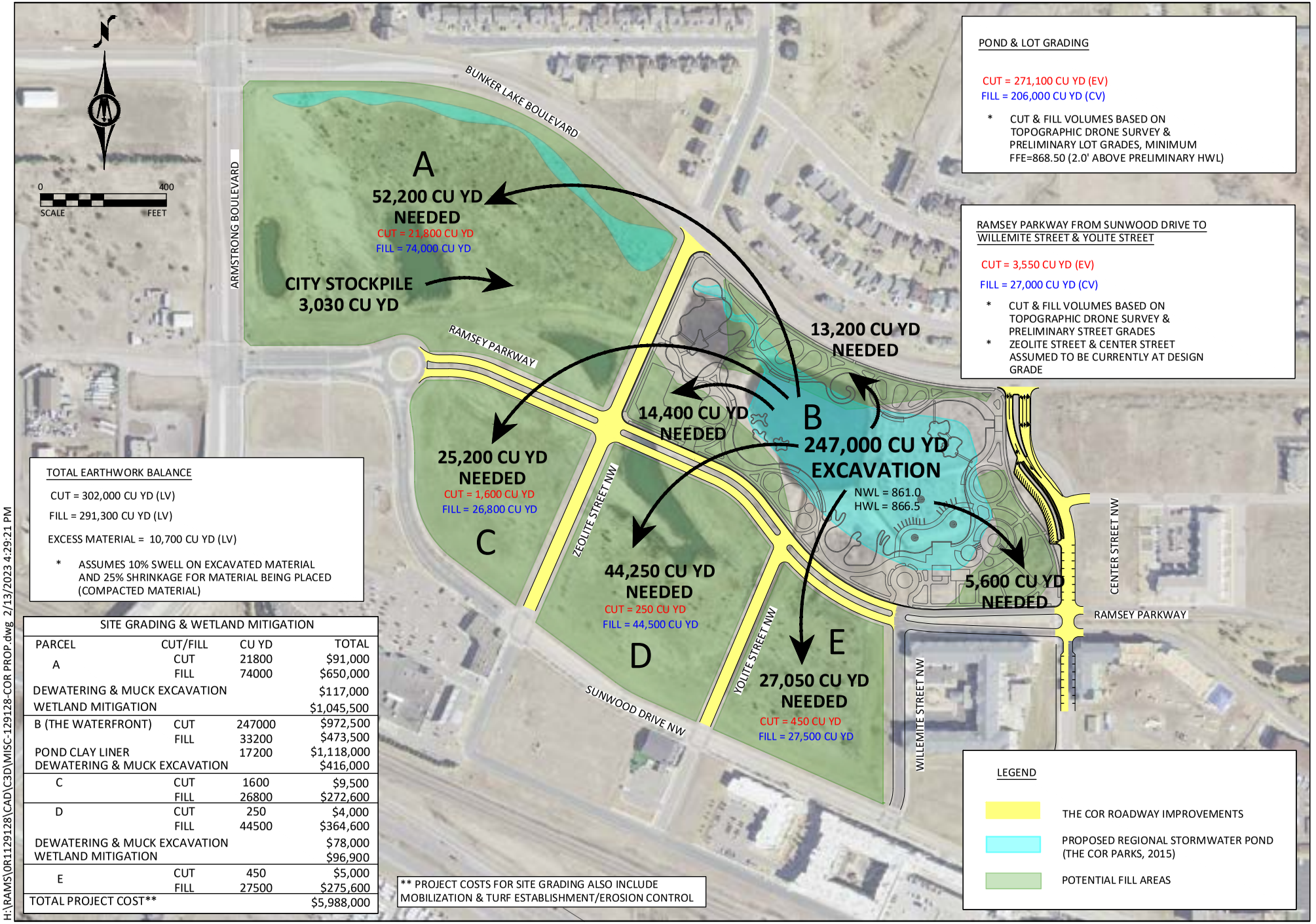
LEGEND

- THE COR BOUNDARY STUDY AREA
- UNDEVELOPED LAND
- THE COR ROADWAY IMPROVEMENTS
- FUTURE POND (THE COR PARKS, 2015)
- 867.5 — AVERAGE EXISTING LOT ELEVATION
- +867.5 — PROPOSED ROADWAY ELEVATION
- +867.5 — FIXED ROADWAY ELEVATION
- +867.5' — EXISTING ROADWAY ELEVATION

HORZ. SCALE: 0, 500, 1000 FEET

NOTE: MINIMUM FLOOR ELEVATION SHALL BE 2.0' ABOVE 100-YEAR HWL

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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

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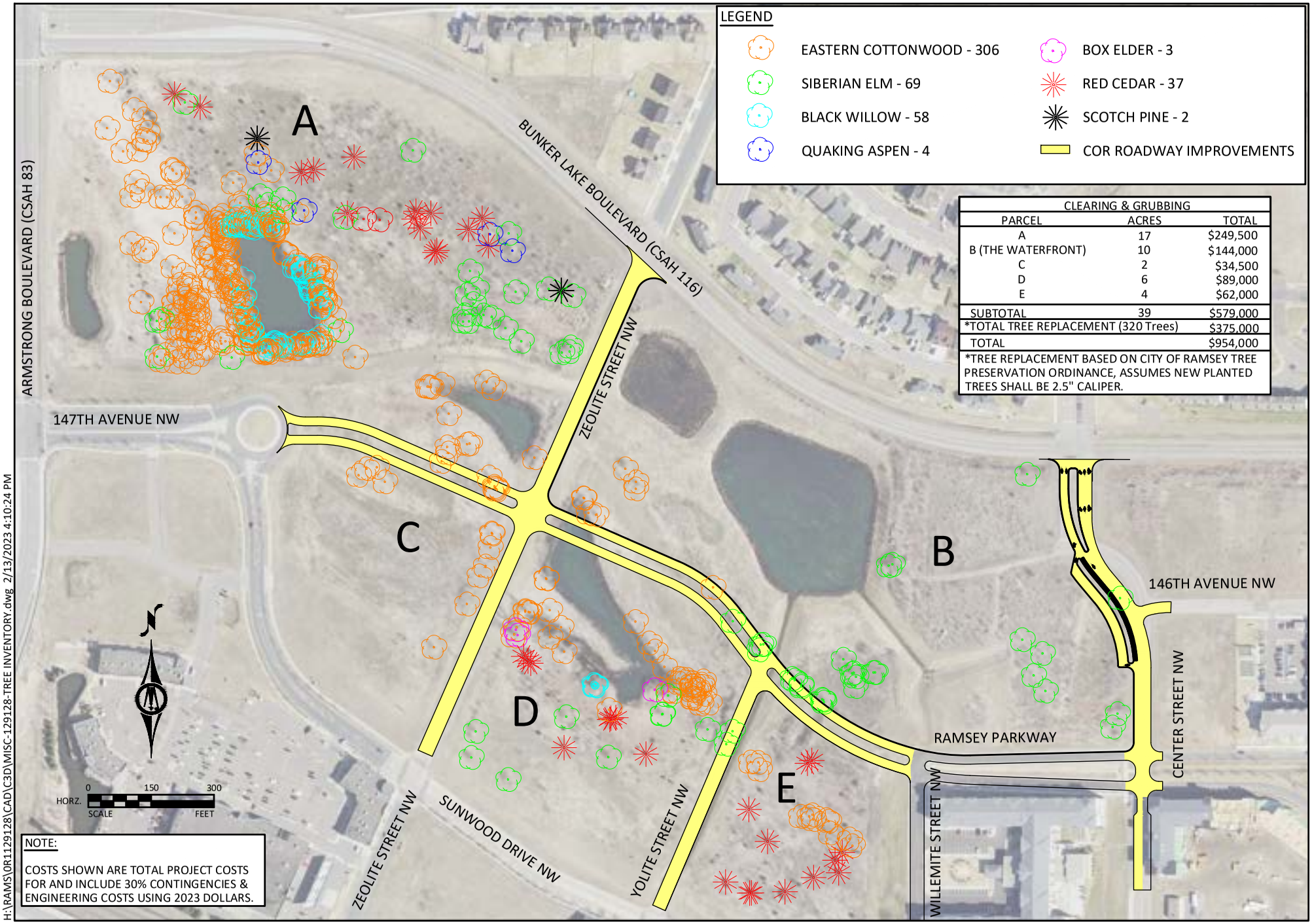
2023 THE COR PUBLIC INFRASTRUCTURE ANALYSIS

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

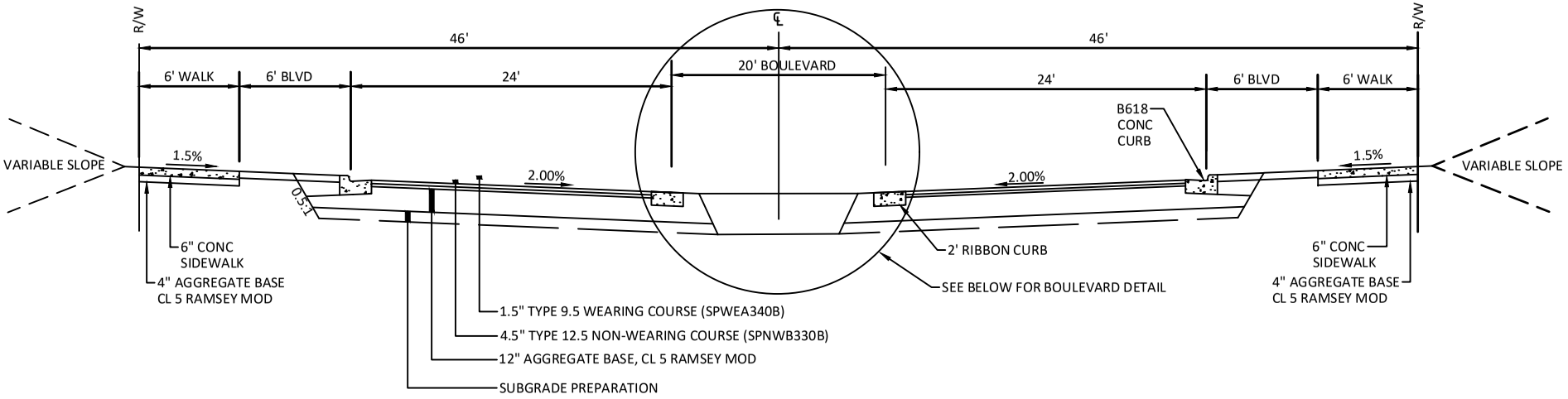
*TREE REPLACEMENT BASED ON CITY OF RAMSEY TREE PRESERVATION ORDINANCE, ASSUMES NEW PLANTED TREES SHALL BE 2.5" CALIPER.

NOTE:

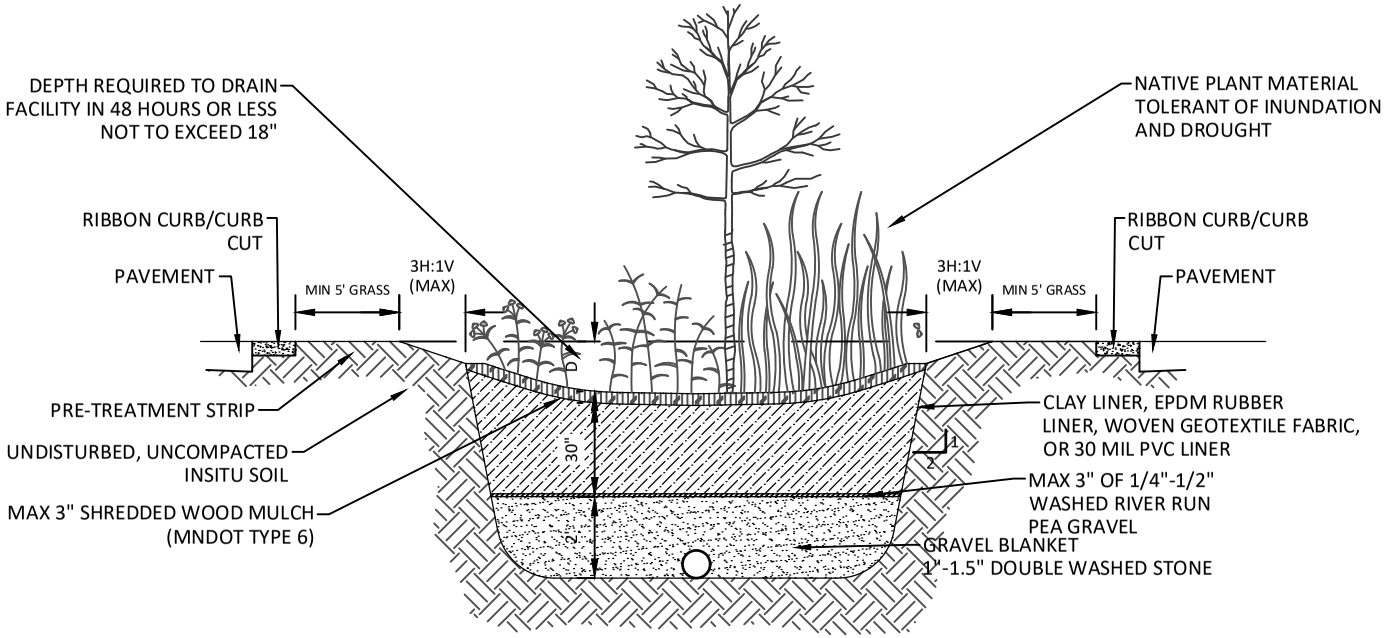
COSTS SHOWN ARE TOTAL PROJECT COSTS FOR AND INCLUDE 30% CONTINGENCIES & ENGINEERING COSTS USING 2023 DOLLARS.

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SEGMENT A / RAMSEY PARKWAY

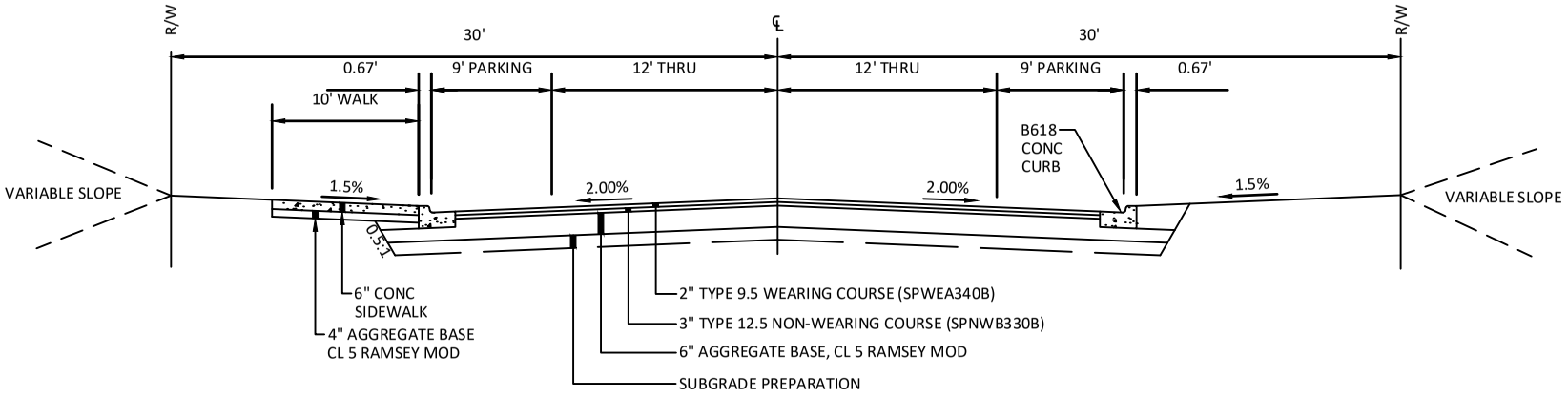


BIORETENTION FACILITY - RAMSEY PARKWAY BOULEVARD

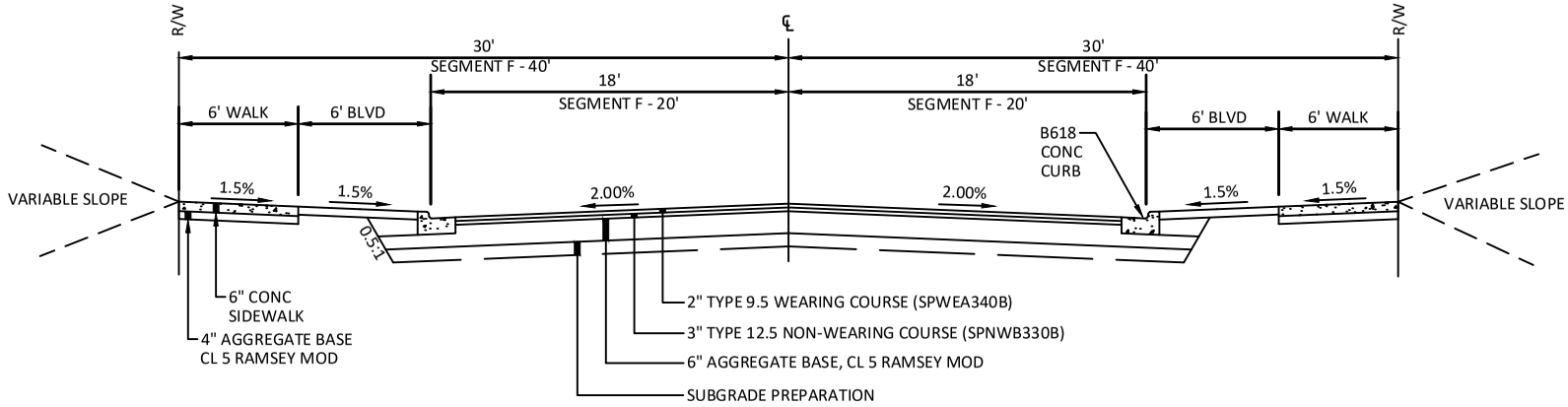


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SEGMENT B-1 / CENTER STREET

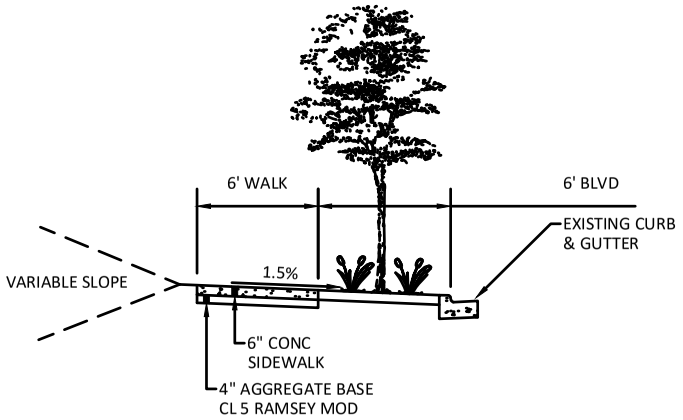


SEGMENT E, F, H, I/YOLITE STREET NW, ZEOLITE STREET NW VETERANS DRIVE, & PERIDOT STREET NW

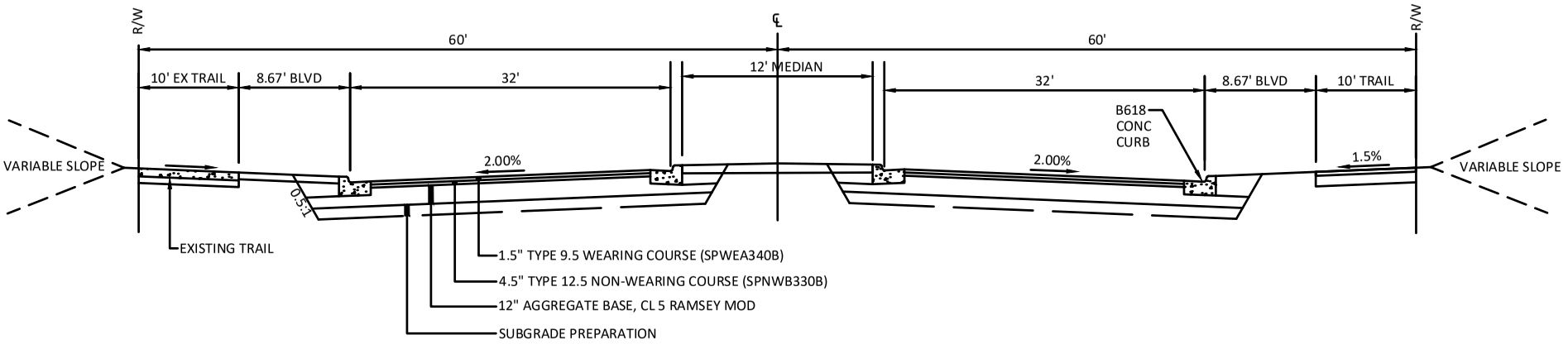


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SEGMENT D / SUNWOOD DRIVE BOULEVARD (LANDSCAPING IMPROVEMENTS)



SEGMENT G / BUNKER LAKE BOULEVARD (BY ANOKA COUNTY)



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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
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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
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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
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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
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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**				

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
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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

1.1 Site / Project Description 1

1.2 Scope of Services 1

2.0 EXPLORATION PROGRAM RESULTS 1

2.1 Exploration Scope 1

2.2 Subsurface Conditions 2

2.3 Groundwater Conditions 2

2.4 Laboratory Test Program 3

3.0 CLOSURE 3

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%

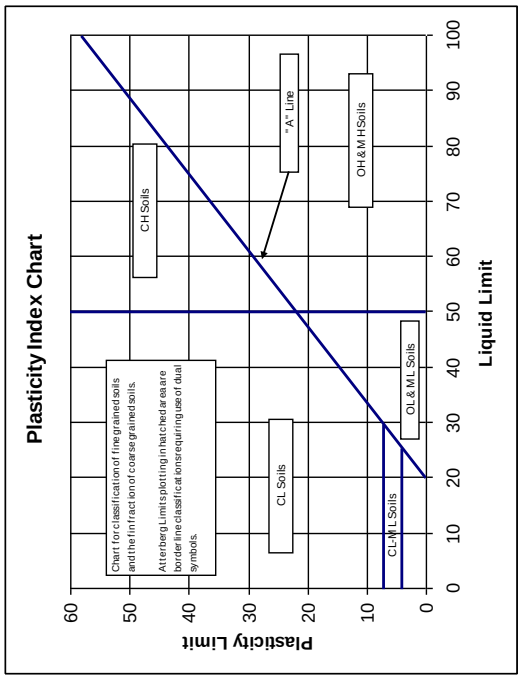
PARTICLE SIZES

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 POORLY GRADED SAND WITH SILT, (SP-SM) light brown, medium to coarse grained, moist, loose to medium dense, trace gravel (Glacial Outwash)	863.5	SS 3	89	2-4-3 (7)							
5		▽		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.

NTI LOG - GENERAL (USE THIS ONE) - NTI-2017-09-14.GDT - 6/27/18 16:45 - R:\RAMSEY\1-PROJECTS\2018 PROJECTS\LAKE FRONT_GEO_18.MSP_05470.000\LAKE FRONT SOILS.GPJ

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.

NTI LOG - GENERAL (USE THIS ONE) - NTI-2017-09-14.GDT - 6/27/18 16:45 - R:\RAMSEY\1-PROJECTS\2018 PROJECTS\LAKE FRONT_GEO_18.MSP_05470.000\LAKE FRONT SOILS.GPJ

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)							
			SS 2	100	5-7-7 (14)							
		NOTE: Slight iron oxide staining at 1.5 feet.	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.

NTI LOG - GENERAL (USE THIS ONE) - NTI-2017-09-14.GDT - 6/27/18 16:45 - R:\RAMSEY1\-PROJECTS\2018 PROJECTS\LAKE FRONT_GEO_18.MSP_05470.000\LAKE FRONT SOILS.GPJ

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.

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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.										

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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.

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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.

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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		SS 2	89	3-3-3 (6)							
		3.0 (Fill)	866.0	SS 3	78	3-4-4 (8)							3
5		POORLY GRADED SAND WITH SILT, (SP-SM) light brown, medium to coarse grained, moist, loose, trace gravel, iron oxide staining (Glacial Outwash)		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.

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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)							
4.5												
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	100	3-2-3 (5)							
10		▽ NOTE: Soil coarse grained at 11.0 feet.	SS 6	100	3-4-4 (8)							
14.5			SS 7	89	4-5-5 (10)							7

Bottom of borehole at 14.5 feet.

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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.

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Appendix

FIGURE 1: HISTORICAL IMAGERY

DELINEATED AQUATIC RESOURCES REPORT

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.

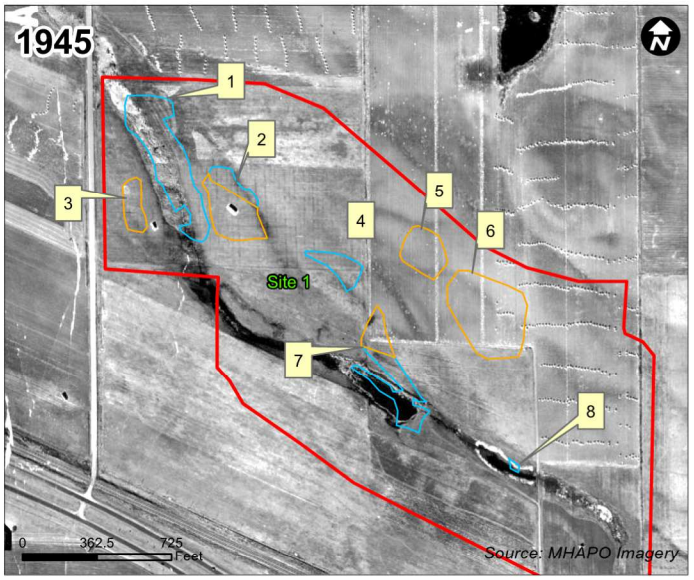
Wetlands 3, 5 and 6, and portions of Wetlands 2 and 7 are ponds excavated in upland and were not constructed with the intent of creating a wetland. These wetlands were observed to have distinct slopes and were excavated to be significantly lower than the surrounding area. Wetland 3 was constructed in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

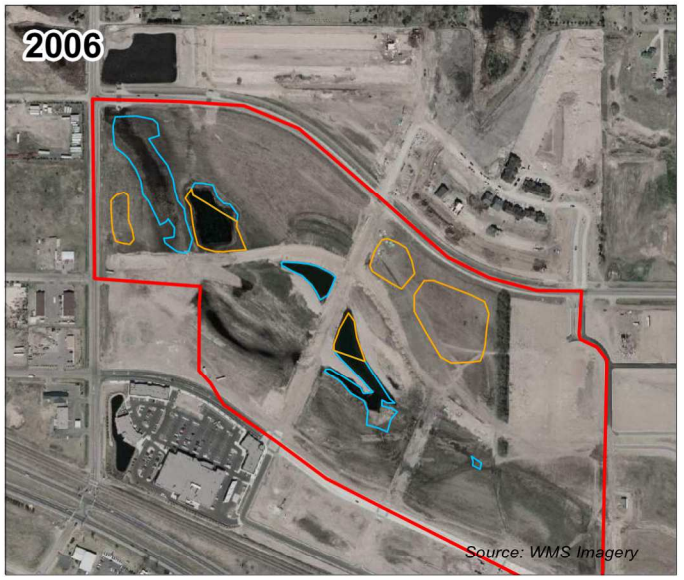
Figure 1: Historical Imagery 1945-2021

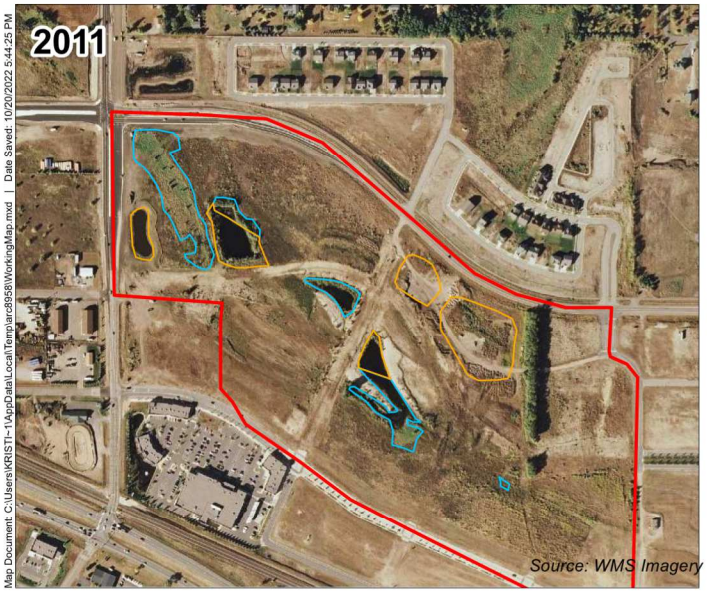
October 2022

BOLTON & MENK
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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

Real People. Real Solutions.

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Exhibit A: Site Location Map
Exhibit B: Site Topography – 2 Foot LiDAR Contours
Exhibit C: National Wetlands Inventory
Exhibit D: Public Waters Inventory
Exhibit E: Anoka County Soil Survey
Exhibit F: Delineated Aquatic Resources
Exhibit G: Delineation Data Sheets

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.

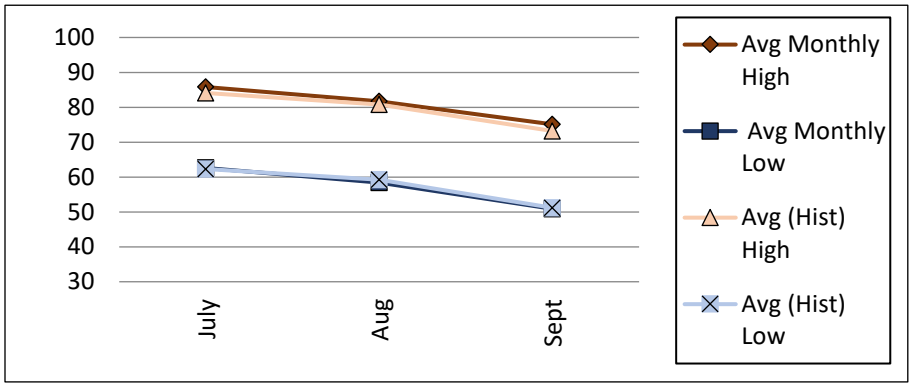
Exhibit F are the site maps showing the delineated aquatic resources.

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.

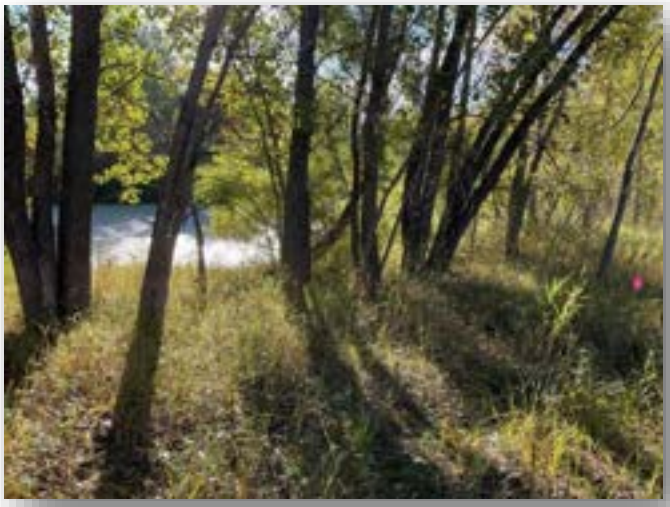
The field investigation found the site has met all three wetland indicators and this portion of the wetland should be considered a palustrine emergent semipermanently flooded/palustrine forested

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

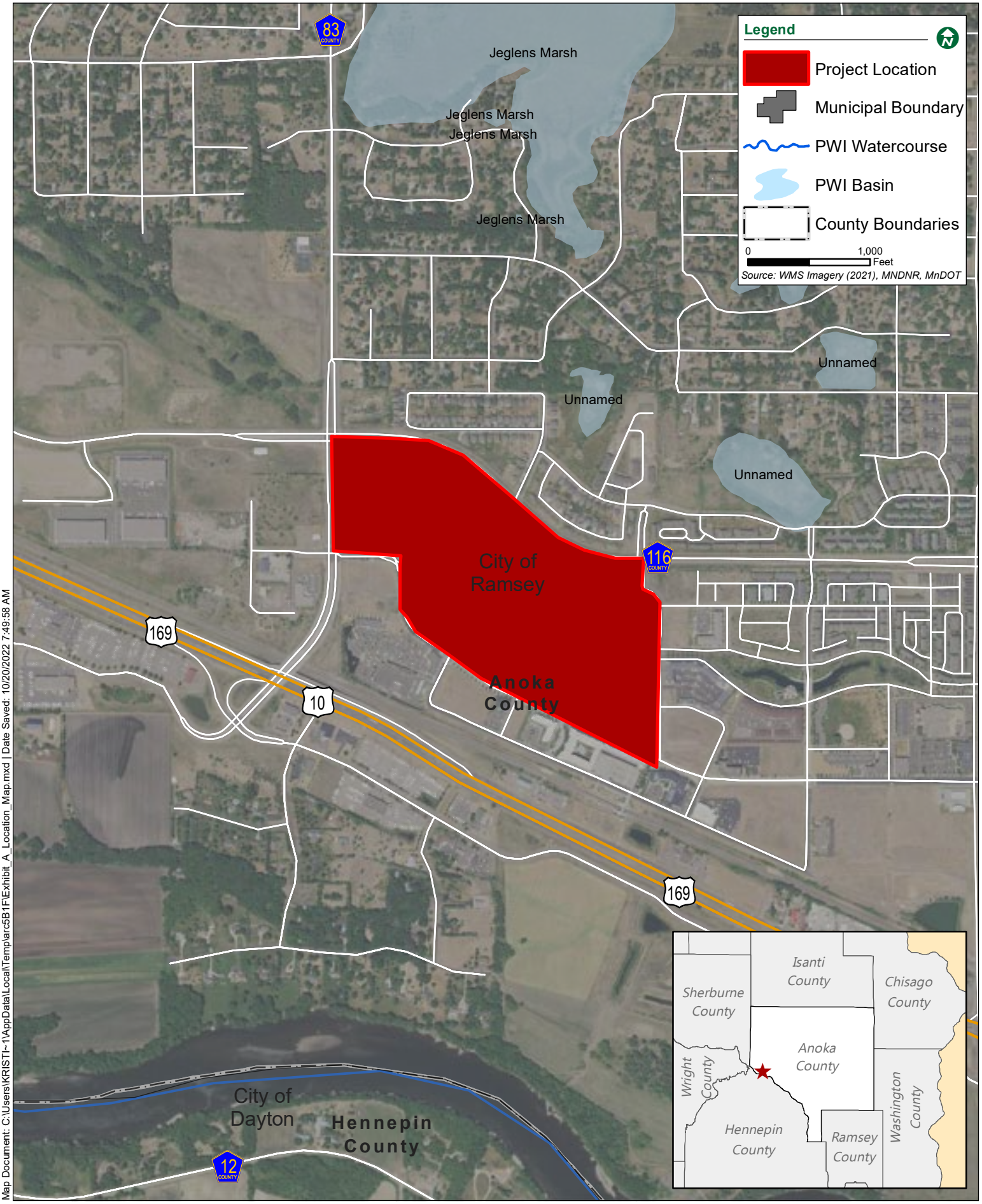
**size measured within study area.*
^wetland type within study area

Sincerely,
BOLTON & MENK, INC.



Kristina Bloomquist, PWS
Certified Wetland Delineator, No. 1340

APPENDIX



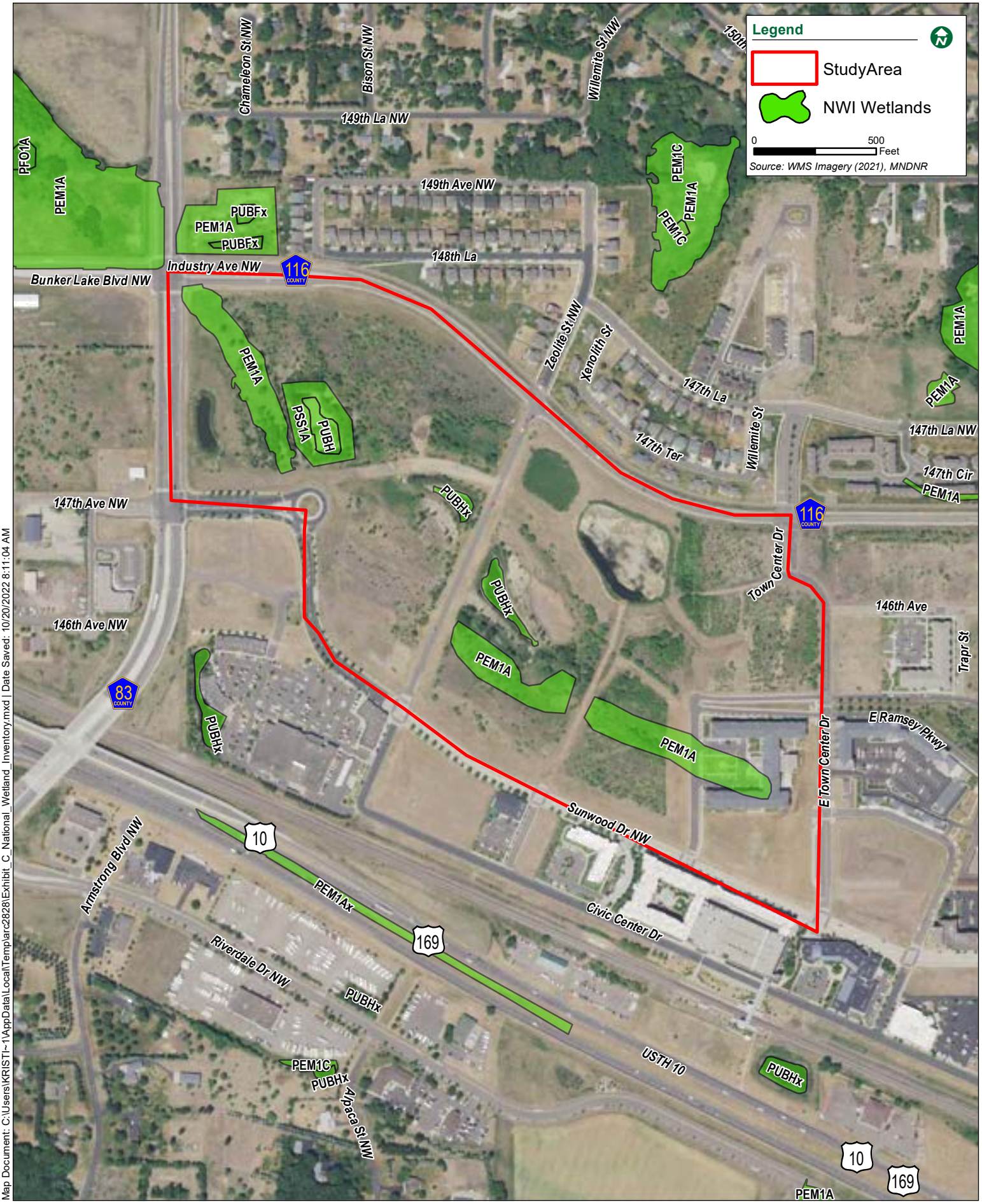
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Exhibit C: National Wetland Inventory

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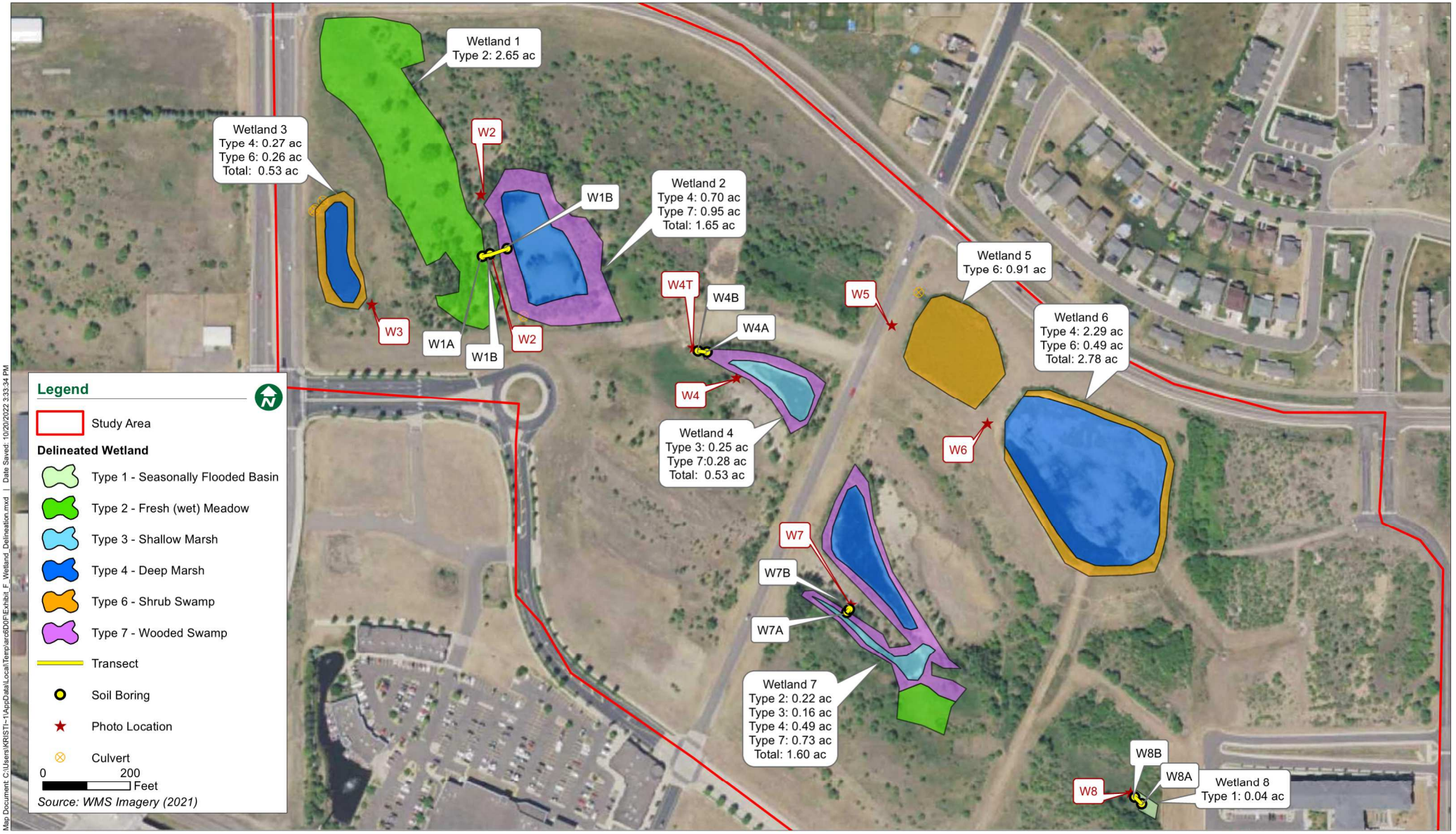


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Symbol	Name	Slopes	Hydric Rating	Hydric Class
Dp	Duelm loamy sand	0-2%	No	7%
D67A	Hubbard loamy sand	0-2%	No	1%
Is	Isan sandy loam	0-1%	Yes	93%

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WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: _____ City/County: _____ Sampling Date: _____

Applicant/Owner: _____ State: _____ Sampling Point: _____

Investigator(s): _____ Section, Township, Range: _____

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR or MLRA): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ 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 _____ Hydric Soil Present? Yes _____ No _____ Wetland Hydrology Present? Yes _____ No _____	**Is the Sampled Area within a Wetland?** **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: _____

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
	_____ = Total Cover		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

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: _____

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

[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: _____ City/County: _____ Sampling Date: _____

Applicant/Owner: _____ State: _____ Sampling Point: _____

Investigator(s): _____ Section, Township, Range: _____

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR or MLRA): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ 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 _____ Hydric Soil Present? Yes _____ No _____ Wetland Hydrology Present? Yes _____ No _____	**Is the Sampled Area within a Wetland?** **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: _____

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
	_____ = Total Cover		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

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: _____

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

[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: _____ City/County: _____ Sampling Date: _____

Applicant/Owner: _____ State: _____ Sampling Point: _____

Investigator(s): _____ Section, Township, Range: _____

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR or MLRA): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ 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 _____ Hydric Soil Present? Yes _____ No _____ Wetland Hydrology Present? Yes _____ No _____	**Is the Sampled Area within a Wetland?** **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: _____

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
	_____ = Total Cover		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

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: _____

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

[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: _____ City/County: _____ Sampling Date: _____

Applicant/Owner: _____ State: _____ Sampling Point: _____

Investigator(s): _____ Section, Township, Range: _____

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR or MLRA): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ 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 _____ Hydric Soil Present? Yes _____ No _____ Wetland Hydrology Present? Yes _____ No _____	**Is the Sampled Area within a Wetland?** **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: _____

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
	_____ = Total Cover		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

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: _____

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

[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: _____ City/County: _____ Sampling Date: _____

Applicant/Owner: _____ State: _____ Sampling Point: _____

Investigator(s): _____ Section, Township, Range: _____

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR or MLRA): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ 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 _____ Hydric Soil Present? Yes _____ No _____ Wetland Hydrology Present? Yes _____ No _____	**Is the Sampled Area within a Wetland?** **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: _____

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
	_____ = Total Cover		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

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: _____

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

[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: _____ City/County: _____ Sampling Date: _____

Applicant/Owner: _____ State: _____ Sampling Point: _____

Investigator(s): _____ Section, Township, Range: _____

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR or MLRA): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ 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 _____ Hydric Soil Present? Yes _____ No _____ Wetland Hydrology Present? Yes _____ No _____	**Is the Sampled Area within a Wetland?** **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: _____

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
	_____ = Total Cover		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

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: _____

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

[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: _____ City/County: _____ Sampling Date: _____

Applicant/Owner: _____ State: _____ Sampling Point: _____

Investigator(s): _____ Section, Township, Range: _____

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR or MLRA): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ 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 _____ Hydric Soil Present? Yes _____ No _____ Wetland Hydrology Present? Yes _____ No _____	**Is the Sampled Area within a Wetland?** **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: _____

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
	_____ = Total Cover		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

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: _____

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

[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: _____ City/County: _____ Sampling Date: _____

Applicant/Owner: _____ State: _____ Sampling Point: _____

Investigator(s): _____ Section, Township, Range: _____

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR or MLRA): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ 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 _____ Hydric Soil Present? Yes _____ No _____ Wetland Hydrology Present? Yes _____ No _____	**Is the Sampled Area within a Wetland?** **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: _____

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
	_____ = Total Cover		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

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: _____

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

[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: _____ City/County: _____ Sampling Date: _____

Applicant/Owner: _____ State: _____ Sampling Point: _____

Investigator(s): _____ Section, Township, Range: _____

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR or MLRA): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ 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 _____ Hydric Soil Present? Yes _____ No _____ Wetland Hydrology Present? Yes _____ No _____	**Is the Sampled Area within a Wetland?** **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: _____

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
	_____ = Total Cover		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

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: _____

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

[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**)
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- ___ 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 _____

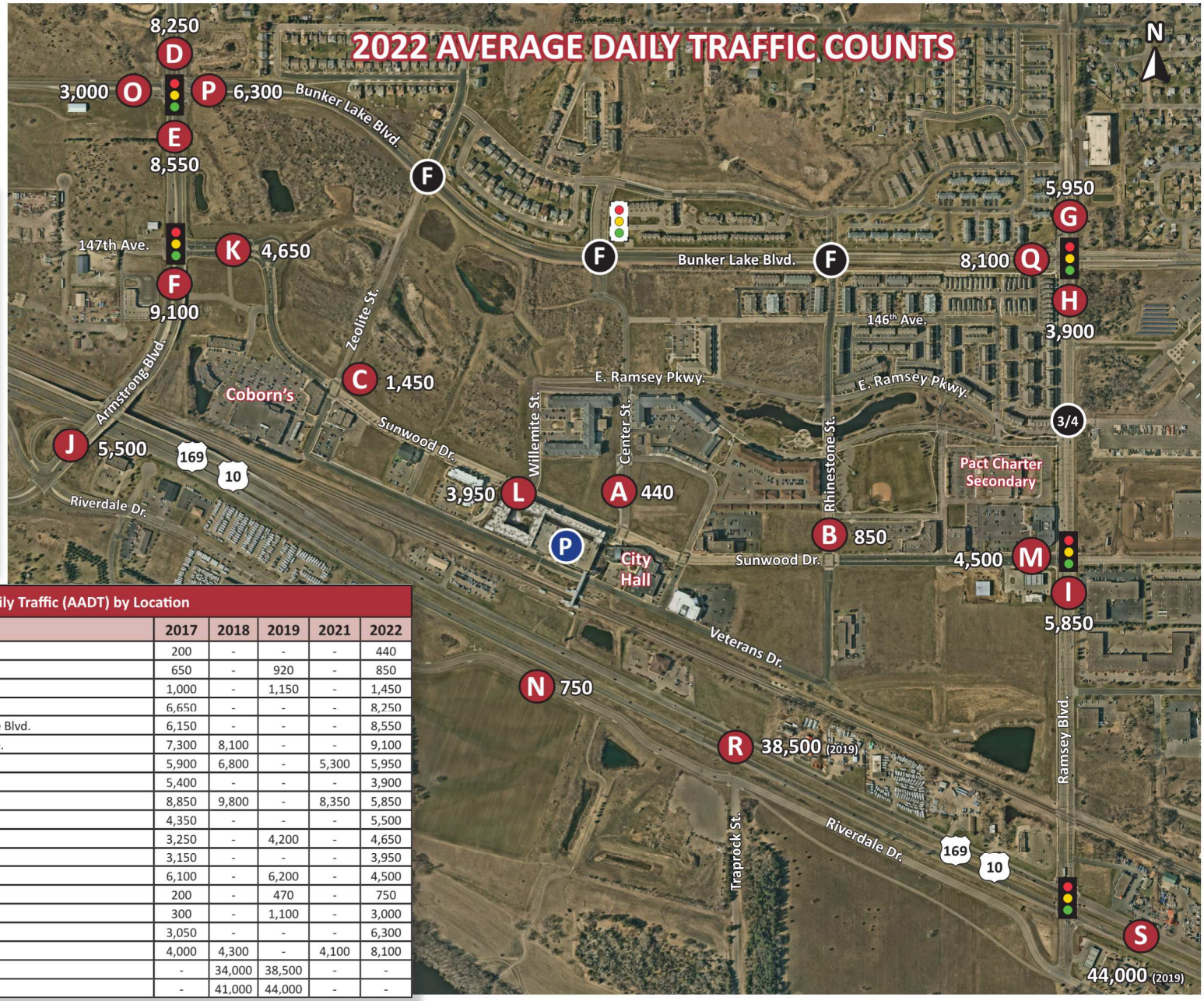
Remarks:

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

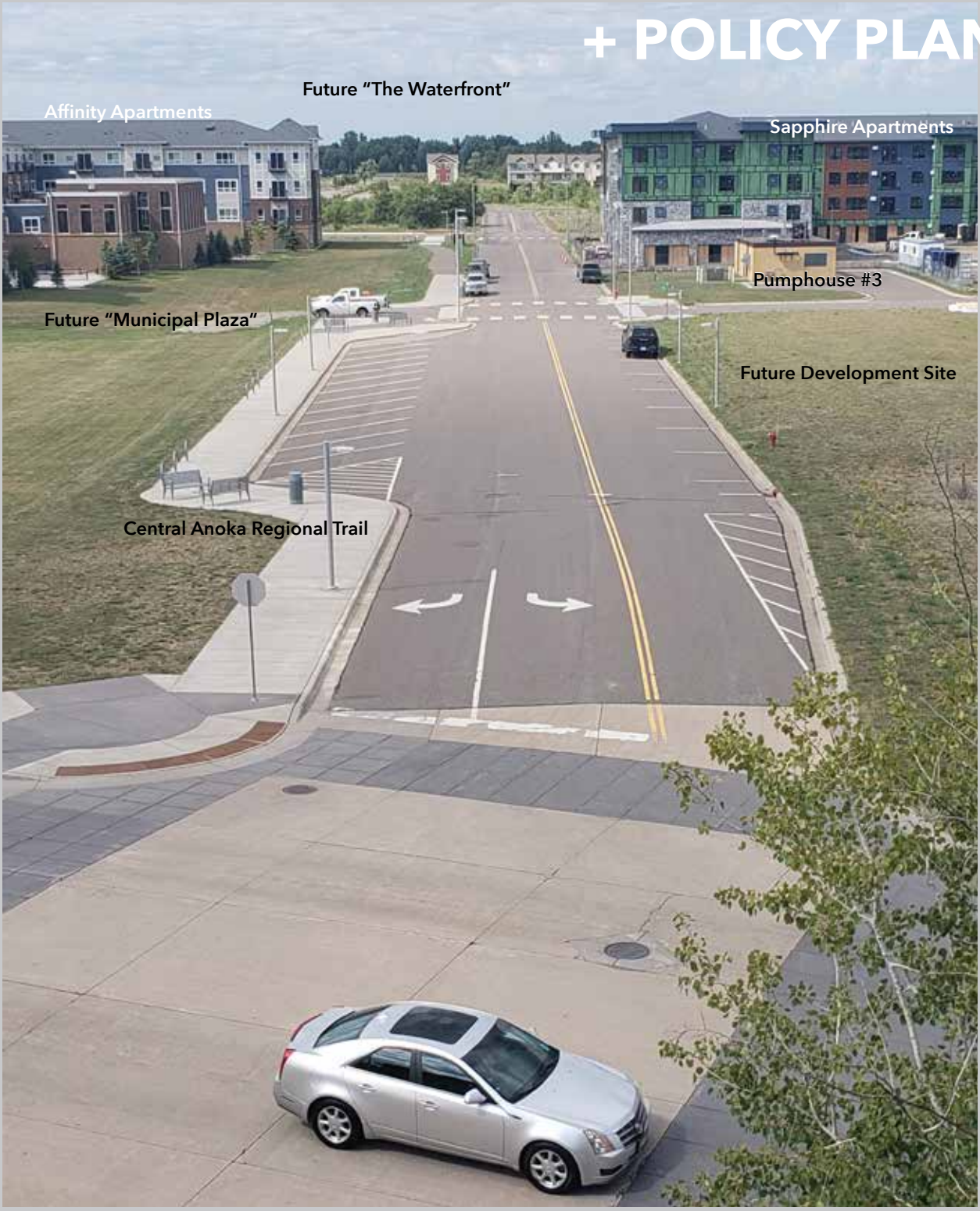


Annual Average Daily Traffic (AADT) by Location

	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

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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.

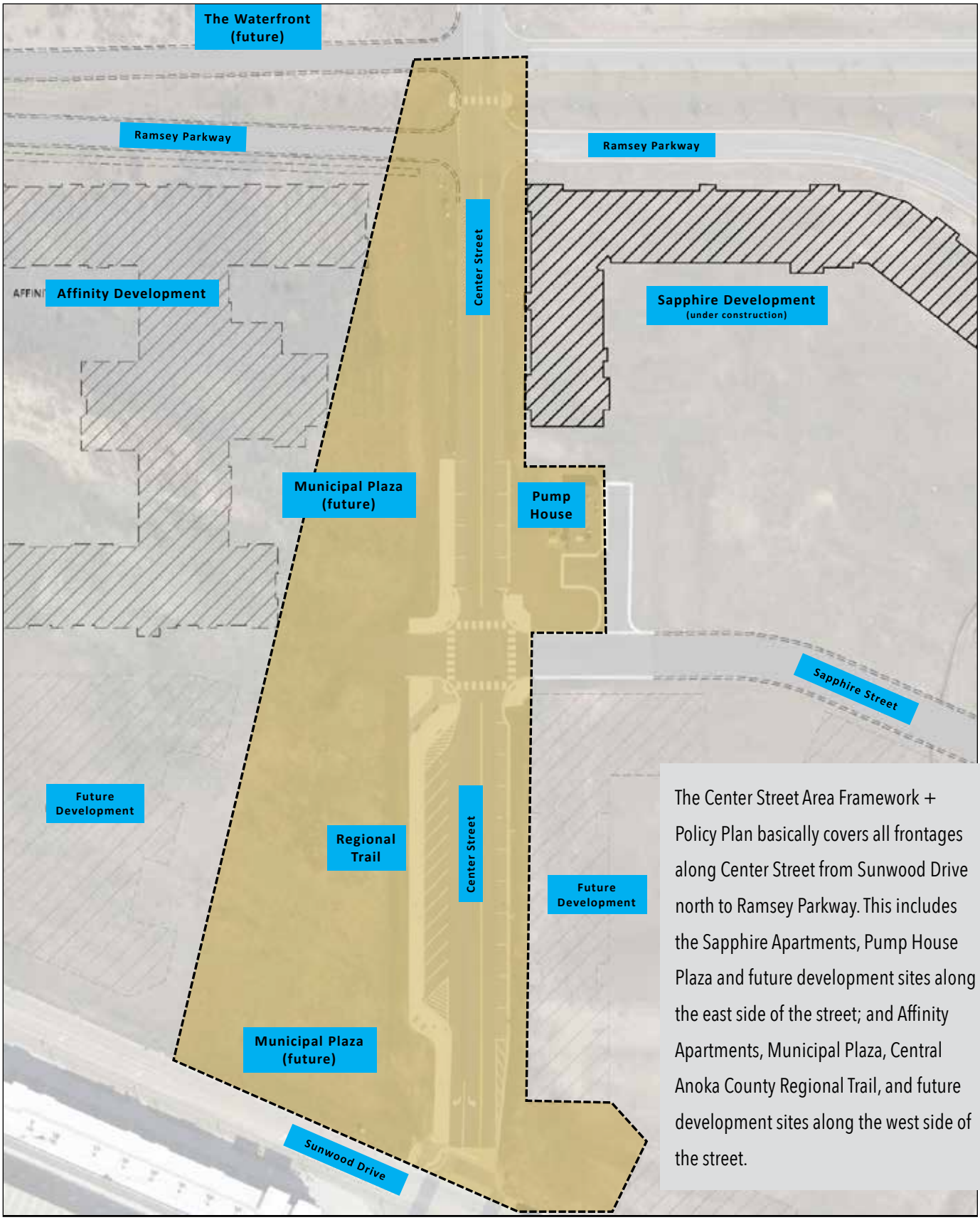


Outcomes + Deliverables

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).

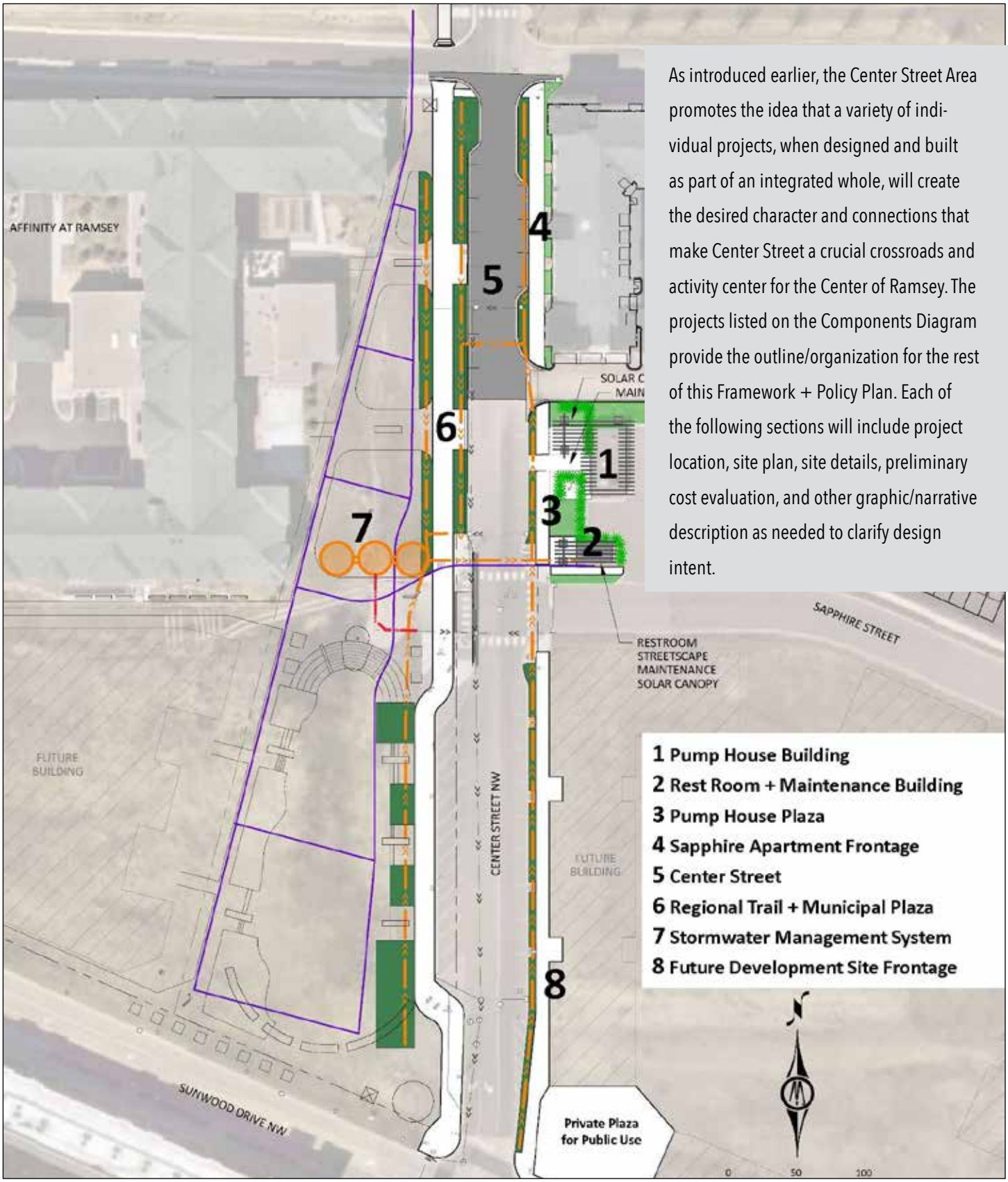
Further, the above referenced Scope of Services will develop the design for the Pump House facade and related architectural treatments, and result in a Design-build RFP that will provide City Council with the cost and contractor (upon approval) that can complete the 2020 Capital Improvement Project for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

Coverage Diagram



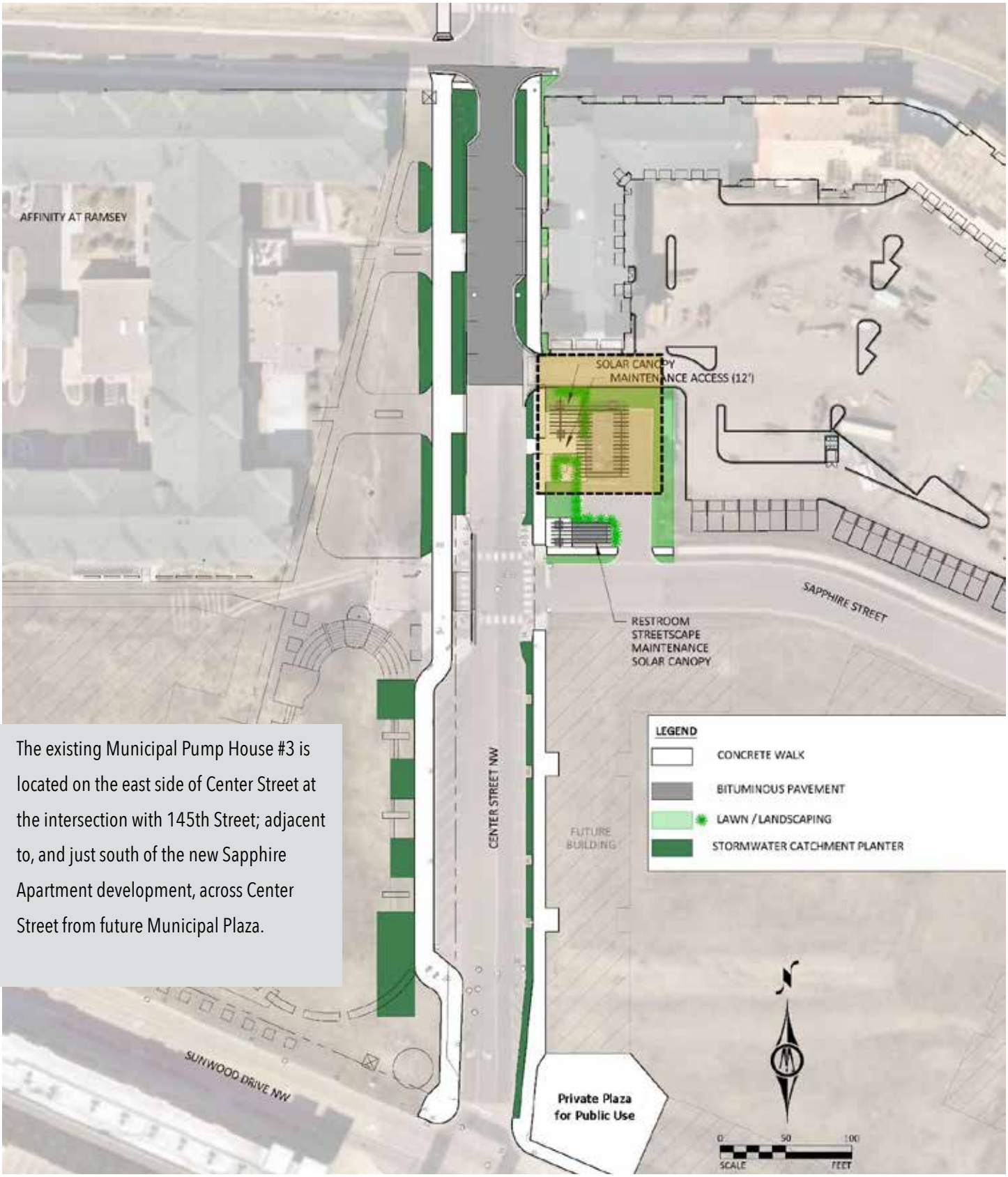
The Center Street Area Framework + Policy Plan basically covers all frontages along Center Street from Sunwood Drive north to Ramsey Parkway. This includes the Sapphire Apartments, Pump House Plaza and future development sites along the east side of the street; and Affinity Apartments, Municipal Plaza,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

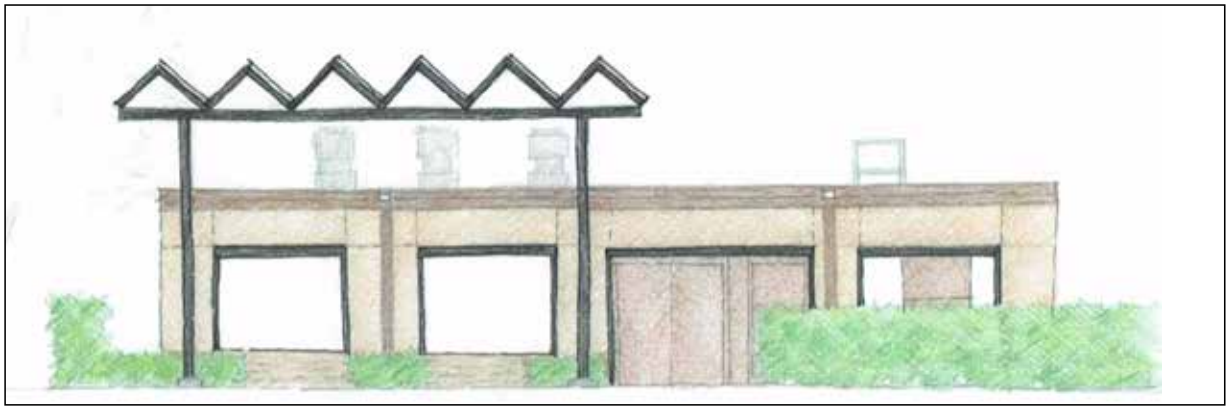
Note: the sequence of project design and construction will begin with Pump House Building facade improvements, followed by Pump House Plaza site and landscape improvements, and then additional project feasibility evaluation and detailed design related to the Rest Room + Maintenance Building.



