City of Ramsey
Agenda
Public Works Committee
Tuesday, November 17, 2020
5:30 pm
Lake Itasca Room, 7550 Sunwood Drive NW

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 October 20, 2020.

5. Committee Business

1. Consider Recommendation to City Council Approving Proposal to Comply with America's Water Infrastructure Act of 2018

2. Consider Recommendation to City Council Authorizing Flashing Yellow Arrow Studies at Select Intersections

6. Committee/Staff Input

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

2. Review Future Topics Calendar

7. Adjournment

Public Works Committee **4. 1.**

Meeting Date: 11/17/2020
Submitted For: Grant Riemer, Engineering/Public Works
By: MaryJo Warner, Engineering/Public Works

Title:

Approve the following meeting minutes.
1. Public Works Committee meeting dated October 20, 2020.

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 October 20, 2020.

Action:

Motion to approve meeting minutes dated October 20, 2020.

Attachments

Minutes

Form Review

Inbox	Reviewed By	Date
Grant Riemer	Grant Riemer	11/12/2020 08:54 AM
Kurt Ulrich	Kurt Ulrich	11/12/2020 02:48 PM
Form Started By: MaryJo Warner		Started On: 11/10/2020 03:59 PM
Final Approval Date: 11/12/2020		

PUBLIC WORKS COMMITTEE
CITY OF RAMSEY
ANOKA COUNTY
STATE OF MINNESOTA

The Public Works Committee conducted a regular meeting on Tuesday, October 20, 2020, at the Ramsey Municipal Center, 7550 Sunwood Drive NW, Ramsey, Minnesota.

Members Present: Chairperson Mark Kuzma
Councilmember Jeff Menth
Councilmember Chris Riley

Also Present: Public Works Superintendent Grant Riemer
City Engineer Bruce Westby
City Administrator Kurt Ulrich

1. CALL TO ORDER

Chairperson Kuzma 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 Riley, seconded by Councilmember Menth, to approve the agenda, as presented.

Motion carried. Voting Yes: Chairperson Kuzma, Councilmembers Riley and Menth. Voting No: None.

4. APPROVE MINUTES

4.01: Approve September 15, 2020, Meeting Minutes

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

Regular Meeting Minutes dated September 15, 2020

Motion carried. Voting Yes: Chairperson Kuzma, Councilmembers Riley and Menth. Voting No: None.

5. COMMITTEE BUSINESS

5.01: Request for Street Light at the Corner of Alpaca St and 166th Ave

Public Works Superintendent Riemer reviewed the staff report and stated that staff agrees with the petition and would recommend installing the light at the intersection.

Motion by Councilmember Riley, seconded by Councilmember Menth, to approve the installation of the street light at the intersection of Alpaca St/166th Avenue.

Motion carried. Voting Yes: Chairperson Kuzma, Councilmembers Riley and Menth. Voting No: None.

5.02: Request to Upgrade Street Light at the Corner of 144th Lane and Tungsten Way

Public Works Superintendent Riemer reviewed the staff report and recommendation not to upgrade to an LED fixture at this time and let Connexus Energy decide when replacement is required. Councilmember Menth asked if there was a timeline provided by Connexus.

Public Works Superintendent Riemer replied that Connexus replaces the fixtures on their maintenance schedule/when it needs replacement. He stated that it could be one year or five years. He noted that the resident was in agreement with that information.

Motion by Councilmember Riley, seconded by Councilmember Menth, to recommend that the City Council not upgrade to an LED fixture at this time and let Connexus Energy decide when replacement is required.

Motion carried. Voting Yes: Chairperson Kuzma, Councilmembers Riley and Menth. Voting No: None.

5.03: Consider Recommendation to City Council Authorizing Requests for Quotes for America's Water Infrastructure Act of 2018

City Engineer Westby reviewed the staff report and recommendation to recommend City Council authorization to solicit Request for Quotes from qualified consultants to comply with the America's Water Infrastructure Act of 2018.

Councilmember Riley asked if most of the information would be the same for each city. He asked if perhaps cities could work together to develop some of the shared information.

City Engineer Westby stated that could be an option but that would take additional time. He reviewed the work that staff is currently working on and did not believe that staff would have additional time for this project. He hoped that a reasonable quote would be obtained for this work so Staff could continue to focus on their primary work duties. He stated that if a reasonable quote is not received, staff could contact other cities and work to complete the required plans in-house. He stated he was not sure how much time it would take to prepare the required plans, and noted that the plans must be updated every five years after initial approval.

Councilmember Riley asked if the plan would change if there is a new water treatment facility.

City Engineer Westby replied that it would not make that much of a difference because it is based on the entire water system, such as the piping and hydrants.

Councilmember Menth stated that he wants to know what is expected by this study.

City Engineer Westby replied that the plan could be robust or bare bones. He commented that the Midwest is pretty insulated from some emergency events that would impact the water supply system and therefore this would not need to be a robust plan.

Councilmember Menth asked if staff should be directed to reach out to neighboring communities to determine if there is an opportunity to share work.

City Engineer Westby confirmed that staff could do that and delay this action by one month until the next meeting.

Councilmember Musgrove asked if part of the work could be completed in-house and the remainder done by a consultant in order to share the workload. She commented that she noticed some links and example information that staff could use to develop the plan.

City Engineer Westby confirmed that links and other information are available online. He reviewed the benefits that would be realized by using a consultant such as familiarity with the required plans and approval processes, and knowledge of what other cities plans include.

Councilmember Riley asked the estimated ballpark cost for this type of work.

City Engineer Westby provided information on an unofficial cost estimate that he received.

Motion by Councilmember Riley, seconded by Councilmember Menth, to direct staff to contact other cities in attempt to work together to reduce costs to prepare the required plans, and to obtain an indication of services that could be provided by the Consultant preparing the water treatment feasibility study related to completing the required plans.

Motion carried. Voting Yes: Chairperson Kuzma, Councilmembers Riley and Menth. Voting No: None.

6. COMMITTEE / STAFF INPUT

6.01: Staff Updates on Improvement Projects and Items of Interest

City Engineer Westby provided an update on current and proposed City, County and MnDOT improvement projects and studies and on other items of interest.

Councilmember Riley stated that he has heard that the TH 47 BNSF railroad crossing is fully funded and asked about the timing on that project.

City Engineer Westby stated that he did not believe the plans were complete yet, so he was unsure how funding could have been obtained without a firm estimate.

Councilmember Riley asked that staff continue to follow that project to stay involved.

Councilmember Menth asked for an update on the schedule of the first Public Advisory Committee (PAC) meeting for the NW Metro Mississippi River Crossing Feasibility Analysis.

City Engineer Westby noted that while this project is proceeding slower than originally planned, MnDOT is working to prepare materials to allow the first meeting of the PAC to occur early this winter.

6.02: Review Future Topics Calendar

No comments.

7. ADJOURNMENT

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

Motion carried.

The regular meeting of the Public Works Committee adjourned at 6:01 p.m.

Respectfully submitted,

_____

Grant Riemer
Public Works Superintendent

Drafted by Amanda Staple
TimeSaver Off Site Secretarial, Inc.

Public Works Committee **5. 1.**

Meeting Date: 11/17/2020

By: Bruce Westby, Engineering/Public Works

Title:

Consider Recommendation to City Council Approving Proposal to Comply with America's Water Infrastructure Act of 2018

Purpose/Background:

Purpose:

The purpose of this case is to consider a recommendation to City Council authorizing Requests for Quotes for America's Water Infrastructure Act of 2018.

Background:

On October 23, 2018, America's Water Infrastructure Act (AWIA) was signed into law, amending numerous provisions of the Safe Drinking Water Act (SDWA). The SDWA was originally passed by Congress in 1974 to protect public health by regulating the nation's public drinking water supply. The law was amended in 1986 and 1996 and requires many actions to protect drinking water and its sources including rivers, lakes, reservoirs, springs, and ground water wells. The SDWA does not regulate private wells which serve fewer than 25 individuals. The SDWA authorizes the United States Environmental Protection Agency (US EPA) to set national health-based standards for drinking water to protect against both naturally-occurring and man-made contaminants that may be found in drinking water. More information on the SDWA is contained in the attached 4 page summary.

The AWIA also amended the Emergency Planning and Community Right-to-Know Act (EPCRA). The revisions to EPCRA require that community water systems (1) receive prompt notification of any reportable release of an EPCRA extremely hazardous substance (EHS) or a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) hazardous substance (HS) that potentially affects their source water, and (2) have access to EPCRA Tier II information (i.e., hazardous chemical inventory data). These requirements went into effect immediately upon signing the law.

The AWIA is a federal law that requires community water systems serving more than 3,300 people to develop or update Risk and Resilience Assessments (RRA's) and Emergency Response Plans (ERP's). The law specifies the components that the RRA's and ERP's must address, and establishes deadlines by which water systems must certify to the US EPA completion of the RRA and ERP. These community water systems, or utilities, must:

- Conduct a Risk and Resilience Assessment (RRA)
- Prepare or revise an Emergency Response Plan (ERP)
- Submit a certification letter upon completion to the U.S. Environmental Protection Agency (U.S. EPA) for each (RRA and ERP)
- Review, update, revise as necessary and submit a recertification for both at least every 5 years thereafter
- Maintain records (keep copies of RRA and ERP and any updates for 5 years after certification submittal)

Below is a table showing the AWIA compliance deadlines, which is based on population served by the community water system, or utility.

The City of Ramsey must comply with the AWIA by June 30, 2021 (RRA) and December 30, 2021 (ERP). If the City does not certify that it has complied with the AIWA by these deadlines, the US EPA can initiate enforcement actions and assess a penalty of up to $25,000 per day for non-compliance.

Several qualified consultants had contacted the City to inquire if the City needs assistance with this effort. On October 20, 2020, Staff requested that the Public Works Committee (PWC) recommend City Council approval to submit Requests for Quotes to qualified consultants in an attempt to receive at least three quotes.

During the October PWC meeting, the Committee members felt Staff should look into potential cost savings measures such as completing some or all of the work in-house, contacting other cities to see if opportunities might exist to prepare parts of the plans that have information common to some or all of the cities, and to ask our consultant that is preparing the Centralized Water Treatment Plant Feasibility Study to see if they could prepare the plans at a reduced fee since they already have ready access to the City of Ramsey's water supply system data.

Staff contacted the cities of Anoka, Andover, Coon Rapids, Fridley, and Saint Francis. All but Saint Francis responded and said they had already hired consultants to prepare their plans so partnering with these cities would not be an option without first restructuring their consultant's contracts.

Staff also requested proposals for preparing the RRA and ERP plans from SEH, Inc., the consultant currently completing the City's Water Treatment Plant Feasibility Study, and to do so using hourly rates that could be reduced if City Staff is able to complete portions of the work in-house.

Staff is therefore requesting that the Public Works Committee recommend City Council approval to accept the attached proposals from SEH, Inc. to assist the City in preparing the RRA to comply with the AWIA by the required deadline of June 30, 2021, at a total cost not to exceed $11,000, and the ERP by the required deadline of December 30, 2021, at a total cost not to exceed $2,500. This would cap the work at a maximum not-to-exceed fee of $13,500.

Staff will also work to complete as much of the RRA and the ERP as possible in-house, and to use SEH, Inc. to complete the remainder of the tasks that Staff is not able to complete by the required deadlines. Per the proposal, the rates will be invoiced hourly so any work Staff can complete will reduce their fees accordingly.

Timeframe:

Staff estimates approximately 20 minutes will be required for presentation and discussion of this case.

Observations/Alternatives:

Alternative #1: Motion to recommend City Council approval of the proposal from SEH, Inc. to assist City Staff in complying with America's Water Infrastructure Act of 2018.

Alternative #2: Motion of other.

Funding Source:

All consultant costs are proposed to be paid from the Water funds.

Recommendation:

Staff recommends alternative #1.

Action:

Motion to recommend City Council approval of the proposal from SEH, Inc. to assist City Staff in complying with America's Water Infrastructure Act of 2018.

Attachments

SEH Proposal AWIA RRA
SEH Proposal AWIA ERP
AWIA Fact Sheet

Form Review

Inbox	Reviewed By	Date
Grant Riemer	MaryJo Warner	11/12/2020 04:27 PM
Kurt Ulrich	Kurt Ulrich	11/12/2020 04:37 PM
Form Started By: Bruce Westby		Started On: 11/09/2020 04:12 PM
Final Approval Date: 11/12/2020		

November 12, 2020

RE: AWIA Risk and Resilience Assessment
Ramsey, MN

Bruce Westby, PE
City Engineer
City of Ramsey
7550 Sunwood Drive NW
Ramsey, MN 55303

Dear Bruce,

On October 23, 2018 the America's Water Infrastructure Act (AWIA) was signed into law. Under this law community water systems with a population greater than 3,300 people must develop or update risk and resilience assessments (RRAs) and emergency response plans (ERPs). With the population served by Ramsey's water system, the RRA is due by June 30, 2021, and the ERP is due within six months of RRA certification. With these two dates fast approaching, the City is now seeking proposals to assist them with the RRA. Please note that this proposal does not include preparing the ERP.

Short Elliott Hendrickson (SEH) has discussed the project with the City and has come to understand the City's goals and desired outcomes from this work. Transmitted herewith is our proposal for professional engineering services for the work of developing the Utility's Risk and Resilience Assessment.