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

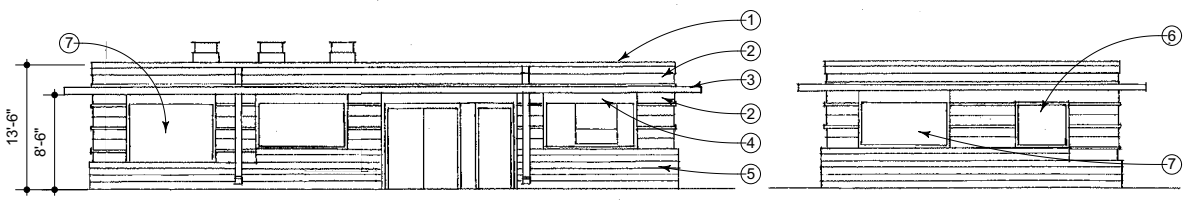


- Concept C: Limestone & brick

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

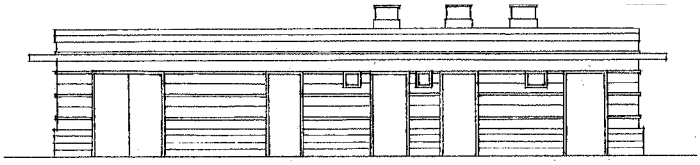
Pump House Building Project Elements

Concept C Developed Design.

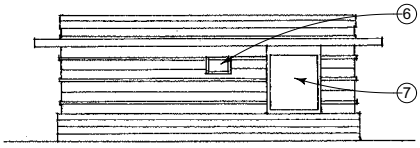


WEST ELEVATION

SOUTH ELEVATION



EAST ELEVATION



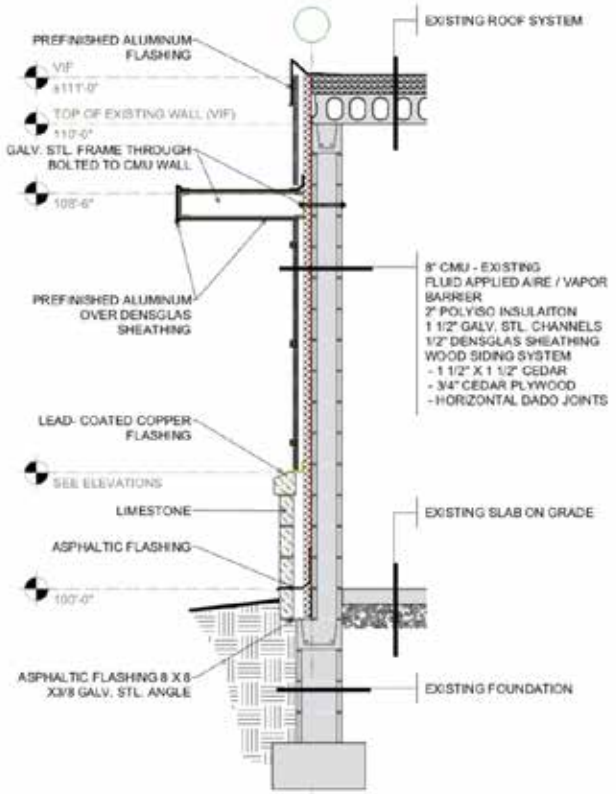
NORTH ELEVATION

BUILDING ELEVATIONS AT PUMP HOUSE- CONCEPT B.1

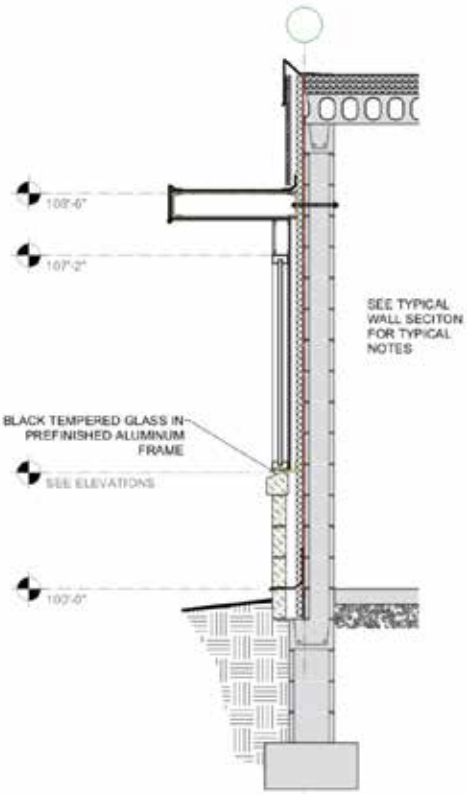
SCALE: 1/8" = 1'-0"

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

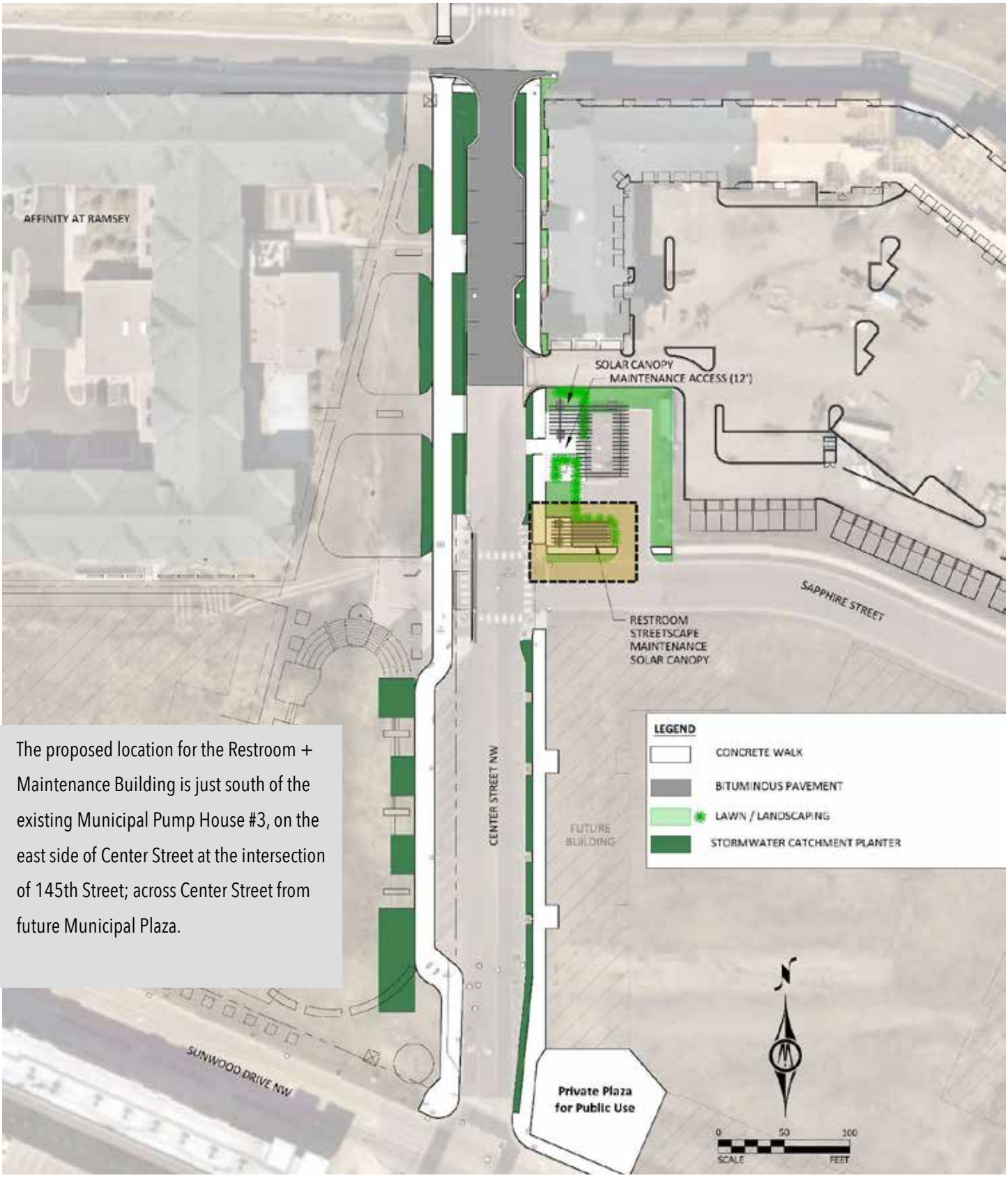


1 / A5.1 TYPICAL WALL SECTION
Scale: 1/2" = 1'-0"



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.

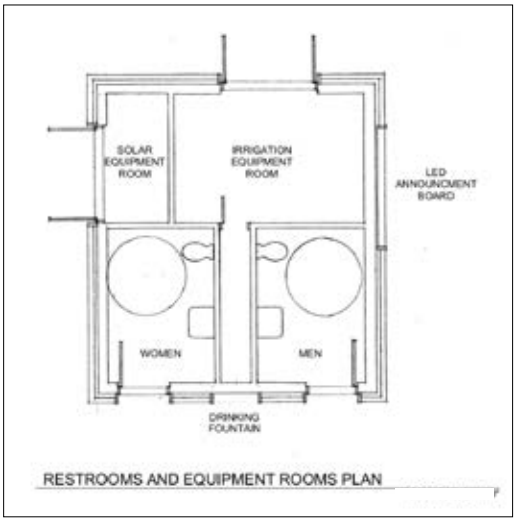


Restroom + Maintenance Bldg

PROJECT DESCRIPTION

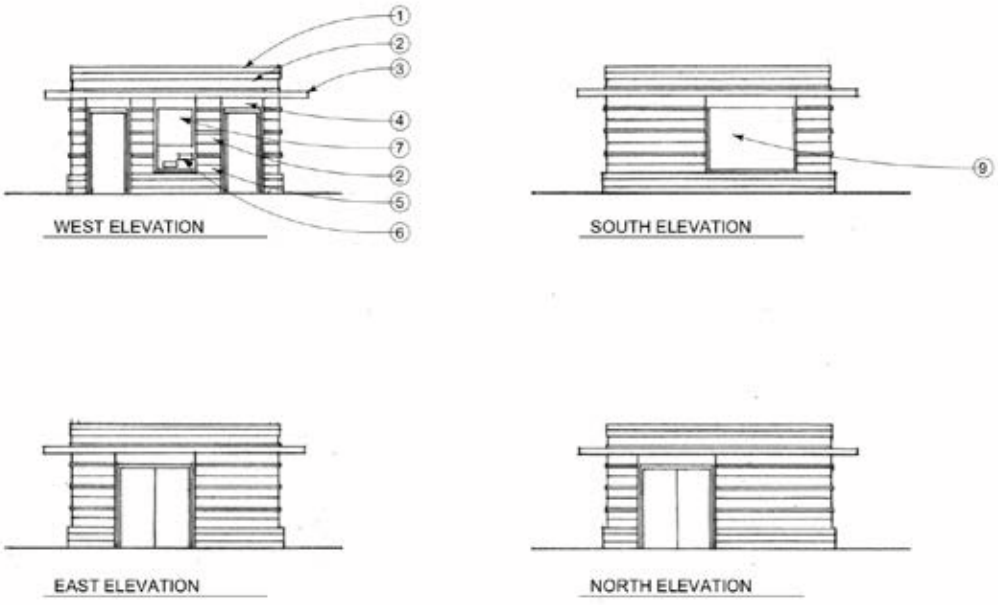
A proposed Restroom + Maintenance Building will be sided with the same materials as the adjacent Pump House #3. This building will support community activities at Center Street's Municipal Plaza. It will also house equipment for the plaza's irrigation system and for the solar array at the Pump House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



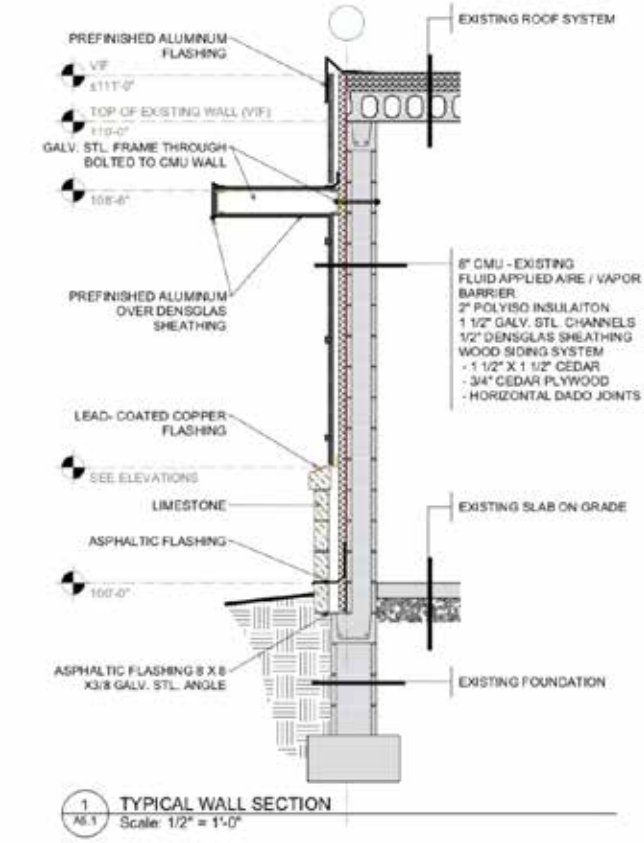
RESTROOMS AND EQUIPMENT ROOMS PLAN

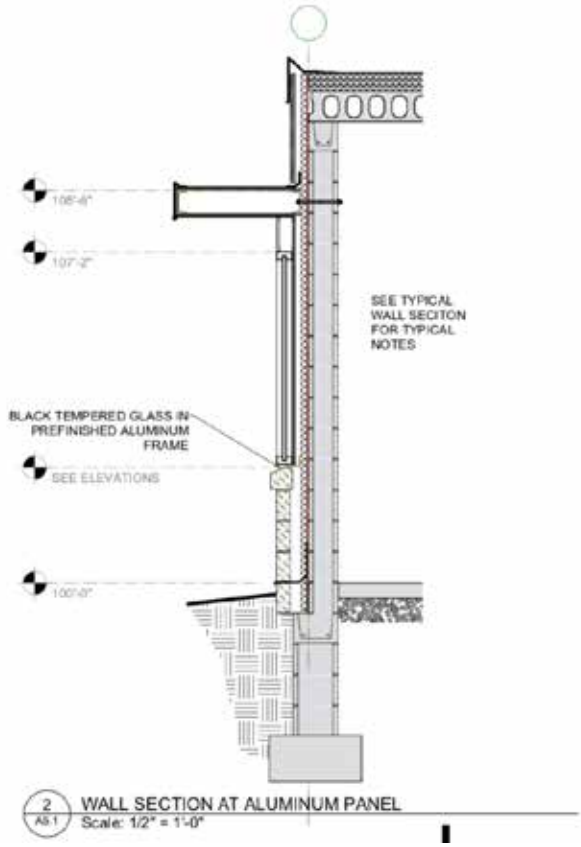
Restroom + Maintenance Bldg Project Elements



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





Restroom + Maintenance Bldg Project Elements

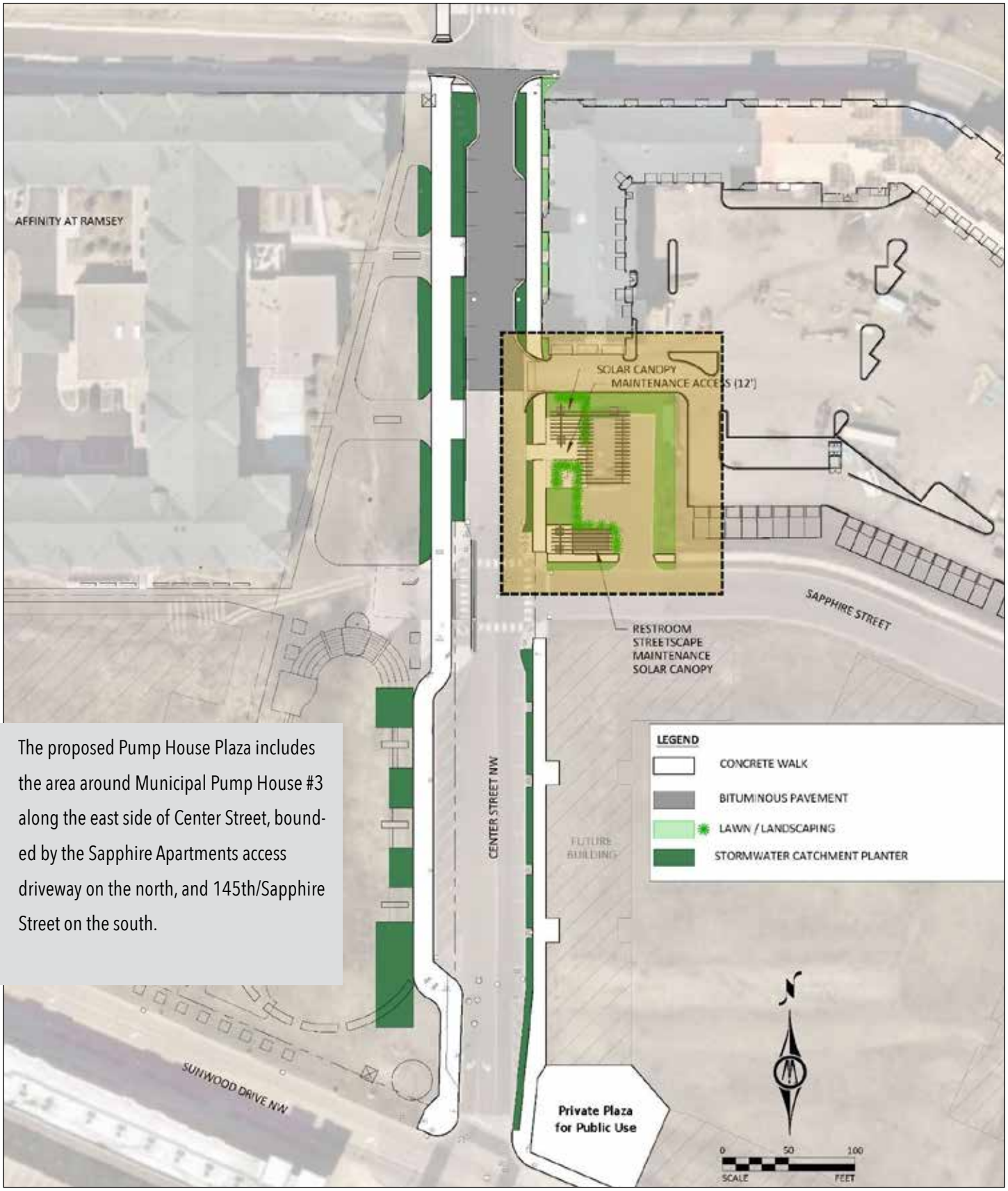




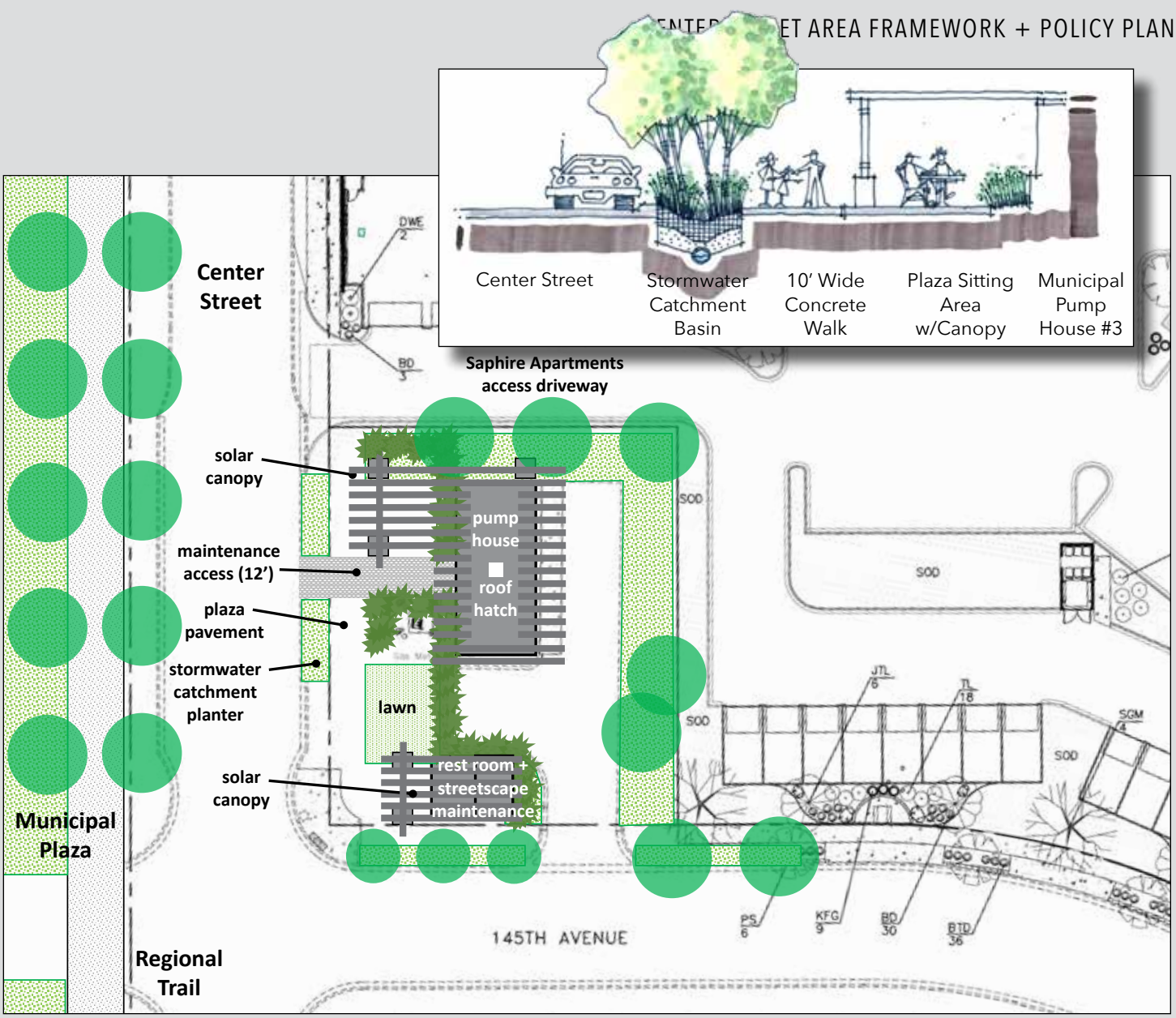


A LED Community Information Board is proposed for the Sapphire Street façade of the Restroom + Maintenance Building. This LED display panel can be used to announce events of community interest, to present the schedule for Municipal Plaza activities, display digital art, etc.(These images shows the capabilities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

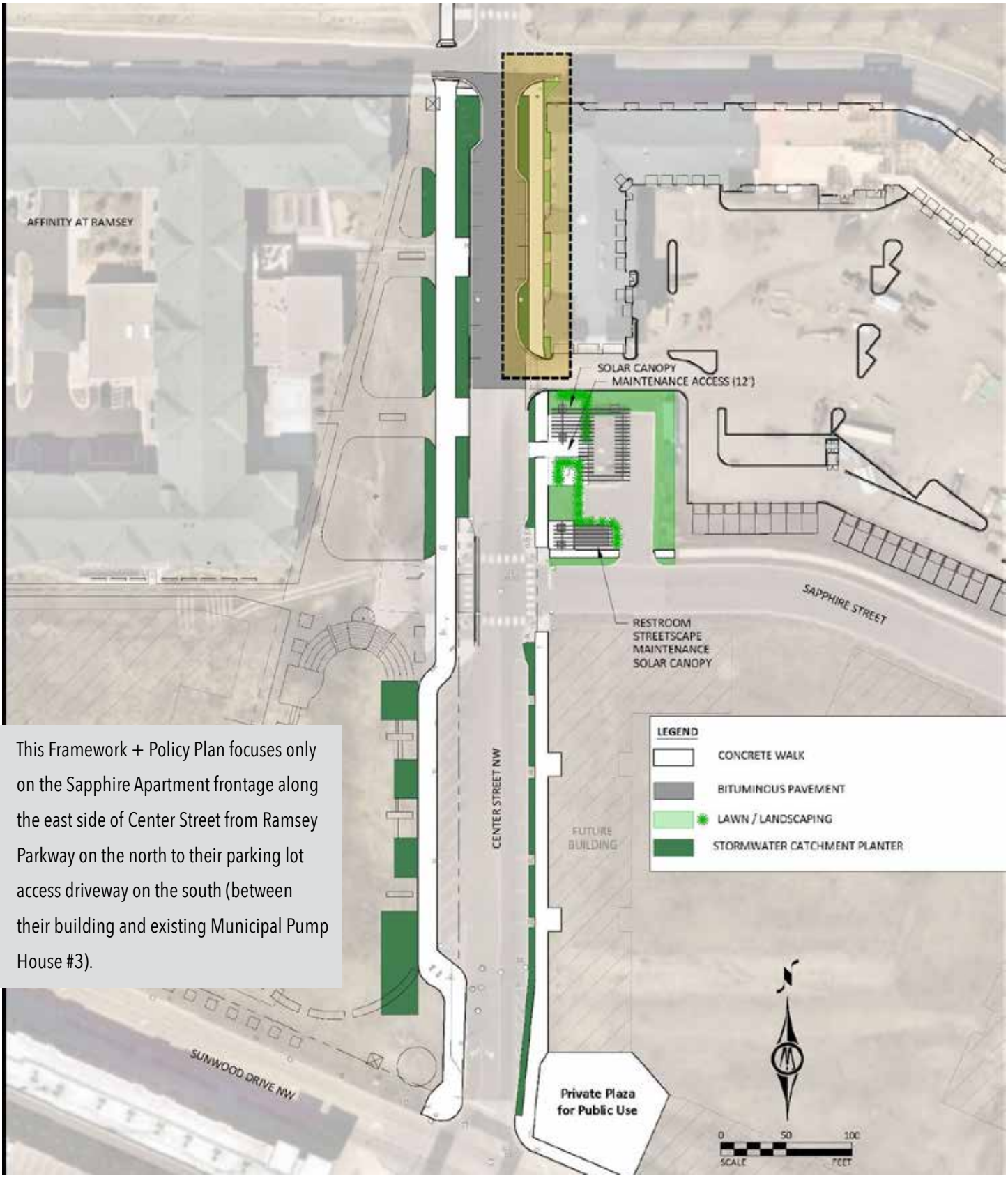
Landscape



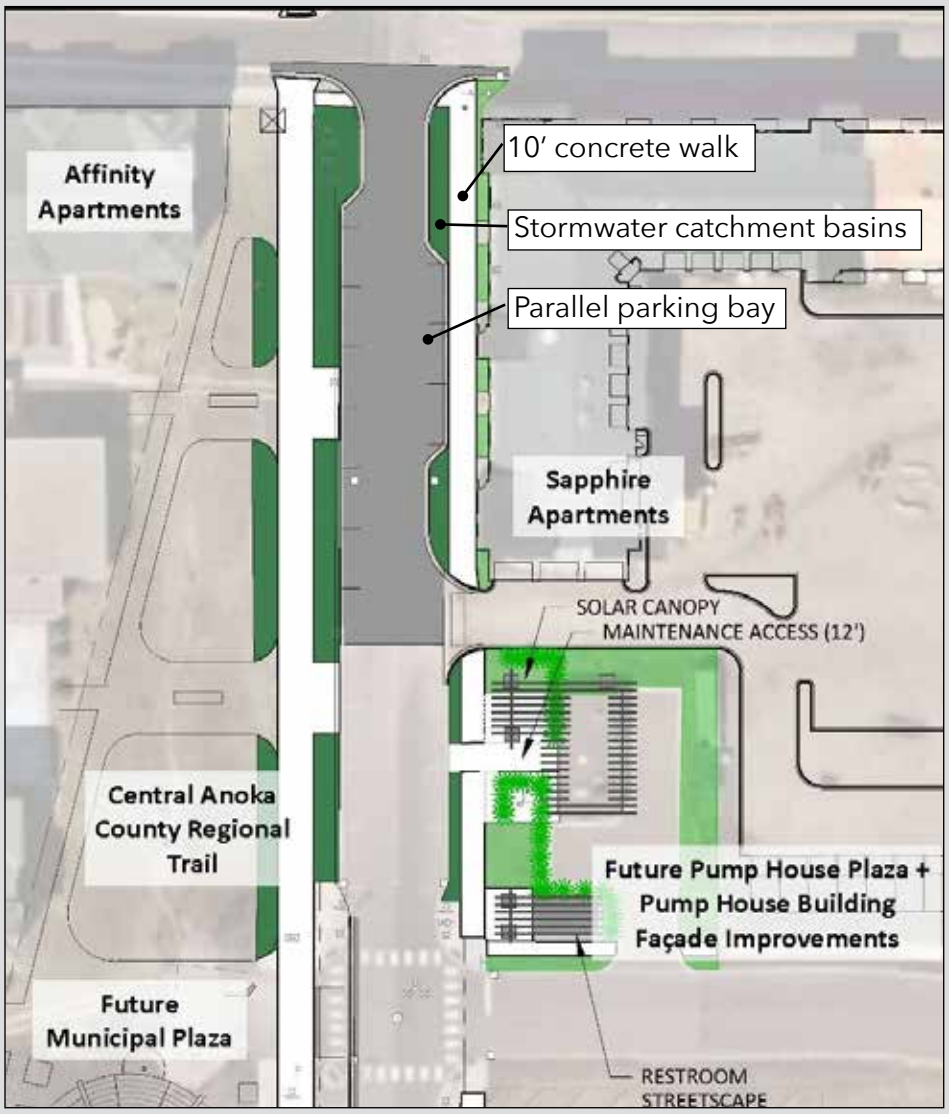



Landscape elements should reflect, or compliment, existing streetscape plantings, and further promote a consistent COR District identity and character; a simple landscape palette provides shade, seasonal color, screening (parking areas/utility boxes), and softens building elevations.

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

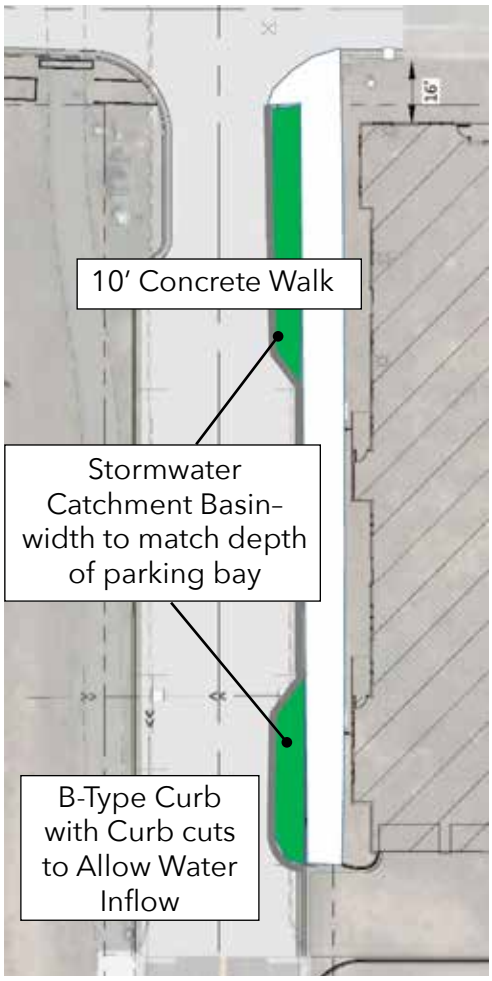
PROJECT DESCRIPTION

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.

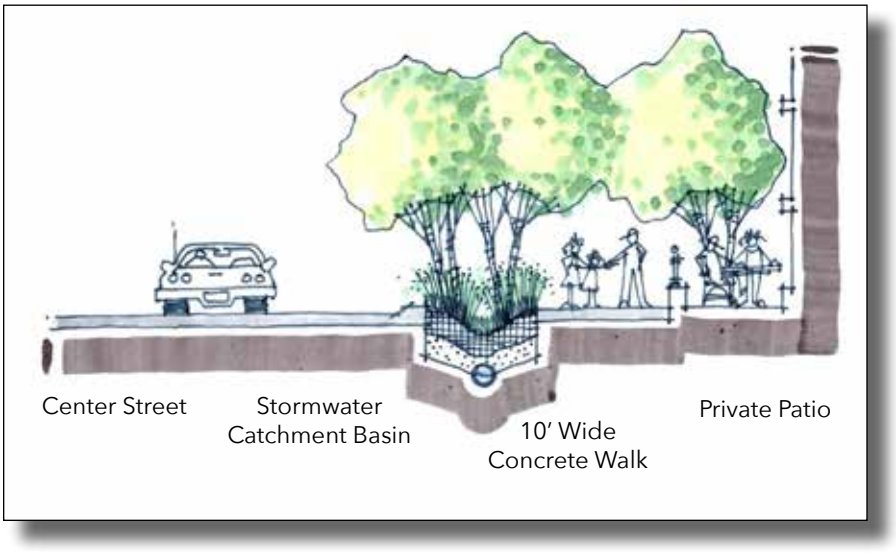
The Sapphire Apartment Frontage will be the first segment of public (pedestrian) realm to be completed, and as such plays an important role in establishing these elements as the benchmark for future projects along the east side of Center Street. A gracious walkway width (10'), connected stormwater basins, 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



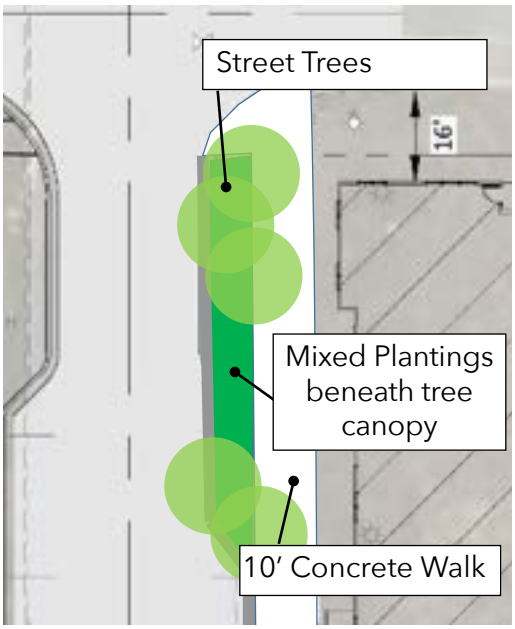
Stormwater catchment basins will be connected to existing storm sewer located in Center Street – future phases will route this water to underground cisterns in Municipal Plaza for irrigation and other re-use purposes.





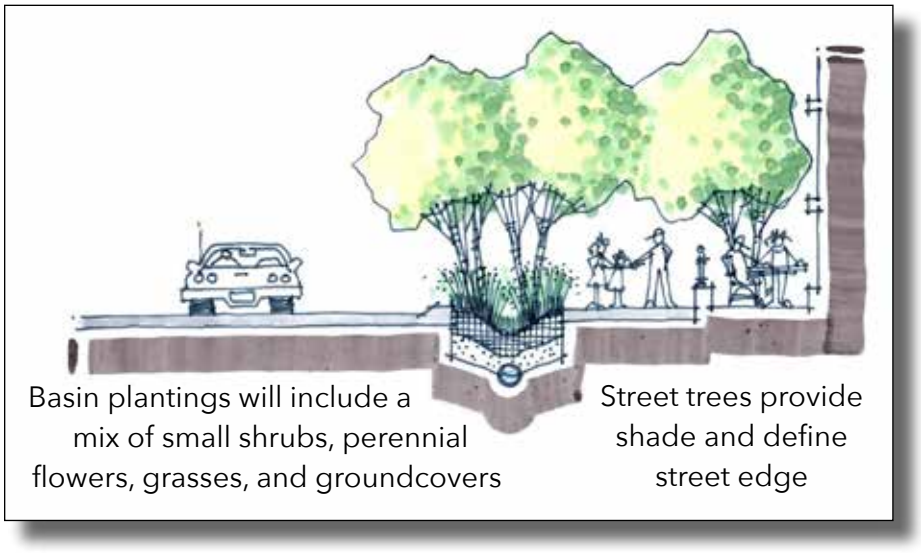


Sapphire Apartment Frontage Project Elements

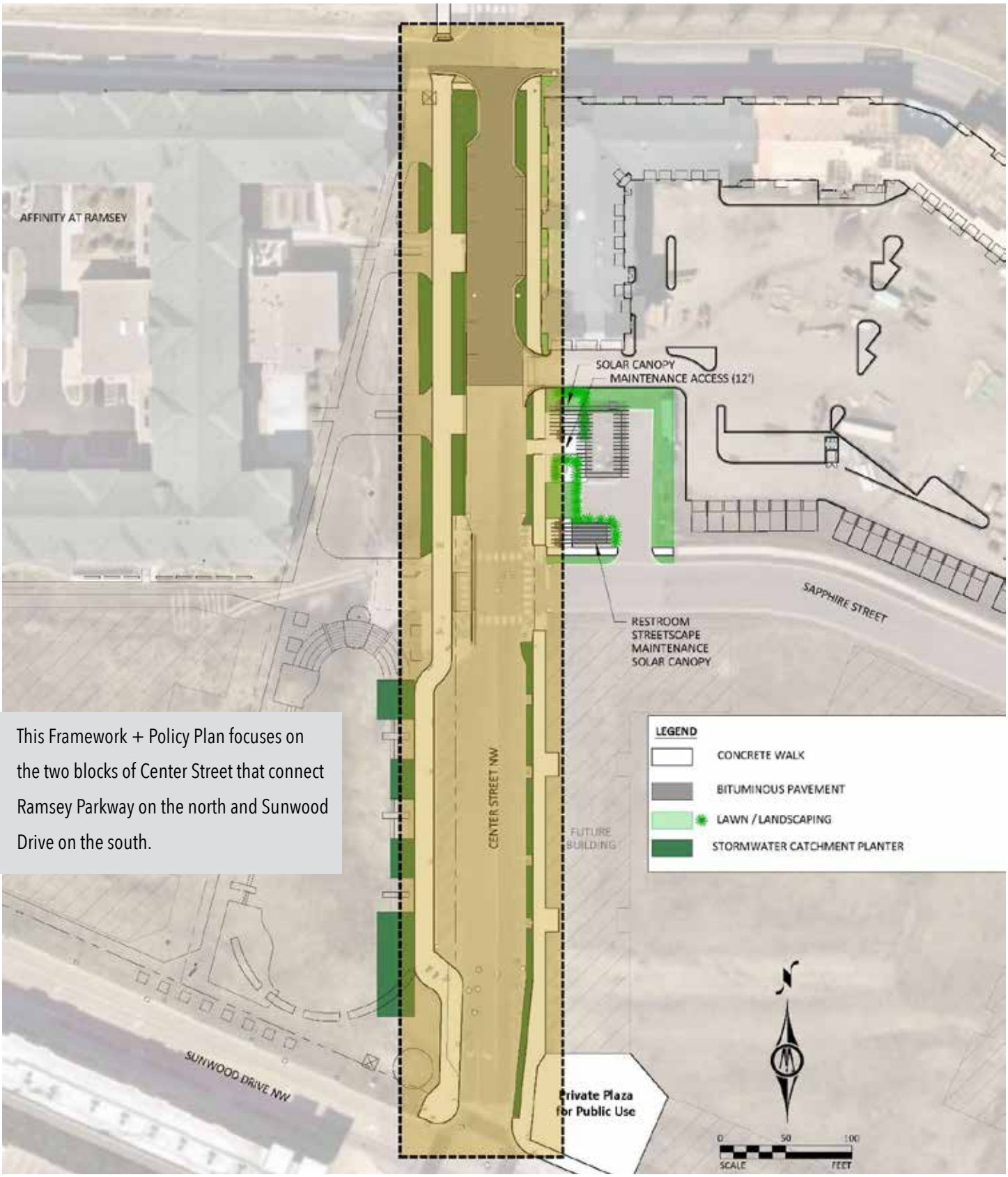




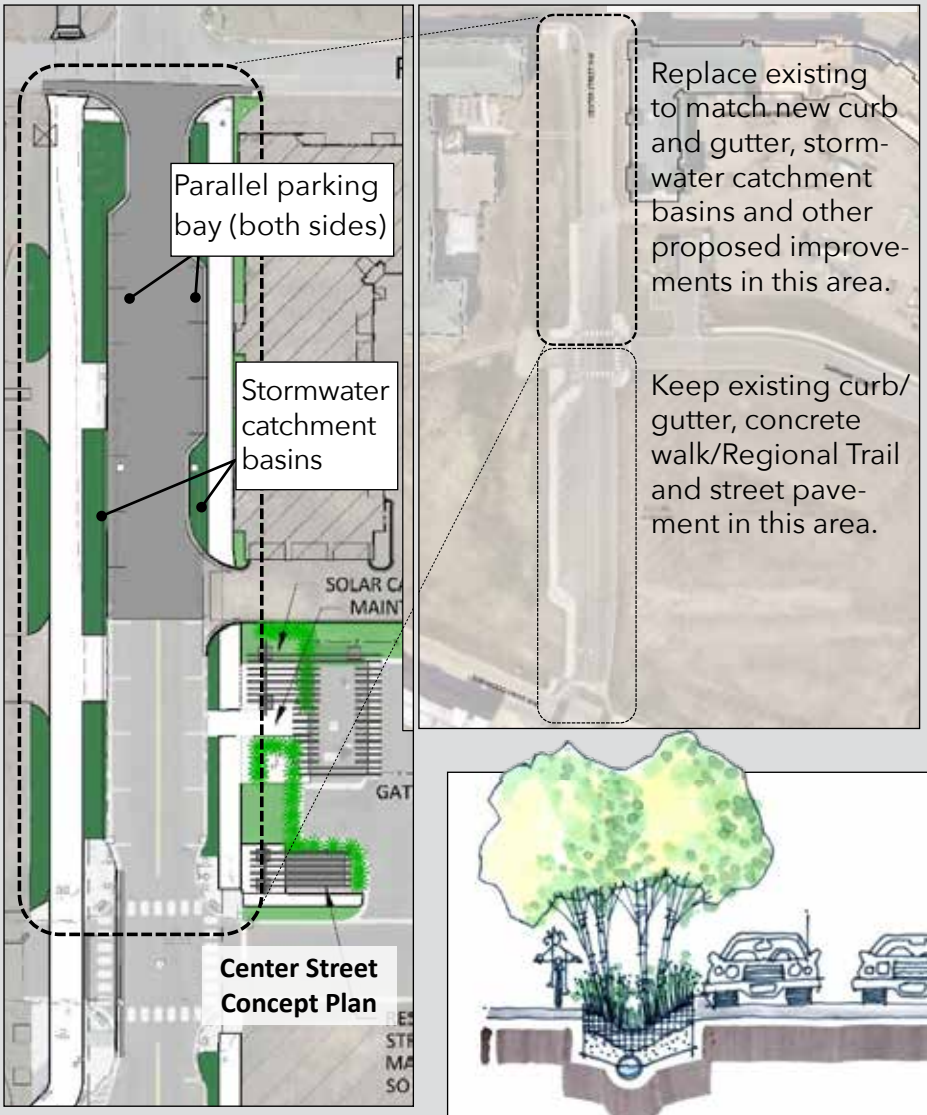


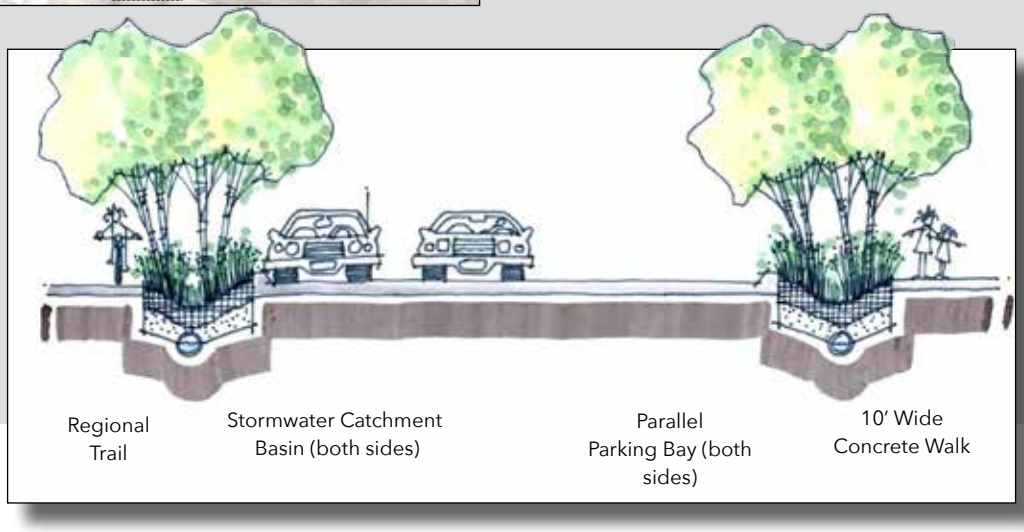


Center Street Location Map



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.





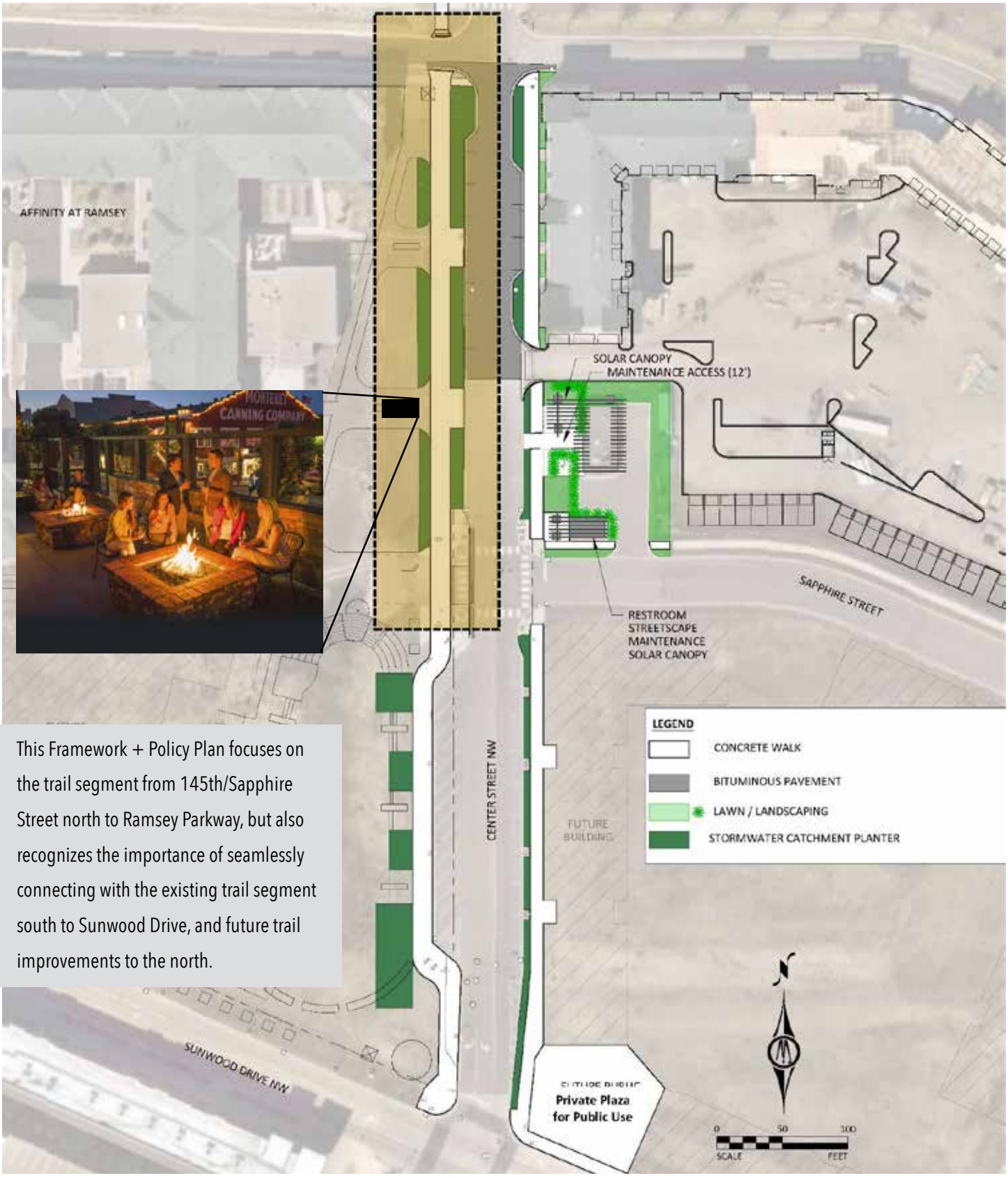
Center Street

PROJECT DESCRIPTION

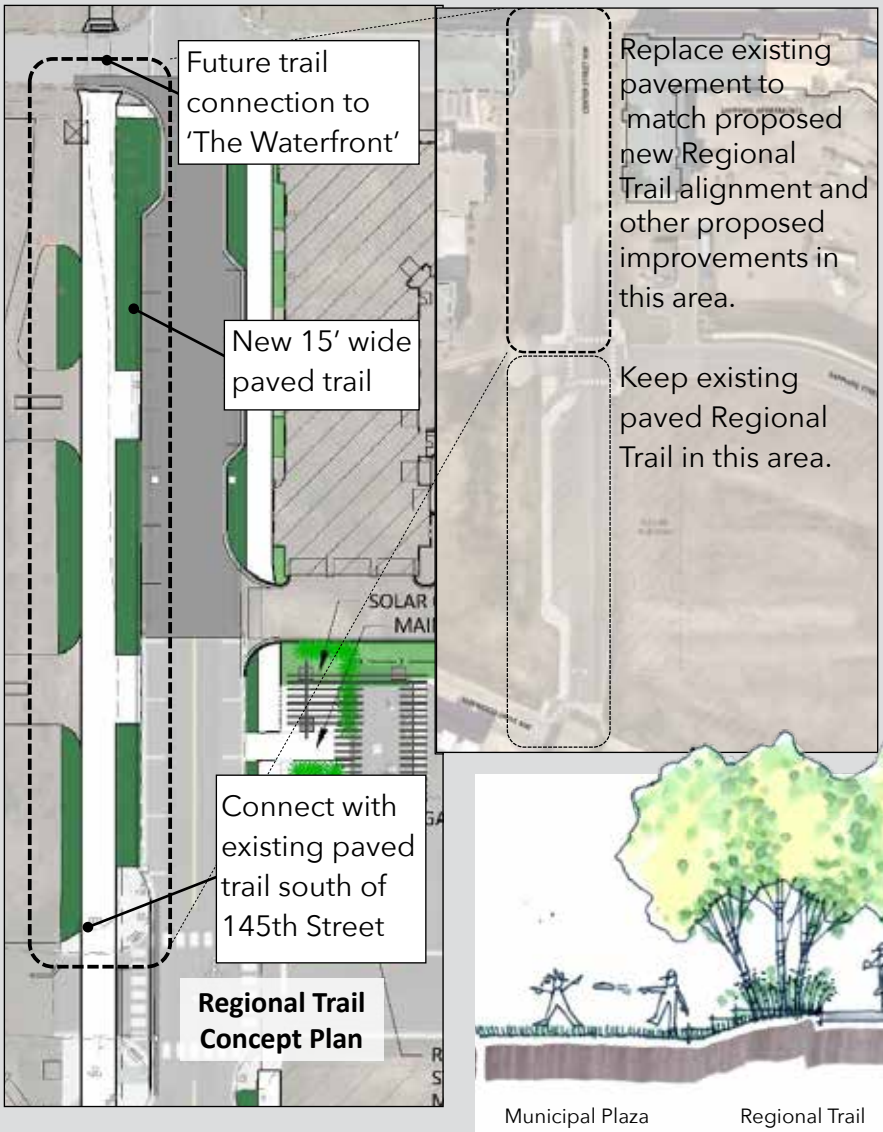
The primary purpose of the Conceptual Site Plan for Center Street is to illustrate how this key north/south connector ties together all the other pieces of this Framework + Policy Plan. At the same time, it also promotes various opportunities for innovative district infrastructure as an integral part 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)

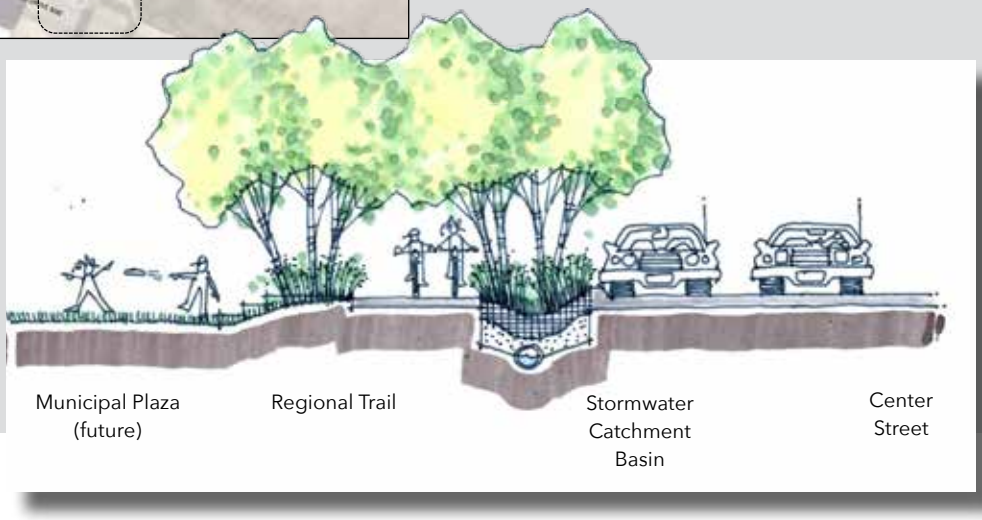
Regional Trail + Municipal Plaza Location Map



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.







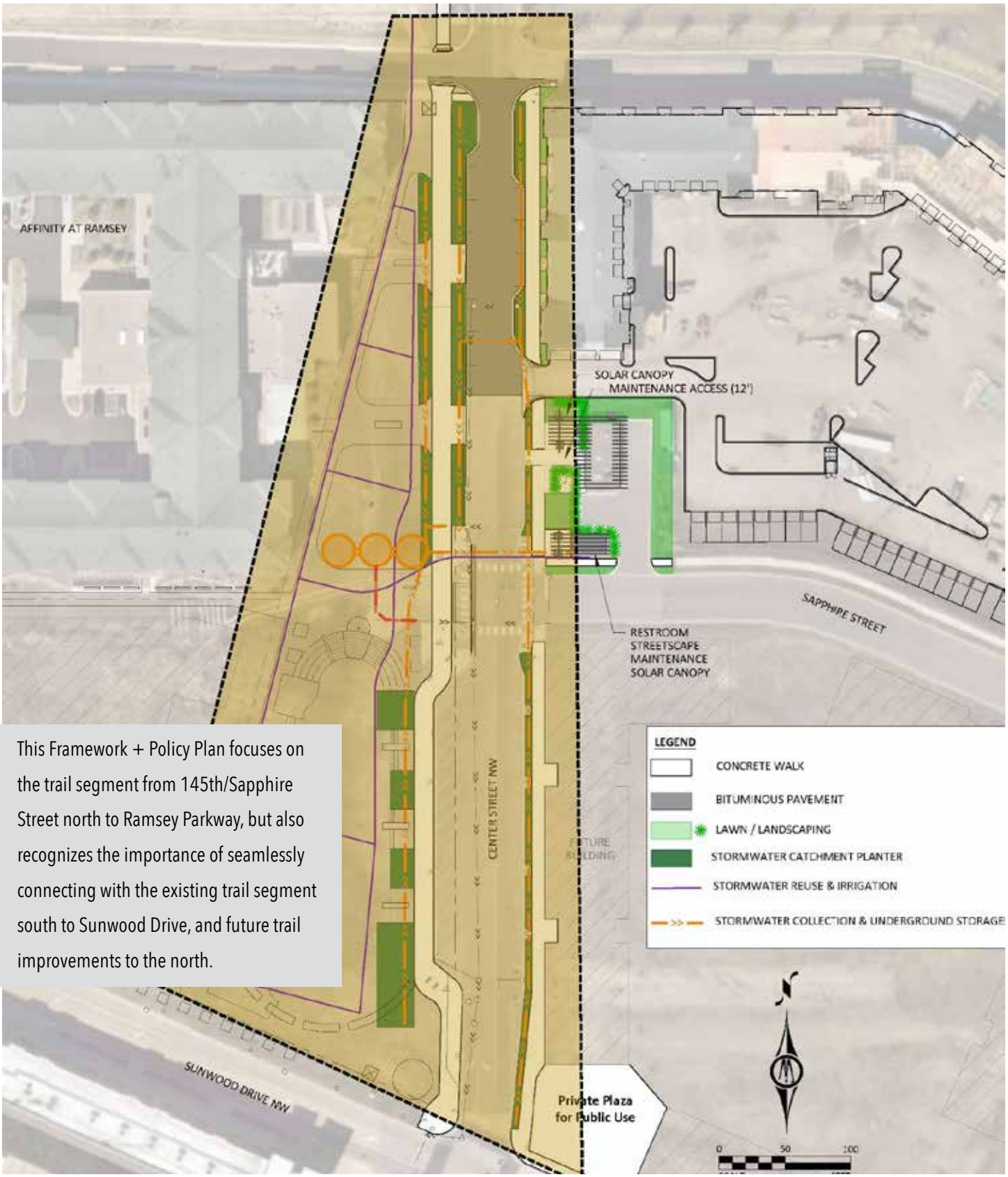
Regional Trail + Municipal Plaza

PROJECT DESCRIPTION

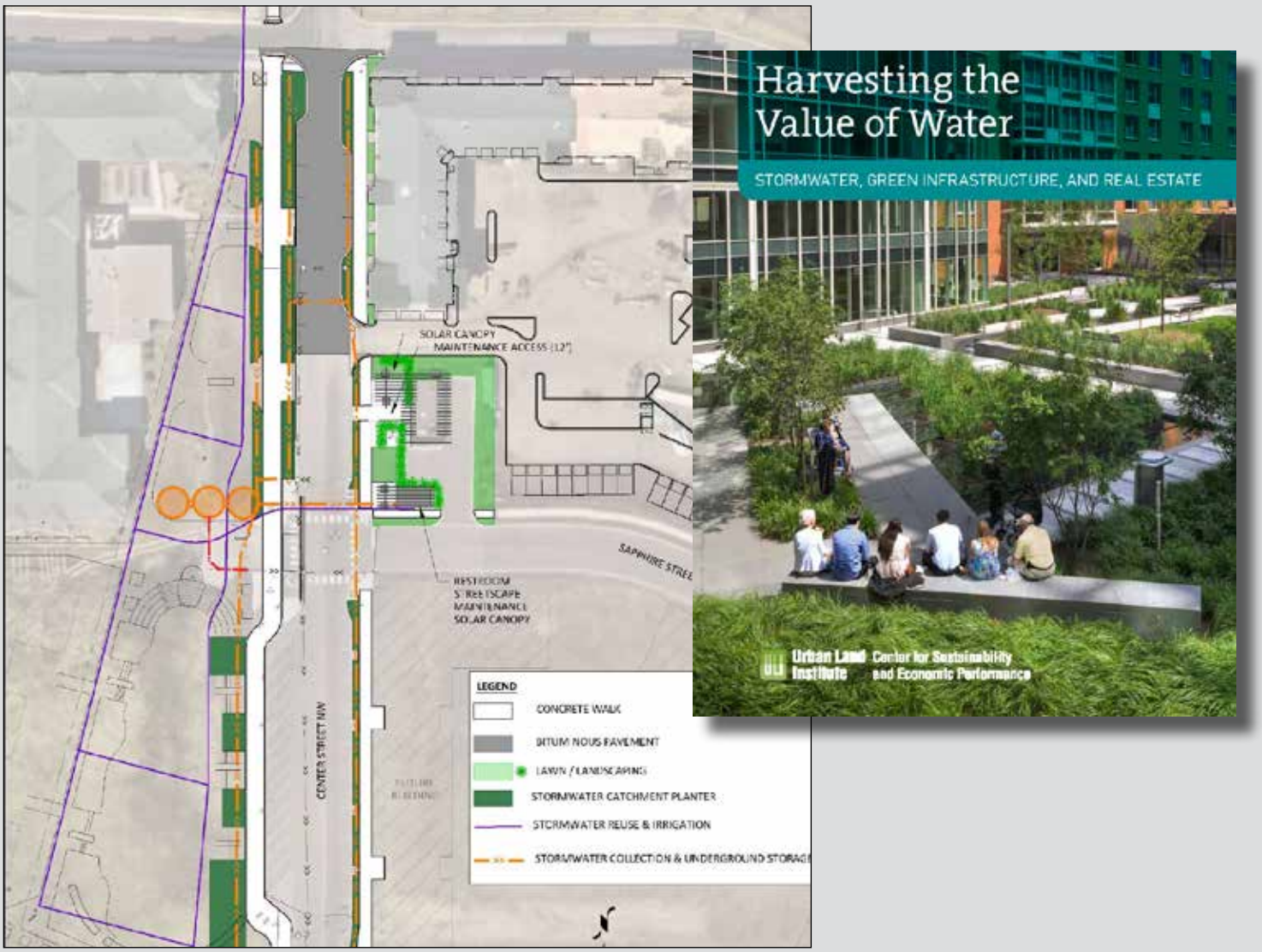
The Central Anoka County Regional Trail is a 26 - mile paved regional trail that traverses the middle of the county connecting Mississippi West Regional Park in Ramsey, to Bunker Lake Regional Park, on to the Rice Creek Chain of Lakes Park Reserve in Lino Lakes and Centerville, MN. All but a portion 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.

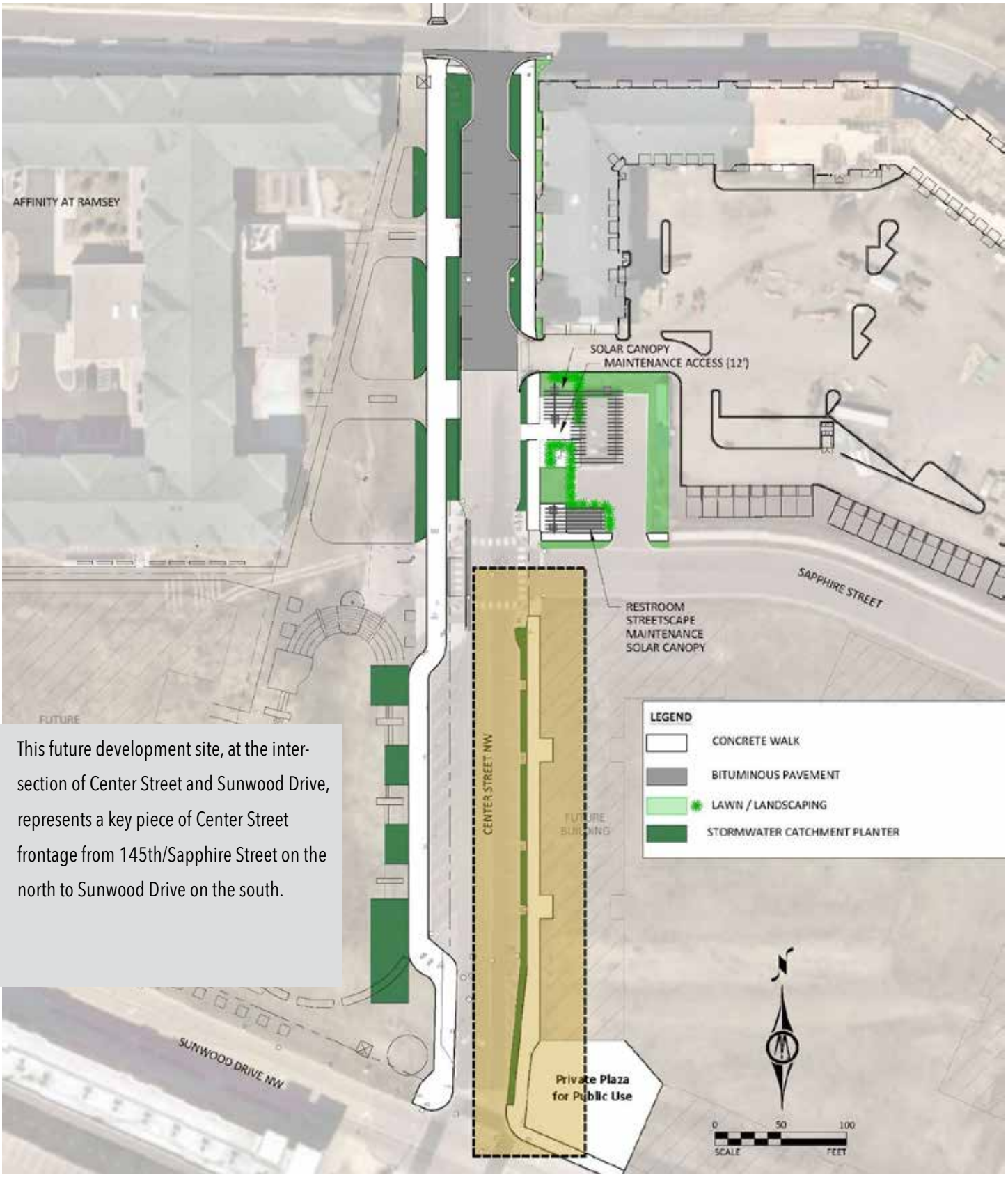
Additional Considerations

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.