Background

The City has an existing Vulnerability Assessment and Emergency Response Plan that was required under the Bioterrorism Act of 2002, but under the Bioterrorism Act, the threat focus was on terrorism and other malevolent threats. Under AWIA, it is required to take an all-hazards approach when developing RRAs, the new vulnerability assessment, and ERPs. Specifically, to be in compliance with AWIA, the City is required to create an RRA that meets the following requirements.

Risk and Resilience Assessments shall include:

- Risks to the water system from malevolent acts, natural disasters, and other hazards.
- Resilience of the water system's critical assets such as wells, treatment processes, and computer systems.
- An assessment of the monitoring practices of the system.
- An assessment of the City's financial infrastructure such as the cybersecurity of the computer systems for payroll and customer billing.
- A review of how the system uses, stores, and handles various chemicals.
- A review of the systems operation and maintenance procedures.

Proposed Project

For this project, SEH proposes to perform a risk and resilience analysis of the City's drinking water system. Following this work, SEH will work with the City to evaluate the risks identified and develop mitigation strategies for risks deemed unacceptable to the City.

Following the completion and certification of these efforts, the City will be in compliance with AWIA's RRA requirements. An ERP, not included in this proposal, will need to be prepared within 6 months of the RRA certification.

Project Scope

For this proposal, SEH proposes to perform the following two (2) basic tasks as listed below:

1. Task No. 1 – Project Initialization and Data Collection
    a. Project setup
        i. Develop and sign the contract for the scope of work.
        ii. Create the project in the SEH accounting system.
    b. Meeting No. 1 – Kick-off meeting with City staff
        i. Confirm and establish scope and goals of the project.
        ii. Identify infrastructure to be assessed during the RRA.
        iii. Identify information and/or materials that are needed or will be useful to conduct the RRA.
    c. Meeting No. 2 – Tour City's existing facilities, and interview Utility Services staff
        i. Inventory and review of the City's critical water assets.
        ii. Inventory and review of the City's existing protection measures for their critical assets.
        iii. Gather input from City Utility Services staff on any perceived or real threats to Utility's critical assets.
        iv. Review the City's SOPs, daily operations, and monitoring procedures. This would include things such as sampling schedules, and inspection procedures.
2. Task No. 2 – Risk and Resilience Assessment
    a. Conduct Risk and Resilience Assessment using the U.S. Environmental Protection Agency's (EPA) Vulnerability Self-Assessment Tool (VSAT) Web Version 2.0.
    b. Work with City staff to develop standard operating procedures and mitigation measures for risks identified through the RRA.
    c. Meeting No. 3 – RRA Analysis & Risk Mitigation Development
        i. SEH will present the results of the RRA and work with the City to assess identified risks and potential mitigation measures for risks deemed unacceptable, as well as assess costs associated with the risks and potential mitigation measures.
    d. Submit draft RRA Results & Report to Owner's project team.
    e. Incorporate Owner's comments into the report and deliver hard copies.
    f. Assist the City in the EPA's certification process of the RRA.

Deliverables

Project deliverables, also defined in the Task descriptions above, include:

1. Electronic and three (3) hard copies of the final RRA Report summarizing the work of Task No. 2 – Risk and Resilience Assessment. Reimbursement for printing is included in the proposed pricing.

Project Schedule

We estimate the project to follow the schedule below:

Contract and Project Setup	Early December 2020
Background Document Review & Data Collection	Mid Dec. – Mid Feb. 2021
Conduct RRA	Mid Feb. – Mid April. 2021
Submit Draft RRA Tech. Memo to City's Team	End April 2021
Finalize RRA Technical Memorandum	Late May 2021
Submit RRA Certification	Late May 2021

Consultant Staff

I will serve as the project manager for this Project and will be responsible for coordinating the overall work efforts for the project. Simon McCormack, PE has completed AWWA's Utility Risk & Resilience Certificate Program and will be responsible for developing the RRA, writing the RRA Report, and assisting with the EPA's certification process

Compensation

Task No. 1 – Project Initialization & Data Collection Fees

We propose to complete the scope of services identified above on an hourly basis that is in accordance with our standard billing rate schedule. We proposed an Hourly Not-to-Exceed amount of $4,700, for this phase, which includes reimbursable expenses. We understand this Not-to-Exceed amount cannot increase without further authorization from you.

Task No. 2 – Risk and Resilience Assessment Fees

We propose to complete the scope of services identified above on an hourly basis that is in accordance with our standard billing rate schedule. We proposed an Hourly Not-to-Exceed amount of $6,300, for this phase, which includes reimbursable expenses. We understand this Not-to-Exceed amount cannot increase without further authorization from you.

Closure

We want to thank you for the opportunity to provide the City of Ramsey with this proposal. As always, it is very important to us our services continue to meet and surpass your needs and expectations. After you have had an opportunity to review this proposal, we would like to hear any comments, concerns or questions you may have.

Sincerely,

SHORT ELLIOTT HENDRICKSON INC.

Christopher Larson, PE
Project Manager

November 12, 2020

RE: AWIA Emergency Response Plan
Ramsey, MN

Bruce Westby, PE
City Engineer
City of Ramsey
7550 Sunwood Drive NW
Ramsey, MN 55303

Dear Bruce,

On October 23, 2018 the America's Water Infrastructure Act (AWIA) was signed into law. Under this law community water systems with a population greater than 3,300 people must develop or update risk and resilience assessments (RRAs) and emergency response plans (ERPs). With the population served by Ramsey's water system, the RRA is due by June 30, 2021, and the ERP is due within six months of RRA certification. With these two dates fast approaching, the City is now seeking proposals to assist them with the ERP. Please note that this proposal does not include preparing the RRA.

Short Elliott Hendrickson (SEH) has discussed the project with the City and has come to understand the City's goals and desired outcomes from this work. Transmitted herewith is our proposal for professional engineering services for the work of developing the Utility's Emergency Response Plan.

Background

The City has an existing Vulnerability Assessment and Emergency Response Plan that was required under the Bioterrorism Act of 2002, but under the Bioterrorism Act, the threat focus was on terrorism and other malevolent threats. Under AWIA, it is required to take an all-hazards approach when developing RRAs, the new vulnerability assessment, and ERPs. Specifically, to be in compliance with AWIA, the City is required to create an ERP that meets the following requirements:

1. Strategies and resources to improve the resilience of the system.
2. Plans and procedures to implement during emergencies.
3. Actions, procedures, and equipment that can be used to prevent or lessen the severity of an emergency.
4. Strategies and equipment to be used to prevent emergencies.

Proposed Project

For this project, SEH proposes to develop an ERP for the City's drinking water system. Certification of the ERP will be done within six (6) months of the certification of the RRA. Following the completion and certification of these efforts, the City will be in compliance with AWIA's ERP requirements.

Project Scope

For this proposal, SEH proposes to perform the following two (2) tasks as listed below:

1. Task No. 1 – Project Initialization and Data Collection
    a. Project setup
        i. Develop and sign the contract for the scope of work.
        ii. Create the project in the SEH accounting system.
    b. Meeting No. 1 – Kick-off meeting with City staff
        i. Confirm and establish scope and goals of the project.
        ii. Identify information and/or materials that are needed or will be useful to develop ERP.
2. Task No. 2 – Emergency Response Plan
    a. Develop an ERP which shall include:
        i. Existing information such as the existing ERP, relevant mitigation measures, contact information, inventory, and relevant information from the City's Wellhead Protection Plan, sanitary surveys, Comprehensive Plan, etc.
        ii. New strategies, resources, plans, and procedures deemed necessary during the Risk and Resilience Assessment to reduce the City's existing risks.
    b. Meeting No. 2 – Present draft ERP to Owner's team.
    c. Incorporate Owner's comments into the ERP and deliver hard copies.
    d. Assist the City in the EPA's certification process of the ERP.

Deliverables

Project deliverables, also defined in the Task descriptions above, include:

1. Electronic and three (3) hard copies of the final ERP developed in Task No. 2 – Emergency Response Plan. Reimbursement for printing is included in the proposed pricing.

Project Schedule

We estimate the project to follow the schedule below:

Develop ERP	June 2021
Submit Draft ERP to City's Team	July 2021
Finalize ERP	August 2021
Submit ERP Certification	August 2021

Consultant Staff

I will serve as the project manager for this Project and will be responsible for coordinating the overall work efforts for the project. Simon McCormack, PE has completed AWWA's Utility Risk & Resilience Certificate Program and will be responsible for developing and writing the ERP, and assisting with the EPA's certification process

Compensation

Task No. 1 – Project Initialization & Data Collection Fees

We propose to complete the scope of services identified above on an hourly basis that is in accordance with our standard billing rate schedule. We proposed an Hourly Not-to-Exceed amount of $500, for this phase, which includes reimbursable expenses. We understand this Not-to-Exceed amount cannot increase without further authorization from you.

Task No. 2 – Emergency Response Plan Fees

We propose to complete the scope of services identified above on an hourly basis that is in accordance with our standard billing rate schedule. We proposed an Hourly Not-to-Exceed amount of $2,000, for this phase, which includes reimbursable expenses. We understand this Not-to-Exceed amount cannot increase without further authorization from you.

Closure

We want to thank you for the opportunity to provide the City of Ramsey with this proposal. As always, it is very important to us our services continue to meet and surpass your needs and expectations. After you have had an opportunity to review this proposal, we would like to hear any comments, concerns or questions you may have.

Sincerely,

SHORT ELLIOTT HENDRICKSON INC.

Christopher Larson, PE
Project Manager

RISK AND RESILIENCE ASSESSMENTS AND EMERGENCY RESPONSE PLANS:

NEW REQUIREMENTS FOR DRINKING WATER UTILITIES

Section 2013 of America's Water Infrastructure Act of 2018 (AWIA) requires community water systems[1] that serve more than 3,300 people to complete a risk and resilience assessment and develop an emergency response plan.

RISK AND RESILIENCE ASSESSMENT

Your utility must conduct a risk and resilience assessment and submit certification of its completion to the U.S. EPA by the following dates:

EMERGENCY RESPONSE PLAN

Your utility must develop or update an emergency response plan and certify completion to the U.S. EPA **no later than six months** after risk and resilience assessment certification. Each utility deadline is unique; however, the dates below are the due dates for utilities who submit a risk and resilience assessment certification by the final due date according to the population served.

Important Dates

- March 31, 2020 if serving ≥100,000 people.
- December 31, 2020 if serving 50,000 to 99,999 people.
- June 30, 2021 if serving 3,301 to 49,999 people.

- September 30, 2020 if serving ≥100,000 people.
- June 30, 2021 if serving 50,000 to 99,999 people.
- December 30, 2021 if serving 3,301 to 49,999 people.

Recertification

Every five years, your utility must review the risk and resilience assessment and submit a recertification to the U.S. EPA that the assessment has been reviewed and, if necessary, revised.

Within six months of submitting the recertification for the risk and resilience assessment, your utility must certify it has reviewed and, if necessary, revised, its emergency response plan.

Visit the U.S. EPA website to find more information on guidance for developing a risk and resilience assessment at https://www.epa.gov/waterriskassessment/conduct-drinking-water-or-wastewater-utility-risk-assessment.

Visit the U.S. EPA website for guidance on developing an Emergency Response Plan at https://www.epa.gov/waterutilityresponse/develop-or-update-drinking-water-or-wastewater-utility-emergency-response-plan.

TOOLS OR METHODS

AWIA does not require the use of any standards, methods or tools for the risk and resilience assessment or emergency response plan. Your utility is responsible for ensuring that the risk and resilience assessment and emergency response plan address all the criteria in AWIA Section 2013(a) and (b), respectively. The U.S. EPA recommends the use of standards, including AWWA J100-10 Risk and Resilience Management of Water and Wastewater Systems, along with tools from the U.S. EPA and other organizations, to facilitate sound risk and resilience assessments and emergency response plans.

[1] Section 2013 of AWIA applies to community water systems. Community water systems are drinking water utilities that consistently serve at least 25 people or 15 service connections year-round.

Still have questions about the new AWIA requirements?
Contact the U.S. Environmental Protection Agency (U.S. EPA) at dwresilience@epa.gov.

Office of Water (4608T)
EPA-817-F-19-004
May 2019

FREQUENTLY ASKED QUESTIONS

I need more information about risk and resilience assessments and emergency response plans:

Risk and resilience assessments evaluate the vulnerabilities, threats and consequences from potential hazards.

What does a risk and resilience assessment include?

- Natural hazards and malevolent acts (i.e., all hazards).
- Resilience of water facility infrastructure (including pipes, physical barriers, water sources and collection, treatment, storage and distribution, and electronic, computer and other automated systems).
- Monitoring practices.
- Financial systems (e.g., billing systems).
- Chemical storage and handling.
- Operation and maintenance.

What does an emergency response plan include?

- Strategies and resources to improve resilience, including physical security and cybersecurity.
- Plans and procedures for responding to a natural hazard or malevolent act that threatens safe drinking water.
- Actions and equipment to lessen the impact of a malevolent act or natural hazard, including alternative water sources, relocating intakes and flood protection barriers.
- Strategies to detect malevolent acts or natural hazards that threaten the system.

Who should I work with when creating my emergency response plan?