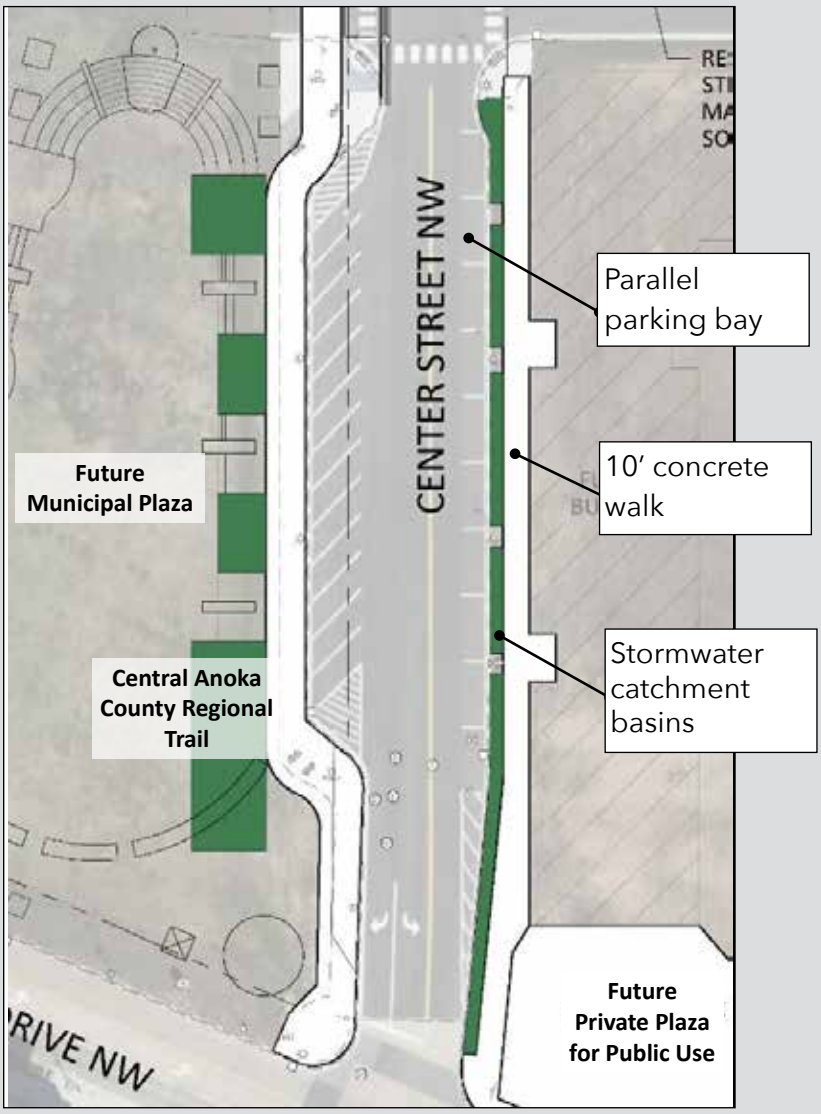
During final design, additional hydraulic information will be provided to provide an effective high flow bypass system. In other words, if the tank is full and the City experiences a 100-year rainfall event, there will be adequate bypass capacity to reduce local flooding and protect the tank(s). Also, 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

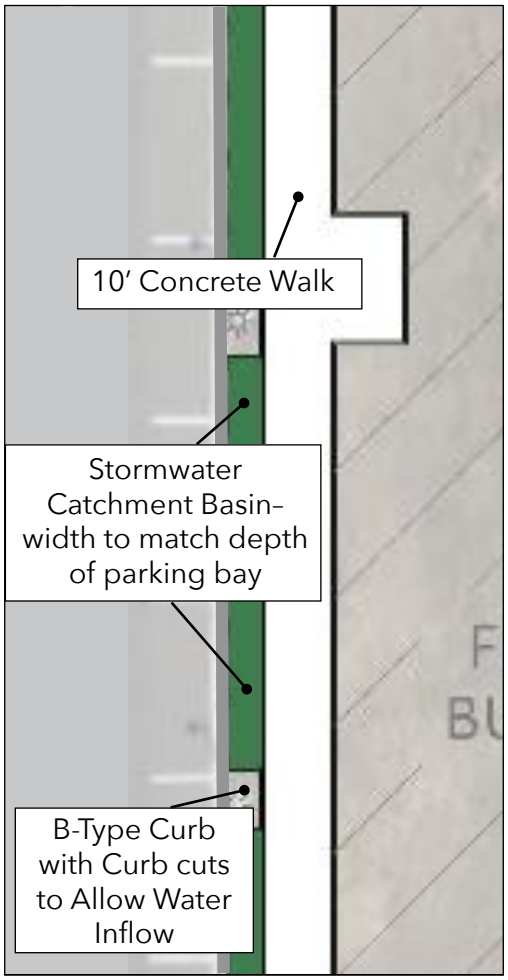
PROJECT DESCRIPTION

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.

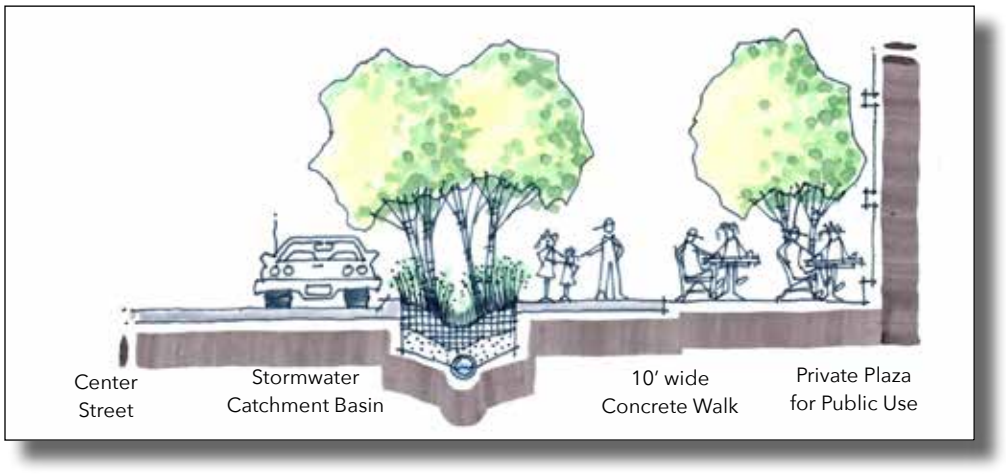
Following in the footsteps of the Sapphire Apartment project, future development of this site will also include a gracious pedestrian walkway (10' width), connected stormwater basins, and landscape plantings that complement existing streetscape, further enhancing the desired Downtown District street character as a welcoming local and regional destination.

Future Development Site Frontage Project Elements



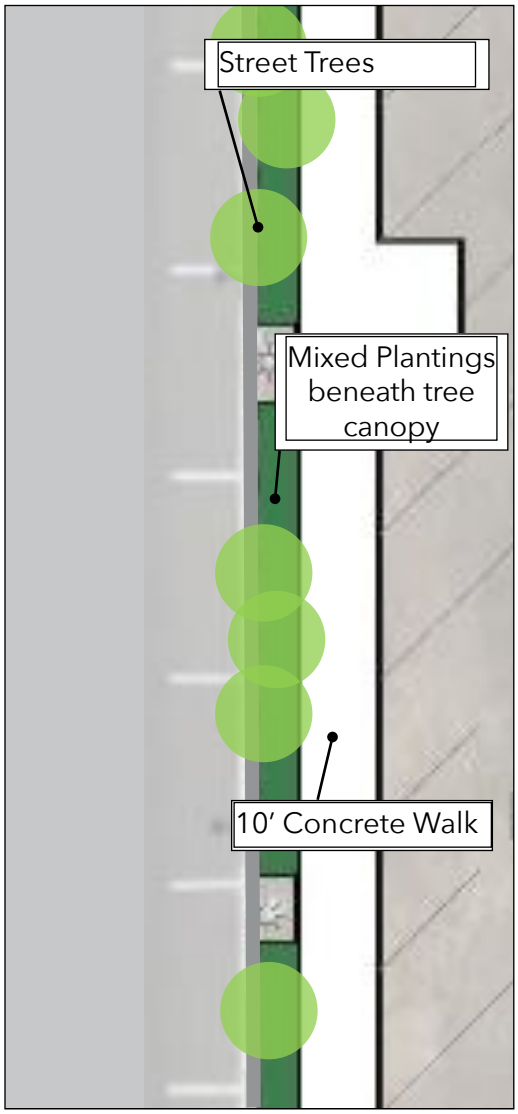
Stormwater catchment basins will be connected to existing storm sewer located in Center Street – future phases will route this water to underground cisterns in Municipal Plaza for irrigation and other re-use purposes.





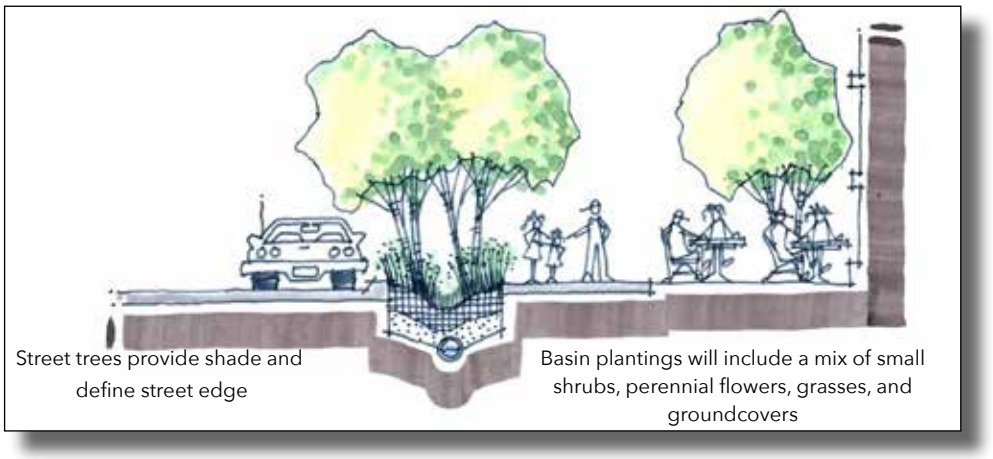


Future Development Site Frontage Project Elements









BOLTON & MENK
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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.

Bolton & Menk is an equal opportunity employer.

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.

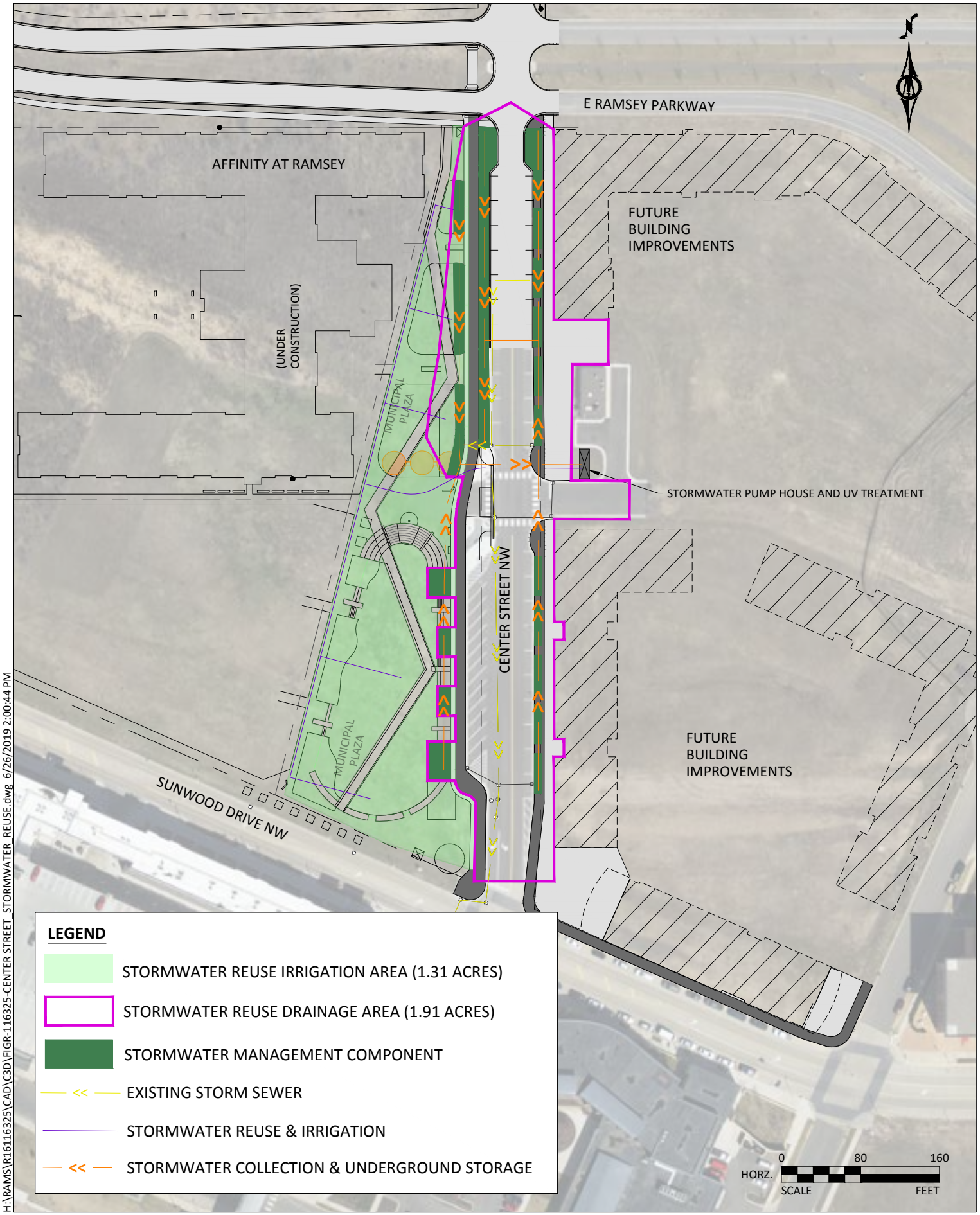
Since the reuse water will pass through a filter and UV treatment system, the impact to groundwater resources through the infiltration of irrigation water is expected to be very minimal. Impacts to groundwater resources in the ERA are not anticipated.

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

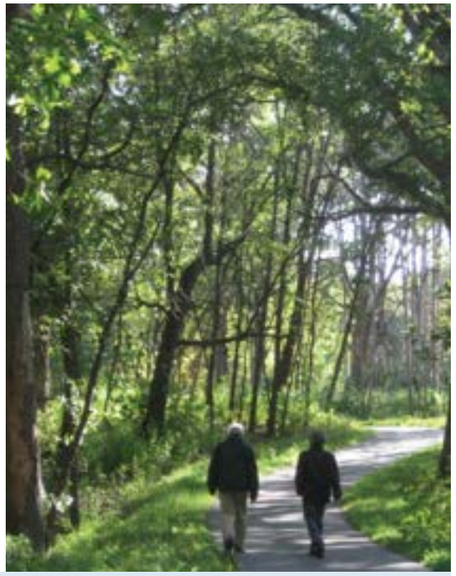
DIVISION	DESCRIPTION	TOTAL ESTIMATED QUANTITY	UNITS	UNIT COST	TOTAL COST
			GENERAL CONDITIONS	10%	$ 146,600
			TESTING	1%	$ 14,653.66
			8% CONSTRUCTION CONTINGENCY	8%	$ 117,300
			TOTAL ESTIMATED CONSTRUCTION COSTS		$ 1,743,900
			PERMITS/BONDS/INSURANCE	3%	$ 52,300
			DESIGN FEES	12%	$ 209,200
			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.





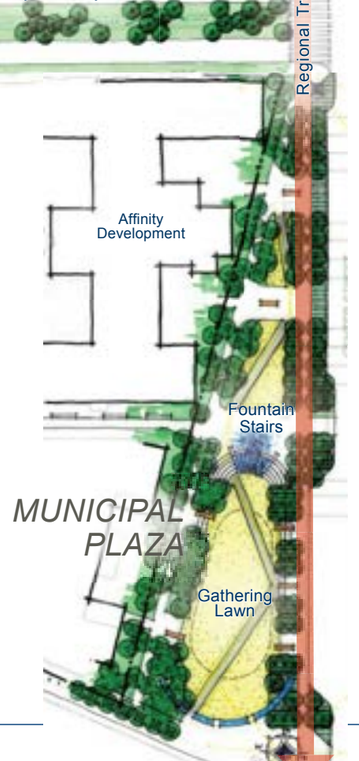
Municipal Plaza will become a signature destination, leveraging private-sector investment with specific focus on adjacent, plaza-frontage uses (such as brew pub, coffee house, with roof terrace) that contribute to the intensity and vibrant street life that characterize successful placemaking

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.



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.







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.



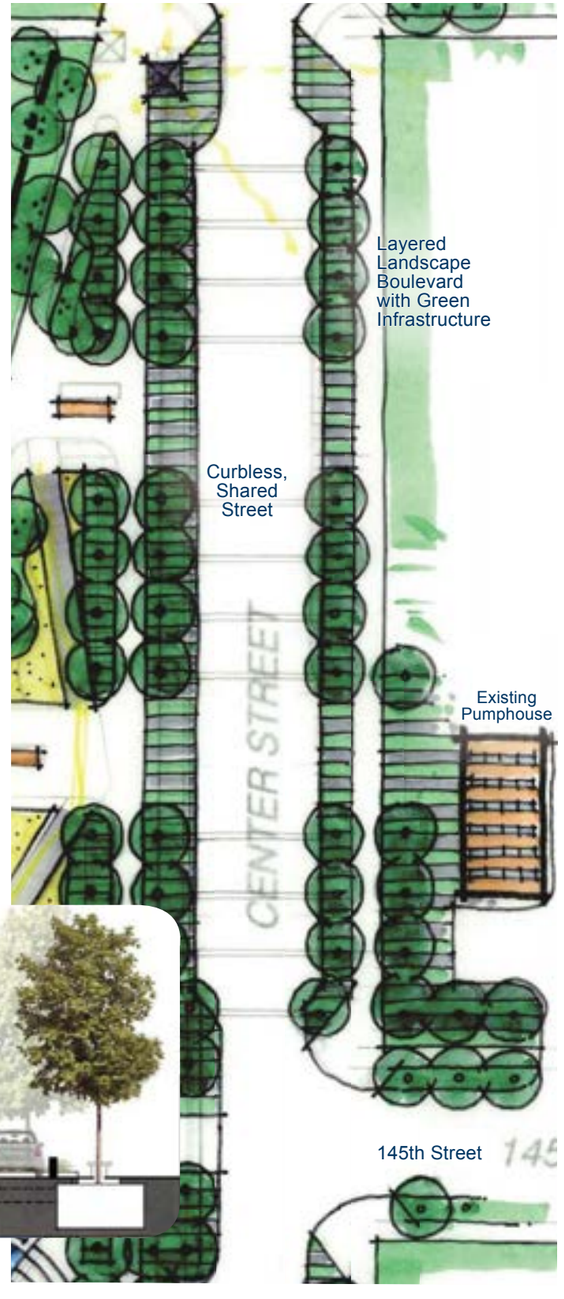
Mixed mode street design promotes ‘pedestrian first’ amentities.



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.

CONTACT

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Parks & Assistant Public Works Superintendent
763.433.9853
mriverblood@cityoframsey.com

Bruce Jacobson
Landscape Architect

BOLTON & MENK
Real People. Real Solutions.

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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

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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.

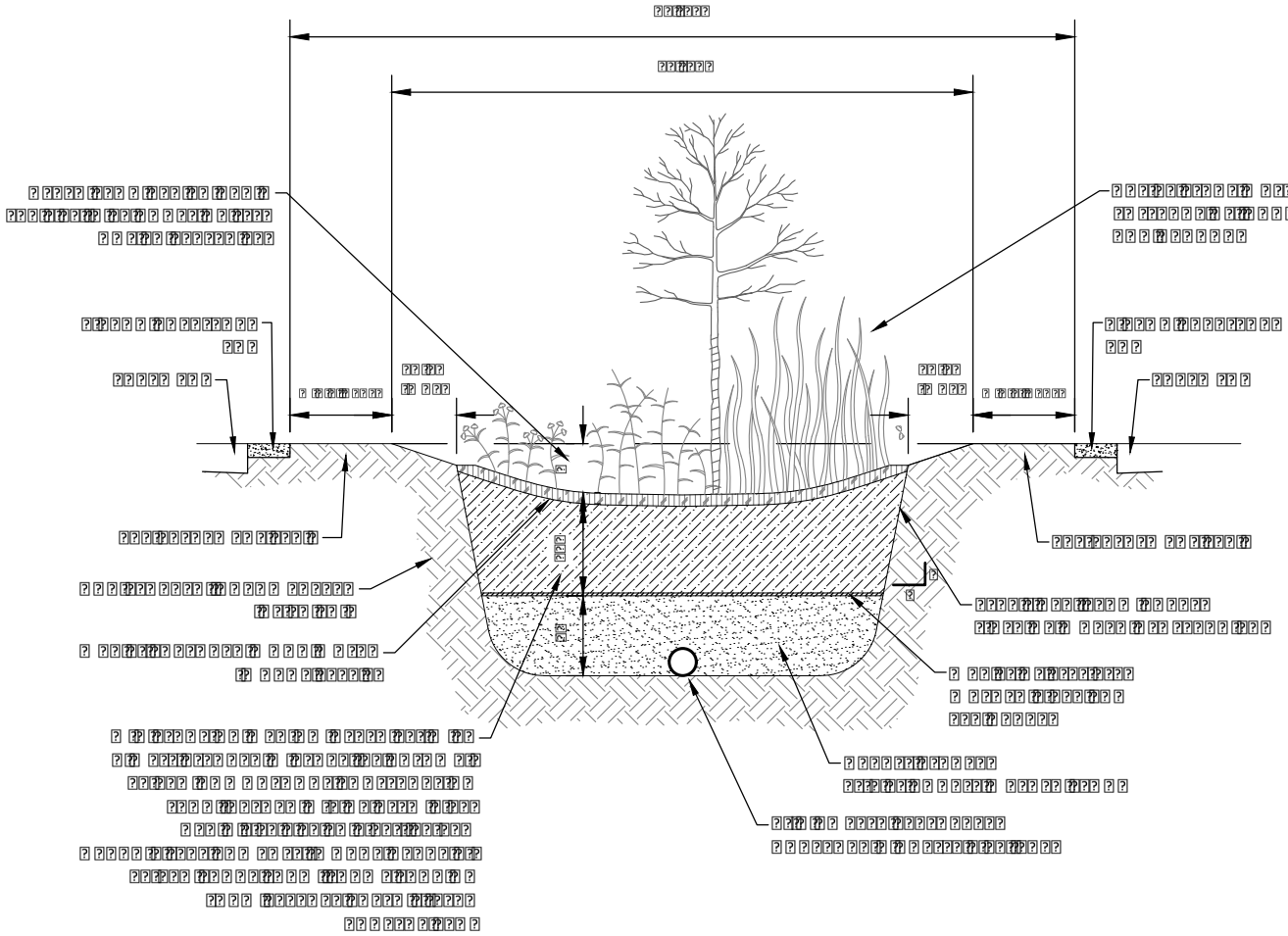
Median Width/Type	Liner Type	Estimated Cost / LF	Estimated Project Cost
20' Raised	NA	$41.00	$64,000
47' Raised	NA	$114.00	$178,000
20' Depressed	Woven Geotextile Liner	$216.00	$338,000
20' Depressed	Clay Liner	$221.00	$346,000
20' Depressed	EPDM Rubber Liner	$237.00	$371,000
47' Depressed	Woven Geotextile 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.



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City of RAMSEY



[illegible]

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[illegible]

City of RAMSEY

[illegible]

© [illegible]

Public Works Committee **5. 3.**

Meeting Date: 02/21/2023

By: Bruce Westby, Engineering/Public Works

Title:

Review HY-10 Ramsey Improvements Feasibility Study

Purpose/Background:

PURPOSE:

The purpose of this case is to review the current status of the HY-10 Ramsey Improvements Feasibility Study.

BACKGROUND:

Attached are copies of related agenda cases with attachments from the following meetings;

- EDA meeting - May 13, 2021
- EDA meeting - December 9, 2021
- City Council regular meeting - December 14, 2021
- EDA meeting - February 9, 2023

The attached agenda cases and attachments outline all relevant details associated with this case. Also attached is the final draft of the HY-10 Ramsey Improvements Feasibility Study, dated February 16, 2023. City staff will provide a summary of the information included in the attached HY-10 Ramsey Improvements Feasibility Study, and will be available to respond to questions.

This information will be presented to the City Council during their February 28th work session.

Timeframe:

Staff anticipates 25 minutes will be required to present this case and respond to questions.

Observations/Alternatives:

N/A

Funding Source:

N/A

Recommendation:

Staff has no recommendations to offer at this time.

Action:

No action is requested or required at this time.

Attachments

May 13, 2021 EDA case

Dec 9, 2021 EDA case

Dec 14, 2021 CC case

Feb 9, 2023 EDA case

IP 18-02 Feas Study

Form Review

Inbox	Reviewed By	Date
Brian Hagen	Brian Hagen	02/16/2023 04:17 PM
Form Started By: Bruce Westby		Started On: 02/16/2023 05:26 AM
Final Approval Date: 02/16/2023		

Economic Development Authority (EDA) 4. 2.
Meeting Date: 05/13/2021
By: Sean Sullivan, Community Development

Title:
Review West Armstrong Redevelopment Plans and Discuss Opportunities for Strategic Acquisition to Preserve Redevelopment Vision (portions of meeting may be closed to the public under Minnesota Statutes Section 13.D.05 Subdivision 3(c)(3) to consider purchase of real property)

Purpose/Background:
Further direction on this case was originally tabled at the April EDA Meeting. Staff is compiling any final questions submitted by EDA Commissioners and will be making further recommendations on or about Monday, May 10. This agenda will be updated at that time.

Purpose:
To discuss support for a potential infrastructure project west of Armstrong Blvd and to consider City role in the potential purchase of property in the area from willing sellers. The parcels below currently have active businesses or structures on site:

1. 8100 146th Avenue NW. Anoka County PID is 29-32-25-14-0012. Legal Description is Lot 1, Block 1, Hauser Addition
2. 8049 146th Avenue NW. Anoka County PID is 29-32-25-14-0011. Legal Description is Lot 4, Block 2, Hy-10 Ramsey
3. 8050 147th Avenue NW. Anoka County PID is 29-32-25-14-0008. Legal Description is Lot 1, Block 2, Hy-10 Ramsey
4. 14700 Armstrong Blvd NW. Anoka County PID is 29-32-25-11-0008. Legal Description is Lot 3, Block 1, Hy-10 Ramsey 3rd Add.
5. XXXX Ferret St NW, Anoka County PID is 29-32-25-11-0009. Legal Description is Lot 1, Block 1, Hy-10 Ramsey

(Number Identified on attached Map)

*Portions of meeting may be closed to the public under Minnesota Statutes Section 13.D.05 Subdivision 3(c)(3) to consider purchase of real property.

Background:
The Industrial market remains strong in the City of Ramsey. Industrial land over 1 acre, that is ready for development is becoming harder to find in Ramsey. Staff has received inquiries from existing Ramsey business looking to expand or build new buildings (15-50,000 SF Range) in the near future. Currently, the 43 acres east of Delta Mod Tech and the 14 acres south of Connexus are under contract or are in negotiations. That leaves approximately 20 acres west of Armstrong Blvd off Bunker Lake Boulevard as the only larger piece of land shovel ready for industrial development.

<u>Purpose</u>
The purpose of this case is to seek high-level policy direction as a recommendation to the City Council to discuss how aggressive the City should be to preserve the vision for cleanup and redevelopment of the industrial park generally west of Armstrong Boulevard and north of Highway 10.

There are 3 major components of planning in this area.

1. Future Land Use Planning/Zoning/Non-Conforming Uses
2. Economic Development Tools to Facilitate Cleanup/Blight Removal and Redevelopment
3. Infrastructure and Roads/Pavement Management Program

Background

Future Land Use Planning/Zoning/Non-Conforming Uses

From approximately 2015 through 2018, the City convened a series of public engagement meetings that led to the visioning and small area plan for this area. The planning area also included areas now known as the Bunker Lake Industrial Park and Riverstone Neighborhood. This redevelopment area is the final piece of this small area plan.

This area pre-dates current zoning regulations and zoning district, providing protections under lawful, non-conforming statutes. This area is generally characterized by aging, underutilized buildings and significant outside storage. As the surrounding areas of The COR, Bunker Lake Industrial Park and Riverstone Neighborhoods continue to develop, this aging industrial park appears to be in conflict with these surrounding areas. Public Nuisance Complaints continue to increase. A former gas station and former liquor store were previously purchased and removed to make way for the Armstrong Interchange.

The future land use vision contemplates this entire area redeveloping. Most of the Property Owners share this redevelopment vision, but timing, financing and market conditions appear to be a barrier. The areas east of Ferret Street are visioned as redeveloping as a primary retail corridor for the community. This area includes the new West Armstrong Retail Center. The areas west of Ferret Street are visioned as redeveloping as another business park similar to the Bunker Lake Industrial Park.

The City continues to respond to numerous zoning inquiries for uses that are not allowed by code and not protected by lawful, non-conforming statutes. The City has shown some flexibility through the issuance of Interim Use Permits that allow a temporary use until such time redevelopment occurs. Staff seeks policy direction as to whether this continued allowance for interim uses is appropriate, or a more aggressive approach is desired.

Economic Development Tools

Redevelopment projects are naturally more complicated and more expensive than 'greenfield' development of raw land. It is unlikely that the City will achieve the broader blight removal and redevelopment vision without financial assistance of some degree, including but not limited to potential acquisition of key parcels to preserve said vision. The site is located within TIF District #14 that also includes The COR.

Infrastructure and Roads/Pavement Management Program

In 2017-2018, the City began planning for the reconstruction of 146th Avenue, 147th Avenue and Ferret Street. In January of 2019, the City cancelled/delayed the project until future land use planning and visioning were complete. With the completion of the 2040 Comprehensive Plan Update, that visioning and land use planning is now complete and the City should be able to move forward with this needed pavement management plan without interfering with the redevelopment vision. In fact, investment in basic infrastructure in this area may leverage interest in private redevelopment. Based on current economic conditions and demand for industrial land, Staff thought this would be a good time to revisit this

position. This project expands sewer and water in the area and also connect Ferret Street to Bunker Lake Boulevard (new infrastructure in addition to reconstruction of existing infrastructure).

Notification:
Notification is not required.

Observations/Alternatives:
Observations:

The current uses (outside storage/industrial) by many of the businesses in the area (generally east of Ferret Street) are not consistent with current zoning (COR Retail). The industrial uses are considered lawful, non-conforming and can continue to operate as long as the use does not change and they are in compliance with city code. A few of these properties have required code enforcement actions to bring them into compliance due to excess outside storage and site use issues and the frequency of this has increased. Staff has been contacted by some landowners in the area west of Armstrong Blvd asking if the City would be interested in acquiring their properties. If the City is committed to a redevelopment City infrastructure project in the area, a strategy should be developed around the prioritization of land acquisition.

Alternatives:
At this time, this is simply a discussion item to determine the EDA level of interest in the proposed redevelopment project and to potentially identify parcels for acquisition. Nothing in this case should be interpreted as the City is actually considering additional land acquisition. Staff has not formulated a formal recommendation, and is seeking broad EDA recommendation. Here are some questions to contemplate:

- Does the EDA support making more industrial zoned property with sewer and water infrastructure available?

- Would the EDA support using TIF/EDA/HRA dollars to prepare plans and specs for roads and utilities?
    - TIF would be an eligible funding source is funds are expended prior to November 28, 2021

- Would the EDA support using TIF/EDA/HRA dollars to extend utilities, rebuild roads and extend Ferret Street north to Bunker Lake Boulevard?
    - TIF would be an eligible funding source is funds are expended prior to November 28, 2021

- Is the EDA interested in purchasing properties with blight and zoning issues (tied to recent zoning requests)?

- Is the EDA interested in purchasing strategically located properties to help facilitate this redevelopment project (i.e, locations for regional storm water)?

Funding Source:
If as a matter of policy and priority, the City felt this was an appropriate acquisition(s), there likely would be adequate economic development funds. Possible funding sources include:

1. EDA Fund
2. Anoka County HRA (Housing and Redevelopment Authority) Fund
3. TIF (Tax Increment Financing) (Expenses incurred prior to November 28, 2021)

Recommendation:
Based on discussion.

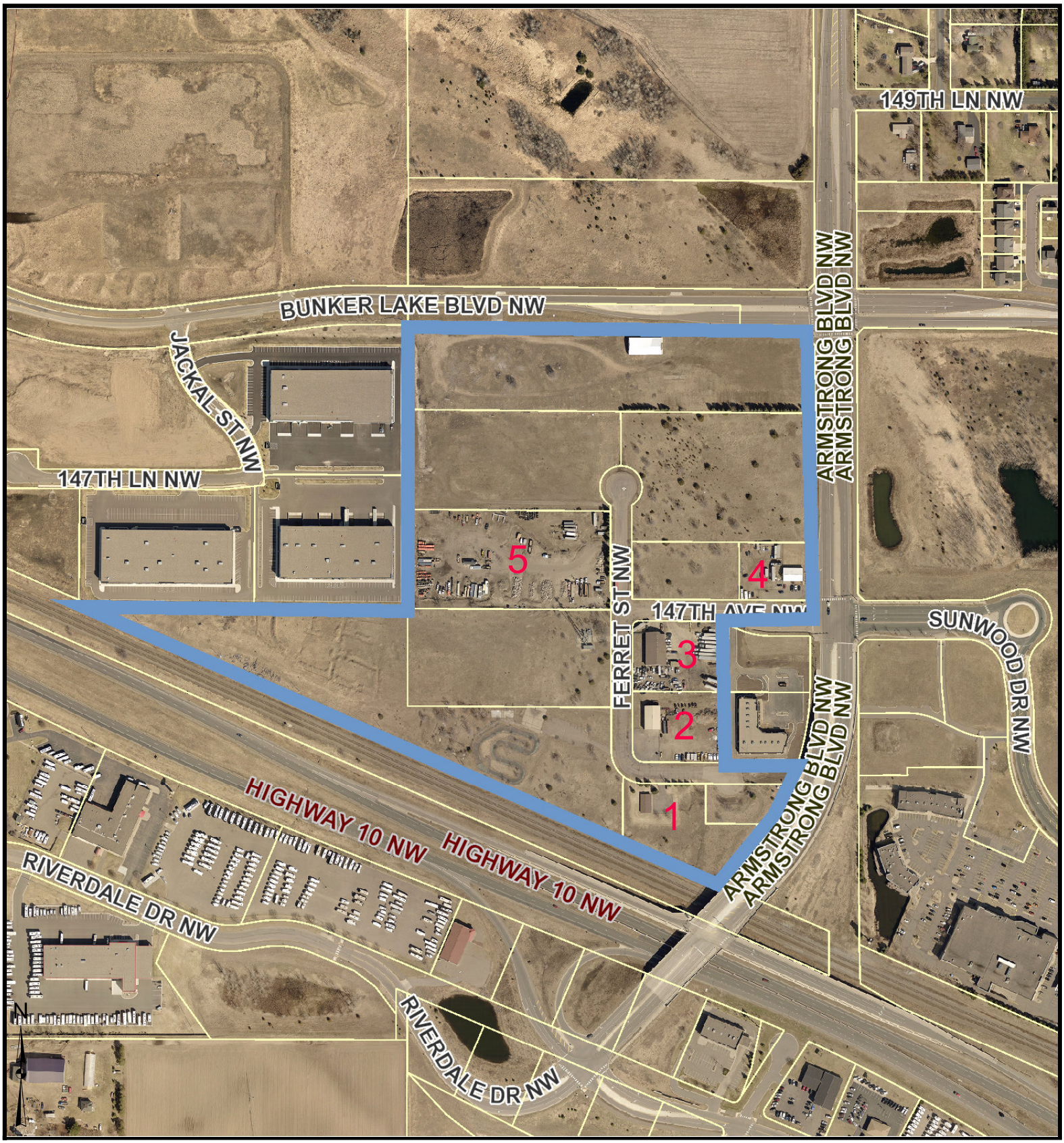
Action:
Based on discussion.

Attachments
Site and Parcel Location Map
January 2019 Project Termination Letter

Form Review

Inbox	Reviewed By	Date
Sean Sullivan (Originator)	Sean Sullivan	05/05/2021 04:20 PM
Brian Hagen	Tim Gladhill	05/07/2021 10:21 AM
Form Started By: Sean Sullivan		Started On: 04/23/2021 03:31 PM
Final Approval Date: 05/07/2021		

West Armstrong Redevelopment Area



Parcel Information: Approx. Acres: 45

Commissioner: MATT LOOK

Plat:

Owner Information:

Sean Sullivan | 1:4,800 | Date: 3/29/2021

Disclaimer: Map and parcel data are believed to be accurate, but accuracy is not guaranteed. This is not a legal document and should not be substituted for a title search, appraisal, survey, or for zoning verification.

City of RAMSEY

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City Hall: 763.427.1410 • Fax: 763.427.5543
www.cityoframsey.com

January 22, 2019

Re: Termination of City Improvement Project #18-02, HY-10 Street Reconstructions

On Tuesday, October 23, 2018, the Ramsey City Council adopted Resolution #18-218 accepting the Feasibility Report for Improvement Project #18-02, HY-10 Ramsey Street Reconstructions, including Staff's recommendation to shelve the project until it is no longer needed, or until abutting property owners request that the streets be repaired, such as in the form of a petition.

The City strives to allocate resources as cost-effectively as possible by completing the proper improvements at the proper time. Considering the significant potential for re-development of the HY-10 Ramsey development, the City felt it would make the most sense to shelve Improvement Project #18-02 at this time. This effectively means the City will not propose to improve the streets in this development while waiting to determine if re-development will occur.

Even though Improvement Project #18-02 was shelved, the City's Public Works Department plans to repair and/or replace the bituminous pavement in and around the intersection of 147th Avenue and Ferret Street this summer.

This will be the last communication you will receive regarding this terminated improvement project. If you have any questions, please contact me at 763-433-9825 or *bwestby@cityoframsey.com*.

Sincerely,

Bruce Westby
City Engineer

Economic Development Authority (EDA) 4. 3.
Meeting Date: 12/09/2021
Submitted For: Sean Sullivan, Community Development
By: Sean Sullivan, Community Development

Title:
West Armstrong Redevelopment Area Update and Approval of Topographic Survey

Purpose/Background:
The purpose of this case is to:
1) Receive West Armstrong Redevelopment Area Update
2) Consider approval of Topographic Survey
3) Consider a recommendation to the City Council to fund the Proposal for Engineering Services (i.e., feasibility, preliminary design, plans and specs) for West Armstrong Redevelopment Area

Background:

In May of 2021, the EDA and City Council reaffirmed the vision of the West Armstrong Redevelopment Area (Industrial and COR zoning) and to asked Staff to put together a plan to identify project costs and design to:
1) Reconstruct 146th, 147th and Ferret Street
2) Extend Ferret St. to Bunker Lake Boulevard
3) Install City Sewer, Water and Storm Sewer

Development Update in West of Armstrong Redevelopment Area and Bunker Lake Business Park
Industrial development and demand remains strong in the City of Ramsey. Recent in-fill Development (65,000 SF - Anderson Dahlen - AEC Energy Park) and developments in Bunker Lake Industrial Park (Oppidan - 405,000 SF and BLIP 4 - 67,000 SF) have reduced the available industrial land to approximately 20 acres. Staff and PSD LLC have been working with an unidentified user to acquire approximately 10 acres and to construct a 100-150,000 SF industrial warehouse building in Bunker Lake Industrial Park. If this project is completed that would leave approximately 10 acres of shovel ready land available for industrial development.

In May of 2021 the City Council and EDA affirmed to land use vision in the West Armstrong Redevelopment area identifying the land west of Ferret St as Commercial / Industrial and the land east of Ferret Street as Retail / Office (COR). Staff has been approached by smaller industrial users and other commercial/industrial projects that have interest in locating to that area if City utilities are available. The City Council directed staff to bring forth a proposal to obtain design and costs to reconstruct and design roadways and to install City utilities.

The Proposed City Road and Infrastructure Project
In 2017-2018, the City began planning for the reconstruction of 146th Avenue, 147th Avenue and Ferret Street. In January of 2019, the City tabled the project with the support of the adjacent private property owners until future land use planning and visioning were complete. With the completion of the 2040 Comprehensive Plan Update, that visioning and land use planning is now complete and the City should be able to move forward with this needed pavement management plan without interfering with the redevelopment vision. In fact, investment in basic infrastructure in this area likely will leverage interest in private redevelopment. This proposed project expands sewer and water in the area and also connects Ferret Street to Bunker Lake

Boulevard (new infrastructure in addition to reconstruction of existing infrastructure).

City Staff has worked with Bolton and Menk to put together a phased approach that will ultimately provide a cost and preliminary design of improvements in the area. A topographical survey and borings are needed prior to putting together a design and cost estimate for the project. A copy of the proposal for the Topographical Survey is attached to this case. Staff is proposing that this cost be paid for out of the EDA Professional Services Fund (9230.6315). Once the Topographical Survey is complete, Bolton and Menk can begin work on the Engineering Services for the West Armstrong Redevelopment Area. The Proposal for Engineering Services (i.e., feasibility, preliminary design, plans and specs) for West Armstrong Redevelopment Area is attached to this case and would need City Council Approval.

Staff is asking for action by the EDA on both of these proposals.

Notification:
Notification is not required.

Observations/Alternatives:
Observations:
The proposal for the Topographic Survey is for $7,955.00. Staff is recommending that the EDA authorize funding this out of its Professional Services (9230-6315. the EDA does not need City Council approval for this expenditure as it is within the the EDA annual approved budget.

The proposal for Engineering Services for West Armstrong Redevelopment Area (Design / Plans and Specs and Updated Bunker Lake Blvd Feasibility Study) is $49,835.00. It should be noted that the Topographical Survey referenced in this proposal has been removed and is included in the $7,955.00 Topographical Survey above. In this proposal there is also a proposed Feasibility Report Update at the line item cost of $8,160. Staff has spoken with City Engineer Bruce Westby and this feasibility update could be performed in-house by the City Engineering team if there is available staff capacity. Staff would ask for flexibility from the EDA and a recommendation the the City Council to fund the entire cost of the study (including the Feasibility Report Update) with the ability to reduce it if the work can be done internally. This item cannot be authorized by the EDA and will need City Council approval.

Proposal for Engineering Services for West Armstrong Redevelopment Area Topographical Survey - $7,955.00 -
Alternatives:

1) EDA authorize funding and order report of Engineering Services for West Armstrong Redevelopment Area Topographical Survey as presented ($7,955.00)
2) Something else

Proposal for Engineering Services for West Armstrong Redevelopment Area (Design/Plans and Specs and Feasibility Update) - $49,835
Alternatives:

1) EDA recommend to City Council to Authorize the Funding and Order Engineering Services for West Armstrong Redevelopment Area (Designs/Plans and Feasibility Update) as presented ($49,835)(Staff Recommendation)
2) EDA recommend to City Council to Authorize the Funding and Order Engineering Services for West Armstrong Redevelopment Area (Designs/Plans and Specs) excluding the Feasibility Report Update ($41,675)
3) Something else

Funding Source:

Engineering Services for West Armstrong Redevelopment Area Topographical Survey
The funding is proposed to come from EDA professional services line item budget 9230-6315.

Engineering Services for West Armstrong Redevelopment Area (Designs/Plans and Feasibility Update)
The funding for this action would be determined based on consultation with Finance Director and City Council direction.

1. PIR Fund
2. EDA Fund Balance
3. Anoka County HRA (Housing and Redevelopment Authority) Fund
4. TIF (Tax Increment Financing) (Expenses incurred prior to November 28, 2023)

Recommendation:

EDA authorize funding and order report of Engineering Services for West Armstrong Redevelopment Area Topographical Survey as presented ($7,955.00)

and;

EDA recommend to City Council to Authorize the Funding and Order Engineering Services for West Armstrong Redevelopment Area (Designs/Plans and Feasibility Update) as presented ($49,835)(Staff Recommendation)

Action:

Motion to authorize funding and order report of Engineering Services for West Armstrong Redevelopment Area Topographical Survey as presented ($7,955.00)

and;

Motion to recommend to City Council to Authorize the Funding and Order Engineering Services for West Armstrong Redevelopment Area (Designs/Plans and Feasibility Update) as presented ($49,835)

Attachments

Site Location Map
ACTION - Proposal for Topographical Survey
ACTION - Proposal for Design and Plans and Specs

Form Review

Inbox	Reviewed By	Date
Sean Sullivan (Originator)	Sean Sullivan	12/01/2021 03:31 PM
Bruce Westby	Bruce Westby	12/02/2021 09:27 AM
Brian Hagen	Brian Hagen	12/02/2021 10:00 AM
Kurt Ulrich	Kurt Ulrich	12/02/2021 02:02 PM

Form Started By: Sean Sullivan Started On: 11/29/2021 10:01 AM

Final Approval Date: 12/02/2021

West Armstrong Redevelopment Area



Parcel Information: Approx. Acres: 45

Commissioner: MATT LOOK

Plat:

Owner Information:

Sean Sullivan	1:4,800	Date: 3/29/2021

Disclaimer: Map and parcel data are believed to be accurate, but accuracy is not guaranteed. This is not a legal document and should not be substituted for a title search, appraisal, survey, or for zoning verification.

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November 23, 2021

Mr. Bruce Westby, P.E.
City Engineer
City of Ramsey
7550 Sunwood Drive NW
Ramsey, Minnesota 55303

RE: Proposal for Engineering Services – West Armstrong Redevelopment Area Topographic Survey

Dear Mr. Westby:

We appreciate the opportunity to present this scope of services for a topographic survey of the West Armstrong Redevelopment Area Improvement project. Our scope and fees were prepared based on our conversations, along with previous documents prepared for the area. The proposed improvements will be generally as described below:

- Street construction & reconstruction of Ferret Street from 146th Avenue to Bunker Lake Boulevard,
- Street reconstruction of 147th Avenue and 146th Avenue to the extents shown on the attached figure,
- Extension of sanitary sewer, water and storm sewer to serve the area, and
- Improvements to Bunker Lake Boulevard necessary to allow for the Ferret Street connection.

Project scope assumptions used in creating this fee proposal include the following:

- **A topographic survey** of the corridors will be required for the project. The Bunker Lake Boulevard survey and design will be completed separately.

SCHEDULE AND FEES

Bolton & Menk will immediately schedule the survey and attempt to complete in 2021. Based on our understanding of the improvements, our proposed fees for the work are $7,955.00.

If there are any questions related to this proposal, please call me at (651) 968-7760.

Sincerely,

Bolton & Menk, Inc.

Kevin P Kielb

Kevin P. Kielb, P.E.
Principal Engineer

BOLTON & MENK
Real People. Real Solutions.

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November 23, 2021

Mr. Bruce Westby, P.E.
City Engineer
City of Ramsey
7550 Sunwood Drive NW
Ramsey, Minnesota 55303

RE: Proposal for Engineering Services – West Armstrong Redevelopment Area

Dear Mr. Westby:

We appreciate the opportunity to present this scope of services for the West Armstrong Redevelopment Area Improvement project. Our scope and fees were prepared based on our conversations, along with previous documents prepared for the area.

The proposal is based on your July 9, 2021 email request, including the layout attached to the email.

SCOPE

The proposed base improvements will be generally as described below:

- Street construction & reconstruction of Ferret Street from 146th Avenue to Bunker Lake Boulevard,
- Street reconstruction of 147th Avenue and 146th Avenue to the extents shown on the attached figure,
- Extension of sanitary sewer, water and storm sewer to serve the area, and
- Improvements to Bunker Lake Boulevard necessary to allow for the Ferret Street connection.

Attached is a figure depicting anticipated improvements.

Project scope assumptions used in creating this fee proposal include the following:

- **A topographic survey** of the corridors will be completed under a separate contract. Information from the survey will be used for the design of the project.
- **Geotechnical** borings will be required for the project. A total of 3 borings within the redevelopment area will be required. We will use a combination of soil borings, record drawings and recommendations from the City's October 18, 2018 study to complete the pavement design for the area roadways.
- **Watermain** will be installed in Ferret Street from 146th Avenue to Bunker Lake Boulevard, connecting to the 12-inch watermain located in 147th Avenue and also connecting to the watermain in Bunker Lake Boulevard. The watermain will also be extended along 146th Avenue to the existing cul-de-sac bulb. Service lines and fire hydrants will be installed along the corridor as-needed. The City will perform a leak test of the existing watermains in the area during the design phase of the project.

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- **State Aid formatted plans and specifications**, will not be required for the project.
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BUNKER LAKE BOULEVARD

Ferret Street is proposed to connect to Bunker Lake Boulevard. The Future Business Park report, completed in 2015, provided recommendations for the long-term configuration of the roadway. A right-in/right-out access is depicted near the proposed connection of Ferret Street to Bunker Lake Boulevard. A full access is shown to the west of the proposed access location. See attached figures 5 and 8 from that study for reference.

The report was prepared prior to significant development in the area and included assumptions of businesses with high traffic volumes being developed in the area. We are proposing to update the traffic analysis completed with the study as a portion of this proposal. Recommendations from a traffic study update could include:

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- Receive previous report from City in Word format,
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SCHEDULE

The project schedule has yet to be determined. Bolton & Menk is available to begin plan preparation upon receiving a notice to proceed from the City.

PERMITTING AND APPROVALS

The work associated with the roadway improvements will require the following permits:

- Lower Rum River Watershed Management Organization (Stormwater and Erosion Control),
- MPCA (NPDES – Construction Stormwater General Permit), and
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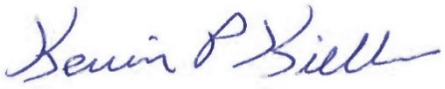
FEES

We have attached a fee spreadsheet depicting hours, rates, and total compensation on a per task basis. We are proposing to use AET for geotechnical services. Based on our understanding of the improvements, our proposed fees for the work, including geotechnical services, are $49,835.00.

If there are any questions related to this proposal, please call me at (651) 968-7760.

Sincerely,

Bolton & Menk, Inc.



Kevin P. Kielb, P.E.
Principal Engineer

ATTACHMENTS:
- Improvements Exhibits
- Future Business Park Exhibits (2 Pages)
- Detailed Fee Spreadsheet

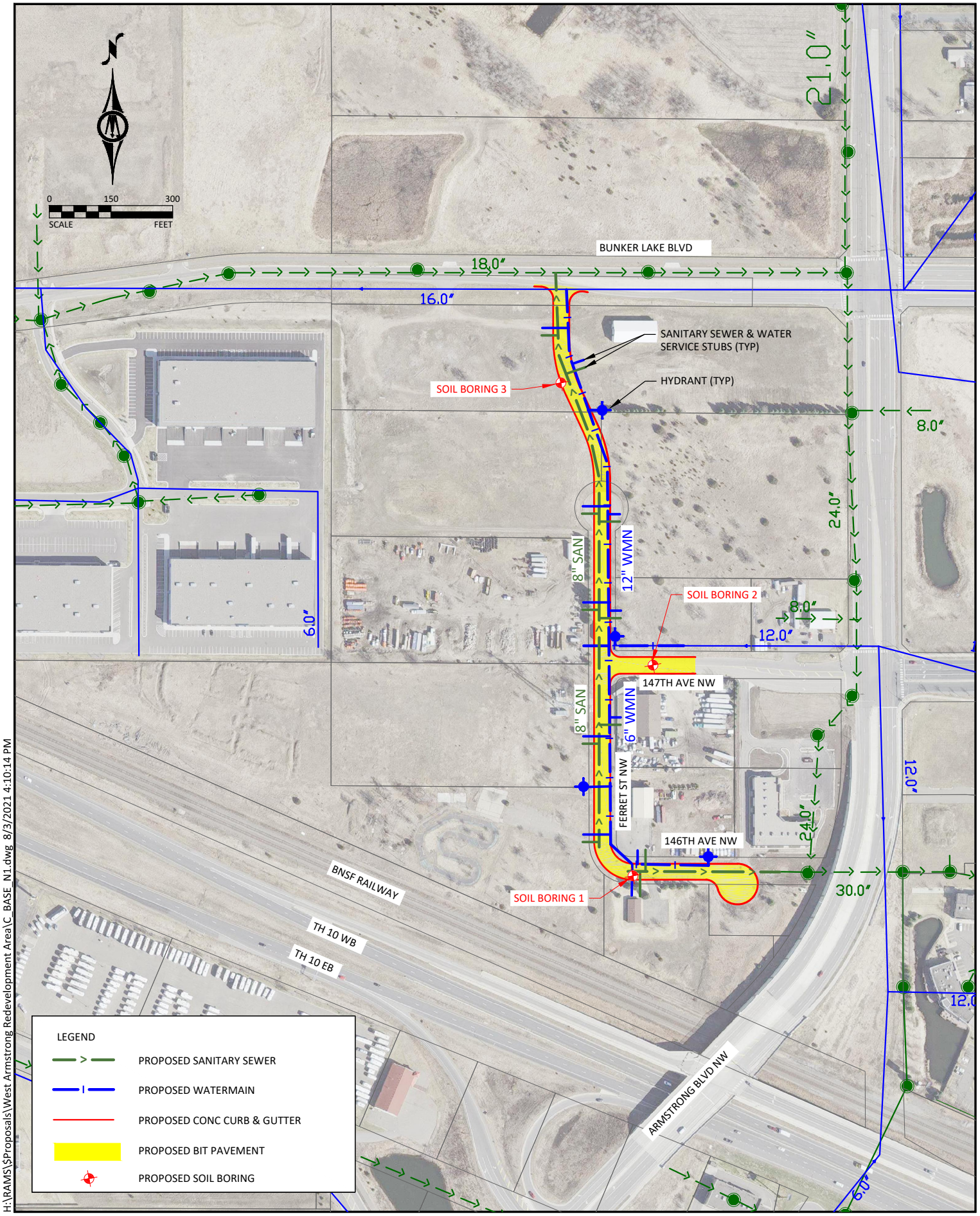
West Armstrong Redevelopment

City of Ramsey

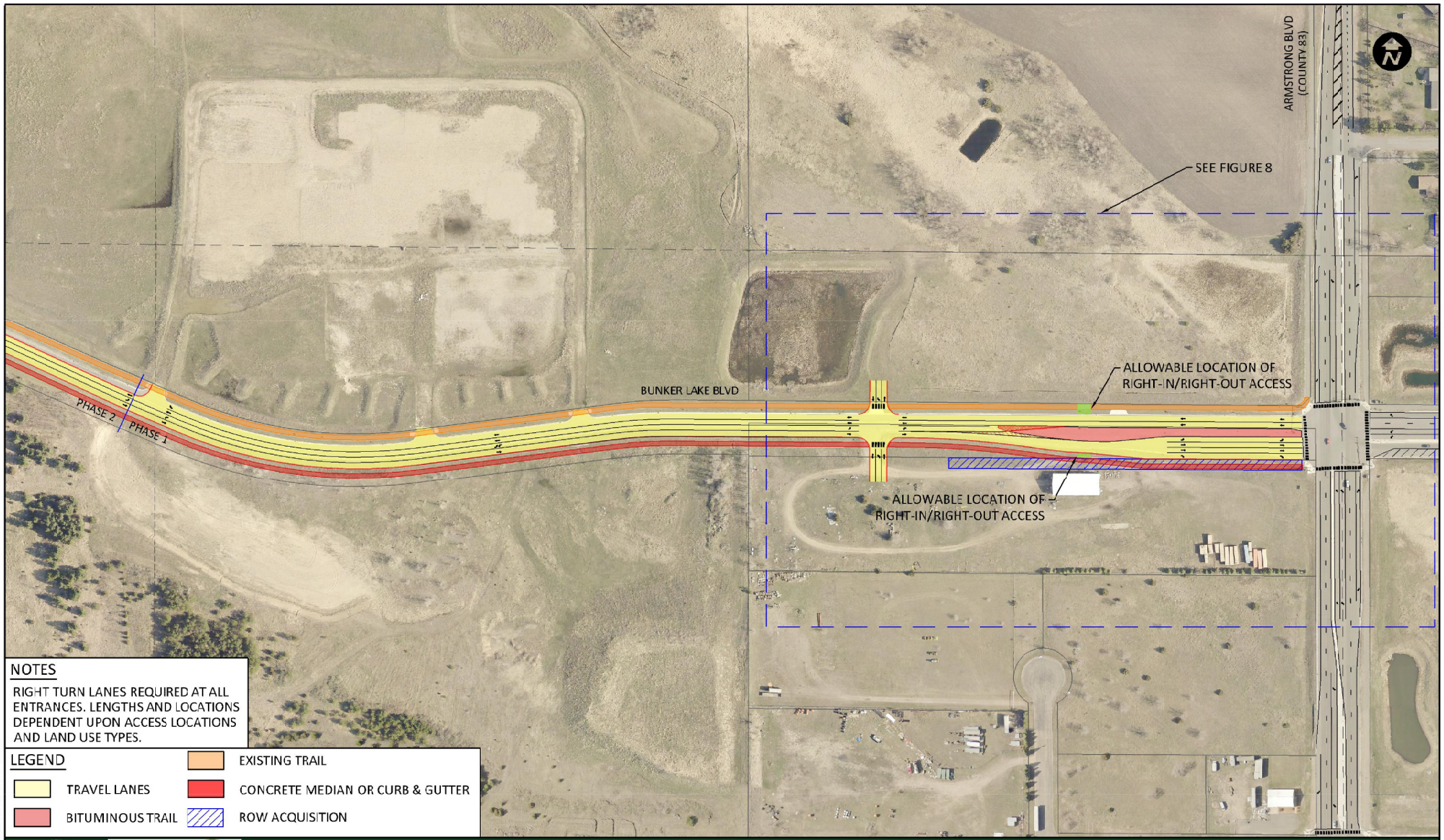
Proposed Improvements

August 2021

BOLTON & MENK



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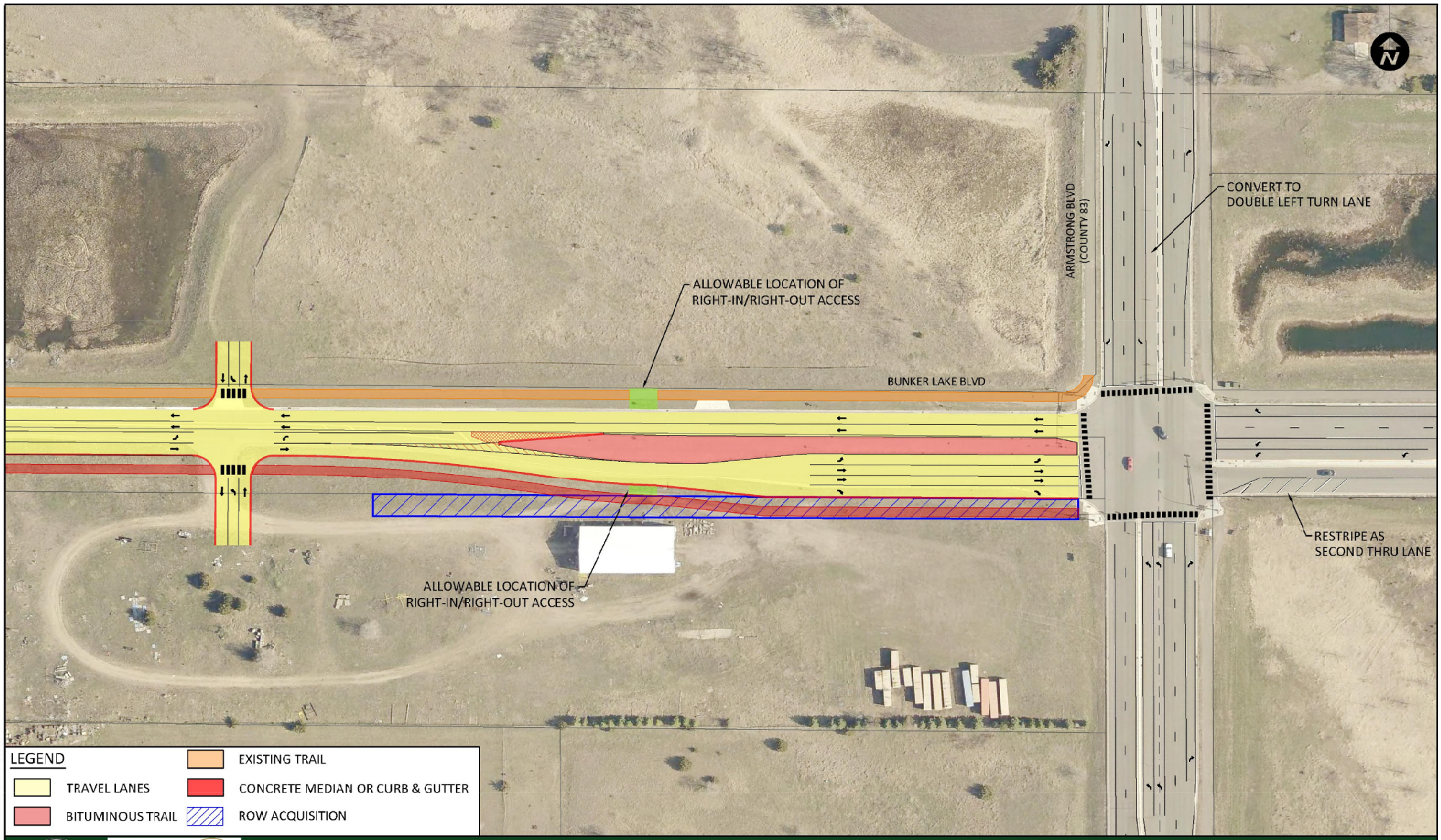
BOLTON & MENK
Engineers & Surveyors

City of RAMSEY

FUTURE BUSINESS PARK
CITY OF RAMSEY, MINNESOTA

FIGURE 5 - GEOMETRICS

July, 2015



BOLTON & MENK
Engineers & Surveyors

City of RAMSEY

FUTURE BUSINESS PARK
CITY OF RAMSEY, MINNESOTA

FIGURE 8 - BUNKER LAKE BOULEVARD AT ARMSTRONG BOULEVARD

July, 2015

DETAILED COST ESTIMATE

CLIENT: City of Ramsey PROJECT: West Armstrong Redevelopment Area	BOLTON & MENK, INC.								
WORK TASK DESCRIPTION	**Project Manager**	**Project Engineer**	**Design Engineer**	**Sr. Traffic Engineer**	**Technician**	**Survey**	**Clerical**	**Total Hours**	**Cost**
Design Services									
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3.0 Bunker Lake Boulevard Traffic Study Update	2	0	10	8	2	0	0	**22**	$3,620
4.0 Utility Coordination	0	4	2	0	2	0	0	**8**	$1,130
5.0 Geotechnical Coordination	0	2	2	0	0	0	1	**5**	$670
6.0 Final Design / Plan Preparation / Estimates / Permits	9	35	66	3	86	0	20	**219**	$29,950
7.0 Bidding Services	5	10	7	0	0	0	5	**27**	$3,890
Subtotal Bolton & Menk Design	**25**	**71**	**82**	**11**	**114**	**0**	**23**	**326**	$46,040
								SUBCONSULTANT - American Engineering Testing	$3,795
								TOTAL for Design through Bidding	**$49,835**

Meeting Date: 12/14/2021
Submitted For: Sean Sullivan, Community Development
By: Sean Sullivan, Community Development

Information

Title:

Adopt Resolution #21-349 Authorizing Funding and Ordering Engineering Services for West Armstrong Redevelopment Area (Plans, Specs and Feasibility Update)

Purpose/Background:

The purpose of this case is to:
1) Receive West Armstrong Redevelopment Area Update
2) Consider adoption of Resolution #21-349 Authorizing Funding and Ordering Engineering Services for West Armstrong Redevelopment Area (Plans, Specs and Feasibility Update)

Background:

In May of 2021, the EDA and City Council reaffirmed the vision of the West Armstrong Redevelopment Area (Industrial and COR zoning) and to asked Staff to put together a plan to identify project costs and design to:
1) Reconstruct 146th, 147th and Ferret Street
2) Extend Ferret St. to Bunker Lake Boulevard
3) Install City Sewer, Water and Storm Sewer

Development Update in West of Armstrong Redevelopment Area and Bunker Lake Business Park

Industrial development and demand remains strong in the City of Ramsey. Recent in-fill Development (65,000 SF - Anderson Dahlen - AEC Energy Park) and developments in Bunker Lake Industrial Park (Oppidan - 405,000 SF and BLIP 4 - 67,000 SF) have reduced the available industrial land to approximately 20 acres. Staff and PSD LLC have been working with an unidentified user to acquire approximately 10 acres and to construct a 100-150,000 SF industrial warehouse building in Bunker Lake Industrial Park. If this project is completed that would leave approximately 10 acres of shovel ready land available for industrial development.