- Utilities must coordinate the risk and resilience assessments, as well as the emergency response plans with local emergency planning committees.

For more information, see www.congress.gov/bill/115th-congress/senate-bill.

I need more information on the certification process:

What do I need to submit to the U.S. EPA?

- Each utility must submit a certification of your risk and resilience assessment and emergency response plan. Each submission must include: utility name, date and a statement that the utility has completed, reviewed or revised the assessment. The U.S. EPA has developed an optional certification template that can be used for email or mail certification. The optional certification form will be available in August 2019.

Who can certify my risk and resilience assessment and emergency response plan?

- Risk and resilience assessments and emergency response plans can be self-certified by the utility.

How do I submit my certification?

- Three options will be provided for submittal: regular mail, email and a user-friendly secure online portal. The online submission portal will provide drinking water systems with a receipt of submittal. The U.S. EPA recommends using this method. The certification system will be available in August 2019.

When can I submit the initial certification?

- Utilities should wait to submit the initial certification to the U.S. EPA until the U.S. EPA publishes *Baseline Information on Malevolent Acts Relevant to Community Water Systems,* which is required under AWIA by August 2019.

Do I need to submit my certification to my state or local government?

- No. Section 2013 of AWIA does not require utilities to submit the certification to state or local governments.

How long do I need to keep a copy of my risk and resilience assessment and emergency response plan?

- Utilities need to keep a copy of both documents for five years after certification.

What if I do not have a copy of my most recent risk and resilience assessment?

- The U.S. EPA intends to destroy vulnerability assessments (VAs) submitted in response to the Bioterrorism Act of 2002, but if utilities would like to have their VA and certification documents mailed to them, contact WSD-Outreach@epa.gov, and on utility letterhead, include the utility name, PWSID, address and point of contact as an attachment to the email.

RESOURCES & TOOLS

Conducting a Risk and Resilience Assessment

- The U.S. EPA's Risk and Resilience Baseline Threat Document (available August 2019).
- The U.S. EPA's Vulnerability Self-Assessment.

Developing an Emergency Response Plan

- Emergency Response Plan Guidance.
- The U.S. EPA's Emergency Response Webpage.
- Local Emergency Planning Committees.

The U.S. EPA Website

- https://www.epa.gov/waterresilience/americas-water-infrastructure-act-2018-risk-assessments-and-emergency-response-plans.

Still have questions about the new AWIA requirements?
Contact the U.S. Environmental Protection Agency (U.S. EPA) at dwresilience@epa.gov.

Office of Water (4608T)
EPA-817-F-19-004
May 2019

Public Works Committee **5. 2.**

Meeting Date: 11/17/2020

By: Bruce Westby, Engineering/Public Works

Title:

Consider Recommendation to City Council Authorizing Flashing Yellow Arrow Studies at Select Intersections

Purpose/Background:

Purpose:

The purpose of this case is to consider a recommendation to the City Council to hire SEH, Inc. to analyze the feasibility of modifying one or more signal systems in the City of Ramsey to add flashing yellow arrow operations.

Background:

Flashing yellow arrows (FYA's) are gaining momentum as an alternative to a standard green ball light for left-turning motorists. They signal to the motorist that it is safe to turn left so long as they yield to oncoming vehicles, which have the right of way. These permitted left turns are unlike protected left turns, where the left-turning motorist does not need to consider opposing traffic because those vehicles have a red light.

In 2017, the City paid to modify the signal system at the intersection of Armstrong Boulevard/CSAH 83 & Sunwood Drive/147th Avenue to include FYA improvements. At the request of Anoka County, the City hired SEH, Inc. to analyze the signal system for potential FYA improvements. A copy of this analysis is attached. The cost for this analysis was about $1,700, which was funded by the Public Improvement Revolving Fund.

Anoka County annually budgets approximately $100,000 to convert 4 to 10 of their 200 signal systems to FYA operations. Anoka County solely utilizes SEH, Inc. to study their signal systems for FYA conversions, and requests that the City also utilize SEH to study signal systems for potential FYA modifications if/when the City is interested in doing so. This helps to ensure that the evaluations are performed consistently County-wide for safety and liability purposes.

During the regular City Council meeting on September 22, 2020, Planning Commission Chair Randy Bauer requested that the City consider adding FYA operations to the signal system at the intersection of Sunwood Drive & CSAH 56/Ramsey Boulevard. In addition, he requested that the City look into whether the operating hours for current FYA operations could be expanded to include the morning and afternoon rush hours. Chair Bauer feels these restrictions are not needed.

According to Anoka County, all costs associated with adding FYA operations to the signal system at Sunwood Drive & CSAH 56/Ramsey Boulevard would be 100-percent a City cost. That said, it is Staff's understanding that Anoka County would support this request.

Regarding process and costs, the City would need to hire SEH, Inc. to analyze the existing signal system(s), including crash histories, traffic volumes and turning movements, to ensure that a FYA installation is warranted, to estimate costs for revising the signal system to include FYA operations, and to determine allowable hours of operation, among other things.

When FYA improvements are first operational, SEH, Inc. recommends that FYA's not be used weekdays from 6 - 9 am or from 3 - 7 pm due to higher traffic volumes. But after FYA's are in service for a year or more, the time of operation can be increased if there are no safety issues or significant increases in traffic volumes.

Staff was also recently questioned as to whether FYA operations could/should be added to the signal systems at

Sunfish Lake Boulevard/CSAH 57 & Alpine Drive, and to Nowthen Boulevard/CSAH 5 & Alpine Drive. Since Alpine Drive is a City Street the City would be responsible for all costs associated with installing any FYA improvements at these intersections.

Construction could easily occur in 2021 if SEH, Inc. is directed to start their analysis efforts in December 2020 and required future approvals are granted in a timely manner.

Timeframe:

Approximately 25 minutes for presentation and discussion.

Observations/Alternatives:

Observations:

The final construction cost for the FYA modifications to the signal system at Armstrong Boulevard & Sunwood Drive/147th Avenue was $29,760. The estimated average cost to modify an existing signal system to include FYA operations is $20,000 to $50,000.

Plans and specifications would be required to advertise for bids for construction of any FYA modifications, which would require separate approvals. Costs to prepare plans and specifications for the FYA improvements at Armstrong Boulevard & Sunwood Drive/147th Avenue were around $6,500.

It should be noted that traffic volumes and patterns are likely to change after the grade separation improvements occur at CSAH 56/Ramsey Boulevard & Highway 10, after CSAH 116/Bunker Lake Boulevard is reconstructed between CSAH 83/Armstrong Boulevard and CSAH 57/Sunfish Lake Boulevard, and after a signal system is installed at CSAH 116/Bunker Lake Boulevard and Sunwood Drive. All of these are likely to have some impact on FYA operations at Sunwood Drive & CSAH 56/Ramsey Boulevard, which could result in a future Anoka County request to remove or modify FYA improvements. This should be confirmed as part of the analysis.

Alternatives:

Alternative #1 – Motion to recommend City Council authorization to hire SEH, Inc. to analyze the feasibility of modifying signal systems to add flashing yellow arrow operations at the intersection(s) of _____.

Alternative #2 – Motion of other.

Funding Source:

The estimated cost for analyzing the feasibility of adding FYA operations to one signal system is $1,800 if the City provides traffic counts, and $3,500 if SEH needs to provide traffic counts. If multiple intersections are analyzed, the cost per signal system would be reduced accordingly. For example, if 6 signal systems are analyzed the estimated cost per signal system would be closer to $1,300.

The Public Improvement Revolving Fund would be the funding source for any such analysis.

Recommendation:

Staff supports either alternative.

Action:

Recommend City Council authorization to hire SEH, Inc. to analyze the feasibility of modifying signal systems to add flashing yellow arrow operations at the intersection(s) of _____.

Attachments

2017 FYA Analysis

Form Review

Inbox	Reviewed By	Date
Grant Riemer	MaryJo Warner	11/12/2020 04:27 PM
Kurt Ulrich	Kurt Ulrich	11/12/2020 04:39 PM
Form Started By: Bruce Westby		Started On: 11/09/2020 04:19 PM
Final Approval Date: 11/12/2020		

SEH

Building a Better World
for All of Us®

March 21, 2017

RE: Ramsey, Minnesota
CSAH 83 at Sunwood Drive/147th Avenue NW Signal System
Flashing Yellow Arrow Considerations
SEH No. RAMSY 141224

Mr. Bruce Westby, PE
City Engineer
City of Ramsey
7550 Sunwood Drive Northwest
Ramsey, Minnesota 55303

Dear Mr. Westby:

As requested, we reviewed the intersection of CSAH 83 (Armstrong Boulevard) and Sunwood Drive/147th Avenue Northwest with regards to proposed modification of the existing intersection traffic signal left turn operations. Recently, the City has received requests to have flashing yellow arrow operation installed and activated at this intersection. In response to these requests, the City had SEH perform an analysis of the intersection to determine if flashing yellow arrow operation can be utilized here. The analysis would include review of the feasibility, cost, and safety of the intersection for flashing yellow arrow operations. Following is the results of our analysis.

This 4-legged intersection was signalized in January 2013 (prior to when the adjacent Trunk Highway 10-CSAH 83 intersection was reconstructed with an interchange), with protected left turn phasing installed for all approaches. The posted speed limit on CSAH 83 is 55 mph, while both Sunwood Drive and 147th Avenue Northwest are posted at 30 mph. The northbound and southbound CSAH 83 approaches and the eastbound 147th Avenue Northwest approaches each have a single left turn lane, while the westbound Sunwood Drive approach has a dual left turn lane. Single through lanes and separate right turn lanes exist on the side street approaches, while each CSAH 83 approach has two separate through lanes and a separate right turn lane approaching the intersection. The intersection is located approximately ¼ mile east of the Trunk Highway 10/CSAH 83 interchange area, with a significant east-to-south horizontal curve for northbound CSAH 83 traffic from the interchange area to where a full left turn lane exists for traffic approaching Sunwood Drive/147th Avenue Northwest.

SEH obtained peak hour turning movement traffic counts on September 29, 2016, several months after the Trunk Highway 10-CSAH 83 interchange area was opened and area traffic patterns were able to stabilize, in order to properly analyze existing traffic conditions. SEH

performed AM peak hour (6-9 am), mid-day (11-1 pm), and PM peak hour (3-7 pm) turning movement traffic counts to determine typical weekday traffic patterns at this intersection.

SEH also obtained crash data for the intersection for the 5 year period of 2011-2015 from the State's crash website. SEH then completed a brief field review of the signal system to confirm that the existing traffic signal plans correspond to the current installation of the signal system and take into account the current intersection geometrics. SEH also reviewed traffic signal cabinet components to determine if additional electrical equipment would be required to be provided in order to allow for flashing yellow arrow operation to be used.

As part of the signal system installation, each intersection approach was set up to operate with protected left turn phasing (3-section RLA-YLA-GLA signals). The intersection has a newer Econolite ASC-3 controller unit and Reno MMU-1600-GE conflict monitor, both of which are fully compatible with upgraded left turn (i.e. flashing yellow arrow) operations. The controller cabinet has sufficient load switch bays available to accommodate flashing yellow arrow operations. Thus, the existing controller and cabinet have the capacity and capability to accommodate future flashing yellow arrow operations for all four intersection approaches without requiring this equipment to be significantly upgraded or revised.

As part of our analysis, SEH utilized the Minnesota Department of Transportation's (MnDOT) flashing yellow arrow installation criteria from their "*Traffic Signal Timing and Coordination Manual*" to analyze extended usage of flashing yellow arrow operations for each intersection approach. A copy of this criteria is attached for your information. Based on comparison of available data with the MnDOT criteria, the following can be inferred:

> The design of this signal system included the initial recommendation of protected left turn phasing for each intersection approach due to the higher posted speed limit of 55 mph on CSAH 83 (as is typical Anoka County practice) and the presence of a dual left turn lane for the westbound Sunwood Drive approach.
>
> With regards to utilizing Flashing Yellow Arrow operations for each left turn movement, the following should be noted:
>
> - According to the current edition of the *AASHTO Geometric Design of Highways and Streets* manual, left-turning drivers "need sufficient sight distance to decide when it is safe to turn left across the lanes used by opposing traffic." This stopping sight distance along CSAH 83 for the design/posted speed of 55 mph is at least 495 feet of clear sight distance to the north and south. For both Sunwood Drive and 147th Avenue Northwest, the recommended stopping sight distance at 30 mph is as least 200 feet to the east and west. Based on a field review of intersection geometrics, the southbound, eastbound, and westbound intersection approaches are straight for several hundred feet in each direction with no impediments to the sight distance (other than possible sun issues for eastbound

traffic in the AM peak hour and for westbound traffic in the PM peak hour during fall-winter months).

For northbound CSAH 83, sight distance is somewhat limited due to a sweeping north-to-west horizontal curve that begins approximately 300 feet north of the intersection. However, there are no impediments to sight distance in the median area and no trees or other topography exist to the north on either side of the roadway that limit sight distance for northbound left turning traffic at the intersection (northbound left turning traffic can see oncoming traffic clearly for at least the minimum stopping sight distance required at the posted 55 mph speed limit).

Based on this information, **available stopping sight distance meets this criteria for each intersection approach**.