In May of 2021, the City Council and EDA affirmed to land use vision in the West Armstrong Redevelopment area identifying the land west of Ferret St as Commercial / Industrial and the land east of Ferret Street as Retail / Office (COR). Staff has been approached by smaller industrial users and other commercial/industrial projects that have interest in locating to that area if City utilities are available. On December 9, 2021 the Anoka Ramsey Athletic Association (ARAA) announced that they have secured site in the West Armstrong Redevelopment to erect a sports dome and other facilities. The City Council directed staff to bring forth a proposal to obtain design and costs to reconstruct and design roadways and to install City utilities and the heighten level of interest in this area certainly supports this action.

The Proposed City Road and Infrastructure Project

In 2017-2018, the City began planning for the reconstruction of 146th Avenue, 147th Avenue and Ferret Street. In January of 2019, the City tabled the project with the support of the adjacent private property owners until future land use planning and visioning were complete. With the completion of the 2040 Comprehensive Plan Update, that visioning and land use planning is now complete and the City should be able to move

forward with this needed pavement management plan without interfering with the redevelopment vision. In fact, investment in basic infrastructure in this area likely will leverage interest in private redevelopment. This proposed project expands sewer and water in the area and also connects Ferret Street to Bunker Lake Boulevard (new infrastructure in addition to reconstruction of existing infrastructure).

City Staff has worked with Bolton and Menk to put together a phased approach that will ultimately provide a cost and preliminary design of improvements in the area. Topographical survey and soil borings are needed prior to putting together a design and cost estimate for the project. A copy of the proposal for the Topographical Survey is attached to this case. The EDA approved this expenditure at the December 9, 2021 Meeting.

Once the Topographical Survey is complete, Bolton and Menk can begin work on the Engineering Services for the West Armstrong Redevelopment Area. The Proposal for Engineering Services (i.e., feasibility, preliminary design, plans and specs) for West Armstrong Redevelopment Area is attached to this case and would need City Council Approval.

Staff is asking for action by the City Council to authorize Engineering Services for West Armstrong Redevelopment Area (i.e., feasibility, preliminary design, plans and specs) outlined in the Bolton and Menk proposal.

Notification:
Notification is not required.

Observations/Alternatives:
Observations:
The proposal for Engineering Services for West Armstrong Redevelopment Area (Design / Plans and Specs and Updated Bunker Lake Blvd Feasibility Study) is $49,835.00. It should be noted that the Topographical Survey referenced in this proposal has been removed and is included in the $7,955.00 Topographical Survey which was already approved by the EDA. In this proposal there is also a proposed Feasibility Report Update at the line item cost of $8,160. Staff has spoken with City Engineer Bruce Westby and this feasibility update could be performed in-house by the City Engineering team if there is available staff capacity. Staff would ask for flexibility from the the City Council to fund the entire cost of the study (including the Feasibility Report Update) with the ability to reduce it if the work can be done internally.

Proposal for Engineering Services for West Armstrong Redevelopment Area (Design/Plans and Specs and Feasibility Update) - $49,835

Alternatives:

1) Adopt Resolution #21-349 Authorizing Funding and Ordering Engineering Services for West Armstrong Redevelopment Area (Designs/Plans and Feasibility Update) as presented ($49,835)(EDA Recommendation)
2) Adopt Resolution #21-349 Authorizing Funding and Ordering Engineering Services for West Armstrong Redevelopment Area (Designs/Plans and Specs) excluding the Feasibility Report Update ($41,675)
3) Something else

Funding Source:
Engineering Services for West Armstrong Redevelopment Area (Designs/Plans and Feasibility Update)
The funding for this action would be the PIR Fund.

Recommendation:

The EDA met on December 9, 2021 and passed a unanimous motion to recommend to the City Council to Authorize the Funding and Order Engineering Services for West Armstrong Redevelopment Area (Designs/Plans and Feasibility Update) as presented ($49,835)

Action:
Motion to Adopt Resolution #21-349 Authorizing Funding and Ordering Engineering Services for West Armstrong Redevelopment Area (Designs/Plans and Feasibility Update) as presented ($49,835)

Attachments

Site Location Map
ACTION - Resolution #21-349
ACTION - Proposal for Design and Plans and Specs
Reference EDA Approved - Proposal for Topographical Survey

Form Review

Inbox	Reviewed By	Date
Sean Sullivan (Originator)	Sean Sullivan	12/09/2021 09:52 AM
Bruce Westby	Sean Sullivan	12/09/2021 09:56 AM
Sean Sullivan (Originator)	Sean Sullivan	12/09/2021 10:05 AM
Bruce Westby	Bruce Westby	12/09/2021 10:31 AM
Brian Hagen	Brian Hagen	12/09/2021 01:15 PM
Kurt Ulrich	Kurt Ulrich	12/09/2021 01:31 PM
Form Started By: Sean Sullivan		Started On: 12/06/2021 04:30 PM
Final Approval Date: 12/09/2021		

West Armstrong Redevelopment Area



Parcel Information: Approx. Acres: 45

Commissioner: MATT LOOK

Plat:

Owner Information:

Sean Sullivan	1:4,800	Date: 3/29/2021

Disclaimer: Map and parcel data are believed to be accurate, but accuracy is not guaranteed. This is not a legal document and should not be substituted for a title search, appraisal, survey, or for zoning verification.

Councilmember _____ introduced the following resolution and moved for its adoption:

RESOLUTION #21-349

RESOLUTION AUTHORIZING FUNDING AND ORDERING ENGINEERING SERVICES FOR WEST ARMSTRONG REDEVELOPMENT AREA

WHEREAS, in May of 2021 the Ramsey EDA and Ramsey City Council affirmed the land use vision in the West of Armstrong Redevelopment Area and directed staff to obtain a proposal to obtain design/plans and specs to reconstruct roadways and to install City utilities in the area; and

WHEREAS, on December 9, 2021, the EDA approved the Engineering Services for the Topographical Survey of the West Armstrong Redevelopment Area and ordered the work to commence; and

WHEREAS, on December 9, 2021, the EDA unanimously recommended that the City Council Authorize Funding and Order Engineering Services for West Armstrong Redevelopment Area (Designs/Plans and Feasibility Update) as defined in the Bolton and Menk proposal for a cost of $49,835; and

WHEREAS, Staff has received development inquiries and interest from landowners in the area to reconstruct roadways and to install City infrastructure to allow this area to redevelop efficiently.

NOW THEREFORE, BE IT RESOLVED BY THE CITY OF RAMSEY, ANOKA COUNTY, STATE OF MINNESOTA, as follows:

1) That the City of Ramsey authorizes $49,835 in funding from the PIR fund and authorizes City Officials to order Engineering Services for West Armstrong Redevelopment Area (Design/Plans and Specs and Feasibility Update)

The motion for the adoption of the foregoing resolution was duly seconded by Councilmember _____, and upon vote being taken thereon, the following voted in favor thereof:

and the following voted against the same:

and the following abstained:

and the following were absent:

whereupon said resolution was declared duly passed and adopted by the Ramsey City Council this 14th day of December, 2021.

_____
Mayor

ATTEST:

_____
City Clerk

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

November 23, 2021

Mr. Bruce Westby, P.E.
City Engineer
City of Ramsey
7550 Sunwood Drive NW
Ramsey, Minnesota 55303

RE: Proposal for Engineering Services – West Armstrong Redevelopment Area

Dear Mr. Westby:

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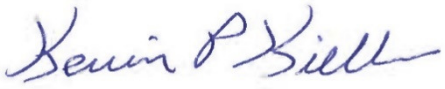
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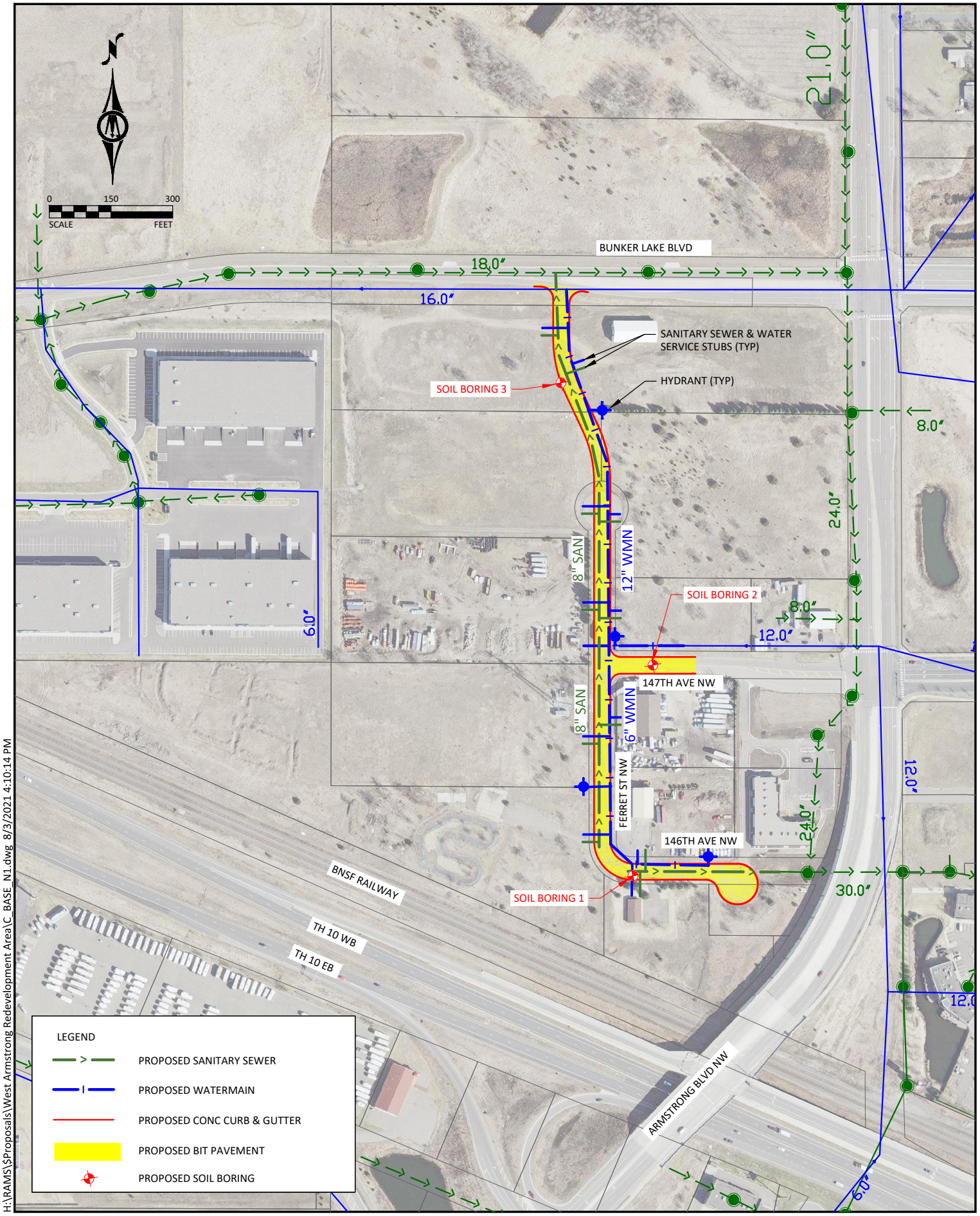
West Armstrong Redevelopment

City of Ramsey

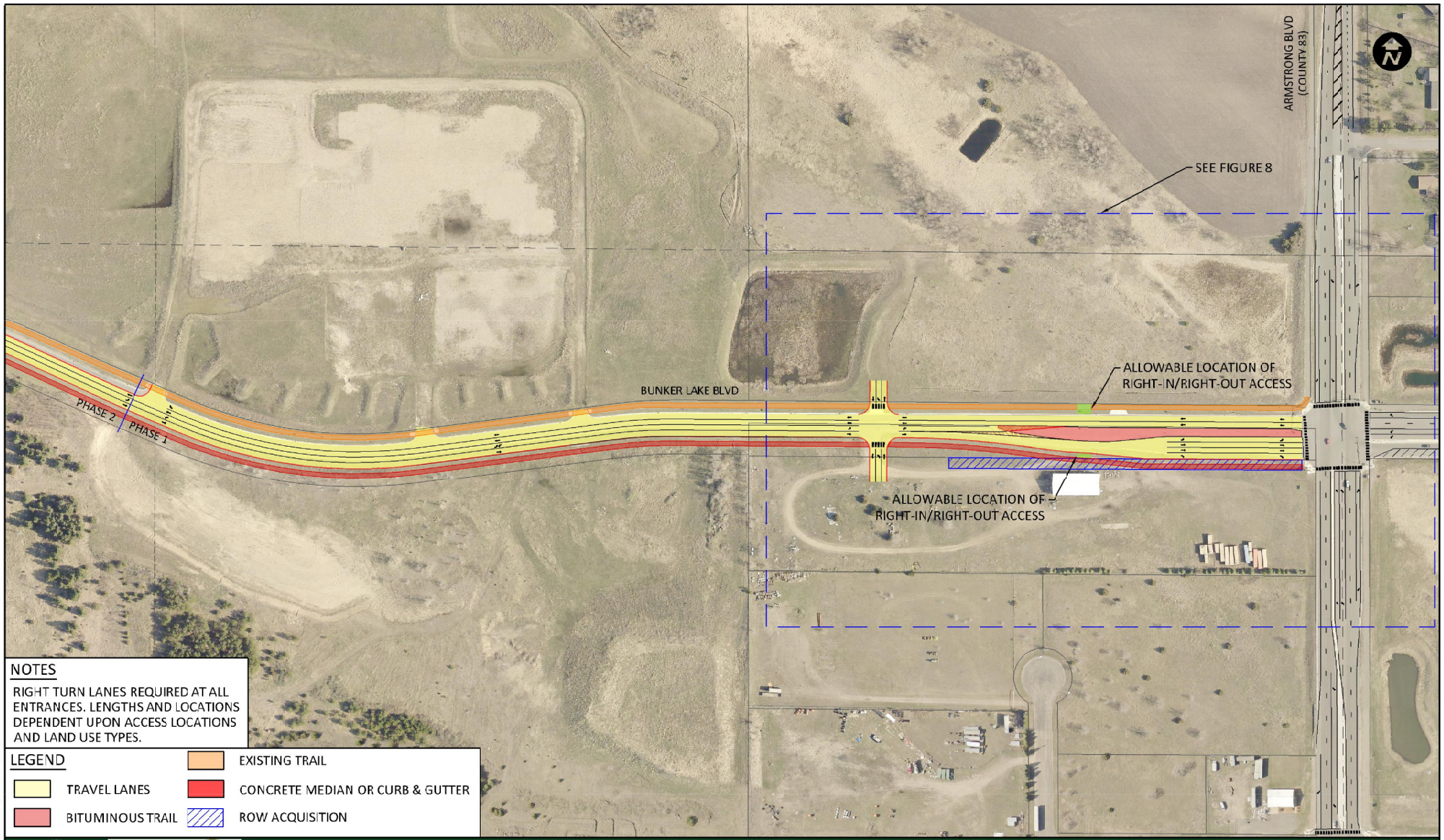
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August 2021

BOLTON & MENK



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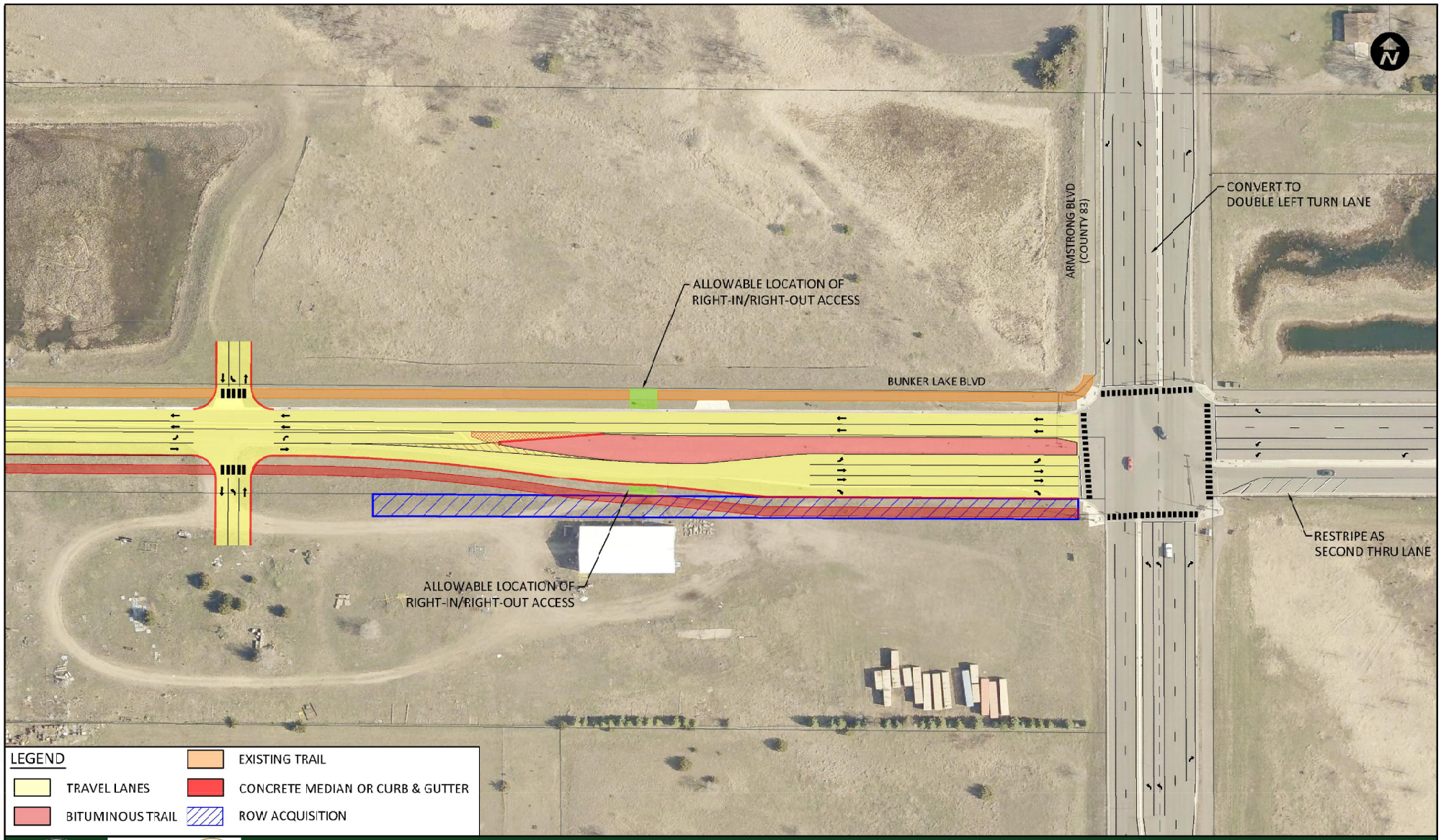
BOLTON & MENK
Engineers & Surveyors

City of RAMSEY

FUTURE BUSINESS PARK
CITY OF RAMSEY, MINNESOTA

FIGURE 5 - GEOMETRICS

July, 2015



BOLTON & MENK
Engineers & Surveyors

City of RAMSEY

FUTURE BUSINESS PARK
CITY OF RAMSEY, MINNESOTA

FIGURE 8 - BUNKER LAKE BOULEVARD AT ARMSTRONG BOULEVARD

July, 2015

DETAILED COST ESTIMATE

CLIENT: City of Ramsey PROJECT: West Armstrong Redevelopment Area	BOLTON & MENK, INC.								
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November 23, 2021

Mr. Bruce Westby, P.E.
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7550 Sunwood Drive NW
Ramsey, Minnesota 55303

RE: Proposal for Engineering Services – West Armstrong Redevelopment Area Topographic Survey

Dear Mr. Westby:

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Project scope assumptions used in creating this fee proposal include the following:

- **A topographic survey** of the corridors will be required for the project. The Bunker Lake Boulevard survey and design will be completed separately.

SCHEDULE AND FEES

Bolton & Menk will immediately schedule the survey and attempt to complete in 2021. Based on our understanding of the improvements, our proposed fees for the work are $7,955.00.

If there are any questions related to this proposal, please call me at (651) 968-7760.

Sincerely,

Bolton & Menk, Inc.

Kevin P Kielb

Kevin P. Kielb, P.E.
Principal Engineer

Economic Development Authority (EDA) 4. 2.
Meeting Date: 02/09/2023
Submitted For: Sean Sullivan, Community Development
By: Sean Sullivan, Community Development

Title:
Receive Draft West Armstrong Area Street Reconstruction Feasibility Report

Purpose/Background:
The purpose of this case is to:
1) Receive Draft West Armstrong Redevelopment Area Street Reconstruction Report
2) Provide comments / suggestions /recommendations to City Council

Background:
The Proposed West Armstrong Street and Infrastructure Project
In 2017-2018, the City began planning for the reconstruction of 146th Avenue, 147th Avenue and Ferret Street. In January of 2019, the City tabled the project with the support of the adjacent private property owners until future land use planning and visioning were complete. With the completion of the 2040 Comprehensive Plan Update, that visioning and land use planning is now complete and the City should be able to move forward with this needed pavement management plan without interfering with the redevelopment vision. In fact, investment in basic infrastructure in this area likely will leverage interest to facilitate private redevelopment. This proposed project expands sewer and water in the area and also connects Ferret Street to Bunker Lake Boulevard (new infrastructure in addition to reconstruction of existing infrastructure). Multiple property owners in the West Armstrong Redevelopment Area have expressed support of the street reconstruction and extension of city services, which is a change from the 2018-2019.

In May of 2021, the EDA and City Council reaffirmed the vision of the West Armstrong Redevelopment Area (Industrial and COR zoning) and to asked Staff to put together a plan to identify project costs and design to:
1) Reconstruct 146th, 147th and Ferret Street
2) Extend Ferret St. to Bunker Lake Boulevard
3) Install City Sewer, Water and Storm Sewer

The City Council directed staff to bring forth a proposal to obtain design and costs to reconstruct and design roadways and to install City utilities. Staff obtained authorization to move forward with the proposal through Resolution #21-349 adopted by the City Council on December 14, 2021.

Draft West Armstrong Area Street Reconstruction Feasibility Report
Bolton and Menk has completed the Draft West Armstrong Area Street Reconstruction Feasibility Report. The cost to complete the project is estimated to be $1,827,159.66 (including 10% contingency)

Development Update in West of Armstrong Redevelopment Area and Bunker Lake Business Park
Industrial development and demand remains strong in the City of Ramsey. Recent in-fill Development (65,000 SF - Anderson Dahlen - AEC Energy Park) and developments in Bunker Lake Industrial Park (Oppidan - 405,000 SF and BLIP 4 - 67,000 SF). PSD LLC is considering the construction of 84,000 SF industrial warehouse building in Bunker Lake Industrial Park in 2023 which will reduce the available industrial land with City Sewer and Water to approximately 10 acres. ARAA has submitted a site plan to construct a Sports Dome on the SW corner of the industrial guided site

Notification:
Notification is not required.

Observations/Alternatives:
Observations:
The Draft West Armstrong Street Reconstruction Feasibility Report outlines the cost and timeline to reconstruct 146th Avenue NW, 147th Avenue NW, Ferret Street NW (and extension to Bunker Lake Boulevard NW) and install City Sewer, Water and Storm Sewer to serve the area. The cost to construct the improvements and land acquisition required for Right of Way (ROW) is estimated to be $1,827,159. This project will open up 26 acres for the ARAA Sports Dome Project development and additional Industrial West of Ferret Street. It will also create access and frontage for about 10 acres of property zoned COR / Retail east of Ferret Street. The study outlines a project timeline that allows for 2023 construction commencing in July and completion at the end of September 2023. There are a few potential funding sources for the project but the Study shows a model based on special assessments and other specific City Funds.

Staff is looking for comments/recommendation in support or against the proposed project and suggestions as to how the project could be funded to be provided to the City Council. Items to be considered include:

Project Timing
Support for ARAA Sports Dome project
Support for identified funding sources
Suggestions for alternative funding sources
Support for Special Assessments for benefited properties
Other comments

Alternatives:
1) EDA recommend that the City Council identify a viable funding source and move forward with construction of the West Armstrong Street Reconstruction Project in 2023
2) Something else

Funding Source:
The Draft West Armstrong Street Reconstruction Feasibility Study identifies the following funding structure for the project:

1. Special Assessments for properties receiving benefit for the project
2. 5-year Street Reconstruction and Overlay Program bonds for city portion of road and sidewalk reconstruction.
3. Water and Stormwater Utility Funds for all utility improvements.

There are other funds that could potentially be used to offset City costs for the project. They include:

1. PIR Fund
2. EDA Fund Balance
3. Anoka County HRA (Housing and Redevelopment Authority) Fund
4. TIF 14 (Tax Increment Financing) (expenses incurred prior to November 28, 2023)

The funding for this action would be determined based on consultation with Finance Director, PWC and City Council.

Recommendation:
Motion to recommend that the City Council identify a viable funding source and move forward with construction of the West Armstrong Street Reconstruction Project in 2023

Action:
Motion to recommend that the City Council identify a viable funding source and move forward with construction of the West Armstrong Street Reconstruction Project in 2023

Attachments
Site Location Map
Draft West Armstrong Street Reconstruction Report

Form Review

Inbox	Reviewed By	Date
Sean Sullivan (Originator)	Sean Sullivan	02/02/2023 08:24 PM
Brian Hagen	Brian Hagen	02/03/2023 02:32 PM
Form Started By: Sean Sullivan		Started On: 02/02/2023 09:46 AM
Final Approval Date: 02/03/2023		

West Armstrong Redevelopment Area



Parcel Information: Approx. Acres: 45

Commissioner: MATT LOOK

Plat:

Owner Information:

Sean Sullivan	1:4,800	Date: 3/29/2021

Disclaimer: Map and parcel data are believed to be accurate, but accuracy is not guaranteed. This is not a legal document and should not be substituted for a title search, appraisal, survey, or for zoning verification.

FEASIBILITY REPORT UPDATE

WEST ARMSTRONG AREA STREET RECONSTRUCTION

CITY IMPROVEMENT PROJECT NO. 18-02

February 2, 2023

Prepared By:

City of Ramsey
Engineering Department
7550 Sunwood Drive NW
Ramsey, MN 55303
763-433-9839
763-433-9848 (Fax)

Bolton & Menk, Inc.
7533 Sunwood Drive NW, Suite 206
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Real People. Real Solutions.

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Bolton-Menk.com

February 2, 2023

Bruce Westby
City Engineer / Public Works Director
City of Ramsey
7550 Sunwood Drive NW
Ramsey, MN 55303

Re: Feasibility Report Update- City of Ramsey Improvement Project #18-02
West Armstrong Area Ramsey Street Reconstruction

Dear Mr. Westby,

Transmitted herewith is an Updated Feasibility Report for the proposed West Armstrong Area Reconstruction, previously titled: "HY-10." The project includes 146th Avenue from Ferret Street to its termini cul-de-sac, 147th Avenue from Ferret Street to 380 feet west of Armstrong Boulevard, and Ferret Street from 146th Avenue to Bunker Lake Boulevard. The report examines the feasibility of reconstructing the bituminous street section and completing other appurtenant improvements.

This Feasibility Report examines the scope of the proposed improvements, explores estimated costs and available funding sources, defines a preliminary project schedule, and determines the necessity, feasibility, and general cost-effectiveness of the proposed improvements, including any alternate designs, as well as whether the improvements would best be completed separately or in conjunction with another project.

I would be happy to discuss this report with you at your convenience. Please feel free to contact me at 651-968-7760 or kevin.kielb@bolton-menk.com with any questions.

Sincerely,
Bolton & Menk, Inc.

Kevin P. Kielb, P.E.
Principal Engineer

Enclosure

CERTIFICATION

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.

Kevin Kielb, PE

Date: February 2, 2022 License No. 23211

`

I hereby certify that this plan, specification or report was reviewed for Quality Control and Quality Assurance purposes and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Bruce Westby, PE

Date: License No. 40116

TITLE SHEET
LETTER OF TRANSMITTAL
CERTIFICATION SHEET
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Appendix A

Figure 1 – Proposed Improvements
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Appendix B

Opinion of Probable Costs
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Ground Penetrating Radar Summary

Appendix D

Revised West Armstrong Area Traffic Analysis Memorandum
Report of Geotechnical Exploration

1. EXECUTIVE SUMMARY

City Improvement Project No. 18-02 proposes to reconstruct streets within the West Armstrong Area. The West Armstrong Area is bordered on the north by Bunker Lake Boulevard, on the south by TH 10, on the east by Armstrong Boulevard, and on the west by the employment district. Project area includes 146th Avenue, 147th Avenue, and Ferret Street. The streets total approximately 2,025 linear feet (0.39 miles) in length.

The proposed improvements include full reconstruction of roadways, utility extensions, boulevard sidewalk, and stormwater management improvements of public right-of-way runoff only. Additionally, the Anoka Ramsey Athletic Association (ARAA) has been developing plans on their property to construct a sports recreation facility. The resulting larger traffic projections warrant further analyses. Maps showing the location and scope of the proposed improvements are included as ***Figure 1*** in ***Appendix A.***

Initially, On July 11, 2017, the City Council adopted Resolution #17-07-170 authorizing the preparation of a Feasibility Report for the reconstruction of HY-10 Ramsey. These streets were originally included in the City's CIP as proposed 2015 overlay improvements. However, the overlay work was delayed when construction of the Highway 10 & Armstrong Boulevard Interchange was funded. Following completion of the Interchange, the pavement was re-evaluated, and Staff determined it would be best to reconstruct these streets in the future. This project is now listed in the current 10-year CIP as a total reconstruction.

On December 14, 2021, the City Council adopted Resolution #21-349 authorizing the engineering services and preparation of this Feasibility Report Update, retitled "West Armstrong Redevelopment Area." Much of the information contained in this Update has been carried forward from the previously authorized and completed feasibility report.

Upon ordering the Feasibility Report Update, the City Council directed Staff to review the existing street alignments and explore whether the streets should be reconstructed in the same locations, or whether it might make sense to realign or extend one or more of the streets to better serve existing properties and/or to connect to the new Bunker Lake Industrial Park.

The engineer's opinion of probable construction costs including streets, drainage, public sewer and water utilities, and property acquisition is **$1,827,159.66**. A summary of the engineer's opinion of probable costs is included in ***Appendix B.***

The project funding mechanisms are yet to be determined by City Staff. A combination of special assessments to benefitting properties, street reconstruction bond proceeds, and stormwater utility funds are possible. Sewer and Water Utility Funds would be used to pay for any public utility improvements.

Eleven (11) parcels have been identified as receiving special benefit from the improvements. Five of the parcels have permanent structures, and the other five are undeveloped. Additionally, to extend Ferret Street north to Bunker Lake Boulevard, roadway right-of-way and drainage and utility easements would be required. These parcels are identified in the preliminary Assessment Map, Property Acquisition Maps, and Preliminary Assessment Roll, which is attached in ***Appendix C***.

If City Staff concludes special assessments will be utilized for these commercial applications, preliminary assessment roles will be prepared at that time. The Assessment Hearing, if applicable, is proposed for November 14, 2023. If the report verifies the assessment rate as proposed is justified, Staff will propose to adopt the final assessment roll using the rate as preliminarily proposed.

2. INTRODUCTION

2.1 Authorization

The preparation of this report update was authorized by the Ramsey City Council on December 14, 2021. This project has been designated as City Improvement Project No. 18-02

2.2 Pavement Maintenance Program Update

Recent redevelopment discussions with adjacent property owners have resulted in a desire to reconstruct the pavements to account for projected traffic increases. Furthermore, as presented in the original feasibility study, the existing pavements have surpassed its useful life.

The City's pavement evaluation process involves a visual evaluation of each street's pavement surface based on the type, extent and severity of each pavement distress observed. Numerous types of pavement distresses may exist within a pavement section including, but not limited to, alligator cracking, block cracking, longitudinal cracking, transverse cracking, rutting, raveling, shoving, potholes and patches. This field data is then used to rate the pavement condition.

City staff evaluates and rates the condition of pavement sections on all City streets on an annual basis using the Pavement Surface Evaluation and Rating (PASER) system. In the summer of 2017, the pavement section of the above referenced street segments was rated with a PASER rating of 2 which indicates these streets require complete reconstruction. City staff patch the streets at least once per year, particularly before winter so the street can be plowed without further damaging the pavement in the process. Pictures of the street are located in ***Appendix A.***

In the summer of 2017, City staff evaluated and rated the condition of the pavement along the West Armstrong Area Street segments. A PASER rating of 2 was determined for 147th Avenue and Ferret Street. A PASER rating of 7 was determined for 146th Avenue, however, as previously noted a portion of this street segment was reconstructed with a temporary bituminous pavement section as part of the Armstrong Interchange project.

2.3 Scope

City of Ramsey Improvement Project 18-02 proposes to reconstruct the existing bituminous pavements, extend Ferret Street north to Bunker Lake Boulevard, install public utility infrastructure for future development, and complete other appurtenant work on 146th Avenue from Ferret Street to its termini cul-de-sac, 147th Avenue from 380 feet west of Armstrong Boulevard to Ferret Street, and Ferret Street from 146th Avenue to Bunker Lake Boulevard which totals approximately 2,000 feet (0.38 miles) in length. A map showing the location and scope of the proposed improvements options is included as ***Figure 1*** in ***Appendix A.***

3. EXISTING CONDITIONS

3.1 Existing Pavement and Soil Conditions

All streets proposed to be improved were constructed in 1988 with bituminous pavement, class 5 aggregate base, bituminous curb, and bituminous curb cuts for storm runoff. However, during the Highway 10/Armstrong Interchange project the west end of 146th Avenue was reconstructed and a temporary cul-de-sac was constructed. The streets were constructed to a width of 40-feet from face-of-curb to face-of-curb. The streets are generally centered within a 66-foot wide right-of-way.

The only pavement maintenance treatments applied to the street segments included crack sealing and seal coating in 1994 and 2001. Spot patching has been performed on an as-needed basis, and has been a yearly treatment recently. In 2017, Staff observed a PASER rating of 2 on 147th Avenue and Ferret Street, and a PASER rating of 7 on 146th Avenue.

In June 2018 traffic counts were taken on 147th Avenue, a traffic volume of 147 average annual daily traffic (AADT) was recorded. Ferret Street and 146th Avenue would be expected to have similar traffic volumes. The only access to these street segments is Armstrong Boulevard. Five of the parcels have active uses. The speed limit is 30 mph for these street segments.

Standard penetration test borings were performed by American Engineering Testing (AET) in 2022. AET's Report of Geotechnical Exploration is attached in ***Appendix D.*** Standard penetration test borings were performed by American Engineering Testing (AET) in 2021. 2.5 to 2.75 inches of bituminous pavement with 8 inches of apparent gravel base was encountered with silty sand and sand with silt layers encountered to depths of approximately 2 to four feet beneath existing grade. The sands with silt from 2 to 4 feet below grade were classified as "Course Alluvium or Fill." Groundwater was encountered at a depth of 10 feet in one of the borings.

Previously, in 2017, Braun Intertec was employed to complete a ground penetrating radar (GPR) analysis for the project area, which included driving a GPR equipped vehicle throughout all street segments within the project area. A summary table and charts of the GPR Analysis are attached in ***Appendix C***. The GPR data determined an average bituminous pavement thickness of 2.9 inches, and an average aggregate base thickness of 9.7 inches. The average street pavement and base section thickness is therefore 12.6 inches, with a minimum section of 7.5 inches located on 147th Avenue, 160 feet east of Ferret Street.

3.2 Watermain

Watermain was installed along 147th Avenue up to the beginning of the proposed improvements in 2012 as part of the Sunwood Drive re-alignment project. The existing watermain is believed to be in good condition and no repairs are anticipated to be required as part of this project. However, Staff plans to leak test the watermain during development of plans and specifications.

3.3 Sanitary Sewer

Sanitary sewer was installed under Armstrong Boulevard in City-owned right-of-way east of the 146th Avenue temporary cul-de-sac as part of the Armstrong Boulevard Interchange project in

2015. The existing sanitary sewer is believed to be in good condition and no repairs are anticipated to be required as part of this project. However, staff plans to televise the sewer during development of plans and specifications.

3.4 Storm Sewer/Drainage

Storm sewer was installed along 147th Avenue up to the beginning of the proposed improvements in 2012 as part of the Sunwood Drive re-alignment project. Currently storm water runoff drains off the two existing cul-de-sacs to low areas. This storm sewer is believed to be in good condition and no repairs are anticipated to be required as part of this project. However, staff plans to televise the sewer during development of plans and specifications.

3.5 Streets

3.5.1 Existing Typical Sections

The width of 146th Avenue, 147th Avenue, and Ferret Street is 40-feet from face-of-curb to face-of-curb. The cul-de-sac on Ferret Street has a 50-foot radius to the back of curb. The streets are generally centered within a 66-foot wide City-owned right-of-way, with a 130-foot wide diameter right-of-way around the cul-de-sac on Ferret Street.

3.5.2 Maintenance History

The West Armstrong area roadways were originally constructed in 1988. 146th Avenue, 147th Avenue, and Ferret Street received crack seal and seal coat in 1994 and 2001. The street segments have regularly received spot patching on an as-needed basis.

3.6 Land Use

The parcels within the construction area are zoned as COR.

4. PROPOSED IMPROVEMENTS

4.1 Street and Stormwater Improvements

4.1.1 Street Improvements

146th Avenue, 147th Avenue and Ferret Street are proposed to be reconstructed with bituminous pavement and concrete curb and gutter.

The proposed surface improvements are shown on ***Figure 1 in Appendix A.***

<u>*Street Design:*</u>
146th Avenue, 147th Avenue, and Ferret Street are currently urban commercial streets with bituminous curb and pavement, 40 feet wide from face-of-curb to face-of-curb. The proposed cul-de-sac is 100-feet in diameter from back-of-curb to back-of-curb. Existing and proposed traffic counts are low for typical commercial streets.

All street segments are proposed to be reconstructed at their current width. A typical section for the proposed pavement reconstruction improvements is shown in ***Figure 2*** in ***Appendix A.***

This Feasibility Report proposes to reconstruct the existing bituminous pavement section using the Full Depth Reclamation (FDR) process. This process generally involves reclaiming the entire existing bituminous pavement section, along with the underlying aggregate base material. The reclaim material will then be salvaged and stockpiled to install the proposed public utilities. Four and one-half inches of bituminous pavement is proposed to be placed on top of a minimum of 8 inches of aggregate base/reclaim material. This pavement section generally meets the City of Ramsey's standard pavement design for commercial/employment district streets. The proposed improvements should have a service life of at least 30-years, assuming maintenance such as overlays, crack sealing and seal coating is routinely performed.

4.1.2 Storm Sewer Improvements

Storm sewer is proposed to be added for street drainage with catch basins being added to convey water off the road and into a proposed ponding and drainage ditches as shown on ***Figures 1 in Appendix A.***

4.1.3 Other Considerations

Driveways:
Existing driveway aprons may need to be reconstructed to varying degrees. The limits of construction will vary with each driveway apron based on the elevation of the street abutting the driveway and the driveway pavement type. During design, Staff will evaluate the construction limits for each driveway and will incorporate this into the plans, but as with all street reconstruction projects, the exact limits of construction will be determined in the field during construction. None are anticipated, but right-of-entry forms will be obtained from private property owners where work is required outside city rights-of-way and easements.

Irrigation Systems:
Developed properties along the project corridor may have private irrigation systems. Staff will notify property owners of pending construction as far in advance as practical to allow them time to relocate their irrigation systems before construction begins.

Parking Restrictions:
Parking is currently provided along both sides of the streets and is not currently restricted except for overnight parking per City code. During project construction, parking will be restricted during allowable working hours.

Pavement Coring:
Existing pavement thicknesses have been found to be inconsistent throughout the City. It is now standard practice to have City Staff on-site during pavement installation to ensure the proper quantities are being placed. As further conformation, Staff is proposing to collect GPR data or to have pavement cores taken at the conclusion of all reconstruction

projects. This is already a requirement on all State Aid projects and will leave more data on the pavement section for future street maintenance projects.

4.2 Stormwater Treatment

The extension of Ferret Street from the north termini cul-de-sac to Bunker Lake Boulevard results in an impervious area increase of 0.4 acres. Also, the existing storm sewer on 147th Avenue drains to existing ponds east of Armstrong Boulevard and north of Sunwood Drive. They were not designed to receive any runoff west of Armstrong Boulevard. Consequently, stormwater retention and/or treatment improvements will be required with this project to reduce the rate at which runoff leaves the site or infiltrates.

4.3 Water Main Improvements

Watermain is proposed to be extended on Ferret Street from Bunker Lake Boulevard to 146th Street. Watermain is also proposed to be extended from mid-block 147th Avenue to Ferret Street. Adding this segment on 147th Avenue will loop together the watermain in this area and provide service for future development.

4.4 Sanitary Sewer Improvements

Sanitary Sewer is proposed to be extended on Ferret Street from Bunker Lake Boulevard to 146th Avenue NW. Adding this segment on Ferret Street will provide service for future development.

4.6 Private Utilities

Staff has not yet met with the telephone, gas, power and cable utilities regarding this project. During preparation of plans and specifications, Staff will meet with the private utility companies to discuss the proposed improvements as noted in the project schedule within this report. The alignment and footprint of the streets will be considered to minimize impacts to private utilities. Impacts to private utilities area anticipated with this project.

Should any utility company indicate they wish to upgrade, replace and/or otherwise modify their services during this project, any such upgrades, replacements and/or modifications will be at the sole discretion and cost of the utility company.

4.7 Traffic Analysis

Based upon the potential traffic changes associated with the redevelopment of the West Armstrong Area, more comprehensive traffic analyses are recommended to be completed at the following locations:

- Bunker Lake Boulevard/Armstrong Boulevard,
- Bunker Lake Boulevard/Ferret Street, and
- Armstrong Boulevard/147th Street.

Initially, a Bunker Lake Boulevard westbound left turn lane and Ferret Street northbound designated left turn lane and right turn lanes are all warranted. The current land use zoned "COR" allows for flexibility. If the west Armstrong Area evolves to more commercial orientated uses with the addition of the ARAA facility and others, additional analysis is warranted to better understand the impacts. A detailed traffic analysis memorandum is included in ***Appendix D.***

4.8 Permits

Permits that are anticipated to be required as part of the proposed improvements include:

- Minnesota Pollution Control Agency (MPCA): Sanitary Sewer Extension
- Minnesota Department of Health (MDH): Watermain Extension
- MPCA General Stormwater Permit: Grading and Storm Water
- Lower Rum River Watershed Management Organization (LRRWMO) Grading and Storm Water

4.9 Right-of-Ways/Easements

It is anticipated that the City will need to acquire additional permanent right-of-way, easements, and/or entire parcels for this project. Costs for right-of-way or easement acquisitions are included in the probable project costs in Appendix B. Property values are based on conversations with property owners and county-assessed values. Actual appraisals will need to be performed to determine final property values.

City Staff will work with private property owners as needed to obtain any required right of entries.

5. FINANCING

5.1 Opinion of Cost

A detailed opinion of probable costs for the proposed improvements can be found in ***Appendix B*** of this report. The opinion of probable costs incorporates anticipated 2023 construction costs for the proposed improvements with 10-percent contingency costs and projected property acquisition costs.

5.2 Funding

5.2.1 Assessments

If City Staff recommend the use of special assessments, the City's adopted Special Assessments Policy allows special assessments to be levied against all benefitting properties in an amount not to exceed 25% of eligible street reconstruction costs. Eligible costs include costs required to reconstruct the street at its current width, and to reconstruct the pavement without increasing its structural capacity. Benefitting properties are defined as any developable parcel that has, or has the ability to create, one or more direct accesses onto the segment of 146th Avenue, 147th Avenue or Ferret Street being reconstructed.

State Statute and the City Charter do not allow for assessments to exceed benefit to the property. Therefore, Staff would want to ensure all assessments applied with this project would not exceed the benefit to assessed properties. Therefore, if special assessments are utilized, Staff recommends ordering a benefit appraisal consultation report for this project in accordance with the City's Special Assessments Policy at the time a construction contract is awarded.

5.2.2 City Contribution

The City contribution to the project would include all funding in excess of the amount collected through special assessments to benefiting properties. No funds have been budgeted for this project. The City's share of eligible project costs related to surface (street) improvements is proposed to come from the previously encumbered 5-year Street Reconstruction and Overlay Program bonds. Water and Stormwater Utility Funds are proposed to pay for all utility improvements.

6. PROJECT SCHEDULE

The proposed project schedule is as follows:

Council Orders Feasibility Report Update..... December 14, 2021

Council Reviews Feasibility Report/Orders Public Informational Meeting.. February 28, 2023

Staff Conducts Public Information Meeting..... January 26, 2023

Council Accepts Feasibility Report/Orders Public Hearing..... March 14, 2023

Council Conducts Public Hearing..... March 28, 2023

Staff Conducts Private Utility Coordination Meeting ..... March 2023

Staff Finalizes Property Acquisition..... March 2023

Council Approves Plans and Specifications / Authorizes Ad for Bids..... April 25, 2023

Final Plat approved ..... April 2023

Staff Receives Bids..... June 1, 2023

Council Awards Contract..... June 13, 2023

Contractor Begins Construction..... July 2023

Contractor Completes Construction..... September 29, 2023

Council Orders Assessment Hearing (if applicable)..... October 10, 2023

Council Conducts Assessment Hearing (if applicable) ..... November 14, 2023

7. CONCLUSIONS AND RECOMMENDATIONS

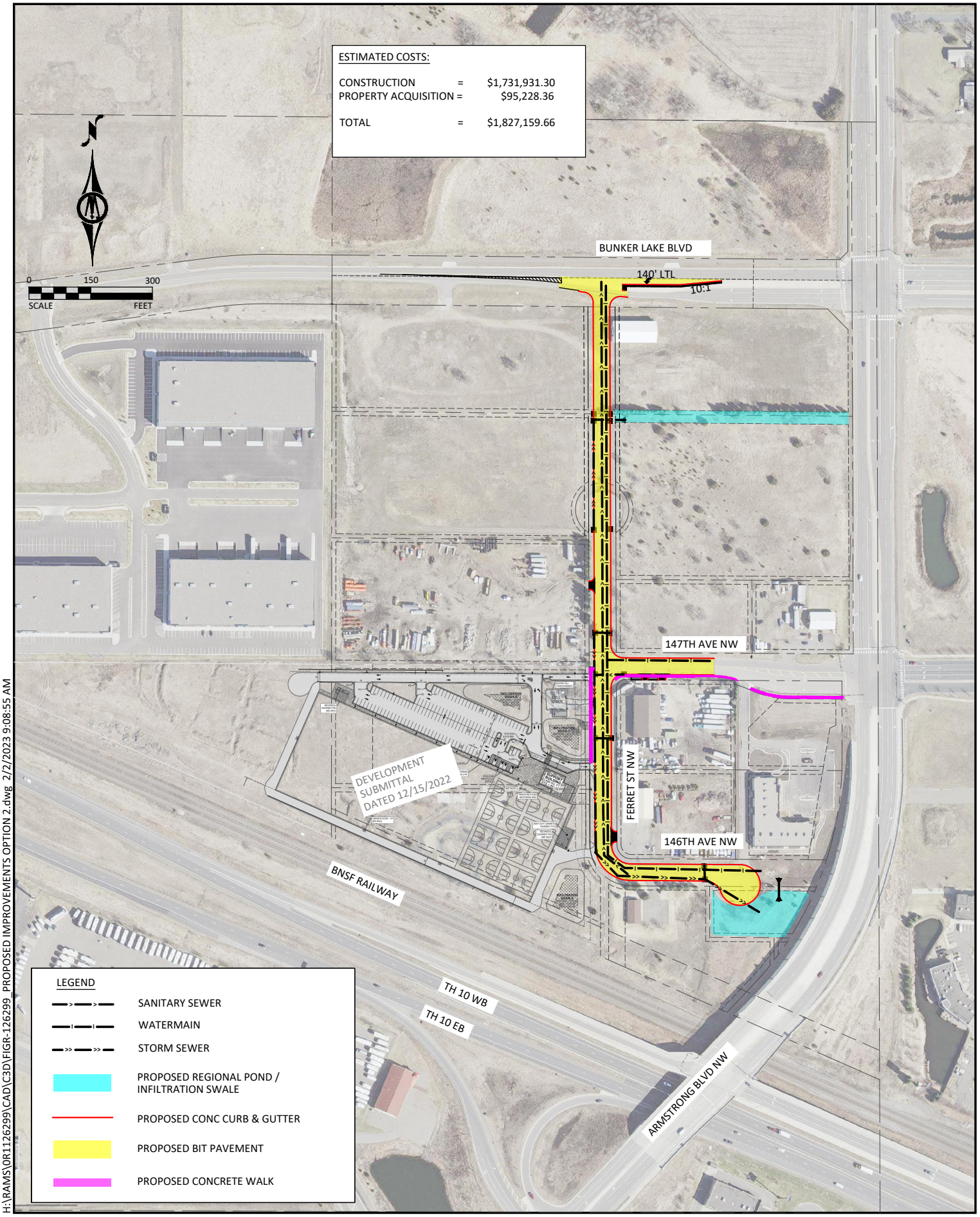
City of Ramsey Improvement Project No. 18-02 proposes to reconstruct the bituminous pavement section, to remove the existing bituminous curb and replace it with a combination of B618 concrete curb and gutter and bituminous curb, and to complete miscellaneous appurtenant work on the following street segments within the West Armstrong Area commercial subdivision:

1. 146th Avenue (approx. 230 linear feet) – Ferret Street to bulb of east cul-de-sac.
2. 147th Avenue (approx. 190 linear feet) – Ferret Street to 180 feet west of Armstrong Boulevard.
3. Ferret Street (approx. 1500 linear feet) – 146th Avenue to Bunker Lake Boulevard

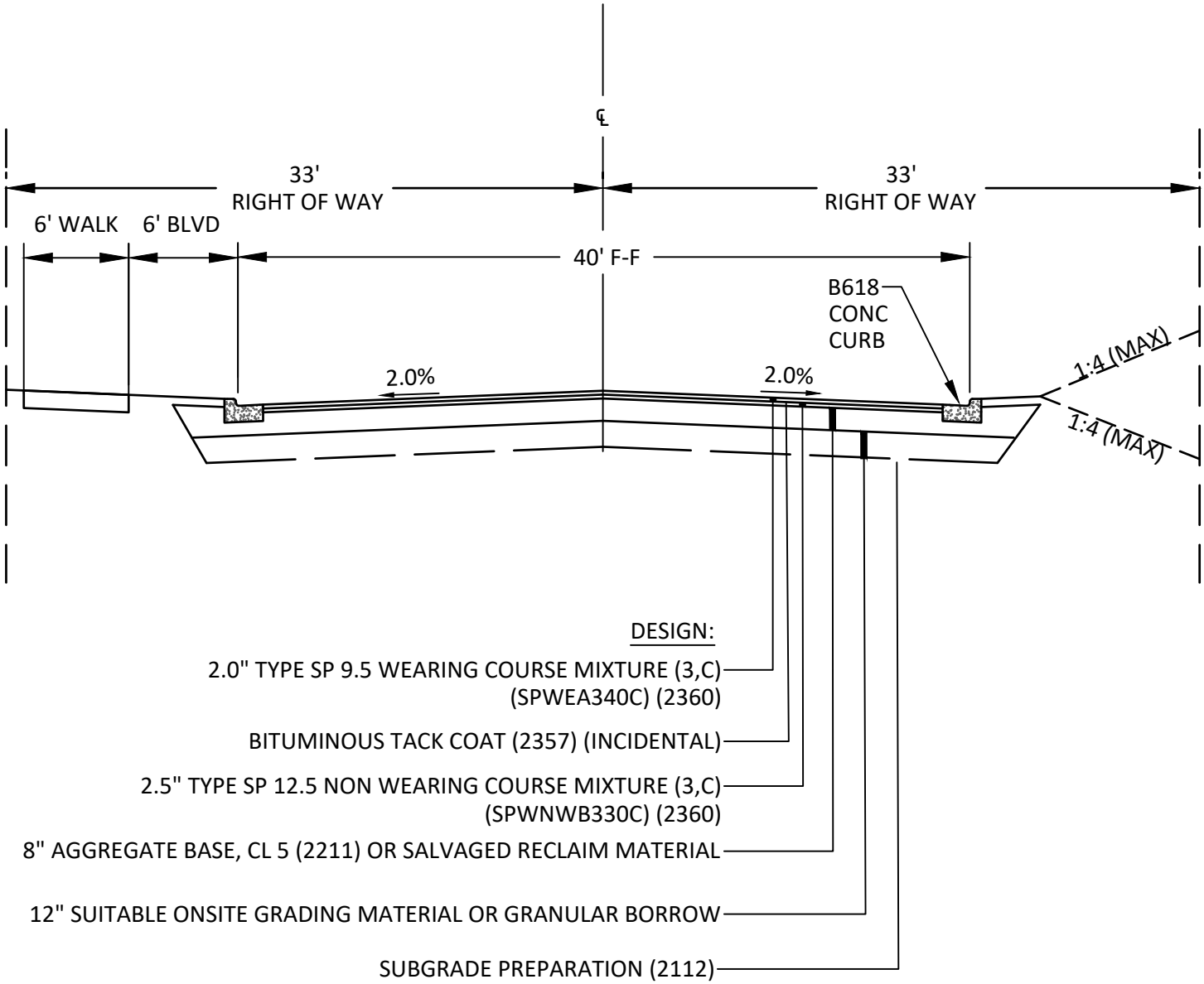
It is the recommendation of City staff that City Project No. 18-02 is feasible, necessary, and cost-effective from an engineering standpoint, and this project would best be constructed as a stand-alone project as proposed herein.

APPENDIX A

Figure 1 – Proposed Improvements
Figure 2 – Typical Section
Project Site Pictures



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H:\RAMS\0R1126299\CAD\C3D\FIGR-126299_TYPICAL SECTION.dwg 2/1/2023 3:43:38 PM

PROJECT SITE PICTURES



1: 146th Avenue from Ferret Street



2: Ferret Street from 146th Avenue



3: Ferret Street from north cul-de-sac



4: 147th Avenue from Ferret Street

APPENDIX B

Opinion of Probable Costs
Preliminary Assessment Map
Property Acquisition
Preliminary Assessment Roll

PRELIMINARY ENGINEER'S ESTIMATE

WEST ARMSTRONG REDEVELOPMENT
CITY PROJECT NO. 18-02
CITY OF RAMSEY, MN
BMI PROJECT NO. 0R1.126299

BOLTON & MENK
Real People. Real Solutions.

Date: 2/1/2023

ENGINEER'S ESTIMATE								ROADWAY		STORM SEWER		SANITARY SEWER		WATERMAIN	
ITEM NO.	MnDOT SPEC NO.	ITEM	NOTES	TOTAL ESTIMATED QUANTITY	UNIT	UNIT PRICE	TOTAL AMOUNT	QUANTITY	AMOUNT	QUANTITY	AMOUNT	QUANTITY	AMOUNT	QUANTITY	AMOUNT
1	2021.501	MOBILIZATION		1	LUMP SUM	$80,000.00	$80,000.00	0.50	$40,000.00	0.16	$12,800.00	0.09	$7,200.00	0.25	$20,000.00
2	2101.502	CLEARING		13	EACH	$500.00	$6,500.00	13	$6,500.00						
3	2101.502	GRUBBING		13	EACH	$200.00	$2,600.00	13	$2,600.00						
4	2101.505	CLEARING		0.25	ACRE	$8,000.00	$2,000.00	0.25	$2,000.00						
5	2101.505	GRUBBING		0.25	ACRE	$6,000.00	$1,500.00	0.25	$1,500.00						
6	2102.503	PAVEMENT MARKING REMOVAL		1,090	LIN FT	$1.50	$1,635.00	1090	$1,635.00						
7	2104.502	REMOVE MAIL BOX & SUPPORT		1	EACH	$100.00	$100.00	1	$100.00						
8	2104.502	REMOVE CASTING ASSEMBLY		1	EACH	$400.00	$400.00			1	$400.00				
9	2104.502	SALVAGE CATCH BASIN		1	EACH	$1,000.00	$1,000.00			1	$1,000.00				
10	2104.502	SALVAGE SIGN		3	EACH	$50.00	$150.00	3	$150.00						
11	2104.502	REMOVE SIGN		1	EACH	$50.00	$50.00	1	$50.00						
12	2104.502	REMOVE GATE VALVE & BOX		1	EACH	$800.00	$800.00							1	$800.00
13	2104.503	REMOVE PIPE SEWERS		12	LIN FT	$20.00	$240.00			12	$240.00				
14	2104.503	REMOVE FENCE		600	LIN FT	$5.00	$3,000.00	600	$3,000.00						
15	2104.503	SAWING BIT PAVEMENT (FULL DEPTH)		1,100	LIN FT	$2.50	$2,750.00	1100	$2,750.00						
16	2104.503	SAWING CONCRETE PAVEMENT (FULL DEPTH)		390	LIN FT	$5.00	$1,950.00	390	$1,950.00						
17	2104.503	REMOVE CURB AND GUTTER		900	LIN FT	$4.00	$3,600.00	900	$3,600.00						
18	2104.504	REMOVE BITUMINOUS PAVEMENT		830	SQ YD	$4.00	$3,320.00	830	$3,320.00						
19	2104.504	REMOVE CONCRETE PAVEMENT		680	SQ YD	$10.00	$6,800.00	680	$6,800.00						
20	2106.507	EXCAVATION - COMMON (EV)	(P) (1)	4,040	CU YD	$18.00	$72,720.00	4040	$72,720.00						
21	2106.507	EXCAVATION - CHANNEL AND POND	(P) (1)	5,300	CU YD	$14.00	$74,200.00			5300	$74,200.00				
22	2106.507	EXCAVATION - SUBGRADE (EV)		200	CU YD	$15.00	$3,000.00	200	$3,000.00						
23	2106.507	STABILIZING AGGREGATE (CV)		200	CU YD	$20.00	$4,000.00	200	$4,000.00						
24	2106.507	COMMON EMBANKMENT (CV)	(P)	500	CU YD	$5.00	$2,500.00	500	$2,500.00						
25	2106.607	HAUL AND STOCKPILE BITUMINOUS MATERIAL	(P)	2,050	CU YD	$12.00	$24,600.00	2050	$24,600.00						
26	2112.519	SUBGRADE PREPARATION		21	ROAD ST	$500.00	$10,500.00	21.0	$10,500.00						
27	2118.507	AGGREGATE SURFACING (CV) CLASS 2		20	CU YD	$85.00	$1,700.00	20	$1,700.00						
28	2123.610	STREET SWEEPER (WITH PICKUP BROOM)		20	HOUR	$200.00	$4,000.00	20	$4,000.00						
29	2211.507	AGGREGATE BASE (CV) CLASS 5 MODIFIED		700	CU YD	$42.00	$29,400.00	700	$29,400.00						
30	2211.607	AGGREGATE BASE (CV) FROM STOCKPILE		2,050	CU YD	$16.00	$32,800.00	2050	$32,800.00						
31	2215.504	FULL DEPTH RECLAMATION (10")		7,350	SQ YD	$2.50	$18,375.00	7350	$18,375.00						
32	2231.604	BITUMINOUS PATCH SPECIAL (DRIVEWAY)		20	SQ YD	$80.00	$1,600.00	20	$1,600.00						
33	2360.509	TYPE SP 9.5 WEARING COURSE MIX (3,C)		1,220	TON	$100.00	$122,000.00	1220	$122,000.00						
34	2360.509	TYPE SP 12.5 NON WEARING COURSE MIX (3,C)		1,500	TON	$95.00	$142,500.00	1500	$142,500.00						
35	2501.502	18" RC PIPE APRON		2	EACH	$1,500.00	$3,000.00			2	$3,000.00				
36	2501.602	TRASH GUARD FOR 18" PIPE APRON		2	EACH	$700.00	$1,400.00			2	$1,400.00				
37	2503.503	12" RC PIPE SEWER DESIGN 3006 CLASS V		300	EACH	$55.00	$16,500.00			300	$16,500.00				
38	2503.503	15" RC PIPE SEWER DESIGN 3006 CLASS V		380	LIN FT	$62.00	$23,560.00			380	$23,560.00				
39	2503.503	18" RC PIPE SEWER DESIGN 3006 CLASS V		725	LIN FT	$70.00	$50,750.00			725	$50,750.00				
40	2503.503	8" PVC PIPE SEWER		1,798	LIN FT	$55.00	$98,890.00					1798	$98,890.00		

PRELIMINARY ENGINEER'S ESTIMATE

WEST ARMSTRONG REDEVELOPMENT
CITY PROJECT NO. 18-02
CITY OF RAMSEY, MN
BMI PROJECT NO. 0R1.126299

BOLTON & MENK
Real People. Real Solutions.

Date: 2/1/2023

ENGINEER'S ESTIMATE								ROADWAY		STORM SEWER		SANITARY SEWER		WATERMAIN	
ITEM NO.	MnDOT SPEC NO.	ITEM	NOTES	TOTAL ESTIMATED QUANTITY	UNIT	UNIT PRICE	TOTAL AMOUNT	QUANTITY	AMOUNT	QUANTITY	AMOUNT	QUANTITY	AMOUNT	QUANTITY	AMOUNT
41	2503.602	8" PIPE PLUG		10	EACH	$200.00	$2,000.00					10	$2,000.00		
42	2503.602	CONNECT TO EXISTING SANITARY SEWER		2	EACH	$1,000.00	$2,000.00					2	$2,000.00		
43	2504.602	ADJUST GATE VALVE BOX		1	EACH	$500.00	$500.00	1	$500.00						
44	2504.602	CONNECT TO EXISTING WATER MAIN		2	EACH	$2,000.00	$4,000.00							2	$4,000.00
45	2504.602	6" GATE VALVE & BOX		7	EACH	$2,300.00	$16,100.00							7	$16,100.00
46	2504.602	8" GATE VALVE & BOX		10	EACH	$3,000.00	$30,000.00							10	$30,000.00
47	2504.602	12" GATE VALVE & BOX		5	EACH	$5,000.00	$25,000.00							5	$25,000.00
48	2504.602	HYDRANT		7	EACH	$6,000.00	$42,000.00							7	$42,000.00
49	2504.603	6" WATERMAIN DUCTILE IRON CL 53		90	LIN FT	$70.00	$6,300.00							90	$6,300.00
50	2504.603	8" WATERMAIN DUCTILE IRON CL 52		323	LIN FT	$75.00	$24,225.00							323	$24,225.00
51	2504.603	12" WATERMAIN DUCTILE IRON CL 52		2,025	LIN FT	$90.00	$182,250.00							2,025	$182,250.00
52	2504.608	WATERMAIN FITTINGS		2,680	POUND	$12.00	$32,160.00							2,680	$32,160.00
53	2506.502	CASTING ASSEMBLY (MANHOLE)		7	EACH	$750.00	$5,250.00					7	$5,250.00		
54	2506.502	CASTING ASSEMBLY (CATCH BASIN)		14	EACH	$750.00	$10,500.00			14	$10,500.00				
55	2506.602	INSTALL CATCH BASIN (SALVAGED)		1	EACH	$4,000.00	$4,000.00			1	$4,000.00				
56	2506.503	CONSTRUCT SANITARY SEWER MANHOLE		59.42	LIN FT	$450.00	$26,739.00					59.42	$26,739.00		
57	2506.503	CONSTRUCT DRAINAGE STRUCTURE DESIGN SPEC 1 (2'X3')		36.00	LIN FT	$500.00	$18,000.00			36.00	$18,000.00				
58	2506.503	CONSTRUCT DRAINAGE STRUCTURE DES 48-4020		46.00	LIN FT	$600.00	$27,600.00			46.00	$27,600.00				
59	2506.602	ADJUST FRAME & RING CASTING		2	EACH	$800.00	$1,600.00	2	$1,600.00						
60	2506.602	SEAL MANHOLE	(3)	7	EACH	$500.00	$3,500.00					7	$3,500.00		
61	2521.514	4" CONCRETE WALK		4,300	SQ FT	$8.00	$34,400.00	4300	$34,400.00						
62	2531.503	CONCRETE CURB AND GUTTER DESIGN B612		55	LIN FT	$14.00	$770.00	55	$770.00						
63	2531.503	CONCRETE CURB AND GUTTER DESIGN B618		4,350	LIN FT	$16.00	$69,600.00	4350	$69,600.00						
64	2531.504	CONCRETE MEDIAN		150	SQ YD	$70.00	$10,500.00	150	$10,500.00						
65	2531.504	8" CONCRETE DRIVEWAY PAVEMENT		180	SQ YD	$80.00	$14,400.00	180	$14,400.00						
66	2531.602	CONCRETE MEDIAN NOSE-SPECIAL		1	EACH	$800.00	$800.00	1	$800.00						
67	2531.602	CONSTRUCT 6" CONCRETE PEDESTRIAN RAMP		5	EACH	$2,500.00	$12,500.00	5	$12,500.00						
68	2540.602	MAIL BOX & SUPPORT		1	EACH	$500.00	$500.00	1	$500.00						
69	2563.601	TRAFFIC CONTROL		1	LUMP SUM	$20,000.00	$20,000.00	0.50	$10,000.00	0.16	$3,200.00	0.09	$1,800.00	0.25	$5,000.00
70	2573.501	STABILIZED CONSTRUCTION EXIT		1	LUMP SUM	$2,500.00	$2,500.00	1	$2,500.00						
71	2573.502	STORM DRAIN INLET PROTECTION		18	EACH	$200.00	$3,600.00	18	$3,600.00						
72	2573.502	CULVERT END CONTROLS		6	EACH	$300.00	$1,800.00	6	$1,800.00						
73	2573.503	SILT FENCE, TYPE MS		1,300	LIN FT	$2.00	$2,600.00	1300	$2,600.00						
74	2573.503	SEDIMENT CONTROL LOG TYPE WOOD FIBER		1,000	LIN FT	$2.50	$2,500.00	1000	$2,500.00						
75	2574.505	FERTILIZER TYPE 3		730	POUND	$1.50	$1,095.00	730	$1,095.00						
76	2574.507	COMMON TOPSOIL BORROW		1,380	CU YD	$40.00	$55,200.00	1380	$55,200.00						
77	2575.504	ROLLED EROSION PREVENTION CATEGORY 20		2,670	SQ YD	$1.50	$4,005.00	2670	$4,005.00						
78	2575.505	SEEDING		2.0	ACRE	$500.00	$1,000.00	2.0	$1,000.00						
79	2575.508	SEED MIXTURE 25-121		100	POUND	$5.00	$500.00	100	$500.00						
80	2575.508	SEED MIXTURE 25-131		330	POUND	$5.00	$1,650.00	330	$1,650.00						
81	2575.508	SEED MIXTURE 33-261		30	POUND	$10.00	$300.00	30	$300.00						

PRELIMINARY ENGINEER'S ESTIMATE

WEST ARMSTRONG REDEVELOPMENT
CITY PROJECT NO. 18-02
CITY OF RAMSEY, MN
BMI PROJECT NO. 0R1.126299

BOLTON & MENK
Real People. Real Solutions.