- Based on the recent crash history at this intersection, no crashes were reported on the State of Minnesota's crash web site between 2011 and 2015. **Thus, there does not appear to be a safety concern at this intersection with the presence of signalized operation**.

- One of the recommendations from the *MnDOT Traffic Signal Timing and Coordination Manual* is to utilize protected left turn phasing only either for situations where the posted speed limit exceeds 45 mph and the peak hour left turning volume is greater than 240 vehicles per hour, or for when the cross product between left turning traffic volume and opposing through traffic volume exceeds 80,000. With regards to the most recent available traffic counts:

  a. Between the hours of 4:00 pm-5:00 pm of the most recent traffic counts, westbound Sunwood Drive left turn volumes were near 130 vehicles per hour. No other intersection approach exceeded 65 left turning vehicles per hour during the PM peak period.

  b. For the midday and AM peak hour counts, no intersection approach had left turning traffic volumes that exceeded 70 vehicles per hour.

  c. The cross product between left turn traffic volumes and opposing through traffic volumes never exceeded 25,000 for any hour counted in 2016.

Following up against the flashing yellow arrow criteria from the *MnDOT Traffic Signal Timing and Coordination Manual:*

1. Left turn lanes line up well for each intersection approach with sufficient turning room in the intersection so that left turn paths were not conflicting. This was observed specifically for the westbound dual left turn lane/eastbound single left turn

movement, where protected left turn phasing was run together for these movements with no conflicts between either direction's left turn movements. Left turn movements are offset far enough such that no conflicts in left turn paths are occurring.

2. As mentioned, the westbound approach has two left turn lanes. For this approach, the MnDOT Manual suggests that protected operation be utilized during the higher volume periods of the day with Engineering judgment being used to determine if flashing yellow operation could be used for all other times of the day.

3. There are less than 3 opposing lanes of through traffic facing each intersection approach.

4. The intersection does not have a high crash rate and there is no significant history of right angle crashes involving left turning traffic.

In summary, as there is no significant crash history for left turning traffic and traffic volumes are likely lower for the entire intersection (outside of the peak traffic periods), the City should be able to consider using Flashing Yellow Arrow operations at this intersection throughout much of a typical weekday and throughout the weekend. In addition, any changes to the operation of the left turn signal phases are not anticipated to impact overall operations of the intersection in a negative way (and delays for left turning traffic will decrease with flashing yellow arrow operations which will improve the overall operation of the intersection). For peak traffic periods though (and for when sun becomes an issue for eastbound and westbound traffic), protected left turn operation is strongly recommended to be implemented.

Some modifications to the existing signal system installation will be required to revise the operation of this signal system and add flashing yellow arrows for each intersection approach. Both overhead end mounted and far left pole mounted left turn signals for each intersection approach will required having 3-section RLA-YLA-GLA signal heads replaced with 4-section RLA-YLA-FYLA-GLA signal heads. For the westbound approach (due to the dual left turn lane), a 5-foot extension will be required to be added to the mast arm facing this approach so that two 4-section overhead signals can be installed and centered on each left turn lane (requirement that each approaching left turn lane have its own flashing yellow arrow signal centered on each left turn lane). No additional through signal heads will be required to be installed facing any of the four approaches, as there are already separate through (RYG) signal heads centered on each through lane. Some additional cabling (6/c#14) will be required to be installed to operate new flashing yellow arrow signal heads on all four intersection approaches based on a review of the field wiring diagram. No new conduit will be required to be installed to accommodate installation of these new cables.

With regards to left turn lane detection, the *MnDOT Traffic Control Signal Design Manual* recommends that either four loop detectors be installed for proper detection (at 5', 20' 35' and 50' from the stop bar or crosswalk) or that two separately wired loop detectors be installed for

existing signal system retrofits at 10' and 40' from the stop bar or crosswalk. Recent County practice has been to have the four separate loop detectors installed in each left turn lane in order to be able to operate the left turn lanes on non-lock operation. For this signal system, left turn lane detection was installed at 10' and 40' from the stop bar for the northbound, southbound, and westbound approaches (each wired separately), while the eastbound approach has four loop detectors installed in the left turn lane. To meet current County practice, additional loop detectors will be required to be furnished and installed 25 feet and 55 feet from the stop bar in the northbound and southbound left turn lanes as well as in both westbound left turn lanes (for a total of 8 new loop detectors). No additional 2/c#14 cables or controller cabinet loop detector cards will be required to operate these new loop detectors since existing loop detectors are already wired separately in each left turn lane.

To allow for flashing yellow arrow operation, we estimate that these modifications (completed by an electrical signal contractor) will cost approximately $40,000. A detailed preliminary engineer's estimate of costs is attached to this letter for your information.

Overall, we do not see any issues with installation and operation of flashing yellow arrows for each intersection approach. However, should the City and County implement flashing yellow arrow modifications to this signal system, **we recommend that the signal system initially operate with protected left turns during both the AM peak period (6:00-9:00 am) and the PM peak period (3:00-7:00 pm) due to higher traffic volumes, higher posted speeds, and the presence of dual left turn lanes through this area**. For all other hours of the day and for all weekend hours, the City and County should be able to consider using flashing yellow arrow operations.

Note that any changes in the operation of this signal system should be monitored by the City and County, including annual review of crash data to ensure that crash frequency does not increase due to modified left turn signal operations.

Please review our analysis and feel free to contact me at 651.490.2073 with any questions or concerns that you may have related to our analysis.

We hope that this information provides you with insight needed to help evaluate and implement the appropriate left turn operations for this intersection.

Sincerely,
SHORT ELLIOTT HENDRICKSON INC.

John M. Gray, PE
Project Engineer

Enclosures
c: Jane Rose, Anoka County Highway Department

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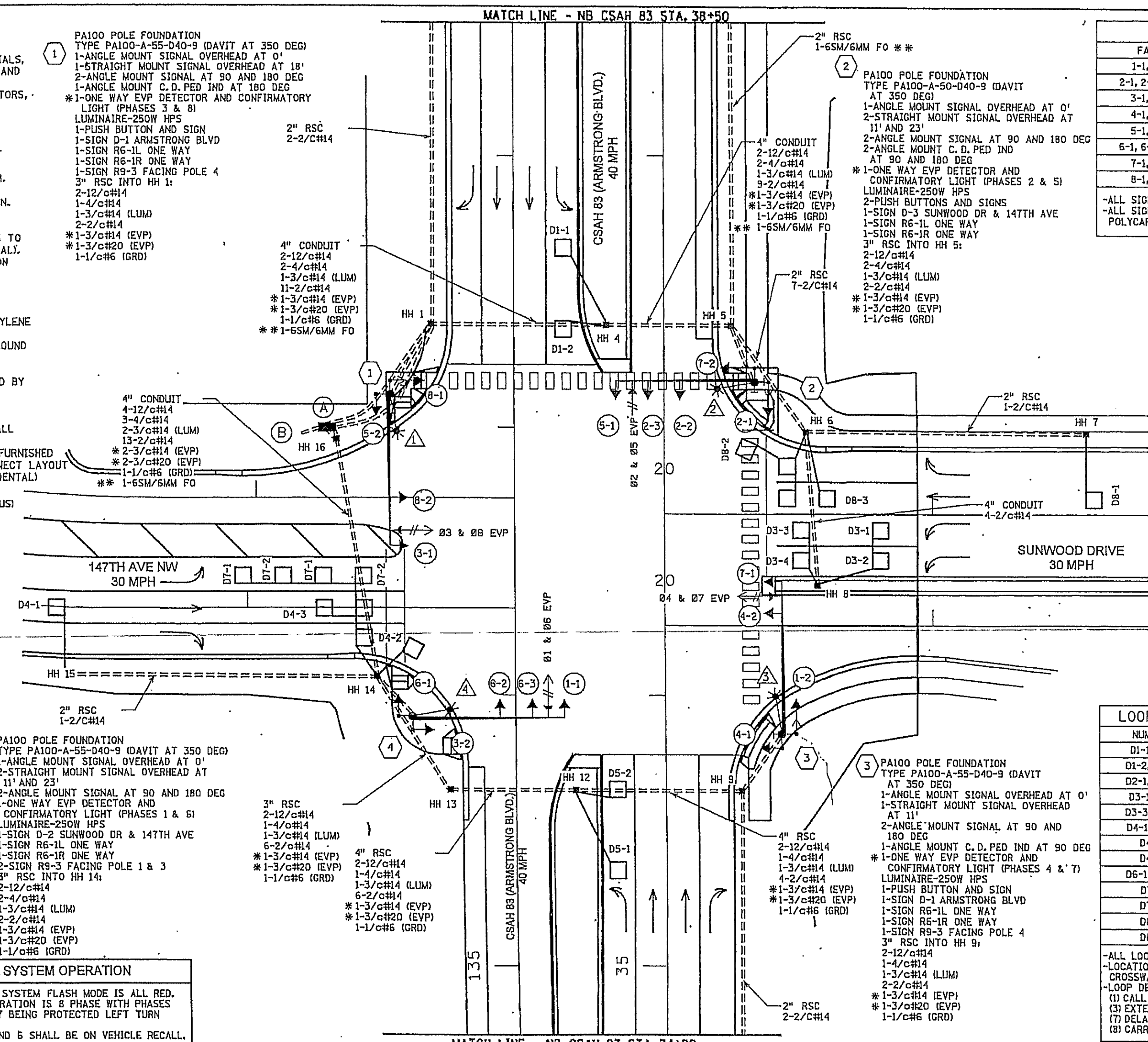
NOTES:

1) SEE SPECIAL PROVISIONS FOR COUNTY FURNISHED MATERIALS, COUNTDOWN PEDESTRIAN INDICATIONS, LED INDICATIONS, AND PAINTING OF SIGNAL SYSTEM.
2) THE EXACT LOCATION OF HANDHOLES, POLES, LOOP DETECTORS, AND EQUIPMENT PAD SHALL BE DETERMINED IN THE FIELD BY THE ENGINEER.
3) NEW HANDHOLES SHALL BE PVC HANDHOLES WITH METAL FRAMES AND COVERS.
4) A 3/4" HALF COUPLING, 3/4" PIPE NIPPLE AND CONDUIT OUTLET BODY FOR EMERGENCY VEHICLE PREEMPTION EQUIPMENT SHALL BE F&I 6' FROM THE END OF MAST ARM.
5) THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING THE POWER COMPANY TO ARRANGE FOR THE POWER CONNECTION.
6) THE CONTRACTOR SHALL LOCATE AND VERIFY INPLACE UTILITIES PRIOR TO COMMENCING WORK.
7) SEE SPECIAL PROVISIONS AND DETAILS REGARDING SIGNS TO BE FURNISHED AND INSTALLED BY CONTRACTOR (INCIDENTAL).
8) EACH PEDESTRIAN INDICATION SHALL BE LED, ONE SECTION "FILLED" HAND/WALKING PERSON INDICATION.
9) ALL POLE MOUNTED VEHICLE AND PEDESTRIAN SIGNAL INDICATIONS SHALL BE MOUNTED USING ONE-WAY SIGNAL HEAD MOUNTS. SEE DETAILS AND SPECIAL PROVISIONS.
10) LOOP DETECTOR WIRES SHALL BE CROSS-LINKED POLYETHYLENE (XLP) IN 3/4" NMC. SEE SPECIAL PROVISIONS.
11) ALL VEHICLES AND PEDESTRIAN SIGNAL HOUSINGS, BACKGROUND SHIELD, AND VISORS SHALL BE FABRICATED USING BLACK POLYCARBONATE MATERIALS. SEE SPECIAL PROVISIONS.
12) (✻ EVP) DENOTES ITEMS TO BE FURNISHED AND INSTALLED BY CONTRACTOR UNDER ITEM NO. 2565 (EMERGENCY VEHICLE PREEMPTION). SEE ESTIMATED QUANTITIES AND SPECIAL PROVISIONS.
13) DISTANCE OFF SHOULDER OR CURB FOR EVP CONDUIT SHALL BE 1-2 FEET.
14) (✻✻ FIBER OPTIC) DENOTES INTERCONNECT FIBER TO BE FURNISHED AND INSTALLED WITH THE SIGNAL SYSTEM. SEE INTERCONNECT LAYOUT AND SPECIAL PROVISIONS 2565 FOR REQUIREMENTS. (INCIDENTAL)

(A) EQUIPMENT PAD - SEE DETAIL
SERVICE CABINET
CONTROLLER AND CABINET
4" RSC TO HH 1:
4-12/c#14
3-4/c#14
✻2-3/c#14 (EVP)
✻2-3/c#20 (EVP)
15-2/c#14
✻✻1-6SM/6MM FO
3" RSC STUBBED OUT (THREAD AND CAP FOR FUTURE USE)
2" RSC STUBBED OUT (THREAD AND CAP FOR FUTURE USE)
1" NMC STUBBED OUT (CAP FOR FUTURE TELEPHONE LINE)

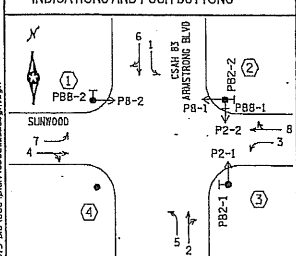
(B) SOP-TRANSFORMER (POWER BY CONNEXUS)
4" RSC TO HH 16:
4-12/c#14
3-4/c#14
✻2-3/c#14 (EVP)
✻2-3/c#20 (EVP)
13-2/c#14

SIGNAL SERVICE CABINET
(SAME FOUNDATION AS CONTROLLER CABINET)
2" RSC INTO HH 1:
UNMETERED STREET LIGHT SERVICE
2-3/c#14 (LUM)
2" RSC INTO HH 16:
UNMETERED STREET LIGHT SERVICE
2-3/C#14 (LUM)
2" RSC STUBBED OUT (FOR POWER BY CONNEXUS)



MATCH LINE - NB CSAH 83 STA. 38+50
MATCH LINE - NB CSAH 83 STA. 34+80
CSAH 83 (ARMSTRONG BLVD.)
40 MPH
147TH AVE NW
30 MPH
SUNWOOD DRIVE
30 MPH
PA100 POLE FOUNDATION
TYPE PA100-A-55-D40-9 (DAVIT AT 350 DEG)
1-ANGLE MOUNT SIGNAL OVERHEAD AT 0'
1-STRAIGHT MOUNT SIGNAL OVERHEAD AT 18'
2-ANGLE MOUNT SIGNAL AT 90 AND 180 DEG
1-ANGLE MOUNT C.D. PED IND AT 180 DEG
✻1-ONE WAY EVP DETECTOR AND CONFIRMATORY LIGHT (PHASES 3 & 8)
LUMINAIRE-250W HPS
1-PUSH BUTTON AND SIGN
1-SIGN D-1 ARMSTRONG BLVD
1-SIGN R6-1L ONE WAY
1-SIGN R6-1R ONE WAY
1-SIGN R9-3 FACING POLE 4
3" RSC INTO HH 1:
2-12/c#14
1-4/c#14
1-3/c#14 (LUM)
2-2/c#14
✻1-3/c#14 (EVP)
✻1-3/c#20 (EVP)
1-1/c#6 (GRD)
PA100 POLE FOUNDATION
TYPE PA100-A-50-D40-9 (DAVIT AT 350 DEG)
1-ANGLE MOUNT SIGNAL OVERHEAD AT 0'
2-STRAIGHT MOUNT SIGNAL OVERHEAD AT 11' AND 23'
2-ANGLE MOUNT SIGNAL AT 90 AND 180 DEG
2-ANGLE MOUNT C.D. PED IND AT 90 AND 180 DEG
✻1-ONE WAY EVP DETECTOR AND CONFIRMATORY LIGHT (PHASES 2 & 5)
LUMINAIRE-250W HPS
2-PUSH BUTTONS AND SIGNS
1-SIGN D-3 SUNWOOD DR & 147TH AVE
1-SIGN R6-1L ONE WAY
1-SIGN R6-1R ONE WAY
3" RSC INTO HH 5:
2-12/c#14
2-4/c#14
1-3/c#14 (LUM)
2-2/c#14
✻1-3/c#14 (EVP)
✻1-3/c#20 (EVP)
1-1/c#6 (GRD)
PA100 POLE FOUNDATION
TYPE PA100-A-55-D40-9 (DAVIT AT 350 DEG)
1-ANGLE MOUNT SIGNAL OVERHEAD AT 0'
2-STRAIGHT MOUNT SIGNAL OVERHEAD AT 11' AND 23'
2-ANGLE MOUNT SIGNAL AT 90 AND 180 DEG
✻1-ONE WAY EVP DETECTOR AND CONFIRMATORY LIGHT (PHASES 1 & 6)
LUMINAIRE-250W HPS
1-SIGN D-2 SUNWOOD DR & 147TH AVE
1-SIGN R6-1L ONE WAY
1-SIGN R6-1R ONE WAY
2-SIGN R9-3 FACING POLE 1 & 3
3" RSC INTO HH 14:
2-12/c#14
2-4/c#14
1-3/c#14 (LUM)
2-2/c#14
✻1-3/c#14 (EVP)
✻1-3/c#20 (EVP)
1-1/c#6 (GRD)
PA100 POLE FOUNDATION
TYPE PA100-A-55-D40-9 (DAVIT AT 350 DEG)
1-ANGLE MOUNT SIGNAL OVERHEAD AT 0'
1-STRAIGHT MOUNT SIGNAL OVERHEAD AT 11'
2-ANGLE MOUNT SIGNAL AT 90 AND 180 DEG
1-ANGLE MOUNT C.D. PED IND AT 90 DEG
✻1-ONE WAY EVP DETECTOR AND CONFIRMATORY LIGHT (PHASES 4 & 7)
LUMINAIRE-250W HPS
1-PUSH BUTTON AND SIGN
1-SIGN D-1 ARMSTRONG BLVD
1-SIGN R6-1L ONE WAY
1-SIGN R6-1R ONE WAY
1-SIGN R9-3 FACING POLE 4
3" RSC INTO HH 9:
2-12/c#14
1-4/c#14
1-3/c#14 (LUM)
2-2/c#14
✻1-3/c#14 (EVP)
✻1-3/c#20 (EVP)
1-1/c#6 (GRD)
4" CONDUIT
4-12/c#14
3-4/c#14
2-3/c#14 (LUM)
13-2/c#14
✻2-3/c#14 (EVP)
✻2-3/c#20 (EVP)
1-1/c#6 (GRD)
✻✻1-6SM/6MM FO
4" CONDUIT
2-12/c#14
2-4/c#14
1-3/c#14 (LUM)
11-2/c#14
✻1-3/c#14 (EVP)
✻1-3/c#20 (EVP)
1-1/c#6 (GRD)
✻✻1-6SM/6MM FO
4" CONDUIT
2-12/c#14
2-4/c#14
1-3/c#14 (LUM)
9-2/c#14
✻1-3/c#14 (EVP)
✻1-3/c#20 (EVP)
1-1/c#6 (GRD)
✻✻1-6SM/6MM FO
2" RSC
1-6SM/6MM FO ✻✻
2" RSC
2-2/C#14
2" RSC
7-2/C#14
2" RSC
1-2/C#14
4" CONDUIT
4-2/c#14
3" RSC
2-12/c#14
1-4/c#14
1-3/c#14 (LUM)
6-2/c#14
✻1-3/c#14 (EVP)
✻1-3/c#20 (EVP)
1-1/c#6 (GRD)
4" RSC
2-12/c#14
1-4/c#14
1-3/c#14 (LUM)
6-2/c#14
✻1-3/c#14 (EVP)
✻1-3/c#20 (EVP)
1-1/c#6 (GRD)
4" RSC
2-12/c#14
1-4/c#14
1-3/c#14 (LUM)
4-2/c#14
✻1-3/c#14 (EVP)
✻1-3/c#20 (EVP)
1-1/c#6 (GRD)
2" RSC
1-2/C#14
2" RSC
2-2/C#14
HH 1
HH 4
HH 5
HH 6
HH 7
HH 8
HH 9
HH 12
HH 13
HH 14
HH 15
HH 16
D1-1
D1-2
D3-1
D3-2
D3-3
D3-4
D4-1
D4-2
D4-3
D5-1
D5-2
D6-1
D6-2
D7-1
D7-2
D8-1
D8-2
D8-3
Ø2 & Ø5 EVP
Ø3 & Ø8 EVP
Ø4 & Ø7 EVP
Ø1 & Ø6 EVP
20
20
135
35
0
20 FT
40 FT

CONTROLLER PHASING, PEDESTRIAN INDICATIONS AND PUSH BUTTONS



SIGNAL SYSTEM OPERATION

- THE SIGNAL SYSTEM FLASH MODE IS ALL RED.
- NORMAL OPERATION IS 8 PHASE WITH PHASES 1, 3, 5 AND 7 BEING PROTECTED LEFT TURN PHASES.
- PHASES 2 AND 6 SHALL BE ON VEHICLE RECALL.

SIGNAL FACE CHART

FACE	R	Y	G	Y	G
1-1, 1-2	←	←	←		
2-1, 2-2, 2-3	●	●	●		
3-1, 3-2	←	←	←		
4-1, 4-2	●	●	●		
5-1, 5-2	←	←	←		
6-1, 6-2, 6-3	●	●	●		
7-1, 7-2	←	←	←		
8-1, 8-2	●	●	●		

-ALL SIGNAL INDICATIONS SHALL BE 12" LED
-ALL SIGNAL HEADS SHALL BE BLACK POLYCARBONATE WITH BACKGROUND SHIELDS

LOOP DETECTOR CHART

NUMBER	SIZE (FT)	LOCATION	FUNCTION
D1-1, 5-1	6x6	40	1
D1-2, D5-2	6x6	10	1
D2-1, D2-2	6x6	475	1
D3-1, 3-2	6x6	40	1
D3-3, D3-4	6x6	10	1
D4-1, D8-1	6x6	120	3, 8
D4-2	2-6x6	5 & -5	7
D4-3	2-6x6	5 & 20	1
D6-1, D6-2	6x6	475	1
D7-1	6x6	20 & 50	1
D7-2	6x6	5 & 35	1
D8-2	2-6x6	5 & -5	7
D8-3	2-6x6	5 & 20	1

-ALL LOOP DETECTORS SHALL BE PVC
-LOCATION: DISTANCE FROM CROSSWALK/STOP BAR IN FEET.
-LOOP DETECTOR FUNCTIONS:
(1) CALL AND EXTEND
(3) EXTEND ONLY
(7) DELAYED CALL, IMMEDIATE EXTEND
(8) CARRY OVER (STRETCH)

NO.	DATE	BY	CHK	REVISIONS

Design By: SD
Plan By: MAS
Checked By: NEH
Approved By: SD

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.
CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER - SEAN DELMORE, PE
DATE: 04/03/12 LIC. NO: 40945

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City of RAMSEY

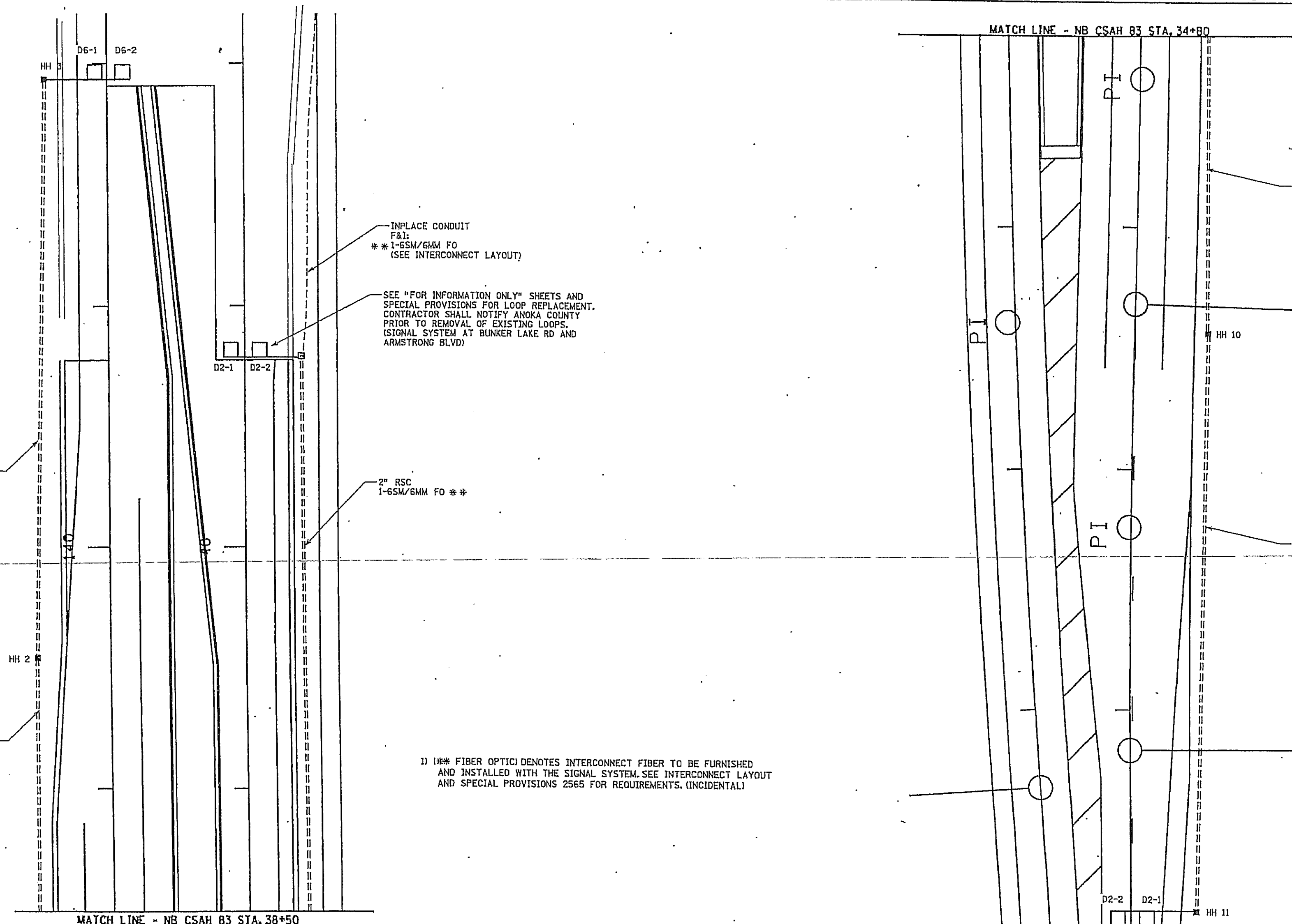
Armstrong Blvd at Sunwood Drive
City of Ramsey, Minnesota