Date: 2/1/2023

ENGINEER'S ESTIMATE								ROADWAY		STORM SEWER		SANITARY SEWER		WATERMAIN	
ITEM NO.	MnDOT SPEC NO.	ITEM	NOTES	TOTAL ESTIMATED QUANTITY	UNIT	UNIT PRICE	TOTAL AMOUNT	QUANTITY	AMOUNT	QUANTITY	AMOUNT	QUANTITY	AMOUNT	QUANTITY	AMOUNT
82	2575.508	HYDRAULIC BONDED FIBER MATRIX		7,000	POUND	$1.50	$10,500.00	7000	$10,500.00						
83	2582.503	4" SOLID LINE MULTI COMP		140	LIN FT	$1.00	$140.00	140	$140.00						
84	2582.503	24" SOLID LINE MULTI COMP		90	LIN FT	$17.00	$1,530.00	90	$1,530.00						
85	2582.503	4" DOUBLE SOLID LINE MULTI COMP		835	LIN FT	$2.00	$1,670.00	835	$1,670.00						
86	2582.518	PAVEMENT MESSAGE MULTI COMP		15.45	SQ FT	$20.00	$309.00	15.45	$309.00						
						ESTIMATED CONTRUCTION TOTAL:	**$1,574,483.00**		**$792,119.00**		**$247,150.00**		**$147,379.00**		**$387,835.00**
						10% CONSTRUCTION CONTINGENCY:	**$157,448.30**		**$79,211.90**		**$24,715.00**		**$14,737.90**		**$38,783.50**
						TOTAL ESTIMATED CONSTRUCTION COST:	**$1,731,931.30**		**$871,330.90**		**$271,865.00**		**$162,116.90**		**$426,618.50**

NOTES:

(1) INCLUDES TOPSOIL STRIPPING AND STOCKPILING

(2) STOCKPILE LOCATION: PUBLIC WORKS, 14199 JASPER STREET NW. CONTRACTOR SHALL USE ALL AVAILABLE STOCKPILE MATERIAL BEFORE IMPORTING AGGREGATE

(3) CHIMNEY SEAL

PRELIMINARY PROPERTY ACQUISITION

WEST ARMSTRONG REDEVELOPMENT
CITY PROJECT NO. 18-02
CITY OF RAMSEY, MN

BOLTON & MENK
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PARCEL	PARCEL ID	PROPERTY ADDRESS/OWNER	NEW R/W	NEW D&U	CONVERTED FROM D&U TO R/W	R/W VACATED	UNIT	UNIT PRICE	TOTAL AMOUNT
1	29-32-25-11-0010	BLOCK 1, LOT 2 - PSD, LLC		1580.0	5618.8	2758.8	SQ FT	$3.08	$13,675.20
2	29-32-25-11-0011	BLOCK 1, LOT 3 - NATIONAL GROWTH, LLC		1470.9	5604.7	2759.1	SQ FT	$3.08	$13,294.82
3	29-32-25-11-0013	14816 ARMSTRONG BLVD NW - PSD, LLC	16501.4	5000.4	660.0		SQ FT	$3.08	$68,258.34

ESTIMATED PROPERTY ACQUISITION TOTAL: **$95,228.36**

TOTAL ESTIMATE CONSTRUCTION COST: **$1,731,931.30**

TOTAL ESTIMATED PROPERTY & CONSTRUCTION COST: **$1,827,159.66**

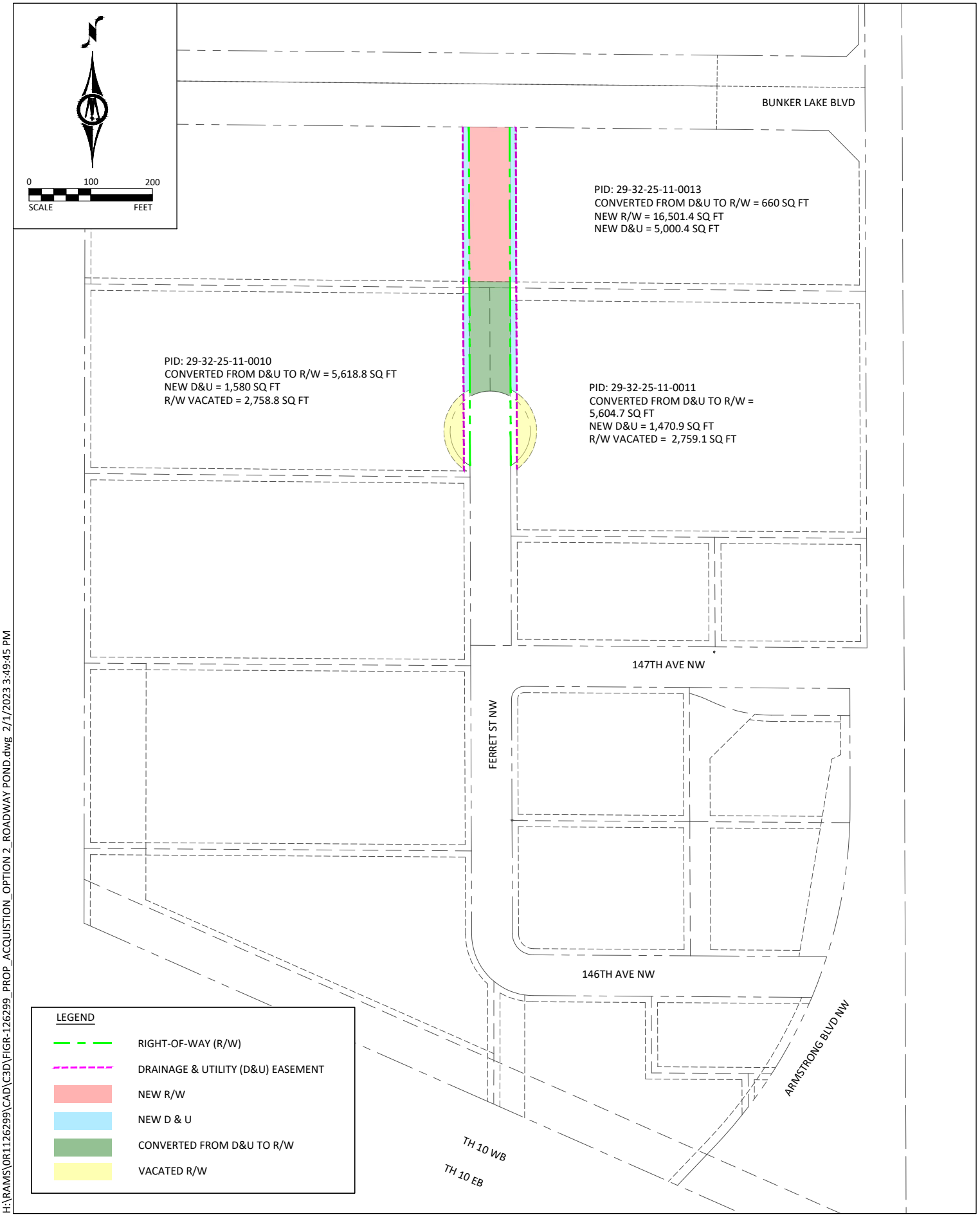
West Armstrong Redevelopment

City of Ramsey

Property Acquisition

February 2023

BOLTON & MENK



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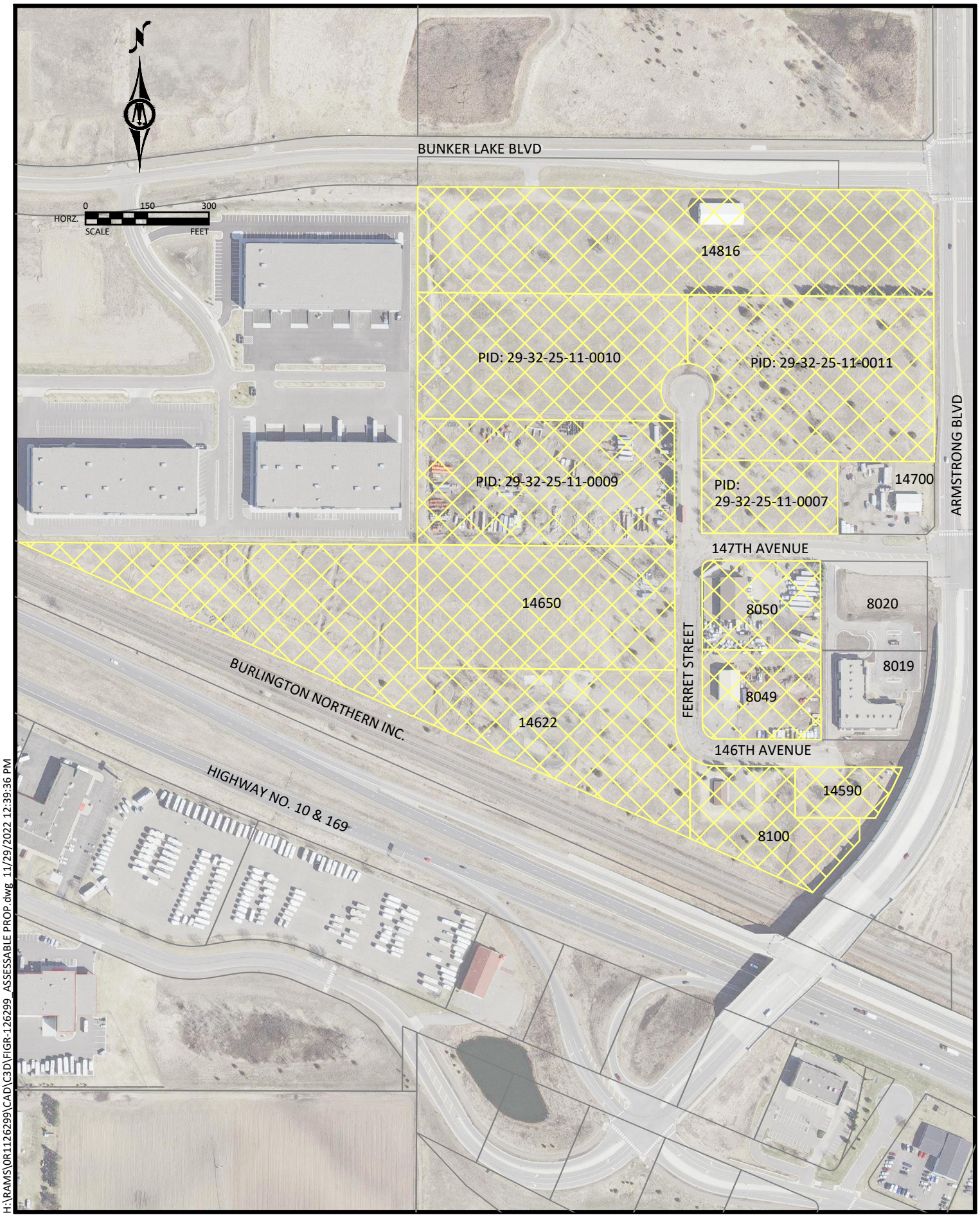
West Armstrong Redevelopment

City of Ramsey

Assessable Properties

November 2022

BOLTON & MENK

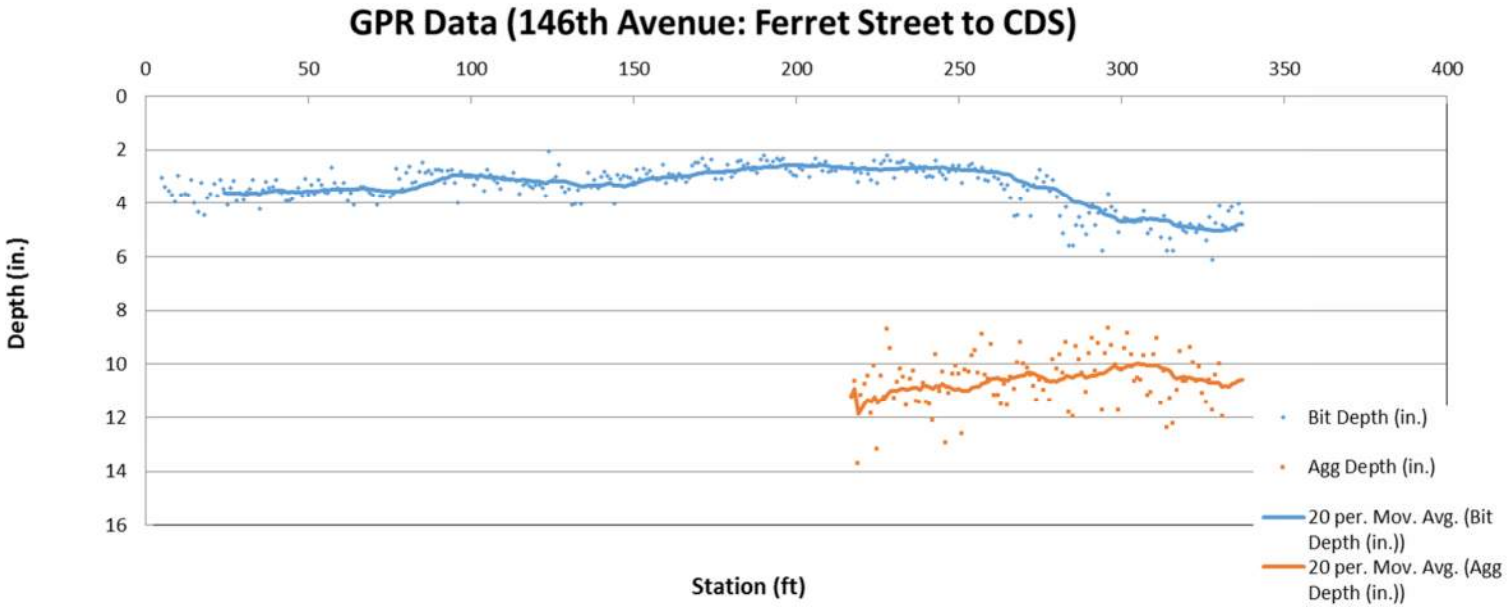


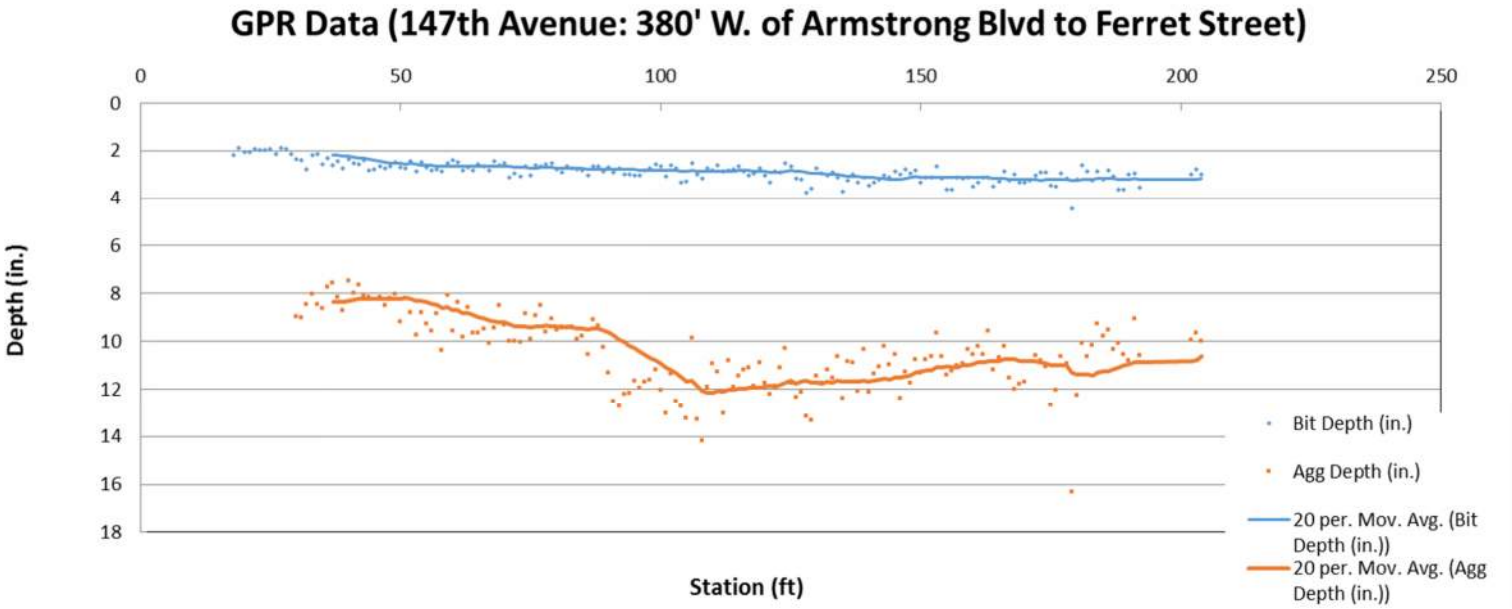
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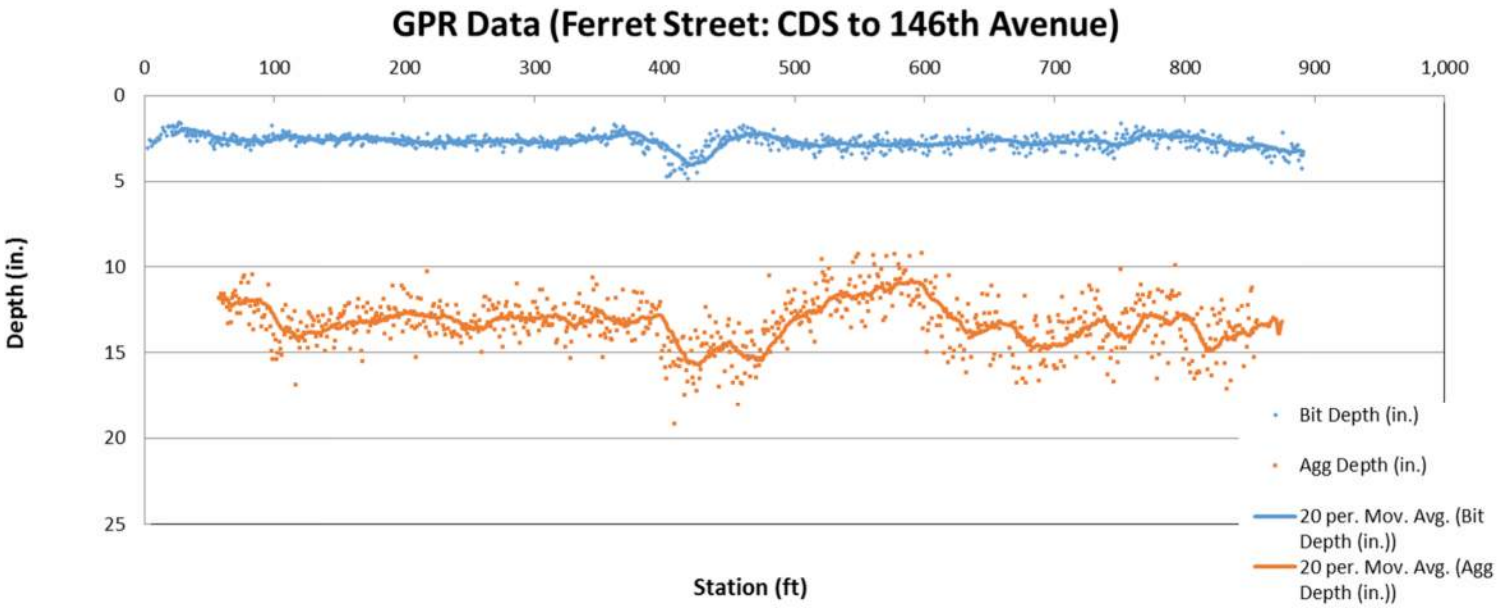
APPENDIX C

Ground Penetrating Radar (GPR) Results

HY-10 Ramsey GPR Summary										
Project Segment		**Pavement**			**Aggregate**			**Section**		
Street	**Segment Description**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Avg**	**Location**
146th Avenue	Ferret Street / CDS	2.0	6.1	3.4	4.3	10.5	6.8	8.6	10.6	296' east of Ferret Street.
147th Avenue	380' west of Armstrong Blvd. / Ferret Street	1.9	4.5	2.9	5.0	11.9	7.6	7.5	10.5	160' east of Ferret Street.
Ferret Street	CDS / 146th Avenue	1.6	4.9	2.7	6.6	15.5	10.6	9.3	13.3	250' north of 146th Avenue
Project Summary		*1.6*	*6.1*	*2.9*	*4.3*	*15.5*	*9.7*	*7.5*	*12.6*	*147th Avenue 160' east of Ferret Street.*




GPR Data (147th Avenue: 380' W. of Armstrong Blvd to Ferret Street)
Depth (in.)
Station (ft)
Bit Depth (in.)
Agg Depth (in.)
20 per. Mov. Avg. (Bit Depth (in.))
20 per. Mov. Avg. (Agg Depth (in.))


GPR Data (Ferret Street: CDS to 146th Avenue)
Depth (in.)
Station (ft)
Bit Depth (in.)
Agg Depth (in.)
20 per. Mov. Avg. (Bit Depth (in.))
20 per. Mov. Avg. (Agg Depth (in.))

APPENDIX D

Revised West Armstrong Area Traffic Analysis Memorandum
Report of Geotechnical Evaluation

BOLTON & MENK
Real People. Real Solutions.

7533 Sunwood Drive NW
Suite 206
Ramsey, MN 55303-5119

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Fax: (763) 427-0833
Bolton-Menk.com

MEMORANDUM

Date: November 17, 2022

To: City of Ramsey

From: Bryan Nemeth, P.E., PTOE

RE: West Armstrong Area Traffic Analysis – Anoka Ramsey Athletic Association (ARAA)
City of Ramsey, MN
City Project No.: 18-02

Development Considerations

The West Armstrong Area reviewed is bordered on the north by Bunker Lake Boulevard, on the south by TH 10, on the east by Armstrong Boulevard, and on the west by the ARAA site. The proposed ARAA recreation facility represents a new type of land use within this area.

A sports recreation facility has traffic peaking characteristics represented by the highest use starting in the PM peak hour and on weekends, with a high inbound and outbound volume (55% in, 45% out). This is a change from the employment district or light industrial land use which generates a higher outbound in the PM (31% in, 69% out).

The proposed ARAA facility has an area of 175,500 square feet with a support building and future expansion of 13,000 square feet. According to the ITE Trip Generation Manual (Multipurpose Recreation Facility) the site would result in approximately 675 trips during the PM peak hour.

Based on the comparison of forecasts between what was previously calculated for the West Armstrong area and the currently proposed land use, there is anticipated to be no difference in trips during the AM peak, but a significant difference in the PM peak.

Bunker Lake Boulevard Improvement Considerations

Roadway Section West of the Existing Median

For Bunker Lake Boulevard, the 3-lane section west of the median (just west of Armstrong Boulevard) is still adequate, as the change in land use affects it minimally in the PM (approx. 25 trips), and even less in the AM.

Right Turn Lanes

Bunker Lake Boulevard eastbound traffic entering any of the sites south of Bunker Lake Boulevard is low; although, with the change in land use, there is a higher potential for use of an eastbound right turn lane at Ferret Street. The need for a right turn lane was reviewed based on 734 through vehicles on eastbound Bunker Lake Boulevard plus 20 vehicles turning right. The right turn lane was determined not to be needed.

For westbound traffic, the amount of traffic coming from the east and entering any of the sites on the north was reviewed:

- For the first access west of Armstrong Boulevard, we estimated 400 employees, or 180 trips entering in the AM. The right turn lane was determined to not be needed as westbound traffic is relatively low (605 vehicles or less in the AM).
- Since the first access did not need a right turn lane, accesses further west wouldn't need right turn lanes either.

Left Turn Lane

For Ferret Street, just west of the existing median, the left turn volumes are estimated to be low in the AM peak but much higher in the PM peak. The industrial traffic will come from both Hwy 10 and from the north and east. Approximately 50% of the traffic entering the area will gain access at 147th Avenue.

The traffic to and from the ARAA recreational facility is projected to come from the residential areas of the City. This indicates that the amount of traffic from Bunker Lake Boulevard is likely to be higher, 55% at the Ferret Street and Bunker Lake Boulevard access:

- 25% from Armstrong Boulevard north of Bunker Lake Boulevard,
- 5% from the west on Bunker Lake Boulevard, and
- 25% from Bunker Lake Boulevard east of Armstrong Boulevard.

The remaining 45% of the traffic is projected to use 147th Avenue:

- 5% from Hwy 10,
- 5% from 147th east of Armstrong Boulevard,
- 20% from Armstrong Boulevard north of Bunker Lake Boulevard, and
- 15% from Bunker Lake Boulevard east of Armstrong Boulevard.

A left turn lane was found to be warranted in the AM based on the following:

- Roadway Speed = 40 mph,
- Advancing Volume = 823,
- Opposing Volume = 493, and
- Left turn volume estimated to be 38.

A left turn lane was found to be warranted in the PM based on the following:

- Roadway Speed = 40 mph,
- Advancing Volume 826,
- Opposing Volume 754, and
- Left turn volume estimated to be 205.

Based on the above information, a westbound left is appropriate for the westbound Bunker Lake Boulevard traffic at Ferret Street. With the low speeds and an urban setting, but significantly higher left turn volume in the PM peak hour due to the recreational facility, a minimum length 210-foot, full-width left turn lane would be appropriate. Tapers can be at either 10:1 or 15:1. There could be need for the left turn lane to be longer based on other development changes that could occur along Ferret Street.

Ferret Street and Bunker Lake Boulevard Intersection

Separate left and right turn lanes along northbound Ferret Street at Bunker Lake Boulevard are recommended.

Recommended Studies

With the change in traffic volumes noted above, we recommend more comprehensive traffic analyses being completed at the following locations:

- Bunker Lake Boulevard /Armstrong Boulevard,
- Bunker Lake Boulevard /Ferret Street, and
- Armstrong Boulevard /147th Street.

The storage length needs at the signalized intersections in the area should be also evaluated as a part of a future traffic analysis.

Other Considerations

The land use in the West Armstrong Area, south of Bunker Lake Boulevard and adjacent to Ferret Street, is zoned “COR” which allows a lot of flexibility. In our previous analysis, this area was considered light industrial, similar land use east of Puma Street and south of Bunker Lake Boulevard. If the West Armstrong Area evolves to more commercial orientated uses with the addition of the ARAA Facility and other facilities such as the Big Adventure Academy/Daycare and Anytime Fitness, additional analysis is warranted to understand the impacts of a more intensive land use.

REPORT OF GEOTECHNICAL EXPLORATION

West Armstrong Redevelopment Area
147th Avenue NW & Ferret Street NW
Ramsey, Minnesota

AET Project No. P-0004952

Date: March 30, 2022

Prepared for:

Bolton & Menk, Inc.

Geotechnical • Materials
Forensic • Environmental
Building Technology
Petrography/Chemistry

American Engineering Testing
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March 30, 2022

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

Attn: Kevin Kielb, PE

RE: Geotechnical Exploration
West Armstrong Redevelopment Area
147th Avenue NW & Ferret Street NW, Ramsey, Minnesota
AET Report No. P-0004952

Dear Mr. Kielb:

American Engineering Testing, Inc. (AET) is pleased to present the results of our subsurface exploration program and geotechnical engineering review for your West Armstrong Redevelopment Area project in Ramsey, Minnesota. These services were performed according to our proposal to you dated July 28, 2021.

We are submitting one electronic (.pdf) copy of the report to you.

Please contact me if you have any questions about the report. I can also be contacted for arranging construction observation and testing services.

Sincerely,
American Engineering Testing, Inc.

Robert J. Olson, PE (MN)
Branch Manager
rolson@teamAET.com
Office: (651) 659-1316
Mobile: (763) 742-8651

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SIGNATURE PAGE

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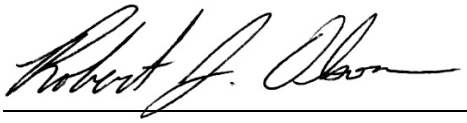
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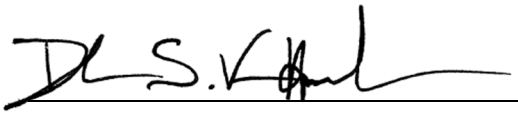
Robert J. Olson, PE (MN)
Branch Manager

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 Minnesota Statute Section 326.02 to 326.15

Name: Robert J. Olson

Date: March 30, 2022 **License #: 45023**

Reviewed by:



Derek S. Van Heuveln, PE (MN)
Senior Engineer

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1.0 INTRODUCTION

The city of Ramsey (City) is proposing to perform street and utility improvements in the West Armstrong Redevelopment Area in Ramsey, Minnesota. To assist planning and design, you have authorized American Engineering Testing, Inc. (AET) to conduct a subsurface exploration program at the site, conduct soil laboratory testing, and perform a geotechnical engineering review for the project. This report presents the results of the above services, and provides our engineering recommendations based on this data.

2.0 SCOPE OF SERVICES

AET's services were performed according to our proposal to you dated July 28, 2021, which you authorized on December 20, 2021. The authorized scope consists of the following.

- Drilling 3 standard penetration test borings to a depth of 14½ feet each.
- Performing soil laboratory testing.
- Performing a geotechnical engineering review based on the data and preparing this report.

These services are intended for geotechnical purposes only. The scope is not intended to explore for the presence or extent of environmental contamination in the soil or groundwater.

3.0 PROJECT INFORMATION

We understand the City is planning to reconstruct 147th Avenue NW, 146th Avenue NW, and Farret Street NW and extend Farret Street NW to the north. These improvements are located west of Armstrong Boulevard NW and south of Bunker Lake Boulevard. We understand that the project will involve reconstructing or constructing a bituminous roadway with public utilities (sewer and watermain).

The above stated information represents our understanding of the proposed construction. This information is an integral part of our engineering review. It is important that you contact us if there are changes from that described so that we can evaluate whether modifications to our recommendations are appropriate.

4.0 SUBSURFACE EXPLORATION AND TESTING

4.1 Field Exploration Program

The subsurface exploration program conducted for the project consisted of 3 standard penetration test borings. The number of borings, boring locations, and boring depths were determined by Bolton & Menk. The logs of the borings and details of the methods used appear in Appendix A. The logs contain information concerning soil layering, soil classification, geologic origins, and moisture condition. A density description or consistency is also noted for the natural soils, which is based on the standard penetration resistance (N-value).

The boring locations are shown on Figure 1 in Appendix A. The borings were located in the field by AET personnel by taping from nearby site features. Surface elevations were approximated based on the web application MnTOPO.

4.2 Laboratory Testing

The laboratory test program included water content testing and percent passing the #200 sieve tests. The test results appear in Appendix A on the individual boring logs adjacent to the samples upon which they were performed.

5.0 SITE CONDITIONS

5.1 Surface Observations

The bituminous roadway surface is in poor condition. The roadway has no curb or gravel shoulder; the shoulder area consists of grass with commercial/industrial businesses beyond the shoulder. The elevation of the roadway slopes downward from south to north with elevations from 874.8 to 869.3 feet at the boring locations. Driveways for the businesses connect to the roadway.

5.2 Subsurface Soils/Geology

The site geology consists of fill or topsoil overlying naturally deposited alluvial soils.

5.2.1 Bituminous Pavement/Fill

Bituminous pavement overlying fill or possible fill was encountered at the surface of Borings SB-2 and SB-3. The surface consisted of 2½ to 2¾ inches of bituminous pavement with approximately 8 inches of apparent gravel base. Beneath the aggregate base, silty sand and sand with silt layers encountered to depths of approximately 2 to 4 feet beneath existing grade. The sands with silt from 2 to 4 feet below grade were classified as “Coarse Alluvium or Fill” as

we were unable to determine the geologic origin from the recovered samples. We could not determine the geological origin based on the recovered samples. The fill and possible fill soils were frozen at the time of exploration. The fill is moderately slow draining and is judged to have moderate frost susceptibility.

5.2.2 Topsoil

Topsoil was encountered at the surface of Boring SB-1. The topsoil extended to a depth of about 1 foot beneath existing grade. The topsoil consists primarily of silty sand. These soils were mostly frozen to a depth of 1 foot. These soils are slow draining and highly susceptible to freeze-thaw movements. Due to the presence of vegetation, we judge these soils to be moderately compressible under structural loads.

5.2.3 Coarse Alluvium

Coarse alluvial sands exist beneath the topsoil, fill, or possible fill at all of the soil borings to the termination depths of the borings. The coarse alluvial soils consist of sands with silt and sands containing variable amounts of gravel, and could include cobbles and/or boulders. These alluvial soils range from very loose to medium dense and are judged to have moderate to moderately high strength and moderate to low compressibility under the anticipated structural loads. The sands and sands with silt are fast draining and are judged to have low susceptibility to freeze-thaw movements.

5.3 Groundwater

We encountered groundwater while drilling at Boring SB-1 at a depth of 10 feet which equated to an approximate elevation of 859.3 feet. As the borings terminated in free draining sands, we judge the measured water level to be reflective of the hydrostatic groundwater level conditions at that point in time.

Groundwater was not measured in Borings SB-2 and SB-3. Due to the borings terminating in free draining sands with silt and sands at depths/elevations near where the groundwater level was measured at Boring SB-1, we judge the water level to be below the depth explored at these boreholes at the time of exploration.

Groundwater levels fluctuate due to varying seasonal and annual rainfall and snow melt amounts, as well as other factors. The Minneapolis metro area has been in a low precipitation pattern for the last 2 years and the presently observed ground water levels may be lower than normal.

6.0 RECOMMENDATIONS

6.1 Definitions

The italicized words used in this section have specific definitions. These definitions are presented on the attached Standard Sheet entitled "Definitions Relating to Pavement Construction" or in ASTM Standards or MnDOT references.

6.2 Approach Discussion

We recommend that at a minimum the upper foot of fill be removed from beneath the proposed roadway extension and removal of the existing bituminous and aggregate base in the reconstruction portion of the project. Additional topsoil or fill may need to be removed based on the organic content of the soils or if soft or loose soils are encountered. We recommend these soils be evaluated by AET geotechnical personnel before new fill is placed. A subgrade R-value of 50 can be assumed for the anticipated subgrade.

6.3 Subgrade Preparation

To prepare the area for new roadway embankment placement, we recommend removing all existing pavement, aggregate base, and topsoil from below the roadway area. The excavation would need to include lateral oversizing to accommodate the lateral loads imposed.

The soils exposed in the subgrade excavations are likely to consist of silty sands, sands with silt, and sands. We recommend these soils be evaluated by AET geotechnical personnel before new fill is placed. If soft or unstable soils are observed, then correction should be performed as needed by subcutting and replacing the inferior soils; or by scarification, drying, and re-compaction.

Following excavation of inferior soils, new engineered fill can be placed as needed to re-attain subgrade elevation. *Suitable Grading Material* can be used as general embankment fill; except that where fill is placed over wet, unstable ground conditions or in standing water, cleaner granular soils should be used.

The fill should be placed per the requirements of MnDOT Specification 2106.3G.1 (Specified Density Method). This specification requires soils placed within the *critical subgrade zone* be compacted to a minimum of 100% of the *standard maximum dry unit weight* defined in ASTM: D698 (Standard Proctor test), at a water content 65% to 102% of the *standard optimum water content*. This water content requirement does not apply to the *sand subbase* zone. A reduced

minimum compaction level of 95% of the *standard maximum dry unit weight* can be used below the *critical subgrade zone*.

6.4 Design R-Value

Based on the subgrade preparation recommendations presented herein, the pavement section (bituminous and aggregate base layers) can be designed based on an R-value of 50.

6.5 Utilities

Based on the conditions encountered at the boring locations, we judge the inorganic soils to be suitable to provide adequate support for utility construction. If silty soils are present at the trench bottom, a 4-inch thick Granular Bedding (MnDOT Specification 3149.F) layer should be placed beneath the pipe to improve support uniformity. We also recommend the removal of any cobbles/boulders in the trench bottoms prior to utility installation. This will reduce the potential for the development of point loads on the pipe that would not be accounted for in the pipe design.

Please refer to the attached standard sheet entitled “Utility Excavation Backfilling” and “Bedding/Foundation Support of Buried Pipe” for additional details regarding utility bedding and utility backfilling.

6.5.1 Trench Backfill

The excavated non-organic soils can be used as backfill for the new utility trenches. Excavated organic soils should not be used as backfill below the roadway. Review of our borings indicates that the trench backfill will primarily consist of sands with silt and sands. These types of soils are generally not considered corrosive. We recommend that bedding be placed uniformly around the pipe to avoid having dissimilar materials touch the pipe that could set up corrosion cells. In our opinion, all metallic utilities should be coated or wrapped.

Utility trench backfill should be placed per the requirements of MnDOT Specification 2106.3G.1 (Specified Density Method). The backfill soils should be placed in a maximum lift thickness of 1 foot or less for the granular soils and 8 inches or less for the cohesive soils. This specification requires all backfill soils placed within an excavation trench be compacted to a minimum of 100% of the *standard maximum dry unit weight* defined in ASTM: D698 (Standard Proctor test). Consideration can be given to modifying the project specifications to allow for a reduced minimum compaction level of 95% of the *standard maximum dry unit weight* to be used below the *critical subgrade zone*. Backfill soils placed in the upper 3 feet of the subgrade should be compacted at a water content between 65% to 102% of the standard optimum water content.

The moisture content below the upper 3-foot zone shall be from 65% to 115% of the standard optimum water content.

7.0 CONSTRUCTION CONSIDERATIONS

7.1 Potential Difficulties

7.1.1 Runoff Water in Excavation

Water can be expected to collect in the excavation bottom during times of inclement weather or snow melt. To allow observation of the excavation bottom, to reduce the potential for soil disturbance, and to facilitate filling operations, we recommend water be removed from within the excavation during construction. Based on the soils encountered, we anticipate the groundwater can be handled with conventional sump pumping.

7.1.2 Disturbance of Soils

The on-site soils can be disturbed under construction traffic, especially if the soils are wet. If soils become disturbed, they should be subcut to the underlying undisturbed soils. The subcut soils can then be dried and recompacted back into place, or they should be removed and replaced with drier imported fill.

7.1.3 Cobbles and Boulders

The soils at this site can include cobbles and boulders. This may make excavating procedures somewhat more difficult than normal if they are encountered.

7.2 Excavation Backsloping

If excavation faces are not retained, the excavations should maintain maximum allowable slopes in accordance with *OSHA Regulations (Standards 29 CFR), Part 1926, Subpart P, "Excavations"* (can be found on www.osha.gov). Even with the required OSHA sloping, water seepage or surface runoff can potentially induce sideslope erosion or sloughing which could require slope maintenance.

7.3 Observation and Testing

The recommendations in this report are based on the subsurface conditions found at our test boring locations. Since the soil conditions can be expected to vary away from the soil boring locations, we recommend on-site observation by a geotechnical engineer/technician during construction to evaluate these potential changes. Soil density testing should also be performed on new fill placed in order to document that project specifications for compaction have been

satisfied.

8.0 ASTM STANDARDS

When we refer to an ASTM Standard in this report, we mean that our services were performed in general accordance with that standard. Compliance with any other standards referenced within the specified standard is neither inferred nor implied.

9.0 LIMITATIONS

Within the limitations of scope, budget, and schedule, we have endeavored to provide our services according to generally accepted geotechnical engineering practices at this time and location. Other than this, no warranty, express or implied, is intended.

Important information regarding risk management and proper use of this report is given in Appendix B entitled “Geotechnical Report Limitations and Guidelines for Use.”

DEFINITIONS RELATING TO PAVEMENT CONSTRUCTION

Top of subgrade: Grade which contacts the bottom of the aggregate base layer.

Sand subbase: Uniform thickness sand layer placed as the top of subgrade which is intended to improve the frost and drainage characteristics of the pavement system by increasing drainage of excess water in the aggregate base and subbase, by reducing and "bridging" frost heaving, and by reducing spring thaw weakening effects.

Critical subgrade zone: The subgrade portion beneath and within three vertical feet of the top of subgrade. A sand subbase, if placed, would be considered the upper portion of the critical subgrade zone.

Suitable Grading Material: Mineral soil materials, typically from the project site, excluding the following: 1) soils which have an organic content exceeding 3%, 2) cohesive soils having a Liquid Limit exceeding 50%, 3) soils which include debris, cobbles, and/or boulders, and 4) soils which are considered acceptable from an environmental standpoint. The soil must also be capable of attaining the specified compaction level at its current water content or at a water content that can be reasonably scarified, blended, and moisture conditioned to a uniform water content in order to uniformly meet compaction requirements.

Granular Material: Soils meeting MnDOT Specification 3149.2B.1. This refers to granular soils which, of the portion passing the 1" sieve, contain less than 20% by weight passing the #200 sieve.

Select Granular Material: Soils meeting MnDOT Specification 3149.2B.2. This refers to granular soils which, of the portion passing the 1" sieve, contain less than 12% by weight passing the #200 sieve.

Select Granular Material (Super Sand): Soils meeting MnDOT Specification 3149.2B.3. This material is cleaner and coarser than Select Granular Material (see specification for specific requirements).

Compaction Subcut: Construction of a uniform thickness subcut below a designated grade to provide uniformity and compaction within the subcut zone. Replacement fill can be the materials subcut, although the reused soils should be blended to a uniform soil condition, moisture conditioned as needed to meet MnDOT Specification 2105.F; and re-compacted per the Specified Density Method defined in MnDOT Specification 2105.3F.1.

Test Roll: A means of evaluating the near-surface stability of subgrade soils (usually non-granular). Suitability is determined by the depth of rutting or deflection caused by passage of heavy rubber-tired construction equipment, such as a loaded dump truck, over the test area. Yielding of less than 1" is normally considered acceptable, although engineering judgment may be applied depending on the equipment used, soil conditions present, and/or depth below final grade.

Unstable Soils: Subgrade soils which do not pass a test roll. Unstable soils typically have water content exceeding the *standard optimum water content* defined in ASTM:D698 (Standard Proctor test).

Organic Soils: Soils which have sufficient organic content such that the soils engineering properties are negatively affected (typically more than 3% organic content). These soils are usually black to dark brown in color.

UTILITY EXCAVATION BACKFILLING

GENERAL

Clayey and silty soils are often difficult to compact, as they may be naturally wet or dry, or may become wet due to ground water or runoff water during construction. Soils will need to be placed within a certain range of water (moisture) content to attain desired compaction levels. Moisture conditioning to within this range can be time consuming and labor intensive, and will require favorable weather.

The degree of compaction and the soil type used for backfill within open cut utility excavations depends on the eventual function of the overlying land surface. Details are as follows:

ROADWAYS

Where trenches are located below roadways, we recommend using inorganic fill and compacting these soils per MnDOT Specification 2105.3F1 (Specified Density Method). On MnDOT funded roads, the 2016 Specification requires 100% compaction over the entire trench depth. On non-MnDOT funded roads, we feel the specification can be relaxed to the previous version of achieving 100% of the Standard Proctor density in the upper 3-foot subgrade zone, and 95% below this depth. Note that this specification also includes moisture content range requirements which are important for proper subgrade stability.

Where available soils are wet or of poor quality, it may be possible to use the “Quality Compaction Method” (MnDOT Specification 2105.3F2) for soils below the upper 3-foot subgrade zone if you can tolerate some subsidence. However, a high level of stability is still important within the upper subgrade zone and recommend that the “Specified Density Method" be used in this upper subgrade area. We caution that if backfill soils in the lower trench area are significantly unstable, it may be difficult or even impossible to properly compact soils within the upper 3-foot subgrade zone. In this case, road subgrade stability can be improved by placing a geotextile reinforcement fabric directly over the unstable soils followed by properly drained granular fill placement.

STRUCTURAL AREAS

If fill is placed beneath or within the significant zone of influence of a structure (typically a 1:1 lateral oversize zone), the soil type and minimum compaction level will need to be evaluated on an individual basis. Because trenches result in variable fill depths over a short lateral distance, higher than normal compaction levels and/or more favorable (sandy) soil fill types may be needed. If this situation exists, it is important that special geotechnical engineering review be performed.

NON-STRUCTURAL AREAS

In grass/ditch areas, backfill soils should be placed in reasonable lift thicknesses and compacted to a minimum of 90% of the Standard Proctor density (ASTM: D698) and/or per the MnDOT “Quality Compaction Method.” If lower compaction levels are accepted, more noticeable subsidence at the surface can occur. Steep or high slopes require special consideration, and if this situation exists, it is important that special geotechnical engineering review be performed.

SPECIAL CASES

Structural retention systems are often used to reduce impacts on adjacent streets/improvements. If localized excavations/pits or annular spaces are created which need to be backfilled, it may not be possible to place and compact soils by the conventional means of backfilling. Retraction of structural systems can also leave soils loosened. Significant settlement can occur in areas where backfill cannot be compacted. If these situations are located in non-structural or non-paved areas, it may be reasonable to accept the settlements and associated follow-up maintenance in order avoid the high cost of trying to compact the soil or placing flowable lean concrete fill. However, there may be areas where fill settlement needs to be avoided, especially as the settlement will be differential from the surrounding surface, or differential from a buried structure in the case of higher piping entering the structure. Where settlement needs to be avoided, the specification should require that the contractor submit a backfill compaction plan along with the retention plan. Improper sequencing of retention system removal and backfilling of the pits could result in excessive settlement and/or lateral movement of nearby improvements.

BEDDING/FOUNDATION SUPPORT OF BURIED PIPE

GENERAL

This page addresses soil bedding and foundation support of rigid pipe, such as reinforced concrete, and flexible pipe, such as steel and plastic. This does not address selection of pipe based on loads and allowable deflections, but rather addresses the geotechnical/soil aspects of uniform pipe support. Bedding/foundation support needs relate to local conditions directly beneath and to the sides of the pipe zone, which may be influenced by soft in-situ ground conditions or by soil disturbance due to soil sensitivity or ground water. Bedding relates to granular materials placed directly beneath the bottom of the pipe (usually 4" to 6" thick), which is intended to provide increased support uniformity. We refer to foundation soils as thicker layers of sands and/or gravels (beneath the bedding zone) intended to provide increased foundation strength support, usually needed due to soft, unstable and/or waterbearing conditions.

GRANULAR BEDDING

With circular pipes, high local loads (approaching point loads) develop if pipes are placed on hard surfaces. Load distribution is improved by placing granular bedding materials beneath the pipe, which are either shaped to match the pipe bottom or are placed without compaction to allow "settling in." The bedding should be placed in such a manner that the pipe will be at the proper elevation and slope when the pipe is laid on the bedding. Common bedding material is defined in MnDOT Specification 3149.2F, Granular Bedding. Published documents recommend rigid pipes having a diameter of 12" to 54" be placed on a bedding thickness of 4", which increases to 6" of bedding for pipe diameters ranging from 54" to 72". Beyond a 72" diameter, the bedding thickness can be equal to the pipe outside diameter divided by 12. Typically, the need for bedding under small diameter pipes (less than 12") depends on the pipe designer's specific needs, although in obvious point loads situations (bedrock, cobbles, significant coarse gravel content), bedding is recommended. Note that bedding should also account for larger diameter bells at joints.

FOUNDATION FILL

Positive uniform strength is usually compromised in soft or unstable trench bottom conditions. In this case, deeper subcuts and foundation fill placement is needed beneath the pipe. In moderate instability conditions, improvement can likely be accomplished with a thicker bedding layer. However, in more significant instability situations, particularly where ground water is present, coarser materials may be needed to provide a stronger foundation. Thicker gravel layers can also be a favorable media from which to dewater. The following materials would be appropriate for stability improvement, with the coarser materials being appropriate for higher instability/ground water cases.

- Fine Filter Aggregate – MnDOT Specification 3149.2J
- Coarse Filter Aggregate –MnDOT Specification 3149.2H

When using a coarser material which includes significant void space, we highly recommend enveloping the entire gravel layer within a geotextile separation fabric. The gravel material includes open void space, and the fabric acts as a separator which minimizes the intrusion of fines into the open void space. If additional granular bedding sand is used above foundation gravel, the fabric would also prevent downward infiltration of bedding sand into the rock void space.

Although it is preferred to not highly compact thin granular bedding zones directly beneath the pipe center, it is desirable to compact the foundation materials to prevent more significant pipe settlement. We recommend foundation fill be compacted to a minimum of 95% of the Standard Proctor density (ASTM: D698). It is not possible to test coarse rock fill, although this material should still be well compacted/ tamped.

Often, pipes entering structures such as catch basins, lift stations, etc., enter the structure at a higher elevation than the structure bottom, and are therefore placed on the structure backfill. Fill beneath these pipes should be considered foundation fill. Depending on the flexibility of the connection design, it may be necessary to increase the minimum compaction level to reduce differential settlements, particularly with thicker fills.

SIDE FILL SUPPORT

If the pipe designer requires support from the side fill, granular bedding should also be placed along the sides of the pipe. In poor soil conditions, the sand fill may need to be placed laterally up to two pipe diameters on both sides of the pipe. With rigid pipe, compacted sand placement up to the spring line (within the haunch area) is usually sufficient. With flexible pipe, side fill should be placed and compacted at least to the top of the pipe. For positive support, it is very important to properly compact the sands within the haunch area.

Appendix A

Geotechnical Field Exploration and Testing
Boring Log Notes
Unified Soil Classification System
Figure 1 – Boring Locations
Subsurface Boring Logs

Appendix A
Geotechnical Field Exploration and Testing
Report No. P-0004952

A.1 FIELD EXPLORATION

The subsurface conditions at the site were explored by drilling and sampling three (3) standard penetration test borings. The locations of the borings appear on Figure 1, preceding the Subsurface Boring Logs in this appendix.

A.2 SAMPLING METHODS

A.2.1 Split-Spoon Samples (SS) - Calibrated to N_{60} Values

Standard penetration (split-spoon) samples were collected in general accordance with ASTM: D1586 with one primary modification. The ASTM test method consists of driving a 2-inch O.D. split-barrel sampler into the in-situ soil with a 140-pound hammer dropped from a height of 30 inches. The sampler is driven a total of 18 inches into the soil. After an initial set of 6 inches, the number of hammer blows to drive the sampler the final 12 inches is known as the standard penetration resistance or N-value. Our method uses a modified hammer weight, which is determined by measuring the system energy using a Pile Driving Analyzer (PDA) and an instrumented rod.

In the past, standard penetration N-value tests were performed using a rope and cathead for the lift and drop system. The energy transferred to the split-spoon sampler was typically limited to about 60% of its potential energy due to the friction inherent in this system. This converted energy then provides what is known as an N_{60} blow count.

The most recent drill rigs incorporate an automatic hammer lift and drop system, which has higher energy efficiency and subsequently results in lower N-values than the traditional N_{60} values. By using the PDA energy measurement equipment, we are able to determine actual energy generated by the drop hammer. With the various hammer systems available, we have found highly variable energies ranging from 55% to over 100%. Therefore, the intent of AET's hammer calibrations is to vary the hammer weight such that hammer energies lie within about 60% to 65% of the theoretical energy of a 140-pound weight falling 30 inches. The current ASTM procedure acknowledges the wide variation in N-values, stating that N-values of 100% or more have been observed. Although we have not yet determined the statistical measurement uncertainty of our calibrated method to date, we can state that the accuracy deviation of the N-values using this method is significantly better than the standard ASTM Method.

A.2.2 Disturbed Samples (DS)/Spin-up Samples (SU)

Sample types described as "DS" or "SU" on the boring logs are disturbed samples, which are taken from the flights of the auger. Because the auger disturbs the samples, possible soil layering and contact depths should be considered approximate.

A.2.3 Sampling Limitations

Unless actually observed in a sample, contacts between soil layers are estimated based on the spacing of samples and the action of drilling tools. Cobbles, boulders, and other large objects generally cannot be recovered from test borings, and they may be present in the ground even if they are not noted on the boring logs.

Determining the thickness of "topsoil" layers is usually limited, due to variations in topsoil definition, sample recovery, and other factors. Visual-manual description often relies on color for determination, and transitioning changes can account for significant variation in thickness judgment. Accordingly, the topsoil thickness presented on the logs should not be the sole basis for calculating topsoil stripping depths and volumes. If more accurate information is needed relating to thickness and topsoil quality definition, alternate methods of sample retrieval and testing should be employed.

A.3 CLASSIFICATION METHODS

Soil descriptions shown on the boring logs are based on the Unified Soil Classification (USC) system. The USC system is described in ASTM: D2487 and D2488. Where laboratory classification tests (sieve analysis or Atterberg Limits) have been performed, accurate classifications per ASTM: D2487 are possible. Otherwise, soil descriptions shown on the boring logs are visual-manual judgments. Charts are attached which provide information on the USC system, the descriptive terminology, and the symbols used on the boring logs.

The boring logs include descriptions of apparent geology. The geologic depositional origin of each soil layer is interpreted primarily by observation of the soil samples, which can be limited. Observations of the surrounding topography, vegetation, and development can sometimes aid this judgment.

A.4 WATER LEVEL MEASUREMENTS

The groundwater level measurements are shown at the bottom of the boring logs. The following information appears under "Water Level Measurements" on the logs:

- Date and Time of measurement
- Sampled Depth: lowest depth of soil sampling at the time of measurement
- Casing Depth: depth to bottom of casing or hollow-stem auger at time of measurement
- Cave-in Depth: depth at which measuring tape stops in the borehole
- Water Level: depth in the borehole where free water is encountered
- Drilling Fluid Level: same as Water Level, except that the liquid in the borehole is drilling fluid

The true location of the water table at the boring locations may be different than the water levels measured in the boreholes. This is possible because there are several factors that can affect the water level measurements in the borehole. Some of these factors include: permeability of each soil layer in profile, presence of perched water, amount of time between water level readings, presence of drilling fluid, weather conditions, and use of borehole casing.

A.5 LABORATORY TEST METHODS

A.5.1 Water Content Tests

Conducted per AET Procedure 01-LAB-010, which is performed in general accordance with ASTM: D2216 and AASHTO: T265.

A.5.2 Material in Soils Finer than the #200 (75 micron) Sieve

Conducted per AET Procedure 01-LAB-060, which is performed in general conformance with ASTM: D1140.

A.6 TEST STANDARD LIMITATIONS

Field and laboratory testing is done in general conformance with the described procedures. Compliance with any other standards referenced within the specified standard is neither inferred nor implied.

A.7 SAMPLE STORAGE

Unless notified to do otherwise, we routinely retain representative samples of the soils recovered from the borings for a period of 30 days.

SAMPLING METHODS

Split-Spoon Samples (SS) - Calibrated to N_{60} Values

Standard penetration (split-spoon) samples were collected in general accordance with ASTM: D1586 with one primary modification. The ASTM test method consists of driving a 2" O.D. split-barrel sampler into the in-situ soil with a 140-pound hammer dropped from a height of 30". The sampler is driven a total of 18" into the soil. After an initial set of 6", the number of hammer blows to drive the sampler the final 12" is known as the standard penetration resistance or N-value. Our method uses a modified hammer weight, which is determined by measuring the system energy using a Pile Driving Analyzer (PDA) and an instrumented rod.

In the past, standard penetration N-value tests were performed using a rope and cathead for the lift and drop system. The energy transferred to the split-spoon sampler was typically limited to about 60% of its potential energy due to the friction inherent in this system. This converted energy then provides what is known as an N_{60} blow count.

Most of today's drill rigs incorporate an automatic hammer lift and drop system, which has higher energy efficiency and subsequently results in lower N-values than the traditional N_{60} values. By using the PDA energy measurement equipment, we are able to determine actual energy generated by the drop hammer. With the various hammer systems available, we have found highly variable energies ranging from 55% to over 100%. Therefore, the intent of AET's hammer calibrations is to vary the hammer weight such that hammer energies lie within about 60% to 65% of the theoretical energy of a 140-pound weight falling 30". The current ASTM procedure acknowledges the wide variation in N-values, stating that N-values of 100% or more have been observed. Although we have not yet determined the statistical measurement uncertainty of our calibrated method to date, we can state that the accuracy deviations of the N-values using this method are significantly better than the standard ASTM Method.

Disturbed Samples (DS)/Spin-up Samples (SU)

Sample types described as "DS" or "SU" on the boring logs are disturbed samples, which are taken from the flights of the auger. Because the auger disturbs the samples, possible soil layering and contact depths should be considered approximate.

Sampling Limitations

Unless actually observed in a sample, contacts between soil layers are estimated based on the spacing of samples and the action of drilling tools. Cobbles, boulders, and other large objects generally cannot be recovered from test borings, and they may be present in the ground even if they are not noted on the boring logs.

CLASSIFICATION METHODS

Soil classifications shown on the boring logs are based on the Unified Soil Classification (USC) system. The USC system is described in ASTM: D2487 and D2488. Where laboratory classification tests (sieve analysis or Atterberg Limits) have been performed, accurate classifications per ASTM: D2487 are possible. Otherwise, soil classifications shown on the boring logs are visual-manual judgments. Charts are attached which provide information on the USC system, the descriptive terminology, and the symbols used on the boring logs.

The boring logs include descriptions of apparent geology. The geologic depositional origin of each soil layer is interpreted primarily by observation of the soil samples, which can be limited. Observations of the surrounding topography, vegetation, and development can sometimes aid this judgment.

WATER LEVEL MEASUREMENTS

The ground water level measurements are shown at the bottom of the boring logs. The following information appears under "Water Level Measurements" on the logs:

- Date and Time of measurement
- Sampled Depth: lowest depth of soil sampling at the time of measurement
- Casing Depth: depth to bottom of casing or hollow-stem auger at time of measurement
- Cave-in Depth: depth at which measuring tape stops in the borehole
- Water Level: depth in the borehole where free water is encountered
- Drilling Fluid Level: same as Water Level, except that the liquid in the borehole is drilling fluid

The true location of the water table at the boring locations may be different than the water levels measured in the boreholes. This is possible because there are several factors that can affect the water level measurements in the borehole. Some of these factors include: permeability of each soil layer in profile, presence of perched water, amount of time between water level readings, presence of drilling fluid, weather conditions, and use of borehole casing.

SAMPLE STORAGE

Unless notified to do otherwise, we routinely retain representative samples of the soils recovered from the borings for a period of 30 days.

UNIFIED SOIL CLASSIFICATION SYSTEM
ASTM Designations: D 2487, D2488

AMERICAN ENGINEERING TESTING, INC.

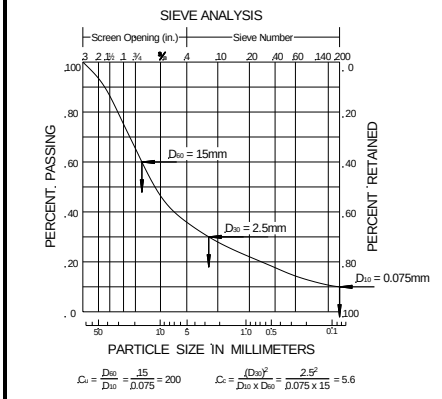
Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests[A]				Soil Classification: Group Symbol	Soil Classification: Group Name[B]
Coarse-Grained Soils More than 50% retained on No. 200 sieve	Gravels More than 50% coarse fraction retained on No. 4 sieve	Clean Gravels Less than 5% fines[C]	Cu≥4 and 1≤Cc≤3[E]	GW	Well graded gravel[F]
			Cu<4 and/or 1>Cc>3[E]	GP	Poorly graded gravel[F]
		Gravels with Fines more than 12% fines[C]	Fines classify as ML or MH	GM	Silty gravel[F,G,H]
			Fines classify as CL or CH	GC	Clayey gravel[F,G,H]
	Sands 50% or more of coarse fraction passes No. 4 sieve	Clean Sands Less than 5% fines[D]	Cu≥6 and 1≤Cc≤3[E]	SW	Well-graded sand[I]
			Cu<6 and/or 1>Cc>3[E]	SP	Poorly-graded sand[I]
		Sands with Fines more than 12% fines[D]	Fines classify as ML or MH	SM	Silty sand[G,H,I]
			Fines classify as CL or CH	SC	Clayey sand[G,H,I]
Fine-Grained Soils 50% or more passes the No. 200 sieve (see Plasticity Chart below)	Silts and Clays Liquid limit less than 50	inorganic	PI>7 and plots on or above "A" line[J]	CL	Lean clay[K,L,M]
			PI<4 or plots below "A" line[J]	ML	Silt[K,L,M]
		organic	Liquid limit–oven dried / Liquid limit – not dried <0.75	OL	Organic clay[K,L,M,N] / Organic silt[K,L,M,O]
	Silts and Clays Liquid limit 50 or more	inorganic	PI plots on or above "A" line	CH	Fat clay[K,L,M]
			PI plots below "A" line	MH	Elastic silt[K,L,M]
		organic	Liquid limit–oven dried / Liquid limit – not dried <0.75	OH	Organic clay[K,L,M,P] / Organic silt[K,L,M,Q]
Highly organic soil			Primarily organic matter, dark in color, and organic in odor	PT	Peat[R]

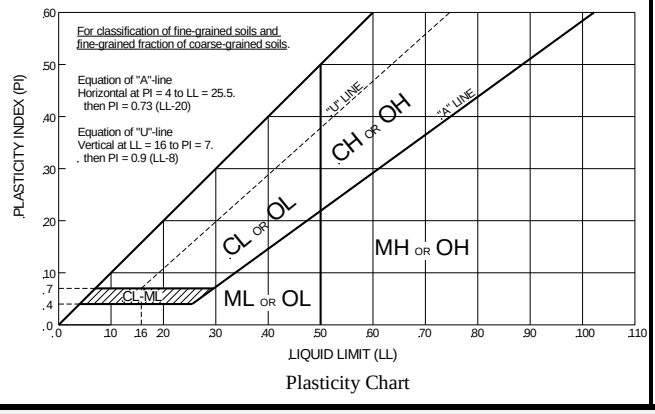
Notes

[A]Based on the material passing the 3-in (75-mm) sieve.
[B]If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.
[C]Gravels with 5 to 12% fines require dual symbols:
GW-GM well-graded gravel with silt
GW-GC well-graded gravel with clay
GP-GM poorly graded gravel with silt
GP-GC poorly graded gravel with clay
[D]Sands with 5 to 12% fines require dual symbols:
SW-SM well-graded sand with silt
SW-SC well-graded sand with clay
SP-SM poorly graded sand with silt
SP-SC poorly graded sand with clay

[E]$Cu = D_{60} / D_{10}$, $Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$

[F]If soil contains ≥15% sand, add "with sand" to group name.
[G]If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.
[H]If fines are organic, add "with organic fines" to group name.
[I]If soil contains ≥15% gravel, add "with gravel" to group name.
[J]If Atterberg limits plot is hatched area, soil is a CL-ML silty clay.
[K]If soil contains 15 to 29% plus No. 200 add "with sand" or "with gravel", whichever is predominant.
[L]If soil contains ≥30% plus No. 200, predominantly sand, add "sandy" to group name.
[M]If soil contains ≥30% plus No. 200, predominantly gravel, add "gravelly" to group name.
[N]PI≥4 and plots on or above "A" line.
[O]PI<4 or plots below "A" line.
[P]PI plots on or above "A" line.
[Q]PI plots below "A" line.
[R]Fiber Content description shown below.





Plasticity Chart

ADDITIONAL TERMINOLOGY NOTES USED BY AET FOR SOIL IDENTIFICATION AND DESCRIPTION

Grain Size

Term	Particle Size
Boulders	Over 12"
Cobbles	3" to 12"
Gravel	#4 sieve to 3"
Sand	#200 to #4 sieve
Fines (silt & clay)	Pass #200 sieve

Gravel Percentages

Term	Percent
A Little Gravel	3% - 14%
With Gravel	15% - 29%
Gravelly	30% - 50%

Consistency of Plastic Soils

Term	N-Value, BPF
Very Soft	less than 2
Soft	2 - 4
Firm	5 - 8
Stiff	9 - 15
Very Stiff	16 - 30
Hard	Greater than 30

Relative Density of Non-Plastic Soils

Term	N-Value, BPF
Very Loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	Greater than 50

Moisture/Frost Condition

(MC Column)

D (Dry): Absence of moisture, dusty, dry to touch.
M (Moist): Damp, although free water not visible. Soil may still have a high water content (over "optimum").
W (Wet/ Waterbearing): Free water visible, intended to describe non-plastic soils. Waterbearing usually relates to sands and sand with silt.
F (Frozen): Soil frozen

Layering Notes

Laminations: Layers less than ½" thick of differing material or color.
Lenses: Pockets or layers greater than ½" thick of differing material or color.