CITY OF RAMSEY, MINNESOTA
TRAFFIC CONTROL SIGNAL SYSTEM INTERSECTION LAYOUT
SIGNAL PLAN
S.A.P. 199-020-010 / C.P. 12-20

SHEET 125 OF 153 SHEETS

Date Printed: 6/26/2012
WSB Filename: K:\01973-010\cad\plan\CD020295_sglt.dgn

318



1) (** FIBER OPTIC) DENOTES INTERCONNECT FIBER TO BE FURNISHED AND INSTALLED WITH THE SIGNAL SYSTEM. SEE INTERCONNECT LAYOUT AND SPECIAL PROVISIONS 2565 FOR REQUIREMENTS. (INCIDENTAL)

NO.	DATE	BY	CHK	REVISIONS

Design By: SD
Plan By: MAS
Checked By: NEH
Approved By: SD

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.
CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER - SEAN DE VORE, PE
DATE: 04/03/12 LIC. NO. 40945

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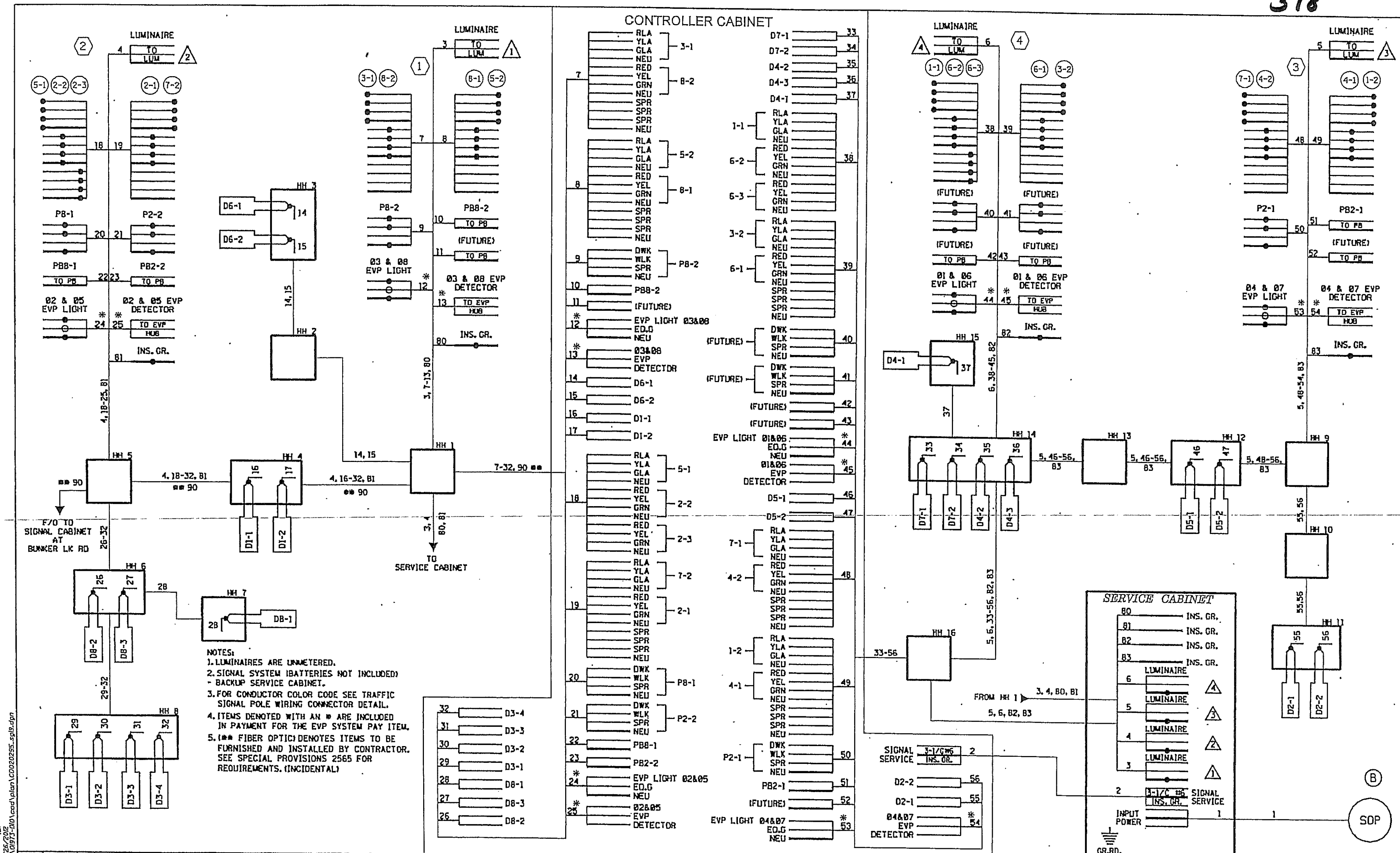
City of Ramsey, Minnesota

CITY OF RAMSEY, MINNESOTA
TRAFFIC CONTROL SIGNAL SYSTEM MATCH LINE
SIGNAL PLAN
S.A.P. 199-020-010 / C.P. 12-20

SHEET 126 OF 153 SHEETS

Date Printed: 6/25/2012
WSB Filename: X:\01973-010\cad\plan\CD020255_sg18.dgn

318



NOTES:
1. LUMINAIRES ARE UNMETERED.
2. SIGNAL SYSTEM (BATTERIES NOT INCLUDED) - BACKUP SERVICE CABINET.
3. FOR CONDUCTOR COLOR CODE SEE TRAFFIC SIGNAL POLE WIRING CONNECTOR DETAIL.
4. ITEMS DENOTED WITH AN * ARE INCLUDED IN PAYMENT FOR THE EVP SYSTEM PAY ITEM.
5. (** FIBER OPTIC) DENOTES ITEMS TO BE FURNISHED AND INSTALLED BY CONTRACTOR. SEE SPECIAL PROVISIONS 2565 FOR REQUIREMENTS. (INCIDENTAL)

Date Printed: 6/26/2012
WSB Filename: K:\01973-010\cad\plan\C0020255_sg19.dgn

NO.	DATE	BY	CHK	REVISIONS

Design By: SD
Plan By: MAS
Checked By: NEH
Approved By: SD

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.
LICENSED PROFESSIONAL ENGINEER - SEAN DELMORE, PE
DATE: 04/03/12 LIC. NO: 40945

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City of RAMSEY
Armstrong Blvd at Sunwood Drive
City of Ramsey, Minnesota

CITY OF RAMSEY, MINNESOTA
TRAFFIC CONTROL SIGNAL SYSTEM WIRING DIAGRAM
SIGNAL PLAN
S.A.P. 199-020-010 / C.P. 12-20

SHEET 127 OF 153 SHEETS

Estimated Costs and Quantities
Revise Signal System (FYA Modifications)
CSAH 83 at Sunwood Drive/147th Avenue NW
Prepared by JMG (SEH) on March 21, 2017

Item	Estimated Quantity	Estimated Unit Cost	Estimated Total Cost
Remove 3-Section Signals	8	$300	$2,400
4-Section Signals (with LED)	9	$900	$8,100
5-Foot Extension	1	$2,500	$2,500
Strap-on Mid Mast Arm Mount	1	$1,000	$1,000
R10-X12 Sign Panels	4	$500	$2,000
Controller Cabinet Modifications	1	$2,000	$2,000
6 x 6 NMC Loop Detectors	8	$1,500	$12,000
6/c#14 Cable (to poles 1, 2, 3, 4)	800'	$2	$1,600
EVP detector modifications	1	$500	$500
Traffic Control	1	$2,500	$2,500
Sub Total			$34,600
Miscellaneous	approx. 15%		$5,400
Total Estimated Revise Signal System Costs			$40,000

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2016 Anoka County Counts
Armstrong Blvd at Sundown Dr/147th St
AM Peak
Ramsey, MN

File Name : 1-CSAH 83 (Armstrong Blvd) at Sundown Drive_147th Avenue 6AM-9AM.ASF
Site Code :
Start Date : 9/29/2016

Groups Printed- Cars + - Trucks

	Armstrong Blvd From North						Sundown Drive From East						Armstrong Blvd From South						147th Street From West						
Start Time	Right	Thru	Left	UTrn	Peds	App. Total	Right	Thru	Left	UTrn	Peds	App. Total	Right	Thru	Left	UTrn	Peds	App. Total	Right	Thru	Left	UTrn	Peds	App. Total	Int. Total
BREAK																									
06:00 AM	0	74	10	0	0	84	3	0	7	0	0	10	10	11	0	0	0	21	0	0	0	0	0	0	115
06:15 AM	0	64	11	0	0	75	2	0	6	0	0	8	12	19	0	0	0	31	1	0	0	0	0	1	115
06:30 AM	0	77	12	0	0	89	2	1	5	0	0	8	9	21	0	0	0	30	0	0	0	0	0	0	127
06:45 AM	0	50	23	0	0	73	3	0	11	0	1	15	22	25	3	0	0	50	0	0	0	0	0	0	138
Total	0	265	56	0	0	321	10	1	29	0	1	41	53	76	3	0	0	132	1	0	0	0	0	1	495
07:00 AM	0	57	13	0	0	70	4	0	9	0	0	13	20	20	3	0	0	43	3	0	0	0	0	3	129
07:15 AM	0	65	18	0	0	83	5	0	9	0	1	15	40	24	0	0	0	64	0	0	0	0	0	0	162
07:30 AM	1	48	15	0	0	64	4	0	5	0	0	9	47	48	0	0	0	95	0	0	0	0	0	0	168
07:45 AM	1	57	18	0	0	76	3	0	11	0	0	14	38	30	1	0	0	69	0	0	1	0	0	1	160
Total	2	227	64	0	0	293	16	0	34	0	1	51	145	122	4	0	0	271	3	0	1	0	0	4	619
08:00 AM	1	32	19	0	0	52	8	0	13	0	0	21	24	18	0	0	0	42	2	0	0	0	0	2	117
08:15 AM	0	57	9	0	0	66	8	0	11	0	0	19	14	17	2	0	0	33	0	1	1	0	0	2	120
08:30 AM	0	46	15	0	0	61	7	1	12	0	1	21	18	21	1	0	0	40	0	0	0	0	0	0	122
08:45 AM	0	33	13	0	0	46	9	0	7	0	0	16	29	20	2	0	0	51	0	0	0	0	0	0	113
Total	1	168	56	0	0	225	32	1	43	0	1	77	85	76	5	0	0	166	2	1	1	0	0	4	472
Grand Total	3	660	176	0	0	839	58	2	106	0	3	169	283	274	12	0	0	569	6	1	2	0	0	9	1586
Apprch %	0.4	78.7	21	0	0		34.3	1.2	62.7	0	1.8		49.7	48.2	2.1	0	0		66.7	11.1	22.2	0	0		
Total %	0.2	41.6	11.1	0	0	52.9	3.7	0.1	6.7	0	0.2	10.7	17.8	17.3	0.8	0	0	35.9	0.4	0.1	0.1	0	0	0.6	
Cars +	2	650	172	0	0	824	57	2	101	0	2	162	271	258	12	0	0	541	5	1	1	0	0	7	1534
% Cars +	66.7	98.5	97.7	0	0	98.2	98.3	100	95.3	0	66.7	95.9	95.8	94.2	100	0	0	95.1	83.3	100	50	0	0	77.8	96.7
Trucks	1	10	4	0	0	15	1	0	5	0	1	7	12	16	0	0	0	28	1	0	1	0	0	2	52
% Trucks	33.3	1.5	2.3	0	0	1.8	1.7	0	4.7	0	33.3	4.1	4.2	5.8	0	0	0	4.9	16.7	0	50	0	0	22.2	3.3

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2016 Anoka County Counts
Armstrong Blvd at Sundown Dr/147th St
Mid-Day Peak
Ramsey, MN

File Name : 2-CSAH 83 (Armstrong Blvd) at Sundown Drive_147th Avenue 11AM-1PM.ASF
Site Code :
Start Date : 9/29/2016