Peat Description

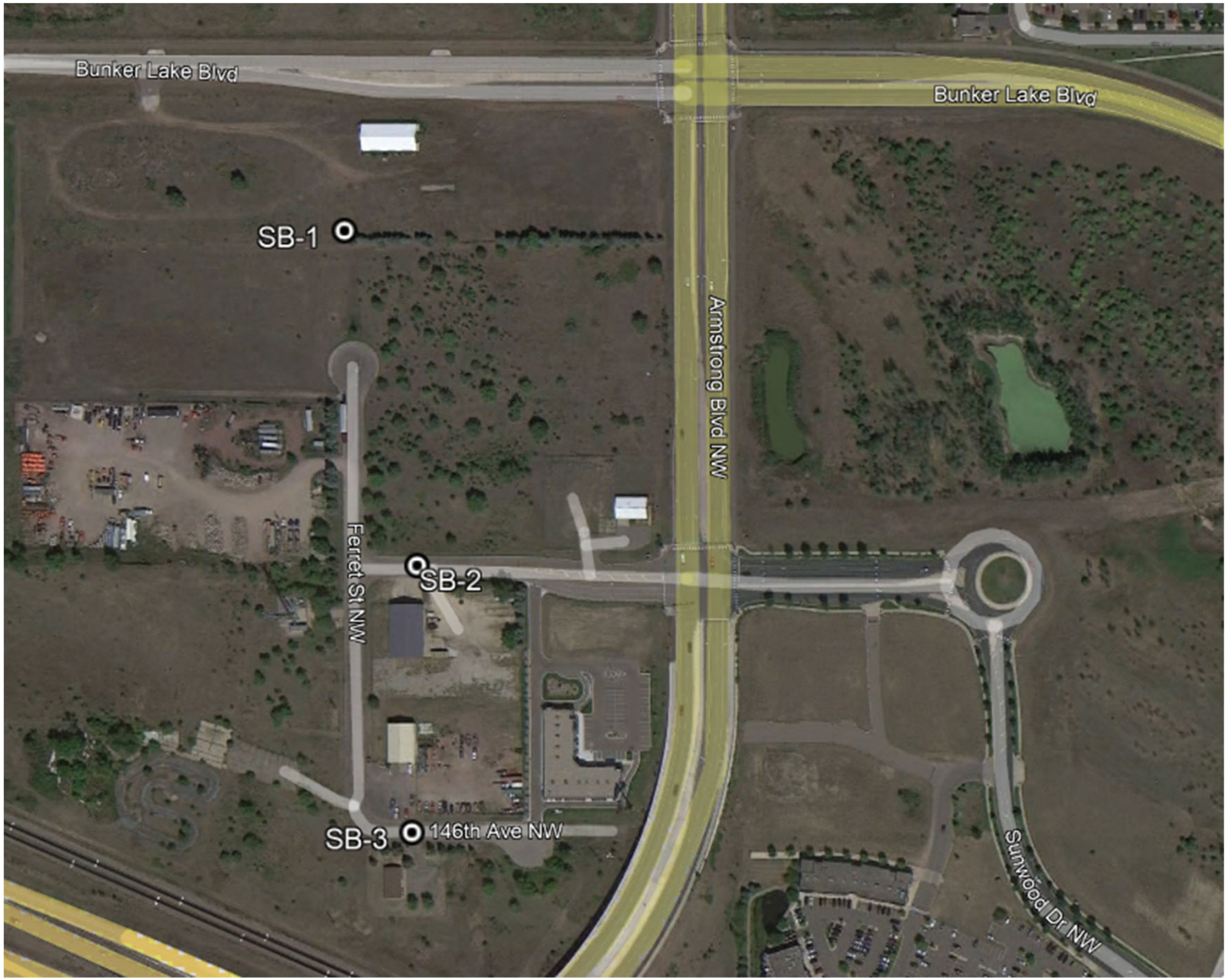
Term	Fiber Content (Visual Estimate)
Fibric Peat:	Greater than 67%
Hemic Peat:	33 – 67%
Sapric Peat:	Less than 33%

Organic Description (if no lab tests)

Soils are described as *organic*, if soil is not peat and is judged to have sufficient organic fines content to influence the Liquid Limit properties. *Slightly organic* used for borderline cases.

Root Inclusions

With roots: Judged to have sufficient quantity of roots to influence the soil properties.
Trace roots: Small roots present, but not judged to be in sufficient quantity to significantly affect soil properties.



AMERICAN ENGINEERING TESTING	**PROJECT** West Armstrong Redevelopment; Ramsey, Minnesota			**AET NO.** P-0004952
	SUBJECT Boring Locations			**DATE** March 2022
	SCALE As Shown	**DRAWN BY** RJO	**CHECKED BY** DSV	**FIGURE 1**

SUBSURFACE BORING LOG

AET No: **P-0004952** Log of Boring No. **SB- 1 (p. 1 of 1)**

Project: **West Armstrong Redevelopment Area Project; Ramsey, MN**

DEPTH IN FEET	Surface Elevation **869.3** MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	DEN	LL	PL	%-#200
1	SILTY SAND, fine to medium grained, dark brown, frozen (SM)	TOPSOIL		F/M	SU						
2	SAND, fine grained, brown, moist, loose (SP)	COARSE ALLUVIUM									
3			6	M	SS	12	4				4
4											
5	SAND WITH SILT, fine to medium grained, brown, moist, very loose, laminations of clayey sand (SP-SM)		4	M	SS	10					
6											
7	SAND, a little gravel, fine to medium grained, grayish brown, moist to about 10' then waterbearing, loose to very loose (SP)										
8			8	M	SS	12					
9											
10			7	M/W	SS	8					
11											
12											
13											
14			3	W	SS	7					
	END OF BORING										

*WD - Water level measured while drilling
*AD - Water level measured at completion of drilling

DEPTH: DRILLING METHOD	WATER LEVEL MEASUREMENTS							NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	
0-13' 3.25" HSA	**1/12/22**	***WD**					**10.0**	
	1/12/22	***AD**		**13.0**	**7.0**		**10.5**	
BORING COMPLETED: **1/12/22**								
DR: **BR** LG: **DR** Rig: **GRD751**								

AET_CORP P-0004952 WEST ARMSTRONG REDEVELOPMENT.GPJ AET+CPT+WELL.GDT 1/18/22

SUBSURFACE BORING LOG

AET No: **P-0004952** Log of Boring No. **SB- 2 (p. 1 of 1)**

Project: **West Armstrong Redevelopment Area Project; Ramsey, MN**

DEPTH IN FEET	MATERIAL DESCRIPTION (Surface Elevation 872.9)	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	DEN	LL	PL	%-#200
1	2.75" Bituminous pavement 8" Aggregate base course FILL, mostly silty sand, a little gravel, brown with a little dark brown, frozen	FILL		F	SU						
2–3	SAND WITH SILT, a little gravel, fine grained, brown, frozen (SP-SM) (possible fill)	COARSE ALLUVIUM OR FILL		F	SU	6	3				7
4–6	SAND WITH SILT, fine grained, brown, moist, medium dense (SP-SM)	COARSE ALLUVIUM	14	M	SS	12					
7–11	SAND, a little gravel, fine to medium grained, brown, moist, loose to very loose (SP)		5	M	SS	10					
			3	M	SS	10					
12–14	SAND WITH SILT, a little gravel, fine to medium grained, grayish brown, moist, loose, laminations of clayey sand (SP-SM)		6	M	SS	10					
	END OF BORING										

*WD - Water level measured while drilling
*AD - Water level measured at completion of drilling

DEPTH: DRILLING METHOD	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL
0-13' 3.25" HSA	**1/12/22**	***WD**					**None**
	1/12/22	***AD**					**None**
BORING COMPLETED: **1/12/22**							
DR: **BR** LG: **DR** Rig: **GRD751**							

WATER LEVEL MEASUREMENTS

NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG

AET_CORP P-0004952 WEST ARMSTRONG REDEVELOPMENT.GPJ AET+CPT+WELL.GDT 1/18/22

SUBSURFACE BORING LOG

AET No: **P-0004952** Log of Boring No. **SB- 3 (p. 1 of 1)**

Project: **West Armstrong Redevelopment Area Project; Ramsey, MN**

DEPTH IN FEET	Surface Elevation **874.8** MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	DEN	LL	PL	%-#200
1	2.5" Bituminous pavement 8" Aggregate base course FILL, mostly silty sand with gravel, dark brown, frozen	FILL		F	SU						
3	SAND WITH SILT, a little gravel, fine to medium grained, brown with a little dark brown, frozen (SP-SM) (possible fill)	COARSE ALLUVIUM OR FILL		F	SU		4				7
5	SAND, a little gravel, fine to medium grained, grayish brown, moist, loose to very loose to loose (SP)	COARSE ALLUVIUM	7	M	SS	12	3				3
8			3	M	SS	12					
10			6	M	SS	12					
13	SAND, a little gravel, fine to medium grained, brown, moist, loose, laminations of silty sand (SP)		8	M	SS	12					
14	**END OF BORING**										

*WD - Water level measured while drilling
*AD - Water level measured at completion of drilling

DEPTH: DRILLING METHOD	WATER LEVEL MEASUREMENTS							NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	
0-13' 3.25" HSA	**1/12/22**	***WD**					**None**	
	1/12/22	***AD**					**None**	
BORING COMPLETED: **1/12/22**								
DR: **BR** LG: **DR** Rig: **GRD751**								

AET_CORP P-0004952 WEST ARMSTRONG REDEVELOPMENT.GPJ AET+CPT+WELL.GDT 1/18/22

Appendix B

Geotechnical Report Limitations and Guidelines for Use

Appendix B
Geotechnical Report Limitations and Guidelines for Use
Report No. P-0004952

B.1 REFERENCE

This appendix provides information to help you manage your risks relating to subsurface problems which are caused by construction delays, cost overruns, claims, and disputes. This information was developed and provided by GBA[1], of which, we are a member firm.

B.2 RISK MANAGEMENT INFORMATION

B.2.1 Understand the Geotechnical Engineering Services Provided for this Report

Geotechnical engineering services typically include the planning, collection, interpretation, and analysis of exploratory data from widely spaced borings and/or test pits. Field data are combined with results from laboratory tests of soil and rock samples obtained from field exploration (if applicable), observations made during site reconnaissance, and historical information to form one or more models of the expected subsurface conditions beneath the site. Local geology and alterations of the site surface and subsurface by previous and proposed construction are also important considerations. Geotechnical engineers apply their engineering training, experience, and judgment to adapt the requirements of the prospective project to the subsurface model(s). Estimates are made of the subsurface conditions that will likely be exposed during construction as well as the expected performance of foundations and other structures being planned and/or affected by construction activities.

The culmination of these geotechnical engineering services is typically a geotechnical engineering report providing the data obtained, a discussion of the subsurface model(s), the engineering and geologic engineering assessments and analyses made, and the recommendations developed to satisfy the given requirements of the project. These reports may be titled investigations, explorations, studies, assessments, or evaluations. Regardless of the title used, the geotechnical engineering report is an engineering interpretation of the subsurface conditions within the context of the project and does not represent a close examination, systematic inquiry, or thorough investigation of all site and subsurface conditions.

B.2.2 Geotechnical Engineering Services are Performed for Specific Purposes, Persons, and Projects, and At Specific Times

Geotechnical engineers structure their services to meet the specific needs, goals, and risk management preferences of their clients. A geotechnical engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared solely for the client.

Likewise, geotechnical engineering services are performed for a specific project and purpose. For example, it is unlikely that a geotechnical engineering study for a refrigerated warehouse will be the same as one prepared for a parking garage; and a few borings drilled during a preliminary study to evaluate site feasibility will not be adequate to develop geotechnical design recommendations for the project.

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project or purpose;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, the reliability of a geotechnical-engineering report can be affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. If you are the least bit uncertain about the continued reliability of this report, contact your geotechnical engineer before applying the recommendations in it. A minor amount of additional testing or analysis after the passage of time – if any is required at all – could prevent major problems.

1 Geoprofessional Business Association, 1300 Piccard Drive, LL14, Rockville, MD 20850
Telephone: 301/565-2733: www.geoprofessional.org, 2019

B.2.3 Read the Full Report
Costly problems have occurred because those relying on a geotechnical-engineering report did not read the report in its entirety. Do not rely on an executive summary. Do not read selective elements only. Read and refer to the report in full.

B.2.4 You Need to Inform Your Geotechnical Engineer About Change
Your geotechnical engineer considered unique, project-specific factors when developing the scope of study behind this report and developing the confirmation-dependent recommendations the report conveys. Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the elevation, configuration, location, orientation, function or weight of the proposed structure and the desired performance criteria;
- the composition of the design team; or
- project ownership.

As a general rule, always inform your geotechnical engineer of project or site changes – even minor ones – and request an assessment of their impact. The geotechnical engineer who prepared this report cannot accept responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.

B.2.5 Most of the "Findings" Related in This Report Are Professional Opinions
Before construction begins, geotechnical engineers explore a site's subsurface using various sampling and testing procedures. Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing is performed. The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgement to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team through project completion to obtain informed guidance quickly, whenever needed.

B.2.6 This Report's Recommendations Are Confirmation-Dependent
The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, they are not final, because the geotechnical engineer who developed them relied heavily on judgement and opinion to do so. Your geotechnical engineer can finalize the recommendations only after observing actual subsurface conditions exposed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.

B.2.7 This Report Could Be Misinterpreted
Other design professionals' misinterpretation of geotechnical engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a continuing member of the design team, to:

- confer with other design-team members;
- help develop specifications;
- review pertinent elements of other design professionals' plans and specifications; and
- be available whenever geotechnical engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction-phase observations.

B.2.8 Give Constructors a Complete Report and Guidance
Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious

problems this practice has caused, include the complete geotechnical engineering report, along with any attachments or appendices, with your contract documents, but be certain to note conspicuously that you've included the material for information purposes only. To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, only from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and be sure to allow enough time to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

B.2.9 Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. This happens in part because soil and rock on project sites are typically heterogeneous and not manufactured materials with well-defined engineering properties like steel and concrete. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. Read these provisions closely. Ask questions. Your geotechnical engineer should respond fully and frankly.

B.2.10 Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical engineering study. For that reason, a geotechnical engineering report does not usually provide environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. Unanticipated subsurface environmental problems have led to project failures. If you have not obtained your own environmental information about the project site, ask your geotechnical consultant for a recommendation on how to find environmental risk-management guidance.

B.2.11 Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, the engineer's services were not designed, conducted, or intended to prevent migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration. Confront the risk of moisture infiltration by including building-envelope or mold specialists on the design team. Geotechnical engineers are not building-envelope or mold specialists.

FEASIBILITY REPORT UPDATE

HY-10 RAMSEY IMPROVEMENTS

CITY IMPROVEMENT PROJECT NO. 18-02

February 16, 2023

Prepared By:

City of Ramsey
Engineering Department
7550 Sunwood Drive NW
Ramsey, MN 55303
763-433-9839
763-433-9848 (Fax)

Bolton & Menk, Inc.
7533 Sunwood Drive NW, Suite 206
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Bolton-Menk.com

February 16, 2023

Bruce Westby
City Engineer / Public Works Director
City of Ramsey
7550 Sunwood Drive NW
Ramsey, MN 55303

Re: Feasibility Report Update- City of Ramsey Improvement Project #18-02
HY-10 Ramsey Improvements

Dear Mr. Westby,

Transmitted herewith is an Updated Feasibility Report for the proposed HY-10 Ramsey Improvements. The project includes 146th Avenue from Ferret Street to its termini cul-de-sac, 147th Avenue from Ferret Street to 380 feet west of Armstrong Boulevard, and Ferret Street from 146th Avenue to Bunker Lake Boulevard. The report examines the feasibility of reconstructing the bituminous street section and completing other appurtenant improvements.

This Feasibility Report examines the scope of the proposed improvements, explores estimated costs and available funding sources, defines a preliminary project schedule, and determines the necessity, feasibility, and general cost-effectiveness of the proposed improvements, including any alternate designs, as well as whether the improvements would best be completed separately or in conjunction with another project.

I would be happy to discuss this report with you at your convenience. Please feel free to contact me at 651-968-7760 or kevin.kielb@bolton-menk.com with any questions.

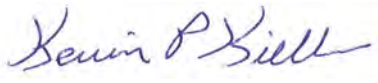
Sincerely,
Bolton & Menk, Inc.

Kevin P. Kielb, P.E.
Principal Engineer

Enclosure

CERTIFICATION

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.



Kevin Kielb, PE

Date: February 16, 2022 License No. 23211

`

TITLE SHEET
LETTER OF TRANSMITTAL
CERTIFICATION SHEET
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1. EXECUTIVE SUMMARY

City Improvement Project No. 18-02 proposes to reconstruct streets within the HY-10 Area. The project area is bordered on the north by Bunker Lake Boulevard, on the south by TH 10, on the east by Armstrong Boulevard, and on the west by the employment district. Project area includes 146th Avenue, 147th Avenue, and Ferret Street. The streets total approximately 2,025 linear feet (0.39 miles) in length.

Two roadway and pond options are being considered at this time. Option 1 includes a regional pond located south of 146th Avenue and west of Armstrong Boulevard. A regional pond would allow all properties south of 147th Avenue to forgo onsite stormwater treatment and utilize the regional pond. The regional pond would require the purchase of the property at 8100 146th Avenue NW. Option 2 includes a smaller stormwater pond for stormwater treatment of roadway runoff only. Additionally, the Anoka Ramsey Athletic Association (ARAA) has been developing plans on their property to construct a sports recreation facility. The resulting larger traffic projections warrant further analyses. Maps showing the location and scope of the proposed improvements are included as ***Figure 1 and 2*** in ***Appendix A.***

Initially, On July 11, 2017, the City Council adopted Resolution #17-07-170 authorizing the preparation of a Feasibility Report for the reconstruction of HY-10 Ramsey. These streets were originally included in the City's CIP as proposed 2015 overlay improvements. However, the overlay work was delayed when construction of the Highway 10 & Armstrong Boulevard Interchange was funded. Following completion of the Interchange, the pavement was re-evaluated, and Staff determined it would be best to reconstruct these streets in the future. This project is now listed in the current 10-year CIP as a total reconstruction.

On December 14, 2021, the City Council adopted Resolution #21-349 authorizing the engineering services and preparation of this Feasibility Report Update. Much of the information contained in this Update has been carried forward from the previously authorized and completed feasibility report.

Upon ordering the Feasibility Report Update, the City Council directed Staff to review the existing street alignments and explore whether the streets should be reconstructed in the same locations, or whether it might make sense to realign or extend one or more of the streets to better serve existing properties and/or to connect to the new Bunker Lake Industrial Park.

The engineer's opinion of probable construction costs including streets, drainage, public sewer and water utilities, and property acquisition is **$2,372,647.02** for option 1 and **$1,827,778.74** for option 2. A summary of the engineer's opinion of probable costs is included in ***Appendix B.***

The project funding mechanisms are yet to be determined by City Staff. A combination of special assessments to benefitting properties, street reconstruction bond proceeds, and stormwater utility funds are possible. Sewer and Water Utility Funds would be used to pay for any public utility improvements.

Option 1 identifies ten (10) parcels as receiving special benefit from the improvements and the city-purchase of the parcel at 8100 146th Avenue. For option 2, Eleven (11) parcels have been identified as receiving special benefit from the improvements. Five of the parcels have permanent

structures, and the other five are undeveloped. Additionally, to extend Ferret Street north to Bunker Lake Boulevard, roadway right-of-way and drainage and utility easements would be obtained. These parcels are identified in the preliminary Assessment Map, Property Acquisition Maps, and Preliminary Assessment Roll, which is attached in ***Appendix C***.

If City Staff concludes special assessments will be utilized for these commercial applications, preliminary assessment roles will be prepared at that time. The Assessment Hearing, if applicable, is proposed for November 14, 2023. If the report verifies the assessment rate as proposed is justified, Staff will propose to adopt the final assessment roll using the rate as preliminarily proposed.

2. INTRODUCTION

2.1 Authorization

The preparation of this report update was authorized by the Ramsey City Council on December 14, 2021. This project has been designated as City Improvement Project No. 18-02

2.2 Pavement Maintenance Program Update

Recent redevelopment discussions with adjacent property owners have resulted in a desire to reconstruct the pavements to account for projected traffic increases. Furthermore, as presented in the original feasibility study, the existing pavements have surpassed its useful life.

The City's pavement evaluation process involves a visual evaluation of each street's pavement surface based on the type, extent and severity of each pavement distress observed. Numerous types of pavement distresses may exist within a pavement section including, but not limited to, alligator cracking, block cracking, longitudinal cracking, transverse cracking, rutting, raveling, shoving, potholes and patches. This field data is then used to rate the pavement condition.

City staff evaluates and rates the condition of pavement sections on all City streets on an annual basis using the Pavement Surface Evaluation and Rating (PASER) system. In the summer of 2017, the pavement section of the above referenced street segments was rated with a PASER rating of 2 which indicates these streets require complete reconstruction. City staff patch the streets at least once per year, particularly before winter so the street can be plowed without further damaging the pavement in the process. Pictures of the street are located in ***Appendix A.***

In the summer of 2017, City staff evaluated and rated the condition of the pavement along the HY-10 Street segments. A PASER rating of 2 was determined for 147th Avenue and Ferret Street. A PASER rating of 7 was determined for 146th Avenue, however, as previously noted a portion of this street segment was reconstructed with a temporary bituminous pavement section as part of the Armstrong Interchange project.

2.3 Scope

City of Ramsey Improvement Project 18-02 proposes to reconstruct the existing bituminous pavements, extend Ferret Street north to Bunker Lake Boulevard, install public utility infrastructure for future development, and complete other appurtenant work on 146th Avenue from

Ferret Street to its termini cul-de-sac, 147th Avenue from 380 feet west of Armstrong Boulevard to Ferret Street, and Ferret Street from 146th Avenue to Bunker Lake Boulevard which totals approximately 2,000 feet (0.38 miles) in length.

Two roadway and pond options are being considered at this time. Option 1 includes a regional pond located south of 146th Avenue and west of Armstrong Boulevard. A regional pond would allow all properties south of 147th Avenue to forgo onsite stormwater treatment and utilize the regional pond. The regional pond would require the purchase of the property at 8100 146th Avenue NW. Option 2 includes a smaller pond for stormwater treatment of roadway runoff only.

Maps showing the location and scope of the proposed improvements options are included as ***Figure 1 and 2*** in ***Appendix A.***

3. EXISTING CONDITIONS

3.1 Existing Pavement and Soil Conditions

All streets proposed to be improved were constructed in 1988 with bituminous pavement, class 5 aggregate base, bituminous curb, and bituminous curb cuts for storm runoff. However, during the Highway 10/Armstrong Interchange project the west end of 146th Avenue was reconstructed and a temporary cul-de-sac was constructed. The streets were constructed to a width of 40-feet from face-of-curb to face-of-curb. The streets are generally centered within a 66-foot wide right-of-way.

The only pavement maintenance treatments applied to the street segments included crack sealing and seal coating in 1994 and 2001. Spot patching has been performed on an as-needed basis, and has been a yearly treatment recently. In 2017, Staff observed a PASER rating of 2 on 147th Avenue and Ferret Street, and a PASER rating of 7 on 146th Avenue.

In June 2018 traffic counts were taken on 147th Avenue, a traffic volume of 147 average annual daily traffic (AADT) was recorded. Ferret Street and 146th Avenue would be expected to have similar traffic volumes. The only access to these street segments is Armstrong Boulevard. Five of the parcels have active uses. The speed limit is 30 mph for these street segments.

Standard penetration test borings were performed by American Engineering Testing (AET) in 2022. AET's Report of Geotechnical Exploration is attached in ***Appendix D.*** Standard penetration test borings were performed by American Engineering Testing (AET) in 2021. 2.5 to 2.75 inches of bituminous pavement with 8 inches of apparent gravel base was encountered with silty sand and sand with silt layers encountered to depths of approximately 2 to four feet beneath existing grade. The sands with silt from 2 to 4 feet below grade were classified as "Course Alluvium or Fill." Groundwater was encountered at a depth of 10 feet in one of the borings.

Previously, in 2017, Braun Intertec was employed to complete a ground penetrating radar (GPR) analysis for the project area, which included driving a GPR equipped vehicle throughout all street segments within the project area. A summary table and charts of the GPR Analysis are attached in ***Appendix C***. The GPR data determined an average bituminous pavement thickness of 2.9 inches, and an average aggregate base thickness of 9.7 inches. The average street pavement and base

section thickness is therefore 12.6 inches, with a minimum section of 7.5 inches located on 147th Avenue, 160 feet east of Ferret Street.

3.2 Watermain

Watermain was installed along 147th Avenue up to the beginning of the proposed improvements in 2012 as part of the Sunwood Drive re-alignment project. The existing watermain is believed to be in good condition and no repairs are anticipated to be required as part of this project. However, Staff plans to leak test the watermain during development of plans and specifications.

3.3 Sanitary Sewer

Sanitary sewer was installed under Armstrong Boulevard in City-owned right-of-way east of the 146th Avenue temporary cul-de-sac as part of the Armstrong Boulevard Interchange project in 2015. The existing sanitary sewer is believed to be in good condition and no repairs are anticipated to be required as part of this project. However, staff plans to televise the sewer during development of plans and specifications.

3.4 Storm Sewer/Drainage

Storm sewer was installed along 147th Avenue up to the beginning of the proposed improvements in 2012 as part of the Sunwood Drive re-alignment project. Currently storm water runoff drains off the two existing cul-de-sacs to low areas. This storm sewer is believed to be in good condition and no repairs are anticipated to be required as part of this project. However, staff plans to televise the sewer during development of plans and specifications.

3.5 Streets

3.5.1 Existing Typical Sections

The width of 146th Avenue, 147th Avenue, and Ferret Street is 40-feet from face-of-curb to face-of-curb. The cul-de-sac on Ferret Street has a 50-foot radius to the back of curb. The streets are generally centered within a 66-foot wide City-owned right-of-way, with a 130-foot wide diameter right-of-way around the cul-de-sac on Ferret Street.

3.5.2 Maintenance History

The area roadways were originally constructed in 1988. 146th Avenue, 147th Avenue, and Ferret Street received crack seal and seal coat in 1994 and 2001. The street segments have regularly received spot patching on an as-needed basis.

3.6 Land Use

The parcels within the construction area are zoned as COR.

4. PROPOSED IMPROVEMENTS

4.1 Street and Stormwater Improvements

4.1.1 Street Improvements

146th Avenue, 147th Avenue and Ferret Street are proposed to be reconstructed with bituminous pavement and concrete curb and gutter.

The proposed surface improvements are shown on ***Figures 1 and 2 in Appendix A.***

Street Design:
146th Avenue, 147th Avenue, and Ferret Street are currently urban commercial streets with bituminous curb and pavement, 40 feet wide from face-of-curb to face-of-curb. The proposed cul-de-sac is 100-feet in diameter from back-of-curb to back-of-curb. Existing and proposed traffic counts are low for typical commercial streets.

All street segments are proposed to be reconstructed at their current width. A typical section for the proposed pavement reconstruction improvements is shown in ***Figure 3*** in ***Appendix A.***

This Feasibility Report proposes to reconstruct the existing bituminous pavement section using the Full Depth Reclamation (FDR) process. This process generally involves reclaiming the entire existing bituminous pavement section, along with the underlying aggregate base material. The reclaim material will then be salvaged and stockpiled to install the proposed public utilities. Four and one-half inches of bituminous pavement is proposed to be placed on top of a minimum of 8 inches of aggregate base/reclaim material. This pavement section generally meets the City of Ramsey's standard pavement design for commercial/employment district streets. The proposed improvements should have a service life of at least 30-years, assuming maintenance such as overlays, crack sealing and seal coating is routinely performed.

4.1.2 Storm Sewer Improvements

Storm sewer is proposed to be added for street drainage with catch basins being added to convey water off the road and into a proposed ponding and drainage ditches as shown on ***Figures 1 and 2 in Appendix A.***

4.1.3 Other Considerations

Roadway and Pond Options:
The proposed pond size and location was evaluated, 2 options are presented:

- Option 1 – Regional Pond
  - This option proposes a regional pond sized appropriately to accept stormwater runoff from the AARA parcels (PID 29-32-25-14-0005 and 29-32-25-14-0015) and parcels south of 147th Avenue and east of Ferret Street.
  - Right-of-way and or easement acquisition at 8100 146th Ave NW will be required to accommodate the regional pond.

- The cul-de-sac is proposed to be located on the south end of Ferret Street as a portion of the right-of-way at 146th Avenue will be needed for the shared regional pond.

- Option 2 – Roadway Pond
  - This option proposes a smaller pond sized to accept stormwater runoff from the project roadway improvements.
  - Pond to be located on the City-owned parcel on the southeast end of 146th Avenue NW. Right-of-way and or easement acquisition is not anticipated for the pond.
  - The cul-de-sac is proposed to be located on the east end of 146th Avenue NW, approximately matching the existing cul-de-sac footprint.

Driveways:

Existing driveway aprons may need to be reconstructed to varying degrees. The limits of construction will vary with each driveway apron based on the elevation of the street abutting the driveway and the driveway pavement type. During design, Staff will evaluate the construction limits for each driveway and will incorporate this into the plans, but as with all street reconstruction projects, the exact limits of construction will be determined in the field during construction. None are anticipated, but right-of-entry forms will be obtained from private property owners where work is required outside city rights-of-way and easements.

Irrigation Systems:

Developed properties along the project corridor may have private irrigation systems. Staff will notify property owners of pending construction as far in advance as practical to allow them time to relocate their irrigation systems before construction begins.

Parking Restrictions:

Parking is currently provided along both sides of the streets and is not currently restricted except for overnight parking per City code. During project construction, parking will be restricted during allowable working hours.

Pavement Coring:

Existing pavement thicknesses have been found to be inconsistent throughout the City. It is now standard practice to have City Staff on-site during pavement installation to ensure the proper quantities are being placed. As further conformation, Staff is proposing to collect GPR data or to have pavement cores taken at the conclusion of all reconstruction projects. This is already a requirement on all State Aid projects and will leave more data on the pavement section for future street maintenance projects.

4.2 Stormwater Treatment

The extension of Ferret Street from the north termini cul-de-sac to Bunker Lake Boulevard results in an impervious area increase of 0.4 acres. Also, the existing storm sewer on 147th Avenue drains to existing ponds east of Armstrong Boulevard and north of Sunwood Drive. They were not designed to receive any runoff west of Armstrong Boulevard. Consequently, stormwater retention and/or treatment improvements will be required with this project to reduce the rate at which runoff leaves the site or infiltrates.

4.3 Water Main Improvements

Watermain is proposed to be extended on Ferret Street from Bunker Lake Boulevard to 146th Street. Watermain is also proposed to be extended from mid-block 147th Avenue to Ferret Street. Adding this segment on 147th Avenue will loop together the watermain in this area and provide service for future development.

4.4 Sanitary Sewer Improvements

Sanitary Sewer is proposed to be extended on Ferret Street from Bunker Lake Boulevard to 146th Avenue NW. Adding this segment on Ferret Street will provide service for future development.

4.6 Private Utilities

Staff has not yet met with the telephone, gas, power and cable utilities regarding this project. During preparation of plans and specifications, Staff will meet with the private utility companies to discuss the proposed improvements as noted in the project schedule within this report. The alignment and footprint of the streets will be considered to minimize impacts to private utilities. Impacts to private utilities area anticipated with this project.

Should any utility company indicate they wish to upgrade, replace and/or otherwise modify their services during this project, any such upgrades, replacements and/or modifications will be at the sole discretion and cost of the utility company.

4.7 Traffic Analysis

Based upon the potential traffic changes associated with the redevelopment of the HY-10 area, more comprehensive traffic analyses are recommended to be completed at the following locations:

- Bunker Lake Boulevard/Armstrong Boulevard,
- Bunker Lake Boulevard/Ferret Street, and
- Armstrong Boulevard/147th Street.

Initially, a Bunker Lake Boulevard westbound left turn lane and Ferret Street northbound designated left turn lane and right turn lanes are all warranted. The current land use zoned "COR" allows for flexibility. If the HY-10 Area evolves to more commercial orientated uses with the addition of the ARAA facility and others, additional analysis is warranted to better understand the impacts. A detailed traffic analysis memorandum is included in ***Appendix D.***

4.8 Permits

Permits that are anticipated to be required as part of the proposed improvements include:

- Minnesota Pollution Control Agency (MPCA): Sanitary Sewer Extension
- Minnesota Department of Health (MDH): Watermain Extension
- MPCA General Stormwater Permit: Grading and Storm Water
- Lower Rum River Watershed Management Organization (LRRWMO) Grading and Storm Water

4.9 Right-of-Ways/Easements

It is anticipated that the City will need to acquire additional permanent right-of-way, easements, and/or entire parcels for this project. Costs for right-of-way or easement acquisitions are included in the probable project costs in Appendix B. Property values are based on conversations with property owners and county-assessed values. Actual appraisals will need to be performed to determine final property values.

City Staff will work with private property owners as needed to obtain any required right of entries.

5. FINANCING

5.1 Opinion of Cost

A detailed opinion of probable costs for the proposed improvements can be found in ***Appendix B*** of this report. The opinion of probable costs incorporates anticipated 2023 construction costs for the proposed improvements with 10-percent contingency costs and projected property acquisition costs.

The engineer's opinion of probable construction costs including streets, drainage, public sewer and water utilities, and property acquisition is **$2,372,647.02** for option 1 and **$1,827,778.74** for option 2.

5.2 Funding

5.2.1 Assessments

If City Staff recommend the use of special assessments, the City's adopted Special Assessments Policy allows special assessments to be levied against all benefitting properties in an amount not to exceed 25% of eligible street reconstruction costs. Eligible costs include costs required to reconstruct the street at its current width, and to reconstruct the pavement without increasing its structural capacity. Benefitting properties are defined as any developable parcel that has, or has the ability to create, one or more direct accesses onto the segment of 146th Avenue, 147th Avenue or Ferret Street being reconstructed.

State Statute and the City Charter do not allow for assessments to exceed benefit to the property. Therefore, Staff would want to ensure all assessments applied with this project would not exceed the benefit to assessed properties. Therefore, if special assessments are utilized, Staff recommends ordering a benefit appraisal consultation report for this project in accordance with the City's Special Assessments Policy at the time a construction contract is awarded.

5.2.2 City Contribution

The City contribution to the project would include all funding in excess of the amount collected through special assessments to benefiting properties. No funds have been budgeted for this project. The City's share of eligible project costs related to surface

(street) improvements is proposed to come from the previously encumbered 5-year Street Reconstruction and Overlay Program bonds. Water and Stormwater Utility Funds are proposed to pay for all utility improvements.

6. PROJECT SCHEDULE

The proposed project schedule is as follows:

Council Orders Feasibility Report Update..... December 14, 2021

Council Approves Feasibility Report..... February 28, 2023

Council Approves Plans and Specifications / Authorizes Ad for Bids..... March 14, 2023

Staff Conducts Private Utility Coordination Meeting ..... March 2023

Staff Receives Bids ..... April 13, 2023

Council Awards Contract..... April 25, 2023

Staff Finalizes Property Acquisition..... June 2023

Contractor Begins Construction..... July 2023

Contractor Construction Substantial Completion ..... September 29, 2023

Contractor Construction Final Completion..... October 20, 2023

7. CONCLUSIONS AND RECOMMENDATIONS

City of Ramsey Improvement Project No. 18-02 proposes to reconstruct the bituminous pavement section, to remove the existing bituminous curb and replace it with a combination of B618 concrete curb and gutter and bituminous curb, and to complete miscellaneous appurtenant work on the following street segments within the HY-10 area commercial subdivision:

1. 146th Avenue (approx. 230 linear feet) – Ferret Street to bulb of east cul-de-sac.
2. 147th Avenue (approx. 190 linear feet) – Ferret Street to 180 feet west of Armstrong Boulevard.
3. Ferret Street (approx. 1500 linear feet) – 146th Avenue to Bunker Lake Boulevard

It is the recommendation of Bolton & Menk, Inc. that City Project No. 18-02, Option 1 and Option 2, are feasible, necessary, and cost-effective from an engineering standpoint, dependent on private development. This project would best be constructed as a stand-alone project as proposed herein.

APPENDIX A

Figure 1 – Proposed Improvements, Option 1: Regional Pond
Figure 2 – Proposed Improvements, Option 2: Roadway Pond
Figure 3 – Typical Section
Project Site Pictures

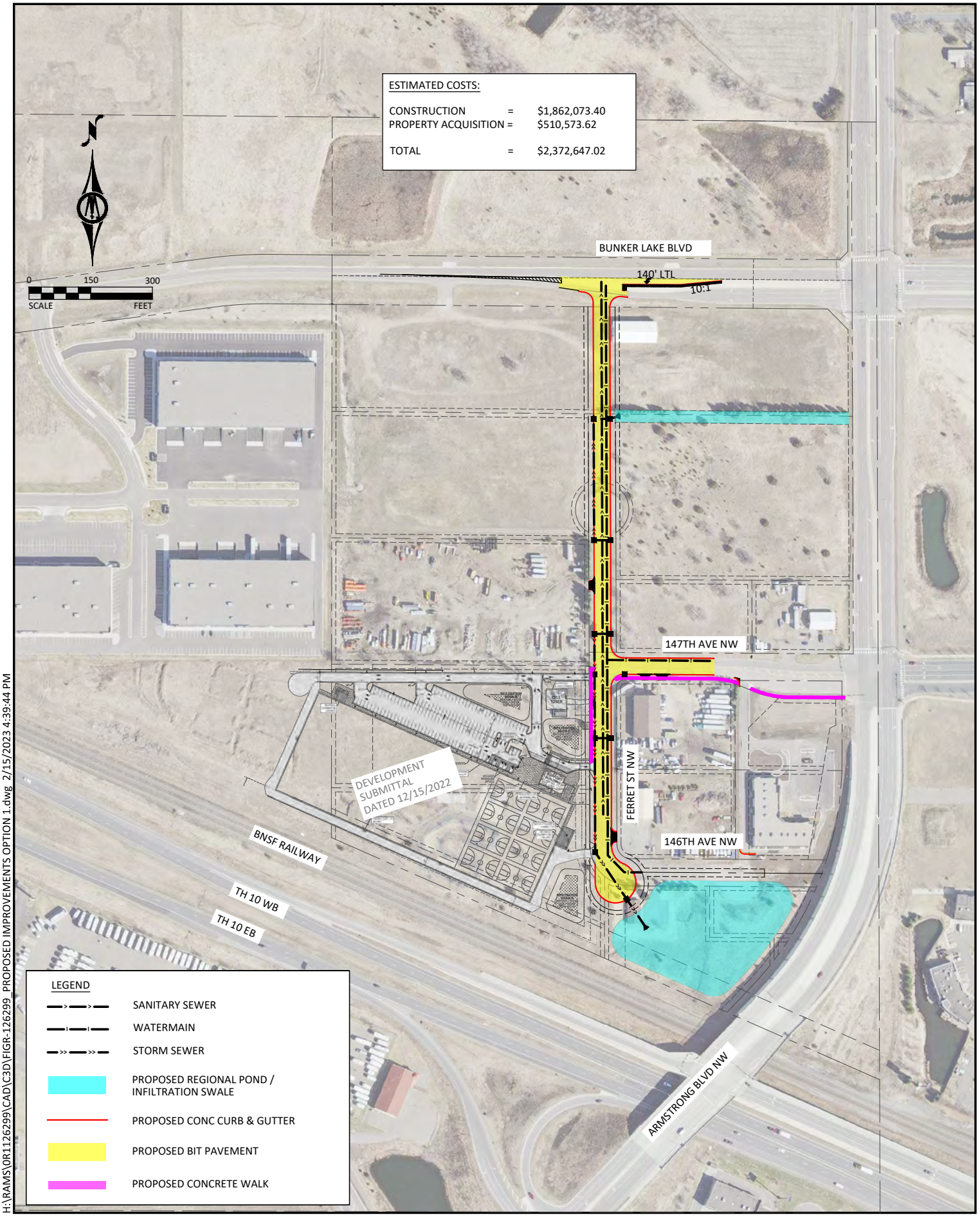
HY-10 Ramsey Improvements

City of Ramsey

Proposed Improvements - Option 1

February 2023

BOLTON & MENK



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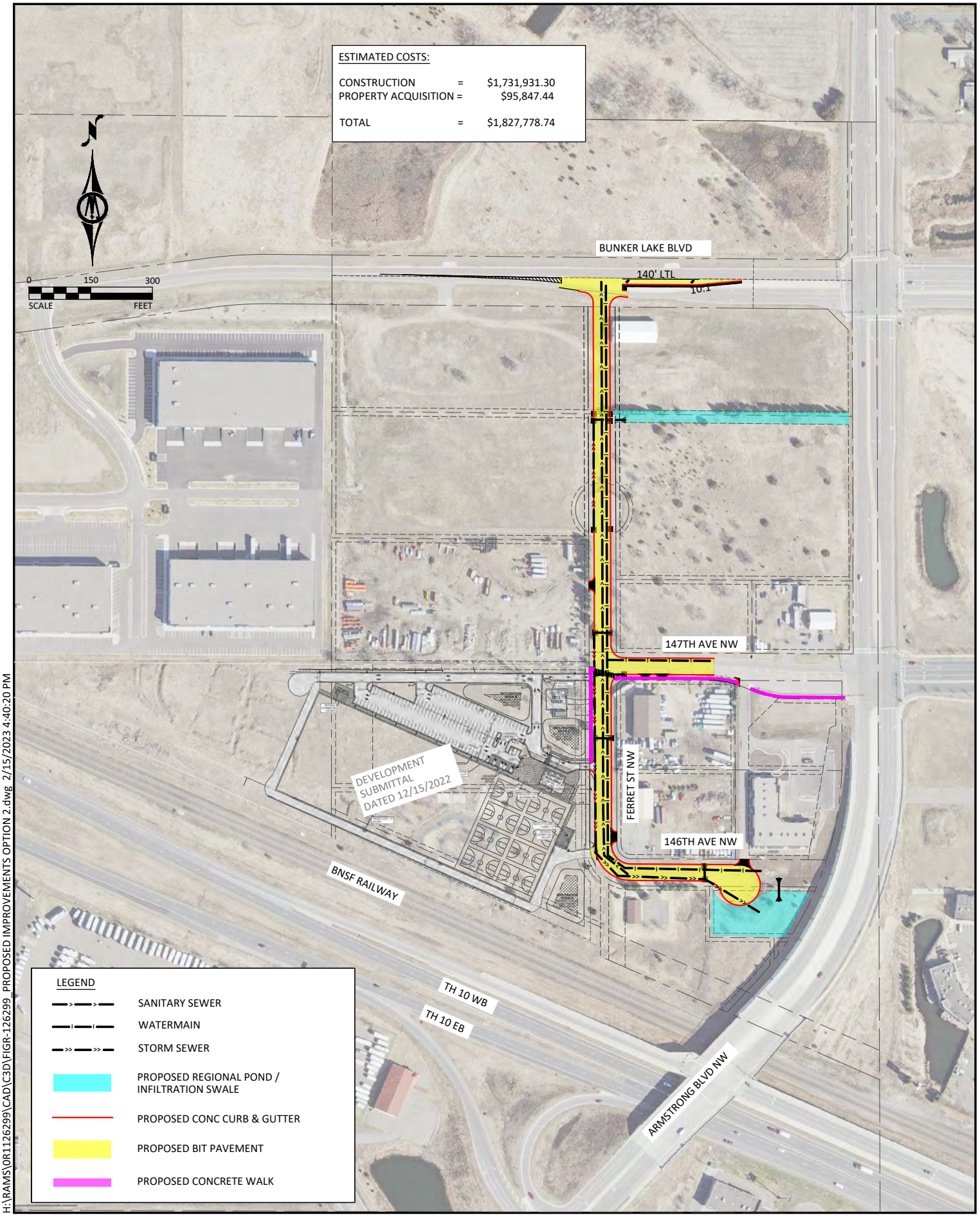
HY-10 Ramsey Improvements

City of Ramsey

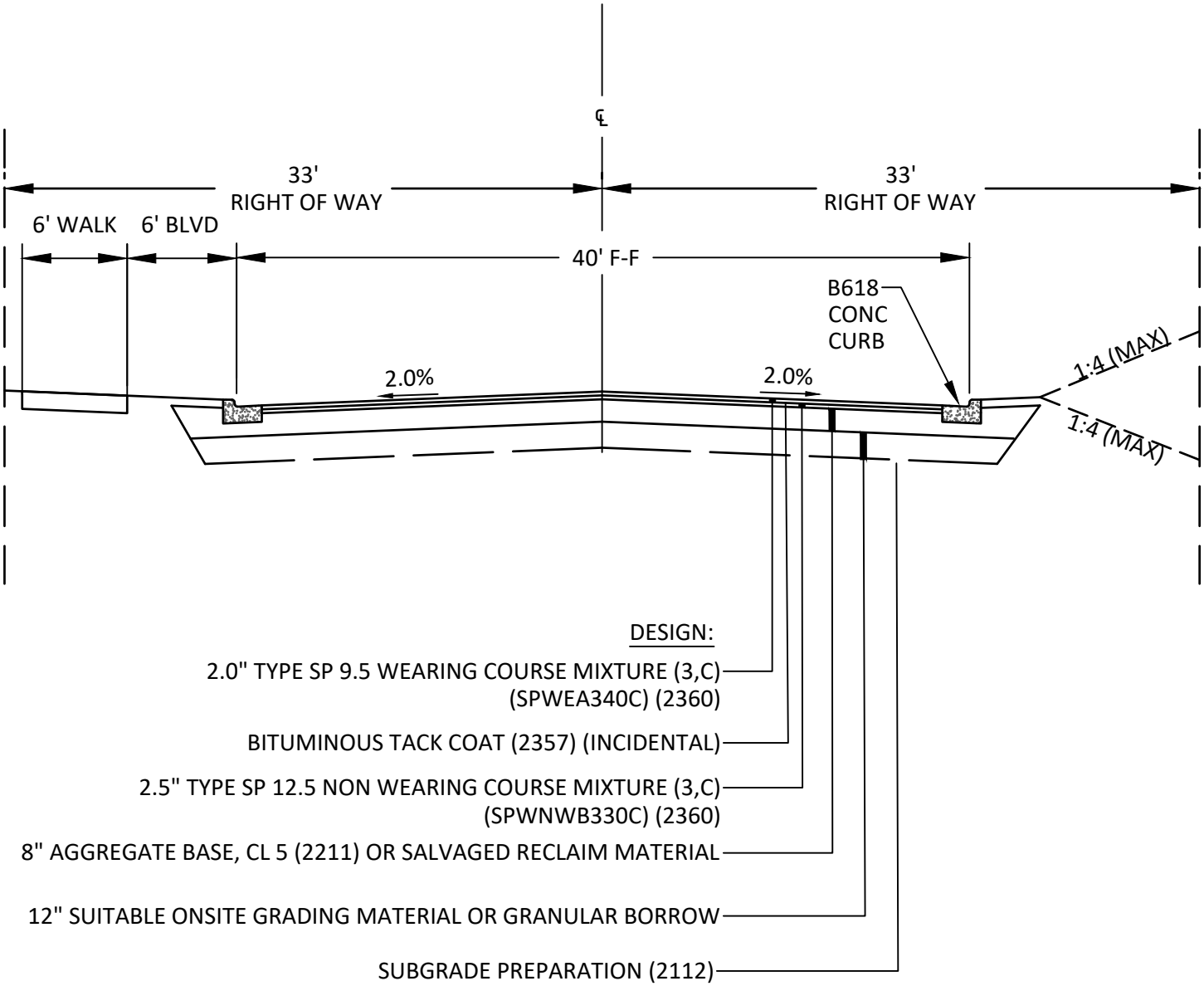
Proposed Improvements - Option 2

February 2023

BOLTON & MENK



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DESIGN:

2.0" TYPE SP 9.5 WEARING COURSE MIXTURE (3,C)
(SPWEA340C) (2360)

BITUMINOUS TACK COAT (2357) (INCIDENTAL)

2.5" TYPE SP 12.5 NON WEARING COURSE MIXTURE (3,C)
(SPWNWB330C) (2360)

8" AGGREGATE BASE, CL 5 (2211) OR SALVAGED RECLAIM MATERIAL

12" SUITABLE ONSITE GRADING MATERIAL OR GRANULAR BORROW

SUBGRADE PREPARATION (2112)

H:\RAMS\0R1126299\CAD\C3D\FIGR-126299_TYPICAL SECTION.dwg 2/15/2023 4:41:10 PM

PROJECT SITE PICTURES



1: 146th Avenue from Ferret Street



2: Ferret Street from 146th Avenue



3: Ferret Street from north cul-de-sac



4: **147th Avenue from Ferret Street**

APPENDIX B

Opinion of Probable Costs
Preliminary Assessment Map
Property Acquisition, Option 1
Property Acquisition, Option 2

ENGINEER'S ESTIMATE - REGIONAL POND OPTION 1

HY-10 RAMSEY IMPROVEMENTS
CITY PROJECT NO. 18-02
CITY OF RAMSEY, MN
BMI PROJECT NO. 0R1.126299

BOLTON & MENK
Real People. Real Solutions.

Date: 2/15/2023

ENGINEER'S ESTIMATE								ROADWAY		STORM SEWER		SANITARY SEWER		WATERMAIN	
ITEM NO.	MnDOT SPEC NO.	ITEM	NOTES	TOTAL ESTIMATED QUANTITY	UNIT	UNIT PRICE	TOTAL AMOUNT	QUANTITY	AMOUNT	QUANTITY	AMOUNT	QUANTITY	AMOUNT	QUANTITY	AMOUNT
1	2021.501	MOBILIZATION		1	LUMP SUM	$90,000.00	$90,000.00	0.45	$40,500.00	0.26	$23,400.00	0.09	$8,100.00	0.20	$18,000.00
2	2101.502	CLEARING		13	EACH	$500.00	$6,500.00	13	$6,500.00						
3	2101.502	GRUBBING		13	EACH	$200.00	$2,600.00	13	$2,600.00						
4	2101.505	CLEARING		0.25	ACRE	$8,000.00	$2,000.00	0.25	$2,000.00						
5	2101.505	GRUBBING		0.25	ACRE	$6,000.00	$1,500.00	0.25	$1,500.00						
6	2102.503	PAVEMENT MARKING REMOVAL		1,090	LIN FT	$1.50	$1,635.00	1090	$1,635.00						
7	2103.501	BUILDING REMOVAL		1	LUMP SUM	$40,000.00	$40,000.00	1	$40,000.00						
8	2104.502	REMOVE MAIL BOX & SUPPORT		1	EACH	$100.00	$100.00	1	$100.00						
9	2104.502	REMOVE CASTING ASSEMBLY		1	EACH	$400.00	$400.00			1	$400.00				
10	2104.502	SALVAGE CATCH BASIN		1	EACH	$1,000.00	$1,000.00			1	$1,000.00				
11	2104.502	SALVAGE SIGN		3	EACH	$50.00	$150.00	3	$150.00						
12	2104.502	REMOVE SIGN		1	EACH	$50.00	$50.00	1	$50.00						
13	2104.502	REMOVE GATE VALVE & BOX		1	EACH	$800.00	$800.00							1	$800.00
14	2104.503	REMOVE PIPE SEWERS		12	LIN FT	$20.00	$240.00			12	$240.00				
15	2104.503	REMOVE FENCE		600	LIN FT	$5.00	$3,000.00	600	$3,000.00						
16	2104.503	SAWING BIT PAVEMENT (FULL DEPTH)		1,100	LIN FT	$2.50	$2,750.00	1100	$2,750.00						
17	2104.503	SAWING CONCRETE PAVEMENT (FULL DEPTH)		390	LIN FT	$5.00	$1,950.00	390	$1,950.00						
18	2104.503	REMOVE CURB AND GUTTER		900	LIN FT	$4.00	$3,600.00	900	$3,600.00						
19	2104.504	REMOVE BITUMINOUS PAVEMENT		830	SQ YD	$4.00	$3,320.00	830	$3,320.00						
20	2104.504	REMOVE CONCRETE PAVEMENT		680	SQ YD	$10.00	$6,800.00	680	$6,800.00						
21	2106.507	EXCAVATION - COMMON (EV)	(P) (1)	3,100	CU YD	$16.00	$49,600.00	3100	$49,600.00						
22	2106.507	EXCAVATION - CHANNEL AND POND	(P) (1)	43,500	CU YD	$6.00	$261,000.00			43500	$261,000.00				
23	2106.507	EXCAVATION - SUBGRADE (EV)		200	CU YD	$15.00	$3,000.00	200	$3,000.00						
24	2106.507	STABILIZING AGGREGATE (CV)		200	CU YD	$20.00	$4,000.00	200	$4,000.00						
25	2106.507	COMMON EMBANKMENT (CV)	(P)	400	CU YD	$5.00	$2,000.00	400	$2,000.00						
26	2106.607	HAUL AND STOCKPILE BITUMINOUS MATERIAL	(P)	2,050	CU YD	$12.00	$24,600.00	2050	$24,600.00						
27	2112.519	SUBGRADE PREPARATION		18	ROAD ST	$500.00	$9,000.00	18	$9,000.00						
28	2118.507	AGGREGATE SURFACING (CV) CLASS 2		20	CU YD	$85.00	$1,700.00	20	$1,700.00						
29	2123.610	STREET SWEEPER (WITH PICKUP BROOM)		20	HOUR	$200.00	$4,000.00	20	$4,000.00						
30	2211.507	AGGREGATE BASE (CV) CLASS 5 MODIFIED		400	CU YD	$42.00	$16,800.00	400	$16,800.00						
31	2211.607	AGGREGATE BASE (CV) FROM STOCKPILE		2,050	CU YD	$16.00	$32,800.00	2050	$32,800.00						
32	2215.504	FULL DEPTH RECLAMATION (10")		7,350	SQ YD	$2.50	$18,375.00	7350	$18,375.00						
33	2231.604	BITUMINOUS PATCH SPECIAL (DRIVEWAY)		20	SQ YD	$80.00	$1,600.00	20	$1,600.00						
34	2360.509	TYPE SP 9.5 WEARING COURSE MIX (3,C)		1,040	TON	$100.00	$104,000.00	1040	$104,000.00						
35	2360.509	TYPE SP 12.5 NON WEARING COURSE MIX (3,C)		1,300	TON	$95.00	$123,500.00	1300	$123,500.00						
36	2501.502	18" RC PIPE APRON		2	EACH	$1,500.00	$3,000.00			2	$3,000.00				
37	2501.602	TRASH GUARD FOR 18" PIPE APRON		2	EACH	$700.00	$1,400.00			2	$1,400.00				
38	2503.503	12" RC PIPE SEWER DESIGN 3006 CLASS V		200	EACH	$55.00	$11,000.00			200	$11,000.00				
39	2503.503	15" RC PIPE SEWER DESIGN 3006 CLASS V		380	LIN FT	$62.00	$23,560.00			380	$23,560.00				
40	2503.503	18" RC PIPE SEWER DESIGN 3006 CLASS V		725	LIN FT	$70.00	$50,750.00			725	$50,750.00				
41	2503.503	8" PVC PIPE SEWER		1,798	LIN FT	$55.00	$98,890.00					1798	$98,890.00		

ENGINEER'S ESTIMATE - REGIONAL POND OPTION 1

HY-10 RAMSEY IMPROVEMENTS
CITY PROJECT NO. 18-02
CITY OF RAMSEY, MN
BMI PROJECT NO. 0R1.126299

BOLTON & MENK
Real People. Real Solutions.

Date: 2/15/2023

ENGINEER'S ESTIMATE								ROADWAY		STORM SEWER		SANITARY SEWER		WATERMAIN	
ITEM NO.	MnDOT SPEC NO.	ITEM	NOTES	TOTAL ESTIMATED QUANTITY	UNIT	UNIT PRICE	TOTAL AMOUNT	QUANTITY	AMOUNT	QUANTITY	AMOUNT	QUANTITY	AMOUNT	QUANTITY	AMOUNT
42	2503.602	8" PIPE PLUG		10	EACH	$200.00	$2,000.00					10	$2,000.00		
43	2503.602	CONNECT TO EXISTING SANITARY SEWER		2	EACH	$1,000.00	$2,000.00					2	$2,000.00		
44	2504.602	ADJUST GATE VALVE BOX		1	EACH	$500.00	$500.00	1	$500.00						
45	2504.602	CONNECT TO EXISTING WATER MAIN		2	EACH	$2,000.00	$4,000.00							2	$4,000.00
46	2504.602	6" GATE VALVE & BOX		6	EACH	$2,300.00	$13,800.00							6	$13,800.00
47	2504.602	8" GATE VALVE & BOX		10	EACH	$3,000.00	$30,000.00							10	$30,000.00
48	2504.602	12" GATE VALVE & BOX		5	EACH	$5,000.00	$25,000.00							5	$25,000.00
49	2504.602	HYDRANT		6	EACH	$6,000.00	$36,000.00							6	$36,000.00
50	2504.603	6" WATERMAIN DUCTILE IRON CL 53		80	LIN FT	$70.00	$5,600.00							80	$5,600.00
51	2504.603	8" WATERMAIN DUCTILE IRON CL 52		323	LIN FT	$75.00	$24,225.00							323	$24,225.00
52	2504.603	12" WATERMAIN DUCTILE IRON CL 52		1,745	LIN FT	$90.00	$157,050.00							1,745	$157,050.00
53	2504.608	WATERMAIN FITTINGS		2,490	POUND	$12.00	$29,880.00							2,490	$29,880.00
54	2506.502	CASTING ASSEMBLY (MANHOLE)		7	EACH	$750.00	$5,250.00					7	$5,250.00		
55	2506.502	CASTING ASSEMBLY (CATCH BASIN)		14	EACH	$750.00	$10,500.00			14	$10,500.00				
56	2506.602	INSTALL CATCH BASIN (SALVAGED)		1	EACH	$4,000.00	$4,000.00			1	$4,000.00				
57	2506.503	CONSTRUCT SANITARY SEWER MANHOLE		60	LIN FT	$450.00	$27,000.00					60	$27,000.00		
58	2506.503	CONSTRUCT DRAINAGE STRUCTURE DESIGN SPEC 1 (2'X3')		24	LIN FT	$500.00	$12,000.00			24	$12,000.00				
59	2506.503	CONSTRUCT DRAINAGE STRUCTURE DES 48-4020		40	LIN FT	$600.00	$24,000.00			40	$24,000.00				
60	2506.602	ADJUST FRAME & RING CASTING		2	EACH	$800.00	$1,600.00	2	$1,600.00						
61	2506.602	SEAL MANHOLE	(3)	7	EACH	$500.00	$3,500.00					7	$3,500.00		
62	2521.514	4" CONCRETE WALK		4,300	SQ FT	$8.00	$34,400.00	4300	$34,400.00						
63	2531.503	CONCRETE CURB AND GUTTER DESIGN B612		55	LIN FT	$14.00	$770.00	55	$770.00						
64	2531.503	CONCRETE CURB AND GUTTER DESIGN B618		3,805	LIN FT	$16.00	$60,880.00	3805	$60,880.00						
65	2531.504	CONCRETE MEDIAN		150	SQ YD	$70.00	$10,500.00	150	$10,500.00						
66	2531.504	8" CONCRETE DRIVEWAY PAVEMENT		180	SQ YD	$80.00	$14,400.00	180	$14,400.00						
67	2531.602	CONCRETE MEDIAN NOSE-SPECIAL		1	EACH	$800.00	$800.00	1	$800.00						
68	2540.602	MAIL BOX & SUPPORT		1	EACH	$500.00	$500.00	1	$500.00						
69	2563.601	TRAFFIC CONTROL		1	LUMP SUM	$20,000.00	$20,000.00	0.45	$9,000.00	0.26	$5,200.00	0.09	$1,800.00	0.20	$4,000.00
70	2573.501	STABILIZED CONSTRUCTION EXIT		1	LUMP SUM	$2,500.00	$2,500.00	1	$2,500.00						
71	2573.502	STORM DRAIN INLET PROTECTION		18	EACH	$200.00	$3,600.00	18	$3,600.00						
72	2573.502	CULVERT END CONTROLS		6	EACH	$300.00	$1,800.00	6	$1,800.00						
73	2573.503	SILT FENCE, TYPE MS		1,300	LIN FT	$2.00	$2,600.00	1300	$2,600.00						
74	2573.503	SEDIMENT CONTROL LOG TYPE WOOD FIBER		1,000	LIN FT	$2.50	$2,500.00	1000	$2,500.00						
75	2574.505	FERTILIZER TYPE 3		1,090	POUND	$1.50	$1,635.00	1090	$1,635.00						
76	2574.507	COMMON TOPSOIL BORROW		1,510	CU YD	$40.00	$60,400.00	1510	$60,400.00						
77	2575.504	ROLLED EROSION PREVENTION CATEGORY 20		13,590	SQ YD	$1.50	$20,385.00	13590	$20,385.00						
78	2575.505	SEEDING		2.8	ACRE	$500.00	$1,400.00	2.8	$1,400.00						
79	2575.508	SEED MIXTURE 25-121		130	POUND	$5.00	$650.00	130	$650.00						
80	2575.508	SEED MIXTURE 25-131		470	POUND	$5.00	$2,350.00	470	$2,350.00						
81	2575.508	SEED MIXTURE 33-261		150	POUND	$10.00	$1,500.00	150	$1,500.00						

ENGINEER'S ESTIMATE - REGIONAL POND OPTION 1

HY-10 RAMSEY IMPROVEMENTS
CITY PROJECT NO. 18-02
CITY OF RAMSEY, MN
BMI PROJECT NO. 0R1.126299

BOLTON & MENK
Real People. Real Solutions.

Date: 2/15/2023

ENGINEER'S ESTIMATE								ROADWAY		STORM SEWER		SANITARY SEWER		WATERMAIN	
ITEM NO.	MnDOT SPEC NO.	ITEM	NOTES	TOTAL ESTIMATED QUANTITY	UNIT	UNIT PRICE	TOTAL AMOUNT	QUANTITY	AMOUNT	QUANTITY	AMOUNT	QUANTITY	AMOUNT	QUANTITY	AMOUNT
82	2575.508	HYDRAULIC BONDED FIBER MATRIX		9,800	POUND	$1.50	$14,700.00	9800	$14,700.00						
83	2582.503	4" SOLID LINE MULTI COMP		140	LIN FT	$1.00	$140.00	140	$140.00						
84	2582.503	24" SOLID LINE MULTI COMP		90	LIN FT	$17.00	$1,530.00	90	$1,530.00						
85	2582.503	4" DOUBLE SOLID LINE MULTI COMP		835	LIN FT	$2.00	$1,670.00	835	$1,670.00						
86	2582.518	PAVEMENT MESSAGE MULTI COMP		15.45	SQ FT	$20.00	$309.00	15.45	$309.00						
						ESTIMATED CONTRUCTION TOTAL:	**$1,692,794.00**		**$764,449.00**		**$431,450.00**		**$148,540.00**		**$348,355.00**
						10% CONSTRUCTION CONTINGENCY:	**$169,279.40**		**$76,444.90**		**$43,145.00**		**$14,854.00**		**$34,835.50**
						TOTAL ESTIMATED CONSTRUCTION COST:	**$1,862,073.40**		**$840,893.90**		**$474,595.00**		**$163,394.00**		**$383,190.50**

NOTES:

(1) INCLUDES TOPSOIL STRIPPING AND STOCKPILING

(2) STOCKPILE LOCATION: PUBLIC WORKS, 14199 JASPER STREET NW. CONTRACTOR SHALL USE ALL AVAILABLE STOCKPILE MATERIAL BEFORE IMPORTING AGGREGATE

(3) CHIMNEY SEAL

PROPERTY ACQUISITION - REGIONAL POND OPTION 1

HY-10 RAMSEY IMPROVEMENTS
CITY PROJECT NO. 18-02
CITY OF RAMSEY, MN

BOLTON & MENK
Real People. Real Solutions.

PARCEL	PARCEL ID	PROPERTY ADDRESS/OWNER	NEW R/W	NEW D&U	CONVERTED FROM D&U TO R/W	CONVERTED FROM R/W TO D&U	R/W VACATED	UNIT	UNIT PRICE	TOTAL AMOUNT
1	29-32-25-14-0012	8100 146TH AVE NW - PETER CHALICH	80,719.2					SQ FT	$4.98	$401,610.00
2	29-32-25-14-0015	14622 FERRET ST NW - ANOKA RAMSEY ATHLETIC ASSOCIATION	1,651.9	1315.3	1291.3			SQ FT	$3.08	$13,116.18
3	29-32-25-11-0010	BLOCK 1, LOT 2 - PSD, LLC		1580.0	5618.8		2758.8	SQ FT	$3.08	$13,675.20
4	29-32-25-11-0011	BLOCK 1, LOT 3 - PSD, LLC		1470.9	5604.7		2759.1	SQ FT	$3.08	$13,294.82
5	29-32-25-11-0013	14816 ARMSTRONG BLVD NW - PSD, LLC	16,501.4	5000.4	660.0			SQ FT	$3.08	$68,258.34
6	29-32-25-14-0008	8050 147TH AVE NW - LEUKAM TRUSTEE JOHN	201.0					SQ FT	$3.08	$619.08

ESTIMATED PROPERTY ACQUISITION TOTAL:	**$510,573.62**
TOTAL ESTIMATE CONSTRUCTION COST:	**$1,862,073.40**
TOTAL ESTIMATED PROPERTY & CONSTRUCTION COST:	**$2,372,647.02**

ENGINEER'S ESTIMATE - ROADWAY POND OPTION 2

HY-10 RAMSEY IMPROVEMENTS
CITY PROJECT NO. 18-02
CITY OF RAMSEY, MN
BMI PROJECT NO. 0R1.126299

BOLTON & MENK
Real People. Real Solutions.

Date: 2/1/2023

ENGINEER'S ESTIMATE								ROADWAY		STORM SEWER		SANITARY SEWER		WATERMAIN	
ITEM NO.	MnDOT SPEC NO.	ITEM	NOTES	TOTAL ESTIMATED QUANTITY	UNIT	UNIT PRICE	TOTAL AMOUNT	QUANTITY	AMOUNT	QUANTITY	AMOUNT	QUANTITY	AMOUNT	QUANTITY	AMOUNT
1	2021.501	MOBILIZATION		1	LUMP SUM	$80,000.00	$80,000.00	0.50	$40,000.00	0.16	$12,800.00	0.09	$7,200.00	0.25	$20,000.00
2	2101.502	CLEARING		13	EACH	$500.00	$6,500.00	13	$6,500.00						
3	2101.502	GRUBBING		13	EACH	$200.00	$2,600.00	13	$2,600.00						
4	2101.505	CLEARING		0.25	ACRE	$8,000.00	$2,000.00	0.25	$2,000.00						
5	2101.505	GRUBBING		0.25	ACRE	$6,000.00	$1,500.00	0.25	$1,500.00						
6	2102.503	PAVEMENT MARKING REMOVAL		1,090	LIN FT	$1.50	$1,635.00	1090	$1,635.00						
7	2104.502	REMOVE MAIL BOX & SUPPORT		1	EACH	$100.00	$100.00	1	$100.00						
8	2104.502	REMOVE CASTING ASSEMBLY		1	EACH	$400.00	$400.00			1	$400.00				
9	2104.502	SALVAGE CATCH BASIN		1	EACH	$1,000.00	$1,000.00			1	$1,000.00				
10	2104.502	SALVAGE SIGN		3	EACH	$50.00	$150.00	3	$150.00						
11	2104.502	REMOVE SIGN		1	EACH	$50.00	$50.00	1	$50.00						
12	2104.502	REMOVE GATE VALVE & BOX		1	EACH	$800.00	$800.00							1	$800.00
13	2104.503	REMOVE PIPE SEWERS		12	LIN FT	$20.00	$240.00			12	$240.00				
14	2104.503	REMOVE FENCE		600	LIN FT	$5.00	$3,000.00	600	$3,000.00						
15	2104.503	SAWING BIT PAVEMENT (FULL DEPTH)		1,100	LIN FT	$2.50	$2,750.00	1100	$2,750.00						
16	2104.503	SAWING CONCRETE PAVEMENT (FULL DEPTH)		390	LIN FT	$5.00	$1,950.00	390	$1,950.00						
17	2104.503	REMOVE CURB AND GUTTER		900	LIN FT	$4.00	$3,600.00	900	$3,600.00						
18	2104.504	REMOVE BITUMINOUS PAVEMENT		830	SQ YD	$4.00	$3,320.00	830	$3,320.00						
19	2104.504	REMOVE CONCRETE PAVEMENT		680	SQ YD	$10.00	$6,800.00	680	$6,800.00						
20	2106.507	EXCAVATION - COMMON (EV)	(P) (1)	4,040	CU YD	$18.00	$72,720.00	4040	$72,720.00						
21	2106.507	EXCAVATION - CHANNEL AND POND	(P) (1)	5,300	CU YD	$14.00	$74,200.00			5300	$74,200.00				
22	2106.507	EXCAVATION - SUBGRADE (EV)		200	CU YD	$15.00	$3,000.00	200	$3,000.00						
23	2106.507	STABILIZING AGGREGATE (CV)		200	CU YD	$20.00	$4,000.00	200	$4,000.00						
24	2106.507	COMMON EMBANKMENT (CV)	(P)	500	CU YD	$5.00	$2,500.00	500	$2,500.00						
25	2106.607	HAUL AND STOCKPILE BITUMINOUS MATERIAL	(P)	2,050	CU YD	$12.00	$24,600.00	2050	$24,600.00						
26	2112.519	SUBGRADE PREPARATION		21	ROAD ST	$500.00	$10,500.00	21.0	$10,500.00						
27	2118.507	AGGREGATE SURFACING (CV) CLASS 2		20	CU YD	$85.00	$1,700.00	20	$1,700.00						
28	2123.610	STREET SWEEPER (WITH PICKUP BROOM)		20	HOUR	$200.00	$4,000.00	20	$4,000.00						
29	2211.507	AGGREGATE BASE (CV) CLASS 5 MODIFIED		700	CU YD	$42.00	$29,400.00	700	$29,400.00						
30	2211.607	AGGREGATE BASE (CV) FROM STOCKPILE		2,050	CU YD	$16.00	$32,800.00	2050	$32,800.00						
31	2215.504	FULL DEPTH RECLAMATION (10")		7,350	SQ YD	$2.50	$18,375.00	7350	$18,375.00						
32	2231.604	BITUMINOUS PATCH SPECIAL (DRIVEWAY)		20	SQ YD	$80.00	$1,600.00	20	$1,600.00						
33	2360.509	TYPE SP 9.5 WEARING COURSE MIX (3,C)		1,220	TON	$100.00	$122,000.00	1220	$122,000.00						
34	2360.509	TYPE SP 12.5 NON WEARING COURSE MIX (3,C)		1,500	TON	$95.00	$142,500.00	1500	$142,500.00						
35	2501.502	18" RC PIPE APRON		2	EACH	$1,500.00	$3,000.00			2	$3,000.00				
36	2501.602	TRASH GUARD FOR 18" PIPE APRON		2	EACH	$700.00	$1,400.00			2	$1,400.00				
37	2503.503	12" RC PIPE SEWER DESIGN 3006 CLASS V		300	EACH	$55.00	$16,500.00			300	$16,500.00				
38	2503.503	15" RC PIPE SEWER DESIGN 3006 CLASS V		380	LIN FT	$62.00	$23,560.00			380	$23,560.00				
39	2503.503	18" RC PIPE SEWER DESIGN 3006 CLASS V		725	LIN FT	$70.00	$50,750.00			725	$50,750.00				
40	2503.503	8" PVC PIPE SEWER		1,798	LIN FT	$55.00	$98,890.00					1798	$98,890.00		

ENGINEER'S ESTIMATE - ROADWAY POND OPTION 2

HY-10 RAMSEY IMPROVEMENTS
CITY PROJECT NO. 18-02
CITY OF RAMSEY, MN
BMI PROJECT NO. 0R1.126299

BOLTON & MENK
Real People. Real Solutions.

Date: 2/1/2023

ENGINEER'S ESTIMATE								ROADWAY		STORM SEWER		SANITARY SEWER		WATERMAIN	
ITEM NO.	MnDOT SPEC NO.	ITEM	NOTES	TOTAL ESTIMATED QUANTITY	UNIT	UNIT PRICE	TOTAL AMOUNT	QUANTITY	AMOUNT	QUANTITY	AMOUNT	QUANTITY	AMOUNT	QUANTITY	AMOUNT
41	2503.602	8" PIPE PLUG		10	EACH	$200.00	$2,000.00					10	$2,000.00		
42	2503.602	CONNECT TO EXISTING SANITARY SEWER		2	EACH	$1,000.00	$2,000.00					2	$2,000.00		
43	2504.602	ADJUST GATE VALVE BOX		1	EACH	$500.00	$500.00	1	$500.00						
44	2504.602	CONNECT TO EXISTING WATER MAIN		2	EACH	$2,000.00	$4,000.00							2	$4,000.00
45	2504.602	6" GATE VALVE & BOX		7	EACH	$2,300.00	$16,100.00							7	$16,100.00
46	2504.602	8" GATE VALVE & BOX		10	EACH	$3,000.00	$30,000.00							10	$30,000.00
47	2504.602	12" GATE VALVE & BOX		5	EACH	$5,000.00	$25,000.00							5	$25,000.00
48	2504.602	HYDRANT		7	EACH	$6,000.00	$42,000.00							7	$42,000.00
49	2504.603	6" WATERMAIN DUCTILE IRON CL 53		90	LIN FT	$70.00	$6,300.00							90	$6,300.00
50	2504.603	8" WATERMAIN DUCTILE IRON CL 52		323	LIN FT	$75.00	$24,225.00							323	$24,225.00
51	2504.603	12" WATERMAIN DUCTILE IRON CL 52		2,025	LIN FT	$90.00	$182,250.00							2,025	$182,250.00
52	2504.608	WATERMAIN FITTINGS		2,680	POUND	$12.00	$32,160.00							2,680	$32,160.00
53	2506.502	CASTING ASSEMBLY (MANHOLE)		7	EACH	$750.00	$5,250.00					7	$5,250.00		
54	2506.502	CASTING ASSEMBLY (CATCH BASIN)		14	EACH	$750.00	$10,500.00			14	$10,500.00				
55	2506.602	INSTALL CATCH BASIN (SALVAGED)		1	EACH	$4,000.00	$4,000.00			1	$4,000.00				
56	2506.503	CONSTRUCT SANITARY SEWER MANHOLE		59.42	LIN FT	$450.00	$26,739.00					59.42	$26,739.00		
57	2506.503	CONSTRUCT DRAINAGE STRUCTURE DESIGN SPEC 1 (2'X3')		36.00	LIN FT	$500.00	$18,000.00			36.00	$18,000.00				
58	2506.503	CONSTRUCT DRAINAGE STRUCTURE DES 48-4020		46.00	LIN FT	$600.00	$27,600.00			46.00	$27,600.00				
59	2506.602	ADJUST FRAME & RING CASTING		2	EACH	$800.00	$1,600.00	2	$1,600.00						
60	2506.602	SEAL MANHOLE	(3)	7	EACH	$500.00	$3,500.00					7	$3,500.00		
61	2521.514	4" CONCRETE WALK		4,300	SQ FT	$8.00	$34,400.00	4300	$34,400.00						
62	2531.503	CONCRETE CURB AND GUTTER DESIGN B612		55	LIN FT	$14.00	$770.00	55	$770.00						
63	2531.503	CONCRETE CURB AND GUTTER DESIGN B618		4,350	LIN FT	$16.00	$69,600.00	4350	$69,600.00						
64	2531.504	CONCRETE MEDIAN		150	SQ YD	$70.00	$10,500.00	150	$10,500.00						
65	2531.504	8" CONCRETE DRIVEWAY PAVEMENT		180	SQ YD	$80.00	$14,400.00	180	$14,400.00						
66	2531.602	CONCRETE MEDIAN NOSE-SPECIAL		1	EACH	$800.00	$800.00	1	$800.00						
67	2531.602	CONSTRUCT 6" CONCRETE PEDESTRIAN RAMP		5	EACH	$2,500.00	$12,500.00	5	$12,500.00						
68	2540.602	MAIL BOX & SUPPORT		1	EACH	$500.00	$500.00	1	$500.00						
69	2563.601	TRAFFIC CONTROL		1	LUMP SUM	$20,000.00	$20,000.00	0.50	$10,000.00	0.16	$3,200.00	0.09	$1,800.00	0.25	$5,000.00
70	2573.501	STABILIZED CONSTRUCTION EXIT		1	LUMP SUM	$2,500.00	$2,500.00	1	$2,500.00						
71	2573.502	STORM DRAIN INLET PROTECTION		18	EACH	$200.00	$3,600.00	18	$3,600.00						
72	2573.502	CULVERT END CONTROLS		6	EACH	$300.00	$1,800.00	6	$1,800.00						
73	2573.503	SILT FENCE, TYPE MS		1,300	LIN FT	$2.00	$2,600.00	1300	$2,600.00						
74	2573.503	SEDIMENT CONTROL LOG TYPE WOOD FIBER		1,000	LIN FT	$2.50	$2,500.00	1000	$2,500.00						
75	2574.505	FERTILIZER TYPE 3		730	POUND	$1.50	$1,095.00	730	$1,095.00						
76	2574.507	COMMON TOPSOIL BORROW		1,380	CU YD	$40.00	$55,200.00	1380	$55,200.00						
77	2575.504	ROLLED EROSION PREVENTION CATEGORY 20		2,670	SQ YD	$1.50	$4,005.00	2670	$4,005.00						
78	2575.505	SEEDING		2.0	ACRE	$500.00	$1,000.00	2.0	$1,000.00						
79	2575.508	SEED MIXTURE 25-121		100	POUND	$5.00	$500.00	100	$500.00						
80	2575.508	SEED MIXTURE 25-131		330	POUND	$5.00	$1,650.00	330	$1,650.00						
81	2575.508	SEED MIXTURE 33-261		30	POUND	$10.00	$300.00	30	$300.00						

ENGINEER'S ESTIMATE - ROADWAY POND OPTION 2

HY-10 RAMSEY IMPROVEMENTS
CITY PROJECT NO. 18-02
CITY OF RAMSEY, MN
BMI PROJECT NO. 0R1.126299

BOLTON & MENK
Real People. Real Solutions.

Date: 2/1/2023

ENGINEER'S ESTIMATE								ROADWAY		STORM SEWER		SANITARY SEWER		WATERMAIN	
ITEM NO.	MnDOT SPEC NO.	ITEM	NOTES	TOTAL ESTIMATED QUANTITY	UNIT	UNIT PRICE	TOTAL AMOUNT	QUANTITY	AMOUNT	QUANTITY	AMOUNT	QUANTITY	AMOUNT	QUANTITY	AMOUNT
82	2575.508	HYDRAULIC BONDED FIBER MATRIX		7,000	POUND	$1.50	$10,500.00	7000	$10,500.00						
83	2582.503	4" SOLID LINE MULTI COMP		140	LIN FT	$1.00	$140.00	140	$140.00						
84	2582.503	24" SOLID LINE MULTI COMP		90	LIN FT	$17.00	$1,530.00	90	$1,530.00						
85	2582.503	4" DOUBLE SOLID LINE MULTI COMP		835	LIN FT	$2.00	$1,670.00	835	$1,670.00						
86	2582.518	PAVEMENT MESSAGE MULTI COMP		15.45	SQ FT	$20.00	$309.00	15.45	$309.00						
						ESTIMATED CONTRUCTION TOTAL:	**$1,574,483.00**		**$792,119.00**		**$247,150.00**		**$147,379.00**		**$387,835.00**
						10% CONSTRUCTION CONTINGENCY:	**$157,448.30**		**$79,211.90**		**$24,715.00**		**$14,737.90**		**$38,783.50**
						TOTAL ESTIMATED CONSTRUCTION COST:	**$1,731,931.30**		**$871,330.90**		**$271,865.00**		**$162,116.90**		**$426,618.50**

NOTES:

(1) INCLUDES TOPSOIL STRIPPING AND STOCKPILING

(2) STOCKPILE LOCATION: PUBLIC WORKS, 14199 JASPER STREET NW. CONTRACTOR SHALL USE ALL AVAILABLE STOCKPILE MATERIAL BEFORE IMPORTING AGGREGATE

(3) CHIMNEY SEAL

PRELIMINARY PROPERTY ACQUISITION - ROADWAY POND OPTION 2

HY-10 RAMSEY IMPROVEMENTS
CITY PROJECT NO. 18-02
CITY OF RAMSEY, MN

BOLTON & MENK
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PARCEL	PARCEL ID	PROPERTY ADDRESS/OWNER	NEW R/W	NEW D&U	CONVERTED FROM D&U TO R/W	R/W VACATED	UNIT	UNIT PRICE	TOTAL AMOUNT
1	29-32-25-11-0010	BLOCK 1, LOT 2 - PSD, LLC		1580.0	5618.8	2758.8	SQ FT	$3.08	$13,675.20
2	29-32-25-11-0011	BLOCK 1, LOT 3 - NATIONAL GROWTH, LLC		1470.9	5604.7	2759.1	SQ FT	$3.08	$13,294.82
3	29-32-25-11-0013	14816 ARMSTRONG BLVD NW - PSD, LLC	16501.4	5000.4	660.0		SQ FT	$3.08	$68,258.34
4	29-32-25-14-0008	8050 147TH AVE NW - LEUKAM TRUSTEE JOHN	201.0				SQ FT	$3.08	$619.08

ESTIMATED PROPERTY ACQUISITION TOTAL: **$95,847.44**

TOTAL ESTIMATE CONSTRUCTION COST: **$1,731,931.30**

TOTAL ESTIMATED PROPERTY & CONSTRUCTION COST: **$1,827,778.74**

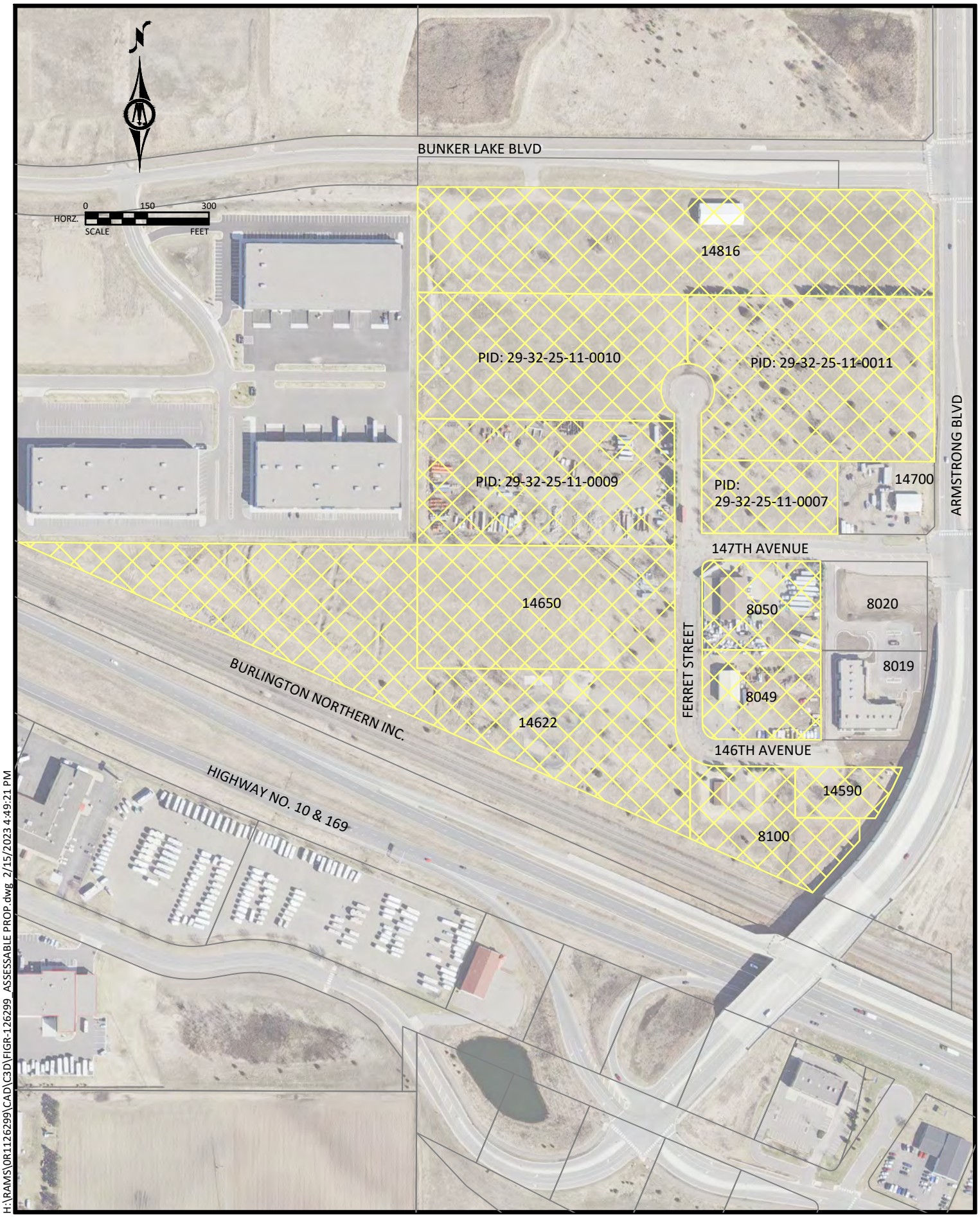
HY-10 Ramsey Improvements

City of Ramsey

Assessable Properties

February 2023

BOLTON & MENK



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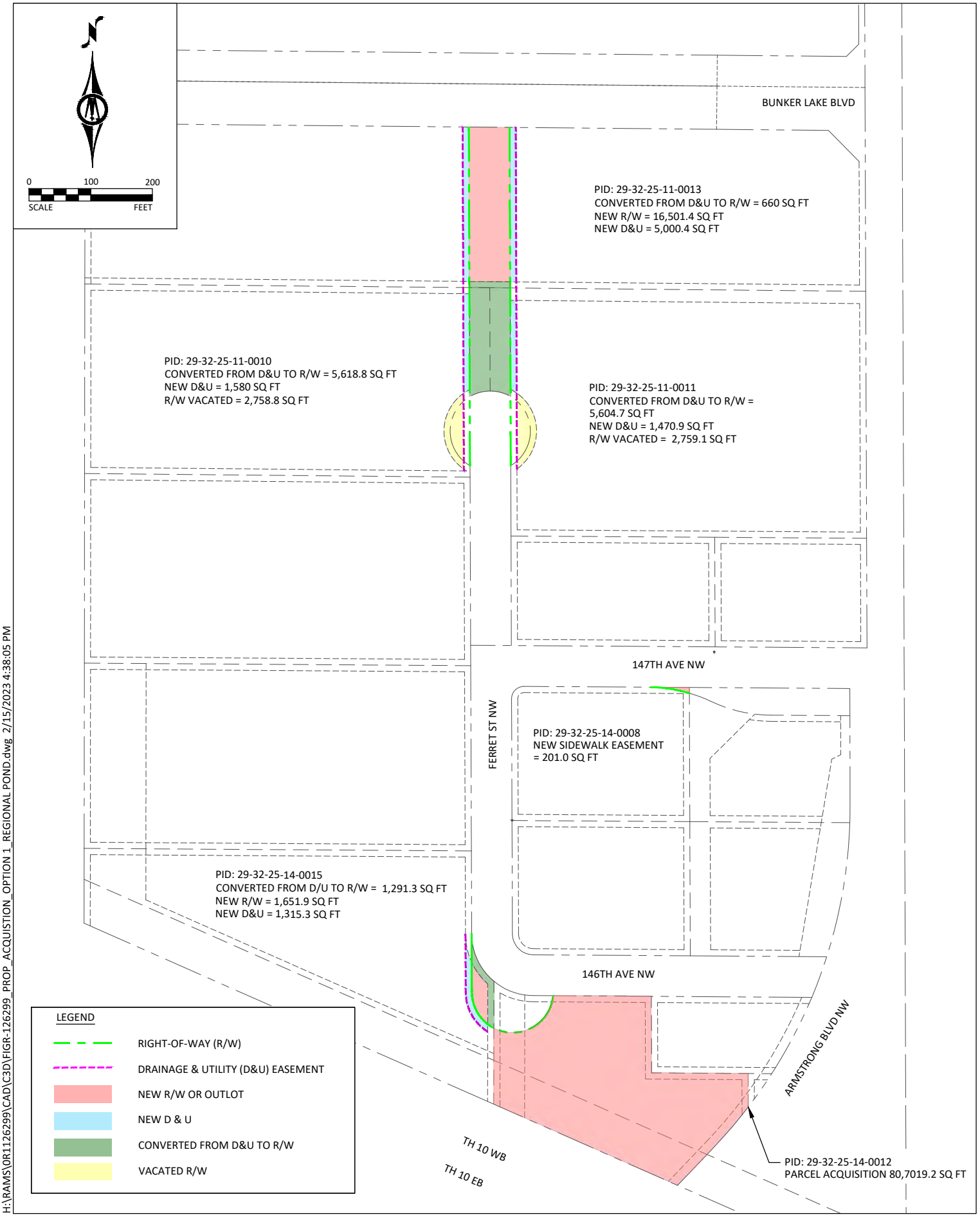
HY-10 Ramsey Improvements

City of Ramsey

Property Acquisition - Option 1

February 2023

BOLTON & MENK



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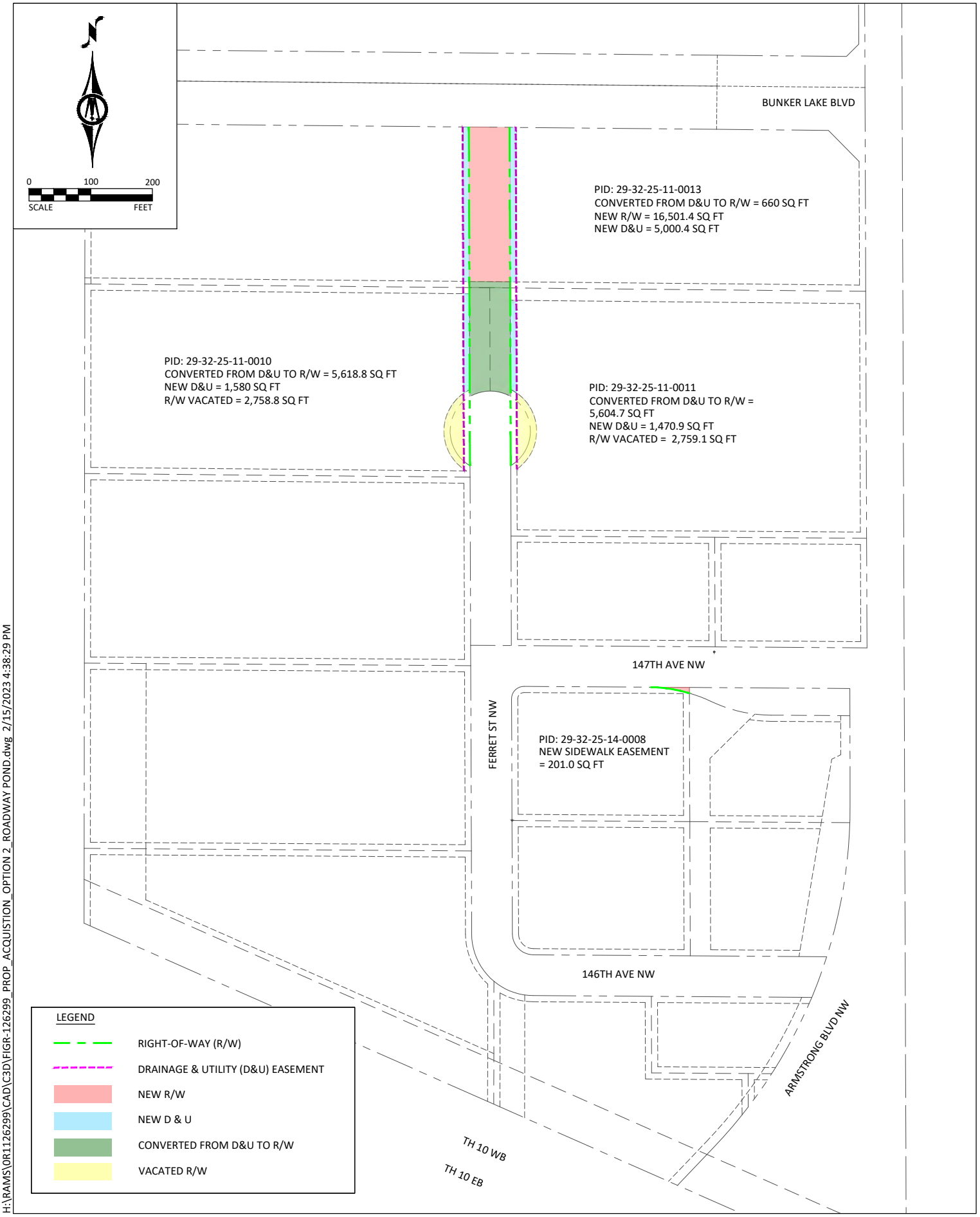
HY-10 Ramsey Improvements

City of Ramsey

Property Acquisition - Option 2

February 2023

BOLTON & MENK

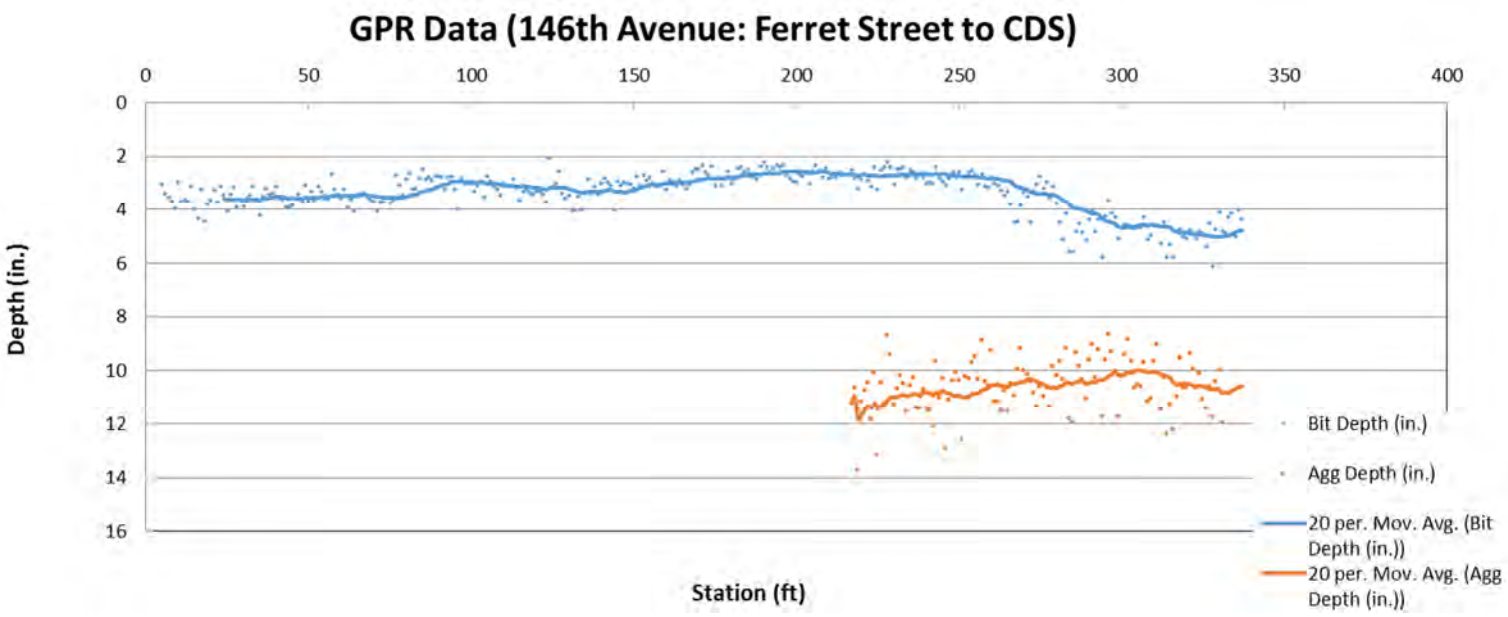


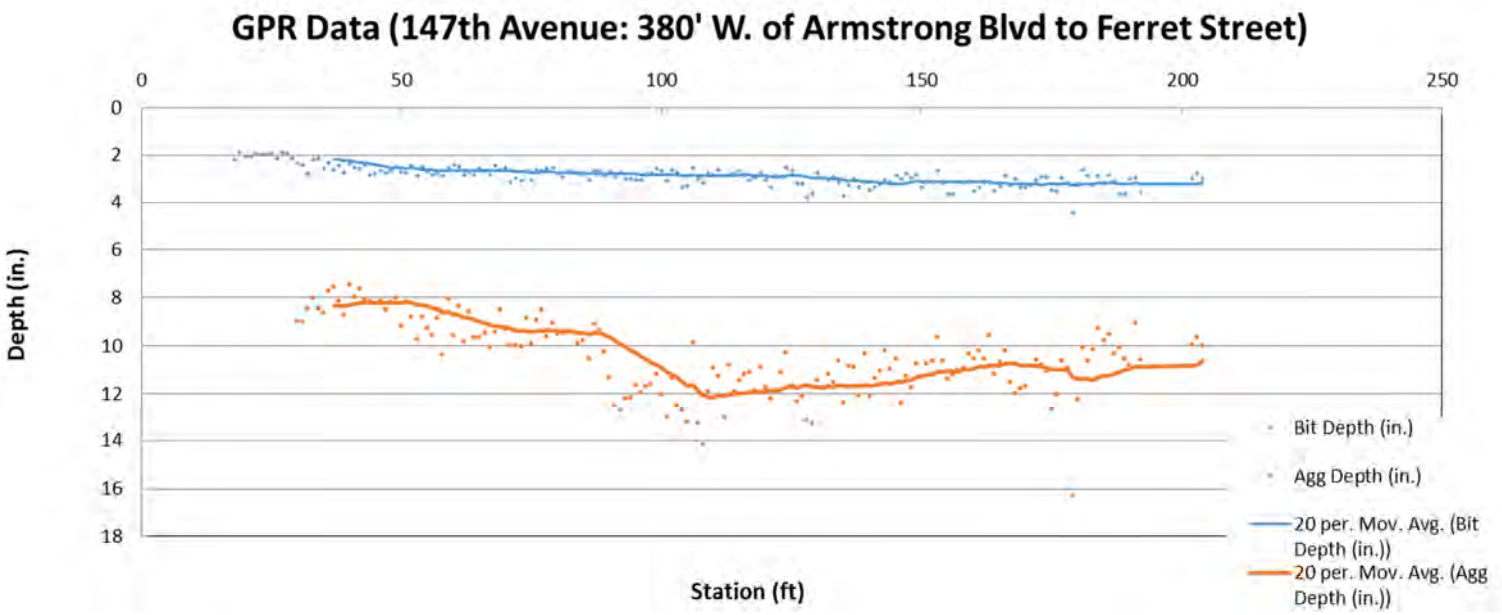
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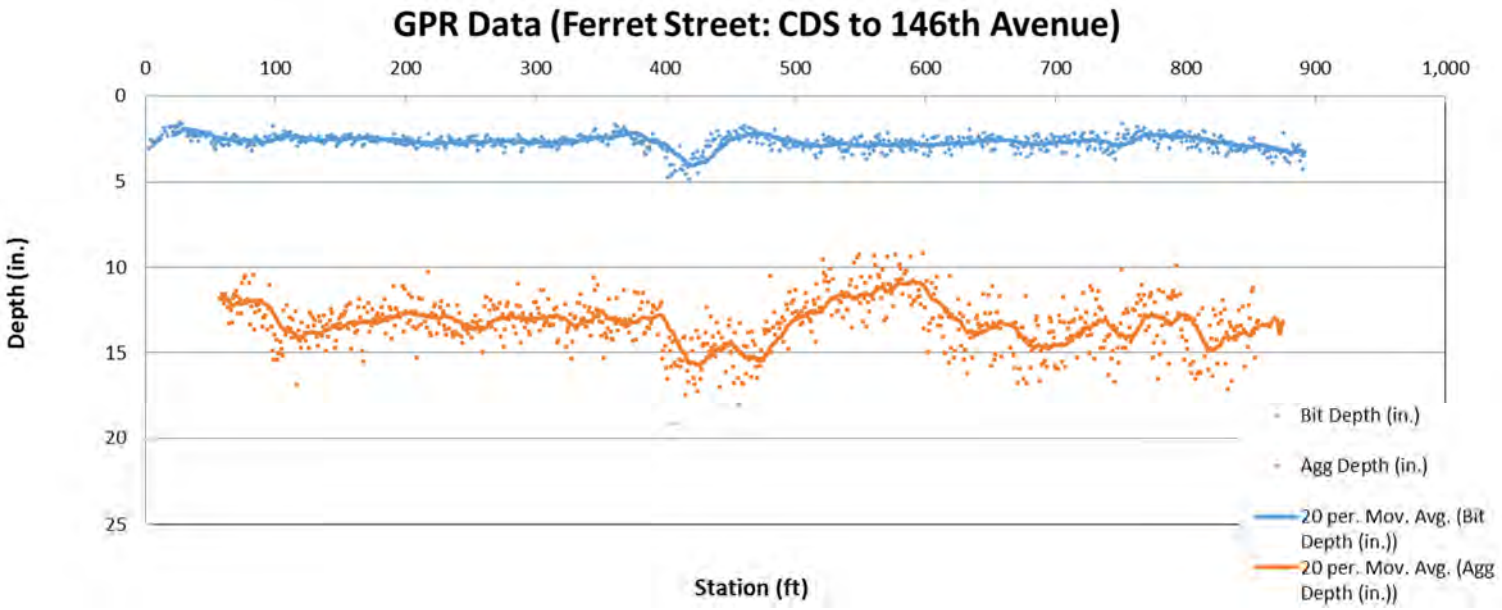
APPENDIX C

Ground Penetrating Radar (GPR) Results

HY-10 Ramsey GPR Summary										
Project Segment		**Pavement**			**Aggregate**			**Section**		
Street	**Segment Description**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Avg**	**Location**
146th Avenue	Ferret Street / CDS	2.0	6.1	3.4	4.3	10.5	6.8	8.6	10.6	296' east of Ferret Street.
147th Avenue	380' west of Armstrong Blvd. / Ferret Street	1.9	4.5	2.9	5.0	11.9	7.6	7.5	10.5	160' east of Ferret Street.
Ferret Street	CDS / 146th Avenue	1.6	4.9	2.7	6.6	15.5	10.6	9.3	13.3	250' north of 146th Avenue
Project Summary		*1.6*	*6.1*	*2.9*	*4.3*	*15.5*	*9.7*	*7.5*	*12.6*	*147th Avenue 160' east of Ferret Street.*




GPR Data (147th Avenue: 380' W. of Armstrong Blvd to Ferret Street)
Depth (in.)
Station (ft)
Bit Depth (in.)
Agg Depth (in.)
20 per. Mov. Avg. (Bit Depth (in.))
20 per. Mov. Avg. (Agg Depth (in.))


GPR Data (Ferret Street: CDS to 146th Avenue)
Depth (in.)
Station (ft)
Bit Depth (in.)
Agg Depth (in.)
20 per. Mov. Avg. (Bit Depth (in.))
20 per. Mov. Avg. (Agg Depth (in.))

APPENDIX D

Revised HY-10 Area Traffic Analysis Memorandum
Report of Geotechnical Evaluation

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: November 17, 2022

To: City of Ramsey

From: Bryan Nemeth, P.E., PTOE

RE: HY-10 Traffic Analysis – Anoka Ramsey Athletic Association (ARAA)
City of Ramsey, MN
City Project No.: 18-02

Development Considerations

The HY-10 Area reviewed is bordered on the north by Bunker Lake Boulevard, on the south by TH 10, on the east by Armstrong Boulevard, and on the west by the ARAA site. The proposed ARAA recreation facility represents a new type of land use within this area.

A sports recreation facility has traffic peaking characteristics represented by the highest use starting in the PM peak hour and on weekends, with a high inbound and outbound volume (55% in, 45% out). This is a change from the employment district or light industrial land use which generates a higher outbound in the PM (31% in, 69% out).

The proposed ARAA facility has an area of 175,500 square feet with a support building and future expansion of 13,000 square feet. According to the ITE Trip Generation Manual (Multipurpose Recreation Facility) the site would result in approximately 675 trips during the PM peak hour.

Based on the comparison of forecasts between what was previously calculated for the HY-10 area and the currently proposed land use, there is anticipated to be no difference in trips during the AM peak, but a significant difference in the PM peak.

Bunker Lake Boulevard Improvement Considerations

Roadway Section West of the Existing Median

For Bunker Lake Boulevard, the 3-lane section west of the median (just west of Armstrong Boulevard) is still adequate, as the change in land use affects it minimally in the PM (approx. 25 trips), and even less in the AM.

Right Turn Lanes

Bunker Lake Boulevard eastbound traffic entering any of the sites south of Bunker Lake Boulevard is low; although, with the change in land use, there is a higher potential for use of an eastbound right turn lane at Ferret Street. The need for a right turn lane was reviewed based on 734 through vehicles on eastbound Bunker Lake Boulevard plus 20 vehicles turning right. The right turn lane was determined not to be needed.

For westbound traffic, the amount of traffic coming from the east and entering any of the sites on the north was reviewed:

- For the first access west of Armstrong Boulevard, we estimated 400 employees, or 180 trips entering in the AM. The right turn lane was determined to not be needed as westbound traffic is relatively low (605 vehicles or less in the AM).
- Since the first access did not need a right turn lane, accesses further west wouldn't need right turn lanes either.

Left Turn Lane

For Ferret Street, just west of the existing median, the left turn volumes are estimated to be low in the AM peak but much higher in the PM peak. The industrial traffic will come from both Hwy 10 and from the north and east. Approximately 50% of the traffic entering the area will gain access at 147th Avenue.

The traffic to and from the ARAA recreational facility is projected to come from the residential areas of the City. This indicates that the amount of traffic from Bunker Lake Boulevard is likely to be higher, 55% at the Ferret Street and Bunker Lake Boulevard access:

- 25% from Armstrong Boulevard north of Bunker Lake Boulevard,
- 5% from the west on Bunker Lake Boulevard, and
- 25% from Bunker Lake Boulevard east of Armstrong Boulevard.

The remaining 45% of the traffic is projected to use 147th Avenue:

- 5% from Hwy 10,
- 5% from 147th east of Armstrong Boulevard,
- 20% from Armstrong Boulevard north of Bunker Lake Boulevard, and
- 15% from Bunker Lake Boulevard east of Armstrong Boulevard.

A left turn lane was found to be warranted in the AM based on the following:

- Roadway Speed = 40 mph,
- Advancing Volume = 823,
- Opposing Volume = 493, and
- Left turn volume estimated to be 38.

A left turn lane was found to be warranted in the PM based on the following:

- Roadway Speed = 40 mph,
- Advancing Volume 826,
- Opposing Volume 754, and
- Left turn volume estimated to be 205.

Based on the above information, a westbound left is appropriate for the westbound Bunker Lake Boulevard traffic at Ferret Street. With the low speeds and an urban setting, but significantly higher left turn volume in the PM peak hour due to the recreational facility, a minimum length 210-foot, full-width left turn lane would be appropriate. Tapers can be at either 10:1 or 15:1. There could be need for the left turn lane to be longer based on other development changes that could occur along Ferret Street.

Ferret Street and Bunker Lake Boulevard Intersection

Separate left and right turn lanes along northbound Ferret Street at Bunker Lake Boulevard are recommended.

Recommended Studies

With the change in traffic volumes noted above, we recommend more comprehensive traffic analyses being completed at the following locations:

- Bunker Lake Boulevard /Armstrong Boulevard,
- Bunker Lake Boulevard /Ferret Street, and
- Armstrong Boulevard /147th Street.

The storage length needs at the signalized intersections in the area should be also evaluated as a part of a future traffic analysis.

Other Considerations

The land use in this area, south of Bunker Lake Boulevard and adjacent to Ferret Street, is zoned "COR" which allows a lot of flexibility. In our previous analysis, this area was considered light industrial, similar land use east of Puma Street and south of Bunker Lake Boulevard. If the HY-10 Area evolves to more commercial orientated uses with the addition of the ARAA Facility and other facilities such as the Big Adventure Academy/Daycare and Anytime Fitness, additional analysis is warranted to understand the impacts of a more intensive land use.

REPORT OF GEOTECHNICAL EXPLORATION

West Armstrong Redevelopment Area
147th Avenue NW & Ferret Street NW
Ramsey, Minnesota

AET Project No. P-0004952

Date: March 30, 2022

Prepared for:

Bolton & Menk, Inc.

Geotechnical • Materials
Forensic • Environmental
Building Technology
Petrography/Chemistry

American Engineering Testing
5548 Barthel Industrial Drive NE, Suite 550
Albertville, MN 55301
TeamAET.com • 800.792.6364

March 30, 2022

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

Attn: Kevin Kielb, PE

RE: Geotechnical Exploration
West Armstrong Redevelopment Area
147th Avenue NW & Ferret Street NW, Ramsey, Minnesota
AET Report No. P-0004952

Dear Mr. Kielb:

American Engineering Testing, Inc. (AET) is pleased to present the results of our subsurface exploration program and geotechnical engineering review for your West Armstrong Redevelopment Area project in Ramsey, Minnesota. These services were performed according to our proposal to you dated July 28, 2021.

We are submitting one electronic (.pdf) copy of the report to you.

Please contact me if you have any questions about the report. I can also be contacted for arranging construction observation and testing services.

Sincerely,
American Engineering Testing, Inc.

Robert J. Olson, PE (MN)
Branch Manager
rolson@teamAET.com
Office: (651) 659-1316
Mobile: (763) 742-8651

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SIGNATURE PAGE

Prepared for:

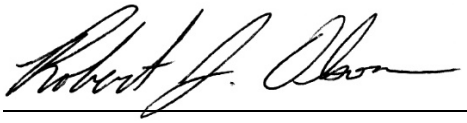
Bolton & Menk, Inc.
7533 Sunwood Drive NW
Ramsey, Minnesota 55303

Attn: Kevin Kielb, PE

Prepared by:

American Engineering Testing, Inc.
5548 Barthel Industrial Drive NE, Suite 500
Albertville, Minnesota 55301
(651) 659-9001/www.TeamAET.com

Authored by:



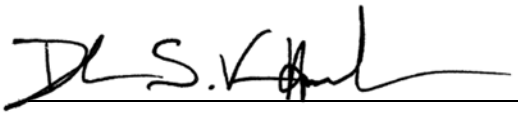
Robert J. Olson, PE (MN)
Branch Manager

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 Minnesota Statute Section 326.02 to 326.15

Name: Robert J. Olson

Date: March 30, 2022 **License #: 45023**

Reviewed by:



Derek S. Van Heuveln, PE (MN)
Senior Engineer

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2.0 SCOPE OF SERVICES 1
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4.1 Field Exploration Program 2
4.2 Laboratory Testing 2
5.0 SITE CONDITIONS 2
5.1 Surface Observations 2
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7.2 Excavation Backsloping 6
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9.0 LIMITATIONS 7

STANDARD SHEETS
Definitions Relating to Pavement Construction
Utility Excavation Backfilling
Bedding/Foundation Support of Buried Pipe

APPENDIX A – Geotechnical Field Exploration and Testing
Boring Log Notes
Unified Soil Classification System
Figure 1 - Boring Locations
Subsurface Boring Logs

APPENDIX B – Geotechnical Report Limitations and Guidelines for Use

1.0 INTRODUCTION

The city of Ramsey (City) is proposing to perform street and utility improvements in the West Armstrong Redevelopment Area in Ramsey, Minnesota. To assist planning and design, you have authorized American Engineering Testing, Inc. (AET) to conduct a subsurface exploration program at the site, conduct soil laboratory testing, and perform a geotechnical engineering review for the project. This report presents the results of the above services, and provides our engineering recommendations based on this data.

2.0 SCOPE OF SERVICES

AET's services were performed according to our proposal to you dated July 28, 2021, which you authorized on December 20, 2021. The authorized scope consists of the following.

- Drilling 3 standard penetration test borings to a depth of 14½ feet each.
- Performing soil laboratory testing.
- Performing a geotechnical engineering review based on the data and preparing this report.

These services are intended for geotechnical purposes only. The scope is not intended to explore for the presence or extent of environmental contamination in the soil or groundwater.

3.0 PROJECT INFORMATION

We understand the City is planning to reconstruct 147th Avenue NW, 146th Avenue NW, and Farret Street NW and extend Farret Street NW to the north. These improvements are located west of Armstrong Boulevard NW and south of Bunker Lake Boulevard. We understand that the project will involve reconstructing or constructing a bituminous roadway with public utilities (sewer and watermain).

The above stated information represents our understanding of the proposed construction. This information is an integral part of our engineering review. It is important that you contact us if there are changes from that described so that we can evaluate whether modifications to our recommendations are appropriate.

4.0 SUBSURFACE EXPLORATION AND TESTING

4.1 Field Exploration Program

The subsurface exploration program conducted for the project consisted of 3 standard penetration test borings. The number of borings, boring locations, and boring depths were determined by Bolton & Menk. The logs of the borings and details of the methods used appear in Appendix A. The logs contain information concerning soil layering, soil classification, geologic origins, and moisture condition. A density description or consistency is also noted for the natural soils, which is based on the standard penetration resistance (N-value).

The boring locations are shown on Figure 1 in Appendix A. The borings were located in the field by AET personnel by taping from nearby site features. Surface elevations were approximated based on the web application MnTOPO.

4.2 Laboratory Testing

The laboratory test program included water content testing and percent passing the #200 sieve tests. The test results appear in Appendix A on the individual boring logs adjacent to the samples upon which they were performed.

5.0 SITE CONDITIONS

5.1 Surface Observations

The bituminous roadway surface is in poor condition. The roadway has no curb or gravel shoulder; the shoulder area consists of grass with commercial/industrial businesses beyond the shoulder. The elevation of the roadway slopes downward from south to north with elevations from 874.8 to 869.3 feet at the boring locations. Driveways for the businesses connect to the roadway.

5.2 Subsurface Soils/Geology

The site geology consists of fill or topsoil overlying naturally deposited alluvial soils.

5.2.1 Bituminous Pavement/Fill

Bituminous pavement overlying fill or possible fill was encountered at the surface of Borings SB-2 and SB-3. The surface consisted of 2½ to 2¾ inches of bituminous pavement with approximately 8 inches of apparent gravel base. Beneath the aggregate base, silty sand and sand with silt layers encountered to depths of approximately 2 to 4 feet beneath existing grade. The sands with silt from 2 to 4 feet below grade were classified as “Coarse Alluvium or Fill” as

we were unable to determine the geologic origin from the recovered samples. We could not determine the geological origin based on the recovered samples. The fill and possible fill soils were frozen at the time of exploration. The fill is moderately slow draining and is judged to have moderate frost susceptibility.

5.2.2 Topsoil

Topsoil was encountered at the surface of Boring SB-1. The topsoil extended to a depth of about 1 foot beneath existing grade. The topsoil consists primarily of silty sand. These soils were mostly frozen to a depth of 1 foot. These soils are slow draining and highly susceptible to freeze-thaw movements. Due to the presence of vegetation, we judge these soils to be moderately compressible under structural loads.

5.2.3 Coarse Alluvium

Coarse alluvial sands exist beneath the topsoil, fill, or possible fill at all of the soil borings to the termination depths of the borings. The coarse alluvial soils consist of sands with silt and sands containing variable amounts of gravel, and could include cobbles and/or boulders. These alluvial soils range from very loose to medium dense and are judged to have moderate to moderately high strength and moderate to low compressibility under the anticipated structural loads. The sands and sands with silt are fast draining and are judged to have low susceptibility to freeze-thaw movements.

5.3 Groundwater

We encountered groundwater while drilling at Boring SB-1 at a depth of 10 feet which equated to an approximate elevation of 859.3 feet. As the borings terminated in free draining sands, we judge the measured water level to be reflective of the hydrostatic groundwater level conditions at that point in time.

Groundwater was not measured in Borings SB-2 and SB-3. Due to the borings terminating in free draining sands with silt and sands at depths/elevations near where the groundwater level was measured at Boring SB-1, we judge the water level to be below the depth explored at these boreholes at the time of exploration.

Groundwater levels fluctuate due to varying seasonal and annual rainfall and snow melt amounts, as well as other factors. The Minneapolis metro area has been in a low precipitation pattern for the last 2 years and the presently observed ground water levels may be lower than normal.

6.0 RECOMMENDATIONS

6.1 Definitions

The italicized words used in this section have specific definitions. These definitions are presented on the attached Standard Sheet entitled "Definitions Relating to Pavement Construction" or in ASTM Standards or MnDOT references.

6.2 Approach Discussion

We recommend that at a minimum the upper foot of fill be removed from beneath the proposed roadway extension and removal of the existing bituminous and aggregate base in the reconstruction portion of the project. Additional topsoil or fill may need to be removed based on the organic content of the soils or if soft or loose soils are encountered. We recommend these soils be evaluated by AET geotechnical personnel before new fill is placed. A subgrade R-value of 50 can be assumed for the anticipated subgrade.

6.3 Subgrade Preparation

To prepare the area for new roadway embankment placement, we recommend removing all existing pavement, aggregate base, and topsoil from below the roadway area. The excavation would need to include lateral oversizing to accommodate the lateral loads imposed.

The soils exposed in the subgrade excavations are likely to consist of silty sands, sands with silt, and sands. We recommend these soils be evaluated by AET geotechnical personnel before new fill is placed. If soft or unstable soils are observed, then correction should be performed as needed by subcutting and replacing the inferior soils; or by scarification, drying, and re-compaction.

Following excavation of inferior soils, new engineered fill can be placed as needed to re-attain subgrade elevation. *Suitable Grading Material* can be used as general embankment fill; except that where fill is placed over wet, unstable ground conditions or in standing water, cleaner granular soils should be used.

The fill should be placed per the requirements of MnDOT Specification 2106.3G.1 (Specified Density Method). This specification requires soils placed within the *critical subgrade zone* be compacted to a minimum of 100% of the *standard maximum dry unit weight* defined in ASTM: D698 (Standard Proctor test), at a water content 65% to 102% of the *standard optimum water content*. This water content requirement does not apply to the *sand subbase* zone. A reduced

minimum compaction level of 95% of the *standard maximum dry unit weight* can be used below the *critical subgrade zone*.

6.4 Design R-Value

Based on the subgrade preparation recommendations presented herein, the pavement section (bituminous and aggregate base layers) can be designed based on an R-value of 50.

6.5 Utilities

Based on the conditions encountered at the boring locations, we judge the inorganic soils to be suitable to provide adequate support for utility construction. If silty soils are present at the trench bottom, a 4-inch thick Granular Bedding (MnDOT Specification 3149.F) layer should be placed beneath the pipe to improve support uniformity. We also recommend the removal of any cobbles/boulders in the trench bottoms prior to utility installation. This will reduce the potential for the development of point loads on the pipe that would not be accounted for in the pipe design.

Please refer to the attached standard sheet entitled “Utility Excavation Backfilling” and “Bedding/Foundation Support of Buried Pipe” for additional details regarding utility bedding and utility backfilling.

6.5.1 Trench Backfill

The excavated non-organic soils can be used as backfill for the new utility trenches. Excavated organic soils should not be used as backfill below the roadway. Review of our borings indicates that the trench backfill will primarily consist of sands with silt and sands. These types of soils are generally not considered corrosive. We recommend that bedding be placed uniformly around the pipe to avoid having dissimilar materials touch the pipe that could set up corrosion cells. In our opinion, all metallic utilities should be coated or wrapped.

Utility trench backfill should be placed per the requirements of MnDOT Specification 2106.3G.1 (Specified Density Method). The backfill soils should be placed in a maximum lift thickness of 1 foot or less for the granular soils and 8 inches or less for the cohesive soils. This specification requires all backfill soils placed within an excavation trench be compacted to a minimum of 100% of the *standard maximum dry unit weight* defined in ASTM: D698 (Standard Proctor test). Consideration can be given to modifying the project specifications to allow for a reduced minimum compaction level of 95% of the *standard maximum dry unit weight* to be used below the *critical subgrade zone*. Backfill soils placed in the upper 3 feet of the subgrade should be compacted at a water content between 65% to 102% of the standard optimum water content.

The moisture content below the upper 3-foot zone shall be from 65% to 115% of the standard optimum water content.

7.0 CONSTRUCTION CONSIDERATIONS

7.1 Potential Difficulties

7.1.1 Runoff Water in Excavation

Water can be expected to collect in the excavation bottom during times of inclement weather or snow melt. To allow observation of the excavation bottom, to reduce the potential for soil disturbance, and to facilitate filling operations, we recommend water be removed from within the excavation during construction. Based on the soils encountered, we anticipate the groundwater can be handled with conventional sump pumping.

7.1.2 Disturbance of Soils

The on-site soils can be disturbed under construction traffic, especially if the soils are wet. If soils become disturbed, they should be subcut to the underlying undisturbed soils. The subcut soils can then be dried and recompacted back into place, or they should be removed and replaced with drier imported fill.

7.1.3 Cobbles and Boulders

The soils at this site can include cobbles and boulders. This may make excavating procedures somewhat more difficult than normal if they are encountered.

7.2 Excavation Backsloping

If excavation faces are not retained, the excavations should maintain maximum allowable slopes in accordance with *OSHA Regulations (Standards 29 CFR), Part 1926, Subpart P, "Excavations"* (can be found on www.osha.gov). Even with the required OSHA sloping, water seepage or surface runoff can potentially induce sideslope erosion or sloughing which could require slope maintenance.

7.3 Observation and Testing

The recommendations in this report are based on the subsurface conditions found at our test boring locations. Since the soil conditions can be expected to vary away from the soil boring locations, we recommend on-site observation by a geotechnical engineer/technician during construction to evaluate these potential changes. Soil density testing should also be performed on new fill placed in order to document that project specifications for compaction have been

satisfied.

8.0 ASTM STANDARDS

When we refer to an ASTM Standard in this report, we mean that our services were performed in general accordance with that standard. Compliance with any other standards referenced within the specified standard is neither inferred nor implied.

9.0 LIMITATIONS

Within the limitations of scope, budget, and schedule, we have endeavored to provide our services according to generally accepted geotechnical engineering practices at this time and location. Other than this, no warranty, express or implied, is intended.

Important information regarding risk management and proper use of this report is given in Appendix B entitled “Geotechnical Report Limitations and Guidelines for Use.”

DEFINITIONS RELATING TO PAVEMENT CONSTRUCTION

Top of subgrade: Grade which contacts the bottom of the aggregate base layer.

Sand subbase: Uniform thickness sand layer placed as the top of subgrade which is intended to improve the frost and drainage characteristics of the pavement system by increasing drainage of excess water in the aggregate base and subbase, by reducing and "bridging" frost heaving, and by reducing spring thaw weakening effects.

Critical subgrade zone: The subgrade portion beneath and within three vertical feet of the top of subgrade. A sand subbase, if placed, would be considered the upper portion of the critical subgrade zone.

Suitable Grading Material: Mineral soil materials, typically from the project site, excluding the following: 1) soils which have an organic content exceeding 3%, 2) cohesive soils having a Liquid Limit exceeding 50%, 3) soils which include debris, cobbles, and/or boulders, and 4) soils which are considered acceptable from an environmental standpoint. The soil must also be capable of attaining the specified compaction level at its current water content or at a water content that can be reasonably scarified, blended, and moisture conditioned to a uniform water content in order to uniformly meet compaction requirements.

Granular Material: Soils meeting MnDOT Specification 3149.2B.1. This refers to granular soils which, of the portion passing the 1" sieve, contain less than 20% by weight passing the #200 sieve.

Select Granular Material: Soils meeting MnDOT Specification 3149.2B.2. This refers to granular soils which, of the portion passing the 1" sieve, contain less than 12% by weight passing the #200 sieve.

Select Granular Material (Super Sand): Soils meeting MnDOT Specification 3149.2B.3. This material is cleaner and coarser than Select Granular Material (see specification for specific requirements).

Compaction Subcut: Construction of a uniform thickness subcut below a designated grade to provide uniformity and compaction within the subcut zone. Replacement fill can be the materials subcut, although the reused soils should be blended to a uniform soil condition, moisture conditioned as needed to meet MnDOT Specification 2105.F; and re-compacted per the Specified Density Method defined in MnDOT Specification 2105.3F.1.

Test Roll: A means of evaluating the near-surface stability of subgrade soils (usually non-granular). Suitability is determined by the depth of rutting or deflection caused by passage of heavy rubber-tired construction equipment, such as a loaded dump truck, over the test area. Yielding of less than 1" is normally considered acceptable, although engineering judgment may be applied depending on the equipment used, soil conditions present, and/or depth below final grade.

Unstable Soils: Subgrade soils which do not pass a test roll. Unstable soils typically have water content exceeding the *standard optimum water content* defined in ASTM:D698 (Standard Proctor test).

Organic Soils: Soils which have sufficient organic content such that the soils engineering properties are negatively affected (typically more than 3% organic content). These soils are usually black to dark brown in color.

UTILITY EXCAVATION BACKFILLING

GENERAL

Clayey and silty soils are often difficult to compact, as they may be naturally wet or dry, or may become wet due to ground water or runoff water during construction. Soils will need to be placed within a certain range of water (moisture) content to attain desired compaction levels. Moisture conditioning to within this range can be time consuming and labor intensive, and will require favorable weather.

The degree of compaction and the soil type used for backfill within open cut utility excavations depends on the eventual function of the overlying land surface. Details are as follows:

ROADWAYS

Where trenches are located below roadways, we recommend using inorganic fill and compacting these soils per MnDOT Specification 2105.3F1 (Specified Density Method). On MnDOT funded roads, the 2016 Specification requires 100% compaction over the entire trench depth. On non-MnDOT funded roads, we feel the specification can be relaxed to the previous version of achieving 100% of the Standard Proctor density in the upper 3-foot subgrade zone, and 95% below this depth. Note that this specification also includes moisture content range requirements which are important for proper subgrade stability.

Where available soils are wet or of poor quality, it may be possible to use the “Quality Compaction Method” (MnDOT Specification 2105.3F2) for soils below the upper 3-foot subgrade zone if you can tolerate some subsidence. However, a high level of stability is still important within the upper subgrade zone and recommend that the “Specified Density Method" be used in this upper subgrade area. We caution that if backfill soils in the lower trench area are significantly unstable, it may be difficult or even impossible to properly compact soils within the upper 3-foot subgrade zone. In this case, road subgrade stability can be improved by placing a geotextile reinforcement fabric directly over the unstable soils followed by properly drained granular fill placement.

STRUCTURAL AREAS

If fill is placed beneath or within the significant zone of influence of a structure (typically a 1:1 lateral oversize zone), the soil type and minimum compaction level will need to be evaluated on an individual basis. Because trenches result in variable fill depths over a short lateral distance, higher than normal compaction levels and/or more favorable (sandy) soil fill types may be needed. If this situation exists, it is important that special geotechnical engineering review be performed.

NON-STRUCTURAL AREAS

In grass/ditch areas, backfill soils should be placed in reasonable lift thicknesses and compacted to a minimum of 90% of the Standard Proctor density (ASTM: D698) and/or per the MnDOT “Quality Compaction Method.” If lower compaction levels are accepted, more noticeable subsidence at the surface can occur. Steep or high slopes require special consideration, and if this situation exists, it is important that special geotechnical engineering review be performed.

SPECIAL CASES

Structural retention systems are often used to reduce impacts on adjacent streets/improvements. If localized excavations/pits or annular spaces are created which need to be backfilled, it may not be possible to place and compact soils by the conventional means of backfilling. Retraction of structural systems can also leave soils loosened. Significant settlement can occur in areas where backfill cannot be compacted. If these situations are located in non-structural or non-paved areas, it may be reasonable to accept the settlements and associated follow-up maintenance in order avoid the high cost of trying to compact the soil or placing flowable lean concrete fill. However, there may be areas where fill settlement needs to be avoided, especially as the settlement will be differential from the surrounding surface, or differential from a buried structure in the case of higher piping entering the structure. Where settlement needs to be avoided, the specification should require that the contractor submit a backfill compaction plan along with the retention plan. Improper sequencing of retention system removal and backfilling of the pits could result in excessive settlement and/or lateral movement of nearby improvements.

BEDDING/FOUNDATION SUPPORT OF BURIED PIPE

GENERAL

This page addresses soil bedding and foundation support of rigid pipe, such as reinforced concrete, and flexible pipe, such as steel and plastic. This does not address selection of pipe based on loads and allowable deflections, but rather addresses the geotechnical/soil aspects of uniform pipe support. Bedding/foundation support needs relate to local conditions directly beneath and to the sides of the pipe zone, which may be influenced by soft in-situ ground conditions or by soil disturbance due to soil sensitivity or ground water. Bedding relates to granular materials placed directly beneath the bottom of the pipe (usually 4" to 6" thick), which is intended to provide increased support uniformity. We refer to foundation soils as thicker layers of sands and/or gravels (beneath the bedding zone) intended to provide increased foundation strength support, usually needed due to soft, unstable and/or waterbearing conditions.

GRANULAR BEDDING

With circular pipes, high local loads (approaching point loads) develop if pipes are placed on hard surfaces. Load distribution is improved by placing granular bedding materials beneath the pipe, which are either shaped to match the pipe bottom or are placed without compaction to allow “settling in.” The bedding should be placed in such a manner that the pipe will be at the proper elevation and slope when the pipe is laid on the bedding. Common bedding material is defined in MnDOT Specification 3149.2F, Granular Bedding. Published documents recommend rigid pipes having a diameter of 12" to 54" be placed on a bedding thickness of 4", which increases to 6" of bedding for pipe diameters ranging from 54" to 72". Beyond a 72" diameter, the bedding thickness can be equal to the pipe outside diameter divided by 12. Typically, the need for bedding under small diameter pipes (less than 12") depends on the pipe designer’s specific needs, although in obvious point loads situations (bedrock, cobbles, significant coarse gravel content), bedding is recommended. Note that bedding should also account for larger diameter bells at joints.

FOUNDATION FILL

Positive uniform strength is usually compromised in soft or unstable trench bottom conditions. In this case, deeper subcuts and foundation fill placement is needed beneath the pipe. In moderate instability conditions, improvement can likely be accomplished with a thicker bedding layer. However, in more significant instability situations, particularly where ground water is present, coarser materials may be needed to provide a stronger foundation. Thicker gravel layers can also be a favorable media from which to dewater. The following materials would be appropriate for stability improvement, with the coarser materials being appropriate for higher instability/ground water cases.

- Fine Filter Aggregate – MnDOT Specification 3149.2J
- Coarse Filter Aggregate –MnDOT Specification 3149.2H

When using a coarser material which includes significant void space, we highly recommend enveloping the entire gravel layer within a geotextile separation fabric. The gravel material includes open void space, and the fabric acts as a separator which minimizes the intrusion of fines into the open void space. If additional granular bedding sand is used above foundation gravel, the fabric would also prevent downward infiltration of bedding sand into the rock void space.