Groups Printed- Cars + - Trucks

	Armstrong Blvd From North						Sundown Drive From East						Armstrong Blvd From South						147th Street From West						
Start Time	Right	Thru	Left	UTrn	Peds	App. Total	Right	Thru	Left	UTrn	Peds	App. Total	Right	Thru	Left	UTrn	Peds	App. Total	Right	Thru	Left	UTrn	Peds	App. Total	Int. Total
BREAK																									
11:00 AM	1	23	8	0	0	32	14	0	11	0	0	25	19	20	0	1	0	40	1	0	0	0	0	1	98
11:15 AM	1	19	11	0	0	31	10	1	17	0	0	28	24	19	1	0	0	44	1	0	0	0	0	1	104
11:30 AM	0	22	8	0	0	30	12	0	15	0	1	28	17	28	0	0	0	45	0	1	0	0	0	1	104
11:45 AM	0	16	12	0	0	28	11	0	8	0	0	19	20	16	1	0	0	37	0	1	0	0	0	1	85
Total	2	80	39	0	0	121	47	1	51	0	1	100	80	83	2	1	0	166	2	2	0	0	0	4	391
12:00 PM	0	27	11	0	0	38	12	0	12	0	0	24	22	31	0	0	0	53	0	0	0	0	0	0	115
12:15 PM	1	17	6	0	0	24	22	2	16	0	0	40	24	34	2	0	0	60	2	1	1	0	0	4	128
12:30 PM	0	24	9	0	0	33	11	0	15	0	0	26	33	18	5	0	0	56	0	1	2	0	0	3	118
12:45 PM	1	22	11	0	0	34	15	0	12	0	0	27	22	28	0	0	0	50	2	0	0	0	0	2	113
Total	2	90	37	0	0	129	60	2	55	0	0	117	101	111	7	0	0	219	4	2	3	0	0	9	474
Grand Total	4	170	76	0	0	250	107	3	106	0	1	217	181	194	9	1	0	385	6	4	3	0	0	13	865
Apprch %	1.6	68	30.4	0	0		49.3	1.4	48.8	0	0.5		47	50.4	2.3	0.3	0		46.2	30.8	23.1	0	0		
Total %	0.5	19.7	8.8	0	0	28.9	12.4	0.3	12.3	0	0.1	25.1	20.9	22.4	1	0.1	0	44.5	0.7	0.5	0.3	0	0	1.5	
Cars +	3	161	75	0	0	239	105	3	102	0	1	211	176	186	8	1	0	371	6	4	3	0	0	13	834
% Cars +	75	94.7	98.7	0	0	95.6	98.1	100	96.2	0	100	97.2	97.2	95.9	88.9	100	0	96.4	100	100	100	0	0	100	96.4
Trucks	1	9	1	0	0	11	2	0	4	0	0	6	5	8	1	0	0	14	0	0	0	0	0	0	31
% Trucks	25	5.3	1.3	0	0	4.4	1.9	0	3.8	0	0	2.8	2.8	4.1	11.1	0	0	3.6	0	0	0	0	0	0	3.6

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3535 Vadnais Center Drive
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2016 Anoka County Counts
Armstrong Blvd at Sundown Dr/147th St
PM Peak
Ramsey, MN

File Name : 3-CSAH 83 (Armstrong Blvd) at Sundown Drive_147th Avenue 3PM-7PM.ASF
Site Code :
Start Date : 9/29/2016
Page No : 1

Groups Printed- Cars + - Trucks

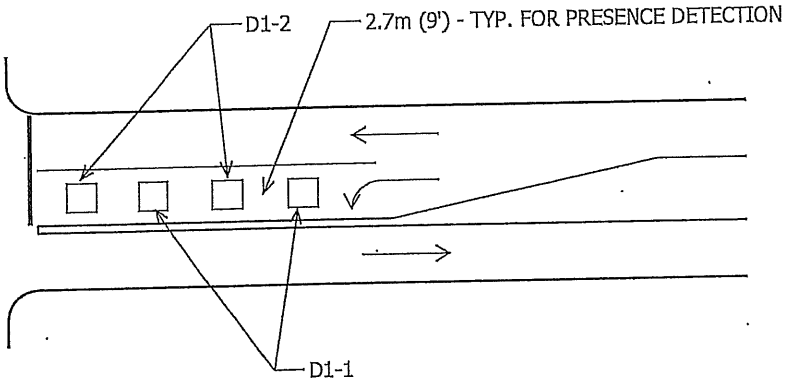
	Armstrong Blvd From North						Sundown Drive From East						Armstrong Blvd From South						147th Street From West						
Start Time	Right	Thru	Left	UTrn	Peds	App. Total	Right	Thru	Left	UTrn	Peds	App. Total	Right	Thru	Left	UTrn	Peds	App. Total	Right	Thru	Left	UTrn	Peds	App. Total	Int. Total
BREAK																									
03:00 PM	0	27	10	0	0	37	23	0	14	0	1	38	29	36	0	1	0	66	0	0	0	0	0	0	141
03:15 PM	0	26	16	0	0	42	20	0	24	0	0	44	17	49	1	0	0	67	5	0	0	0	0	5	158
03:30 PM	0	47	17	0	0	64	31	0	22	0	0	53	30	57	2	0	1	90	0	0	0	0	1	1	208
03:45 PM	0	34	19	0	0	53	26	0	10	0	0	36	41	53	0	2	0	96	1	0	1	0	0	2	187
Total	0	134	62	0	0	196	100	0	70	0	1	171	117	195	3	3	1	319	6	0	1	0	1	8	694
04:00 PM	0	46	7	0	0	53	35	0	30	0	0	65	27	54	0	0	0	81	0	0	0	0	0	0	199
04:15 PM	1	29	22	0	0	52	33	0	29	0	0	62	29	58	0	0	0	87	0	0	1	0	0	1	202
04:30 PM	0	52	10	0	0	62	45	0	41	0	0	86	31	65	0	1	1	98	1	0	0	0	0	1	247
04:45 PM	1	33	18	0	0	52	32	1	29	0	0	62	32	73	1	0	0	106	1	0	0	0	0	1	221
Total	2	160	57	0	0	219	145	1	129	0	0	275	119	250	1	1	1	372	2	0	1	0	0	3	869
05:00 PM	2	38	20	0	0	60	47	0	23	0	0	70	35	73	0	1	0	109	4	0	0	0	0	4	243
05:15 PM	0	45	9	0	0	54	37	0	22	0	0	59	36	64	0	0	0	100	0	0	0	0	0	0	213
05:30 PM	0	49	14	0	0	63	34	0	20	0	2	56	26	56	2	0	0	84	1	0	1	0	0	2	205
05:45 PM	1	38	14	0	0	53	26	0	7	0	1	34	31	68	1	2	0	102	0	0	2	0	0	2	191
Total	3	170	57	0	0	230	144	0	72	0	3	219	128	261	3	3	0	395	5	0	3	0	0	8	852
06:00 PM	0	46	15	0	0	61	41	0	17	0	1	59	32	49	1	1	0	83	0	0	1	0	0	1	204
06:15 PM	0	38	16	0	0	54	34	0	19	0	3	56	24	54	0	1	0	79	0	0	0	0	0	0	189
06:30 PM	0	41	12	0	4	57	20	0	21	0	5	46	25	47	0	0	0	72	1	0	0	0	0	1	176
06:45 PM	0	24	17	0	0	41	25	0	13	0	0	38	26	31	0	0	0	57	0	0	0	0	0	0	136
Total	0	149	60	0	4	213	120	0	70	0	9	199	107	181	1	2	0	291	1	0	1	0	0	2	705
Grand Total	5	613	236	0	4	858	509	1	341	0	13	864	471	887	8	9	2	1377	14	0	6	0	1	21	3120
Apprch %	0.6	71.4	27.5	0	0.5		58.9	0.1	39.5	0	1.5		34.2	64.4	0.6	0.7	0.1		66.7	0	28.6	0	4.8		
Total %	0.2	19.6	7.6	0	0.1	27.5	16.3	0	10.9	0	0.4	27.7	15.1	28.4	0.3	0.3	0.1	44.1	0.4	0	0.2	0	0	0.7	
Cars +	5	602	233	0	0	840	508	1	339	0	2	850	460	866	4	9	1	1340	14	0	6	0	0	20	3050
% Cars +	100	98.2	98.7	0	0	97.9	99.8	100	99.4	0	15.4	98.4	97.7	97.6	50	100	50	97.3	100	0	100	0	0	95.2	97.8
Trucks	0	11	3	0	4	18	1	0	2	0	11	14	11	21	4	0	1	37	0	0	0	0	1	1	70
% Trucks	0	1.8	1.3	0	100	2.1	0.2	0	0.6	0	84.6	1.6	2.3	2.4	50	0	50	2.7	0	0	0	0	100	4.8	2.2

Exhibit 4-6 Protected Permissive and FYA Left Turn – Separate Left Turn Lane

LOOP DETECTOR PLACEMENT

PROTECTED/PERMISSIVE AND FLASHING YELLOW LEFT TURN

SEPARATE LEFT TURN LANE



LOOP DETECTOR FUNCTIONS
1 = CALL AND EXTEND

NUMBER	FUNCTION	SIZE	LOCATION
D1-1	1	2 - 1.7 x 1.7m (6' X 6')	6m (20') & 15m (50')
D1-2	1	2 - 1.7 x 1.7m (6' X 6')	1.5m (5') & 11m (35')

LOCATION = DISTANCE FROM STOP BAR TO LOOP DETECTOR

NOTES:

1) CONTROLLER PHASE AND DETECTOR FUNCTION SHALL BE NON-LOCK MEMORY WITH NO RECALL.
2) USE BACK UP PROTECTION TO PREVENT LEFT TURN TRAP IF THERE ARE OPPOSING LEFT TURNS.
3) DESIGN SPEED IS 25 MPH.
4) EACH NUMBERED LOOP DETECTOR SHALL HAVE A SEPARATE LEAD-IN CABLE AND SEPARATE AMPLIFIER.
5) IF USING NMC LOOPS, A SINGLE LARGER LOOP CAN REPLACE THE DUALS.
6) DETECTOR CROSS SWITCHING MAY BE USED.
7) USE THIS FIGURE IF INSTALLING A FLASHING YELLOW ARROW (FYA).

FIGURE 5

Metric				US Customary			
		Intersection sight distance				Intersection sight distance	
		Passenger cars				Passenger cars	
Design speed (km/h)	Stopping sight distance (m)	Calculated (m)	Design (m)	Design speed (mph)	Stopping sight distance (ft)	Calculated (ft)	Design (ft)
20	20	30.6	35	15	80	121.3	125
30	35	45.9	50	20	115	161.7	165
40	50	61.2	65	25	155	202.1	205
50	65	76.5	80	30	200	242.6	245
60	85	91.7	95	35	250	283.0	285
70	105	107.0	110	40	305	323.4	325
80	130	122.3	125	45	360	363.8	365
90	160	137.6	140	50	425	404.3	405
100	185	152.9	155	55	495	444.7	445
110	220	168.2	170	60	570	485.1	490
120	250	183.5	185	65	645	525.5	530
130	285	198.8	200	70	730	566.0	570
				75	820	606.4	610
				80	910	646.8	650

Note: Intersection sight distance shown is for a passenger car making a left turn from an undivided highway. For other conditions and design vehicles, the time gap should be adjusted and the sight distance recalculated.

Exhibit 9-67. Intersection Sight Distance—Case F—Left Turn from Major Road

If stopping sight distance has been provided continuously along the major road and if sight distance for Case B (stop control) or Case C (yield control) has been provided for each minor-road approach, sight distance will generally be adequate for left turns from the major road. Therefore, no separate check of sight distance for Case F may be needed.

However, at three-leg intersections or driveways located on or near a horizontal curve or crest vertical curve on the major road, the availability of adequate sight distance for left turns from the major road should be checked. In addition, the availability of sight distance for left turns from divided highways should be checked because of the possibility of sight obstructions in the median.

At four-leg intersections on divided highways, opposing vehicles turning left can block a driver's view of oncoming traffic. Exhibit 9-98, presented later in this chapter, illustrates intersection designs that can be used to offset the opposing left-turn lanes and provide left-turning drivers with a better view of oncoming traffic.

Varying Between Protected, Protected/Permissive, and Permissive Operation

As discussed above, the FYA can be considered a variable operation signal indication. Consider the following items:

- ✓ All FYA signals may vary operation between protected, protected/permissive, and permissive operation at various times of the day and night.
- ✓ Each signal approach will need to be analyzed individually to determine the time-of-day FYA operation by considering the following criteria:
  a) Cross-product volumes of left turns and opposing throughs at various times of day
  b) Speed limit
  c) Sight distance limitations
  d) Number of opposing through lanes
  e) Double left turn lanes or single left turn lanes
  f) Opposing left turn lane offset
  g) Cross street or mainline approach
  h) Comprehensive left turn crash analysis of approaches with similar characteristics

Test for Protected Only Operation 24 Hours per Day

In some cases, the left turn indication should run in the most restrictive Protected-Only mode 24 hours per day. Refer to Exhibit 3-13 for the Protected Only Left Turn Operation Guidelines. If the answer to question 1 or 2 is "yes", then protected operation should be used throughout the day.

Exhibit 3-13 Part 1: Protected-Only Left Turn Operation 24 Hours per Day

Part 1: Protected Only Operation - 24 hrs/day Guidelines

Question 1: Conflicting Left Turns

Do the opposing left turn paths conflict?

○ Yes
○ No

> If the answer is Yes, then use Protected Operation 24 hours/day.
> If the answer is No, proceed to the next question.

Question 2: Limited Sight Distance

Does the left turner have very limited sight distance as defined in the current AASHTO "A Policy on Geometric Designs of Highways and Streets"?

○ Yes
○ No

> If the answer is Yes, then use Protected Operation 24 hours/day.
> If the answer is No, proceed to part 2 to check for FYA by TOD.

> If the Answer is Yes to Question 1 or 2, use Protected Operation 24 hours/day
> If the Answer is No to all of the above, proceed to Part 2.

If the answer is "yes" to any of the questions in Part 1, then Protected-Only operation is suggested throughout the day. If the answer to all of the questions is "no", then proceed to Part 2 (Exhibit 3-14) to check for permissive FYA operation by time of day.