Although it is preferred to not highly compact thin granular bedding zones directly beneath the pipe center, it is desirable to compact the foundation materials to prevent more significant pipe settlement. We recommend foundation fill be compacted to a minimum of 95% of the Standard Proctor density (ASTM: D698). It is not possible to test coarse rock fill, although this material should still be well compacted/ tamped.

Often, pipes entering structures such as catch basins, lift stations, etc., enter the structure at a higher elevation than the structure bottom, and are therefore placed on the structure backfill. Fill beneath these pipes should be considered foundation fill. Depending on the flexibility of the connection design, it may be necessary to increase the minimum compaction level to reduce differential settlements, particularly with thicker fills.

SIDE FILL SUPPORT

If the pipe designer requires support from the side fill, granular bedding should also be placed along the sides of the pipe. In poor soil conditions, the sand fill may need to be placed laterally up to two pipe diameters on both sides of the pipe. With rigid pipe, compacted sand placement up to the spring line (within the haunch area) is usually sufficient. With flexible pipe, side fill should be placed and compacted at least to the top of the pipe. For positive support, it is very important to properly compact the sands within the haunch area.

Appendix A

Geotechnical Field Exploration and Testing
Boring Log Notes
Unified Soil Classification System
Figure 1 – Boring Locations
Subsurface Boring Logs

Appendix A
Geotechnical Field Exploration and Testing
Report No. P-0004952

A.1 FIELD EXPLORATION

The subsurface conditions at the site were explored by drilling and sampling three (3) standard penetration test borings. The locations of the borings appear on Figure 1, preceding the Subsurface Boring Logs in this appendix.

A.2 SAMPLING METHODS

A.2.1 Split-Spoon Samples (SS) - Calibrated to N_{60} Values

Standard penetration (split-spoon) samples were collected in general accordance with ASTM: D1586 with one primary modification. The ASTM test method consists of driving a 2-inch O.D. split-barrel sampler into the in-situ soil with a 140-pound hammer dropped from a height of 30 inches. The sampler is driven a total of 18 inches into the soil. After an initial set of 6 inches, the number of hammer blows to drive the sampler the final 12 inches is known as the standard penetration resistance or N-value. Our method uses a modified hammer weight, which is determined by measuring the system energy using a Pile Driving Analyzer (PDA) and an instrumented rod.

In the past, standard penetration N-value tests were performed using a rope and cathead for the lift and drop system. The energy transferred to the split-spoon sampler was typically limited to about 60% of its potential energy due to the friction inherent in this system. This converted energy then provides what is known as an N_{60} blow count.

The most recent drill rigs incorporate an automatic hammer lift and drop system, which has higher energy efficiency and subsequently results in lower N-values than the traditional N_{60} values. By using the PDA energy measurement equipment, we are able to determine actual energy generated by the drop hammer. With the various hammer systems available, we have found highly variable energies ranging from 55% to over 100%. Therefore, the intent of AET's hammer calibrations is to vary the hammer weight such that hammer energies lie within about 60% to 65% of the theoretical energy of a 140-pound weight falling 30 inches. The current ASTM procedure acknowledges the wide variation in N-values, stating that N-values of 100% or more have been observed. Although we have not yet determined the statistical measurement uncertainty of our calibrated method to date, we can state that the accuracy deviation of the N-values using this method is significantly better than the standard ASTM Method.

A.2.2 Disturbed Samples (DS)/Spin-up Samples (SU)

Sample types described as "DS" or "SU" on the boring logs are disturbed samples, which are taken from the flights of the auger. Because the auger disturbs the samples, possible soil layering and contact depths should be considered approximate.

A.2.3 Sampling Limitations

Unless actually observed in a sample, contacts between soil layers are estimated based on the spacing of samples and the action of drilling tools. Cobbles, boulders, and other large objects generally cannot be recovered from test borings, and they may be present in the ground even if they are not noted on the boring logs.

Determining the thickness of "topsoil" layers is usually limited, due to variations in topsoil definition, sample recovery, and other factors. Visual-manual description often relies on color for determination, and transitioning changes can account for significant variation in thickness judgment. Accordingly, the topsoil thickness presented on the logs should not be the sole basis for calculating topsoil stripping depths and volumes. If more accurate information is needed relating to thickness and topsoil quality definition, alternate methods of sample retrieval and testing should be employed.

A.3 CLASSIFICATION METHODS

Soil descriptions shown on the boring logs are based on the Unified Soil Classification (USC) system. The USC system is described in ASTM: D2487 and D2488. Where laboratory classification tests (sieve analysis or Atterberg Limits) have been performed, accurate classifications per ASTM: D2487 are possible. Otherwise, soil descriptions shown on the boring logs are visual-manual judgments. Charts are attached which provide information on the USC system, the descriptive terminology, and the symbols used on the boring logs.

The boring logs include descriptions of apparent geology. The geologic depositional origin of each soil layer is interpreted primarily by observation of the soil samples, which can be limited. Observations of the surrounding topography, vegetation, and development can sometimes aid this judgment.

A.4 WATER LEVEL MEASUREMENTS

The groundwater level measurements are shown at the bottom of the boring logs. The following information appears under "Water Level Measurements" on the logs:

- Date and Time of measurement
- Sampled Depth: lowest depth of soil sampling at the time of measurement
- Casing Depth: depth to bottom of casing or hollow-stem auger at time of measurement
- Cave-in Depth: depth at which measuring tape stops in the borehole
- Water Level: depth in the borehole where free water is encountered
- Drilling Fluid Level: same as Water Level, except that the liquid in the borehole is drilling fluid

The true location of the water table at the boring locations may be different than the water levels measured in the boreholes. This is possible because there are several factors that can affect the water level measurements in the borehole. Some of these factors include: permeability of each soil layer in profile, presence of perched water, amount of time between water level readings, presence of drilling fluid, weather conditions, and use of borehole casing.

A.5 LABORATORY TEST METHODS

A.5.1 Water Content Tests

Conducted per AET Procedure 01-LAB-010, which is performed in general accordance with ASTM: D2216 and AASHTO: T265.

A.5.2 Material in Soils Finer than the #200 (75 micron) Sieve

Conducted per AET Procedure 01-LAB-060, which is performed in general conformance with ASTM: D1140.

A.6 TEST STANDARD LIMITATIONS

Field and laboratory testing is done in general conformance with the described procedures. Compliance with any other standards referenced within the specified standard is neither inferred nor implied.

A.7 SAMPLE STORAGE

Unless notified to do otherwise, we routinely retain representative samples of the soils recovered from the borings for a period of 30 days.

SAMPLING METHODS

Split-Spoon Samples (SS) - Calibrated to N_{60} Values

Standard penetration (split-spoon) samples were collected in general accordance with ASTM: D1586 with one primary modification. The ASTM test method consists of driving a 2" O.D. split-barrel sampler into the in-situ soil with a 140-pound hammer dropped from a height of 30". The sampler is driven a total of 18" into the soil. After an initial set of 6", the number of hammer blows to drive the sampler the final 12" is known as the standard penetration resistance or N-value. Our method uses a modified hammer weight, which is determined by measuring the system energy using a Pile Driving Analyzer (PDA) and an instrumented rod.

In the past, standard penetration N-value tests were performed using a rope and cathead for the lift and drop system. The energy transferred to the split-spoon sampler was typically limited to about 60% of its potential energy due to the friction inherent in this system. This converted energy then provides what is known as an N_{60} blow count.

Most of today's drill rigs incorporate an automatic hammer lift and drop system, which has higher energy efficiency and subsequently results in lower N-values than the traditional N_{60} values. By using the PDA energy measurement equipment, we are able to determine actual energy generated by the drop hammer. With the various hammer systems available, we have found highly variable energies ranging from 55% to over 100%. Therefore, the intent of AET's hammer calibrations is to vary the hammer weight such that hammer energies lie within about 60% to 65% of the theoretical energy of a 140-pound weight falling 30". The current ASTM procedure acknowledges the wide variation in N-values, stating that N-values of 100% or more have been observed. Although we have not yet determined the statistical measurement uncertainty of our calibrated method to date, we can state that the accuracy deviations of the N-values using this method are significantly better than the standard ASTM Method.

Disturbed Samples (DS)/Spin-up Samples (SU)

Sample types described as "DS" or "SU" on the boring logs are disturbed samples, which are taken from the flights of the auger. Because the auger disturbs the samples, possible soil layering and contact depths should be considered approximate.

Sampling Limitations

Unless actually observed in a sample, contacts between soil layers are estimated based on the spacing of samples and the action of drilling tools. Cobbles, boulders, and other large objects generally cannot be recovered from test borings, and they may be present in the ground even if they are not noted on the boring logs.

CLASSIFICATION METHODS

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The boring logs include descriptions of apparent geology. The geologic depositional origin of each soil layer is interpreted primarily by observation of the soil samples, which can be limited. Observations of the surrounding topography, vegetation, and development can sometimes aid this judgment.

WATER LEVEL MEASUREMENTS

The ground water level measurements are shown at the bottom of the boring logs. The following information appears under "Water Level Measurements" on the logs:

- Date and Time of measurement
- Sampled Depth: lowest depth of soil sampling at the time of measurement
- Casing Depth: depth to bottom of casing or hollow-stem auger at time of measurement
- Cave-in Depth: depth at which measuring tape stops in the borehole
- Water Level: depth in the borehole where free water is encountered
- Drilling Fluid Level: same as Water Level, except that the liquid in the borehole is drilling fluid

The true location of the water table at the boring locations may be different than the water levels measured in the boreholes. This is possible because there are several factors that can affect the water level measurements in the borehole. Some of these factors include: permeability of each soil layer in profile, presence of perched water, amount of time between water level readings, presence of drilling fluid, weather conditions, and use of borehole casing.

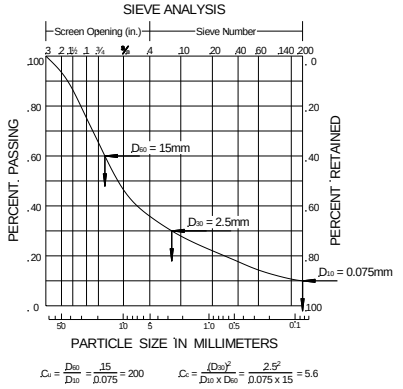
SAMPLE STORAGE

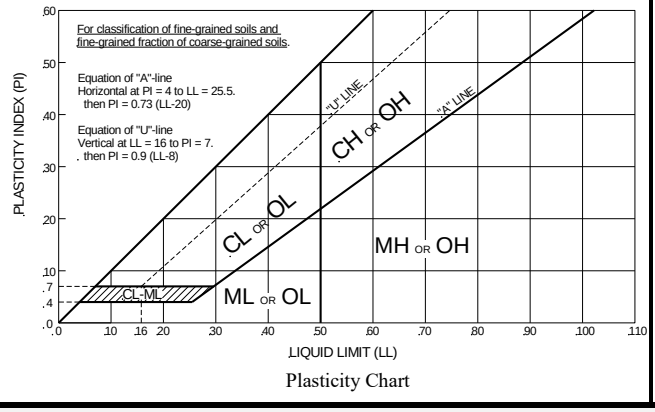
Unless notified to do otherwise, we routinely retain representative samples of the soils recovered from the borings for a period of 30 days.

UNIFIED SOIL CLASSIFICATION SYSTEM
ASTM Designations: D 2487, D2488

AMERICAN ENGINEERING TESTING, INC.

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests[A]				Soil Classification: Group Symbol	Soil Classification: Group Name[B]
Coarse-Grained Soils More than 50% retained on No. 200 sieve	Gravels More than 50% coarse fraction retained on No. 4 sieve	Clean Gravels Less than 5% fines[C]	Cu≥4 and 1≤Cc≤3[E]	GW	Well graded gravel[F]
			Cu<4 and/or 1>Cc>3[E]	GP	Poorly graded gravel[F]
		Gravels with Fines more than 12% fines[C]	Fines classify as ML or MH	GM	Silty gravel[F,G,H]
			Fines classify as CL or CH	GC	Clayey gravel[F,G,H]
	Sands 50% or more of coarse fraction passes No. 4 sieve	Clean Sands Less than 5% fines[D]	Cu≥6 and 1≤Cc≤3[E]	SW	Well-graded sand[I]
			Cu<6 and/or 1>Cc>3[E]	SP	Poorly-graded sand[I]
		Sands with Fines more than 12% fines[D]	Fines classify as ML or MH	SM	Silty sand[G,H,I]
			Fines classify as CL or CH	SC	Clayey sand[G,H,I]
Fine-Grained Soils 50% or more passes the No. 200 sieve (see Plasticity Chart below)	Silts and Clays Liquid limit less than 50	inorganic	PI>7 and plots on or above "A" line[J]	CL	Lean clay[K,L,M]
			PI<4 or plots below "A" line[J]	ML	Silt[K,L,M]
		organic	Liquid limit–oven dried / Liquid limit – not dried <0.75	OL	Organic clay[K,L,M,N] / Organic silt[K,L,M,O]
	Silts and Clays Liquid limit 50 or more	inorganic	PI plots on or above "A" line	CH	Fat clay[K,L,M]
			PI plots below "A" line	MH	Elastic silt[K,L,M]
		organic	Liquid limit–oven dried / Liquid limit – not dried <0.75	OH	Organic clay[K,L,M,P] / Organic silt[K,L,M,Q]
Highly organic soil			Primarily organic matter, dark in color, and organic in odor	PT	Peat[R]





Plasticity Chart

Notes

[A]Based on the material passing the 3-in (75-mm) sieve.
[B]If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.
[C]Gravels with 5 to 12% fines require dual symbols:
GW-GM well-graded gravel with silt
GW-GC well-graded gravel with clay
GP-GM poorly graded gravel with silt
GP-GC poorly graded gravel with clay
[D]Sands with 5 to 12% fines require dual symbols:
SW-SM well-graded sand with silt
SW-SC well-graded sand with clay
SP-SM poorly graded sand with silt
SP-SC poorly graded sand with clay

[E]$Cu = D_{60} / D_{10}$, $Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$

[F]If soil contains ≥15% sand, add "with sand" to group name.
[G]If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.
[H]If fines are organic, add "with organic fines" to group name.
[I]If soil contains ≥15% gravel, add "with gravel" to group name.
[J]If Atterberg limits plot is hatched area, soil is a CL-ML silty clay.
[K]If soil contains 15 to 29% plus No. 200 add "with sand" or "with gravel", whichever is predominant.
[L]If soil contains ≥30% plus No. 200, predominantly sand, add "sandy" to group name.
[M]If soil contains ≥30% plus No. 200, predominantly gravel, add "gravelly" to group name.
[N]PI≥4 and plots on or above "A" line.
[O]PI<4 or plots below "A" line.
[P]PI plots on or above "A" line.
[Q]PI plots below "A" line.
[R]Fiber Content description shown below.

ADDITIONAL TERMINOLOGY NOTES USED BY AET FOR SOIL IDENTIFICATION AND DESCRIPTION

Grain Size

Term	Particle Size
Boulders	Over 12"
Cobbles	3" to 12"
Gravel	#4 sieve to 3"
Sand	#200 to #4 sieve
Fines (silt & clay)	Pass #200 sieve

Gravel Percentages

Term	Percent
A Little Gravel	3% - 14%
With Gravel	15% - 29%
Gravelly	30% - 50%

Consistency of Plastic Soils

Term	N-Value, BPF
Very Soft	less than 2
Soft	2 - 4
Firm	5 - 8
Stiff	9 - 15
Very Stiff	16 - 30
Hard	Greater than 30

Relative Density of Non-Plastic Soils

Term	N-Value, BPF
Very Loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	Greater than 50

Moisture/Frost Condition

(MC Column)

D (Dry): Absence of moisture, dusty, dry to touch.
M (Moist): Damp, although free water not visible. Soil may still have a high water content (over "optimum").
W (Wet/ Waterbearing): Free water visible, intended to describe non-plastic soils. Waterbearing usually relates to sands and sand with silt.
F (Frozen): Soil frozen

Layering Notes

Laminations: Layers less than ½" thick of differing material or color.
Lenses: Pockets or layers greater than ½" thick of differing material or color.

Peat Description

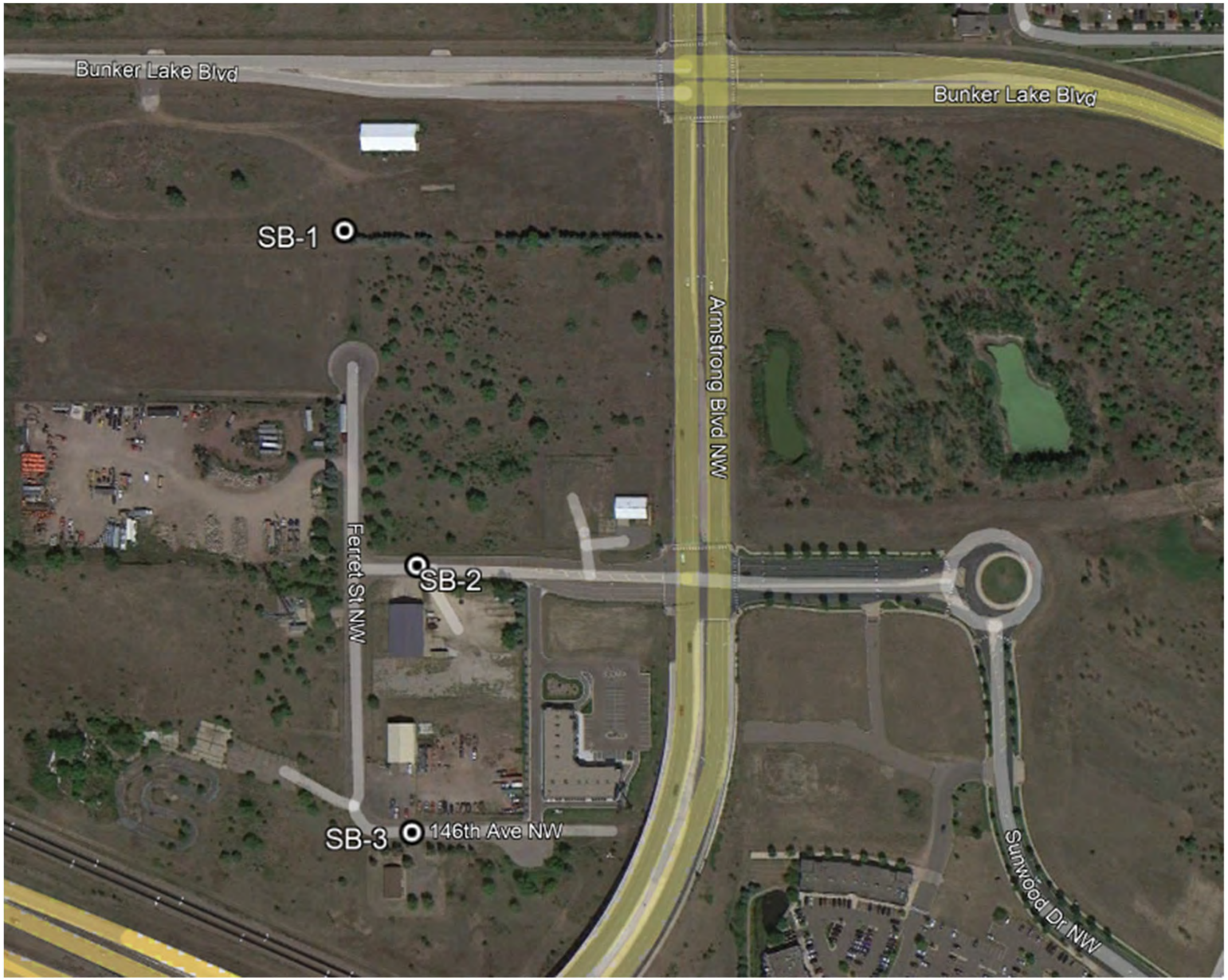
Term	Fiber Content (Visual Estimate)
Fibric Peat:	Greater than 67%
Hemic Peat:	33 – 67%
Sapric Peat:	Less than 33%

Organic Description (if no lab tests)

Soils are described as *organic*, if soil is not peat and is judged to have sufficient organic fines content to influence the Liquid Limit properties. *Slightly organic* used for borderline cases.

Root Inclusions

With roots: Judged to have sufficient quantity of roots to influence the soil properties.
Trace roots: Small roots present, but not judged to be in sufficient quantity to significantly affect soil properties.



AMERICAN ENGINEERING TESTING	**PROJECT** West Armstrong Redevelopment; Ramsey, Minnesota			**AET NO.** P-0004952
	SUBJECT Boring Locations			**DATE** March 2022
	SCALE As Shown	**DRAWN BY** RJO	**CHECKED BY** DSV	**FIGURE 1**

SUBSURFACE BORING LOG

AET No: **P-0004952** Log of Boring No. **SB- 1 (p. 1 of 1)**

Project: **West Armstrong Redevelopment Area Project; Ramsey, MN**

DEPTH IN FEET	Surface Elevation **869.3** MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	DEN	LL	PL	%-#200
1	SILTY SAND, fine to medium grained, dark brown, frozen (SM)	TOPSOIL		F/M	SU						
2	SAND, fine grained, brown, moist, loose (SP)	COARSE ALLUVIUM									
3			6	M	SS	12	4				4
4											
5	SAND WITH SILT, fine to medium grained, brown, moist, very loose, laminations of clayey sand (SP-SM)		4	M	SS	10					
6											
7	SAND, a little gravel, fine to medium grained, grayish brown, moist to about 10' then waterbearing, loose to very loose (SP)										
8			8	M	SS	12					
9											
10			7	M/W	SS	8					
11											
12											
13											
14			3	W	SS	7					
	END OF BORING										

*WD - Water level measured while drilling
*AD - Water level measured at completion of drilling

DEPTH: DRILLING METHOD	WATER LEVEL MEASUREMENTS							NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	
0-13' 3.25" HSA	**1/12/22**	***WD**					**10.0**	
	1/12/22	***AD**		**13.0**	**7.0**		**10.5**	
BORING COMPLETED: **1/12/22**								
DR: **BR** LG: **DR** Rig: **GRD751**								

AET_CORP P-0004952 WEST ARMSTRONG REDEVELOPMENT.GPJ AET+CPT+WELL.GDT 1/18/22

SUBSURFACE BORING LOG

AET No: **P-0004952** Log of Boring No. **SB- 2 (p. 1 of 1)**

Project: **West Armstrong Redevelopment Area Project; Ramsey, MN**

Surface Elevation **872.9**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	DEN	LL	PL	%-#200
1	2.75" Bituminous pavement 8" Aggregate base course FILL, mostly silty sand, a little gravel, brown with a little dark brown, frozen	FILL		F	SU						
2	SAND WITH SILT, a little gravel, fine grained, brown, frozen (SP-SM) (possible fill)	COARSE ALLUVIUM OR FILL		F	SU	6	3				7
4	SAND WITH SILT, fine grained, brown, moist, medium dense (SP-SM)	COARSE ALLUVIUM	14	M	SS	12					
7	SAND, a little gravel, fine to medium grained, brown, moist, loose to very loose (SP)		5	M	SS	10					
10			3	M	SS	10					
12	SAND WITH SILT, a little gravel, fine to medium grained, grayish brown, moist, loose, laminations of clayey sand (SP-SM)		6	M	SS	10					
14	**END OF BORING**										

*WD - Water level measured while drilling
*AD - Water level measured at completion of drilling

DEPTH: DRILLING METHOD	WATER LEVEL MEASUREMENTS							NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	
0-13' 3.25" HSA	**1/12/22**	***WD**					**None**	
	1/12/22	***AD**					**None**	
BORING COMPLETED: **1/12/22**								
DR: **BR** LG: **DR** Rig: **GRD751**								

AET_CORP P-0004952 WEST ARMSTRONG REDEVELOPMENT.GPJ AET+CPT+WELL.GDT 1/18/22

SUBSURFACE BORING LOG

AET No: **P-0004952** Log of Boring No. **SB- 3 (p. 1 of 1)**

Project: **West Armstrong Redevelopment Area Project; Ramsey, MN**

DEPTH IN FEET	Surface Elevation **874.8** MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	DEN	LL	PL	%-#200
1	2.5" Bituminous pavement 8" Aggregate base course FILL, mostly silty sand with gravel, dark brown, frozen	FILL		F	SU						
3	SAND WITH SILT, a little gravel, fine to medium grained, brown with a little dark brown, frozen (SP-SM) (possible fill)	COARSE ALLUVIUM OR FILL		F	SU		4				7
5	SAND, a little gravel, fine to medium grained, grayish brown, moist, loose to very loose to loose (SP)	COARSE ALLUVIUM	7	M	SS	12	3				3
8			3	M	SS	12					
10			6	M	SS	12					
13	SAND, a little gravel, fine to medium grained, brown, moist, loose, laminations of silty sand (SP)		8	M	SS	12					
14	**END OF BORING**										

*WD - Water level measured while drilling
*AD - Water level measured at completion of drilling

DEPTH: DRILLING METHOD	WATER LEVEL MEASUREMENTS							NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	
0-13' 3.25" HSA	**1/12/22**	***WD**					**None**	
	1/12/22	***AD**					**None**	
BORING COMPLETED: **1/12/22**								
DR: **BR** LG: **DR** Rig: **GRD751**								

AET_CORP P-0004952 WEST ARMSTRONG REDEVELOPMENT.GPJ AET+CPT+WELL.GDT 1/18/22

Appendix B

Geotechnical Report Limitations and Guidelines for Use

Appendix B
Geotechnical Report Limitations and Guidelines for Use
Report No. P-0004952

B.1 REFERENCE

This appendix provides information to help you manage your risks relating to subsurface problems which are caused by construction delays, cost overruns, claims, and disputes. This information was developed and provided by GBA[1], of which, we are a member firm.

B.2 RISK MANAGEMENT INFORMATION

B.2.1 Understand the Geotechnical Engineering Services Provided for this Report

Geotechnical engineering services typically include the planning, collection, interpretation, and analysis of exploratory data from widely spaced borings and/or test pits. Field data are combined with results from laboratory tests of soil and rock samples obtained from field exploration (if applicable), observations made during site reconnaissance, and historical information to form one or more models of the expected subsurface conditions beneath the site. Local geology and alterations of the site surface and subsurface by previous and proposed construction are also important considerations. Geotechnical engineers apply their engineering training, experience, and judgment to adapt the requirements of the prospective project to the subsurface model(s). Estimates are made of the subsurface conditions that will likely be exposed during construction as well as the expected performance of foundations and other structures being planned and/or affected by construction activities.

The culmination of these geotechnical engineering services is typically a geotechnical engineering report providing the data obtained, a discussion of the subsurface model(s), the engineering and geologic engineering assessments and analyses made, and the recommendations developed to satisfy the given requirements of the project. These reports may be titled investigations, explorations, studies, assessments, or evaluations. Regardless of the title used, the geotechnical engineering report is an engineering interpretation of the subsurface conditions within the context of the project and does not represent a close examination, systematic inquiry, or thorough investigation of all site and subsurface conditions.

B.2.2 Geotechnical Engineering Services are Performed for Specific Purposes, Persons, and Projects, and At Specific Times

Geotechnical engineers structure their services to meet the specific needs, goals, and risk management preferences of their clients. A geotechnical engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared solely for the client.

Likewise, geotechnical engineering services are performed for a specific project and purpose. For example, it is unlikely that a geotechnical engineering study for a refrigerated warehouse will be the same as one prepared for a parking garage; and a few borings drilled during a preliminary study to evaluate site feasibility will not be adequate to develop geotechnical design recommendations for the project.

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project or purpose;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, the reliability of a geotechnical-engineering report can be affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. If you are the least bit uncertain about the continued reliability of this report, contact your geotechnical engineer before applying the recommendations in it. A minor amount of additional testing or analysis after the passage of time – if any is required at all – could prevent major problems.

1 Geoprofessional Business Association, 1300 Piccard Drive, LL14, Rockville, MD 20850
Telephone: 301/565-2733: www.geoprofessional.org, 2019

B.2.3 Read the Full Report
Costly problems have occurred because those relying on a geotechnical-engineering report did not read the report in its entirety. Do not rely on an executive summary. Do not read selective elements only. Read and refer to the report in full.

B.2.4 You Need to Inform Your Geotechnical Engineer About Change
Your geotechnical engineer considered unique, project-specific factors when developing the scope of study behind this report and developing the confirmation-dependent recommendations the report conveys. Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the elevation, configuration, location, orientation, function or weight of the proposed structure and the desired performance criteria;
- the composition of the design team; or
- project ownership.

As a general rule, always inform your geotechnical engineer of project or site changes – even minor ones – and request an assessment of their impact. The geotechnical engineer who prepared this report cannot accept responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.

B.2.5 Most of the "Findings" Related in This Report Are Professional Opinions
Before construction begins, geotechnical engineers explore a site's subsurface using various sampling and testing procedures. Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing is performed. The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgement to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team through project completion to obtain informed guidance quickly, whenever needed.

B.2.6 This Report's Recommendations Are Confirmation-Dependent
The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, they are not final, because the geotechnical engineer who developed them relied heavily on judgement and opinion to do so. Your geotechnical engineer can finalize the recommendations only after observing actual subsurface conditions exposed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.

B.2.7 This Report Could Be Misinterpreted
Other design professionals' misinterpretation of geotechnical engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a continuing member of the design team, to:

- confer with other design-team members;
- help develop specifications;
- review pertinent elements of other design professionals' plans and specifications; and
- be available whenever geotechnical engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction-phase observations.

B.2.8 Give Constructors a Complete Report and Guidance
Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious

problems this practice has caused, include the complete geotechnical engineering report, along with any attachments or appendices, with your contract documents, but be certain to note conspicuously that you've included the material for information purposes only. To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, only from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and be sure to allow enough time to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

B.2.9 Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. This happens in part because soil and rock on project sites are typically heterogeneous and not manufactured materials with well-defined engineering properties like steel and concrete. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. Read these provisions closely. Ask questions. Your geotechnical engineer should respond fully and frankly.

B.2.10 Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical engineering study. For that reason, a geotechnical engineering report does not usually provide environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. Unanticipated subsurface environmental problems have led to project failures. If you have not obtained your own environmental information about the project site, ask your geotechnical consultant for a recommendation on how to find environmental risk-management guidance.

B.2.11 Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, the engineer's services were not designed, conducted, or intended to prevent migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration. Confront the risk of moisture infiltration by including building-envelope or mold specialists on the design team. Geotechnical engineers are not building-envelope or mold specialists.

Public Works Committee **5. 4.**

Meeting Date: 02/21/2023

By: Bruce Westby, Engineering/Public Works

Title:

Recommend City Council Approval of Plans and Authorization to Advertise Bids for 2023 Crackseal Improvements

Purpose/Background:

PURPOSE:

The purpose of this case is to receive an update from Staff on the proposed 2023 Craskseal Improvements and consider providing a recommendation to City Council to approve the proposed plans and authorize advertising bids for City Improvement Project #23-08, 2023 Crackseal Improvements.

BACKGROUND:

As part of the City of Ramsey's proactive Pavement Management Program, the City annually hires contractors to seal cracks in bituminous pavement on about 15 to 25 miles of public streets, depending on the scope and severity of cracks and available funding. Cracksealing protects existing pavement by preventing stormwater runoff from seeping through cracks in the pavement and joints between the pavement and concrete curb and gutter and utility castings, minimizing future damage due to wet subgrade soils, especially during freeze-thaw cycles.

Typically, the city will crackseal bituminous pavement 3 years after a street is constructed, after it receives an overlay, or after it is reconstructed, then generally every 7 years after until it receives another overlay or is reconstructed. However, cracksealing is generally performed on pavement sections with Pavement and Surface Evaluation Rating (PASER) values between 7 and 10, which City staff assign on an annual basis. Therefore, the actual time between crackseal improvements on a given street segment depends upon the physical condition of the pavement as it ages.

This year, Staff is proposing to seal cracks in the bituminous pavement on about 18.8 miles of public streets as highlighted in red on the attached plan. These street segments generally have PASER ratings between 7 and 10, though some have ratings of 5 and 6. Street segments with PASER values of 5 total 4,124 feet or 0.8 miles, and streets with PASER values of 6 total 9,137 feet or 1.7 miles. These street segments are proposed to receive crackseal improvements because they are either contained within an area of streets that have PASER values of 7 or higher and we are attempting to maintain all street segments in the area on the same maintenance schedule moving forward, or because they are not identified within the CIP as receiving improvements within the next 10 years so we need to limp them along as cost-effectively as possible until they can be added to the CIP in the future.

Attached is a street segment summary for streets proposed to receive crackseal improvements in 2023.

Timeframe:

Staff anticipates 10 minutes will be needed to present this case and respond to questions.

Observations/Alternatives:

OBSERVATIONS:

As in the past, staff will not be mailing notices for this project since the work is generally unimpactful and fast moving so mailing notices would generally not be beneficial or cost-effective.

ALTERNATIVES:

Alternative 1: Motion to recommend City Council approval of plans and authorization to advertise bids for City Improvement Project #23-08, 2023 Crackseal Improvements.

Alternative 2: Motion of other.

Funding Source:

The project cost estimate is $218,730.

Each year the City budgets $200,000 for crackseal and pavement rejuvenator improvements, and as always staff strives to spend all $200,000 in an attempt to maintain our paved streets as cost-effectively as possible. City staff is proposing to apply all 2023 pavement rejuvenator improvements to State Aid streets and to pay for these improvements using State Aid Funds, leaving the entire budgeted amount of $200,00 for crackseal improvements. Staff is therefore targeting a project cost slightly in excess of $200,000 with the hope that the lowest bid received is less than the engineer's estimate and we are able to complete all of the proposed crackseal improvements. However, if the low bid exceeds $200,000, staff can remove as many segments from the 2023 crackseal improvement project as needed to reduce the project cost to $200,000.

Recommendation:

Staff recommends approving Alternative #1.

Action:

Recommend City Council approval of plans and authorization to advertise bids for City Improvement Project #23-08, 2023 Crackseal Improvements.

Attachments

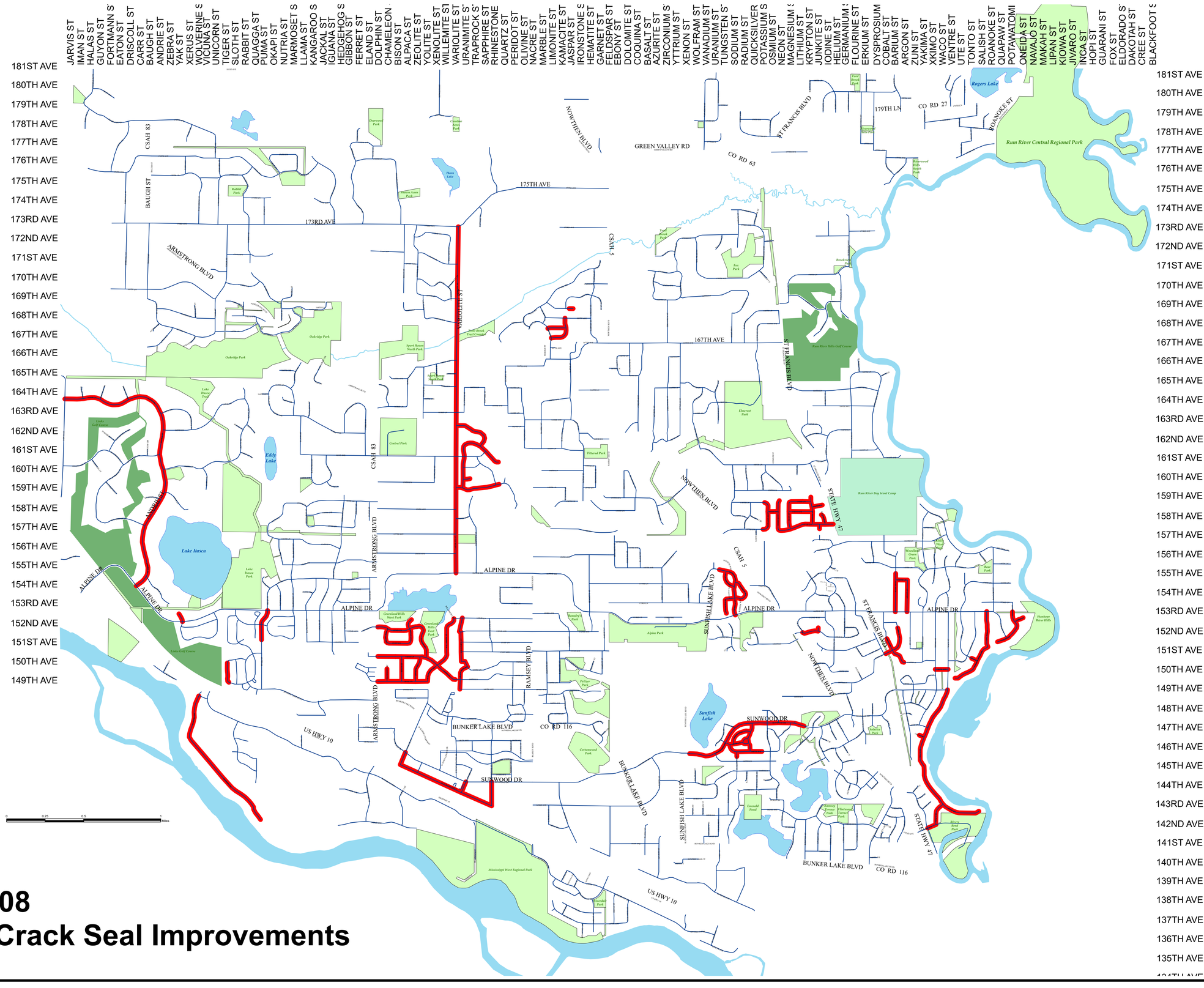
IP 23-08 Plan

IP 23-08 Street Segments Summary

Form Review

Inbox	Reviewed By	Date
Brian Hagen	Brian Hagen	02/16/2023 01:53 PM
Form Started By: Bruce Westby		Started On: 02/13/2023 01:01 PM
Final Approval Date: 02/16/2023		

IP 23-08
2023 Crack Seal Improvements



2023 Crack Seal Preliminary Summary 12_8_2022

Plat Alpine Acres

Name	DESCRIPT	PRG_TYP	PRG_YR	OL	CONST	OL2	RC	Miles_2	RTG_2021
Sodium St	Alpine Dr / CR 57	CS	2023		2004	0	0	0.37	5
Radium St	153rd Lane / Sodium St	CS	2023		2004	0	0	0.14	6
153rd Lane	Sodium St / Radium St	CS	2023		2004	0	0	0.06	5

Sum Miles_2 0.57

Plat Alpine Acres 2nd

Name	DESCRIPT	PRG_TYP	PRG_YR	OL	CONST	OL2	RC	Miles_2	RTG_2021
Tungsten St	Sodium St / Sodium St	CS	2023		2004	0	0	0.13	6
Tungsten St	153rd Lane / CDS	CS	2023		2004	0	0	0.09	5
153rd Lane	Sodium St / Tungsten St	CS	2023		2004	0	0	0.06	6

Sum Miles_2 0.28

Plat Apple Ridge

Name	DESCRIPT	PRG_TYP	PRG_YR	OL	CONST	OL2	RC	Miles_2	RTG_2021
Krypton Court	157th Lane / CDS	CS	2023		1998	0	0	0.07	8
Lithium St	157th Lane / 158th Ave	CS	2023		1998	0	0	0.08	8
158th Ave	Lithium / W EOP	CS	2023		1998	0	0	0.04	8
157th Lane	TH 47 / Junkite Ct	CS	2023		1998	0	0	0.05	8
157th Lane	Junkite Court / Krypton	CS	2023		1998	0	0	0.04	8
157th Lane	Krypton / Lithium	CS	2023		1998	0	0	0.05	8
157th Lane	Lithium / W EOP	CS	2023		1998	0	0	0.08	8
Krypton St	157th Lane / S EOP	CS	2023		1998	0	0	0.03	8

Sum Miles_2	0.44									
Plat		Bowers Mississippi Acres								
	Name	DESCRIPT	PRG_TYP	PRG_YR	OL	CONST	OL2	RC	Miles_2	RTG_2021
	Bowers Dr	N EOP /S EOP	CS	2023	2004	1982	0	0	0.58	6
	Bowers Dr	148th Ave / N EOP	CS	2023	2004	1982	0	0	0.04	6
Sum Miles_2	0.62									
Plat		Bowers Mississippi Acres 2nd								
	Name	DESCRIPT	PRG_TYP	PRG_YR	OL	CONST	OL2	RC	Miles_2	RTG_2021
	Bowers Dr	N EOP / S EOP	CS	2023	2004	1982	0	0	0.09	6
Sum Miles_2	0.09									
Plat		Bowers Mississippi Acres 3rd								
	Name	DESCRIPT	PRG_TYP	PRG_YR	OL	CONST	OL2	RC	Miles_2	RTG_2021
	Bowers Dr	N EOP / S EOP	CS	2023	2004	1982	0	0	0.28	6
Sum Miles_2	0.28									
Plat		Brookfield 6th								
	Name	DESCRIPT	PRG_TYP	PRG_YR	OL	CONST	OL2	RC	Miles_2	RTG_2021
	Kamacite Street	S EOP - 168th Ave	CS	2023	0	2016	0	0	0.03	9
Sum Miles_2	0.03									
Plat		Brookfield 7th								
	Name	DESCRIPT	PRG_TYP	PRG_YR	OL	CONST	OL2	RC	Miles_2	RTG_2021
	167th Crossing	Limonite St - PC Kamacite St	CS	2023	0	2016	0	0	0.08	9
	Kamacite Street	PC 167th Crossing - 167th Lane	CS	2023	0	2016	0	0	0.06	9
	Kamacite Street	167th Lane - N EOP	CS	2023	0	2016	0	0	0.03	9
	167th Lane	Limonite Street - Kamacite Street	CS	2023	0	2016	0	0	0.12	9
Sum Miles_2	0.29									
Plat		Cole Addition								
	Name	DESCRIPT	PRG_TYP	PRG_YR	OL	CONST	OL2	RC	Miles_2	RTG_2021
	168th Lane	W EOP / CDS	CS	2023	0	2018	0	0	0.02	10
Sum Miles_2	0.02									

Plat		Greenland Hills								
	Name	DESCRIPT	PRG_TYP	PRG_YR	OL	CONST	OL2	RC	Miles_2	RTG_2021
	Chameleon St	149th Lane / CDS	CS	2023	2002	1981	0	0	0.08	8
	Zeolite St	S EOP / 150th Lane	CS	2023	2002	1981	0	0	0.17	8
	Willemite St	149th Lane / CDS	CS	2023	2002	1981	0	0	0.48	8
	Bison St	149th Lane / 150th Lane	CS	2023	2002	1981	0	0	0.16	8
	Yolite St	150th / 152nd Lane EOP	CS	2023	2002	1981	0	0	0.23	8
	150th Lane	W EOP / E EOP	CS	2023	2001	1975	0	0	0.44	8
	149th Lane	Armstrong Blvd / Willemite St	CS	2023	2002	1981	0	0	0.32	8
Sum Miles_2	1.88									
Plat		Greenland Hills Plat 2								
	Name	DESCRIPT	PRG_TYP	PRG_YR	OL	CONST	OL2	RC	Miles_2	RTG_2021
	152nd Lane	Alpaca St / Chameleon St	CS	2023	2002	1978	0	0	0.15	8
	151st Lane	Alpaca St / Chameleon St	CS	2023	2002	1978	0	0	0.16	8
	152nd Lane	E EOP / Alpaca St	CS	2023	2002	1978	0	0	0.07	8
	152nd Lane	Chameleon St / CR 83	CS	2023	2002	1978	0	0	0.07	8
	Chameleon St	151st Lane / 152nd Lane	CS	2023	2002	1978	0	0	0.09	8
	Alpaca St	151st Lane / 152nd Lane	CS	2023	2002	1978	0	0	0.09	8
	Alpaca St	152nd Lane / CDS	CS	2023	2002	1978	0	0	0.07	8
Sum Miles_2	0.7									
Plat		Halland Acres								
	Name	DESCRIPT	PRG_TYP	PRG_YR	OL	CONST	OL2	RC	Miles_2	RTG_2021
	154th Lane	Barium St / Argon St	CS	2023	2001	1980	0	0	0.08	5
	Argon St	153rd Ave /	CS	2023	2001	1980	0	0	0.21	7

		154th Lane								
	Barium St	153rd / N EOP	CS	2023	2001	1980	0	0	0.25	5
Sum Miles_2	0.54									
Plat		Harvest Estates 2nd Addition								
	Name	DESCRIPT	PRG_TYP	PRG_YR	OL	CONST	OL2	RC	Miles_2	RTG_2021
	152nd Circle	152nd Ln / CDS	CS	2023		2019	0	0	0.02	10
	152nd Lane	Krypton Ter / 152nd Cir	CS	2023		2019	0	0	0.1	10
Sum Miles_2	0.12									
Plat		MSA								
	Name	DESCRIPT	PRG_TYP	PRG_YR	OL	CONST	OL2	RC	Miles_2	RTG_2021
	Variolite St	302 ft N 166th Ave / CR 63 (173rd Ave)	CS	2023	1998	1981	0	2020	0.82	10
	Variolite St	458 ft S 166th Ave / 302 ft N 166th Ave	CS	2023	1998	1981	0	2020	0.11	10
	Variolite St	161st Ave / 458 ft S 166th Ave	CS	2023	1998	1981	0	2020	0.56	10
	Variolite St	Alpine Dr / 161st Ave	CS	2023	1998	1983	0	2020	0.76	10
	Sunwood Dr	Bridge / 145th Lane	CS	2023	2016	1996	0	0	0.67	9
	164th Lane	Andrie St / Driscoll Cir	CS	2023		1985	0	2016	0.18	10
	164th Lane	Fortmann Cir / Halas Cir	CS	2023		1985	0	2016	0.12	10
	164th Lane	Halas Cir / Jarvis St	CS	2023		1985	0	2016	0.12	10
	164th Lane	Driscoll Cir / Fortmann Cir	CS	2023		1985	0	2016	0.2	10
	Andrie St	S EOP / 164th Lane	CS	2023		1985	0	2016	0.18	10
	Andrie St	164th Lane / 164th Lane	CS	2023		1985	0	2016	0.08	10
	Andrie St	S EOP / N EOP	CS	2023		1987	0	2016	1.02	10
	Uranimite St	149th Ave / 150th Lane	CS	2023	2002	1979	0	0	0.17	8
	Uranimite St	150th Lane /	CS	2023	2005	1981	0	0	0.35	7

	Sunwood Dr	152nd Lane CR 57 / 145th Lane	CS	2023	2016	1996	0	0	0.17	9
	Rhinestone St	Veterans Drive / Sunwood Dr	CS	2023		2007	0	0	0.16	9
	Zeolite St	Sunwood Dr / Veterans Drive	CS	2023		2005	0	0	0.09	9
	Veterans Drive	Zeolite St / Sapphire St	CS	2023		2005	0	0	0.44	9
	Veterans Drive	Saphire / Rhinestone	CS	2023		2007	0	0	0.21	9
	Puma St	Lift Station 8 / 152nd Ave	CS	2023		2011	0	2020	0.1	10
	Puma St	152nd Ave / Alpine Dr	CS	2023		2020	0	0	0.1	10
Sum Miles_2	6.61									
Plat		Northfork Alpine Addition								
	Name	DESCRIPT	PRG_TYP	PRG_YR	OL	CONST	OL2	RC	Miles_2	RTG_2021
	Alpine Ct	Alpine Dr - CDS	CS	2023	0	2016	0	0	0.06	10
Sum Miles_2	0.06									
Plat		Ramsey Town Center IP 05-22								
	Name	DESCRIPT	PRG_TYP	PRG_YR	OL	CONST	OL2	RC	Miles_2	RTG_2021
	Sapphire St	Sunwood Dr / Veterans Drive	CS	2023		2005	0	0	0.08	10
Sum Miles_2	0.08									
Plat		River Bluffs								
	Name	DESCRIPT	PRG_TYP	PRG_YR	OL	CONST	OL2	RC	Miles_2	RTG_2021
	Oneida St	153rd Ave / E EOP	CS	2023		1992	0	0	0.05	8
	Oneida St	153rd Ave / E CDS	CS	2023		1992	0	0	0.06	8
Sum Miles_2	0.11									
Plat		River Bluffs 2nd								
	Name	DESCRIPT	PRG_TYP	PRG_YR	OL	CONST	OL2	RC	Miles_2	RTG_2021
	152nd Ave	Oneida St / CDS	CS	2023		1994	0	0	0.06	7
	Oneida St	152nd Ave / S EOP	CS	2023		1994	0	0	0.09	7

	Oneida St	152nd Ave / N EOP	CS	2023		1994	0	0	0.07	6
Sum Miles_2	0.22									
Plat		River Pines 1st								
	Name	DESCRIPT	PRG_TYP	PRG_YR	OL	CONST	OL2	RC	Miles_2	RTG_2021
	Neon St	157th Lane / N EOP	CS	2023		1999	0	0	0.12	8
	157th Lane	Neon St / E EOP	CS	2023		1999	0	0	0.07	8
Sum Miles_2	0.19									
Plat		River Pines 2nd								
	Name	DESCRIPT	PRG_TYP	PRG_YR	OL	CONST	OL2	RC	Miles_2	RTG_2021
	158th Ave	E EOP / Neon St	CS	2023		2000	0	0	0.11	8
	158th Lane	E EOP / Neon St	CS	2023		2000	0	0	0.09	8
	Neon St	158th Ave / 158th Lane	CS	2023		2000	0	0	0.06	8
Sum Miles_2	0.26									
Plat		River Pines 3rd								
	Name	DESCRIPT	PRG_TYP	PRG_YR	OL	CONST	OL2	RC	Miles_2	RTG_2021
	Osmium St	157th Lane / 158th Ave	CS	2023		2001	0	0	0.12	8
	157th Lane	Osmium St / E EOP	CS	2023		2001	0	0	0.08	7
Sum Miles_2	0.2									
Plat		River Pines 4th								
	Name	DESCRIPT	PRG_TYP	PRG_YR	OL	CONST	OL2	RC	Miles_2	RTG_2021
	Potassium St	W EOP / W EOP	CS	2023		2002	0	0	0.21	8
	Osmium St	158th Ave / N CDS	CS	2023		2002	0	0	0.07	8
	158th Ave	Potassium / Osmium	CS	2023		2002	0	0	0.07	8
Sum Miles_2	0.35									
Plat		River Pines 5th								
	Name	DESCRIPT	PRG_TYP	PRG_YR	OL	CONST	OL2	RC	Miles_2	RTG_2021
	158th Court	Lithium St / CDS	CS	2023		2002	0	0	0.07	8

	158th Lane	Lithium / W EOP	CS	2023		2002	0	0	0.05	8
	Lithium St	158th Ave / 158th Lane	CS	2023		2002	0	0	0.07	8
	Lithium St	158tj Lane/ NEOP	CS	2023	0	2002	0	0	0.03	8
Sum Miles_2	0.22									
Plat		Rivers Bend								
	Name	DESCRIPT	PRG_TYP	PRG_YR	OL	CONST	OL2	RC	Miles_2	RTG_2021
	142nd Lane	Waco St / CDS	CS	2023	2010	1985	0	0	0.25	8
	Waco St	142nd Lane / 1/2 S EOP	CS	2023	2010	1985	0	0	0.06	8
	146th Cir	Waco St / CDS	CS	2023	2010	1985	0	0	0.03	8
	Waco St	Sunwood Dr / 142nd Lane	CS	2023	2010	1985	0	0	0.83	8
Sum Miles_2	1.17									
Plat		Rivers Bend 2nd								
	Name	DESCRIPT	PRG_TYP	PRG_YR	OL	CONST	OL2	RC	Miles_2	RTG_2021
	Waco St	S EOP / 1/2 N EOP	CS	2023	2010	1985	0	0	0.09	9
Sum Miles_2	0.09									
Plat		Rivers Bend Plaza								
	Name	DESCRIPT	PRG_TYP	PRG_YR	OL	CONST	OL2	RC	Miles_2	RTG_2021
	142nd Ave	Xkimo St/ Waco St	CS	2023	2010	1985	0	0	0.06	8
Sum Miles_2	0.06									
Plat		Riverstone 3rd								
	Name	DESCRIPT	PRG_TYP	PRG_YR	OL	CONST	OL2	RC	Miles_2	RTG_2021
	Tiger Street	149th Ave / 150th Ln	CS	2023		2019	0	0	0.13	10
Sum Miles_2	0.13									
Plat		Rum Acre Estates								
	Name	DESCRIPT	PRG_TYP	PRG_YR	OL	CONST	OL2	RC	Miles_2	RTG_2021
	Juniper Ridge Dr	E EOP / CDS	CS	2023	2000	1975	0	0	0.31	7
	151st Ave	W EOP / Juniper Ridge Dr	CS	2023	2000	1975	0	0	0.04	8

	Salish St	153rd Ave / Juniper Ridge Dr	CS	2023	2000	1975	0	0	0.23	8
Sum Miles_2	0.58									
Plat		Section 21 Unplatted								
	Name	DESCRIPT	PRG_TYP	PRG_YR	OL	CONST	OL2	RC	Miles_2	RTG_2021
	150th Lane	CR 83 / W EOP Greenland Hills	CS	2023	2002	1981	0	0	0.12	7
Sum Miles_2	0.12									
Plat		Section 24 Unplatted								
	Name	DESCRIPT	PRG_TYP	PRG_YR	OL	CONST	OL2	RC	Miles_2	RTG_2021
	150th Ave	Xkimo St / Waco St	CS	2023	2006	1979	0	0	0.08	8
Sum Miles_2	0.08									
Plat		Sweetbay Ridge								
	Name	DESCRIPT	PRG_TYP	PRG_YR	OL	CONST	OL2	RC	Miles_2	RTG_2021
	Uranimite St	161st / 162nd Ave	CS	2023		2010	0	0	0.08	10
	162nd Ave	Uranimite / Rhinestone	CS	2023		2010	0	0	0.11	10
	Rhinestone St	161st / Sapphire	CS	2023		2010	0	0	0.05	10
	163rd Ave	Varioite / Sapphire	CS	2023		2010	0	0	0.2	10
	Sapphire St	Rhinestone / 163rd Ave	CS	2023		2010	0	0	0.08	10
	Rhinestone St	161st Ave/ CDS	CS	2023		2010	0	0	0.11	10
Sum Miles_2	0.63									
Plat		Village of Sunfish Lake								
	Name	DESCRIPT	PRG_TYP	PRG_YR	OL	CONST	OL2	RC	Miles_2	RTG_2021
	146th Lane	Sunwood Dr / Sodium St	CS	2023		2003	0	0	0.05	8
	146th Lane N	park circle / Radium St	CS	2023		2003	0	0	0.05	8
	146th Lane S	park circle / Radium St	CS	2023		2003	0	0	0.04	8
	Sodium St	146th Lane / Radium St	CS	2023		2003	0	0	0.16	8
	146th Lane	Sodium St /	CS	2023		2003	0	0	0.06	9

	Radium St	park circle Sunwood Dr / Sodium St	CS	2023		2003	0	0	0.06	7
	Radium St	Sodium St / 146th Way S	CS	2023		2003	0	0	0.08	8
	Radium St	146th Lane S / 146th Ave	CS	2023		2004	0	0	0.06	8
	Tungsten Way	146th Ave / S EOP	CS	2023		2004	0	0	0.03	9
	146th Ave	146th Lane / Tungsten Way	CS	2023		2004	0	0	0.07	8
	146th Ave	Tungsten Way / Radium St	CS	2023		2004	0	0	0.09	8
	146th Ave	Radium St / E EOP	CS	2023		2004	0	0	0.08	8
Sum Miles_2	0.83									
Plat		Willow Ridge								
	Name	DESCRIPT	PRG_TYP	PRG_YR	OL	CONST	OL2	RC	Miles_2	RTG_2021
	Barium St	Cobalt St / TH 47	CS	2023		1995	0	0	0.05	6
	Cobalt St	N EOP / Barium St	CS	2023		1995	0	0	0.08	6
	Barium St	N EOP / Cobalt St	CS	2023		1995	0	0	0.17	6
	Cobalt St	Barium St / N EOP	CS	2023		1995	0	0	0.11	7
Sum Miles_2	0.41									
Plat		Woodlands								
	Name	DESCRIPT	PRG_TYP	PRG_YR	OL	CONST	OL2	RC	Miles_2	RTG_2021
	159th Avenue	Variolite / E EOP	CS	2023		2015	0	0	0.05	10
	Uranimite St	159th Ave / 161st Ave	CS	2023		2015	0	0	0.2	10
	159th Lane Ct	Uranimite St / CDS	CS	2023		2015	0	0	0.04	10
Sum Miles_2	0.29									
Plat		Woodlands 2nd								
	Name	DESCRIPT	PRG_TYP	PRG_YR	OL	CONST	OL2	RC	Miles_2	RTG_2021
	159th Ave	Uranimite St -	CS	2023	0	2016	0	0	0.25	10

		Sapphire St
Sum Miles_2	0.25	
Sum Miles_2	18.8	

Public Works Committee **6. 1.**

Meeting Date: 02/21/2023

By: Bruce Westby, Engineering/Public Works

Title:

Receive Updates on Improvement Projects, Studies and Items of Interest

Purpose/Background:

The purpose of this case is to update the Public Works Committee on current and proposed City, County and MnDOT improvement projects and studies, and on other items of interest to the Committee.

City Improvement Projects

- **161st Avenue Reconstruction (IP #23-01)**
  - Staff is preparing plans and specifications
  - Staff is coordinating design with PACT Charter school
  - Staff applied for ATIP trail grant funding per Council approval
  - 2023 construction proposed
- **Central Park Parking Lot Reconstruction (IP #23-02)**
  - Staff is preparing plans and specifications
  - 2023 construction proposed
- **167th Avenue Reconstruction (IP #23-04)**
  - Bolton & Menk is preparing plans and specs per Council approval
  - Staff applied for ATIP trail grant funding per Council approval
  - 2023 construction proposed
- **Barthels Rum River Acres 2nd Reconstruction (IP #23-05)**
  - Staff is preparing plans and specifications
  - 2023 construction proposed
- **2023 MSA Pavement Overlay Improvements (IP #23-06)**
  - Staff is preparing plans and specifications
  - 2023 construction proposed
- **2023 Neighborhood Pavement Overlay Improvements (IP #23-07)**
  - Staff is preparing plans and specifications
  - 2023 construction proposed
- **2023 Crack Seal Improvements (IP #23-08)**
  - Staff is preparing plans and specifications
  - 2023 construction proposed
- **2023 Pavement Rejuvenator Improvements (IP #23-09)**
  - Staff is preparing plans and specifications
  - 2023 construction proposed
- **Whispering Pines Estates Plat 3 Reconstructions (IP #23-10)**
  - Staff is preparing plans and specifications
  - 2023 construction proposed
- **Trott Brook Crossing Sanitary Sewer Lift Station Improvements (IP #23-11)**
  - Bolton and Menk is preparing plans and specifications per Council approval
  - 2023 construction proposed
- **HY-10 Ramsey Improvements (IP #23-12)**
  - Bolton and Menk is preparing plans and specifications per Council approval
  - 2023 construction proposed to support ARAA sports dome project
- **Autumn Heights Street Reconstructions (IP #22-02)**
  - Construction complete è punch list mode
- **Riverdale Drive Trunk Utility Improvements (IP #22-05)**

- Construction complete è punch list mode
- **Highway 47 Sound Wall north of Xkimo Street (IP #22-17)**
  - City Council will consider authorizing bids soon (March/April)
- **WTP Trunk Watermain Improvements (#21-08)**
  - Plans are being revised to minimize project costs and include WTP commissioning improvements (well-house valves, etc.)
  - City Council will consider authorizing bids when plans are complete
- **Centralized Water Treatment Plant (#21-09)**
  - Bid opening March 9th @ 1 PM
  - City Council to consider accepting bids and awarding contract March 28th
- **Ramsey Gateway Highway 10 Improvements (IP #20-11)**
  - Final design nearly complete
  - Property/easement acquisitions nearly complete
  - Construction anticipated mid 2023 through early 2026 (2024 - 2025 majority)
  - Riverdale Drive east of SLB & temp US 10 widening mid 2023
- **Riverdale Drive Extension – Llama Street to Bowers Drive (IP #20-05)**
  - Construction substantially complete è Hwy 10 improvements still needed
- **Wetland 114P Outlet Control Improvements (#19-07)**
  - Executing contract
  - Awaiting DNR Permit

City of Anoka Improvement Projects

- **Highway 47 Corridor Improvements**
  - Construction proposed for 2025
  - Anoka webpage https://clients.bolton-menk.com/anokahwy47/

Anoka County Improvement Projects

- **Roundabout at Armstrong Boulevard/CSAH 83 and Alpine Drive (IP #23-03)**
  - Anoka County received $1.35M in HSIP funds (est. project cost $1.5M)
  - JPA includes City cost share of $28,667.64
  - Bids opened February 13th (results as yet unknown)

MnDOT Improvement Projects

- **Anoka Solution Highway 10 Improvements**
  - Final completion Spring 2024
  - 2-lanes open for winter
  - Anoka webpage https://clients.bolton-menk.com/hwy10/
  - MnDOT webpage http://www.dot.state.mn.us/metro/projects/hwy10-anoka/
- **US 10 / 169 & Ferry Street / TH 47 Interchange**
  - Final completion Spring 2024
  - MnDOT webpage http://www.dot.state.mn.us/metro/projects/hwy10-anoka/
- **Ferry Street / Trunk Highway 47 Grade Separation @ BNSF Rail Crossing**
  - Preliminary design suspended to explore s-curve realignment
  - $45M in bonds authorized October 2020
  - Construction proposed for 2024 or later
  - MnDOT webpage http://www.dot.state.mn.us/metro/projects/hwy47rr-anoka/
- **Rum River Bridge Replacement**
  - Final completion Spring 2024
  - Three lanes each direction
  - MnDOT webpage http://www.dot.state.mn.us/metro/projects/hwy10-anoka/

Studies & Items of Interest

- **Sunfish Lake Sedimentation Basin Improvements**
  - Property owner interested in pursuing request to fill swale and grade basin
  - Staff delineated rear property line last Fall and notified property owner
  - Staff contacted property owner again in February by email and letter
- **CSAH 5 / Nowthen Boulevard Corridor Study**
  - *Final report will be presented February 21st*
- **Elk River Highway 10 Corridor Study**
  - Staff will present the final report when available
  - Study website https://www.highway10corridorstudy.com/

Timeframe:

Staff estimates up to 15 minutes will be needed for updates and discussion.

Observations/Alternatives:

N/A

Funding Source:

N/A

Recommendation:

N/A

Action:

No formal action required. For Committee review and discussion purposes only.

Attachments

No file(s) attached.

Form Review

Inbox	Reviewed By	Date
Brian Hagen	Brian Hagen	02/16/2023 03:09 PM
Form Started By: Bruce Westby		Started On: 02/09/2023 01:52 PM
Final Approval Date: 02/16/2023		

Public Works Committee **6. 2.**

Meeting Date: 02/21/2023

By: Bruce Westby, Engineering/Public Works

Title:

Review Future Topics Calendar

Purpose/Background:

Attached is a calendar of future topics for review and discussion by the Public Works Committee. The calendar includes topics drawn from Committee requests received during meetings and/or unresolved topics previously discussed by the Committee. Calendar dates are subject to change based on the availability of information and required attendees, staff workload, and competing interests and objectives.

Timeframe:

Less than 5 minutes is anticipated to be necessary to review the future topics calendar and address questions.

Observations/Alternatives:

N/A

Funding Source:

N/A

Recommendation:

Staff recommends reviewing the attached calendar and to either approve the calendar by consensus or to direct Staff to revise the calendar as follows; _____.

Action:

No formal action required. For Committee review and discussion purposes only.

Attachments

Feb2023 PWC Calendar

Form Review

Inbox	Reviewed By	Date
Brian Hagen	Brian Hagen	02/16/2023 01:41 PM
Form Started By: Bruce Westby		Started On: 02/09/2023 01:53 PM
Final Approval Date: 02/16/2023		

Public Works Committee Future Topics Calendar *

Date	Topics for Discussion – Committee Action
Future/TBD	Sunfish Lake Sedimentation Basin Improvements *(Westby)*
Future/TBD	Sunwood Drive Roundabout Landscaping *(Riverblood)*
Date	**Topics for Discussion – Regulatory**
Future/TBD	Sunfish Lake Blvd./CSAH 57 Speed Study Results *(Westby)*
Future/TBD	Bunker Lake Blvd./CSAH 116 Speed Study Results *(Westby)*
Date	**Topics for Discussion – Policy**
Future/TBD	Landscaped Median Maintenance Policy *(Riverblood)*
May 2023	Draft Trail Maintenance Policy *(Riverblood)*
May 2023	Draft Stormwater Pond Maintenance Policy *(Westby)*
Date	**Topics for Discussion – Planning and Budget**
Future/TBD	Asset Management Programming Update *(Westby)*
Future/TBD	Replace City monument sign TH 47 & Bunker Lk Blvd. *(Riverblood)*
Future/TBD	Targeted Trail Gap Connection Planning *(Riverblood)*
~~Ongoing~~	~~EAB Diseased Boulevard Tree Removal/Replacement Plan Update~~
Date	**Topics for Discussion – Staff Updates**
Future/TBD	Elk River Highway 10 Corridor Study *(Westby)*
~~February 2023~~	~~Anoka County Nowthen Blvd/CSAH 5 Corridor Study *(Westby)*~~
Ongoing	Project Review Process Improvements *(Westby)*
Ongoing	Flashing Yellow Arrow Improvement Opportunities *(Westby)*
Ongoing	TH 47 Improvements, Bunker Lk Blvd to Hwy 10 *(Westby)*

* Dates subject to change based on availability of information, required attendees, staff workload, and competing interests and objectives.