Test for FYA Operation by Time of Day

Part 2 (Exhibit 3-14) should be performed for each time of day interval. Typically, the evaluation would be for 4 or more intervals throughout the day (AM Peak, Mid-day Peak, PM Peak and Off Peak). Other intervals can be evaluated as warranted.

For the Cross-Product (Question 6) use the highest hourly cross product during the interval evaluated.

Exhibit 3-14 Part 2: Permissive FYA Operation by Time of Day

Part 2: Time of Day Operation of FYA

_____ Start Time

_____ End Time

Question 3: Number of Left Turn Lanes

Does the left turn have two (2) or more lanes?

○ Yes
> If the answer is **Yes**, Protected Operation is **suggested** during the **high** volume times of the day (use Engineering Judgment if Decision to run FYA by TOD).

○ No
> If the answer is **No**, proceed to the next question.

Question 4: Number of Opposing Through Lanes

Does the left turn face three (3) or more opposing through lanes?

○ Yes
> If the answer is **Yes**, Protected Operation is **suggested** during the **high** volume times of the day (use Engineering Judgment if Decision to run FYA by TOD).

○ No
> If the answer is **No**, proceed to the next question.

Question 5: Crash History

Is protected/permissive operation in place and is there a high number of left turn related collisions during this time interval over a 3-year period susceptible to correction by protected only phasing?

○ Yes
> If the answer is **Yes**, Protected Operation is **suggested** for this TOD.

○ No
> If the answer is **No**, proceed to the next question.

Question 6: Speed and Cross Product

Is the Speed 45 MPH or greater and the Peak Hour left turn volume greater than 240 vph or is the peak hour cross product greater than 80,000 (100,000 if 2 opposing lanes)?

○ Yes
> If the answer is **Yes**, Protected Operation is **suggested** for this TOD.

○ No
> If the answer is **No**, FYA may be possible during this time period.

> If the answer is **Yes** to all Questions, Protected Only Operation is **Suggested** during this TOD (use Engineering Judgment if Decision to run FYA by TOD).

> If the answer is **No** to all Questions, FYA may be used during this TOD.

If the answer to all of the questions in Part 2 are "yes", protected only operation is suggested. Use engineering judgment if a decision to run FYA for the evaluated time period.

Question 6 does include a threshold volume of 240 vph for the subject left turn. However, if the opposing through volume is low, apply engineering judgment to determine if FYA operation could be used even if the left turn volume exceeds 240 vph.

If permissive FYA operation is allowed, protected/permissive operation may be investigated. The decision to use protected/permissive operation should be based on a capacity analysis.

Definitions

- ✓ **Protected only left turn operation:** signal phasing that allows left turn movements to only be made on an exclusive phase (green arrow).
- ✓ **Conflicting Left Turn Paths:** At some locations geometric constraints at the intersection cause the paths of opposing left turn vehicles to cross as overlap creating a conflict. An example is an approach that crosses a divided roadway with a wide median. In these locations, it may be necessary to operate the left turns in a lead-lag sequence or a split phase sequence, not allowing simultaneous opposing left turns. This operation will require protected left turns.
- ✓ **Opposing through lane (conflict):** The opposing through lanes are the lanes across from, and in conflict with, the left turning vehicle. Multiple lanes make it difficult for a driver to evaluate gaps in oncoming traffic. An opposing separate right turn lane will typically not be counted with opposing through lanes unless engineering judgment indicates that the lane configuration and number of right turns will cause conflicts with the left turn movement.
- ✓ **Limited Sight Distance (Requirements):** The minimum sight distance values necessary for the design vehicle volume to complete the turn movement. Distance should be calculated from the stop bar for the mainline left turning vehicle. Measurement is based on travel path, speed, and acceleration vehicle height. Both the sight distance for passenger vehicles and trucks should be checked using heights and distance requirements per the AASHTO Geometric Design Guide. The current reference at time this manual was prepared is the 2004 Guide, Chapter 9, Exhibit 9-67).
- ✓ **Dual Left Turn Lanes:** Multiple left turn lanes may consist of exclusive left turn lanes or a combination of exclusive left turn lanes and lanes that are shared by through and left turning traffic. Both the dual lane and the left turn lane opposing this operation are suggested to operate with protected phasing. Left turn lanes without opposing traffic, such as left turns off of a one- way street, does not require protected only phasing based upon this criteria. It might also be possible to run the FYA in permissive mode during low volume times of the day.
- ✓ **Protected/permissive left turn operation:** signal phasing that provides an exclusive phase (green arrow) followed by a permissive phase (flashing yellow arrow), time during the signal cycle where left turning traffic may make a left turn after yielding to oncoming traffic.
- ✓ **Left Turn Related Collisions:** These are Collisions that could be corrected by protected only phasing, such as those between those involving a left turning vehicle and an opposing through vehicle. At higher speeds the accidents collisions are likely to be more severe. Therefore, a lower number of collisions might be used as the parameter for consideration for high-speed approaches. Because of the variations in collisions overtime, an average number of collisions per year over a 3- year period should be used if the data is available.
- ✓ **Speed:** Because it can be difficult for a driver to accurately judge available gaps in traffic approaching at high speeds, the engineer must exercise discretion when considering permissive or protected permissive left turn phasing with opposing speeds of 45 MPH or above.

Use of posted speed limit is recommended. Non-arterial approaches may have lower speeds than the posted speed limit because they are often in a stop condition upon the arrival of traffic. Grades affect the acceleration rate of the left turner and the stopping distance and speed of the opposing through traffic and are therefore considered in conjunction with speeds.

✓ **Cross Product:** The left turn volume multiplied by the opposing through volume. The cross product values used are taken from the Wisconsin Department of Transportation (WisDOT) Traffic Signal Design Manual discussion on left turn conflicts analysis, Chapter 2, Section 3, Subject 4. Cross product used represents a high frequency of conflicts for left turners looking for gaps in through traffic.

FYA during Free Operation

With the variable-phasing operation of the FYA head, free operation will no longer have an assigned fixed phasing operation. Therefore, standard free operation will need to be set up in the signal controller so technicians can put signals quickly to FREE with a standard phasing operation desired at the specific time. Here is an example of the standard FREE operations that will need to be set up in the signal controller:

1. All left turns protected
2. All left turns protected/permissive
3. All left turns permissive
4. Mainline protected, cross street protected permissive
5. Mainline protected, cross street permissive
6. Mainline protected/permissive, cross street protected
7. Mainline protected/permissive, cross street permissive
8. Mainline permissive, cross street protected
9. Mainline permissive, cross street protected/permissive Minimum Green Times

Minimum Green Times

Mn/DOT currently sets the minimum green time based on the type of phasing operation where protected lefts have a 7 second minimum green and protected/permissive lefts have a 5 second minimum green. Given the FYA head is a variable phasing operation head, a decision will need to be made as to if there should be more than one minimum green value that changes with the phasing operation; or if a universal minimum green should apply to all phasing operations.

If one minimum green is used, and if a left turn phase will ever run protected, the left turn minimum green should be set at 7 seconds. If a left turn will never run protected (i.e. only run protected/permissive or permissive), then the left turn minimum green should be set at 5 seconds.

EVP Preemption Operation under FYA

A. Protected-only Operation

✓ When the FYA is not allowed (protected only), the pre-emption will bring up the protected left turn and the adjacent through phase. The opposing FYA will not be allowed during preemption (refer to Exhibit 3-15).

Public Works Committee **6. 1.**

Meeting Date: 11/17/2020

By: Bruce Westby, Engineering/Public Works

Title:

Receive Staff Updates on Improvement Projects, Studies and Items of Interest

Purpose/Background:

rpose/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

- **The COR Regional Infiltration Basin (#18-09)**
  - Final payment anticipated December 2020
- **Wetland 114P Outlet Control Improvements (#19-07)**
  - Requested by DNR
  - Construction proposed 2021
- **Variolite Street Reconstruction (#20-01)**
  - Sanitary sewer and watermain construction complete
  - Base course paving complete
  - Wear course paving weather dependent
  - Centerline striping will be provided in 2020

Anoka County Improvement Projects

- **Roundabout at Armstrong Boulevard/CSAH 83 and Alpine Drive**
  - Anoka County received $1.35M in HSIP funds (est. project cost = $1.5M)
  - Anoka County and City of Ramsey share is $150,000 each (per $1.5M est.)
  - Construction proposed for 2022, pending City and County approvals
- **CSAH 116 & TH 47 Intersection Improvements**
  - Constructing additional turn lanes to improve congestion and safety in 2021
  - *Staff will review the final design layout with the PWC during the meeting*

MnDOT Improvement Projects

- **US 10 / 169 & Ferry Street / TH 47 Interchange**
  - Construction proposed 2022 - 2024
- **Ferry Street / Trunk Highway 47 Grade Separation @ BNSF Rail Crossing**
  - Preliminary design is still on hold
  - MnDOT exploring realignment of Highway 47 to remove S-curve, which would require the relocation of Alter Recycling
  - Tentatively proposed for construction in 2024 or later
- **Rum River Bridge Replacement**
  - Construction proposed 2022 - 2024
  - Proposing three lanes between Highway 47 and 7th Street

Studies & Items of Interest

- **Anoka Solution Highway 10 Improvements**

    - Construction proposed 2022 - 2024
- **NW Metro Surface Water Supply Feasibility Study**
    - Member cities include Corcoran, Dayton, Ramsey and Rogers
    - MCES funded 100% using Clean Water Funds
    - Final draft of study complete è Staff will review at future meeting
- **City of Ramsey Centralized Water Treatment Facility Study**
    - Final draft of study complete è Staff will review at future meeting
- **Ramsey Gateway Highway 10 Improvements**
    - Design efforts underway for both Ramsey Blvd. and Sunfish Lake Blvd.
    - $63.9M has been secured; another $20M has been requested
    - Other funding sources will continue to be pursued
- **NW Metro Mississippi River Crossing Feasibility Analysis (NEW)**
    - No updates at this time
- **TH 47 Safety Study (NEW)**
    - No updates at this time
- **Reduced Speed Limits on Local Streets**
    - No new requests received since last discussed
    - Monitoring discussions in Minneapolis and Saint Paul

Timeframe:

Staff estimates up to 15 minutes will be needed for updates and discussion.

Observations/Alternatives:

NA

Funding Source:

NA

Recommendation:

NA

Action:

No formal action required. For Committee review and discussion purposes only.

Attachments

No file(s) attached.

Form Review

Inbox	Reviewed By	Date
Grant Riemer	MaryJo Warner	11/12/2020 04:27 PM
Kurt Ulrich	Kurt Ulrich	11/12/2020 04:34 PM
Form Started By: Bruce Westby		Started On: 11/09/2020 04:10 PM
Final Approval Date: 11/12/2020		

Public Works Committee **6. 2.**

Meeting Date: 11/17/2020

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:

Staff estimates less than 5 minutes will be necessary to review the future topics calendar and address questions.

Observations/Alternatives:

NA

Funding Source:

NA

Recommendation:

NA

Action:

No formal action required. For Committee review and discussion purposes only.

Attachments

PWC Calendar Nov2020

Form Review

Inbox	Reviewed By	Date
Grant Riemer	MaryJo Warner	11/12/2020 04:27 PM
Kurt Ulrich	Kurt Ulrich	11/12/2020 04:36 PM
Form Started By: Bruce Westby		Started On: 11/09/2020 04:11 PM
Final Approval Date: 11/12/2020		

Public Works Committee Future Topics Calendar *

Date	Topics for Discussion – Committee Action
January 2021	Sunfish Lake Sedimentation Basin Improvements *(Westby)*
February 2021	Available Funding Assistance for Wet Basement Repairs *(Westby)*
Future/TBD	Sunwood Drive Roundabout Landscaping *(Riemer)*
Date	**Topics for Discussion – Regulatory**
Future/TBD	Sunfish Lake Boulevard Speed Study Results *(Westby)*
Future/TBD	Bunker Lake Boulevard Speed Study Results *(Westby)*
Future/TBD	County Ditch Maintenance / Buffer Law *(Westby)*
Date	**Topics for Discussion – Policy**
Future/TBD	Landscaped Median Maintenance Policy *(Riemer)*
March 2021	Draft Trail Maintenance Policy *(Westby)*
April 2021	Draft Stormwater Pond Maintenance Policy *(Westby)*
Date	**Topics for Discussion – Planning and Budget**
January 2021	Municipal State Aid System (MSAS) Revisions *(Westby)*
June 2021	Review 1996 and 2007 (unadopted) TH 47 Corridor Studies *(Westby)*
Ongoing	Public Works Facility Review/Update *(Riemer)*
Future/TBD	Asset Management Program *(Westby)*
Date	**Topics for Discussion – Staff Updates**
Ongoing	Water Conservation Opportunities / Incentives *(Westby)*
Ongoing	NW Metro Area Regional Surface Water Supply Study *(Westby)*
Ongoing	Centralized Water Treatment Facility – Prelim. Design Report *(Westby)*
Ongoing	NW Metro Mississippi River Crossing Feasibility Analysis *(Westby)*
Ongoing	TH 47 Safety Study *(Westby)*

* Dates subject to change based on availability of information, required attendees, staff workload, and competing interests and objectives.